Indigenous Guardian programs as a model for evaluating traditional land use in post-reclaimed sites

by

Alexandra Davies Post

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This thesis explores Indigenous Guardian programs as a model for monitoring post-reclaimed mine sites in Treaty 8 Territory, Alberta, Canada. As a joint research project between Fort McKay First Nation (FMFN), University of Calgary and University of Waterloo co-researchers, the research goal was to further develop inclusive planning approaches that supported FMFN's vision for reclamation in their Traditional Territory.

Rooted in the Two-Roads Reconciliation & Reclamation Framework, which emphasizes bridging Indigenous Knowledge and Western science, this study investigates the potential of Indigenous Guardian programs to evaluate the ability of reclaimed lands to meet the traditional land use activities of FMFN. The research was guided by principles of participatory action research and wise practices described in the body of knowledge referred to in the literature as Indigenous research methodologies. Co-researchers from FMFN determined the scope, methods, analysis, and framing of this research.

This thesis reviews the literature and compares and contrasts the differences between community-based monitoring, Indigenous-led community-based monitoring, and Indigenous Guardian programs as models for monitoring in post-reclaimed sites. This assessment suggests that Indigenous Guardian programs offer a modern model of an Indigenous stewardship ethic that has existed since time immemorial and is a component of the modern expression of inherent rights and cultural revitalization within the communities that establish these programs.

Drawing on existing literature on Indigenous-led monitoring and 26 semi-structured interviews conducted with participants across Canada, this study highlights the alignment between Indigenous Guardian programs and the Two-Roads Reconciliation & Reclamation Framework. The findings 1) underscore the significance of recognizing Indigenous rights and knowledge systems in monitoring practices and moving beyond participatory approaches to ecological monitoring; 2) describe the Indigenous Guardian program model approach to setting monitoring and program objectives in their territories; 3) documents some of the benefits of Indigenous Guardian programs, including their role in strengthening capacity in their communities, generating data for decision-makers and supporting cultural resurgence among generations of community members as well as benefiting the broader Canadian public; 4) documents challenges that Indigenous Guardian programs face which are rooted in the legacy and ongoing impact of colonialism.

Overall, this thesis contributes to the discourse on Indigenous-led monitoring and offers considerations for FMFN and the oil sands industry regarding Indigenous Guardian programs as a tool to evaluate the ability of reclaimed lands to meet traditional land use needs in Treaty 8 Territory.

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Chapter 1
Introduction

1.1 Project Background and Conceptual Framing

My research began as a subproject of an innovative reclamation approach co-designed by Fort McKay First Nation (FMFN), an oil sands company in Alberta and an academic research team from the University of Waterloo and the University of Calgary. The research project intended to close the gap between social-ecological mine reclamation and closure planning in service of a movement toward a participatory and collaborative process (Daly et al., 2023). The collaborative approach to mine closure and reclamation was termed "co-reclamation," which was built on the Two Roads Approach (Daly et al., 2022; Two Roads Research Team, 2011, 2012). The Two-Roads Approach is an ethnoecological framework that supports Fort McKay's vision for mine closure and reclamation that represents Cree and Dene understandings and relationships with lands, waters and non-human relations in Treaty 8 Territory (Two Roads Research Team, 2011). In this framework, both Indigenous and Western knowledge remain distinct, each on their own road, with opportunities for collaboration, or bridges, that bring together both roads to advance reclamation outcomes. These approaches provide a conceptual framework for bridging Indigenous Knowledge and Western science for the purposes of reclamation.

1.1.1 Fort McKay First Nation

The research partner for this study was the FMFN Sustainability Department and a working group of land users, knowledge holders and Elders. FMFN resides on the banks of the Athabasca River roughly 60 km north of Fort McMurray in Treaty 8 Territory. About 800 members of Dene and Cree descent live in the community of Fort McKay. The Cree and Dene people of Fort McKay have stewarded this territory since time immemorial, practicing their inherent rights to gather, hunt, fish and be in relationship with the lands and waters (Fort McKay First Nation, 1994). These rights are affirmed by section 35 of the Constitution and recognized through the United Nations Declarations of the Rights of Indigenous Peoples (Constitution Act, 1982; UN General Assembly, 2007).

FMFN's Traditional Territory contains the Athabasca oil sands, which has created large-scale industrial impacts since 1967. Figure 1 shows the industrial footprint from 1967 to today, demonstrating the immense cumulative impacts within FMFN Traditional Territory.

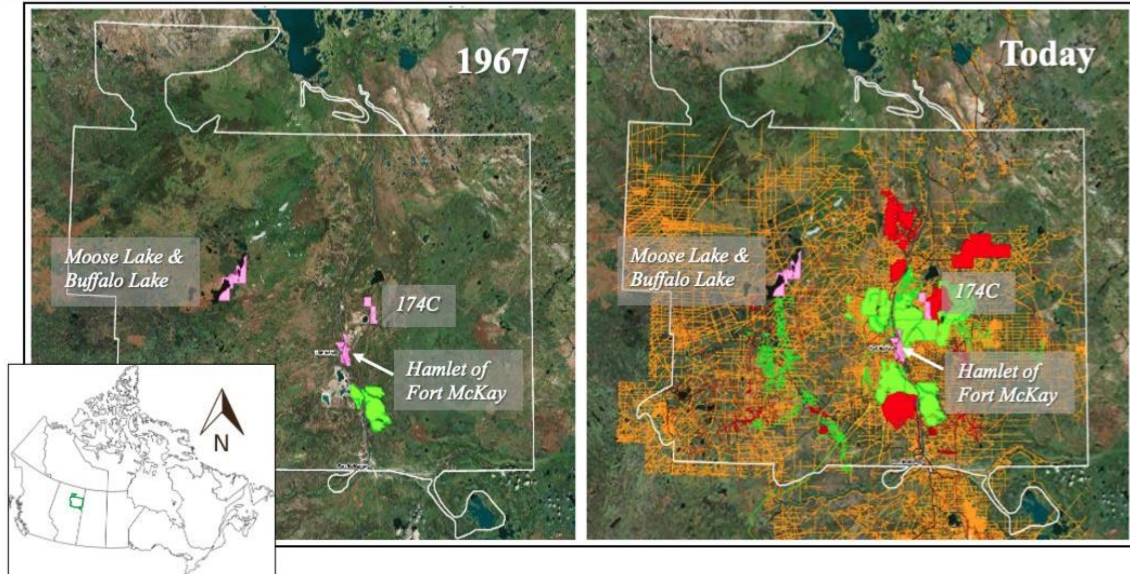

Figure 1 Changes in the industrial footprint in Fort McKay First Nation from 1967 to the present day.

Note: (Left) A birds-eye view of the oil sands industrial footprint within the FMFN Traditional Territory (white line) in 1967, the year oil sands activities started, and (right) present day. Pink is FMFN reserve lands, green is active oil sands projects, red is proposed or approved but not yet operating projects, and orange is primarily oil and gas exploration footprint. (Daly et al., 2022).

FMFN has a long-established history of collaboratively working with oil sand companies in their traditional territory while maintaining their members' inherent Aboriginal Treaty rights and FMFN's McKay First Nation's vision of reclamation and closure planning. This work builds on the existing work of the Cumulative Environmental Management Association (CEMA) to manage the cumulative effects of oil sands activities. The literature review and methodology section highlights how this body of work informed the research project.

1.2 Research Project Overview

1.2.1 Phase 1: Relationship Building and Collaboration Principles

Denzin et al. suggest criteria for critical Indigenous inquiry, including being "ethical, healing, transformative, decolonizing, and participatory" (p.2, 2008). As a researcher, it was essential to follow wise practices articulated in the body or research associated with Indigenous methodologies.

This often begins by building relationships; a list of the engagements can be found in section 3.2. This journey began for me in August 2019 when the university, company, and Fort McKay co-researchers gathered at Moose Lake, a protected area in Fort McKay's Traditional Territory. We began to get to know one another and familiarize ourselves with the Territory and each other. The group of Elders, land users and knowledge holders from Fort McKay, the employees and consultants from FMFN became co-researchers in this research project.

Once we returned from Moose Lake, it was clear that the co-researchers needed to develop some rules of engagement as we entered an ethical space for collaboration (Ermine, 2007). We set out to co-develop a code of conduct to guide effective, intercultural dialogue within the context of mine closure and reclamation planning in service of the first phase of the Two-Roads Reconciliation & Reclamation Framework (Daly, 2023). Instead of a code of conduct, we developed the Cycle of Respect (CoR) (figure 2), a dynamic and ever-evolving set of principles and themes to guide our research together.

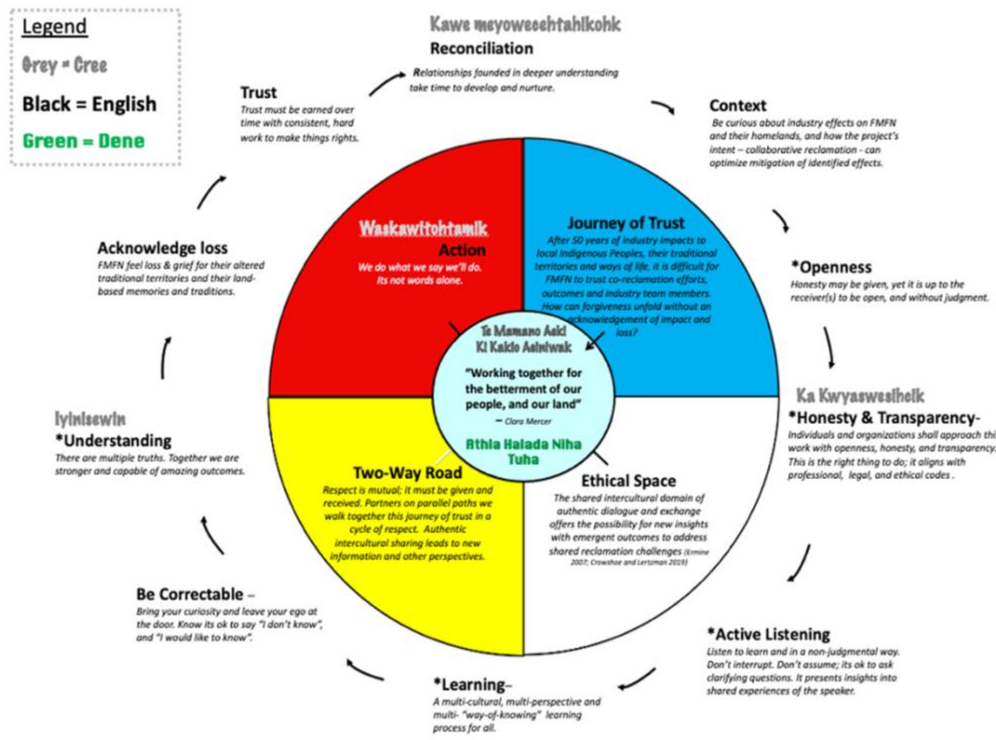

Figure 2 The Cycle of Respect (Daly et al., 2023).

1.2.2 Phase 2: Know and Understand

In February 2020, Fort McKay, university and company co-researchers again gathered in Fort McKay to discuss the vision of the reclaimed site. This meeting saw the beginnings of the Two-Roads Reconciliation & Reclamation Framework (Figure 3) (Daly et al., 2023). The Two-Roads Reconciliation & Reclamation Framework describes six key phases for Indigenous and non-Indigenous peoples to move through while working within their distinct knowledge systems and worldviews. The Two-Roads Reconciliation & Reclamation Framework acts as a model for collaborative reclamation and closure plans in Treaty 8 to be designed so that they may enable future generations of Fort McKay to stay connected to their land, water and ancestors. The Two-Roads Reconciliation & Reclamation Framework is meant to be used in combination with the Cycle of Respect and builds on the existing work done to date by Fort McKay through the Two Roads Approach. It is foundational to this research, especially phase six, or bridge six.

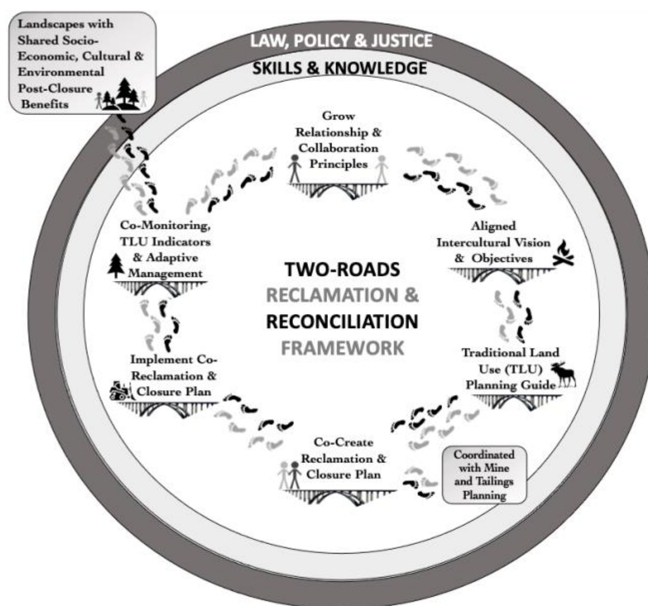

Figure 3 Phases of the Two-Roads Reconciliation & Reclamation Framework (Daly et al., 2023).

With the knowledge gathered in these meetings, co-researchers began to familiarize themselves with each other’s visions for the co-reclamation project. Table 1 highlights the mine closure visions of Fort McKay and company co-researchers.

Table 1 Project and/or Mine Closure Visions

Fort McKay	Company
Reclaiming the land is a form of reconciliation, and Fort McKay First Nation must define those targets. Part of reconciliation is to recognize the land in its original state, who are the original peoples of the land, along with the impacts that have been done, and to acknowledge the loss and resulting ongoing trauma. We will achieve this through long-term commitment with proper ceremony, First Nation (Cree and Dene) languages and knowledge, and the best of reclamation science to foster mutual understanding and respect and bring back respect to the land for current and future generations.	Collaboratively reclaim impacted land with Fort McKay First Nation to enhance reciprocal learning in land stewardship, relationships and trust in reclamation and closure outcomes.

During these meetings the university co-researchers were able to summarize the barriers to achieving a shared vision expressed by the company and Fort McKay co-researchers. Daly et al. (2023) identified four commonly expressed barriers to co-reclamation which include mistrust in government, industry and reclamation, one-sided system driven by government policies, regulations, and oil sands industry practices, differing worldviews and priorities between Indigenous peoples and company employees, and ongoing disconnection Fort McKay co-researchers experience from their traditional territory.

While barriers to understanding one another's vision for reclamation may have been expected, a global pandemic that would prevent in-person gatherings was not. We intended to set another gathering in April of 2020; of course, this was not possible. Instead, we shifted to gathering remotely from home via virtual engagement (see Table 5 for a list of those meetings). The shift to virtual gathering prevented some co-researchers from participating in the research process and presented new challenges in the research process, including limiting the ability of FMFN co-researchers to shape the research agenda.

1.2.3 Phase 3: Determine Research Goals

As we shifted to gathering remotely due to the COVID-19 response in our respective geographies, we began to explore what phases of the Two-Roads Reconciliation & Reclamation Framework could be carried out from home. Our first virtual project-wide gathering kicked off on April 21st, which brought together the university, the company and a subset of Fort McKay co-researchers. A detailed description of these engagements is available in Chapter 3: Methodology and Methods. Fort McKay co-researchers identified the need for a better understanding of community-centred approaches to monitoring, the sixth bridge within the Two-Roads Reconciliation & Reclamation Framework (figure 3). The community co-researchers needs determined the research project's goals and scoped my objectives, methods and outcomes of this research (Denzin et al., 2008). A review of the literature determined that Indigenous Guardian programs were a model that aligned with the Two-Roads Approach and offered a framework for monitoring traditional land use (TLU) (Reed et al., 2021). With this in mind, the research objectives below were co-created with Fort McKay co-researchers

1.3 Research Goal and Objectives

The goals and objectives were co-created with Fort McKay co-researchers. The methodology section provides greater detail on how this was done.

The goal of my study is to provide a summary and synthesis of the current state of knowledge on community-led monitoring to identify a monitoring model that evaluates the re-establishment of TLU capability on reclaimed oil sands mines and in situ footprints using the Two-Roads Reconciliation & Reclamation Framework located in the Traditional Territory of FMFN.

1.3.1.1 Objectives:

1. Through direct consultation with Fort McKay co-researchers, identify the scope, priorities, protocols, and methods to summarize the current state of knowledge on community monitoring.
2. Through a literature review, describe the current state of knowledge, terminology, and best practices for community-led monitoring, with an emphasis on Indigenous Guardian models.
3. Through semi-structured, key informant interviews, engage leading experts, practitioners, thought leaders, funders and knowledge holders in the field of community monitoring with an emphasis on Indigenous Guardian programs.

1.4 Positionality Statement

I began my research journey as a graduate student at the University of Waterloo in 2019 on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples, situated on the Haldimand Tract, the land granted to the Six Nations. I was raised on the traditional territory of the Wendat, the Haudenosaunee Confederacy, the Anishinaabeg, and the Treaty Lands of Mississaugas of the Credit. I was born next to the Credit River, which was a route for many Indigenous peoples who travelled from Lake Simcoe to Lake Ontario (Lake Ontario's name comes from the Iroquoian word "Oniatarí:io," and means lake of shining waters). I was privileged to travel across what is now known as Canada while writing my thesis and planted roots in the lands protected by the Dish with One Spoon Wampum Belt Covenant. I have benefited greatly from the lands and waters that the Haudenosaunee, Anishinaabe and allied Nations have cared for since time immemorial.

I began my research journey when I was invited by Dan McCarthy (University of Waterloo) to participate in a research project around reclamation between an Indigenous Nation and an oil sands company. I was first introduced to Cree and Dene culture by the co-researchers on this project, and I am still struck by their generosity and patience with us as co-researchers. I had little experience working with Indigenous knowledge holders and was confronted with my own understanding of identity. Having lived a life of privilege and comfort, I was confronted for the first time with the loss and trauma described by the community members of Fort McKay. It was a profound shift in my thinking that in order to advance reclamation, we first needed to acknowledge the loss that

community members had experienced from the oil sands disturbances in Treaty 8 Territory. Beginning to understand the loss was the beginning of understanding my own journey.

As a middle-class white woman, I have felt that the dominant Western worldview often was in service of me and was designed to maintain my standing in society. Through my journey in the literature and the research process, I was continuously confronted with the legacy of colonialism, from which my family and I have directly benefited. This power inequity is at the heart of what motivated me in this thesis and my career.

While writing this thesis, I took a position at a large conservation organization in Canada that seeks to support the authority and jurisdiction of Indigenous Nations to steward their lands and waters. In this role, I was able to deepen my understanding of how institutions yield power and shape how we think about the environment. I am still learning about my role in supporting Indigenous-led stewardship and how my internal biases and worldview maintain or dismantle the status quo for conservation and stewardship in what is now known as Canada.

1.5 Thesis Structure

Chapter 1: Introduction – This chapter provides an overview of the research project, why I was engaged in it and some of the key conceptual frameworks that guided the research. This section also outlines the objectives of this thesis.

Chapter 2: Literature Review – this chapter provides an overview and summary of how Indigenous Knowledge and Western science are distinct systems that have generative meaning and knowledge. This chapter will inform the methodology section and provide a framework for understating the differences between models that could evaluate traditional land use activities in FMFN traditional territory. This chapter meets objective 2.

Chapter 3: Methodology and methods – this chapter describes the methodological framework used in this study, Indigenous Research Methodologies, and summarizes some of the wise practices of working with Indigenous researchers. This section also described the methods used to complete the objectives listed above. This chapter describes in detail how I met objectives one and two.

Chapter 4: Results – This section describes the results of objective two, which included conducting 26 semi-structured interviews to contribute to the current state of knowledge and practice of Indigenous-led monitoring. The results of the semi-structured interviews yielded key insights into

how Indigenous Guardian programs set their objectives, what impacts Indigenous Guardian programs have, and the challenges Indigenous Guardian programs face in Canada.

Chapter 5: Conclusion – in the final chapter of this thesis, I summarize the key takeaways from my research and provide considerations for those implementing monitoring programs in the Intercultural Closure and Reclamation Framework.

Chapter 2
Literature Review

2.1 Introduction

The literature review centers around two major themes. The first describes themes in academic literature around Indigenous Knowledge and the distinction between Indigenous and Western ways of being and knowing. Building on the key tenants of each knowledge system, the literature review will explore and summarize some of the ways that Indigenous Knowledge and Western science interact with one another in the research process. I will describe the value of conceptual frameworks in multi-cultural research with Indigenous peoples and Western scientists and ultimately decide on using the Two Roads Approach, created by Fort McKay community members and SENES Consultants, as a conceptual framework for this study (Two Roads Research Team 2011, 2012). This section of the literature review acts as the foundation for the methodology section, which describes what steps the research team took to integrate the principles and wise practices into our research and identifies where the study fell short of applying the identified principles.

In the second part of the literature review, I will describe how community-based monitoring, Indigenous-led monitoring and Indigenous Guardian programs are characterized in the literature and analyze whether these models take into consideration Indigenous and Western ways of being and knowing. The literature review analyzes these models through dimensions of epistemology, power and participation in the programs, which build on Table 2 (Wilson, 2008).

The literature review was informed by the workshops, gatherings and conversations that I had with Fort McKay co-researchers and centred around their needs for monitoring traditional land use in a post-reclaimed site. See Chapter 3: Methodology and Methods section for more detail on the engagements with co-researchers. The literature review was conducted to explore models that could be used by Fort McKay to monitor a site that was co-reclaimed using the framework in Figure 3, the Two-Roads Reconciliation & Reclamation Framework.

2.1.1 Critical Indigenous Literature

Many scholars have compared the differences between Indigenous and Western ways of knowing and being (Kovach, 2009; Smith, 1999; Wilson, 2008). These differences are often juxtaposed with Indigenous and Western worldviews, an unconsciously assumed set of mental lenses that influence

how we perceive the world and our place within it (Reid et al., 2021). Of course, neither Indigenous nor Western peoples are homogenous, and within each group, there are distinct social, cultural, moral, and philosophical differences. However, a set of shared perceptions and experiences bind people within their group to a shared worldview and the literature is clear that while cultural and personal differences, of course, exist within worldviews, there are greater distinctions between Indigenous and Western ways of knowing (Reid et al., 2021).

Scholars often refer to differing worldviews by describing how people view knowledge generation, perception, and their relationship with reality. These differing sets of assumptions and values around knowing are often broken down into ontological, epistemological, axiological and methodological differences. A description of these differences is outlined in Table 2 (Wilson, 2008)

Table 2 Summary of differences between Indigenous and Western worldviews (adapted from Wilson, 2021).

	Definition	Indigenous	Western
Ontology	A set of beliefs about the world and about gaining knowledge that "goes together to guide people's actions as to how they are going to go about doing their research" (Wilson, 2008, p. 175).	Stresses one's relationship to reality and a connection between the physical and spiritual, highlighting the importance of ceremony (Wilson, 2008).	Focuses on the external world while removing oneself from it (Wilson, 2008).
Epistemology	The theory of knowledge or to know something	Relational and fluid way of knowing that emphasizes respectful, and reciprocal exchanges between human,	Based on hypothesis and theory construction, believing that humans are objective and there is

	in space and time (Wilson, 2008).	more than human relations and spiritual realm (Hart, 2008; Wright et al., 2019)	empirical truth (Reid et al., 2021).
Methodology	How you are going to use your way of thinking	Prioritize relationships, interconnectedness, and respect for the natural world. Indigenous methodologies are characterized by a focus on reciprocity, relationality, and holism (Kovach, 2009)	Emphasizes objective, scientific and reductionist approaches that strive to reduce value-based approaches to knowledge generation (Johnson & Murton, 2007).
Worldview	The systematic way in which we use to perceive the world around us and our place in it.	Viewing the world with a wholistic and cyclical view with humans embedded and inseparable from the whole (Little Bear, 2000; Reid et al., 2021).	Viewing the world through a linear, static and singular viewpoint that fosters externalization though objectivity (Little Bear, 2000)

Because of the differences in how cultures generate meaning and understanding of the world around them, scholars, Elders and Knowledge Holders have created conceptual frameworks that support cross-cultural collaboration between Indigenous knowledge holders and Western researchers. The next section describes some examples of these conceptual frameworks.

2.1.2 Braiding Knowledge – Conceptual Frameworks

As Table 2 describes, Indigenous Knowledge is deeply relational and holistic and should not be considered a product or body of knowledge (Berkes et al., 2007; Johnson & Murton, 2007). For this reason, one can not separate the knowledge from the knowledge holder. As McGregor describes, Indigenous Knowledge is "something one does" (McGregor, 2004, p. 385). Therefore, for scholars to generate meaning that is inclusive of Indigenous worldviews, we need to bring together Western and Indigenous knowledge holders and scholars with inequitable and collaborative research frameworks.

This is a foundational principle of Indigenous research methodologies and is explored in the methodology section.

Power is rooted within the networks of all social interactions and exists where human relationships exist (Hickey, 2020). Dimensions of power are evident in the structural and functional components of human relationships and are present in normative and functional or actionable ways (Digeser, 1992; Foucault, 1994; Luke, 1974). Indigenous research methodologies address power in the relationships that emerges between researchers. Power inequities emerge when researchers, especially in academia, attempt to include Indigenous Knowledge within a Western model or framework of inquiry (Smith, 1999). By integrating Indigenous Knowledge into Western models of inquiry, researchers knowingly or unknowingly weaken Indigenous teachings by generalizing and taking out context, assimilating Indigenous Knowledge so that it is tokenized or invisible (Reid et al., 2021). Instead, researchers are actioning models that allow both ways of knowing to exist alongside each other while remaining distinct. While there are many terms for this approach, some of which are described in Table 3, in this thesis, I will use braiding. Braiding is defined as a practice of bringing together Western and Indigenous peoples towards a "generative orientation" which weaves together knowledge "to create something new and contextually relevant, while not erasing differences, historical and systemic violence, uncertainty, conflict, paradoxes and contradictions." (Jimmy & Andreotti, 2019, p.21). Braiding, as a method, provides support for how Indigenous and Western knowledge systems can co-exist within a research program and, if conditions are suited, benefit one another and research outcomes. It is important to establish a method of pairing or braiding knowledge when bringing together Indigenous and non-Indigenous co-researchers. Otherwise, the risk of integrating or incorporating Indigenous knowledge into Western modes of knowledge generation can become all too real and harm can be done to researchers (Reid et al., 2021). A table of these conceptual frameworks used by Indigenous and Western researchers from around the world is described below. While each conceptual framework is distinct and represents the unique context of localized Indigenous culture, common themes include making space for all distinct knowledges (Bartlett et al., 2012; Maxwell et al., 2020; McGregor, 2004), a recognition of the power imbalance between the use of western and Indigenous knowledges (Howitt & Suchet-pearson, 2006; McGregor, 2004; Muller, 2012; Zanotti & Palomino-Schalscha, 2016) and that there is value in these knowledge systems coming together for to achieve a common goal (Bartlett et al., 2012; Maxwell et al., 2020; Muller, 2012).

Table 3 A comparison of conceptual frameworks for pairing Indigenous and non-Indigenous knowledge adapted from Reid et al., 2020 (p. 246).

English term (abbreviation)	Indigenous term (language)	Area	Definition (source)
Double-Canoe	Waka-Taurua (Māori;)	Aotearoa /New Zealand	A conceptual framework formalized in 2018 for unifying knowledges and ways of knowing, especially Western and Māori. It is described as "two canoes… lashed together… each canoe represents the worldview and values of the people who are coming together to achieve a common purpose… each group is inherently different, and the knowledge, values and actions of each are not made to fit into the other" (Maxwell et al., 2020, p. 2).
Plural Coexistence	Varied - Terms for these concepts are found across many Indigenous languages worldwide and vary by language/language group.	Global	A model of cross-cultural relations that acknowledges and respects Indigenous ontologies and is attentive to the historical and current western hegemony within environmental management (Howitt & Suchet-pearson, 2006; Zanotti & Palomino-Schalscha, 2016).

Two-Eyed Seeing	Etuaptmumk (Mi’kmaw)	Eastern Canada /Maritimes	Coined by Mi’kmaw Elder Albert Marshall in 2004 for unifying knowledge systems. It is described as “learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and to use both these eyes together, for the benefit of all” (Bartlett et al., 2012, p. 335).
Two Row Wampum	Kaswentha (Haudenosaunee)	Central Canada	A 17th-century treaty belt to record an agreement between the Haudenosaunee Confederacy and Dutch settlers. “It consists of two rows of purple beads separated by rows of white beads. The purple rows represent the different vessels of the Dutch (a ship) and the Haudenosaunee (a canoe) travelling side-by-side down the “river” of existence (the white beads). While the two vessels remain separate (i.e. the cultures remain distinct), the people from each vessel are meant to interact and assist each other as need be” (McGregor, 2004, p. 13).
Two Ways	Ganma (Yolngu)	Northern Territory, Australia	A metaphorical concept of how to mix knowledges equitably and achieve meaningful two-way collaborations. “It relates to the separateness of fresh water and saltwater knowledge even at the point where they meet and mix. It is like what some [non-Indigenous people] call a

			“dialectical” relationship, in which two opposed patterns of ideas complement, interact, and relate to one another, but never lose their distinctiveness as separate and opposed parts of one whole.” (Muller, 2012, p. 61).

As compiled by Reid et al. (2021), Table 3 represents “a small selection of a much larger number of Indigenous conceptualizations for promoting knowledge coexistence” (p. 6). One conceptual framework not included in Table 2 is the Two Roads approach developed by FMFN and other Indigenous community members and SENES Consultants (2011, 2012). The Two Roads Approach creates space for Indigenous people to affirm and develop their own ways of working on research questions and Western scientific ways of approaching reclamation science. This creates the opportunity for the best available knowledges to be applied through reciprocal sharing that can lead to a foundation of trusting and equitable relationships. The Two Roads approach recognizes that Indigenous Knowledge is key to understanding complex and holistic socio-ecological systems and allows for processes that are independent of scientific or Western ways of knowing (Two Roads Research Team, 2011, 2012). Noting the dimensions of power and recognition, the framework provides space for each way of knowing and meaning creation to occur in tandem and on equal footing (Two Roads Research Team, 2011). This framework is specifically relevant for bringing together knowledges around land-based phenomena as it recognizes Indigenous knowledge holders as Knowledge Holders who monitor and have a deep understanding of the socio-ecological system (Ostrom, 2009; Two Roads Research Team, 2012). I intended to use this conceptual framework to guide the research activities that resulted in this thesis. However, COVID-19 restrictions, loss of research partners and shifting research agenda hindered my ability to implement this approach in practice. A description of the methodology deployed is included in Chapter 3: Methodology and Methods.

2.2 Approaches to Monitoring – from Citizen Science to Indigenous Guardians

The previous section outlined how Indigenous Knowledge is distinct from Western science and noted the implications of the research. The distinction between Indigenous Knowledge and Western science is also key to understanding models for monitoring environmental conditions. This section explores how the literature characterizes the different models of how the "public" gathers information to understand the environmental conditions of the places they care about. In this section, I will explore some common models in North America. I will discuss how community-based monitoring (CBM) is described in the literature and the limitations of applying CBM to understand impacts on traditional land use. This section also highlights alternative models to CBM that center Indigenous Knowledge in modes of inquiry and monitoring.

2.2.1 Community-Based Monitoring

Citizen science can be described as "the process whereby citizens are involved in science as researchers" (Martell et al., 2021, p. 1). Under the umbrella of citizen science, many terms have been used to describe the efforts of various stakeholders and their initiatives; this can include, but is not limited to, community science, voluntary biological monitoring, community-based management, community-based monitoring, community-led monitoring, community-based environmental protection (Conrad & Daoust, 2008; Whitelaw et al., 2003). These terms are often used without distinction; for example, Conrad and Doust state that they use CBM and community-based management interchangeably but make the distinction between community-based environmental protection (CBEP) and CBM since CBEP requires environmental decision-making while CBM does not (2008). In this thesis, CBM is included under the umbrella of citizen science and is one term that describes the process whereby citizens, community groups, local institutions, Indigenous community members, and stakeholders are included in scientific monitoring, tracking, and responding to a common environmental concern or phenomenon (Conrad & Hilchey, 2011; Conrad & Daoust, 2008; Kruger & Shannon, 2000; Whitelaw et al., 2003).

A variety of frameworks are available in the citizen science and CBM literature that help to delineate the wide array of CBM models and programs. Typically, these are described as spectrums ranging from top-down to bottom-up governance arrangements or descriptions of CBM typologies based on the intent of the monitoring program (Conrad & Daoust, 2008; Whitelaw et al., 2003). For example, Whitelaw et al. (2003) suggest four types of CBM programs in Canada: government-led,

interpretive, advocacy, and multiparty. The first, government-led CBM, is described as a top-down approach whereby citizens often collect large amounts of data relevant to both government and community priorities. The second emphasizes educational outcomes of monitoring through participation in data collection, coined the interpretive; this approach adds meaning to monitors' experience. Third, advocacy monitoring focuses on local community concerns and often does not rely on private or government support. Lastly, multiparty monitoring is where all and any concerned stakeholders may participate in monitoring, including government, private industry and Indigenous communities (Whitelaw et al., 2003). Whitelaw et al. also note that multi-party monitoring is often more effective than advocacy monitoring, although both are designed to inspire action in decision-makers.

Danielsen et al. (2009) use a similar approach as Whitelaw et al. (2003) as he organizes CBM programs on a spectrum from professional researcher executed to locally based monitoring programs using five categories, externally driven, professionally executed, externally driven monitoring with local data collectors, collaborative monitoring with external data interpretation, collaborative monitoring with local data interpretation and autonomous local monitoring. The Danielsen et al. (2009) model is also referenced in Indigenous-led community-based monitoring (ICBM) literature, which will be explored in the next section.

Lawrence (2006) uses a participatory dimension in a comparative framework for CBM in Europe and North America. Lawrence (2006) delineates CBM participation through dimensions of power and knowledge, rejecting the dichotomy of top-down (data extraction) and bottom-up (participant-centered change) characterization of CBM programs and instead proposes a more nuanced set of outcomes that balance external value and internal value for in participants. Lawrence (2006) describes four types of participation, transformative, collaborative, functional, and consultative, ranging from most local citizen control and power to a centralized power structure outside of local actors' control.

While there are a variety of ways to categorize CBM programs in North America, frameworks typically focus on the intent of the monitoring program (Whitelaw et al. 2003), dimensions of power between the participants (Lawrence, 2006) and spectrums of engagement and types of stakeholder involvement (Danielsen et al., 2009; Whitelaw et al., 2003). There is little mention in CBM literature about dominant knowledge paradigms or ontological differences of monitors, western, Indigenous, or otherwise.

Indigenous-led monitoring is often excluded in the academic CBM literature, and therefore, conceptual frameworks for CBM often do not include Indigenous knowledge or Indigenous relationships with their environment. It seems that this distinction is intentional, as CBM literature largely uses a “stakeholder narrative” to describe the activities of monitoring programs and does not address Indigenous environmental governance. Reed et al. (2020) argue that stakeholder narratives have the potential to decrease Indigenous Nations’ ability to exercise rights to self-governance and minimize their environmental decision making. In this way, imposing Western models of CBM onto Indigenous communities may reinforce a stakeholder relationship with industry and the state. Therefore, alternative models to community-led monitoring are explored more deeply in the next section.

2.2.2 Indigenous-led Monitoring and Environmental Governance

The literature and ongoing environmental management practice are often centred around Western and scientific management approaches in Canada. Some scholars argue that environmental degradation, both past and present, has emerged from colonial and Western approaches to environmental governance (Arney et al., 2022; Moreton-Robinson, 2015; Wynter, 2003). Indigenous ways of managing their relationships with nature are not a response to colonial approaches to environmental management but continuations of Indigenous ways of life, ceremony, kinship, care and living with the land, water and creatures since time immemorial. Some of these management approaches include creating territorial management plans, traditional governance, leading and contributing to conservation and restoration efforts, co-constructing knowledge for assessments and monitoring, countering the drivers of unsustainable resource use and resisting environmental injustices, playing key roles in environmental governance across scales, and offering alternative conceptualizations of the interrelations between people and nature (Brondízio et al., 2021).

In the next section, I will explore Indigenous-led monitoring and stewardship and describe it as a distinct model for monitoring Indigenous TLU. Specifically, I will describe the current state of knowledge of Indigenous-led monitoring programs and how Indigenous Guardian programs as a model can offer a modern interpretation of how Indigenous peoples have always engaged and stewarded their territories.

The Two Roads Approach has identified the need for Indigenous methods for research and monitoring in reclamation as distinct spaces for "Indigenous questions, objectives and ways of

knowing (Indigenous methodologies)" (Two Roads Research Team, 2011, p.11). This section will review the literature on Indigenous-led approaches to monitoring and stewardship with that lens. I use the term 'stewardship' rather than 'management,' as stewardship reflects the "holistic concept for guiding productive and sustained relationships [between people and] the environment" (Bennett et al., 2018, p. 597). While Indigenous Guardian programs include many of the stewardship actions described by Brondízio et al. (2021), this literature review focuses on monitoring activities exclusively. Table 4 summarizes the key tenants of Indigenous Guardian programs and describes how the model is distinct from CBM models as described in the literature. These models could be explored as part of the "Aboriginal Road to Reclamation," which identified the need for Indigenous peoples to set research and monitoring goals in reclamation (Two Roads Research Team, 2011, 2012).

2.2.3 Indigenous-led Community-Based Monitoring

Similar to CBM programs, ICBM programs are monitoring programs that are led and carried out by Indigenous community members that collect, analyze, and report on the environmental conditions of their land, water, creatures, ice and air (Beausoleil et al., 2022; Natcher & Brunet, 2020). Like CBM programs, ICBM programs vary widely between communities. However, the literature provides a few ways to categorize them (Parlee et al., 2014; Whitelaw et al., 2003). ICBM programs can be described through spectrums of power (Wilson et al., 2018; Wiseman & Bardsley, 2016) and knowledges used (Wiseman & Bardsley, 2016). A few models for describing the differences between programs are highlighted below.

ICBM programs can be described by their epistemological underpinnings, namely if the program is based on Indigenous Knowledge ways of knowing or Western/settler methods (Wiseman & Bardsley, 2016). This can be analyzed through the program's integration of traditional stewardship methods, cultural revitalization, supporting traditional land use activities and intergenerational knowledge-sharing (Natcher & Brunet, 2020; Reed et al., 2021; Wilson et al., 2018; Wiseman & Bardsley, 2016).

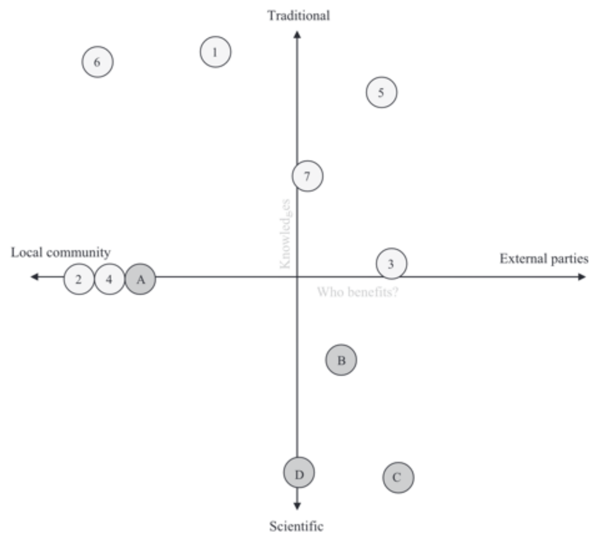

Figure 4 Analysis of ICBM programs (Wiseman & Bardsley, 2016, p. 59)

In Figure 4, Wiseman & Bardsley (2016) characterize ICBM through two spectrums; on the Y axis, the authors place traditional and scientific knowledge on either end of the spectrum and on the X axis, who benefits from the knowledge generated in the program. The author highlights ICBM programs in the Alinytjara Wilurara (AW) NRM region in the northwest of South Australia (lettered data points) as well as programs described in the academic literature (numbered data points). While we know that scientific and traditional knowledge systems can co-exist through a variety of conceptual frameworks (see Table 2), the authors seem to make the distinction based on the knowledge used (i.e. traditional and scientific observation, the technology used (i.e. methodology) and primary data gatherers (Indigenous people vs external researchers) to describe ICBM programs and place them along the y-axis. Who benefits (x-axis) seems to be answered by determining who is using the data. Still, there are limited details around ownership, control, access and possession (OCAP) (First Nations Information Governance Centre (FNIGC), 2023). The point here is that there is tension within ICBM programs around who participates and guides the program outcomes and methodologies. We can also see this tension articulated by Wilson et al. (2018).

Wilson et al. (2018) notes that "a governance lens illuminates the potential for CBM as a tool for asserting Indigenous sovereignty and jurisdiction and as a way of understanding CBM as more than data gathering – as a form of Indigenous governance" (p. 297). Wilson et al. (2018) describe how governance arrangements are crucial in determining how the monitoring program can support

Indigenous-led environmental management and suggests building on Danielsen et al. (2009) model for CBM by adding a typology of governance arrangements, illustrated in Figure 5. Here, we see that ICBM can be analyzed through dimensions of power by describing who is leading the process and outcomes from the monitoring program (Wilson et al., 2018; Wiseman & Bardsley, 2016).

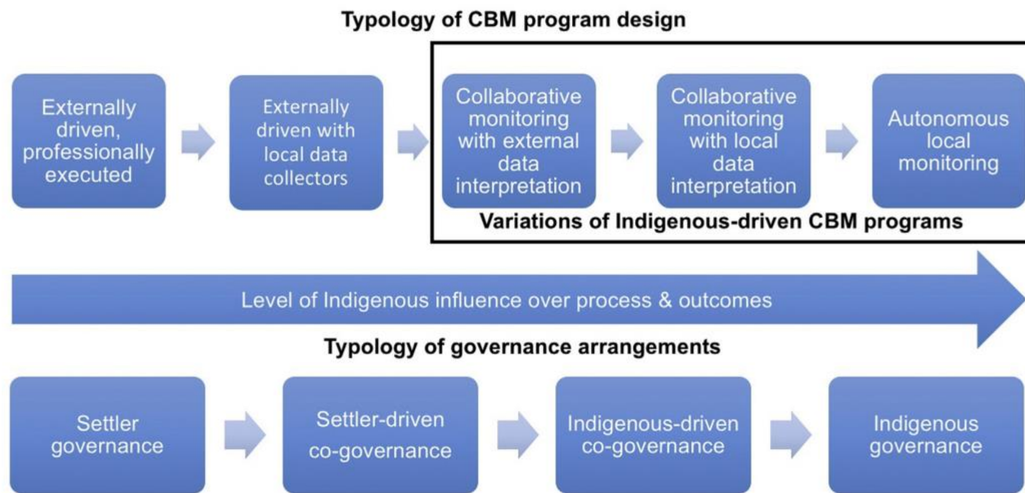

Figure 5 Comparison of CBM typology with governance arrangements involving Indigenous peoples (Wilson et al., 2018, p. 291).

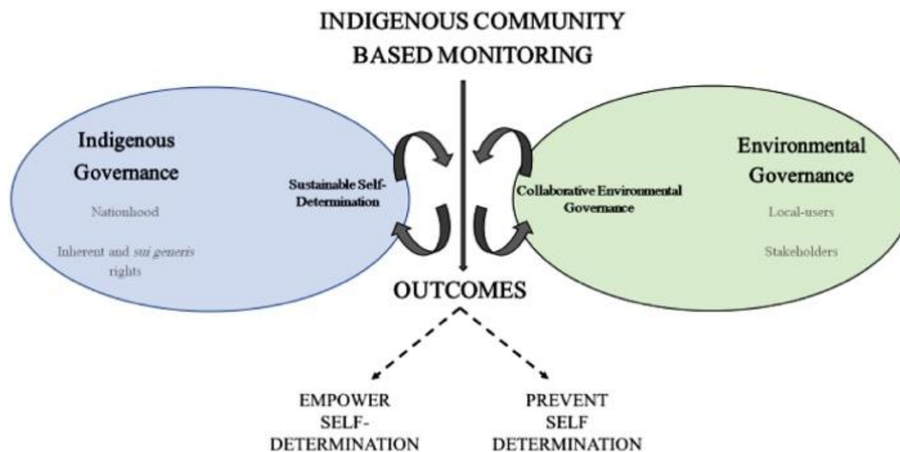

Figure 6 Framework for how ICBM can empower or prevent self-determination (Reed et al., 2020, p. 3).

Reed et al. (2020) evaluate ICBM programs based on the "conceptualization of Indigenous Peoples' role in decision-making" (p. 3). Figure 6 highlights the feedback loops from program models that create outcomes that prevent or empower delf determination. The authors assert that if a stakeholder or local user model is used, the program may hinder the "meaningful articulation of Indigenous self-determination" (p. 3). However, if the ICBM program is rooted in an Indigenous governance framework where Nationhood is centred in the program design, then the program outcomes can empower Indigenous Nationhood and revitalization of traditional or Indigenous models of environmental management. The latter approach will be explored more by reviewing the literature on Indigenous Guardians program models.

2.2.3.1 Critique of ICBM

Figure 6 highlights one of the critiques of ICBM, specifically how ICBM programs can hinder sustainable self-determination (Reed et al., 2020). ICBM has been shown to be influenced and shaped by principles of patronage and colonial and neoliberal incentives, which could limit the ability of Indigenous governments to manage and steward their traditional territories (Cameron, 2012; Natcher & Brunet, 2020). In a review of Indigenous participation in environmental monitoring, Thompson et al. (2020) conclude that "a key challenge of conducting effective monitoring that leverages both Indigenous knowledge systems and science is the power imbalances that uncouple Indigenous monitoring efforts from management." and recommends initiatives "carefully consider the ways in which power and governance shape their programs and the ability of their monitoring to lead to meaningful management actions." (p. 9). Strategies to overcome these critiques are described by Thompson et al. (2020) and include logistical support for communities, an adaptation of cross-cultural, collaborative frameworks (i.e. the ones described in Table 2), building trust between parties, maintaining community engagement, supplying adequate funding to community participants and ensuring high-quality data.

The following section will explore a final model of monitoring, which is Indigenous-led Indigenous Guardian programs, sometimes called Watchmen programs on the coast of British Columbia or Indigenous Rangers in Australia.

2.2.4 Indigenous Guardians - Model for Monitoring

"Guardians" is an umbrella term used to describe the "boots on the ground" professionals who are working on behalf of their Nation and community on the land, water, and ice to monitor, protect and steward their traditional territories (EcoPlan International, Inc., 2016; Indigenous Leadership Initiative, 2022; Social Ventures Australia (SVA), 2016). Approximately a quarter of all First Nation communities have Indigenous Guardian programs or have secured funding to establish Indigenous Guardian programs (ECCC, 2023).

Indigenous Guardian programs are described as a physical presence or extension of their Nation's authority on the land and, therefore, embody an Indigenous stewardship ethic that is unique to their culture, geography and relationship with the territory (EcoPlan International, Inc., 2016; Stanton, 2021). The term stewardship implies a duty of care for the land that is often rooted in the culture, laws, and history of the Nation and includes a relational and reciprocal component which extends beyond management (Pickering Sherman et al., 2010; Reed, 2020). Indigenous Guardian duties might include monitoring resource use within their territory, promoting compliance with Indigenous, federal and provincial laws and regulations, monitoring industry and resource extraction, monitoring cultural indicators, supporting youth engagement and cultural continuity, providing search and rescue services, emergency response, support research conducted on the territory and engage in public outreach and education (Coastal First Nations - Great Bear Initiative, 2022; EcoPlan International, Inc., 2016; Indigenous Leadership Initiative, 2022; Social Ventures Australia (SVA), 2016). Despite the valuable services Indigenous Guardians provide, programs often face constraints that limit their ability to reach their full potential. A report commissioned by the Coastal First Nations in 2022 found that challenges for Indigenous Guardian Watchmen included inconsistent and short-term funding, training, seasonal employment, enforcement authority and lack of public awareness. More detail on these challenges is explored in *Chapter 4: Results.*

Most often, Indigenous Guardians are employed by their Nation to conduct activities that are of high priority to the Nation and community members. This is an important distinction from CBM programs which are often characterized by volunteer participation (Conrad & Daoust, 2008). By no means are the lines between these models totally distinct, and some authors refer to the activities that Indigenous Guardian programs carry out as CBM (Mamun & Natcher, 2023; Parlee et al., 2021). However, we will see in *Chapter 4: Results,* why looking at CBM and Indigenous Guardian programs

as different models for environmental monitoring and management is useful for advancing Indigenous sovereignty and environmental governance (Reed et al., 2020).

When Indigenous Guardian programs are described in the literature, there is an emphasis on how indicators (Parlee et al., 2021), program goals (Arney et al., 2022), and management practices (Mamun & Natcher, 2023; Popp et al., 2020) are determined not only by the communities' priorities but the strategic goals and laws of Indigenous governments, especially in the context of Indigenous Protected and Conserved Areas (IPCAs) (White, 2022). Indigenous Guardian programs are characterized as being "embedded within the way of life of the community and socio-cultural practices such as hunting, trapping, fishing, harvesting of plants, and cultural and spiritual ceremony" (Parlee et al., 2021, p. 5) and are models for developing and strengthening capacity within Indigenous communities (Arsenault et al., 2019; Wells et al., 2020). This way, Indigenous Guardians embody local stewardship practices in the community's culture, history, laws, way of life, and worldviews. This positions them to respond to concerns that community members may have regarding traditional land use. This theme will be explored in more detail in Chapter 4: Results.

2.2.4.1 Critique of Indigenous Guardian Programs

Most often in the literature, Indigenous Guardian programs are analyzed through a decolonizing lens and evaluated for their ability to promote self-determination in Indigenous nations. In a foundational paper, (Reed et al., 2021) describes how Indigenous Guardian programs as a model can break free from the "stakeholder narrative" and affirm a rights-based approach to environmental management; this approach, however, can lead to colonial entanglement. As Coulthard (2007) describes, "the politics of recognition in its contemporary form promises to reproduce the very configurations of colonial power that Indigenous peoples' demands for recognition have historically sought to transcend" (p. 437). Reed et al. (2021) acknowledge that Indigenous Guardian programs rely on politics of recognition and again pull rights holders, Indigenous Guardians, into a colonial entanglement, where Indigenous communities may seek solutions promoted by state-centered forums, i.e., federal funding, recognition of authority. Arney et al. (2022) seem to take this critique further, emphasizing that the colonial state "maintains territorial authority, controls much of the governance process, and creates a "colonial entanglement" (p.12). Arney et al. (2022) go on to explain that Indigenous Guardian programs are predicated upon the recognition of rights by crown governments and question whether Indigenous Guardian programs can promote self-determination. Instead,

according to Alfred (2015), Indigenous Nations can engage in the process of Indigenous regeneration, which includes restoring the Indigenous presence on the land, increasing traditional diets, the transmission of culture, knowledge and spiritual teachings among generations and re-emergence of Indigenous institutions as governing authorities. While Reed et al. (2021) do not answer whether Indigenous Guardian programs advance Indigenous self-determination, they suggest an exploration of the intersection of Indigenous Guardians Programs and IPCAs. This pathway is affirmed in a report published by the Indigenous Leadership Initiative (ILI) that states that "IPCAs and Indigenous Guardian programs are the ultimate expression of Indigenous rights (including inherent rights, Aboriginal rights and title)" (White, 2022). It is not the goal of this thesis to answer that question but rather to report on how Indigenous Guardians describe their model for monitoring and how that advances their Nation's goals around stewardship and environmental decision-making.

The following sections contextualize the models and evaluate their ability to monitor traditional land use and support co-reclamation.

2.2.5 Comparison of Monitoring Models

Models for monitoring environmental conditions raised by communities' concerns are often unique to each program's specific context, community, location, participant and knowledges. While the literature describes these models as distinct and unique, we see in practice that the name of the program is not a good indication of what the program activities are (Parlee et al., 2021). However, it is important to be clear about the terms the academic literature uses to describe these models. Table 4 summarises some of the key components of CBM, ICBM and Indigenous Guardian programs to clarify the information presented above.

Table 4 Comparison of models for community monitoring programs

Theme	CBM	ICBM	Indigenous Guardians
Governance structure	Varied, community, volunteer association NGO or government agency (Whitelaw et al., 2003)	Associations of monitors either within the leadership of a Nation, group of Nations, Universities or other monitoring	Feed into band or hereditary leaderships governance structure (Berkes et al., 2007; White, 2022)

		organizations (Beausoleil et al., 2022).	
Knowledge used to gather information	Uses science-based metrics and local knowledge (Conrad & Hilchey, 2011)	Uses science and/or Indigenous ways of knowing to monitor environmental conditions (Beausoleil, 2020; Wiseman & Bardsley, 2016)	Guardians use land based expertise and scientific methods to monitor and maintain presence on the land (SVA, 2016). There is an emphasis on weaving western and Indigenous knowledge together (Popp et al., 2020)
Decision making power	Is not explicitly involved in environmental decision making (Conrad & Daoust, 2008)	Often participates in co-management or Indigenous-led management around environmental governance (Reed et al., 2020)	Indigenous Guardians support the ability of leadership and community members to make environmental/stewardship decisions (ILI, 2022)
Monitors participation	A spectrum from volunteer citizens and stakeholders to scientific professionals who self-select as volunteers (Conrad & Daoust, 2008).	Indigenous land users, Elders, youth, and community members volunteering or paid by the Nation (Parlee et al., 2014).	Indigenous Guardians are highly trained professionals who are designated as stewards for their Nation, community or coalition of Nations (Coastal First Nations - Great Bear Initiative, 2022).

Ultimately, Indigenous Guardian programs is the model that centers Indigenous Knowledge, deconstructs colonial approaches to environmental management, and supports reconnection to the land in a way that other models do not.

2.3 Conclusion

While there are distinct Indigenous cultures across Turtle Island, there is a worldview that informs how Indigenous peoples generate knowledge, perceive the world around them and build relationships with the land and waters that are distinct from Western worldviews (Kovach, 2009; Little Bear, 2000; Wilson, 2008). When Indigenous and Western cultures come together to generate meaning and understand the world around us, we use conceptual frameworks like the Two Roads Approach to ensure ethical space (Ermine, 2007; Two Roads Research Team, 2011, 2012).

Looking at the literature, we can see that some approaches to Indigenous-led monitoring are better suited to recognizing the power structures that reinforce or challenge existing Western scientific hegemony (Reed et al., 2020). Indigenous Guardian programs emerged from the literature as a modern model of an Indigenous stewardship ethic that has existed since time immemorial and an important component of modern expression of inherent rights and self-determination (Four Directions Management Services, 2022).

For these reasons and their suitability in the context of the co-reclamation project, Indigenous Guardian programs are the subject of this thesis. This literature review helped inform the methodology, research questions, and participant selection that scoped the interviews to those involved in or supported Indigenous Guardian programs. This decision led to a better understanding of how a rights-based approach rooted in Indigenous Knowledge could evaluate the TLU capabilities and rebuild connection to disturbed sites in FMFN's traditional territory.

Chapter 3
Methodology

3.1 Introduction to Indigenous Research Methodologies

Indigenous peoples and communities contain many diverse and unique cultures, customs and ways of being. Indigenous worldviews are often described as being founded on a relational ontology and a recognition of interconnectedness with the self, land, and all living things and creatures that inhabit the world we live in (Jimmy & Andreotti, 2019; Kimmerer, 2013; Kovach, 2009). This worldview also emphasizes the relational ethic where knowledge is not separated from the "environment, families, ancestors, ideas, and the cosmos" that shape who we are (Wilson, 2008, p.194).

Research done by or alongside Indigenous researchers often utilizes Indigenous methodologies to guide research choices. Indigenous methodologies refer to research methodologies that encompass Indigenous systems of knowledge and reference within it, the social relations of knowledge production (Kovach, 2009). Those who deploy Indigenous methodologies must ensure their "interpretive strategies and skills [are] fitted to the needs, language, and traditions of their respective Indigenous community" (Denzin et al., 2008, p. 20). The approach outlined in this section follows key tenets of Indigenous methodologies and describes the co-researchers' approach to our joint inquiry. Co-researchers are collaborative contributors and investigators in a research study; the term is deployed to "validate and privilege the experiences of participants, making them experts and therefore co-researchers and collaborators in the process of gathering and interpreting data" (Boylorn, 2008, p. 600). In the subsequent section, 3.1.1 Indigenous Research Methodologies*,* I will describe the methodological approach I took in this project. Then in, 3.2 Methods and Objectives, I will describe the specific methods deployed in the research and some of the milestones along the way.

3.1.1 Indigenous Research Methodologies

Reflexivity is a critical tenant in Indigenous methodologies, especially when braiding Indigenous and non-Indigenous ways of knowing. It can be powerful in assisting researchers in exploring their assumptions, biases, and values (Russell-Mundine, 2012). Reflexivity is especially relevant in contexts where Western or non-Indigenous researchers can distort, overlook, or misinterpret knowledge, thereby perpetuating ignorance (Smith, 1999). I endeavour to practice self-locating reflections throughout the research to explore the complexities of engaging Indigenous methodologies

as a non-Indigenous person in a Western academic institution (Kovach, 2009). Kwame (2017) draws upon Margret Kovach's work to describe how "self-locating enables others to locate us and also offers the opportunity to explore how we, as researchers, will influence and be influenced by the research process" (p. 218). It is important to note that reflexivity is not a solution to the ways in which non-Indigenous researchers can perpetuate modern forms of colonialism. Russell-Mundine (2012) emphasizes that reflexivity is just one part of Indigenous methodologies and "without challenging the structures and systems that lead to exclusion and silencing of Aboriginal voices, experiences and matters of importance to them, reflexivity is simply a useful but ultimately shallow tool" (p.87).

While reflexivity is woven into the work presented in this thesis, it is just one piece of how I do research in a good way. As described below, I draw upon Indigenous methodologies and Participatory Action Research to ensure that Fort McKay co-researchers shaped and guided the research goals, study design and methods.

There is an ongoing history of extractive and exploitative research conducted on and sometimes with Indigenous peoples and their communities (Smith, 1999). Many scholars have written on how research centers Western worldviews while othering Indigenous ways of knowing under the guise of a neutral and objective research agenda, causing harm to the Indigenous peoples and communities involved (Battiste & Henderson, 2000; Cochran et al., 2008; Datta, 2018; Smith, 1999). Seeking not to continue the harmful patterns of non-Indigenous researchers that came before me, this research engages Indigenous methodologies. It seeks to center Indigenous voices in the research process and outcomes. Indigenous methodologies are not a response to Western methods of inquiry and do not offer a dichotomy of ways of knowing. Instead, Indigenous methodologies provide an environment where Indigenous values, traditions, knowledge, and relationships can live, which disrupts the homogeneity of Western inquiry in the academy and beyond (Drawson et al., 2017; Kovach, 2009). Indigenous methodologies focus on the voices, cultures and needs of Indigenous peoples conducting the research to ensure knowledge generated from research is relevant and useful to the community and co-researchers (Drawson et al., 2017; Wilson, 2008). While no one definition of Indigenous methodologies is widely accepted, Porsanger (2004) states rather succinctly that "Indigenous approaches are based on Indigenous knowledge and ethics that determine the means of access to knowledge, the selection and use of "theoretical" approaches, and determine in addition the tools (methods) for conducting research" (p. 109).

Denzin et al. suggest criteria for critical Indigenous inquiry, including being "ethical, performative, healing, transformative, decolonizing, and participatory" (p.2, 2008). The authors go on to say that inquiry with Indigenous peoples "must be committed to dialogue, community, self-determination and cultural autonomy. It must meet people's perceived needs. It must resist efforts to confine inquiry to a single paradigm or interpretive strategy. It must be unruly, disruptive, critical, and dedicated to the goals of justice and equity" (Denzin et al., 2008, p. 2). These criteria largely align with Thambinathan and Kinsella (2021), who list four practices that a qualitative researcher can use in decolonizing research, which include exercising critical reflexivity, reciprocity, and respect for self-determination, embracing "Other(ed)" ways of knowing, and embodying a transformative praxis (p.1). Kovach (2009) states, "following protocol, showing guardianship over sacred knowledge, standing by cultural validity of knowledge and giving back" (p.147) are all ways to gain trusting relationships between researchers and the communities that guide the research.

The four R's respect, relevance, reciprocity, and responsibility are often cited in Indigenous community-based participatory action research, (Castleden et al., 2012). The four Rs offer Western researchers and their respective institutions an operational pathway for creating research that breaks harmful patterns of the past and creates new ways of doing research in a good way and are woven throughout the thesis. (Kirkness & Barnhardt, 2001).

3.1.1.1 Conceptual frameworks

As the Literature Review mentions, there are many ways to bridge or weave Indigenous ways of knowing, however, the co-researchers decided to use the Two-Roads approach to guide the research team and the research methodologies. The co-researchers made efforts to embody the features of the approach by appreciating the differences in the ways of knowing between all co-researchers. Methods for gathering stories and mobilizing and disseminating knowledge were chosen based on their ability to bring to light the complexity and meaning of the experiences of Fort McKay co-researchers.

Given that the very co-researchers who guided this work also created the Two Roads approach, it was clear that this would be the framework we chose to use for the research project (Daly et al., 2022). It was important to respect the place-based knowledge and frameworks Fort McKay co-researchers had documented long before this research team began our relationship. Once the conceptual underpinnings of the research were established, work could begin to set the study's objectives.

The methodology and subsequent results sections are structured with this framework in mind. Section 3.2.1 outlines how the co-researchers collaborated as a part of the research project using principles from the Two Roads Approach and participatory action research (PAR) to create frameworks and shared understanding for collaborating (Cameron et al., 2014; Castleden et al., 2012; Two Roads Research Team, 2011, 2012). These models and frameworks for working together acted as the foundation of the relationships between the co-researchers and worked to create an ethical space (Ermine, 2007). This foundation allowed for the research questions and objectives to be co-created for this thesis and the inquiry to reflect the needs of Fort McKay co-researchers. Table 5 includes a summary of virtual meetings the author and co-researchers attended.

3.1.1.2 Borrowing from Participatory Action Research

The co-researchers also borrowed from participatory action research (PAR) as we co-created the project. Combining PAR and community-based participatory research methods with Indigenous research methods is common with Indigenous and Western research collaborations as they are often seen as complementary methodologies, both as a philosophy to research and as an approach (Cameron et al., 2014; Castleden et al., 2012; Drawson et al., 2017). To do this in a good way, especially when the research is situated within an Indigenous community context, the research must be collective, reflective and embedded in the values of its host community (Baum, 2006). In this way, the intent of PAR aligns with key tenants of decolonizing methodologies: embodying a collaborative and respectful research paradigm (Kovach, 2009)

PAR is often viewed as a response to other methods in qualitative inquiry that fail to provide a framework for understanding the research "participant" relationship and the collaborative co-developing of knowledge and the research process (MacDonald, 2012). PAR is embedded in democratic values and rejection of top-down research approaches where participants are often viewed as passive subjects (Whyte, 1991). Kemmis et al. (2014) state that, "responsibility for the research is taken collectively, by people who act and research together in the first- person (plural) as 'we' or 'us'" (p.16). Given this framing, the researchers will refer to Fort McKay community members as co-researchers (Whyte, 1991). The process of PAR should be empowering and lead to people having increased control over their lives" (Baum, 2006).

3.2 Objectives and Methods

The objectives for this thesis are described below. Through the methodology described above and direct consultation with Fort McKay co- researchers we identify the scope, priorities, protocols, and methods for summarizing the current state of knowledge on community monitoring. Using principles of Indigenous methodologies and PAR, the university and Fort McKay co-researchers built a foundation together through in-person gatherings (see section 3.2.1.1) and virtual meetings (see Table 5 for a summary). At these gatherings and meetings, we took the time to understand how we would work together and what frameworks we would use and determined what was relevant for me to study in this research project (Castleden et al., 2012; Kovach, 2009; Two Roads Research Team, 2011, 2012). While some of this section does include the outcomes of these processes and activities, this work is still described as the methods since the activities outlined below laid the foundation for relationship building between me and co-researchers from FMFN. This follows the best practices outlined in section 3.1.1. The outcomes of the relationship building are described in section 3.2.1.2. and section 3.2.2. details how I used semi-structured, key informant interviews and coded interviews using inductive analysis.

3.2.1 Methods

3.2.1.1 Objective 1

Co-develop research scope and priorities with Fort McKay co-researchers. Following the criteria and best practices described above, the first objective of this research project was to develop the study priorities with Fort McKay co-researchers. The following sections describe the gatherings and meetings that led to the creation of this research project and the detours along the way.

August 27-30, 2019 – The First Gathering

On August 26^{th,} 2019, the university team met in Fort McMurray, Alberta, to begin our co-reclamation research project. This was the beginning of the project for me and was my first introduction to Fort McKay and co-researchers. From the Fort McMurray airport, we took a small floatplane north to Moose Lake, protected by the Moose Lake Access Management Plan (MLAMP), which prohibits major infrastructure development within that buffer zone. This area is often described as being one of the last intact areas in Fort McKay's traditional territory where Cree and Dene community members can practice their treaty rights, continue cultural traditions and transfer

knowledge among generations on the land (Fort McKay First Nation v Prosper Petroleum Ltd (Prosper), 2020; Moose Lake Access Management Plan, 2021). This choice of site for our first gathering was intentional, as it would set the tone for the research project being in service to the lands, waters, and all living things in the Fort McKay co-researchers' traditional territory.

We gathered together along a set of picnic tables to hear about what the next two days had in store for the co-research team. During this initial "orientation," Christine Daly, lead co-researcher, read aloud the University of Calgary ethics committee-approved consent and release form. At this step, we saw tensions between the university and community co-researchers emerge as the approach juxtaposed the Western academic methods that were required of the university team with the relational nature of the gathering. The language used in the consent forms was not language used by the co-researchers from FMFN, and it was clear that the co-researchers would need to establish their own version of consent and ethical standards for each other (see Figure 2). The agenda for Moose Lake was intentionally left open to leave room to get to know one another on a personal level, learn the traditional activities that Fort McKay co-researchers practiced and be on the land. Most of the time was spent taking walks, going out onto the lake and sharing meals with one another.

Fort McKay and university co-researchers suggested that a survey could be conducted during the Moose Lake gathering to determine a baseline of where co-researchers were starting their research journey from and to see where they would likely need support (i.e., through identifying training opportunities). Creswell (2005) describes surveys as a tool to determine individual opinions on a variety of topics. The survey was designed to understand the participants' perspectives on the co-reclamation research project to foster effective communication and trust-building between all participants.

The university co-researchers developed a set of eight questions that asked project co-researchers to self-identify as either Fort McKay co-researchers or company co-researchers. We administered the survey to the group and received 13 responses: seven company co-researchers, six Fort McKay co-researchers, and one survey participant who chose to identify as a Fort McKay consultant. While we intended the survey to be confidential, most co-researchers completed the survey together in the dining area of the Moose Lake main building with very little privacy. While some co-researchers completed the survey individually, others required assistance. Through this survey and subsequent interactions, we realized that some of the co-researchers needed some "unlearning" opportunities. The

co-researchers engaged Vanessa Andreotti to undertake training and learning opportunities to deepen their understanding of emerging themes of the research project.

I had the privilege of sitting down with one co-researcher to complete the survey together in an interview format. This method provided a richer understanding of the co-researcher's perspective than the responses recorded on the surveys completed in written form. It was also clear that the co-researchers felt more confident explaining themselves orally than writing their thoughts on paper. Still, trust needed to be established between me and the co-researchers. It had seemed that by the university team introducing the survey this early in the process, the co-researchers were being studied, not guiding the study. This was a touchpoint for the research team and reoriented me back to research methods that were situated within an Indigenous research paradigm as opposed to traditional Western qualitative methods.

The survey population included all co-researchers, excluding the university team who were asked to administer the survey by Fort McKay co-researchers, who attended the Moose Lake gathering in August 2019 (n=14) but received responses from 13 co-researchers. Given the survey sample size was nearly the same as the population size, I could not use traditional statistical significance analysis (Kelley, 2003). Instead, qualitative survey analysis was used to identify key themes. Creswell (2005) recommends qualitative survey analysis to explore meanings and experiences, which aptly captures the survey content. Given this is a case study of one First Nation and one company working together, the purpose of this survey is not to extend to other First Nations but to provide context for the relationship-building process between the co-researchers.

The survey results were analyzed using in vivo coding to ensure the emphasis of the coding process is on the words spoken by participants (Manning, 2017). This is especially important when conducting cross-cultural work, as the meanings and context of words used by the co-researchers are specific to them and their experiences (Saldana, 2016). Each question was coded separately to identify themes that both Fort McKay and the company co-researchers had in common. This was to establish what shared beliefs, concerns, and values were held by the co-researchers.

November 13-14, 2019, Cycle of Respect

After returning from Moose Lake, the co-researchers again met virtually to determine an agenda for another gathering in FMFN. The university co-researchers suggested a code of conduct to facilitate the relationship-building and mending goals of the research project. Following the Two Roads

Approach, the university co-researchers sought to identify a method for developing the code of conduct that would be culturally relevant and create the conditions for meaningful and honest conversations between co-researchers. A method for developing the code of conduct was adapted from Holmes et al., who utilized PAR and narrative inquiry to create an Indigenized code of conduct with the Denesoline community members and Elders who steward the Thelon Wildlife Sanctuary and Thaidene Nene National Park Reserve. While Holmes et al. (2016) utilized interviews, but the research team decided to hold a talking circle instead, as talking circles fostered a group dynamic that interviews simply could not (Chilisa, 2011; Wilson, 2008). In November 2019, Fort McKay (n=10), company (n=8), and university (n=3) co-researchers met at the Fort McKay Youth Centre in Fort McKay to create what we thought would be a code of conduct.

Before the code of conduct discussion began, we came together to begin the gathering in a good way by following protocol taught to us by Fort McKay co-researchers. As a group, we first smudged, setting our intention for the day to be respectful and open. Once seated, the university co-researchers presented protocol to Fort McKay co-researchers and asked them to share their knowledge with the research team and guide our project. We presented each Fort McKay co-researcher with tobacco and asked them to share their knowledge. Once each of the co-researchers accepted the tobacco, we began our discussion.

It is important to note that the code of conduct intended to guide the ethical space between Fort McKay, company, and university co-researchers (Ermine, 2007). Each of these co-researchers holds their own sets of principles for guiding behaviour, for example, the Cree Seven Sacred Teachings, Dene Laws, and company values. The intent of the code of conduct was not to override these established ways of guiding behaviour but to offer a shared set of principles, weaving together the existing set of guiding beliefs for the purpose of the research project.

Chilisa (2011) and Wilson (2008) recognize that narrative methods have a particular alignment with Indigenous ways of knowing and talking circles. Because of this natural alignment, the co-researchers adapted Holmes et al.'s approach from interviews to talking circles to facilitate storytelling to multiple audiences, Fort McKay community members and consultants, company reclamation professionals, and University facilitators. The storyteller selects, organizes, and emphasizes the story based on their perception of its relevance, which is influenced by the setting in which the story is told and to whom the story is told to (Riessman, 2008). By broadening the

storyteller's audience from one co-researcher, which would occur in an interview format, to many co-researchers in a talking circle, the shared stories were told in a cross-cultural context.

Narrative inquiry is often used in a variety of social sciences settings, and there is a particular alignment between Indigenous methodologies and the Two Roads Approach (Smith, 1999). Although narrative methods may be considered new to some, as a form of knowledge transmission, narrative methods or stories have been used since time immemorial (Clandinin, 2006; Kovach, 2009). Narrative inquiry involves the study of "an individual's experience in the world and, through the study, seek ways of enriching and transforming that experience for themselves and others" (Clandinin & Rosiek, 2007, p. 42). These personal stories and experiences are shaped by social, cultural and institutional environments, allowing co-researchers to explore how personal and societal conditions influence the storyteller's experiences (Green et al., 2006). Wilson (2008) notes the alignment of this approach with Indigenous methodologies, as the storyteller enters into a relationship with the individuals who are listening to the story.

Co-researchers were invited to join the circle intended to create a code of conduct. The circle opened by introducing an eagle feather offered by Métis company co-researcher, and the talking feather was passed clockwise around the circle, following FMFN protocol. I began the circle by explaining the purpose of the talking circle and provided a prompt for co-researchers to share a memorable experience that had teachable moments from past oil sands industry and Indigenous community consultation and engagement. The talking feather was passed around the talking circle, allowing each co-researcher to share without interruption for as long as they chose. The talking circle was audio recorded while a university co-researcher recorded notes in point form on a flipchart in view of all co-researchers. Once each member in the talking circle finished, the circle was closed, and the group divided into two subgroups.

In each subgroup both company and Fort McKay co-researchers contributed with a university co-researcher facilitating discussion and recording notes on a flip chart. To begin the discussion, we projected what values the co-researchers associated with affective collaboration, as defined by the individual answers documented through the survey administered at Moose Lake. Building off the survey results, facilitators prompted co-researchers to identify principles that support these values and incorporate lessons learned from the stories heard in the talking circle.

Co-researchers recalled stories that were shared and identified themes that were common or resonated with them (Green et al., 2006). Themes from the circle emerged through discussion with co-researchers within sub-groups and included openness, honesty and transparency, active listening, learning, being correctable, understanding, acknowledging loss, trust and reconciliation.

Co-researchers workshopped the stories that emerged from the subgroups to develop principles that are intended to guide the interactions between the co-researchers when working together. During discussions in sub-groups university co-researchers wrote out these principles and collaboratively discussed which principles should be included in a code of conduct. In each subgroup, co-researchers agreed that instead of a code of conduct or a list of principles, a more dynamic and circular graphic should be used instead. Once sub-groups came together, both agreed to change the code of conduct to a "Cycle of Respect" and place emergent principles and themes on a medicine wheel illustration (see Figure 2).

University of Calgary and University of Waterloo co-researchers edited the Cycle of Respect for readability and formatting before presenting it back to Fort McKay and company co-researchers during two February 2020 workshops and a series of meetings in March and April 2021. The intent was to co-create the Cycle of Respect through a series of collaborative and iterative sets of workshops and meetings. Co-creation is loosely conceptualized as groups of people "in many dimensions, across varying scales and over different time dimensions" coming together to work collaboratively on a joint initiative, project or product (Herrmann-Pillath, 2020, p. 1). Feedback was gathered continuously from the working group throughout two three-day working group sessions and through online meetings as the working group shifted to working at a distance due to COVID-19 restrictions. Following the principles outlined in PAR and the Two Roads approach, this work was iterative and flexible, allowing for experimentation and emergent themes to be explored (Daly et al., 2023).

After the in-person gatherings in FMFN in February 2020, another meeting was planned for April 2020. Then the COVID-19 pandemic struck Canada, and the research team had to adapt. Instead, we shifted to gathering remotely via Zoom, the first of which was a set of virtual meetings that happened on April 21 and 22, 2020. These meetings were set to strategize how the research team would adapt to the COVID-19 restrictions imposed by our respective organizations and governments and were attended by the university, company, and a subset of Fort McKay co-researchers via Zoom. While our in-person gatherings began with prayer, smudging, and offering protocol, these virtual meetings

began with asking all to mute their microphone, apologies for spotty connections and re-introductions. A summary of these meetings is included in Table 5.

In the April 2020 meeting, the company co-researchers presented their "Co-Reclamation Project Milestone Schedule" - an Excel document that delineated project tasks associated with the Two-Roads Reconciliation & Reclamation Framework and their proposed due dates. This schedule was developed by the company co-researchers and was offered to FMFN co-researchers for comments. The schedule was designed to align with Figure 3 and highlight what project tasks would be better suited to current restrictions. Some items did not align with Fort McKay co-researchers' priorities, those items were not considered for this researcher paper. However, both co-researcher groups agreed upon some items. The project tasks that could be completed from home, didn't require being on the land, were a priority for Fort McKay co-researchers and could be completed by a small subset of the research team were identified as opportunities while we self-isolated at home. "Co-develop a monitoring plan that incorporates both scientific and Indigenous knowledge" was identified as a project task that could be started despite working at a distance.

Both Fort McKay and the company co-researchers identified the potential monitoring plan initially as a CBM program, and both Fort McKay and the company co-researchers identified CBM frameworks and best practices as a gap in their existing knowledge. A literature review was suggested as a starting point for the monitoring program and a task that I could complete. Initially focused on CBM monitoring frameworks, the literature review provided details on the spectrum of CBM programs often cited in Western academic literature. This brief review was shared on June 8th to gauge what direction Fort McKay and company co-researchers would like to take the literature review in consultative, collaborative, or transformative. Ultimately, the frameworks described in CBM literature did not provide any guidance or practices that honoured the Two Roads Approach or other frameworks that braid Indigenous and Western knowledge (Two Roads Research Team, 2011, 2012). The outcome of the conversation was that, at best, a literature review on CBM alone would not honour the diverse knowledge systems and worldviews of the research group and, at worst, would impose a Western and settler viewpoint of monitoring onto the Cree and Dene Fort McKay co-researchers (Kirkness & Barnhardt, 2001; Kovach, 2009). Instead, a more robust look into the current state of knowledge on Indigenous-led monitoring programs was suggested in the co-reclamation meeting on July 22nd, 2020.

To meet Fort McKay co-researchers' expectations, I pivoted the methods to better account for the Cree and Dene values, beliefs, and ways of knowing to ensure my research project is respectful, collaborative, and relational (Wilson, 2008). In addition to a literature review, Fort McKay co-researchers determined that interviewing managers and monitors from Indigenous-led monitoring programs would create a more useful deliverable to the community. The interviews were designed to better understand the best practices for monitoring led by Indigenous communities. The co-researchers from the company and Fort McKay collaboratively decided it would be a suitable thesis topic and decided to make the monitoring work the focus of my research and master's thesis. This approach to determining the thesis questions aligns with best practices associated with PAR and Indigenous methodologies (Baum, 2006; McIntyre, 2008).

The goals and objectives of my thesis were co-created by Fort McKay and the company co-researcher at the beginning phases of the research (see section 1.3 Research Goal and Objectives). We had also begun to identify potential interview questions. However, in the summer of 2021, the company research partner decided to terminate the research agreement and was no longer a partner in the research project. Before the company research partner terminated the research contract, the intent was to balance the study goals to support both Fort McKay and company co-researchers objectives and expectations. However, once the company partner left, Fort McKay co-researchers could direct the research goals and objectives entirely to better reflect their priorities.

Through a series of meetings with a subset of Fort McKay co-researchers, we re-identified the research scope and priorities. The models of monitoring shifted from co-monitoring to more transformative approaches to stewardship. Fort McKay suggested interviewing participants and leaders from monitoring programs rooted in Nations reinvigorating their inherent rights to self-governance. The programs suggested focused less on data collection but rather on re-establishing Indigenous presence on the land in a culturally significant way. Some examples included the Ni Hat'ni Dene Guardians, Dehcho K'éhodi Stewardship Program, Tallurutiup Imanga pilot Guardian Program, Sahtú Nę K'ə́dıkə́ - Keepers of the Land Program and Coastal Stewardship Network. These programs also focused less on partnerships with industry and more on strengthening capacity within the community.

By developing the research questions and interview participant list, it became evident that Fort McKay co-researchers and I were identifying not only CBM programs but Indigenous Guardian

Programs whose scope reached beyond data collection towards exercising the program Nation's inherent rights and self-governance (Reed et al., 2021). Throughout several meetings with Fort McKay, ten interview questions were developed for program leads and Indigenous Guardians and ten for academic experts and members of organizations who support Indigenous Guardian programs.

Table 5 Summary of virtual meetings attended by author and co-researchers

Date	Topic	Attendance	Key Developments
April 21-22 2020	Planning for the project during and post COVID-19	Company, University, and subset of Fort McKay co-researchers	Co-reclamation project Milestone Schedule review and CBM literature review suggested.
June 8, 2020	CBM update and planning for project	Company, University, and subset of Fort McKay co-researchers	Provided update on CBM literature review.
July 22, 2020	Co-reclamation team update and planning	Company, University, and subset of Fort McKay co-researchers	Interviews with Indigenous led monitors were suggested.
September 18, 2020	Co-reclamation team update and planning	Company, University, and subset of Fort McKay co-researchers	Reflection on FMFN Memo and further alignment on goals and objectives.
September 25, 2020	Co-reclamation	Company, University, and subset of Fort	Review online gathering workshop agenda.

	team update and planning	McKay co-researchers	
October 16, 2020	Co-reclamation team update and planning	Company, University, and subset of Fort McKay co-researchers	
November 10, 2020	Co-reclamation team update and planning	Company, University, and subset of Fort McKay co-researchers	Decide to postpone online gathering from December 2020 to early 2021.
February 1, 2021	CBM Interview Discussion	Subset of Fort McKay and University co-researchers	First meeting without project lead, new turn over.
March 30 2021	Co-reclamation team update and planning	Company, University, and subset of Fort McKay co-researchers - New Team Lead	
May 3, 2021	Continued CBM Interview Discussion	Subset of Fort McKay and University co-researchers	
June 16, 2021	Continued CBM	Subset of Fort McKay and	

	Interview Discussion	University co-researchers	

3.2.1.2 Objective 2

Conduct semi-structured interviews, to contribute to the current state of knowledge and practice of Indigenous-led monitoring. This objective was set by a working group of Fort McKay co-researchers. The sampling pool, criteria, interview questions and protocol were co-designed Fort McKay co-researchers in meetings described above.

Semi-structured Interviews

While it was suggested that a Fort McKay co-researcher lead the interviews, scheduling and the time constraint on co-researchers made this difficult, so the working group decided I would conduct the interviews independently.

With a semi-structured format, the interview questions are relatively set. Still, I, as the interviewer, am free to respond to the interviewee's answers to explore tangential or emergent areas that arise. The researcher is also able to clarify and rephrase questions for the interviewee (Creswell & Creswell, 2018). The nature of semi-structured interviews allows the interviewee to raise topics that they believe are relevant to the interview, while the pre-determined questions ensure that topics required to address the research objectives are covered as well (Moore et al., 2017). Prompts, follow-up questions, and clarification were used in the interviews to ensure that the research questions were addressed in the interviews. In this way, the semi-structured interview was reciprocal, and both the interviewee and the researcher were able to engage with each other (Groenewald, 2018). While structured interviews were considered, they would not be flexible enough to ensure the interviews were appropriate for the varied and unique context of each Indigenous Guardian program approached for this study (Creswell & Creswell, 2018). Unstructured interviews were also considered; however, given that Fort McKay co-researchers were interested in specific information, the unstructured nature of this type of interview may have led to conversations of little use to co-researchers. Ultimately, the interview guide was semi-structured, which allowed for flexibility while meeting Fort McKay and my research goals.

Participant selection

Following best practices in PAR and Indigenous research methodologies, Fort McKay co-researchers and university co-researchers co-developed the list of participants. Fort McKay co-researchers suggested a list of programs that aligned with their vision of a monitoring program that could evaluate the success of a co-reclaimed piece of land. From this list, I expanded the scope of the interviews by compiling a set of criteria for selecting interview participants from Indigenous-led monitoring programs. The criteria (below) were compiled to ensure that the interview participants could share lessons learned from programs that would be useful and interesting and align strategically with Fort McKay co-researcher's goals. The criteria are listed below and were verified by Fort McKay co-researchers.

Interview participants must be on-land stewards, managers, or coordinators for monitoring programs that:

- Are located in Canada
- Are currently operating (September 2021)
- Are led by Indigenous government(s) and/or organization(s)
- Have at least three of the benefits realized by the Nation conducting the monitoring program described below (Wiseman & Bardsley, 2016)
    - Cultural benefits (language revitalization, knowledge transmission among generations, monitoring of culturally significant sites)
    - Economic benefits (creating sustainable livelihoods, supporting professional and educational development)
    - Benefits to the land, water, and more than human relations (ensuring compliance with management plans, monitoring industry impacts, monitoring species population levels, water quality monitoring, etc.)
    - Supporting the Nation's (or Nations') right to self-determination (honouring traditional laws, supporting internal decision-making power, increasing indigenous presence and use of country)

The criteria were compared to an inventory of Canadian Indigenous Guardian programs published by The Indigenous Guardians Toolkit, a Nature United project. This pool was chosen because it allowed programs to self-identify as a Guardian, Watchmen, Ranger, CBM or other program, unlike the Indigenous Guardians Pilot map developed by Environment and Climate Change Canada. This list

was compiled with the recommended programs from Fort McKay and produced a list of 34 programs with program managers and directors identified for each. I sent each manager a recruitment email with the university-approved information letter and a letter from a Fort McKay co-researcher detailing FMFN's leadership in the study; this was for participants to see that FMFN was the lead in project design and benefiting from the research. If no response was received, a follow-up email would be sent approximately seven business days later.

Expert interviews

In addition to those leading and participating in Indigenous Guardian programs, thought leaders, academic experts, and organizations supporting monitoring work were also identified as pools to recruit interview participants. This pool of interview participants was largely identified through snowball or chain referral sampling (Biernacki & Waldorf, 1981). Indigenous Guardians and program leads were asked in each interview if they would like to recommend a colleague, program lead or another expert in the field of Indigenous-led monitoring. Those recommended by interview participants were compared to the set of criteria below. The recommended participant would have to meet only one of the following criteria:

- Support communities in developing their monitoring programs.
- Supported capacity strengthening
- Have published on Guardian, ICBM or CBM programs in Canada that included Indigenous monitors

A pilot interview was conducted with one expert interview participant to identify "if there are flaws, limitations, or other weaknesses within the interview design" and to allow me "to make necessary revisions prior to the implementation of the study" (Turner, 2014, p. 757). The pilot interview was conducted with a Canadian researcher who has written extensively on CBM programs and has worked with Indigenous Nations on monitoring programs. Minor revisions to the interview guide were made to improve question clarity and flow.

A total of 26 participants and eight Indigenous Guardian programs were involved. I stopped conducting interviews when I reached data saturation which is referred to as the most widely used method to increase rigor when conducting interviews (Denzin & Lincoln, 2017). Data saturation occurs "when the researcher collects many similar instances of the phenomenon, so that certainty is incrementally built" (Denzin & Lincoln, 2017 p. 809). Once data saturation was reached, I provided a

summary of programs and organizations who participated in the interviews to Fort McKay co-researchers and asked if there were additional participants, they would like me to interview. Four more programs were provided, but unfortunately, contacts did not respond to my request for participation.

Interview Guide:

The interview guide consists of ten questions in line with Creswell and Creswell's (2018) recommendation of between five and ten questions. As mentioned in the section above, the interview questions were formulated in partnership with Fort McKay co-researchers to ensure that the knowledge shared would be relevant and useful to Fort McKay's Guardians and the Sustainability Department. The formulation of the guide followed Kallio et al.'s (2016) framework in Figure 7.

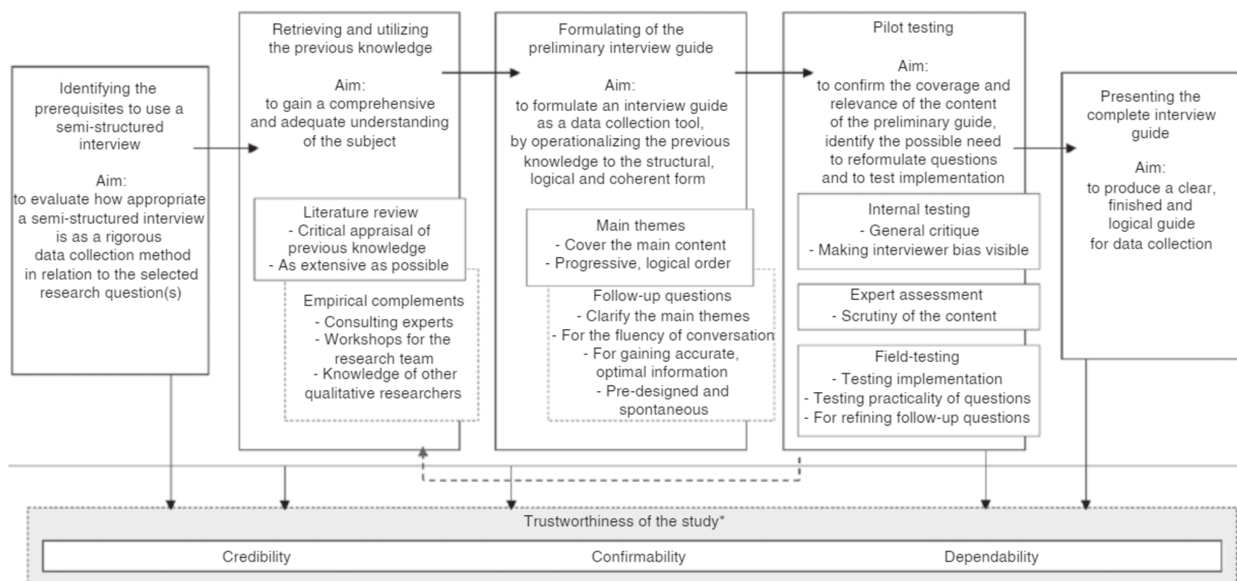

Figure 7 A framework for developing a qualitative semi-structured interview guide (Kallio et al., 2016, p. 2962).

The questions in the guide were crafted to achieve a rich data set, be participant-oriented and not leading while still being clear and open-ended (Astedt-Kurki & Heikkinen, 1994; Creswell & Creswell, 2018; Louise Barriball & While, 1994). They were also developed to fit within an Indigenous research paradigm by incorporating relationality. Wilson (2008) notes the importance of relationality and relational accountability within Indigenous research methodologies. This accountability was woven into the interview process in three ways. First, a letter from Fort McKay

Director of Sustainability was sent to each interview participant describing the intent of the research and how it would be useful to Fort McKay. This would give the interviewee an audience and a purpose for the knowledge they would share. Second, a brief overview and description of FMFN and the research were shared with interview participants so that they could understand the context of the work and how it was situated within the Fort McKay co-researchers' goals and objectives. Finally, I introduced myself the way that the Fort McKay Cree and Dene Elders had taught the co-researchers sharing where I was from, a land acknowledgement, where my parents are from and where my grandparents came from. Some call this phase one or report building with the participant (Creswell & Creswell, 2018).

While the interview questions were pre-prepared by Fort McKay co-researchers and myself, the semi-structured nature of the interview created space for me to explore specific topics raised by interviewees, pivot the interview to suit better the specific Indigenous Guardian program or expert's focus and to ask for clarification of interviewee's answers. In this way, the interviews sometimes became more of an informal dialogue. This is described as a "conversational method" by Kovach (2009) and "aligns with an Indigenous worldview that honours orality as means of transmitting knowledge and upholds the relational which is necessary to maintain a collectivist tradition" (p. 43)

At the end of each interview, I offered each participant a summary of the key themes, lessons, challenges, and opportunities I identified in my research. Each interviewee accepted and was eager to learn from the stories shared by other interviewees. While I did not expect the information to be new to the interview participants, it was simply an offering of a summary of shared knowledge and experience that would capture the lived experiences of colleagues that may resonate with the interviewees.

Data Analysis

Interview transcripts were recorded in real-time in Zoom through OtterAI, a transcription software. After completing the interviews, I "cleaned" the transcript by reviewing the audio recording and ensuring it was accurate. Once all interviews were transcribed, I prepared the raw data files and "cleaned" the data to ensure all transcripts were in a common format; these pages were printed along with any notes I had taken during the interview process (Thomas, 2006). Including my own notes was an important step in ensuring reflexivity during the research process, which is crucial in identifying biases and is especially important for inter-cultural interviews (Russell-Mundine, 2012). Once the

transcripts were prepared, printed, and collated, I re-read them in detail to gain familiarity with the content and an initial understanding of the tone, ideas, and themes in the transcripts.

Once familiar with the data, I began coding the answers to each question in Nvivo, a qualitative analysis software. A code is a word or phrase that captures the theme of a phenomenon and links it to a particular category; codes created from the phrase or word the interviewee has used are referred to as *in vivo* coding (Rossman & Rallis, 2017). Through inductive coding, I identified and defined the themes that emerge from the text, with "upper-level" categories, which are general and derived from evaluation aims, to "lower-level" categories, which are usually comprised of in vivo codes (Thomas, 2006). The first coding pass resulted in mostly "lower level" codes that identified segments of the text; these were noted and used for quotations in the later sessions (Creswell & Creswell, 2018; Thomas, 2006). These identified segments were aggregated into categories based on common themes to answer the research questions. Within each category, I looked for subtopics and new insights, including contradictory points of view, and reviewed and revised each category. These core themes described the phenomena at hand and became the significant findings of my thesis for objective 3. These steps are illustrated in Figure 8 below.

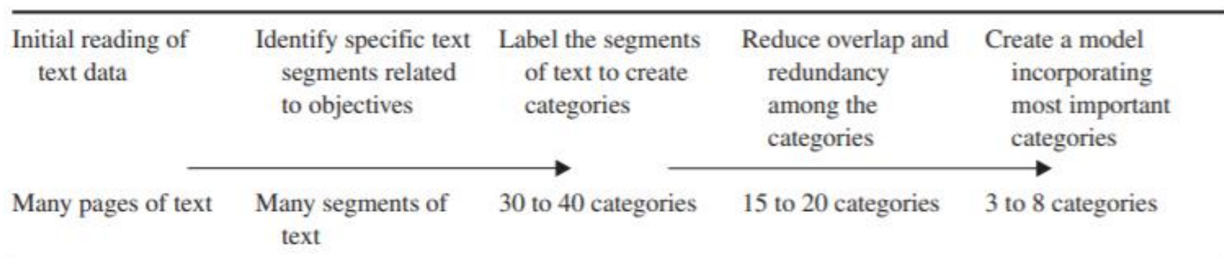

Figure 8 Coding process for inductive analysis (Thomas, 2006, p.241)

Limitations and Challenges

There are limitations and challenges associated with the study, with the first being the challenges related to shifting to online and remote work due to COVID-19 restrictions. The intent of the research project was to be as collaborative, participant-oriented and inclusive as possible. However, the shift to online meetings prevented many of the Fort McKay co-researchers from attending working sessions where the co-researchers were making decisions regarding the direction of the research. That shift resulted in a smaller subgroup of Fort McKay co-researchers, the university team, and I made decisions about the research direction without input from all co-researchers. This hampered the ability

to build relationships with the Fort McKay co-researchers who were not able to join online or virtual meetings and have validation come from the community at large. While I did present my results to a smaller subset of co-researchers, I did so virtually which prevented a deeper discussion of my approach and subsequent findings.

In addition, the industry partner's decision to leave the research project also had a negative effect on the research in the following ways. The study's intent was to support the development of a monitoring program that could evaluate the success of a co-reclaimed site in FMFN Traditional Territory. With no industry partner, there was no physical site to ground this research's outcomes. Fort McKay’s co-researchers reiterated during the research project that planning for reclamation required having a site to visit, smell, touch, and be on to create outcomes that would support their vision.

Chapter 4
Results

This section describes the results of objective two, which was to contribute to the current state of knowledge and practice of Indigenous-led monitoring. Table 6 outlines the codes assigned to participants to ensure anonymity while also identifying their experience with Indigenous Guardians and Indigenous-led monitoring.

This chapter is structured to answer the questions that were co-created with Fort McKay co-researchers during the meetings described in Table 5. This approach is consistent with the research principles described in section 2.1.1. This chapter is divided into three sections, which answer how Indigenous Guardian programs set objectives and what purpose they serve, the challenges and constraints associated with establishing and running Indigenous Guardian programs, and the impacts of Indigenous Guardian programs. The subthemes within each section were compiled using the methods outlined in Figure 8 in section 3.2.1.2 (Thomas, 2006). The methods used to answer these questions were developed in partnership with Fort McKay co-researchers and are outlined in section 3.2.1.2.

Table 6 Interview Participant Summary

Participant Code	Participant type	Number of Participants
AE (1-6)	Academic Experts	6
G (1-4)	Indigenous Guardians	4
GM (1-12)	Indigenous Guardian Managers and coordinator	12
MO (1-4)	Organizations that support Indigenous-led Monitoring and Indigenous Guardians	4
	Total Participants	**26**

The results chapter is divided into three sections based on the emergent themes identified in the coding phase of the research. The results of the semi-structured interviews yielded key insights into

how Indigenous Guardians programs set their objectives and determine what and how to monitor key indicators important to the community. In addition, the challenges that were described by interview participants illustrate complex systems of colonial governance structures that limit the ability of Indigenous Guardians programs to reach their full potential in Canada. Finally, this chapter will describe the outcomes of Indigenous Guardians programs on the individual, community and national scale. This section will highlight some of the key reports described in the literature review sections and note where this study aligns and diverges from the literature on Indigenous-led stewardship and Indigenous Guardian programs.

4.1 How are Indigenous Guardian Programs Setting Objectives?

No two Indigenous Guardian programs are identical; each is a unique expression of their Nationhood, community and their land, ice and waters. What a program chooses to focus its activities and priorities on can be a complex or straightforward decision for the Nation or Nations it serves.

While the literature characterizes CBM programs into four categories based on how the program was initiated, the results from the interviews show that Indigenous Guardian programs do not seem to fit into CBM program frameworks (Conrad & Daoust, 2008; Danielsen et al., 2009; Whitelaw et al., 2003). Instead, programs are often started and guided by community concerns around harvesting and practicing traditional land use, strategic goals from leadership, reestablishing traditional relationships and responsibility to the land and strengthening capacity in the community. Indigenous Guardian programs take a rights-based approach to programs and embed them in their Nation's governance structure, unlike CBM programs in Canada (C. T. Conrad & Daoust, 2008; Pollock & Whitelaw, 2005).

This section will explore how Indigenous Guardian programs decided what to monitor and where to focus their stewardship efforts. This is an important dimension to monitoring programs as choosing what to monitor, especially determining indicators, plays "a crucial role in accurate assessments of social-ecological change and outcomes" of ecosystems (Muhl et al., 2022, p. 448). Exploring these questions was difficult for some interview participants, especially Indigenous Guardian program managers. When asked how their program established its goals, GM-4 stated, "We just built them." Managers, Indigenous Guardians, and stewardship staff are so embedded in the communities where Indigenous Guardian programs operate that it can sometimes be difficult for people to describe how objectives were set.

When probed further, objective setting methods were described in more detail, and three themes emerged. This section will explore how community concerns, planning, partnership and collaboration with other organizations influence Indigenous-led monitoring programs' priorities.

How communities decide what to focus their program on can shape the outcomes and impacts of their Indigenous Guardian program. For example, one general manager described that the data output for the project is not the "motivating factor for our communities and the work that we do… the number one motivating factor for that I've heard communities express has been the strengthening of language, way of life, culture, and governance, like just that expression of governance out on the land through that work. So, information collection and data management ends up being like a byproduct of it all. And they're very important. They're very, very important byproducts, but like, that's typically not what's driving them" (GM-9). Instead of focusing entirely on the data outputs for Indigenous Guardian programs, themes around resurgence, primarily through "spiritual, cultural, economic, social and political" means, emerged in the interviews and are in line with reports from regional analysis of Indigenous Guardian programs (Corntassel, 2012, p. 87; Indigenous Leadership Initiative, 2022). The ways that Indigenous Guardian programs set their objectives are described below.

4.1.1 Community-Centred Approaches to Establish Monitoring Priorities

Given the nature of Indigenous Guardian programs, it is of little surprise that most program managers and Indigenous Guardians described a "bottom-up" approach. Fifteen interview participants directly linked their program objectives to the concerns that community members, knowledge holders and Elders had identified. Concerns around cumulative effects from industry and safety concerns were especially relevant to interview participants. While some programs used formal community engagement sessions, interviews and workshops, they were described more as a formality rather than an integral component of program planning. The interviews also revealed the theme of aligning monitoring program goals with strategic priorities identified by leadership. These internal factors were described as the driving force of monitoring programs. However, there were also external opportunities that influenced the goals and objectives of monitoring programs. Funding opportunities and requirements were also a way that priorities were set and, to some programs, also acted as a constraint.

When GM-4 was asked how they determined objectives, they stated "we just built them". Because the managers, Indigenous Guardians and stewardship staff are so embedded in the communities where Indigenous Guardian programs operate, it could sometimes be difficult for interview participants to describe how objectives were set. GM-5 explained how community members and Elders would bring their concerns to the Indigenous Guardians: "a lot of the concerns coming in from

Elders on the water, like our rivers were really low one year where it was never seen like that before. So, I think that was kind of a worry and other Elders and community members were coming to us about that. That's when we installed all of our staff gauges and the beginning of our water monitoring.". In this case, the Indigenous Guardian program and managers are able to respond to community and Elder concerns without having to solicit engagement sessions. The community members felt that they could bring their concerns to the Indigenous Guardians, and they would be heard. This is a central tenant in how Indigenous Guardians programs serve their communities.

GM-11 described creating the Indigenous Guardian program objectives and work plan and verifying their work with the community through formal engagement sessions. GM-11 stated, "through our stewardship organization later on… we did do community consultation and community consultation had brought up a lot of the things that we already have on the go, and it just goes to show that you know, we're on the right track. And we're looking at things that are important to our people and making sure that we are hearing them.". GM-4 went on to say that while there were "a lot of community meetings… our communities are small, and we talk to each other all the time and people just bring up concerns". They described the two most important ways of collecting communities' concerns were "word of mouth and community meetings" GM-5 called this "moccasin telegraph.".

Some programs devised more formal sessions GM-1 and GM-2 described more formal sessions where community members decided "the need for [the program], identified some of the management structures, [and] identified some of the goals for sampling.". another program's Indigenous Guardians described using "informal conversations" and "community interviews" alongside presentations made to the community as a tool to determine how they would set their monitoring agenda.

What makes this approach an important piece of Indigenous Guardian programs, participant GM-7 explained, is that "questions like that, that were coming from the community about monitoring, and about environmental impacts, there was really no home or place to take a lot of those questions," community members were not getting the information they needed or wanted from any other monitoring program. GM-7 explained further, "there was some incorporation of Indigenous Knowledge, but really, it was more as an afterthought, not necessarily, you know, one of the drivers of those monitoring programs in the region. So, we wanted that front and center in terms of a need to address the community's concerns about resource development." Indigenous Guardian programs filled that gap and, in turn, built trust within the community so that their community could have

answers to the questions and information about the current state of their environment using both Indigenous Knowledge and science (Parlee et al., 2021). The outcomes of this work are explored later in this chapter.

Much of the concerns from the community were around the cumulative impacts from industry that were felt in their day-to-day use of the land (G-1, GM-7, G-2, GM-3 GM-8, GM-5 GM-11, GM-10, and MO-2). Interview Participants described threats from tourism (G-1, GM-11, GM-10), mills (MO-1), water quality and quantity (GM-1, GM-5, and GM-8) climate change (GM-8), development (GM-7, G-2, GM-3) and mining (GM-5). Participants noted that starting their own monitoring program was necessary because there were no other tables to bring forward the concerns of the community members. GM-7 noted that they "have no freaking choice" because no one else is monitoring the cumulative effects of industry on their "culture way of life and our rights", again describing a gap in the current monitoring and enforcement practice of disturbed areas. As mentioned in section 2.2.2, the Two Roads Research Team (2011) also identified the need for community members to monitor the impacts of industry on their traditional land use, using the "Two Roads approach, with a distinct aboriginal methodology for research and monitoring" (p.ii). Given the ability of Indigenous Guardians to center Indigenous knowledge and braid Indigenous knowledge with Western science, Field (Parlee et al., 2021; Popp et al., 2020; Reed et al., 2021), this monitoring model might be suited for reclamation that adopts the Two Roads Approach.

GM-7 described their programs as "really a result in responding to development." GM-4 stated, "We knew that, you know, the increase of land use within our areas close to our communities was increasing. So, we wanted to keep an eye on who was out there. So, we built an objective for that". The pressure from encroaching development, industry and disturbances creates the need for communities and Nations to build monitoring plans that can articulate the changes in their lived environment and provide the information needed to respond to community member's concerns (GM-4, MO-1), protection of resources (GM-11, GM-3) and to bring the information to tables such as impact assessment processes (MO-2, GM-7).

4.1.2 Embedding Monitoring Objectives in Strategic Planning

Pairing the bottom-up approach with a strong emphasis on engaging Indigenous Nations leadership also emerged as a theme in the interviews. There is a strong role of leadership, both Chief and Council and hereditary leadership, in setting goals and objectives. Not a strictly bottom-up approach,

Indigenous Guardian programs also have their objectives set based on priorities of leadership within their communities. GM-8 stressed the importance of "acceptance from the community's leadership support." Objectives are set to empower leadership and community members to have the information for decision-making at their own tables through land use planning, marine planning, protected areas and environmental assessments.

Eleven participants referenced land use planning as a key component influencing how their Indigenous Guardian program sets their objectives (GM-6, G-2, G-3, G-4, MO-2, AE-2, GM-10, GM-11, GM-12, MO-4 and AE-6). This can happen in a few ways; some participants described how their Indigenous Guardian program gathered the knowledge and data needed for their Nation's leadership to create a land use plan (GM-10). On the other hand, some Indigenous Guardians described how the land use planning process set up the structure necessary for them to develop a Guardian program and the objectives flowed from the plan itself (GM-11). For others, it's not that simple. GM-6, G-2, G-3, and G-4 described their objectives flowing from and into their land use plan. G-4 explains this saying, "we're unceded, and we haven't signed a treaty. But we do have our land use plan…. And so, our Guardian program came out of our land use plan but our land use plan also flows into our Guardian program and so they're one within each other".

Indigenous Guardians are a crucial component of adaptive management in the lands and waters that land use plans, management plans and Indigenous Protected and Conserved Areas (IPCAs) cover (GM-11). The complexity of these plans and the governance structure is beyond the scope of this thesis. However, interview participants noted that the co-management structures often rely on Indigenous Guardians to monitor and enforce both traditional laws set by Hereditary Chiefs and community leaders as well as provincial, territorial and federal laws (MO-4 and MO-2). AE-1 noted the importance of Indigenous Guardians bringing their knowledge to their leadership to shape management arrangements, supporting the role of Indigenous knowledge in creating and sustaining Indigenous-led and co-management arrangements and IPCAs (White, 2022). This knowledge is particularly relevant to ensure that community needs are met within these co-management structures, not just the settler government's monitoring needs. MO-2 notes "monitoring should be an opportunity to express I think, [community] values and those rights".

Part of mitigating the threats to the lands, waters, creatures and ice that Indigenous communities rely on involves enforcement. While the term enforcement is not a preferred term used by participants

since “enforcement is such a loaded term in like a very colonial like militaristic sense” (MO-4), “it's more of having that presence on the land to ensure that that that people are aware that [our Nation] does monitor their lands” (AE-6). G-1, GM-3, GM-5, GM-4, GM-11, G-2, AE-2, GM-12 and AE-6 all referenced the important role that Indigenous Guardians play in monitoring and enforcing the laws, rules, regulations, plans and decisions that their hereditary leadership or their chief and council set in their traditional territory. This connection is also identified in reports from Coastal First Nations - Great Bear Initiative (2022), Social Ventures Australia (2016) and Environmental Law Centre Society (2020). Some of these activities included monitoring their own community members, tourists, industry operators, and visitors from neighbouring areas to ensure compliance. GM-11 noted their role is to “work on behalf of the Chiefs to make sure that people are abiding by the rules that the Chiefs put out.”. While it depends where the community falls in terms of their justice system, Indigenous Guardians are the boots on the ground presence that encourages community members and visitors to abide by Indigenous law.

Whether Indigenous Guardians are providing the information and data, acting as the enforcement and monitors of the plan, or operationalizing management plans, the objectives that Guardians set for their program are integrated with the Nation’s vision for the land, waters and more than human creations. Whether that is codified in a formal management plan varies between Nations. While Reed et al. (2021) suggests that more research is needed to identify whether land use planning initiatives, such as IPCAs, could enable Indigenous Guardian programs to advance Indigenous self-determination and governance over their lands and waters, interview participants are reporting that Indigenous Guardians are strengthening the governance of their Nations (GM-3, GM-5, GM-4, GM-11, G-2, AE-2, GM-12 and AE-6).

4.1.3 Deciding Priorities Around Cultural Laws and Traditional Responsibilities

Six participants also clarified that their monitoring programs centred around their inherent rights to self-governance as Indigenous peoples and their responsibility to steward the lands and waters upon which they reside. There was a clear focus on stewarding the land for future generations and ensuring that the “resources bounce back” (G-1). These rights and responsibilities primarily focused on fish and wildlife, water quality, restoration activities, and culturally significant areas (G-1 G-2, GM-1, GM-11, G-4 and GM-10).

In one program, both GM-4 and G-3 referenced their inherent rights and how the recognition of their rights in the community and outside are critical components of why their program started and how they focus their efforts. Specifically, GM-4 stated, "the development of our Guardian program, is our Inherent Right to lands, to manage our own land. And so those are our first few steps that we are taking towards those things... This also feeds into how hereditary laws are maintained and the ways the inherent rights and inherent responsibilities are maintained and monitored". G-3 explained the connection between Guardian programs and the recognition of the rights of Indigenous peoples, "Indigenous rights and people being aware of what's gone on in residential homes and for people that live on reserves … a lot of that kind of contributes to the better understanding of people and more availability of funding…I think that's the reason why [the program] started up again and, you know, my opinion".

One participant linked the program's monitoring goals, establishing their own baseline for tributaries in the river, to "the relationship that [the community] had with all the tributaries in a way that enable them to exercise their fishing and hunting and muskrat harvesting, etc. Then they created an even further level, to represent the level of water required for them to for example, bring back a moose after they've harvested it" (AE-2). These baselines give leadership a picture of the conditions necessary for the community to exercise their traditional rights and practices.

The types of species that are monitored are also influenced by traditional food sources and support cultural revitalization in the community (Eckert et al., 2018). GM-12 described their approach to identifying program objectives was to start with what was the most important thing to the community: fish. "It's a no go if we can't monitor fish…it's about access to resources" given that that "fish is more important than anything". They can monitor potential threats, establish new habitats, and communicate with their community members about what impacts and mitigation they can expect on their fishing. GM-11 described a similar approach: "The future plan is to restock our sea foods, replenish our sea foods and make sure that we maintain balance within our ecosystem and recreate the biodiversity that we've had previously previous to contact, I guess you could say because everything was well managed. Everything was well taken care of prior to European contact, and you know, ever since Europeans came everything has just been changed dramatically". Identifying and mitigating threats to traditional land use activities was a key priority for Indigenous Guardian programs identified by Indigenous Guardians and Managers throughout the interviews. The need was also made

ever apparent by Indigenous Guardians and managers because this approach to monitoring traditional land use fills a gap that no one else is willing to serve (G-2, GM-11 and MO-2).

4.1.4 Capacity Development as an Objective

Indigenous Guardian represent the governance systems in their territory and are often called to fill in gaps in community services. While the focus of the interview questions largely revolved around monitoring and how interview participants developed monitoring program objectives, it was clear that Indigenous Guardian programs are not designed strictly for data collection. GM-7, G-4, G-3, GM-9 GM-4, GM-6, GM-10 and GM-11 all mentioned that the goal of the program was to strengthen capacity within the community to steward their traditional territories and fill gaps in services that other governments might otherwise fill. Capacity development should emphasize the inherent existence of capacity already within the community and offer support to processes that are already underway (Spencer et al., 2017). Indigenous Guardian programs are strengthening the existing capacity in communities and providing a modern expression of traditional stewardship and monitoring roles in their communities (Reed et al., 2020). This section explores how Indigenous Guardian programs emphasize strengthening their community capacity and use program objectives to develop their community members further. However, more research could be conducted to identify how Indigenous communities get the support needed to strengthen capacity in their Indigenous Guardian programs.

In a report published in 2022, Coastal First Nations - Great Bear Initiative found that while provincial and federal employees believe they are fulfilling their ministerial mandates, they are limited by "critical barriers in compliance and enforcement, emergency response and public safety, and environmental conservation and management" (p. 12) as well as a limited presence on the North, Central and Haida Gwaii coasts. The report summarizes and exemplifies how Guardian Watchmen are filling these gaps and serving their community by maintaining a presence on the coast, collecting data, and consistent emergency response (Coastal First Nations - Great Bear Initiative, 2022). While the report focused solely on the coasts of British Columbia, interview participants, particularly Indigenous Guardian Managers, noted similar experiences in their territories and that this is a "great source of pride for those communities" (GM-9). Furthermore, Indigenous Guardians are described as being better positioned as first responders since often "Guardian programs really are located in more isolated regions. And so, you know, we're always here. And sometimes the services aren't" (GM-9).

In this way, Indigenous Guardian programs contribute to Indigenous nations' expression of self-determination. G-4 noted the questions that helped shape their Indigenous Guardian program: "There's that vision of Guardians kind of building that Indigenous capacity and being able to use our voice and be able to really think outside the box in terms of decolonization. What does that mean? What does that mean for rights and titles? What does that mean for monitoring? What does that mean for our own governance?".

GM-3, GM-4 and GM-10 all noted their intention to use their Indigenous Guardian programs to support the healing that needed to happen within their communities and neighbouring communities. They described the healing that occurs when Indigenous Guardians are on the land and are embodying the traditional stewardship roles that are rooted in their culture, language and way of being (EcoPlan International, Inc., 2016; Parlee & O'Neil, 2007; White, 2022). GM-4 described their program goals is to "bring people to start their healing or continue their healing and get healthy enough to want to be able to have full time jobs and the training and stuff required to restore our land stewardship responsibilities". GM-4 and GM-3 described the intergenerational effects of residential schools and the trauma that has impacted their communities. They saw an Indigenous Guardian program as a tool to help restore the connections to culture, language and the land that residential schools and the resulting intergenerational trauma had attempted to sever. Parlee et al. (2007) note that "healing includes revitalization of individual, family, and community capacity to deal with past, present, and future challenges" and, for many Indigenous peoples, includes understanding their Indigenous values and ways of life (p. 125). Interview participants identified that Indigenous Guardian programs are supporting the revitalization of systems that improve community members' access to traditional ways of being on the land that colonial forces had broken. GM-10 also noted the need for healing from residential schools and the impact of colonial systems on their community. They said that the Indigenous Guardians who participated in the program built up their confidence and played a part in healing from that trauma. They also went on to say because of their journey, they become "healed healers instead of wounded healers" and support not only their community's connection to the lands and waters but also create the opportunity for others across Canada and the world to build a connection to the land and waters that they steward.

Embedded within the goals of strengthening capacity and connections within the Nation is the intent to strengthen the cultural identity of Indigenous Guardians as Indigenous men and women and to support a healing process from the legacy of residential schools, impacts of colonialism and

intergenerational trauma (Indigenous Leadership Initiative, 2022). GM-7 described the types of capacity development that were prioritized in their Indigenous Guardian program, developing both the capacity to execute Western scientific methods and developing Indigenous Guardian's understanding of their Nation's knowledge and culture, "We need to, you know, do training to understand what the environmental effects are, both on a western science and through knowledge translation from Elders to youth, and making sure that this oral knowledge system is protected and enhanced as we move forward.". GM-9 also described the importance of strengthening "the capacity of your own people to lead this work" to strengthen their Dene law and culture. Maintaining culture and language in their community is a crucial and integral part of what guides programs and how they prioritize their work. G-4 described the program's focus on strengthening capacity for their Nation so that Indigenous Guardians can move forward and operationalize not only the Nation's vision and management of their territory but their way of knowing and understanding their territory. Indigenous Guardians and Managers described that they are embedded in the fabric of culture and both traditional and non-traditional governance models in their community (Hessami et al., 2021; Parlee & O'Neil, 2007; Popp et al., 2020).

In addition to the deep spiritual and personal growth that programs develop, there is also a focus on professional development opportunities within the programs (Arsenault et al., 2019; Danielsen et al., 2009; EcoPlan International, Inc., 2016). GM-6 noted that their program makes training and professional development opportunities for Indigenous Guardians priorities for the program goals. The intent is to give Indigenous Guardians the freedom to pursue the facets of their role that are most important to them and that the community needs. Ultimately, when funded, designed, and carefully tailored to local issues, Indigenous Guardian programs can provide data and information and strengthen capacity within the community, resulting in "practical and effective management interventions" (Danielsen et al., 2009, p. 640).

While most Indigenous Guardian programs noted that their priorities were primarily determined by their community members' concerns, leadership's strategic priorities and filling capacity gaps, there were still monitoring objectives shaped by external factors. In the next section, we will explore how external organizations shape priorities in Indigenous-led monitoring programs in Canada.

4.1.5 Partnerships and Funding Opportunities

Partnerships and funding opportunities also greatly influence how Indigenous Guardian programs set objectives. Funding constraints and opportunities can affect how much a Nation can monitor, what it can monitor and the methods used for monitoring (Indigenous Leadership Initiative, 2022; White, 2022). Partnerships can include industry, academic entities, crown government initiatives and other Nations or Guardian programs.

The following section will highlight that funding is one of the most significant challenges that Guardian programs face. However, interview participants also describe funding as an opportunity, albeit a profoundly complicated one, as it is often tied to priorities external to the community that receives it.

Industry funding is an example of how partnerships can enable monitoring but is tied to the activities that often harm the lands, waters, and people in the community. Some interview participants noted that they would not receive money from any resource extraction companies. In contrast, others used financial agreements to cover the monitoring costs the community would incur from monitoring industry impacts on their traditional territory. GM-7 explained that impact benefit agreements covered a large portion of their program's monitoring costs but that this arrangement is problematic, stating that their community has “no choice” but to monitor the impacts “because [industry] is not doing it adequately. The government is not. But [they are] saying [they are] helping us by giving us this funding as a benefit? It’s sort of like I don’t really see it clearly that way”. Indigenous Guardian programs must grapple with how funding impacts what they monitor and the “responsibilities and reporting and obligations” that go along with monitoring (GM-1). Some programs noted that their funding comes from usage fees from tourists who visit their traditional territory. With a usage fee, the budget for the monitoring activities increases as more tourists visit the Nation’s traditional territory, increasing the frequency of patrols and the amount of Indigenous Guardians that the Nation employs. However, this creates an incentive to maintain the tourism industry despite the impacts on the territory (GM-3).

Outside of industry funding, programs are also receiving funding from crown governments. GM-5, GM-4, and GM-3 described these funding opportunities as having a positive impact on their monitoring programs since federal funding ensured that their programs had access to equipment, training and labs that would have otherwise been out of reach for the program. GM-5 also noted that

the partnership resulted in monitors developing lasting skills that were transferable as the program progressed. MO-2 however, offered a critique on how funding opportunities and partnerships shape Indigenous-led monitoring programs goals and objectives. MO-2 stated "you're sort of trying to pigeonhole your community things into some federal or provincial funding stream. So, Species at Risk is a really good example of that where communities where we are like, they don't necessarily have a strong relationship with Wolverine, but there's an opportunity to get funding for species at risk. And so, they're doing Wolverine projects…". Participants indicated that funding could shape program priorities but also may offer the opportunity to build transferable skills for future projects. Ultimately, who is providing funding and what activities the funding enables are critical considerations for shaping the priorities of Indigenous-led monitoring.

Partnering with other Indigenous Nations was also a theme that often arose in interviews, both by Nations who had considered partnering with other Nations and those already in an Indigenous Guardian network. These Networks are often geographically based, with neighbouring Nations interested in monitoring the same area using similar indicators. GM-8 stated "it's probably important because communities sort of tend to have maybe similar concerns. Like caribou being one or water quality. So, you sort of, you know, having a common interest and it's easier to sort of spark a conversation". These conversations can result in regional monitoring systems that support any number of Nations' access to information and data. This collaborative approach offers Nations a way to harness the joint capacity between Nations and gather data that answers questions from the communities participating in the network.

Coordinating monitoring activities required deeper and more formal conversations around data management and program priorities. In the case of GM-11, that required hiring a consultant company to conduct formal interviews of community members across five Nations to determine what monitoring priorities were most important in the region. While one interview participant (GM-12) noted that these partnerships can be challenging, most interview participants found these partnerships beneficial G-4 stated, "I see a lot of benefit in being able to connect your community with other communities that are similar and being able to have that information sharing is really, really important and just seeing like, what are other communities facing and what are challenges are they facing? Are there suggestions for any ways that you guys can support? I feel like that's it's really undervalued, solidarity between Indigenous communities, especially for land of protection". The benefits of Indigenous Guardian Networks are also articulated by The Environmental Law Centre

Society (Environmental Law Centre, 2020)who note that “networking and collaboration are necessary insofar as communities have varying capacities to implement their own programs. Networks help to share capacity, infrastructure, training, and organizational know-how with individual Guardian groups” (p.77). In addition, AE-2 stated, “building peer-to-peer networks, and I think that’s probably the most exciting element of the work that, you know, I’ve seen in the last five or six years.” These networks also offer a chance for Nations to “create a strong argument for a united approach” and lobby the government to fund structures where Guardians and their Nations decide their monitoring programs in a way that honours the traditional ways of knowing and the current realities that Indigenous communities face today [GM-12].

Ultimately, each Indigenous Guardian program is unique, still interview participants described how across Canada, Indigenous-led monitoring programs capture and address the concerns that community members voice about the lands and waters that they rely on. Indigenous-led monitoring approaches are focused on addressing these concerns through the collection of data and by aligning their work with the strategic priorities set by the Nation’s leadership. Despite the intent of Indigenous Guardian programs, calls to increase funding for Indigenous Guardians are often justified by citing gaps in monitoring data, supporting conservation goals, and the government of Canada’s commitment to biodiversity at COP15, but are less likely to include goals set by the Nations themselves (Wells et al., 2020). These factors sometimes align with funding opportunities that provide the financial resources to address community concerns. However, sometimes funders may influence the indicators and outcomes of monitoring; more research could be conducted to explore how funding shapes Indigenous Guardian programs.

In light of these tensions, there has been a notable shift in how Indigenous communities will access funds for Indigenous Guardian programs in the future. In the 2021 budget, the Canadian government committed up to $100 million to support programs, which includes $5.8 million to run the First Nations National Guardian Network, an Indigenous-led organization that provides an Indigenous approach to funders and crown government around conservation in Canada (Environment and Climate Change Canada, 2022). More research could explore how an Indigenous-led approach to funding enables the potential of Indigenous Guardian programs in Canada. The topic of funding is explored in greater detail in the next section, along with other challenges that Indigenous Guardian programs experience.

4.2 Challenges Associated with Establishing and Running Indigenous Guardian Programs

The challenges described in this section align with the findings from Coastal First Nations - Great Bear Initiative's 2022 report referenced in section 2.2.4, but as we will see, this section contextualizes the barriers described in a colonial system that limits the potential of Indigenous Guardian programs from across the country. This section will explore Indigenous-led monitoring programs' challenges when establishing and operating programs. This section will thus provide an overview of how interview participants described the impact of past and ongoing settler colonialism on their programs and communities.

4.2.1 Ongoing Impacts of Colonialism

According to Alfred (2009), "...colonialism is best conceptualized as an irresistible outcome of a multigenerational and multifaceted process of forced dispossession and attempted acculturation – a disconnection from land, culture, and community – that has resulted in political chaos and social discord within First nations communities and the collective dependency of First Nations upon the state" (p. 52). Colonialism transects each identified theme and is a meta-theme in this section. This section will also discuss how funding, capacity, and governance challenges impact Indigenous-led monitoring. Twelve interview participants noted the ongoing impact of colonialism as a significant challenge they face in their monitoring programs, their communities, and Nation. Of course, this is a pervasive and far-reaching issue that intersects with every program, initiative, and expression of Nationhood. It is a multi-layered and nuanced topic which transcends Indigenous Guardian programs and Indigenous-led monitoring. To tease apart each layer of how colonialism impacts Indigenous peoples and the structures they create is beyond the scope of this thesis. However, how colonialism affects the establishment and operations of Indigenous Guardian programs and monitoring initiatives is within the bounds of this section. Therefore, this section will focus on the impacts colonial and settler systems have on Indigenous Guardians themselves, on programming and project management, and the structural limitations that limit the ability of programs to achieve their desired outcomes (Reed et al., 2021). In this section, interview participants described the impacts of colonialism on the operations of their program on an individual or personal level as well as a community or structural dimension.

On a personal level, Indigenous Guardians and managers described the toll that participating in colonized governance processes has had on their wellbeing and teams'. Indigenous Guardians described the emotional impact of facing the federal and provincial decision-making mechanisms. On an individual level, we can see that modern "colonial bureaucracy" can lead to challenges in the personal well-being of Indigenous Guardians (G-4), especially in the cases of large-scale resource development (Parlee & O'Neil, 2007). One Indigenous Guardian stated "I'm the younger one in the group and so I'm pretty naive when it comes to government processes and stuff like that. And so, I think being a Guardian you're being able to witness the ongoing colonization and the systematic barriers that we're facing. And so, I know that's one of the things that I struggled with a lot was just the colonial bureaucracy" (G-4). This led to burnout for the interview participant.

Another participant (G-4) noted that colonial legislation, such as the Indian Act was designed to, "take the Dene, off the land and corral them…. it's a vicious thing when you go right back to the beginning of legislation and where we've ended up today". The legacy of the Indian Act, colonization and residential schools has been well documented in the literature as a cause of post-traumatic stress disorder (Evans-Campbell, 2008), intergenerational trauma (Brave Heart & DeBruyn, 1998), traumatic grief (Poonwassie, 2006) at the individual, family and community level (Fast & Collin-Vézina, 2020). The same participant tied the history of Canadian legislation to intergenerational trauma experienced in Indigenous communities. Several other participants also noted that healing from intergenerational trauma caused by the Indian Act, residential schools, and other systems and events that have caused harm in First Nation and Indigenous communities is a crucial yet challenging piece of running and being part of a Guardian program. Multiple structural socio-economic conditions highlight the ongoing colonization of Indigenous peoples living in Canada, which can limit the ability of Indigenous communities to foster social change and move toward self-determination while maintaining their culture, language, traditions and practices (McCarthy et al., 2014). This struggle, as participants stated, "has an impact on day-to-day operations" (MO-4) and noted the health and wellness issues that exist in First Nation and Indigenous communities that are a result of passed and ongoing settler colonial systems (MO-4 and GM-10). Where interview participants described the challenges of intergenerational trauma and the impacts of colonialism, they also described the work that their communities are doing to heal from the trauma and how their Guardian program contributes to the healing journey.

Five interview participants described how colonial governments are impacting Indigenous Guardian programs, resulting in trauma. Indigenous Guardians are supporting the healing journey from trauma caused by colonial legislation and systems both on a personal level and a community level. In addition, themes around how crown governments and Western science can influence Indigenous-led monitoring work on a programmatic scale also emerged. Generally, this was characterized as a challenge, stemming "mainly from government, but also from just white settler culture and relationship to land" (MO-2). MO-2 described that the scope of Indigenous-led monitoring programs is often reduced to what is covered under Treaty Rights, such as "the things that you need, that you kill and eat and those are the only things you get… any monitoring built around, but you know, no real space for sacred sites, or maybe even medicinal plants are part of the challenge" (MO-2). MO-2 described these limitations on Indigenous Guardian programs where the monitoring program or objectives are set by funding requirements, external review processes (EAs), research agendas, private companies, and environmental non-governmental organizations. In this context, Indigenous Guardian programs must face what Dennison (2012) describes as a colonial entanglement, whereby programs are forced to engage with and operate within colonial forces that both support and undermine the potential of Indigenous Guardian programs to be successful.

One participant said, "always navigating and managing and engaging with federal and provincial governments in the ways that they want to do things that don't necessarily align with the way that the Nation wants to do things or how they see things" (MO-2). Another participant noted this challenge as the most significant impediment to programs and went on to say,

> "When we don't have, you know, authority, like full authority, and our lands and territories, we're always subject to the political whims of like largely a settler government and I think like that, in my mind, is an ongoing challenge and will be an ongoing challenge until we really address that that kind of decolonization question. Until we really kind of rectify that, like you said that original relationship, that Nation to Nation relationship that really embeds environmental decision making" (AE-2).

Even in regimes or arrangements that appear to be co-managed, there are still issues of authority and understandings of knowledge, as AE-2 describes: "processes or wildlife management processes are all legacy broken processes that even though they're embedded in co-management boards, and so it's basically you know, science that's informing everything about polar bear management, and how old is that and yeah, it's even though it's co-management, and Inuit running it, it's still colonized, you

know, there's nothing decolonized about the process at all. And the communities are the ones that we've been working with. They forced us into accepting that we needed to do research".

Colonial systems of governance can impose conditions that limit the ability of Indigenous-led monitoring programs to reach their full potential (Eckert et al., 2018; Mamun & Natcher, 2023; Reed et al., 2021). These conditions are felt personally, impacting the community's wellbeing and can impact the program operations. These factors act as the context for the specific challenges or factors that interview participants identified. Figure 9 outlines a conceptual framework for how this section is laid out with the ongoing impact of colonialism setting the context for the specific challenges that interview participants identified, including funding, strengthening and retaining capacity and governance.

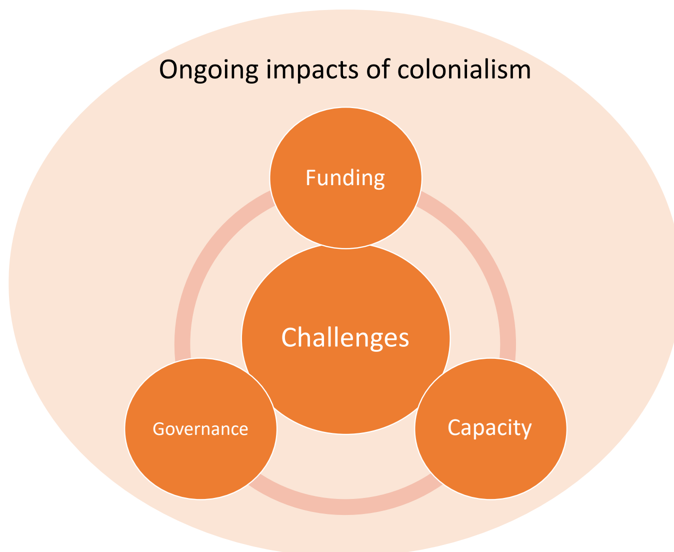

Figure 9 Challenges Framework for Indigenous Guardians

Note: a framework for understanding the interrelated challenges and the context for the specific challenges that Indigenous Guardian programs face.

4.2.1.1 Trauma and the Impact of Colonialism on Communities

Interview participants described how trauma and the legacy of colonial impacts have impacted Indigenous communities and that healing from the ongoing and past violence is a crucial priority for their program. This was described in the earlier section as a critical priority for Indigenous-led monitoring programs, but it is also noted as a challenge that impacts the operations of Indigenous-led

monitoring programs (Evans-Campbell, 2008; Fast & Collin-Vézina, 2020; Parlee & O'Neil, 2007; Reed et al., 2020).

When asked about the challenges that Indigenous Guardians face, one participant became uneasy and stated

> "How do I say this? I mean, I don't think it's any great surprise that, a lot of First Nations communities like deal with greater amounts of poverty and different substance abuse issues and health and wellness issues. And the living conditions, housing conditions, all that stuff, right? I think that's a huge reality that's being faced by Guardians, a lot of Guardians, right?... I'm nervous to say this, because I want to also highlight, there's also so much wonderful work and amazing, magic that happens in communities and some incredible thought leaders and like beautiful, beautiful homes and beautiful places. But I also think that there is a lot of struggle there too and that is that has an impact on day to day operations, frankly" (MO-4).

The interview participant contextualizes their comments by adding that these impacts are due to the colonial structures that have historically impacted First Nations and the current federal and provincial systems that do not align with how Indigenous-led monitoring programs and their Nations measure success. A Guardian Manager noted that "in the communities, there's a lot of struggle" especially in age groups 20-30, which comprise the majority of their Guardian workforce (GM-5). An employee of an NGO described these "accessibility" challenges such as the need for childcare and other supports such as transportation and fuel, the ability to take time off work for volunteer positions and their familial responsibilities all impede some member's ability to be a part of any Indigenous-led monitoring program (MO-5). These challenges are common in Indigenous communities impacted by colonialism (Spencer et al., 2017).

Supporting the well-being of Indigenous Guardians is crucial when continuing to build the capacity of these programs. Guardians are part of supporting the revitalization of Nations. It is necessary to ask, as one researcher put it, "how are we supporting, well-being of our individuals and our families of our communities and our Nations? All of which you know, are central to the success of you know, a Guardian program" (AE-2). A part of this support can be the community's Elders and knowledge holders. While most participants described the benefit of Elders to their programs, one Indigenous Guardian Manager noted how a changing demographic has posed difficulties for their program. GM-10 stated, "After we start losing the Elders… I didn't have that support anymore. And so, the program

started to change" (GM-10). The loss of Elders can have a devasting impact on their communities, and Indigenous Guardian programs also feel the effects of the loss and what it means for their work on behalf of the Nation (Eckert et al., 2018).

4.2.1.2 Capacity

Capacity was the most referenced challenge, with 14 participants noting that staffing and retaining staff were the most significant obstacles to running an effective Indigenous-led monitoring program. This research takes a systems-based approach to capacity building where community capacity is evaluated on the individual, organizational and system level (Porzecanski et al., 2022). Participants noted challenges around strengthening technical capacity, overcoming trauma and providing a competitive wage as factors limiting Indigenous Guardian programs' capacity.

Interview participants described the difficulties recruiting staff due to the nature of the work (GM-5 (GM-10). Indigenous Guardians expressed a gruelling work schedule and working "at the grindstone, non-stop, you know, sometimes seven days a week for months" (G-2). One manager described being in the field as, at times, "a miserable place," but "it's those individuals that love work, and they're few and far between. And those that do it just for a job. You will find really quick that they're not going to be around. So, the weaknesses that we don't know how to identify those diamonds in the rough" (GM-12). Despite the challenges associated with strengthening capacity in the Indigenous Guardian programs, the success of these programs is predicated on having a well-trained and dedicated staff. The Indigenous Guardians and program managers who participated in this study noted that strengthening the capacity in the community was one of the program's greatest successes and is described in earlier sections.

Program managers also described difficulty managing the immense workload and responsibilities that are required of Indigenous Guardian programs (GM-5, GM-12, GM-10, GM-4). One manager explained staying "on call" while Guardians were in the field, noting that she "had a radio phone that just sat behind my table here and it was on 24/7 and so I never had a break because I was one ear open, listening for them, making sure they're safe. And if they weren't, I had this list of things that needed to be done." (GM-10). The pressure on program managers results in burnout and tensions between the crews and teams in the field and the goals and objectives set by leadership and the community.

A key component of strengthening individual capacity for an Indigenous-led monitoring program is developing the technical expertise to monitor and collect data with scientific rigour grounded in the community's worldview and culture. While not all programs are focused on data collection, some programs focus on strengthening the technical capacity of their crews, which is a top priority for program staff. Strengthening the capacity needed to execute environmental monitoring projects was identified as a challenge by six interview participants, particularly Indigenous Guardian managers.

Strengthening the technical capacity included performing environmental monitoring (GM-8 and GM-1), managing data (GM-5 and GM-9), maintaining equipment (GM-12) and operational safety procedures (G-4), and were cited by interview participants who were running Indigenous Guardian programs or were Indigenous Guardians themselves. GM-1 noted that these challenges were most acute when “getting a program started” and emphasized that “every team has those challenges if you're bringing folks into any system, you got to train them on how to use the technology, how to use a system.” Another interview participant stated, “data management is another highlighted one, that I'd say the more advanced programs have been able to find solutions towards, but usually at the outset, when you're just starting out the program and building the program, you often have limited capacity, and that limited capacity often doesn't make sense of managing your own sources of information” (GM-9). Data is commonly cited in the literature as a challenge for community-led monitoring and can impact the Nation or community group’s ability to create change based on data collected by community members (Danielsen et al., 2009; McKay & Johnson, 2017). In some cases, Indigenous Guardian programs have partnered with university researchers to develop their monitoring methodology (Housty et al., 2014; Popp et al., 2020). Interview participants noted that this was useful but desired to build the same capacity in the community over time.

On a practical level, Guardians noted the challenges of getting the certification and requirements needed to be on the job. G-4 noted, “other challenges I guess would be licenses. We need more people with driver's licenses” GM-12 described their biggest issue as “training of our Guardians on maintenance of two stroke engines”. The programs often overcame these practical and operational challenges but were described as obstacles when hiring and building their Indigenous Guardian teams.

GM-8 noted that their Indigenous Guardian program developed capacity over time after noticing “a gap” in the community. Many Indigenous Guardians programs build this training into their

programming to overcome challenges associated with staffing for environmental monitoring; in the case of GM-8, “we sort of adapted in a sense to be able to, to fill in that gap and get people in the communities trained throughout the years.” Another interview participant noted, “A lot of our schools, a lot of our students were pushed through just to have an adult grad, you know, they weren't getting the learning that they needed to be able to graduate and move on. So, there's a really a huge barrier there for a lot of our young people and I feel [Indigenous Guardian Programs] give them the opportunity to reconnect with their culture and you know, that they can get out there and do some work and do things.” (GM-5). Recently, programs such as the Stewardship Technician Training Program (STTP) from the University of Vancouver Island have been created to support Indigenous Guardians to learn monitoring and data collection skills while pairing those skills with Indigenous Knowledge held by Elders in their communities. In a recent report, STTP evaluated the program’s performance and determined that this program “did an excellent job of delivering on the primary goal of transferring Stewardship Knowledge and Skills, as well as significantly contributing to Employability; Personal Wellbeing; Self-Improvement; Coastal Networks; and Guardian and Technician Credibility and Respect” (Coastal First Nations - Great Bear Initiative, 2020, p. 4). More training programs that support skill development for Indigenous Guardians in a culturally resonated way could be an approach to strengthening their skills and supporting communities’ goals for stewardship in their territory.

4.2.1.3 Funding

One of the common challenges raised by 13 interview participants was securing the funding needed to meet program goals. Participants referenced the funding from the federal government Indigenous Guardian Pilot project. However, they noted that these funds were still insufficient to enable Indigenous Guardian programs to reach their full potential in their communities. Despite these increases in availability, “funding that's been provided to communities [is] still far, far, underfunded, right?... far, far underfunded” and “[there is] not enough money in the federal budget for all the people that want to do Guardians programs.” (MO-2). Another interview participant running a program stated, “when you look at the contributions we are getting there, not a large amount of money” (GM-5). This lack of funds results in programs being unable to retain current employees or scale the Guardian program to meet program, community, and leadership’s goals resulting in economic barriers to participating (Austin et al., 2018). Still, some interview participants noted that

there has been more funding than ever before “there was no money and for land Guardian programs, period, full stop. When I when I started, there was nothing.” (G-2).

There is also a clear intersection between funding and strengthening capacity in Indigenous Guardian programs and the communities in which they operate within (Coastal First Nations - Great Bear Initiative, 2020). Many programs cannot run year-round and provide employment opportunities on a seasonal basis. This results in cycles where Indigenous Guardians are employed and, in the field, often working long hours to being laid off without pay. One manager described their challenge: “we do rely heavily on several different pots of funds in different projects and wherever we can get funding to start building it up for the next year. So that we're not laying off people until more funding comes so it's been painstaking, hoping for the best and keep putting out the proposals” (GM-4). Again, the programmatic cycle of funding opportunities limits the ability of Nations and communities to build the type of infrastructure, resources, and knowledge accumulation necessary for Indigenous Guardian programs to meet the needs of their community. If funding was secured, Nations could provide year-round employment opportunities that allow members of their community to stay in the community and work on behalf of their Nation (AE-2). This limitation is described in more detail in the section above.

While the amount of funding available to Indigenous Guardian programs is increasing (Indigenous Leadership Initiative, 2022), the model for providing funding to Indigenous-led monitoring initiatives has not improved according to interview participants. Participants referenced the challenging nature of cyclical programmatic funding available to Indigenous Guardian programs, referencing that most funding available to programs is often only for 1-2 years and does not support “financial sustainability and long-term management” (AE-1). Interview participants noted that other Indigenous-led monitoring programs have shut down because the funding cycle is designed for short-term projects which were misaligned with the needs and goals of their community (GM-7). This funding arrangement also hinders the ability of Indigenous communities to build capacity and “develop this sort of infrastructure to really support these programs and succeeding, support that ongoing kind of knowledge accumulation and just supporting people to stay in their communities” (AE-1). While the theme of strengthening capacity was often tied to funding constraints, one participant put it clearly: “the importance of multiyear long-term funding, and an opportunity to work on behalf of their Nations, and to do work that really reinforces where they come from, both from a land perspective, as well as a family perspective, that is so valuable” (MO-4). Without securing long-term funding

sources, Indigenous-led monitoring programs may not be able to meet the goals that their community or leadership set out for them.

In summary, while funding opportunities are increasing across Canada for Indigenous Guardian programs (Indigenous Leadership Initiative, 2022), the nature and model for funding is not aligned with the nature of work that Indigenous Guardians perform nor the role they have in their communities (Reed et al., 2021). While funds are available, the amount distributed to each Nation is often insufficient to resource effectively and staff the program. While Guardian programs can be funded in numerous ways, it is a limiting factor to the program's capacity.

4.2.1.4 Governance

A key component of Indigenous Guardian programs is that they are the physical presence on the lands and waters of their territory and are extensions of the leadership of their Nation and community (Artelle et al., 2019). Guardians are collecting data that empowers community members and leaders and supports decision making within Nations relating to land and water (Social Ventures Australia (SVA), 2016). Indigenous Guardians also monitor human activities to ensure that the use of the lands and waters comply with management decisions, rules, and regulations.

While not all Indigenous-led monitoring programs monitor for human activities and compliance, the theme of authority and ability to enforce laws, rules and regulations was raised as a challenge for programs. Twelve interview participants noted difficulties associated with enforcement and authority when describing their challenges as an Indigenous Guardian program or supporting Indigenous Guardian programs. The interview participants that are running Indigenous Guardian programs are currently operating under an ‘observe, record and report’ program model, however, there is a desire to have “the authority to implement…repercussions or fines” (G-1) when the Nation’s laws or stewardship plans are not being followed by visitors to the territory or community members. This theme was especially relevant for interview participants who monitor industrial impacts within their Nation’s traditional territory. G-2 noted the frustration that this caused their crew stating “we can only observe record report. So, it doesn't matter how many times you're out on the ground if you can't act on it”. Another academic expert supporting Indigenous-led monitoring programs across Canada noted this limiting factor: "We can do all of these things, but we can't do enforcement” (AE-2).

These challenges associated with enforcement and jurisdiction also bring to light conversations around authority, rights and jurisdiction between governments Indigenous and crown governments in

Canada (Indigenous Leadership Initiative, 2022). One participant noted that these conversations often put provincial governments in a "conflict position" (MO-3). Another stated Indigenous Guardian programs provide "an opportunity to have very open and explicit conversations around authority…and in ways that I think are needed and they're critical, but they're hard conversations' (MO-4). It was a common theme that programs raise questions about authority and decision-making. Specifically, the relationships between Indigenous Nations and settler governments were described as a "limiting factor" (AE-2) of the potential of Indigenous Guardian programs in Canada. AE-2 and AE-1 explained how "when we don't have, authority, like full authority, and our lands and territories" programs are "subject to the political whims of like largely a settler government and I think like that, in my mind is an ongoing challenge". A "shared recognition of jurisdiction between two Nations or many Nations", being able to "address that that kind of decolonization question" and establish a "Nation to Nation relationship that really embeds environmental decision making," are all approaches to overcoming these challenges in order to advance Indigenous Guardian programs (AE-2). Issues of jurisdictional authority and enforcement continue to influence Indigenous Guardians' conversations within their Nation and with provincial and federal governments. This results in colonial entanglement (Dennison, 2012) where Indigenous Guardians are forced to operate within the federal and provincial policy paradigm while embodying their own Nation's laws and authority. While there are limitations to the enforcement power of Guardians, as MO-4 describes, Guardians remain the "face of authority on behalf of the Nation" and practice enforcement in an Indigenous and decolonized way.

Interview participants also described the challenges of mobilizing data and observations when interfacing with industry, government and other monitoring groups (Danielsen et al., 2009; McKay & Johnson, 2017). Some interview participants described this as "coming to the table" (GM-7) or a "nexus of interaction" (MO-2) where communities, supported by their Indigenous-led-monitoring program, "have a bit of leverage" (MO-2) to influence decision-making and advance their community's strategic priorities. Establishing a nexus of interaction can be difficult and is often centred around resource extraction or increased disturbance to the territory. The community often initiates these interactions, as GM-7 explains, "there's no table or there's no forum that exists where with the Crown, where we could say sit down on a cumulative scale and say okay, this is what our monitoring results mean, and say, what are we going to do about it?". Another Indigenous Guardian program lead used the consultation process of a proposed pipeline to "make the case to authorities,

regulatory authorities about why they should work with us. And they weren't a willing partner at the beginning of those discussions.” (GM-9). Other tables noted were the consultation for a mine proposal, oil sand development, national park, permitting processes, and other environmental assessments. At these tables, the data and information of the Indigenous Guardians or monitors were used to advocate for their community. While Indigenous communities are equipped with data, the power relationships between crown governments and Indigenous communities are deeply inequitable (MO-2). In addition, these processes are slow and bureaucratic according to interview participants and they are not able to respond to time sensitive threats that impact communities’ ability to exercise their traditional rights and protect the land (GM-1).

4.2.2 Conclusion

There are more Indigenous Guardian programs in Canada than ever before, (Indigenous Leadership Initiative, 2022) However, there are significant constraints that limit the ability of programs to reach their full potential. The challenges described in this section are rooted in a settler colonial system that tips balances of power in favour of Western modes of environmental government and management. Participants articulated that the relationship to the Crown is limited and constrained by the state, namely provincial and federal agencies and that Indigenous Guardian programs are still subject to politics of recognition, especially around the recognition of the rights of First Nations and Indigenous communities to right to self-determination and inherent right to self-government (Coulthard, 2007). While many programs are overcoming these challenges, we may not see the full potential of Indigenous Guardian programs realized without addressing how the Crown constrains and limits the powers of Indigenous Nations.

4.3 What are the Impacts of Indigenous Guardian Programs?

While Indigenous Guardians and managers experience challenges establishing and running programs, they also describe the numerous benefits of having an Indigenous Guardian program in their communities. In a 2016 study, Social Ventures Australia analyzed the outcomes of Indigenous Guardian programs across the Canadian Northwest Territories and compared them to the outcomes of Australian ranger programs. The report examined the outcomes for Guardians, community members, and government, including the Canadian Federal Government and the Government of Northwest Territories (GNWT) and non-government organization (NGO) partners. This report concluded that Indigenous Guardians in the NWT experience positive personal outcomes through their roles in their

community, including increased skills, confidence, pride and income, and better health and well-being. The community also experienced social and economic benefits, better cultural and environmental management and a strengthened relationship with the land (Social Ventures Australia (SVA), 2016). Externally, organizations and governments experienced benefits through increased monitoring and environmental protection in the regions where Guardians are monitoring. Indigenous Guardian programs also provide skilled employment opportunities for communities in the north (Social Ventures Australia (SVA), 2016). The results of the 2016 report closely match the results of this study from across Canada. Guardians and managers described how being a part of these programs has impacted them and the change they have seen in their colleagues. In this section, the impacts or the long-term outcomes associated with structural changes (Gharesifard et al., 2019) of Indigenous Guardian programs will be described at the individual, community, and national levels. It is important to note that interview participants made connections between these levels and explained how the personal impacts can inspire and uplift the community. These categories are therefore loosely held and act as a tool to delineate the results and improve readability.

4.3.1 Personal Impacts on Indigenous Guardians

The stewardship activities that Indigenous Guardians programs engage in are shown to deepen spiritual, cultural, and emotional connections to the land and others involved in stewardship, which can result in improved mental well-being and stress in stewards (Nikolakis et al., 2023). In this section, Indigenous Guardians described how their role creates feelings of empowerment, reconnection to culture and nature, and confidence. These feelings have permeated through personal and professional experiences of Guardians and are explored in this section.

Indigenous Guardian programs were described as a model that formalizes community member's existing relationship with the land through positions that utilize on the land skills for community benefits (G-1). Participants described tailoring the positions to the skill set of community members, GM-8 stated "We have a community member that sort of was very keen and we we've always sort of gone back and used his expertise of the land to begin with, and then you sort of add the science component as part of that. So, it's sort of a success story, in a sense." Guardians noted the professionalization of their role in the community as a benefit (Reed et al., 2021). G-2 stated "I did bits of archaeology work, tons of monitoring stuff, but never had a title to go with it. And when I started on having that title, even though it doesn't come right now with a lot of power, like our

conservation officers, it still makes me feel more empowered when a job I do think I'm proud to say that I'm a Land Guardian and it fits in with a lifestyle type of work that I do…". GM-9 also noted the creation of jobs, "you can see the growth and success over time by how your team starts to grow around you. And sometimes that can also bring in some challenges. But that's a clear indicator, like the ability for it to contribute to the economy, through programs like through jobs, through the creation of jobs". Job creation in the community and economic benefits were consistently noted as one of the significant benefits of Indigenous Guardian programs by interview participants and the literature (Austin et al., 2018; McKay & Johnson, 2017). These jobs aligned with their communities' vision and offered opportunities to build and strengthen the capacity of the community and Nation. Simply put, "It's definitely getting community members back out on the land. It's providing jobs" (GM-4).

Interviews revealed themes of professional development achievements were important to Guardian programs and that training was a crucial component in creating sustainable jobs within the community and beyond (Coastal First Nations - Great Bear Initiative, 2020; Social Ventures Australia (SVA), 2016). While Guardians are highly competent in navigating their own territory, GM-4 noted the importance of training that allows Guardians to learn transferable skills that could be applied within the territory or beyond. GM-4 stated, "Our Guardians have gone through tons of training, which you know, will always be useful for them should our program falter for whatever reason they will have a lot of skills built up for, for work in the environmental field going forward". GM-1 stated "[Guardians] are savvy on the land, what this program has allowed them the opportunity to add that Western science to that Indigenous knowledge and given them that holistic view of the land… [Guardians] know a lot more than most graduates from universities in science programs environmental science programs. They can tell you things. They know how to use the monitoring equipment they know, they know the land, and they know the science, they know the science as well. So, it has been very educational in that way for them.".

More than jobs and professional development Guardians also experience healing, as described above, from intergenerational trauma and a connection to a pan-Indigenous movement of stewardship and connection to culture (Nikolakis et al., 2023; Social Ventures Australia (SVA), 2016; Tedmanson & Guerin, 2011). GM-5 noted that "I feel this [program] gives [Guardians] the opportunity to reconnect with their culture and you know that they can get out there and do some work and do things. So, and we've taken some young guys out and you can really see the change in them being out

on the land." One Indigenous Guardian also stated that she gained "a lot of insight and kind of lit a fire underneath me knowing and being connected with other programs across the country, and kind of being able to have a space dedicated for us to all get on the same page and become and just be aware of what kinds of things we're facing, because I think that's what we're facing a lot is a lot of division." In support of that reconnection to a pan-indigenous stewardship movement is Guardians learning from Elders in their community (Austin et al., 2018). GM-8 noted that Elders' involvement in Indigenous Guardian training benefited the Indigenous Guardian's work and understanding of the land, culture, community, and themselves.

Indigenous Guardian programs' impact on the individual is felt in their professional and personal lives. In the community, Guardians increased social capital, as measured by connection to family, community, spiritual ties and land, which supports both physical health and mental health (Tedmanson & Guerin, 2011). When programs are successful, they create a new generation of stewards who are accredited and professionalized but also reconnected to the land and their culture (Coastal First Nations - Great Bear Initiative, 2020). As programs mature and become an integral part of their community, we can see these benefits transcend the personal level to the community level. This next section highlights some outcomes and impacts in communities with established Indigenous Guardian programs.

4.3.2 Community Benefits

Indigenous Guardian programs are building up individuals in their communities, but the benefits continue beyond the personal or professional experience of the Guardians themselves (Coastal First Nations - Great Bear Initiative, 2020; Nikolakis et al., 2023). In interviews, the respondents often referenced Indigenous Guardian programs' impact on the entire community, primarily through the program's ability to facilitate greater connection and deepening relationships or use of the land and water. Respondents described how the professional capacity development of Guardians strengthens community services, resulting in increased safety and the ability to advance their Nation's goals and make decisions. Another meaningful way that Guardians impact their community is by being a part of their community's cultural resurgence, which includes movement towards Nationhood and self-determination and supporting youth's connection to the land. This section highlights how Guardians are strengthening communities and Nations through their work.

4.3.2.1 Community Capacity Strengthening

In the previous section, participants identified that Indigenous-led monitoring programs are often tasked with delivering services and filling gaps in their community. The literature has documented that many remote communities experience a lack of services, especially around safety (Coastal First Nations - Great Bear Initiative, 2022). Interview participants described how Indigenous Guardian programs are strengthening the capacity within the community to provide services and responses to community needs. GM-1, G-4, GM-9 and MO-4 noted the role that Guardians play in filling gaps between provincial and federal agencies, including search and rescue and emergency first response (Arsenault et al., 2019; Coastal First Nations - Great Bear Initiative, 2022; Wells et al., 2020). MO-4 stated, "So in terms of just a location perspective, they are there, they're local, if there's a spill, if there's someone missing all of those things, they have the skills and the equipment to be the ones first on the ground to grab them. So, from a very, like economic standpoint, there are those values that exist." GM-1 stated that Guardians ensure that "the community can enjoy the land in all safety and in peace" noting that Guardians are facilitating the access of the territory for community members by providing safer conditions for land users. Beyond the physical safety of community members, Guardians support the efforts of leadership, keeping the community healthy and able to harvest from their territory without fear of contaminants and pollutants. G-2 stated, "We deal with community health... You know, how many berries there are…we do like harvest surveys and harvest samples, take samples of people's harvests to see whether or not they're good to eat, you know what I mean and concentrations of heavy metals and things like that... People worrying about if it's healthy enough to drink that water or if it's healthy enough to eat that moose or is it healthy enough to eat those fish?' Guardians help to answer these questions and respond to concerns that the community members have. Because of the data collected by Indigenous Guardian programs, community members have greater trust in the consumption of traditional foods or can make decisions to adjust their consumption to country foods.

GM-1 called their Guardians the "line of defence" as they actively looked for issues, especially resulting from industry activities, in their patrol area to ensure community members could move and harvest safely throughout their Traditional Territory. GM-8 described the ability of Guardians to answer the questions and concerns that community members have about harvesting on their traditional territory as a key success of their program. Having the ability to answer questions within

the community without needing to hire outside consultants is a significant achievement for Indigenous Guardian programs. GM-7 similarly states,

> "Through the training program, the development of a training program was a significant impact in recognizing, like, okay, we can develop a CBM program, run the program, but we can also design a curriculum and how we do our own training, accredited training program. So, it's educational as well. So that is a significant I think, positive outcome for the community is recognizing you know, what they can take on training. They could develop capacity themselves, they can recruit, then they can partner with institutions."

Capacity strengthening for Indigenous Guardian programs was a reoccurring theme and was especially important given the bottom-up, needs-based approach that programs take. By responding to community member's concerns, Guardians gain or seek out the skills required to sustain and care for their Nation (GM-8). This results in blanket capacity for the community to respond to and mitigate community concerns (G-4). As GM-9 stated, "I think great sources of pride for those communities in those Indigenous Guardian programs that not only have they been able to build their capacity to do the work for their, for their nation, in terms of taking care of land and water."

4.3.2.2 Data for Decision-Makers

Globally, Indigenous communities have moved towards renewed self-determination in resource management by bringing together Indigenous knowledge and Western scientific researchers to advance their research management goals (Housty et al., 2014). As communities strengthen their capacity, they also conduct studies and collect data for decision-makers in their Nation. Almost all interview participants described data collection as a key part of their program and how the work of Indigenous Guardians supports decision-makers within communities (N=23). This section explores how data is a crucial component of some programs for decision-makers.

GM-8 described the way that their Guardians collect samples, "we already like our standard of collecting the water samples, as well as fish and whatnot. It's like pretty much standardized to what the mines are currently doing in the NWT". This approach allows for the data collected by the Guardians to be used by the community to monitor the effects of industry and then use federal and provincial mechanisms to ensure compliance and enforcement of standards set by those governments. Guardians collect harvest study data, water quality data, air quality data, invasive species monitoring and may other types of data that helps leadership within the communities make decisions and

advocate for their community when at a “nexus of interaction” described in the earlier sections (G-2). GM-9 stated Indigenous Guardian programs “empower your community to make decisions if you're able to store [data], and then be able to take that data and then translate it to your decision makers.” The literature notes the importance of the role Guardians play “in ensuring that traditional knowledge is brought to bear in a broad spectrum of land and resource decision making” (Environmental Law Centre, 2020, p. 29).

This can especially be relevant for establishing baseline data and highlighting the impacts that new projects have had on environmental and social conditions (GM-1, GM-4 and GM-5). Baselines were established through scientific and Western methods and recorded Traditional Knowledge shared by Elders and land users (GM-2). In this “formal” format, Nations are able to use that information “to have a conversation, or to take action” at whatever tables they sit at or create, both internal and external to the community (GM-1 and GM-2). GM-8 stressed the importance of sharing the data internally and noted that as a key success of their program, it was important that the community at large, especially Elders, were aware of the changes and current conditions of the land, water and creatures.

In addition, data collection also supports the operationalization of laws established by the Nation itself; GM-3 stated “Guardian programs introduced some new regulation to the amount of sea lice per fish… that are sort of stronger than the federal government's regulations we've also been monitoring their facilities” while enforcement remains an issue for Guardians monitoring for their traditional laws, it still empowers the community to make decisions on industry players and who they allow to operate in their territory (Parlee & O’Neil, 2007).

While Guardians are collecting data themselves, they often partner with other organizations, including non-profits and academics, to pursue their monitoring objectives. These affiliations and partnerships require data-sharing agreements and research protocols that help protect the data collected within and in the community. Guardians are stewarding not only the land, but the intellectual property of the Nation and the outputs of research conducted in their Territories (GM-3 and G-1). For GM-6 this is an improvement on the way data was collected in the past:

> now we're collecting data, we create our surveys on the work that [scientists are] doing as well… before it was you'd have scientists come in, collect data, hire a community member just to have them but they weren't trained on what they were doing it was kind of just

> to have that presence. We weren't sure what was happening with that data or where it was going or getting a really good understanding of it… I see a huge difference [with the Guardian program]. We started in working with the different governments and being able to go out on the field with them and collect our own data as well and report back to them…

This data collection helps create tables that recenter Indigenous ways of knowing and being and makes space for the voices of Nations. GM-7 clearly articulated that there is a gap in existing regulatory systems around cumulative effects and impacts on Indigenous people's inherent rights. They went on to say, "There's no table or there's no forum that exists where with the Crown, where we could say sit down on a cumulative scale and say okay, this is what our monitoring results mean, and say, what are we going to do about it? Those tables don't exist, so we got to create them. And again, because that's a significant gap in decision making".

In an attempt to fill this gap, the data collected by the program "gives us information in order to respond to the development. And that's usually through new applications… In our IBAs, we have sort of table setup where we can bring forward concerns about environmental change or impacts. And so, the monitoring information helps us bring forward those concerns that are recognized by the by the program". Indigenous Guardian programs gather data and also facilitate knowledge sharing among generations, which, if funded and supported, can result in improved representation in decision-making in negotiations and policy external to the community (Arsenault et al., 2019). GM-7 explained that an "established knowledge system, collection protocols, methodologies" that was validated by the community and leadership "[eliminated] a lot of uncertainty" in those processes.

4.3.2.3 Cultural Resurgence

Beyond data collection, Indigenous Guardian programs are one way that Nations facilitate a strengthening of culture within their communities through land-based learning, youth and Elder connections and ensuring land users are safe and supported while on the land. G-4 stated that their program, "has been able to advocate for some more, I guess, on the land programming and to incorporate more community members. We've been able to help in more cultural activities". This resulted in an increased "curiosity" to see what Guardians are doing or where they are going in their traditional territory. G-4 noted that being "able to sit down and have a conversation with somebody in the community that isn't as engaged as I am, I think that's a benefit in itself.".

Indigenous Guardian programs also facilitate knowledge transfer from Elders and the land for the Nation's or communities' youth. For example, GM-9 described their program used a lot of effort in building land-based culture programming for youth, that "[strengthens] their sense of identity, giving different generations a chance to connect on the land." the manager described an increased ability for communities to "assert themselves to reclaim or strengthen language and culture opportunities in their communities" through Guardian's interactions with youth. Guardians also impact the next generation of stewards in their territory. While each program is unique, some Guardians play an integral role in getting youth on the land and reconnecting with their culture. GM-1 described, "The program has improved [the youths'] knowledge of the land because, as I mentioned, they're out there working with Elders, on the land, going out in canoe trips, seeing spots that they may not necessarily be inclined to visit on their own. So, this has been helpful to their knowledge of the land that providing that opportunity for transfer of knowledge from the Elders to them.". G-4 also described the benefits of getting youth on the land and inspiring the next generation of their community to steward and occupy their Traditional Territory. While colonial impacts, such as forced assimilation and residential skills, have made knowledge transfer more difficult, Eckert et al. (2018) describes how Indigenous communities revitalizing their stewardship practices, primarily through local language and cultural education and strengthening Indigenous Knowledge within community members, mitigate the impacts of colonial structures on their community. Bringing land users, Elders, and youth together facilitates the intergenerational knowledge exchange and learning experiences that can support larger changes in the community and support cultural revitalization (Four Directions Management Services, 2022; Social Ventures Australia (SVA), 2016).

Youth are also participating in monitoring and data collection as a part of Indigenous Guardian programs. GM-1 described how youth participate in data collection so they may create "climate leadership and for [the youth] to take the responsibility to feel ownership of some of these issues and to actively come up with solutions or to help to come up with solutions." GM-8 also described how the activities of the Guardians can inspire the next generation of stewards in their Nation's Traditional Territory, stating, "Some of the youth maybe didn't have an interest in sort of fish or sediment or water or whatever. And liking them to sort of like, hey, this is something I want to do in the future and sort of like and at the end of the day, sort of preserving alter language and way of life.". If made a priority, intergenerational knowledge transfer and the reinvigoration of youth stewarding and caring

for the land can become an outcome that is realized by communities that establish Indigenous Guardian programs (Indigenous Leadership Initiative, 2022; Parlee et al., 2021; White, 2022).

Guardians are impacting their communities in positive ways. They are deepening connections and relationships to the land and acting as a presence of the Nation on the territory. They are also strengthening their community's capacity to answer questions, make decisions and collaborate with external organizations. The benefits are not limited to communities and Nations with Indigenous Guardian programs. Interview participants and recent reports clearly highlight the value of Indigenous Guardians to the Canadian public.

4.3.3 Canadian Society and Reconciliation

Today, Indigenous Guardian programs are recognized and funded by the federal government, are partnering with academic institutions (AE-3) and are influencing the practices of tourism (MO-4), fisheries (GM-1) and resource extractive industries (GM-9). While rooted in their community and culture, Indigenous Guardian programs also benefit the wider Canadian public and advance national goals towards conservation, stewardship and safety. In a report commissioned by Coastal First Nations - Great Bear Initiative (2022), Guardians programs on the coasts of BC have been shown to benefit the general public and provincial and federal governments through filing gaps of provincial and federal agencies, contributing to improved public knowledge, and providing opportunities to meet commitments of reconciliation. This study shows similar impacts across Canada and where Indigenous Guardian programs steward their territories. This section explores some of the benefits realized by organizations and citizens outside of communities and Nations that host Indigenous Guardians programs.

There are Indigenous Guardians monitoring and collecting data in areas that are both remote and have little research activity to some of the most studied and monitored in Canada (Coastal First Nations - Great Bear Initiative, 2022; White, 2022). In each case, they collect and synthesize important data and record observations that capture changes that could affect their rights. While this data is important for Nations to make decisions and advocate for their communities, the knowledge gathered by their work creates benefits that reach far beyond the communities where it was collected. GM-1, GM-3, G-1, and GM-8 described how their Guardians collect and share data with the public, contributing to research journals (G-1 and GM-3) and databases, both private and public (GM-1 and GM-8). GM-1 stated, “We have a public portal that anyone can access the data from our program,

which is crucial, so that means a community has access to the data. And also, researchers like you". GM-8, GM-3 and G-1 described the relationships with researchers and universities from the Indigenous Guardian program. GM-8 described how their Indigenous Guardian program utilizes university researchers to answer their communities' questions and address their concerns about the health of the environment. GM-3 described a more complicated relationship with researchers and how a research protocol was crucial to ensure equitable and mutually beneficial outcomes to the research. GM-3 stated,

> "Anybody that's coming from a university academic perspective is the most hesitant to sign the research protocol. Because within that, they there's ramifications about publishing data, without including [Guardian's] name in the publication. So, there's so much pushback, because academia focuses on papers and pumping out publications. And the Nations really don't benefit anything from that. And that's sort of what the research protocol agreement is to include ended in Indigenous Knowledge, Western science, and working in a collaborative approach for these research projects, rather than just the researcher coming in, doing their thing, and then leaving, which most do. That is sort of the essence behind the research protocol agreement.".

In this case, Guardians in GM-3's program continue to work with researchers and create research outcomes that benefit the Nation and the wider academic and research community and embody the frameworks described by Reid et. al, 2020 in Table 3.

Guardians' research also informs compliance and enforcement in industrial activity. GM-3 described, "It's been really good with the monitoring. We caught some things that a lot of people didn't know about, and forced the industry to change right away, because they're kind of like sliding it under everybody's nose". In areas where government monitoring is sparse, Indigenous Guardian programs can ensure compliance by monitoring and collecting data that is then shared with enforcement officers, either municipal, provincial or federal (Popp et al., 2020). In this way, Guardians are ensuring compliance that benefits everyone.

In areas with little industrial or commercial activity, Indigenous Guardians are collecting data that will establish a baseline for their region that could inform impact assessments and other planning for industrial or commercial development (GM-8). This data supports decision-makers from all levels of government to make informed decisions around development and helps industry establish baseline conditions critical to assessing their environmental impact. This stewardship benefits the broader

Canadian public as Indigenous Guardians continue to advance research, conservation and environmental regulations in Canada.

4.4 Conclusion

The results of the semi-structured interviews yielded key insights into how Indigenous Guardian programs are setting objectives and how these programs can address community needs and empower leaders to make decisions to effectively manage their lands and resources in a culturally resonating way. While some programs in the North of Canada (Social Ventures Australia (SVA), 2016) and on the coast of British Columbia have documented the success of their Indigenous Guardian programs, a national approach to recognizing the impact of Indigenous Guardian programs is still emerging (Coastal First Nations - Great Bear Initiative, 2020, 2022). Interview participants also highlighted how external factors such as funding and research partners influence Guardians' monitoring goals and methods. While some described this as a benefit, others believed these relationships to be complex and sometimes created monitoring objectives that were not aligned with community needs. While there were practical considerations that posed challenges for the operation of Indigenous Guardian programs, we heard from interview participants that the complex system of current colonial impacts that touch every part of life in Indigenous communities had their toll on Guardian programs. From the literature, we see that these systems of power and recognition limited the ability of Indigenous Nations to make decisions regarding their land, resources, water and people.

Still, the impacts of Indigenous Guardian programs are felt across the country, both within and outside of the communities that host them and are part of a larger movement towards Indigenous regeneration. The work of Alfred (2015) describes how Indigenous communities can shift towards regeneration and resurgence of culture and Indigenous ways of being. Looking at the impacts that Indigenous Guardian programs have on their community, we see that they are a part of collective efforts to restore Indigenous presence of the land, revitalize traditional stewardship roles and responsibility, and transmit Indigenous way of knowing among generations.

Chapter 5
Conclusion

The research project was designed to explore models that could support the co-reclamation of traditional land use indicators and adaptive management stages in the Two-Roads Reconciliation & Reclamation Framework (Daly, 2023). Beginning as a joint research initiative with an oil sands company and Fort McKay co-researchers, the project's goal was to further develop participatory and inclusive planning approaches that fostered shared decision-making between an oil sands company and Fort McKay First Nation in Treaty 8 Territory. The project resulted in frameworks and tools for cross-cultural reclamation and closure planning, including the Two-Roads Reconciliation & Reclamation Framework noted in Figure 3. This study focused on the 6th bridge, co-monitoring, TLU indicators and adaptive management and proposes that the Indigenous Guardian program model might be well suited to carry out the monitoring required to evaluate reclaimed land effectively.

The study was guided by Indigenous methodologies and principles of PAR, which seeks to balance power dynamics between "researcher" and "participant," offering a collective and reflective approach to research. While the researcher intended to ensure that the study results were valuable and relevant to the community of Fort McKay, the shift to remote research due to COVID-19 limited the ability of this researcher to embed this research meaningfully within the community of Fort McKay. Despite this, this research offers a model that Fort McKay could consider in future engagements with oil sands companies to monitor reclaimed land. This research also contributes to the literature on Indigenous Guardians and Indigenous-led stewardship and management in Canada.

5.1 Summary of Findings

Based on the outcomes from workshops and meetings held with Fort McKay co-researchers, the literature review on Indigenous-led monitoring approaches and the themes that emerged from the interviews, this study finds that Indigenous Guardian programs could be a successful model for evaluating traditional land use in closure and reclamation within the Two-Roads Reconciliation & Reclamation Framework.

The literature clarifies the distinction between monitoring models through dimensions of power, particularly between Indigenous and Western knowledge, rights and stakeholder-based narratives and connection to the land and traditional models of stewardship. In the literature, a variety of models are

suggested that involve the “public.” However, it was essential to distinguish the monitors of FMFN not as stakeholders concerned about the environment but rather as rights holders who are re-establishing their relationship with a landscape that has been changed by industrial activity. The model that would evaluate the success of a co-reclaimed site would need to have Dene and Cree values and worldviews embedded within the monitoring program. This aligns with Indigenous Guardian program models currently operating across Canada, including in FMFN.

One of the most important factors was the models’ consideration of braiding Indigenous knowledge and Western science. While models such as CBM do not exclude Indigenous peoples from participating, there is little consideration given to how Western science and Indigenous knowledge interact within the monitoring framework. For this reason, I looked for models that explicitly address and explore dimensions of power between knowledge systems and seek to deconstruct the power imbalances that might exist in monitoring programs. The literature identified Indigenous Guardian programs and Indigenous-led community-based monitoring. Given the conditions of the project, we determined that Indigenous Guardian programs are better suited in the context of the Two-Roads Reconciliation & Reclamation Framework. It was determined that in order to understand how an environment is changed and whether or not it can sustain traditional land use, the land must be evaluated by Indigenous people who are also re-establishing their relationship with the land, water, creatures and ice. The literature described differences in monitoring models’ governance structure, knowledge used to gather information, decision-making framework and monitors’ identity, revealing that Indigenous Guardian programs are the most applicable model in monitoring TLU indicators.

The results of the interviews also highlight how the Indigenous Guardian program creates lasting positive impacts in their communities. The research shows that Indigenous Guardian programs build and strengthen capacity in their communities, generate data for decision-makers and support cultural resurgence among generations of community members. In addition, programs are not only benefiting the communities that implement them but to the broader public. Results show that the impact of Indigenous Guardian programs is felt by the Canadian public and could advance reconciliation in Canada, part of FMFN’s vision for reclamation noted in Table 1.

The interviews also highlighted how Indigenous Guardian programs are setting objectives for what to monitor. Indigenous Guardian programs embed their monitoring objectives into strategic planning and vision for the territory, aiming to tie monitoring goals to land use planning and internal decision-

making. Indigenous Guardian programs also aim to strengthen capacity in their Nations through training opportunities and skills building, often pairing the on-the-land expertise of Knowledge Holders with other technical skills and Western science. The interviews also highlighted an alignment between how Indigenous Guardian programs set their monitoring objectives and approaches described in the Two-Roads Reconciliation & Reclamation Framework. Indigenous Guardian programs largely center around community concerns and cultural laws, responding to community members' questions and goals around harvesting in their traditional territory and stewarding the lands and waters. Indigenous Guardian programs could provide an avenue to address community questions around reclaimed sites post-closure that company or government-run monitoring could not.

Despite these benefits, there are still a number of challenges associated with Indigenous Nations establishing and running Indigenous Guardian programs that interview participants identified. One overarching theme was the legacy and ongoing impact of colonialism, which weighs on Indigenous communities and individuals. This theme permeated discussions throughout the interviews and linked the specific obstacles identified by interview participants. The specific challenges that Indigenous Guardians identified were sustainable long-term funding that supports programmatic activities determined by the Nation, strengthening the necessary capacity to run programs, and governance challenges such as jurisdictional authority and practicing enforcement. In the context of FMFN, some of these challenges such as funding and technical capacity may be addressed through reciprocal and respectful partnerships and agreements in reclamation using the Two-Roads Reconciliation & Reclamation Framework with oil sands companies (Daly et al., 2021 and Two Roads Research Team 2011, 2012).

The following section offers considerations for those who might enter into the Two-Roads Reconciliation & Reclamation Framework and are interested in applying a Two-Roads Approach to monitoring reclamation outcomes.

5.2 Considerations

The objectives of Indigenous Guardian programs are often set to address community concerns regarding harvesting, environmental health, and the relationship community members have with the land and waters. The goals of reclamation within the Two-Roads Reconciliation & Reclamation Framework include re-establishing traditional land use and for communities to trust the outcomes of reclamation and create landscapes with shared socioeconomic, cultural, and environmental post-

closure benefits (Daly et al., 2021). The considerations listed below are not intended to act as recommendations but as perspectives around how Indigenous Guardian programs could be a model that Nations consider adopting the Two-Roads Reconciliation & Reclamation Framework. The considerations are informed by the literature review, results, and the conversations held in Fort McKay First Nation from 2019 to 2021.

5.2.1 Indigenous GuardianPprograms Align with the Two Roads Approach

Indigenous Guardian programs offer a model centred around Indigenous Knowledge and monitoring traditional land use activities. Indigenous ways of knowing and being in relation with the land are at the heart of the model. Therefore, Indigenous Guardian programs are well suited to be applied within the Two Roads Approach to reclamation as it allows Indigenous Guardians to monitor impacts on Indigenous ways of life and their relationship to the land, water and non-human relations.

5.2.2 Indigenous Guardian Programs Provide a Rights-Based Approach to Monitoring in the Oil Sands

Fort McKay co-researchers made clear they are rightsholders's co-researchers made clear they are rightsholders, not stakeholders. Indigenous Guardian programs provide a monitoring model that recognizes Indigenous peoples' unique rights and responsibilities to steward, monitor and be in relationship with the land. Since oil sand disturbances have broken relationships to the land, Indigenous Guardian programs could offer an opportunity to build a relationship with the reclaimed site that promotes intergenerational knowledge sharing between youth, Guardians and Elders of the community. This provides a healing opportunity and a way to reconnect a novel ecosystem with its traditional stewards.

5.2.3 Indigenous Guardian programs Connect Community to Decision-Making

Indigenous Guardian programs are well positioned to respond to and report back on community concerns regarding the environment, especially where harvesting for food and social and ceremonial needs. Given the lack of trust between communities and oil sands operators, there is an opportunity for Indigenous community members to respond to the concerns their fellow community members have on reclamation. This would require access to reclamation sites and connecting data to adaptive management mechanisms in reclamation planning.

5.2.4 Oil Sands Operators Have an Opportunity to Advance Reconciliation through Supporting Indigenous Guardian Programs

The challenges identified by interview participants could be overcome through a strategic partnership with oil sands operators who enter into a Two-Roads Reconciliation & Reclamation Framework with communities. Indigenous Guardians could be offered support from operators in three ways. The first is by providing long-term unrestricted funding that supports the ability of Nations to steward and monitor not only the reclaimed site but their traditional territory at the scale deemed appropriate by the community. Second, operators could provide access and pathways for monitoring and data collection results to guide adaptive management of reclaimed sites and operations in the region. Lastly, operators and industry associations could offer technical support through capacity-strengthening opportunities such as training and providing access to equipment and research facilities for Indigenous Guardians and their partners.

5.3 Future Research

As an application of the larger research project, there is an opportunity for an oil sands operator and a community to move through the stages of the Two-Roads Reconciliation & Reclamation Framework and analyze how the framework informs the development or application of an Indigenous Guardian program in reclamation planning. This would require using the tools and frameworks developed throughout the project to build trust and use the Two Roads Approach in reclamation and closure planning.

In the literature, continued documentation of Indigenous Guardian programs is needed to articulate the benefits to the Canadian public, ecosystem sustainability, the communities that implement them across Canada and the Indigenous Guardians' wellbeing. While studies have been conducted in the Northwest Territories and along the coastline of British Columbia, a large-scale national-level survey may yield interesting insights into how different jurisdictions enable or hinder the ability of Indigenous Guardians to reach their full potential. This review could include an analysis of the ability of Indigenous Guardian programs to advance or hinder Nations' self-determination. In this inquiry, the role of funding could be explored to evaluate how shifts in funding from the federal government to Indigenous-led organizations enable the full potential of Indigenous Guardians to be realized.

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