

Exploring Collaborative Frameworks to Assess and Monitor Conservation Outcomes of Indigenous
Protected and Conserved Areas (IPCAs)

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Abstract

Within Canada, active strives are being made to achieve Canada's Target 1 conservation goal. The creation of area-based conservation methods such as Other Effective Conservation Measures (OECMs) and Indigenous Protected and Conserved Areas (IPCAs), provide the means to achieve these goals. However, the current screening tools used to identify and monitor OECMs and IPCAs heavily reflect exclusively western science, thereby creating barriers for Indigenous nations. This research uses the collaborative framework of Two- Eyed Seeing to identify potential criteria indicators that are inclusive of Indigenous traditional knowledge to assess the governance systems, cultural and spiritual outcomes, and conservation outcomes of IPCAs. A rapid literature review was conducted to analyze the current screening metrics used by the Canadian government which revealed the potential for criteria for monitoring metrics. This paper highlights the need for place-based conservation management, co-governance models and wellness indicators in current monitoring tools for OECMs and IPCAs.

Key words: Indigenous Protected and Conserved Areas (IPCAs), Other Effective Conservation Measures (OECMs), Indigenous led conservation, Canada's Target 1

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Introduction

The urgency to navigate the environmental challenge of protecting and restoring ecosystems, biodiversity and nature amidst the climate crisis has never been greater. The Intergovernmental Science-Policy Platform's (IPBES) Global Assessment on Biodiversity and Ecosystem Services (IPBES, 2019) highlights the devastating loss of species richness, ecosystem services, and ecological integrity across the globe, revealing an alarming rate of extinction that puts over one million species at risk. Areas of rich biodiversity have never faced more anthropogenic and natural threats of loss, and for years protected areas have been the cornerstone of conservation action. It is emphasized that the accelerated devastation to ecological health and wellbeing directly impacts human health and wellbeing (Vasseur et al., 2002). Immediate collaborative and global action to restore ecological systems is paramount as the catastrophic outcomes of climate change increases. The policy decisions that are made now will significantly impact the environment and social wellbeing of our entire planet (Jenkins et al., 2018).

In 2010, the parties of the Convention on Biological Diversity (CBD) adopted the 20 Aichi Targets in the pursuit of cultivating global conservation of biodiversity (CBD, 2011). Aichi Target 11 outlines that "By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes." (CBD, 2011, p2). The CBD has reported that by 2020 the Aichi Target 11 has been partially achieved (CBD, 2020). The global inability to achieve the outset Aichi Targets demonstrates the necessity of a shift in the mindset of what constitutes conservation and sustainable development. Our present sole focus on attaining biodiversity conservation without the considerations for the interconnection between humans and nature may halt our ability to attain a sustainable and equitable future. To effectively conserve and protect nature we must prioritize a shift to understanding how we can sustainably conserve our environment through a wider holistic perspective by considering ecological and social outcomes of conservation. Globally, Indigenous Nations have been more effective at conserving and protecting nature because of the recognition of the interconnected relationship between ecological and human wellbeing within their knowledge systems (Dawson et al., 2021). Current conservation action and policy are likely to fail without Indigenous consent and partnership.

The urgency to abandon the current colonial approach to conservation is being echoed globally (Artelle et al., 2019). Without Indigenous partnership, the paramount global increase in conserved lands will be impossible (Artelle et al., 2019). There is an emerging understanding that areas of high biodiversity and high ecological integrity cannot be protected without Indigenous consent and leadership (Artelle et al., 2019). Specifically in Canada, there is an evident lack in capacity of current governmental systems to monitor and support ecologically intact areas across the country due to limited or no access to areas, absence of knowledge of area, and budgetary constraints (Artelle et al., 2019). However, many Indigenous nations hold long-standing place-based relationships and knowledge of the land that strengthens their capacity to steward and monitor these areas of ecological significance (Artelle et al., 2019). Many ecosystems within Canada have remained ecologically preserved and free from significant

degradation caused by the Anthropocene because of the stewardship and protection of Indigenous Nations (Artelle et al., 2019). For this reason and many others, in Canada, there has been growing advocacy for the inclusion of Indigenous Peoples and their wellbeing in conservation and climate change policy (Pearce et al., 2015). Canada has a long colonial history of exclusion and relentless displacement of Indigenous Peoples from discourse surrounding conservation (Moola and Roth, 2019). The colonial exclusion of Indigenous Peoples in the development of conservation policy and approaches has resulted in the displacement of Indigenous Peoples from their traditional lands (M'sit No'kmaq et al., 2021). This has led to the ultimate loss and disconnection of the spirituality between Indigenous Peoples and their land (Moola and Roth, 2018). Furthermore, the practice of establishing Canadian national and provincial parks has resulted in the presence of Indigenous Peoples and knowledge being erased (M'sit No'kmaq et al., 2021).

In 2021, with the anticipation of the new post-2020 Global Biodiversity, Canada has committed to conserving 25% of land and freshwater ecosystems by 2025 (ECCC, 2021). The Canadian Federal government has welcomed the guidance and collaboration with Indigenous Nations to develop a pathway for long-term sustainable conservation. It is only recently, that Canada has become more inclusive of Indigenous Peoples in conservation efforts and has outlined the need for Indigenous engagement to successfully conserve 17% of Canada's land and freshwater ecosystems in The Pathway to Canada Target 1 (CFPT, 2016). The Indigenous Circle of Experts (ICE) published a key document entitled "We Rise Together" in response to Canada's Pathway to Target 1 and the Aichi Target 11 (ICE, 2018). In this report, ICE highlights and addresses the urgency of "re-Indigenizing" conservation through the implementation of a form of Other Effective Conservation Measures (OECMs) called Indigenous Protected and Conserved Areas (IPCAs). The ICE report defines IPCAs as "lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through indigenous laws, governance, and knowledge systems. Culture and language are the heart and soul of an IPCA." (ICE, 2018, p.5). The report goes on to illustrate that the essential elements of an IPCA are that they are Indigenous-led initiatives, they consist of long-term commitments to conservation and provide an opportunity of healing for Indigenous Peoples in reconnecting with the land, and that there is biodiversity conservation (ICE, 2018). An IPCA is an area-based conservation method that can strengthen Canada's efforts towards accomplishing Target 1 (if appropriate) and can encourage the prosperity of Indigenous Peoples in Canada (ICE, 2018).

However, many structural and systematic barriers prevent Indigenous Peoples from participating in conservation and environmental management, many of which are rooted in the problematic colonial history and current federal bureaucracy (Townsend et al., 2019). Colonialism has created a systematic barrier and false representation of Indigenous knowledge as insufficient and substandard in comparison to western knowledge (Reid et al., 2021). In this paper western knowledge does not only connote the contemporary and mainstream science that stems from western countries but instead what values are reflected in the practices which are reductionism and based on physical law. The current power imbalances in place have resulted in a misrepresentation of Indigenous Peoples and Indigenous knowledge as powerless or useless to conservation and resolving other issues such as climate change. Historically, mainstream western science has inaccurately represented Indigenous Peoples as vulnerable to environmental and climate change because of lack of western education and knowledge meaning they had no means of adaption or mitigation, and are therefore powerless (Whitney et al., 2020). This misconception

of Indigenous Peoples is often used as the moral rationale for why governments made decisions on their behalf without consulting Indigenous Peoples.

Similarly, the implementation and reporting surrounding an IPCA can be complicated. There is ambiguity and inconsistency in the reporting and monitoring of the conservation action of area-based conservation methods, such as IPCAs, that are to be used in measuring progress toward Canada's Target 1. Many of the current practices and reporting methods strictly adhere to western knowledge systems and do not take socio-bio-cultural impact into consideration. This can result in structural barriers that prevent IPCAs from being established first and then receiving essential support thereby limiting the capacity of the approach (Zurba et al., 2019). Furthermore, the lack of consistency in the current guidelines for reporting and monitoring the socio-ecological benefits and outcomes in IPCAs can also diminish the management capacity of the community (Tran et al., 2020). It is recognized that without sufficient methods of monitoring and reporting, it becomes difficult to assess the efficiency and sustainability of IPCAs in achieving their conservation and social goals (Tran et al., 2020). Indigenous Nations have noted that the lack of recognition of data and biological principles of Traditional Ecological Knowledge and Indigenous knowledge systems in the current mainstream conservation assessment practices is a significant barrier in reporting the conservation efforts of the Nation (Artelle et al., 2019). To effectively conserve nature, there is a need to develop an assessment and monitoring system of the conservation outcomes of area-based conservation that centers Indigenous knowledge.

This major paper aimed to identify possible indicators of socio-ecological characteristics for assessing the sustainability of IPCAs that pull from a collaborative knowledge framework of Two-Eyed Seeing, where in deference to ethical space both Indigenous knowledge and western scientific methods are equally respected. My research scoped and analyzed the literature to identify possible socio-ecological indicators that are more relevant to Indigenous culture to develop a system that can measure the sustainability of terrestrial ecosystem IPCAs and their contributions to nature conservation that is representative of both Indigenous Knowledge and western practices.

Methods

Considering the importance of acknowledging the role of Indigenous Nations in protecting Mother Earth, this paper, based on the framework of Two-Eyed Seeing and ethical space, provides a basis for the development of a monitoring system. The monitoring system assesses the conservation outcomes of IPCAs to recognize their effective stewardship. More precisely, the two sub-objectives of my project are: to examine the literature to identify potential indicators of sustainability and nature conservation of IPCAs; and co-determine with Elder Larry McDermott which indicators could be the most effective to assess the sustainability and nature conservation outcomes of IPCAs.

Rapid Literature Review

To explore the first objective of this study, a rapid literature review was conducted to identify relevant indicators of nature conservation in terrestrial ecosystems. A rapid literature review is a form of knowledge synthesis that critically assesses the current literature by using

systematic review methods (Grant and Booth, 2009). A rapid review provides a rigorous and in-depth examination of the current literature within a limited timescale (Grant and Booth, 2009). The rapid literature review was conducted with consideration to ensure equal representation of Indigenous knowledge systems and western knowledge systems. Similarly, the rapid literature review method provided the opportunity to broaden the scope and review key challenges and themes faced by Indigenous Nations in creating and maintaining successful Indigenous Protected and Conserved Areas. By using a rapid literature review method, relevant indicators of governance, cultural and spirituality outcomes, and nature conservation outcomes were found within academic literature within the time (three months) and human resource (only one) constraints of this project.

The two academic databases selected for this review to search the literature were “Academic Search Complete” and “Web of Science Complete.” Both databases were accessible through the Brock Library. These databases were chosen on the premise that both databases are interdisciplinary and would be able to provide a general overview of issues within both the social and ecological sectors of Indigenous Protected and Conserved Areas. The search was carried out from September 9th, 2022, until October 17th, 2022. Search terms utilized in both databases were “Indigenous Protected and Conserved Areas,” “Indigenous Protected Areas” “Indigenous-led conservation.” Only three search terms were used based on the project's constraints, and these terms provided a variety of literature that broadly described the fundamental challenges faced within this field. When conducting the search in the “Academic Search Complete” database, only publications within the last five years (2017-2022) were considered. In addition, the filters that were applied to the search were English language only, academic journals only. The remaining articles obtained would be screened to exclude topics not relevant to this paper, such as articles outlining challenges within marine IPCAs, fishing industries, or protected areas exclusive of Indigenous Peoples. Final articles obtained using this search process for “Academic Search Complete” database was 389 articles (Table 1). The exact process was replicated for all search terms when conducting the search for “Web of Science Complete” (Table 2). To ensure both Indigenous knowledge and western knowledge were equally and accurately represented in the review, grey literature was also analyzed for potential indicators. Through a snowballing technique (using the bibliography of an article to find other relevant work), grey literature was identified in Conservation Through Reconciliation's (CRP) IPCA Knowledge Basket (CRP, 2022) as well as the Canadian Science Publishing Community Engaged research collection (CSP, 2022). The CRP created the IPCA Knowledge Basket aiming to create a digital space where Indigenous knowledge and experience within Indigenous-led conservation can be honored and shared with all communities (CRP, 2022).

The system will be comprised of and assess three principal aspects of IPCAs, governance, nature conservation outcomes and spirituality and cultural outcomes. There are 3-4 indicators under each of the three principal criteria and are either quantitatively or qualitatively based. These 6-12 indicators could be used to assess the sustainability and effectiveness of IPCAs, which could then be reported to quantify progress towards Canada's conservation goals.

Two-Eyed Seeing makes space for multiple ways of knowing in nature conservation

After identifying potential indicators, the system used to evaluate IPCAs was co-developed with Elder Larry McDermott. The system was produced following a Two-Eyed

Seeing approach to ensure the monitoring practices are conducive to Indigenous-led conservation and that is representative of both western and Indigenous knowledge. Elder Larry McDermott represented the Indigenous “eye” (perspective), and I represented the Western “eye” (perspective). To construct this major research paper, I wrote a draft of the collectively agreed upon principles and indicators which were then proposed to Elder Larry for revision and approval. This was done at every step of this major research paper to ensure co-development of the metric. Using the Two-Eyed Seeing framework was important as it ensured that both perspectives were equally considered and respectfully engaged. It should be noted that Two-Eyed Seeing and ethical space principles highlight the importance of co-development, where both “eyes” equally contribute to the construction of the system.

Ethical and sustainable nature conservation can weave Indigenous knowledge systems with western systems. (Tengo et al., 2017). Knowledge co-production with both systems is being emphasized to examine challenges that neither system hold a sufficient answer to (Jonhson et al., 2016). Knowledge co-production is the transformative solution to respond to the climate and biodiversity crisis. To consider the current unequal power structures and relationships, an emphasis should be placed on bridging knowledge systems rather than synthesizing systems (Johnson et al., 2017). In Canada’s history, the integration or utilization of Indigenous knowledge is often at a disadvantage to Indigenous nations because of the unequal power structure. Whitney et al (2020) highlight four key strategies to reform current Canadian environmental governance to be inclusive of Indigenous wisdom in environmental management and reduce power imbalances. One of these strategies includes the need for co-governance adaptive strategies, where the utilization of a collaborative framework such as Two-Eyed Seeing can produce effective climate change mitigation.

The Two-Eyed Seeing concept was coined by Elder Dr. Albert Marshall and follows the Mi’kmaw framework of “Etuaptmunk” (Bartlett et al., 2012). Elder Dr. Albert Marshall acknowledges that he is a holder of the Mi’kmaw knowledge of “Etuaptmunk” and describes the teaching as “learning to see from one eye with the strength of indigenous knowledges and ways of knowing, and from the other eye with the strengths of mainstream knowledges and ways of knowing, and to use both these eyes together for the benefit of all” (Marshall and Bartlett., 2004, p.1). The Two-Eyed Seeing framework can reduce the chance of assimilation of Indigenous knowledge and instead equitably bridge the gap between systems to address a challenge (Reid et al., 2021). Two-Eyed Seeing is described as learning how to use the strengths of Indigenous knowledge and western science to provide a combined perspective that can be used to find solutions to any problem (Bartlett et al., 2012). The use of Two-Eyed Seeing in environmental management plans can mend the uneven power relations and knowledge inequities that many Indigenous communities face, by decolonizing the mainstream system that can be harmful to Indigenous populations (Reid et al., 2021).

Two-Eyed Seeing can provide researchers and Indigenous populations with the opportunity to achieve “plural co-existence” where Indigenous and western knowledge systems are considered complementary in natural resource management so that they can cohesively work together to build a more equitable and sustainable future (Howitt and Suchet-Pearson, 2006). The application of a Two-Eyed Seeing framework in conservation management and practices is significant because of the centering message of Netukulimk that Two-Eyed Seeing builds on. Netukulimk is a cultural conservation concept of the Mi’kmaw Nation that guides individual and collective beliefs of promoting the preservation of ecological integrity of nature for the next

seven generations (McMillian and Prosper, 2016). The notion of conserving for the future while creating an ethical space for learning that highlights the differences between the two perspectives and reducing the us-them dichotomies is what makes the Two-Eyed Seeing Framework relevant to finding solutions to the biodiversity and climate crisis (Reid et al., 2021). The use of the Two-Eyed Seeing Framework in conservation research to develop novel approaches and practices is important to create ethical solutions that can be more effective and sustainable.

By using a Two-Eyed Seeing approach to developing a system to assess IPCA's in Canada's conservation goals, we can further dismantle current power imbalances in the current assessment and monitoring tools utilized in conservation action. Similarly, a Two-Eyed Seeing approach diminishes the opportunity for Indigenous knowledge to be "othered" or overlooked within the current colonial conservation structures. It should be noted that although this paper undertakes the Two-Eyed Seeing approach, this does not presume that the Indigenous perspective provided in this paper is the only view of all Indigenous Peoples. Two-Eyed Seeing is not a binary perspective and does not conform to the notion that various Indigenous perspectives are interchangeable. Due to the nature of the place-based relationships between many Indigenous Nations and their traditional lands there will never be a one sized solution for all nations. Instead, this paper aims to provide options that can be used to elevate and empower Indigenous communities in current conservation systems.

Following Two-Eyed Seeing practices of co-development and co-research (Reid et al., 2021), the author and contributors (i.e., my committee) to this major paper collaboratively reviewed Canada's Decision Support Tool (CFPT, 2021) for assessing and identifying potential areas to be characterized as either protected areas or OECMs. All contributors took turns reflecting on the information outlined within the document while actively listening and engaging with each other. Canada's Decision Support screening tool was created to guide communities in their development of area-based conservation methods in the attempt to achieve Canada's Target 1, as well as to be used as guidance in what will be required to recognize these protected areas and OECMs. This document was created by the Canadian Council on Ecological Areas and collaboratively revised with the direction of Pathway to Canada Target 1 as part of the conservation toolkit (CFPT, 2021). This document was chosen to be analyzed as it provided the standards for protected areas and OECMs as set out by the Canadian Government (CPCAD, 2021). The screening tool was designed to provide transparency and consistency in identifying OECMs and protected areas in Canada (CFPT, 2021). In Canada, following the recommendation set out in *We Rise Together* (ICE, 2018), IPCAs can be either a protected area or OECM depending on its primary objectives and the choice of the community (CPCAD, 2021). Therefore, the decision screening tool would be used to identify potential ICPAs.

Principles/Results

The current metrics used to assess and report the outcomes of IPCAs and other OECMs in Canada rely heavily on the ecological biodiversity outcomes as stated by the federal government. However, effective nature conservation should involve other considerations, especially of both environmental, biocultural, and social areas. Through the literature search and guidance of Larry McDermott, it was determined that to measure the sustainability and outcomes of IPCAs, the indicators used to assess potential IPCAs must fall within the fundamental principles of IPCAs. Following the guidance provided by the Indigenous Circle of Experts "We

Rise Together” report, governance, spirituality and cultural values, and conservation outcomes were identified to be the three main principles chosen in this paper. Governance structures and the way an area-based conservation method is managed can have significant impacts on the capacity and sustainability of the IPCA (Jonas et al., 2017). ICE’s report (2018) emphasizes the importance of the governance system and structures of the IPCA being set by the community to ensure the needs of the community are met. Similarly, as reported by ICE (2018) a principal element of IPCAs is how the IPCA can provide an opportunity for healing colonial trauma to the Indigenous Nations through spiritual and cultural outcomes. ICE’s report also highlights the importance that IPCAs consist of a long-term commitment to conservation, as well as providing opportunities for Indigenous Peoples to reconnect with the land so that both the land and communities can heal (2018). Thereby it would provide the possibility for true reconciliation to take place (ICE., 2018). In the next paragraphs, I explain the details of each of the three principles. But first, I describe how the assessments of IPCAs could be visually illustrated to better interlace Indigenous knowledge (Figure 1).

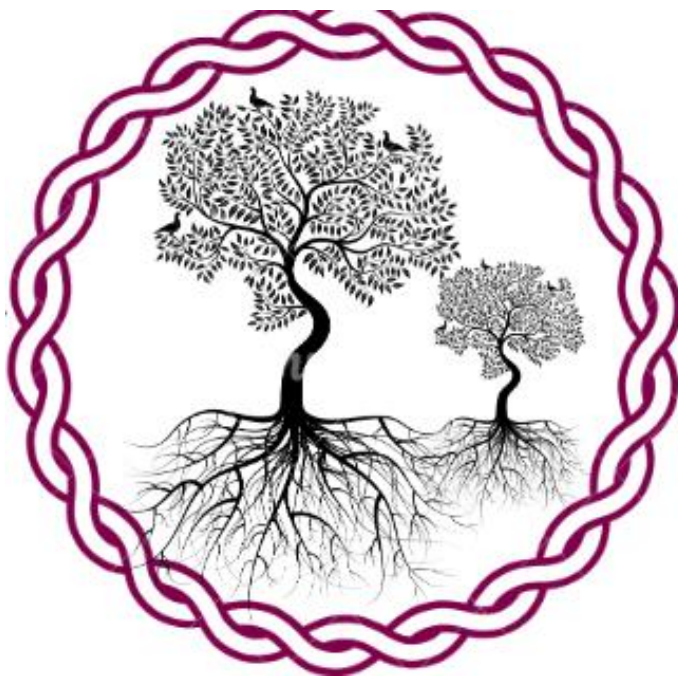


Figure 1. Visual illustration of how Indigenous knowledge, Ethical Space and Two-Eyed Seeing principles can be woven within current sustainability and conservation assessment standards, while considering the importance of protecting Mother Earth for the future generations.

During initial conversations regarding sectors of conservation that are exclusive of Indigenous knowledge, it was highlighted that the physical uncoupling of governance, spirituality and cultural values and conservation within current assessment metrics can create further barriers for communities to use Indigenous knowledge in the metric systems. Current assessment tools measure progress and outcomes of governance, spirituality and cultural values, and conservation as separate entities, which are to be evaluated at an individual level. However,

this directly contrasts many Indigenous knowledge systems that regard all three principles as highly intertwined and interconnected. The image of the large tree (Figure 1) represents the interconnectedness of the three principles and illustrates how each principle cannot survive without the other. The entirety of the image is encircled with a woven rope, expressing the ethical collaboration between Indigenous and western knowledge systems. Both systems are thus woven together, but never assimilated nor integrated. Each strand of rope is strong and resilient on its own, as each knowledge system holds its own strength. It is important to note the distinction within the image of the knowledge systems being woven together, as past conservation action assimilated Indigenous Traditional knowledge and culture for only utility purposes which has been harmful for Indigenous Nations globally (Reid, et al., 2021). In addition, the woven rope is a reminder of the Two Row Wampum Belt. The Two Row Wampum Belt has been recognized as one of the oldest treaties that was made between settlers and Haudenosaunee Peoples on Turtle Island. Wampum belts were created to signify alliances between communities. The understanding behind the belt and the treaty is that each community will live parallel to each other and in peace. Intending that both communities can work together but never will either side impose their tradition or way of life on each other but instead live side by side like brothers. History exemplifies how this treaty was not upheld and for a long time was not recognized by the Canadian government. It is an important treaty to many Indigenous nations, and we must recognize its significance in ethical collaboration within conservation.

Similarly, the two trees represent the recognition of the A Dish with One Spoon wampum, which is appreciated as one of the first environmental wampum agreements created. The basis of the wampum comes from a story in oral tradition that describes how the land and earth is shared amongst the different communities and eventually settlers, as well shared with future generations. In the agreement, the dish represents the land, and the spoon is each community. The wampum agreement explains that we should only be taking from the land as much that can fit onto our spoon and no more than that. Also always being considerate of how much we are leaving for those who come after us, there should always be enough for 7 generations after us. The first tree shows the IPCA community, and the second tree is the recognition of the future generations to come.

Each root systems of the tree encapsulate the spiritual and cultural values that are the foundation of IPCAs and are the grounding of Indigenous-led conservation. The dependence and well-being of the tree is determined by the health of the root system and vice versa. Genuine ethical collaboration requires the acknowledgement and support for the cultural, spiritual, and traditional values and lessons within Indigenous knowledge. The tree trunk represents the governance system. Just as the trunk provides the tree's structure, the governance system provides organization and construction to an IPCA. The branches on the tree are representative of the conservational and overall outcomes of an IPCA. The birds living within the tree branches and leaves connote the reciprocal relationship between humans and nature that is central to many Indigenous knowledge systems. This image was created to present how Two-Eyed Seeing approaches can recognize and bridge the interconnections between governance, spiritual and cultural values, and conservation outcomes in current area-based conservation assessment tools.

Governance

There is a prominent distinction in the interpretation of the term governance in western systems and in Indigenous systems. In deference to the Two-Eyed Seeing approach, a common shared language must be developed between researchers so that a strong shared foundation of knowledge can be produced (Reid et al., 2021). To correctly assess the principles of governance in IPCAs, it is essential that the values and integrity associated with the term governance are clearly defined. In this major research paper, the term governance is used to reflect the shared, reciprocal, and collaborative relationship between Mother Earth and humans and between humans themselves. The use of the term governance in this major research paper is rooted in natural law. This paper does not conform to the western perspective of governance that conveys power structures or a complete authoritative system that commands communities and nature. It is important that a collaborative definition of governance is created, and a shared language is built as it is crucial in defining how this metric will assess the systems that establish and care for the IPCA. As well as determining how to assess the arrangements that forge how the IPCA will manage and operate. Indigenous governance systems bridge the various laws, understandings, and practices of each Indigenous Nation (Artelle et al., 2019). Governance is deeply entrenched in cultural and spiritual values that cannot be separated when assessing, monitoring or identifying IPCAs and thereby it is essential that our understanding of the term governance in this major paper reflects this.

Governance is a vital component of management, responsibility, and care of area-based conservation methods such as IPCAs and OECMs (IUCN, 2017). Governance determines how long-term commitments to biodiversity conservation will be maintained and supported. Governance also plays an essential role in area-based conservation to determine what legal mechanisms give what authority to either enforce the protection of biodiversity or prevent activities that would be harmful to local biodiversity (IUCN, 2017). The recognition of legal mechanisms is an important characteristic of OECMs and is known as “Effective Means to biodiversity conservation –1” (CFPT, 2021). The governance mechanisms' ability to prevent, control, or manage activities which may negatively influence biodiversity conservation is an important consideration when identifying an OECM (CFPT, 2021). This is recognized as “Effective means to biodiversity conservation –2 in conservation assessments (CFPT, 2021). A crucial component to both OECMs and IPCAs are the long-term commitments required of the governmental bodies to biodiversity conservation (Artelle et al., 2018). Environmental responsibility and governance of IPCAs entails making thoughtful choices that factors in the impact of the choice on future generations and their ability to enjoy the lands and waters (ICE, 2018). Therefore, it is essential that the governing bodies have recognized legal ability and mechanisms to prevent current and future incompatible activities that may be harmful to biodiversity conservation (CFPT, 2021). Thereby it stands that in IPCAs, the legal framework based on natural law would translate into a governance body comprised of and shaped by the Indigenous nations who would be managing the IPCA.

Similarly, governance is an important pillar to IPCAs to form and shape the required conservation outcomes and necessary commitments to the community (ICE, 2018). Indigenous governance systems bridge the various laws, understandings, practices of each Indigenous Nation and therefore can play a prominent role in the maintenance of all outcomes of an IPCA

(Artelle et al., 2019). In the “We Rise Together” report, ICE (2018) highlights the importance of the governance role in an IPCA to ensure that the committed biodiversity conservation effort and outcomes are reflective of the Indigenous nations needs and future objectives. No matter the type of governance chosen by the community of an IPCA, Indigenous led conservation worldviews should be prominently featured in the outcomes of the IPCA. The conservation standards which should fit the nation's needs are designed by the governing management for the IPCA. In Canada, IPCAs also provide an opportunity for true reconciliation to take place and opportunities for reconnection to the land and healing of both the land and Indigenous Peoples (ICE, 2018). Consequently, a key outcome that can be produced by an IPCA is the elevation and national recognition of Indigenous rights and responsibilities (ICE, 2018). The elevation of Indigenous rights includes the long-standing place-based physical and spiritual relationships with the land and water. It thereby includes the right to benefit from the natural world in a respectful manner. Governing bodies hold the responsibility to uplift both Indigenous rights and Indigenous ways of knowing in conservation, making it an important pillar to IPCAs that must be assessed. This metric identifies potential criteria for how it can identify, assess, and monitor the governmental influence and outcome of an IPCAs. ICE’s (2018) vision and hope for Canada is that the entire system of protected and conserved areas is identified, managed, and built with Indigenous governments, following the principles of Free Prior and Informed Consent as declared within the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP, 2017). However, there are still many structural barriers that prevent holistic identification and assessment of governance in IPCAs in Canada, including the current definition of governance recognized in Pathway to Target 1 and guidance on the various governance models applicable to area-based conservation. Potential criteria that would better assess governance in IPCAs will evaluate the required primary consent of rights holders such as Indigenous Peoples, the characteristics that are vital to ethical shared governance or co-governance, and current jurisdiction and law in the associated geographical area.

Canada’s decision support tool that is used to guide identification of OECMs and IPCAs defines governing authority as “A government, institution, individual, Indigenous government or organization, not-for-profit organization, corporation, communal groups or other body acknowledged as having [some or all] authority and responsibility for decision making and management of an area” (CFPT, 2021, pg. 3). This definition to some degree connotes the sense of responsibility that is essential in Indigenous governance but still follows western perspective of a commanding authority over a specified entity or area, and policies that follow physical laws not natural laws. The screening document outlines the administrative role of control that governance plays in impacting biodiversity conservation in area-based conservation initiatives but does not acknowledge the inherent responsibility of stewardship that is vital to Indigenous ways of living. It is proposed that the screening document and assessment tools be revised to allow for the recognition of integrated holistic approaches to governance that are more inclusive of Indigenous governance systems. A potential remedy would be to include criteria to the assessment tools that can evaluate the efficacy of collaborative governance roles and better characterize and identify the governance model undertaken by the IPCA. Further criteria to evaluate governance systems in ICPAs that are inclusive of Indigenous ways of knowing are assessment of law and cultural sanctions that are beyond the current scope (Figure 2).

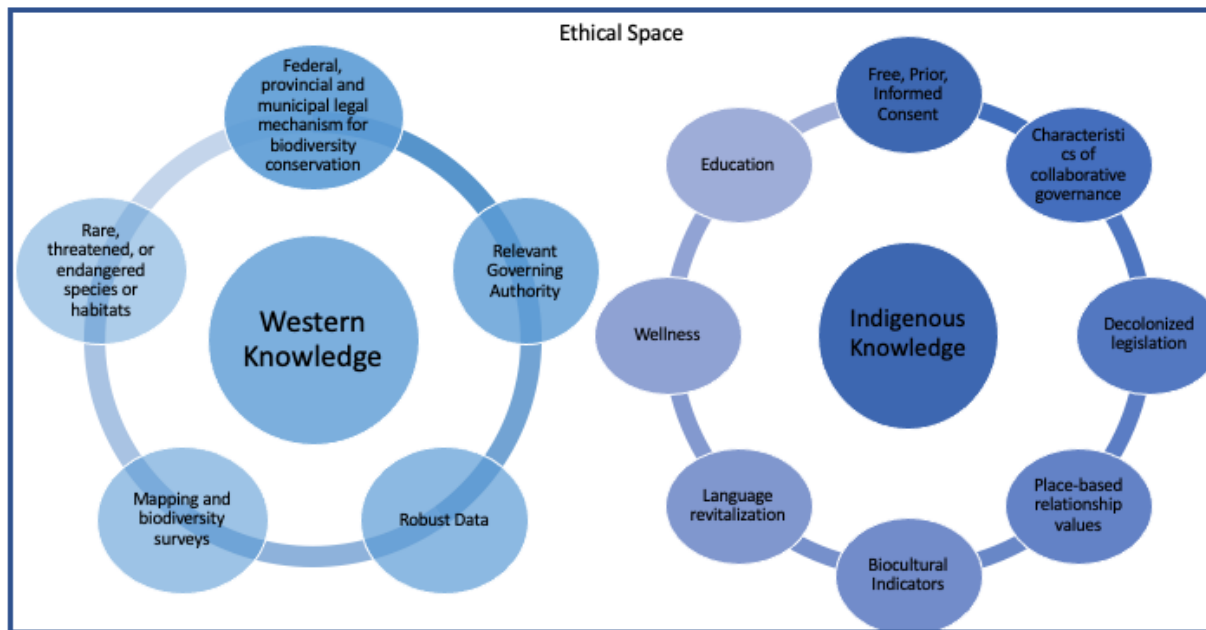


Figure 2. Current indicators included in assessment and screening tools in Canada pictured within in the western knowledge wheel (on the left). Suggested indicators for screening, assessment and monitoring tools that are inclusive of Indigenous knowledge and created within ethical space are pictured within the Indigenous knowledge wheel (on the right).

Characteristics of co-governance

Canada’s Pathway to Target 1 current guidelines regarding the governance types that are recognized in area-based conservation are limited. The screening document discloses that the governance types recognized in Canada for both OECMs, and protected areas are the four governance models outlined in the protected area management category and governance type (CFPT, 2021) (IUCN, 2017). These governance models include governance by the government, shared governance, private governance and governance by Indigenous Peoples and local communities (IUCN, 2017). There are 6 subtypes of governance under each of the four main models (IUCN, 2017). ICE (2018) also identifies and highlights four models of governance and partnerships in IPCAs. These models include Indigenous government-crown government partnerships where each side is working in partnership to recognize, identify or manage a protected area and Hybrid partnerships in which multiple partners are collaboratively working to manage protected or conserved land and all play a significant role in developing the collaborative plan. As well as Indigenous government – non-governmental partnerships which are often beneficial in the acquisition of private properties for a greater conservation purpose and Sole Indigenous governance in which Indigenous governments would make unilateral decisions on how to manage the lands. Unlike ICE’s report (2018) the screening document does not provide further guidance on how collaborative, partnerships and governance types such as “shared governance” can ethically take place in either OECMs, IPCAs or protected areas. Although there is some similarity in the governance model types from both the IUCN and ICE, there are significant differences that influence how governance is evaluative. For instance, the IUCN

describes a subtype of shared governance as collaborative management where there are various forms of pluralist influence (IUCN, 2017). However, ICE's (2018) description of collaborative governance incorporates ethical space principles, by elaborating on the importance of collaboration from start to finish of a project, as well as ensuring that each knowledge system is weighted and respected equally. By identifying characteristics of ethical collaborative governance, we can change the current perspective of governance to be more inclusive of the Indigenous holistic approach to governance and co-governance (Moyo, 2022). Therefore, by including prominent features of ethical collaborative partnerships in governance as a criterion for current assessments and identification metrics of IPCAs we can further reduce the gap between Indigenous knowledge systems and Canada's IPCA identification, assessment, and monitoring tools.

Collaborative approaches can also provide a favorable alternative to prevalent top-down conservation approaches, which have been historically imposed on Indigenous nations by centralized governance (Artelle et al., 2019). By including recognized features of collaborative governance as indicators and criteria of governance, we can begin to weave Indigenous principles central to governance into our current knowledge systems and thereby creating a metric that is two-eyed. Similarly, including features of collaborative governance can help increase the capacities of Nations in creating long-term successful IPCAs (Tran et al., 2020). Research done by Moyo (2021), analyzed the literature to reveal how the exclusion of Indigenous Peoples in the political governmental systems of a protected area in Okhahlamba-Drakensberg in South Africa could be remedied by the inclusion of Indigenous knowledge in decision-making processes. The article highlighted the need for co-governance with Indigenous communities at every level of power to dismantle tokenistic normativity and engage in meaningful partnerships in conservation (Moyo, 2021). When characteristics of social learning and shared action/commitment, communication and negotiation, and pluralism are implemented into the decision-making process of collaborative governance, it ensures that Indigenous Peoples and knowledge are actively engaged at each level of decision-making (Moyo, 2021). Similarly, characteristics of transparency, communication, and accountability are essential aspects of future collaboration that moves away from current colonial systems (Dawson et al., 2021). It is important to understand that collaborative governance systems are required to ensure that these characteristics are equally expected from and applied to each party and knowledge system (Dawson et al., 2021). Also, decision-making processes need to be co-governed, requiring an iterative cycle where each side has equal opportunity to be involved at every level (Reid et al., 2021).

Including characteristics of ethical collaborative governance or co-governance is an important step in recognizing and enforcing ethical inclusion of Indigenous Peoples in OECMs. It can also be used as reinforcement to reduce further harm done to Indigenous Peoples "in order to protect nature." This metric incorporates concepts of transparency, communication, accountability, social learning, and shared action/commitment to provide a two-eyed approach to conservation assessment of IPCAs and OECMs.

Free, prior, and informed consent

The creation of protected areas and parks was centered on the notion of conservation and recreational experiences (ICE, 2018). As a result, Indigenous Peoples and their health and well-

being were viewed as an obstacle to the enjoyment of the parks (ICE, 2018). Thereby creating a forced displacement and imposed jurisdiction that eliminated Indigenous cultural practices that were critical to the local biological diversity (M'sit No'kmaq et al., 2021). The forced displacement has resulted in intergenerational trauma and loss of trust in the Canadian government (Whitney et al., 2020). IPCAs can be a form of healing and active engagement in Truth and Reconciliation by the Canadian government (ICE, 2018). However, for true Truth and Reconciliation to take place, improvements need to be made to understanding consent and engagement with Indigenous nations in creating area-based conservation initiatives such as OECMs that are within Indigenous lands and territories. Free and informed consent is an important element of ethical conservation as highlighted in ICE's (2018) vision and hope for area-based conservation initiatives in Canada. Free, prior, and informed consent in Canada is a specific inherent right of Indigenous Peoples, that provides Indigenous nations with the capacity to give or withhold consent to an initiative that may affect their territory, rights, and resources (JUS, 2018). It entails consent that is given freely, voluntarily and without coercion, and provided in advance (JUS, 2018). Nations are actively informed prior to providing consent and are ongoingly updated on the process (JUS, 2018). Free, prior, and informed consent is an important aspect of recognizing and reinforcing the rights and responsibilities of Indigenous Peoples as outlined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP, 2007) (ICE, 2018).

Similarly, the IUCN emphasizes the necessity of governance systems of OECMs to be ethical and encourages the utilization of Free and Informed Consent (IUCN, 2017). Guidelines regarding protected areas and OECM identification and assessment state that consent from the primary and relevant governmental systems within the geographic location are required (CFPT, 2021). If multiple governmental systems are involved in reporting and monitoring an OECM, the primary governmental authority must be fully aware of the implications of recognition (CFPT, 2021). Similarly, it is stated that affirming to section 35 of the Constitution Act (1982) Indigenous Peoples (First Nation, Inuit, Metis Nation, and other Metis peoples) have treaty rights and Aboriginal rights to harvest, collect and practice cultural activities, protocols and ceremonies and must be consulted if any OECM or protected area interferes with these rights (CFPT, 2021). Justification of any possible interference or infringement of rights must be made and be in accordance with the precedence set by the Canadian courts would need to be provided (CFPT, 2021). However, without acknowledgment or incorporation of free, prior, and informed consent it cannot be outlined how consultation or collaboration with Indigenous Peoples can be ethically accomplished. Likewise, ethical collaborative co-governance systems that hold each knowledge system to the same weight and parallel with each other can be built by following the recommendations of ICE (2018) and incorporating the principles of ethical space into conservation approaches.

Recognizing the rights, responsibilities and titles of Indigenous Peoples is fundamental to ethical conservation and needs to be embodied in our identification, assessment, and monitoring practices for OECMs and IPCAs. For this reason, this research highlights the importance of including the principles of free, prior, and informed consent and ethical space as criteria in monitoring metrics. By following and setting standards to both free, prior, and informed consent and ethical space, we can begin to alter our current assessment tools to becoming more two-eyed and widening the scope to include Indigenous Peoples.

Decolonizing Legislation

A requirement to be recognized as an IPCA or OECM in Canada is to be able to present which legal mechanisms the governance system can apply to provide jurisdiction over the geographical space (CFPT, 2021). As a governing authority, there is a requirement to have a legal ability to prevent activities that might interfere with biodiversity conservation from ever occurring, in order to meet the effective means standards one and two (CFPT, 2021). Although Indigenous law and governance is recognized as an official governance body to ensure biodiversity conservation in the criteria set for effective means 1, the legal mechanisms included in Indigenous governance is not recognized in effective means 2. The colonial lens in Canada's conservation screening guides prevents Indigenous law to be recognized as a legal means to stop or prevent activities that are incompatible to biodiversity conservation from occurring. In Canada, there are 55 national pieces of legislation that are written for creating protected areas, resulting in the legal protection of over 77 different types of protected areas across Canada (ICE, 2018). However, there has yet to be any form or filling of national legislation that calls for the protection of areas that are cultural, spirituality and ecologically important to Indigenous Peoples or any legislation that acknowledges the voluntary conservation actions of Indigenous Peoples (ICE, 2018). Within some of the provinces in Canada, there are some designations that have been used to protect areas that are important to Indigenous Peoples, such as the use of "conservancies" (ICE, 2018). The current protected area laws in Canada allow for the recognition of a sole Indigenous government arrangement or jurisdiction in specific cases such as tribal lands to be recognized as IPCAs, and however there are still many current protective legislations are in direct conflict with the natural law followed by the IPCAs (ICE, 2018). There is a vital need to decolonize the concepts of what is acknowledged as legal mechanisms in our conservation assessment tools and systems, as well as provide the necessary space for where Indigenous and natural laws can be included in the process of identifying an IPCA.

Indigenous stewardship and guardianship over lands and waters are best understood and described through the lens of natural law and cannot be explained through western systems of governance (ICE, 2018). Indigenous law can be described as stemming from natural law, "... which in turn came from higher universal principals connected to the observations of nature and the principle of peaceful relationship with the rest of creation in the forms of duty, responsibility and the guardianship of the lands and waters" (ICE, 2018. pg8). There is significant opportunity in conservation for the recognition of Indigenous jurisdiction and revitalization of past treaties signed by settlers and Indigenous Peoples to occur (ICE, 2018). Although section 35 of the Constitution is recognized in current Canadian screening practices of OECMs and IPCA, there is a need to better understand and recognize traditional hunting and cultural laws that conflict with Canadian law. Decolonizing legislation recognized in our conservation screening tools is important to enable Indigenous nations and communities to holistically describe their governance systems, conservation, and cultural goals of IPCAs. Indigenous law also plays an important role in cultural and spiritual values and therefore can have further implications that arise if not assessed properly and provided space to do so. It is important to consider how local customs are used in governance systems. This is because when local customs and institutions are included in conservation governance it is more likely for positive conservation outcomes and increased wellbeing to occur (Dawson et al., 2021). Local ecological knowledge must be recognized across all scales of governance (Dawson et al., 2021) to accurately describe the function and outcomes

of IPCAs. Without the decolonization of recognized legislation and legal systems within conservation assessment and screening tools, identification, and monitoring of IPCAs will remain one-eyed and unequally influenced by western governance systems.

Spirituality and cultural values

Spiritual and cultural values are a key pillar in IPCAs. Indigenous cultural and spiritual values are the heart and center of IPCAs and extremely important in ensuring long-term success (ICE, 2018). ICE (2018) recognizes that the protection and conservation of Indigenous traditional spiritual and cultural values, is required to ensure that IPCAs form the capacity to be self-sustaining and maintain long-term goals. Canada's screening tool for OECM assessment provides an example of a metric used to collect the required information for OECM identification. Within this screening tool, it is advised that there is only a maximum of three to four sentences available to provide the overall cultural and spiritual context and connection to the site and in-situ biodiversity (CFPT, 2021). The screening tool does not recognize the importance of spiritual values and cultural outcomes that are acknowledged by Pathway to Target 1 or ICE. Spiritual and cultural values play critical role in IPCA's ability to support and stimulate the Indigenous resurgence movement (ICE, 2018). It is evident that the vast role spirituality values and cultural outcomes play in successful IPCAs cannot be effectively recognized or evaluated in four sentences. Similarly, the screening guide does not provide any indicators or criteria to evaluate the spiritual and cultural outcomes of an IPCA or OECM. Providing indicators that are inclusive of Indigenous knowledge systems and ways of life, to measure the achievement in reaching spiritual and cultural outcomes in IPCAs is important in further develop the capacity of the initiative itself (Tran et al., 2020). IPCAs can be a beacon of teachings in the Indigenous community and can serve as a method to actively engage youth and communities in reconnecting with the spiritual and cultural teachings of the land (ICE, 2018). It is necessary that the importance of spiritual and cultural values is acknowledged, and Indigenous nations are provided with the opportunity to evaluate and monitor the cultural outcomes of IPCA. Suggested criteria of spirituality values and cultural outcomes are indicators of revitalization of Indigenous values, intergenerational learning/education and well as social indicators of wellbeing.

Revitalization of Indigenous languages

There has been a global outcry recognizing the devastating loss of many Indigenous languages across the world. The United Nations has acknowledged the critical state that many Indigenous nations are in and have declared 2022-2032 the International Decade of Indigenous Languages (GOC, 2022). The International Decade of Indigenous Languages aims to develop action to mobilize stakeholders in the revitalization and preservation of these languages. In Canada, many Indigenous languages were lost after the continued and brutal attempts of assimilation of Indigenous youth in residential schools (McIvor and Anisman, 2018). IPCAs provide significant opportunities to engage in action to revitalize Indigenous languages in nations across Canada. Language revitalization could be examined as an indicator of intergenerational learning and protection of cultural and spiritual values. Language is an important aspect of intergenerational healing and resurgence (Goolmeer et al., 2022). Many Indigenous languages are inextricably linked to the land and hold the spiritual connection and relationship to the land, that has been lost by colonialism (ICE, 2018).

There is possibility within the scope of an IPCA for language revitalization programs to effectively address the needs of the community, and further improve the capacity of the IPCA (ICE, 2018). Efforts to recognize and include traditional language (whenever possible, for the communities themselves) should be evident within IPCA assessment tools. Current assessment and identification tools of OECMs and IPCAs need to be more explicit of Indigenous knowledge and include language that is supportive of Indigenous knowledge (Goolmeer et al., 2022). Indigenous nations should not have to abide by either western scientific or colloquial language in order to have the important outcomes recognized in conservation assessment tools and should be provided with the opportunity to use Indigenous language to recognize culturally salient species. Enabling Indigenous language to be recognized and accepted within conservation assessment tools, creates further intergenerational educational opportunities. As well as more opportunities for nations to reconnect and heal with the land (ICE, 2018). Similarly, in circumstances when there is collaborative or co-governance systems or ethical space principles being applied, it is essential that a co-developed and shared language is used. By adapting to weaving Indigenous language and terms into our current conservation metrics we begin to develop a shared understanding of the success of IPCAs and begin to heal traumatic bonds. Using social indicators such as language revitalization is an important aspect to successfully evaluate the holistic achievement of IPCAs. By understanding how language plays an important role in education and biodiversity conservation and providing indicators that are representative of the integrated Indigenous systems.

Wellbeing Indicators

After the 2020 Coronavirus pandemic, scientists around the world acknowledged the connection between human health and wellbeing and nature (Fazey et al., 2020). As noted above, the increased loss in biodiversity and climate change caused by anthropogenic pressures has resulted in the need to recognize and understand the intricate links between nature and humans. Advocates for Indigenous-led conservation have for many years emphasized the significant link between conservation and Indigenous personal wellbeing. Human wellbeing is an integrated, holistic approach and concept to the overall quality of a person's life and the factors affecting it, which can entail both physical and mental health and economic health (Larson et al., 2019). Many cultural keystone species and habitats contribute to the economic stability of a community and are strongly linked to identity and cultural fulfillment (Deroy et al., 2019). For example, many coastal Indigenous communities in Canada have strong cultural connections to sea grass, which provides the communities with cultural, ecosystem and economic services (Deroy et al., 2019). The consideration of this significant link between nature conservation and wellbeing is evidently missing from global conservation assessment and screening metrics. Many cultural values cannot be measured or quantifiable through standard western practices but still play an important part in IPCAs and need to be assessed and monitored (Deroy et al., 2019). Wellbeing indicators provide room for culturally relevant place-based indicators to be utilized by communities to evaluate the specific objectives of their IPCA (Deroy et al., 2019).

The literature shows that many wellbeing factors directly influence the health and wellness of a person being used as indicators (Larson et al., 2019). These factors include feeling strong in your personal culture, having the legal right/access to areas of cultural significance, having relevant education within your communities, feeling strong in your body and mind, knowing that my family/community feel strong in their bodies and minds, and making sure

cultural language is not lost (Larson et al., 2019). These factors all play a considerable role in wellbeing as well as are critical in achieving the main objectives of IPCAs (biodiversity conservation, protecting spiritual and cultural heritage/values and long-term commitments to the nation's specific needs) (ICE, 2018). Similarly, there are many public health concerns that are encompassed in wellness that can be addressed and evaluated by wellness indicators. There is an explicit connection between public health and biodiversity conservation and climate change (Jenkins et al., 2018). As climate change concern grows, there is increasing concern for how nutrition, water management, communicable and non-communicable diseases will impact physical human health (Jenkins et al., 2018). Also, there appears to be a significant link to how active and passive exposure and connection to nature positively impact human health (Jenkins et al., 2018). The inclusion of wellness indicators that can evaluate the physical health of the community can address and monitor potential challenges in the future. Furthermore, food security and sovereignty are a growing concern for many Indigenous nations and may be a primary objective in their IPCA. Many nations may choose to have their traditional lands recognized as an IPCA to protect their security of culturally relevant species that are used for substance and medicine. IPCAs can be used to protect traditional hunting and gathering practices that could increase the community's security and sovereignty (Jenkins et al., 2018).

Wellbeing indicators are important to include into conservation assessment and monitoring tools because they provide the ability to make space for the understanding of the interconnectedness of governance, cultural values and conservation that is prominent in Indigenous knowledge systems. Wellbeing indicators demonstrate the interconnectedness between human health and ecological health, that past attitudes in biodiversity conservation ignored. Wellbeing indicators can track the successful and negative outcomes of IPCAs at both a global and local level (Corrigan et al., 2018). They also include social indicators vastly missing from global protected area management effectiveness database indicators (Corrigan et al., 2018). The ability of wellness indicators to be measured quantitatively and qualitatively provides further dismantlement of harmful notions of "real science" in conservation. Thereby creating a two-eyed seeing perspective within our conservation assessment metrics.

Biodiversity Conservation Outcomes

Biodiversity conservation is the only requirement of OECMs as outlined by the IUCN and the Canadian federal government (IUCN, 2017) (CFPT, 2021). Biodiversity conservation is inherently entangled with the prosperity of IPCAs and are critical to Indigenous resurgence and protection of Indigenous rights and responsibilities (ICE, 2018). However, there is significant influence from western science practices in current screening guides and literature on biodiversity conservation, that often undermine and invalidate Indigenous knowledge systems. A major barrier in Indigenous-led conservation is the exclusion of Indigenous knowledge regarding biodiversity conservation as it is not recognized as "science" and is often misconstrued as "less valuable" to western scientific practices (Reid et al., 2021).

To be identified as a OECM or IPCA in Canada, there must be identification of biodiversity conservation prior to the recognition of the areas as an area-based conservation method (CFPT, 2021). Likewise, governmental bodies of area-based conservation initiatives must be able to provide on-going identification of key biodiversity attributes specific to the site and their values, that can be tracked and described over time (IUCN, 2017). The Canada

screening guide for OECMs endorses the use of “robust monitoring data” such as sample surveys to demonstrate biodiversity conservation, and recommends the use approved provincial harvesting reports to infer species abundance if “robust monitoring data” is not available (CFPT, 2021). It is advised that if this information is not available, there is possibility for discussions with site managers and knowledge holders to explore the biodiversity conservation effectiveness assessment (CFPT, 2021). However, no further information or description is provided on what these discussions would look like and the implications of them. There appears to be potential to revise identification and monitoring of IPCAs to consider place-based relationships in conservation. Place-based approaches refer to acknowledging the unique attributes and needs of a specific geographic area, engaging with multiple stakeholders or rightsholders, seizing opportunities for local skills and resources, and adapting to new learning and stakeholder interests (Jenkins et al., 2018). Place based relationships are central to most Indigenous knowledge systems and cultural values and provide greater opportunity for Indigenous nations to recognize and translate cultural values into conservation objectives that are recognized in Canada (Artelle et al., 2019). Place- based value led management also recognized that Indigenous relationships differ based on nation and location and could thereby reduce harm caused by pan-Indignity (Jenkins et al., 2018). The inclusion of place-based values led management with required on or off-site meetings could avoid proposal formats that privilege western quantitative scientific practices and instead embrace establishing credibility with formats that are compatible with Indigenous knowledge systems (Artelle et al., 2019). There should be availability to note the outcomes within place-based values led management methods when monitoring and assessing conservation outcomes of IPCAs to establish credibility, as well as provide space for knowledge to be shared and taught and used for future generational learning.

It is imperative that assessment metrics and screening guides work to include criteria to the recognition of biodiversity conservation that is two-eyed, to dismantle these structural barriers. This research highlight indicators that are representative of Indigenous knowledge to evaluate and identify the biodiversity conservation of a potential IPCA or OECM. Indicators that are inclusive of Indigenous knowledge and can help to dismantle further barriers to Indigenous nations include place-based biocultural indicators and culturally significant/salient entities.

Biocultural Indicators

Biocultural indicators have been highlighted as a holistic alternative to the current biodiversity conservation indicators used in global conservation assessment metrics (Deroy et al., 2019). Biocultural indicators provide further opportunity to reduce barriers to Indigenous nations in reporting and identifying biodiversity conservation in IPCAs (Goolmeer et al., 2022). Many current biodiversity indicators privilege and favor western knowledge systems, reducing opportunities for Indigenous-led conservation to be recognized in Canada’s conservation target goals. The key biodiversity attributes and indicator lists include the use of rare, threatened, or endangered species and habitats recognized under the IUCN red list of threatened species, range-restricted species and ecosystems in natural settings, important species aggregations such as migratory path or spawning grounds, etc. (IUCN, 2017). IUCN also recognizes ecosystems with high levels of ecological integrity as a key biodiversity attribute. However, ICE’s (2018) recommendations support that the creation of IPCAs that does not solely rely on ecological integrity but support the locally biocultural relevant species within the area. Biocultural indicators contribute to the support of place-based values led management, thereby creating

further space for Indigenous knowledge to be recognized in standard conservation assessment metrics.

Biocultural indicator assessment starts with understanding the values that are important to local communities (Deroy et al., 2019). Thereby, the use of biocultural indicators embraces locally relevant indicators that best address the community's concerns, needs, and values. They recognize the relationship between ecological stewardship and well-being (Goolmeer et al., 2022). Indigenous nations would receive the acknowledgement of their place-based values by setting and choosing the appropriate locally relevant biocultural indicator. The appropriate number of biocultural indicators can also be chosen by the nation, to better accommodate the budgetary needs of the IPCA (Deroy et al., 2019). Therefore, using biocultural indicators would be fundamental in supporting place-based cultural perspectives/management in reporting biodiversity outcomes in Canada (Goolmeer et al., 2022). Similarly, biocultural indicators approaches can help foster the community's socio-cultural resilience and wellbeing, thereby providing further support for the evaluating the social and ecological outcomes on an IPCA (Deroy et al., 2019). Cultural outcomes can also be monitored using biocultural indicators, as they provide the flexibility to be either qualitative or quantitative measurement practices (Deroy et al., 2019). Overall, there is significant opportunity to amend current conservation assessment and identification metrics, policies and IPCA standards to include the addition of Indigenous-led objectives and outcomes that are appropriate to the needs of the community, through the inclusion of biocultural indicators.

Importance of Biocultural Diversity

As advocacy for Indigenous-led conservation and stronger collaborative partnerships with Indigenous nations grows, there is an increasing concern for the apparent disconnection between western endangered and concerned species lists, and species that are culturally significant to Indigenous nations (Deroy et al., 2019). It has become evident that many species that are crucial to Indigenous resurgence and protection of Indigenous cultural are not included on global biodiversity inventories (Deroy et al., 2019). This disconnection between western and Indigenous knowledge systems transparently indicates a major gap between each knowledge system, and further barriers in achieving conservation targets. Canada's screening guide advises the need for OECMs to have direct evidence of biodiversity conservation outcomes including the condition of the habitat, ecological processes, species abundance, impact of invasive species and effect of ecological isolation (CFPT, 2021). However, the species of concern for Indigenous nations are not in parallel with Canada's listed species to protect in achieving Canada's Target 1 (ICE, 2018). For example, the grizzly bear was identified to be both an ecological significant species and culturally relevant species to many First Nations in the Great Bear Rainforest but was not included on Canada's list of species at risk (Deroy et al., 2019). ICE (2018) identifies this as a major problem in IPCAs that needs to be addressed in Canada's standards for conservation and protection and call for the inclusion of species that are key in Indigenous cultures. It is noted that the protection and conservation of culturally significant species is fundamental to the survival Indigenous nations and their ability to connect and live spiritually with the land (ICE, 2018). Culturally significant entities are a form of biocultural indicators that are essential in achieving biocultural diversity.

The inclusion and utility of culturally significant entities and using culturally salient indicators in conservation assessment provide resolution to this gap and generates a pathway for shared conservation goals between Indigenous nations and the Canadian government to be co-developed. The use of culturally significant entities and choosing these culturally salient indicators involves species or indicators of environment that are culturally salient meaning they are entrenched in Indigenous cultural practices (use in food, social, symbolic, or ceremonial practices) (Deroy et al., 2019). The use of culturally significant entities moves away from the concern of the amount of land that is protected in our conservation goals and switches the perspective to what is being protected and by who (Goolmeer et al., 2022). Culturally significant entities are the solution to officially recognizing the need to protect and support Indigenous nations and their culture in our conservation policies. As well as providing the imperative space for Indigenous-led conservation in Canada, to effectively save what is left of our biodiversity before it is too late. Without the use of culturally significant entities indicators or indicators that are culturally salient it would be difficult for IPCA governance systems to design conservational targets that relevant of their community and reflect the needs of their community. Similarly, many of the culturally significant indicators hold economic value to the nation as well and play a key role in ensuring the IPCA becomes self-sustaining (ICE, 2018). Culturally salient indicators such as culturally significant entities are a key factor in support for Indigenous resurgence and place-based values led management that centres Indigenous knowledge and wellbeing. The inclusion of culturally salient indicators in conservation assessment and monitoring tools is essential and must be appropriately incorporated in Canada's conservation goals. Without recognition in the significant of culturally salient indicators, Canada will never appropriately support successful IPCAs and truth and reconciliation.

Discussion

OECMs opened the door to “re-Indigenizing” conservation and IPCAs

At the adoption of the Aichi Targets in 2010, the CBD did not clearly define OECMs and there was little understanding of the differences between an OECM and a protected area (Donald et al., 2019). With concerns on how to achieve Target 11 and how to effectively conserve nature, an interest in developing a definition for OECMs became urgent (Jonas et al., 2017). A task force was developed, and a definition was adopted by the CBD in 2018. It defines OECMs as “a geographically defined area other than a protected area, which is governed and managed in a way that achieves positive and sustained long term outcomes for the in-situ conservation of nature, with associated ecosystem functions and services and where applicable, cultural, spiritual, socioeconomic and other locally relevant values” (CBD, 2018, p. 1).

The unique feature of OECM is that it does not require biodiversity conservation as its primary objective, which is a requirement in the classification of protected areas (Alves-Pinto et al., 2021). This unique feature of OCEMs highlights the opportunity to expand the scope of areas that demonstrate effective conservation but do not fall under the western thought of a protected area. This is significant for many Indigenous Nations globally. The highly specified definition of protected areas excluded many ecosystems of high biodiversity and intact ecological integrity because they were governed and managed by Indigenous Peoples, whose primary objective was not necessarily conservation as defined by western systems.

The utilization of OECMs as a conservation tool can result in the empowerment of Indigenous communities as ecological stewards in the management of their traditional lands (Gurney et al., 2021). It is suggested that OECMs can be used by Indigenous communities to recognize their work in effectively preserving the ecological integrity of their land that would usually be excluded from mainstream conservation management systems such as protected areas. When conducting interviews with conservation experts in the field, Alves-Pinto et al. (2021) report that, for most experts, the primary benefit to OECMs is the ability to encapsulate areas of high biodiversity that would have been excluded under a Protected Area classification. While a protected area may disrupt the Indigenous governance system, an OECM allows the First Nations to self-govern the management of the areas being preserved (Gurney et al., 2018). Another unique feature of OECMs is that they are defined by their outcomes and must deliver effective in-situ conservation before it can be officially designated (Jonas et al., 2017). Much of the literature on OECMs highlights the potential benefit of promoting and achieving effective protection of nature through long-term sustainable conservation partnerships (Donald et al., 2019). It is recognized in the literature that the application of OECMs can increase the ecological representativeness and connectivity of conservation areas and provide an opportunity for collaborations between stakeholders that can foster engagement (Garnett et al., 2018).

The inclusion and recognition of OECMs are an area-based conservation method that differs from a protected area, granted for the door to “re-Indigenizing” conservation to be opened and more effective methods of conserving nature to be considered. It is now recognized that conservation of nature is no longer solely bounded by the ecological outcomes of an area. Instead, a wider perspective can be taken to identify how to manage the interconnected relationships between nature and humans to produce sustainable and ethical conservation. Protection of spirituality and cultural practices is now recognized as an important aspect of nature conservation and is set out as criteria for OECMs (IUCN, 2017) It is one of the principles of OECMs that local and Indigenous knowledge and values that are fundamental to the in-situ conservation and effective conservation cannot be achieved without ethical collaboration (Jonas et al., 2021;) (Bhola et al., 2021). The recognition of OECMs also encompasses wider landscapes and seascapes to be included as an area-based conservation method, which is significant, as the land and the sea are connected and are one for many Indigenous Nations (ICE, 2018). Canada’s recognition of IPCAs as a form of OECMs means that Indigenous Peoples no longer must choose to become a protected area and potentially surrender governance for their lands to contribute to nature conservation. The development of IPCA is a significant step in achieving effective nature conservation in Canada. However, steps still must be taken to produce a system that can assess the sustainability and nature conservation outcomes of IPCAs that can be accepted by the federal and global organizations.

IPCAs provide the perspective shift required in conservation as they impact the essential socio-cultural aspect that nature conservation missed in the past. IPCAs can strengthen intergenerational learning about stewardship within Indigenous communities that have been lost due to Canada’s colonial past and provide federally recognized protection of bioculturally significant areas (Tran, Ban and Bhattacharyya, 2020). The characterization of an IPCA can secure traditional lands that are critical for the community to practice their culture by hunting, fishing, or gathering medicinal plants (Moola and Ruth, 2019). IPCAs can also benefit Indigenous communities by providing the resources and funding that are critical in rebuilding intergenerational knowledge in stewardship that has been lost due to colonization (Tran et al.,

2020). IPCAs hold the potential to elevate the agency of Indigenous Peoples and their governance (Tran, Ban and Bhattacharyya, 2020). They provide the opportunity to further develop and advance progress toward the establishment of ethical space within Canadian conservation movements.

Indigenous Resurgence

Indigenous approaches to protection and stewardship over lands and waters have existed since time immemorial yet have only recently been recognized as suitable for conservation goals in the current colonial society (Tran et al., 2020). As Indigenous Peoples were forcefully displaced from their traditional lands, the traditional knowledge and care of that land was removed. Indigenous Peoples could no longer conduct or participate in activities that were crucial in maintaining the land and their cultural identity (Moola and Roth, 2018). As a result of the colonial systems, Indigenous knowledge has since been othered and labelled as senseless storytelling with no real value (Whyte et al., 2016). Recently, there has been a global push by scientists, environmental activists, and Indigenous Nations to recognize the strength in Indigenous knowledge in producing effective biodiversity conservation. This push is a vital stride in the resurgence and protection of Indigenous governance, culture and leadership that were lost because of the colonial power structures implemented by settlers. Indigenous resurgence is a political, philosophical, and social movement to address the harm and injustice that has been done to Indigenous Peoples since their displacement from their traditional lands by settler colonialism (Artelle et al., 2019). This research strives to push for further acceptance of Indigenous knowledge as accurate science and support for Indigenous resurgence by dismantling harmful colonial “othering” of Indigenous knowledge by actively engaging in ethical space practices and Two-Eyed Seeing.

Ethical space and Two-Eyed Seeing practices are essential in centering Indigenous worldviews and ways of knowing in conservation, which are paramount in creating ethical conservation action (M'sit No'kmaq et al., 2021). When ethical space and Two-Eyed Seeing approaches are taken within conservation research and assessment, plural coexistence can be built between Indigenous and western knowledge systems. Thereby providing the necessary space for ethical collaboration to occur. Advancements to IPCAs must continue to build plural coexistence in conservation practices. Plural coexistence is when indigenous knowledge systems and western systems are considered equal so that they can cohesively work together to build a more equitable and sustainable future (Howitt and Suchet-Pearson, 2006). In striving for plural coexistence my research improves how we understand the complex systems of biodiversity through multiple knowledge systems to create a more enriched picture of how to save Mother Earth. There is an essential need to recognize that many IPCAs are highly complex socio-ecological systems to reduce unintended harm that may occur from a singular perspective. Plural coexistence is a crucial key in Indigenous resurgence in Canada and in Canada's Truth and Reconciliation promises of working together to move forward in honoring the agreements made by both ancestral groups to live side by side.

However, to accurately encompass plural co-existence and make space for Indigenous knowledge in conservation, we must provide the capacity for the resurgence of Indigenous Nations as leaders in environmental stewardship. This requires the global recognition that Indigenous resurgence is tightly intertwined with the wellbeing of Indigenous Peoples.

Supporting the resurgence of Indigenous leadership within conservation goes beyond the western scope of conservation (Artelle et al., 2019). It requires support for the re-establishment of wellbeing and traditional cultural practices central to place-based stewardship (Artelle et al., 2019). There is a reciprocal relationship between wellbeing and humans, especially Indigenous Peoples, which has been recognized within literature but not within the practical implementation of biodiversity conservation methods (Tran et al., 2020). The wellbeing of Indigenous Peoples is bounded to the health of local nature and species, as the wellbeing of those who inhabited the areas of interest declines so does biodiversity (Dawson et al., 2021). Nonetheless, only 25% of total global protected area management effectiveness database indicators are locally relevant or in consideration of indicators beyond conservation outcomes (Corrigan et al., 2018). Due to the entwined intricacies of Indigenous resurgence, wellbeing and effective conservation, wellbeing and social cultural outcomes must be equally evaluated when considering the effectiveness of conservation practices (Corrigan et al., 2018). This research contributes to the knowledge that social wellbeing is an intricate part of the conversation on what we will protect nature, by actively analyzing and indicating socio-ecological indicators that are representative of Indigenous knowledge that should be included in the assessments of OECMs and IPCAs. The reclaiming of Indigenous cultural practices that are interlaced with Indigenous Peoples' connection to the land is an essential key to Indigenous resurgence (Artelle et al., 2019). As well as a major pillar in OECMs and IPCAs, and thereby needs to be effectively addressed within assessment tools (Tran et al., 2020).

Indigenous resurgence is an ongoing movement to protect and maintain the resilience of Indigenous Peoples and their cultural, spiritual, and land-based knowledge. This research plays an important role in the support and advocating for Indigenous resurgence, by developing and identifying indicators that assess the key elements of an OECM or IPCA through both an Indigenous and western way of understanding and knowing. Ongoing progress in Indigenous Resurgence will be vital to creating ethical and effective global biodiversity conservation.

Sustainability Relevance

The current climate and conservation crisis that our global community faces require prompt and meaningful action. Environmental action that excludes the socio-cultural wellbeing of humans and communities is not effective at producing long-term conservation outcomes. It is imperative, that Indigenous voices are highlighted and observed in future discussions about conservation of nature movements. A critical shift to decolonizing conservation will create novel ethical and sustainable solutions to conserving our planet. IPCAs can empower Indigenous Nations, revitalize cultural generational learning, and protect culturally and ecologically significant areas and species (Tran et al., 2020). ICE (2018) has advocated IPCAs to promote Indigenous autonomy and stewardship in Canada. Monitoring and reporting the effectiveness and sustainability of IPCAs is vital in further developing the capacities of the IPCA (Tran et al., 2020). Similarly, a system that assesses the effectiveness and sustainability of IPCA can be used in quantifying Canada's conservation progress, when appropriate.

This major paper contributes to the growing field of sustainability science by providing a practical ethical solution to the challenge of sustainably conserving our natural earth. Sustainability science investigates how society can navigate the root causes of unsustainability by analyzing the interactions between natural and social systems (Kates, 2011). The core features

of sustainability science that mark its divergence from “traditional” science are that it is solution-oriented and is interdisciplinary or transdisciplinary research (Kates, 2011). It is a solution-oriented practice in which knowledge can be linked with action to measure sustainable development, promote equality, construct the ability to adapt and create sustainable development pathways (Clark and Harley, 2020). Sustainability science is a problem-driven field and is a practical applied science that aims to transfer knowledge into actionable solutions (Clark and Harley, 2020). My research incorporated the solution-oriented component of sustainability science by addressing an obstacle that prevents sustainable changes from being implemented and has been identified by academic scholars, stakeholders, and actors.

This paper addressed the challenge of effectively measuring and evaluating the outcomes of IPCAs. By identifying indicators that could be used to create an assessment and monitoring system that measures the effectiveness of IPCAs, Indigenous communities could be recognized and empowered for their contributions to Canada’s Target 1. My research provided the opportunity for Indigenous communities to promote intergenerational learning within the community by supporting their ecological practices (Tran, Ban and Bhattacharyya., 2020). It could be used to navigate the practical challenge of how Canada will achieve Target 1 and thoroughly conserve nature before it is too late.

This research equally contributed to the interdisciplinary component that is essential in sustainability science. A core feature of my research is the interlacing and facilitation of different bodies of knowledge, which is an important step for future transdisciplinary research to occur. A significant challenge in the use of OECMs is implementing systems that are representative of both western and Indigenous knowledge systems. Effective biodiversity conservation must be the product of Indigenous knowledge systems working in tandem with western science to allow Indigenous Peoples to retain their environmental management and land rights. By using the ethical collaborative framework of Two-Eyed Seeing indicators were chosen based on the strengths of both Indigenous knowledge systems and western knowledge systems. The identification of common tools/indicators is an important step in engaging in interdisciplinary work. Lang et al. 2012, describes an interdisciplinary model of sustainability research with three phases. The three phases of this model are problem framing and team building, co-creation of solution-oriented transferable knowledge and re-integration and application of created knowledge (Lang et al., 2012). My research adopts the first and second steps of this interdisciplinary research model. In the first phase of this model, the contributors of this paper collaboratively framed the problem and core research question using insights from both sides. In the second phase, the researchers co-created a solution-oriented metric using a Two-Eyed Seeing framework to create transferable knowledge. Although the re-integration and application of the collaborative knowledge is out of the scope of this research, it paves the pathway for future research to design a collaborative research study that utilizes the indicators found in my research to analyze the application of an assessment metric representative of both Indigenous and western knowledge.

Conclusion

One of the recommendations of ICE (2018) for the Canadian Federal government was that, as part of ethical space, to recognize IPCA indicators would be related to environmental, social, cultural, and economic realizations. It was recognized that the indicators needed to be

specifically related to environment, reconciliation, revitalization of language, cultural practices, protocol and ceremony, job creation, sustainable livelihoods, and social wellbeing (2018). This research recognized and identified indicators for assessing the three main pillars of IPCAs, governance, spirituality values and cultural outcomes and biodiversity conservation outcomes. There is an intersection between governance and the well-being of Indigenous Peoples because local conservation decisions will be dependent on place-based principles, knowledge, and customs which are all aspects of a person's wellbeing. (Dawson et al., 2021). This intersection between governance, culture and conservation was another reason as to why it was imperative to identify effective indicators for the three pillar using a Two-Eyed Seeing approach. This approach is inclusive of Indigenous knowledge systems and ways of life, along with social indicators, to create a two-eyed holistic metric to evaluate and identify IPCAs in Canada. Indigenous resurgence involves Indigenous Nations determining how Indigenous rights, partnerships and reconciliation will be respected (Artelle et al., 2019). Therefore, it is paramount that the indicators used within any assessment tools lend way for the establishment of effective and successful IPCAs created within ethical space. It is essential that we accurately describe and assess the governance systems, cultural outcomes, and conservation outcomes in IPCAs. Without such assessments barriers for Indigenous nations to be included in conservation dialogue and effort may continue to exist in the establishment of IPCAs (Tran et al., 2020). Due to the time constraints and limitations of this research, the metric could not be applied to case study. However, this study provides the opportunity for future research, to analyze and evaluate how the two-eyed metric develop can assess and identify IPCAs. As well Indigenous guardian programs may be a way to undertake how the inclusion of these indicators within their assessment and monitoring programs can allow for better collaboration with federal and provincial governmental agencies, in recognizing their conservation efforts towards Canada's Target 1.

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Appendix 1: Rapid Literature Search Results

Table 1. Academic Search Complete Database

Search Term	Results	Results after filters (English language only, 2017-2022, academic journals only)
Indigenous Protected and Conserved Areas	30	14
Indigenous Protected Areas	746	288
Indigenous led conservation	206	87

Table 2. Web of Science Complete Database

Search Term	Results	Results after filters (English language only, 2017-2022, academic journals only)
Indigenous Protected and Conserved Areas	199	92
Indigenous Protected Areas	1949	848
Indigenous led conservation	992	417