

# Achieving the 30 by 30 Biodiversity Target in Canada through Indigenous Protected and Conserved Areas

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## Abstract

Canada has committed to the United Nations Kunming-Montreal Global Biodiversity Framework (GBF), including protecting 30% of land and sea by 2030 while recognizing Indigenous rights. By 2024, Canada has conserved 13.8% of terrestrial and 15.5% of marine protected and conserved areas (PCAs), leaving a major gap in protection. This article posits that Indigenous protected and conserved areas (IPCAs) are the best way to protect an additional 160 million hectares of land and 80 million hectares of sea required to meet GBF target 3 by 2030 and fulfill UNDRIP commitments, and reconciliation promises. We explore this potential by mapping IPCAs against governance, critical habitats for species at risk, peatlands, and greenstone belts. Currently, Indigenous governance is underrepresented; of nearly 15,000 PCAs, only 96 (<1%) are Indigenous-governed or co-governed. More Indigenous governance is needed for existing PCAs and more IPCAs. Our spatial analysis suggests that IPCAs in Canada offer a viable approach to protecting critical habitats for species at risk, peatland biodiversity, and Indigenous rights to meet Canada's 30 by 30 GBF target. If the average size of the proposed IPCAs matches the 5-million-hectare size of Manitoba's Seal River watershed IPCA, the proposed 35 IPCAs will move Canada closer to its terrestrial targets. The proposed IPCAs incorporate the Earth's key life support systems, including the highest concentration of peatlands, which is largely missing from other PCAs, and critical habitat for species like Boreal Caribou (*Rangifer tarandus caribou*) and other endangered species.

## Keywords

Indigenous Protected and Conserved Areas, Indigenous Peoples, Biodiversity

## 1. Introduction

The Earth's life-support systems are threatened by climate change, pollution, and biodiversity loss, with seven of the nine planetary boundaries transgressed (Sakschewski et al., 2025). The species extinction rate rose by 12% from 1993 to 2024, with over 47,000 species at risk of extinction (United Nations, 2025). The decline of Earth's biodiversity and ecosystem services needs urgent action to halt the damage (IPBES, 2019; Sakschewski et al., 2025; United Nations, 2025; WWF, 2024).

The United Nations (UN) Kunming-Montreal Global Biodiversity Framework (GBF) aims to halt biodiversity loss and create harmony with nature (Convention on Biological Diversity [CBD], 2022). This revamped GBF strategy developed 23 targets "to take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery" (CBD, 2022: p. 8). Seven of these targets specifically prioritize Indigenous Peoples' rights, including the first and third targets. The first target is to plan and manage all areas to reduce biodiversity loss. This GBF goal is "to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of Indigenous Peoples and local communities" (CBD, 2022: p. 9). The GBF is referring to the rights of Indigenous Peoples defined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007, which has many Indigenous land-related rights (United Nations, 2008). The third GBF target is to "conserve 30% of Land, Waters and Seas" by 2030, "recognizing and respecting the rights of [I] ndigenous [P] eoples and local communities, including over their traditional territories" (CBD, 2022: p. 9).

The GBF's third target of 30 by 30 requires major conservation efforts globally (CBD, 2022). In 2024, globally, 9.9% of the oceans and 17.5% of terrestrial land and water are protected (Protected Planet, 2025; UNEP-WCMC & IUCN, 2024). Rather than being onerous and another requirement, respecting Indigenous rights applied to land, knowledge, and governance increases the hope of biodiversity gains and facilitates Indigenous leadership (Wilson et al., 2024). Reaching GBF goals and targets requires Indigenous Peoples' full and meaningful participation (Indigenous Circle of Experts [ICE], 2018; Wall et al., 2025; Wilson et al., 2024). Clearly, the colonial paradigm of exploiting nature is not working, requiring a paradigm shift towards balance with nature (CBD, 2022). Indigenous knowledge systems and governance offer sophisticated systems to bring about this shift (CBD, 2022; Wilson et al., 2024).

Indigenous Peoples' active stewardship of land and water has been incredibly effective at protecting biodiversity-rich ecosystems. These biodiverse ecosystems are where 6% of Indigenous Peoples protect 80% or more of the biodiversity (Cyca, 2023; Fernández-Llamazares et al., 2024; Tauli-Corpuz et al., 2020; Wilson et al., 2024). Indigenous protected and conserved areas (IPCAs) offer a way for

Indigenous Peoples' effective biodiversity conservation to be employed in colonial states, like Canada (Hoesen & Lemieux, 2025; ICE, 2018; Moola & Roth, 2018; Wall et al., 2025; Zurba et al., 2019). Full participation of Indigenous Peoples and the advancement of Indigenous science in conservation are essential for achieving the GBF targets in Canada (Wilson et al., 2024).

All of Canada is the ancestral land/traditional territory of Indigenous Peoples—First Nations, Inuit, and Métis. Thus, area-based conservation must account for Indigenous territories, knowledge, and governance (ICE, 2018; CBD, 2022). Canada's PCAs are categorized into protected areas and other effective area-based conservation measures (OECMs) (Environment & Climate Change Canada [ECCC], 2024b). The PCAs are formed primarily to preserve biodiversity over the long term, whereas OECMs support biodiversity conservation while also fostering cultural, spiritual, social, economic, and other community-related values (ECCC, 2024b). As the existing conservation model in Canada is dominated by Western approaches, Indigenous led and co-created conservation that prioritizes Indigenous knowledge and practices is critical in Canada (Wilson et al., 2024). Indigenous governments in Canada seek IPCAs based on Indigenous law, stewardship, and traditional land-use practices, which have effectively conserved biodiversity since time immemorial in Canada but in colonial times have been thwarted (ICE, 2018; M'sit No'kmaq et al., 2021).

Canada adopted the GBF in 2022 and committed to halting biodiversity loss, protecting 30% of land, waters, and seas by 2030, and upholding Indigenous rights (ECCC, 2024a). To reach target 3, Canada promised to double its PCAs. ECCC data shows limited year-over-year growth: terrestrial protection rose from 13.7% in 2023 to 13.8% in 2024, while marine protection moved from 14.7% to 15.5% over the same period (ECCC, 2023; ECCC, 2025a). Canada also has to reconcile its history of genocidal policies towards First Nations, including land reconciliation, which is Canada's 43<sup>rd</sup> truth and reconciliation call to action (Truth and Reconciliation Commission of Canada [TRCC], 2015a; Crown-Indigenous Relations and Northern Affairs Canada, 2025).

This journal article posits that IPCAs are critical to meet the GBF targets, particularly targets 1 and 3. For example, for the GBF's third target, Canada needs an additional 160 million hectares of land and water, and 80 million hectares of sea, protected in a way that respects Indigenous Peoples' rights by 2030. Through mapping, the GBF goal 3 is explored for governance options, critical habitat (for species at risk, intact forest and peatlands), and avoidance of Canada's critical mineral interests in greenstone belts. By integrating spatial analysis with GBF target 3 of 30 by 30 biodiversity and Indigenous rights protection, this paper explores whether IPCAs offer a win-win-win situation for Indigenous Peoples, Canada, and biodiversity.

## 2. Literature Review

This literature review examines biodiversity's intersection with Indigenous Peo-

ples' rights, analyzing the importance of Indigenous stewardship and governance for biodiversity conservation.

## 2.1. The Indigenous Peoples in Area-based Biodiversity Conservation

Indigenous Peoples play a critical role in protecting biodiversity and ecosystem services globally (CBD, 2022; IPBES, 2019; Mansuy et al., 2023; Wilson et al., 2024; WWF, 2024). Indigenous Peoples' effectiveness at conservation is clear from biodiversity statistics despite their relatively small populations and land management areas. Indigenous Peoples manage an estimated 28% of land where 80% or more of global biodiversity is concentrated (Garnett et al., 2018), despite being only 6% of the global population (Fernández-Llamazares et al., 2024; Garnett et al., 2018; Tauli-Corpuz et al., 2020; WWF, 2024).

The GBF in 2022 was the first biodiversity convention to recognize Indigenous rights (CBD, 2022; Gurney et al., 2023). Prior to 2022, Indigenous Peoples' rights were not recognized by the United Nations' biodiversity conventions. For example, the CBD recognized only Indigenous Peoples' role in biodiversity conservation and the need for equitable sharing of benefits, but not a governance role (CBD Secretariat, 2010b; Watson et al., 2018). Biodiversity efforts previously often displaced Indigenous Peoples and undermined Indigenous access to their traditional territories, with colonial laws trying to extinguish Indigenous rights to ancestral land (Gurney et al., 2023; CBD Secretariat, 2010a).

The GBF is a major shift to recognize the importance of Indigenous Peoples' rights, knowledge, and roles. The GBF transforms area-based conservation from undermining to recognizing Indigenous Peoples' knowledge, innovation, rights, and roles as the primary land stewards (CBD, 2022). **Figure 1** shows the specific requirements for Indigenous Peoples' rights to be in line with UNDRIP for seven GBF targets (UNEP-WCMC & IUCN, 2024).



**Figure 1.** The seven targets of the Global Biodiversity Framework that consider Indigenous Peoples, which Canada's Nature Strategy adopted verbatim (Illustration credit: Shirley Thompson & Parinaz Shariat Zadeh).

Historically, area-based conservation excluded and displaced Indigenous Peoples. Park regulations were colonial, often denying Indigenous rights to hunt, fish, and exercise other treaty rights (Antonelli, 2023; Maxwell et al., 2020). These parks often displaced Indigenous communities through land grabs (Cyca, 2023; Wood, 2022b). Historically, conservation area expansion was managed by colonial governments and corporate actors without acknowledging Indigenous Peoples' territories and led to extensive human rights violations (Wilson et al., 2024; York Factory First Nation, 2012). A 30% target without Indigenous Peoples' inclusion would represent a direct threat to biodiversity due to their important roles (Wilson et al., 2024). However, Indigenous Peoples' inclusion may turn this biodiversity crisis around (Wilson et al., 2024).

## 2.2. Canada's 2030 Nature Strategy

Canada committed to the GBF in 2022. Canada has prioritized Indigenous Peoples' rights and knowledge in its Nature Strategy (ECCC, 2024a). Canada's first of its six pillars in its nature strategy is: "Recognizing, upholding, and implementing the rights of Indigenous Peoples and advancing reconciliation, as Indigenous Peoples are the original caretakers of the lands, waters, and ice" (ECCC, 2024a: p. 2). Further, pillar 5 identifies that equal weight will be given to Indigenous Knowledge and Western science: "Using the best available science and knowledge, incorporating new insights, sharing information, and giving equal weight to Western science and Indigenous Knowledge" (ECCC, 2024a: p. 2).

Canada's 2030 Nature Strategy adopted the GBF targets verbatim, including upholding Indigenous rights. Thus, Canada is committed to GBF target 3 to increase area-based conservation to 30% by 2030, respecting Indigenous Peoples' rights (ECCC, 2024a). At the end of December 2024, approximately 15,000 PCAs protected 13.8% of Canada's 998 million hectares of terrestrial territory and 15.5% of Canada's 575 million hectares of marine territory (ECCC, 2025a). To meet its 30 by 30 GBF target, Canada needs to protect an additional 16.2% (162 million hectares) of land and freshwater, and 14.5% (83 million hectares) of sea by 2030. Collaboration with Indigenous governments is critical for Canada to meet these targets (ECCC, 2024a).

Recognizing Indigenous Peoples' rights as a pillar of the nature strategy (ECCC, 2024a) aligns with Canada's commitment to implement UNDRIP through the UNDRIP Act and to advance reconciliation (TRCC, 2015b). The UNDRIP Act promised to align Canadian laws with UNDRIP including Indigenous Peoples' self-determination (article 3), self-government (article 4), free and prior informed consent (articles 10, 19, and 32), rights to ancestral land use and occupancy (articles 24 - 32), and rights to ancestral land's conservation and protection (article 29), along with many other inherent rights (United Nations, 2008). In 2016, the Canadian government fully endorsed UNDRIP, after voting against it in 2007 and supporting it as an aspirational document in 2010 (Department of Justice Canada, 2025).

UNDRIP was elected as the framework for reconciliation in Canada, calling for

all levels of government to adopt and implement UNDRIP to address the rights and needs of Indigenous Peoples (TRCC, 2015b). Implementing UNDRIP in Canada is the TRCC’s 43<sup>rd</sup> Call to Action for reconciliation with Indigenous Peoples. In 2021, the Canadian government enacted the *United Nations Declaration on the Rights of Indigenous Peoples Act*, S.C. 2021, c.14 (2021) (the “Canada DRIPA”) for the legal implementation of the UNDRIP.

Canada has legal and policy barriers to UNDRIP, including the Indian Act, as displayed in Figure 2. In the coloured boxes is the legal wording of the different Indigenous land rights recognized in UNDRIP, linked to the Indian Act article that takes away this right. Thapa applied the current version of the Indian Act, 1985, C. I-5, to identify articles that contain land provisions (The Indian Act, 1985) and compared them to UNDRIP. Of particular consideration for the GBF is UNDRIP, articles 26, 29, and 31. Article 26 (1) recognizes Indigenous land and resources: “Indigenous Peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. Article 29 (1) recognizes a right to conservation and protection of their Native land:

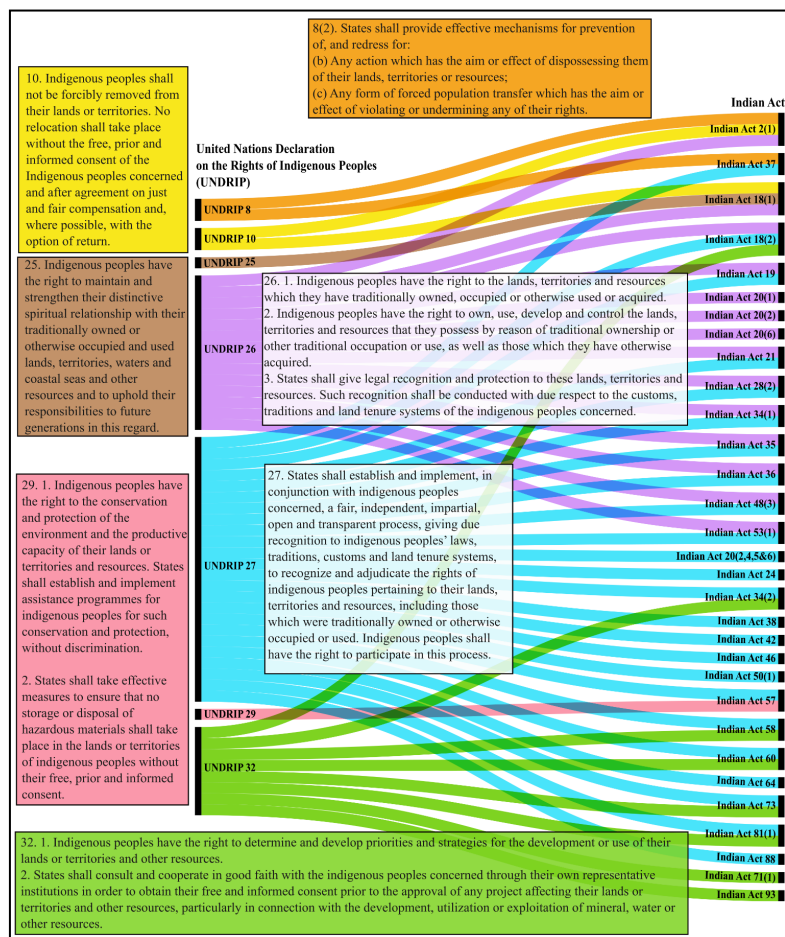


Figure 2. UNDRIP’s land-related articles contradict the Indian Act’s articles (Illustration credit, Thapa, K.).

Indigenous Peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for Indigenous Peoples for such conservation and protection, without discrimination.

Further, Article 32 (1) enshrines Indigenous Peoples' right to decide the development of their Native lands: recognizes that Indigenous Peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources. Other barriers include the Constitution Act. For example, section 91 (24) of the Constitution Act of 1867 states that the federal government has the legal jurisdiction over "Indians and lands reserved for the Indians" (Canada, 2024).

### 2.3. Indigenous Protected and Conserved Areas in Canada

The crux of IPCAs is Indigenous Peoples-led conservation of Indigenous ancestral lands (Cyca, 2023; Rutgers, 2024b). As all of Canada is the ancestral land of Indigenous Peoples, Indigenous rights need to be an integral aspect of area-based conservation, which needs to be formalized through Indigenous governance systems (ICE, 2018). The IPCAs are considered to be consistent with treaties according to Dr. Stewart Hill (personal communication, November 10, 2025).

Indigenous Peoples in Canada defined the requirements for IPCAs in Canada (ICE, 2018). In the Canadian context, IPCAs are: 1) "Indigenous-led", 2) establish a "long-term commitment to conservation", and 3) "elevate Indigenous rights and responsibilities" (ICE, 2018: p. 5). The IPCAs incorporate Indigenous land guardianship through land-based learning, spirituality, hunting, fishing, trapping, harvesting, and cultural ceremonies (Cyca, 2023; Rutgers, 2024a).

The move from colonial parks to IPCAs is viewed as a "turning point" in decolonizing land (Moola & Roth, 2018: p. 201). Indigenous governance through IPCAs protects land from colonial development and maintains the continuity of Indigenous land use and occupancy (Cox, 2023; Rutgers, 2024b; Seal River Watershed Alliance, 2023). IPCAs connect Indigenous Peoples with their ancestral lands (ICE, 2018) and provide access to their traditional foods, timber, medicines, and sacred sites (Rutgers, 2024a; Wall et al., 2025), whereas colonial parks have a long history of creating barriers to Indigenous Peoples' traditional land use.

Canada first mentioned IPCAs in its sixth national report to the CBD in 2018 (Canada, 2018). This report noted that IPCAs were considered too ambitious to achieve Canada's 2020 biodiversity goals because of the extensive consultations and negotiations required with Indigenous governments for land claim agreements. Conversely, Indigenous Peoples are proposing IPCAs and taking leadership in conducting their own consultations (Cox, 2023), which streamlines the process. Indigenous governments provide a more efficient solution for accelerating IPCA negotiations by designating their own proposed area where no corporate barriers exist and by organizing biodiversity research, community consultation, and feasibility analysis (ICE, 2018).

## 2.4. Highly Significant Landscapes for Protection

Canada has the most extensive peatlands in the world (UNEP, 2024; WCS Canada, 2025). Canada's vast peatlands support biodiversity and store five times more carbon than the Amazon rainforest (Hugelius et al., 2020a; Southee et al., 2020). Additionally, peatlands play a vital role in regulating the Earth's climate by storing significantly more carbon than all other vegetation types combined (Southee et al., 2020; WCS Canada, 2025). Peatlands are Canada's ecologically vital ecosystems for carbon storage, water cycle regulation, and biodiversity (UNEP, 2024). Peatlands are essential for climate regulation and ecological resilience (Hugelius et al., 2020a; Southee et al., 2020). Peatland conservation is key to climate goals and biodiversity (Hugelius et al., 2020a; Southee et al., 2020; UNEP, 2024; WCS Canada, 2025).

Prioritizing peatland protection would improve the ecological function of the boreal forest, lower wildfire risk, and support Canada's climate mitigation efforts and Indigenous stewardship (Olmsted et al., 2021; WCS Canada, 2025). Additionally, conserving peatlands through existing and new IPCAs offers another opportunity for countries like Canada to advance the 30 by 30 GBF target (UNEP, 2024; WCS Canada, 2025). Boreal peatlands, wetlands, and forests are vital habitats for many species, including reptiles, birds, and mammals, and traditional land uses of Indigenous Peoples (Hesselink, 2019). These lands face threats from industrial activity, climate change, and habitat fragmentation (Hesselink, 2019; WCS Canada, 2025).

Critical habitats for at-risk species are essential areas for their recovery and survival, as habitat loss remains a primary threat to these species in Canada (Auditor General of Canada, 2025). For example, Woodland Caribou (*Rangifer tarandus caribou*) is a wildlife species listed as threatened under the *Species at Risk Act, SC 2002, c 29*. Habitat loss, degradation, and fragmentation have led to declines in woodland caribou populations throughout their distribution (Environment Canada, 2012). The Woodland Caribou's distribution extends across the boreal forest from the northeast corner of the Yukon, east across two territories and seven provinces to Labrador, and south to Lake Superior in Ontario (Environment Canada, 2012).

Woodland Caribou requires large areas composed of continuous tracts of undisturbed habitat, particularly boreal forests (Natural Resources Canada, 2025). Caribou are important for sustenance and identity to many Indigenous Peoples, having cultural, social and economic value (Hill, 2020). To measure intact forests that Woodland Caribou and other species require, remote sensing tools are used. For example, the Normalized Difference Vegetation Index (NDVI) can monitor vegetation and landscape health (NASA Earthdata, 2025; Thapa et al., 2024). The NDVI provides a measure of vegetation greenness, productivity, and disturbance to assess ecological integrity over space and time (Al-quraishi et al., 2021; Pettorelli, 2013; Thapa et al., 2024).

## 2.5. Canada's Critical Minerals Strategy

Critical minerals are deemed the building blocks for the global energy transition to the green and digital economy and are vital to national security (Thompson et al., 2023). Canada's Critical Minerals Strategy was funded by nearly \$4 billion in Budget 2022, setting an economic course for Canada to be a leader in critical minerals and clean digital technologies (Canada, 2022). Greenstone belts typically have high concentrations of critical minerals, such as gold, nickel, copper, and platinum-group elements, for mining (Bogossian, 2021). These areas are prioritized for mining and exploration; however, greenstone belts are vital wildlife habitats and culturally important sites for Indigenous Peoples (Onyeneke et al., 2024; Thapa et al., 2024; Thompson et al., 2019; Thompson et al., 2020). Greenstone belts' importance to industry creates challenges for conservation, ecological integrity, and landscape connectivity (Thompson et al., 2023). Land-use decisions around mining in greenstone belts significantly impact Canada's efforts to meet the 30 by 30 GBF targets and uphold Indigenous rights (ICE, 2018).

Mining greenstone belts can impact a significantly larger area because mining requires energy, water, land, roads, and infrastructure development, including settlements. Greenstone belts, which are vast rock formations rich in gold and other critical minerals, cover a large part of northern Canada (Bogossian, 2021). Globally, half of the world heritage sites, including the Pimachiowin Aki located south of Island Lake in Manitoba, overlap with the 1 km boundary of at least one of the mining, oil, and gas extraction sites (UNESCO et al., 2025).

In the Canada Target 1 challenge, Indigenous governments and other applicants were asked to propose PCAs in areas without encumbrances and to get provincial/territorial approval for the areas chosen. Greenstone belts in their traditional territory became a barrier to acceptance of their PCAs as Manitoba's Land Use Planning Act Regulation 81/2011 was passed without First Nation consultation, stating: "Only uses that are compatible with exploration, extraction and development of the resources should be accommodated on lands adjacent" to the mineral potential lands, including greenstone belts, (Manitoba Government, 2011: p. 36). The position of the Manitoba government (2011: p. 36) is that "Mineral, ... such as greenstone belts ... must be identified and protected from conflicting surface land uses that could interfere with access to the resources".

## 3. Materials and Methods

We analyzed Canada's 2023 PCAs' database of almost 15,000 PCAs (ECCC, 2023) to see which PCAs had any Indigenous governance, ownership, or managing role (s). We categorized Indigenous roles in governance type, ownership, managing authority, enabling mechanisms, and protected area type. After determining that 96 PCAs had an Indigenous aspect, we categorized PCAs as Indigenous-governed, Indigenous-co-governed, or non-Indigenous-governed, as shown in **Table 1**. Indigenous-governed PCAs are those entirely governed, owned, and/or managed by

Indigenous governments or institutions. Also, those PCAs are Indigenous-governed, which Canada owns, but Indigenous governments are the sole managing authority. In contrast, Indigenous-cogoverned PCAs are those where Indigenous governments or institutions do not govern or own a PCA but co-manage with non-Indigenous governments or institutions.

**Table 1.** Criteria of the Canadian Protected and Conserved Area Database (CPCAD) used to map the indigenous governance of PCAs.

PCA Categories as per the CPCAD				Governance Mapping Category applied
Ownership	Governance type	IPCA status	Managing authority	
Indigenous	Indigenous	Yes/No	Indigenous or mixed	Indigenous governed PCAs, i.e., IPCAs
Non-Indigenous or not reported	Indigenous or collaborative	Yes	Indigenous	
Non-Indigenous	Non-Indigenous	No	Indigenous and non-Indigenous	Indigenous co-governed PCAs
Non-Indigenous	Non-Indigenous		Non-Indigenous	Non-Indigenous governed PCAs

Source: Adapted from [ECCC \(2023\)](#).

Spatial analyses and mapping were conducted in ArcGIS Pro 3.3.2 using the following data to see PCAs and proposed IPCAs' intersection with ecosystem issues (e.g., critical habitat, intact tree cover, concentrated peat deposits of global significance) and greenstone belt avoidance:

- 1) National and watershed boundaries from Esri's Living Atlas ([Esri Canada, 2024](#)).
- 2) Spatial and attribute data from the Canadian Protected and Conserved Areas Database ([ECCC, 2023](#)).
- 3) The proposed IPCA boundaries were accessed from ArcGIS Online ([Papuga, 2022](#)), digitized from [Neil et al. \(2024\)](#) during the establishment phase, one from Tataskweyak Cree Nation, which included their resource management area and digitized with a 10 km buffer, and one from the unfunded proposed Anisininew Okimawin proposal submission.
- 4) Greenstone belt data were accessed through ArcGIS Online ([Paige.giddy\\_Orix, 2022](#)), and a one km buffer was applied to avoid structural disturbance, contamination, and environmental risk in PCAs ([Sonter et al., 2020](#); [Tang & Werner, 2023](#)).
- 5) Peatlands raster dataset (100 sq km resolution) from [Hugelius et al. \(2020b\)](#), based on >7000 peat cores and harmonized soil datasets, were reclassified at ten-unit intervals, clipped using Extract by Mask, and converted to polygons for area calculations.
- 6) The critical habitat dataset for species at risk, including Woodland Caribou, was accessed from Open Government Data ([ECCC, 2025b](#)).
- 7) Manitoba's Vegetation cover from Sentinel-2 imagery (June 1 - September 31, 2024) was analyzed with a 5% cloud cover mask (1056 scenes) to gener-

ate NDVI using the Geemap (Wu, 2020). NDVI was extracted at a threshold of  $\geq 0.6$  to get an intact tree composite map in ArcGIS Pro (Thapa et al., 2024).

Buffer outputs were consolidated and compared with PCAs, peatlands, and species-at-risk habitats. The Albers Equal Area Conic projection was used for national analyses, and NAD 1983 UTM Zone 14N for Manitoba. Overlaps between PCAs, greenstone belts, peatlands, and critical habitats were evaluated using clip, extract, and reclassification tools. Zonal statistics and “Summarize Data” tools calculated PCA areas, overlaps, and land cover metrics.

## 4. Results

### 4.1. Indigenous Protected and Conserved Areas in Canada

The review of 15,142 PCAs listed in Canada’s PCA database found that 96 PCAs, or 0.75% by number, have an Indigenous government’s governance or a co-governance role. Indigenous governments govern eight PCAs. These IPCAs are large, covering 3.8 million hectares and averaging almost 0.5 million hectares each. For the 300 million hectares required for the total 30% of Canada’s land and water, these four represent 1.27%.

Figure 3 shows these PCAs/IPCAs are located in unceded territories with modern treaties in the Yukon, NWT, and BC for the marine park. Indigenous-governed PCAs are, on average, larger than other PCAs, particularly when located in the north, where there is less forestry, agriculture, settlements, and road networks. The average size of Indigenous-governed and co-governed PCAs is 155,000 hectares (ha) ( $n = 96$ ), compared to 14,000 ha ( $n = 15,046$ ) for non-Indigenous-governed PCAs. Larger marine conservation areas tend to be in offshore areas or in northern Canada, where less destructive land uses occur with lower population density.

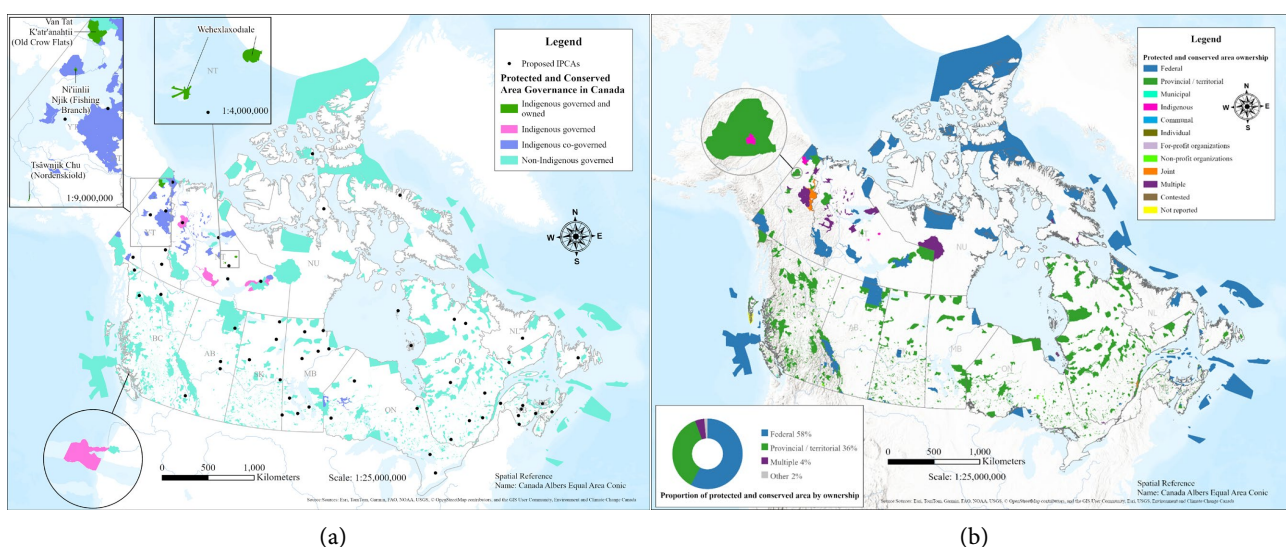


Figure 3. Protected and Conserved Areas (PCAs) categorized for (a) Governance and (b) ownership.

Co-governance has Indigenous governments co-managing with other non-Indigenous governments or institutions. The 88 PCAs co-governed cover 11.1 million hectares of Canada, mainly in unceded territories in the north and a few in northwestern Ontario under Ontario's Far North Act. The 15,000 PCAs that are non-Indigenous-governed cover 224 million hectares.

Indigenous Peoples in Canada self-govern four PCAs as Indigenous governed and owned, legally holding land rights to 0.5 million hectares. These land rights constitute 0.05% of the country's total area. The vast majority of PCAs have no Indigenous governance or ownership. The eight Indigenous-governed are either Indigenous-owned, mixed, or federally owned (Table 2). Co-governed areas are mainly federal. Although most of the large PCAs are owned by the federal government, including all the marine PCAs, the province owns more PCAs, but smaller PCAs. Clearly, the new requirement for respect for Indigenous rights in the GBF requires both changes in how PCAs are governed in the future and shifts in the historical PCAs.

**Table 2.** Indigenous-governed protected and conserved areas in Canada (source: ECCC, 2023).

Location	Name (Area)	IPCA	Enabling Mechanism	Ownership Type	Governance type	Managing Authority
Northwest Territories (NWT)	Ts'udé Niljé Tuyeta Territorial Protected Area (1,010,000 ha)	Yes	NWT PA Act	Provincial/Territorial	Collaborative governance	Indigenous government
	Thaidene Néné Territorial Protected Area (910,200 ha)	Yes	NWT PA Act	Provincial/Territorial	Collaborative governance	Indigenous government
	Wehexlaxodiale (97,680 ha)	Not known	Tłı̄chō Land Use Plan Act	Tłı̄chō Government	Indigenous Peoples	Indigenous government
	Edézhzié Protected Area (1,224,908 ha)	Yes	Canada Wildlife Act	Federal	National government	Canadian Wildlife Services
Coastal Pacific Marine	Gwaxdlala/Nalaxdlala (Lull/Hoeya) marine refuge (2137 ha)	Yes	Fisheries Act (1985, c. F-14)	Federal	Not reported	Not reported
Yukon	Van Tat K'atr'anahtii (Old Crow Flats) (394,703 ha)	No	Vuntut Gwitchin First Nation Final Agreement	Indigenous	Indigenous Peoples	Vuntut Gwitchin First Nation
	Ni'iinlii Njik (Fishing Branch) (14,094 ha)					
	Tsáwnjik Chu (Nordenskiöld) (7740 ha)	No	Little Salmon/Carmacks First Nation Final Agreement; Yukon Wildlife Act	Indigenous	Collaborative governance	Environment Yukon; Little Salmon/Carmacks First Nation

#### 4.2. Proposed Indigenous Protected and Conserved Areas: Canada Target 1 Challenge

The Target 1 Challenge is Canada's IPCA funding process, which includes most of the selected 62 PCA projects and incorporates Indigenous governance through

the IPCA approach (ECCC, 2021). Although Canada does not clearly state whether all the projects are IPCAs, the government notes: “These projects help to improve connectivity, advance Indigenous-led conservation and reconciliation, and have co-benefits for species at risk or carbon storage” (ECCC, 2021). Thirty IPCA projects under the Target 1 Challenge include area coverage, with an average area of 1 million ha, as shown in **Table 3**.

**Table 3.** Area coverage of fifteen Indigenous protected and conserved area projects listed in the Target 1 Challenge (adapted from ECCC, 2021).

S. N.	Canada Target 1 Challenge Project Name	Area (ha)	Recipient	Province
1	Qat'muk: developing an Indigenous Protected and Conserved Area in the central Purcell Mountains (Establishment)	211,045	Ktunaxa Nation Council Society	British Columbia
2	Establishing Tahltan Indigenous Protected and Conserved Areas through the Tahltan Nation Land Use Planning Process (Establishment)	291,380	Tahltan Central Government	British Columbia
3	Métis Settlements Indigenous Protected and Conserved Areas Initiative (Establishment)	50,000	Métis Settlements General Council	Alberta
4	Kitaskino Nuwenëné Wildland Park - Phase 2 Expansion (Establishment)	149,814	Mikisew Cree First Nation	Alberta
5	A Collaborative Approach to Developing Indigenous Protected and Conserved Areas in Athabasca Dënesuliné Nuhenéné (Establishment)	600,000	Ya'thi Néné Land and Resource Office	Saskatchewan
6	Seal River Watershed Indigenous Protected Area Initiative (Establishment)	5,000,000	Sayisi Dene First Nation	Manitoba
7	Nitaskiinan: Planning to Protect our Hudson Bay Coastal Lands (Establishment)	4,660,900	York Factory First Nation	Manitoba
8	Shawanaga Island Indigenous Protected and Conserved Area (Establishment)	1020	Shawanaga First Nation	Ontario
9	Establishing and co-managing a network of new protected areas based on areas of importance to the Crees of Eeyou Istchee (Establishment)	6,564,436	Cree Nation Government	Quebec
10	Conducting public consultations, a key step in the creation of nine new protected areas in Nunavik (Quebec, Canada) and the achievement of consensual conservation objectives (Establishment)	2,980,000	Kativik Regional Government	Quebec
11	Protection Mutehekau Shipu/Rivière Magpie (Establishment)	263,000	Conseil des Innu de Ekuanitshit	Quebec
12	Protection of Pipmuacan by the Première Nation innue de Pessamit (Establishment)	389,500	Conseil des Innu de Pessamit	Quebec
13	Ya'nienhonhndeh protected area (Establishment)	71,100	Conseil de la Nation huronne-wendat	Quebec
14	Masko Cimakanic Askic (Preliminary work)	33,520	Conseil de la Nation Atikamekw	Quebec

## Continued

15	Reconciliation & Stewardship through Land Conservation in Mi'gmaq Traditional Territory of Fort Folly First Nation and the UNESCO Fundy Biosphere Reserve (Establishment)	3500	Fort Folly First Nation	New Brunswick
16	Establishing the Skutik Indigenous Protected and Conserved Area (IPCA) in New Brunswick, Canada (Establishment)	3650	Passamaquoddy Recognition Group Inc.	New Brunswick
17	New Brunswick Mi'gmaq Indigenous Protected and Conserved Areas Proposal (Establishment)	2730	Mi'gmawe'l Tplu'taqnn Inc.	New Brunswick
18	Wolustokwiyik/Maliseet Indigenous Protected and Conserved Area (WMIPCA) (Establishment)	2500	Maliseet Nation Conservation Council	New Brunswick
19	Advancing Target 1 in Nova Scotia - A Collaborative Conservation Approach (Establishment)	36,332	Nova Scotia Environment	Nova Scotia
20	Inuit Protected and Conserved Area for Arqviiliit (Ottawa Islands) Nunavik (Establishment)	24,000	Inukjuak Local Nunavimmi Umajulivijiit Katujiqatigininga (LNUK) and Northern Village (NV) of Inukjuak	Nunavut
21	Qikiqtait: The Belcher Islands Archipelago Protected and Conserved Area (Establishment)	323,800	The Arctic Eider Society	Nunavut
22	Conservation Measures on Inuit Owned Lands (Establishment)	690,941	Qikiqtani Inuit Association	Nunavut
23	Proposed Agguttinni Territorial Park (Establishment)	1,646,500	Government of Nunavut	Nunavut
24	Identification and Conservation of Traditional Lands as OECMs through Tlicho Government Land Use Plan Review Process (Establishment)	2,217,900	Tłı̨chų Government	Northwest Territories
25	Thaidene Nënë Indigenous and Territorial Protected Area Establishment	611,000	Government of the Northwest Territories	Northwest Territories
26	Thaidene Nënë Establishment	611,000	Lutsel K'e Dene First Nation	Northwest Territories
27	Ts'udé Niljné Tuyeta Indigenous and Territorial Protected Area Establishment	503,000	Yamoga Land Corporation	Northwest Territories
28	Dinàgà Wek'èhodi Indigenous and Territorial Protected Area Establishment	35,000	Tłı̨chų Government	Northwest Territories
29	Developing a Conservation Designation for the Eastern Yukon North Slope within the Indigenous Protected and Conserved Areas Program Framework (Establishment)	840,000	Wildlife Management Advisory Council	Yukon
30	Peel Watershed Land Use Plan (Establishment)	3,897,400	Government of Yukon	Yukon
	Total	32,714,968		
	Average	1,090,499		

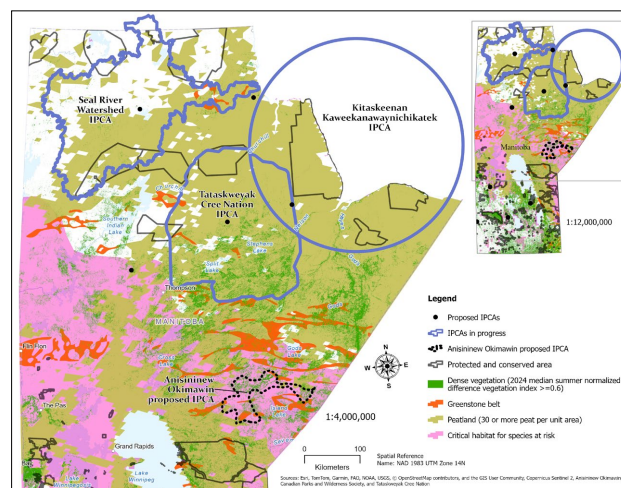
About two-thirds are establishment projects expected to deliver a PCA in the near future, presumably before 2030, to meet the 30 by 30 GBF target. One-third are preliminary work projects to build PCAs in the longer term (5 to 10 years). For example, in Manitoba, three of the nine PCAs are in the establishment phase,

and two of those are IPCAs in northern Manitoba, as shown in **Table 4** below.

**Table 4.** The three establishment projects, including two IPCA in Manitoba (adapted from *ECCC, 2021*).

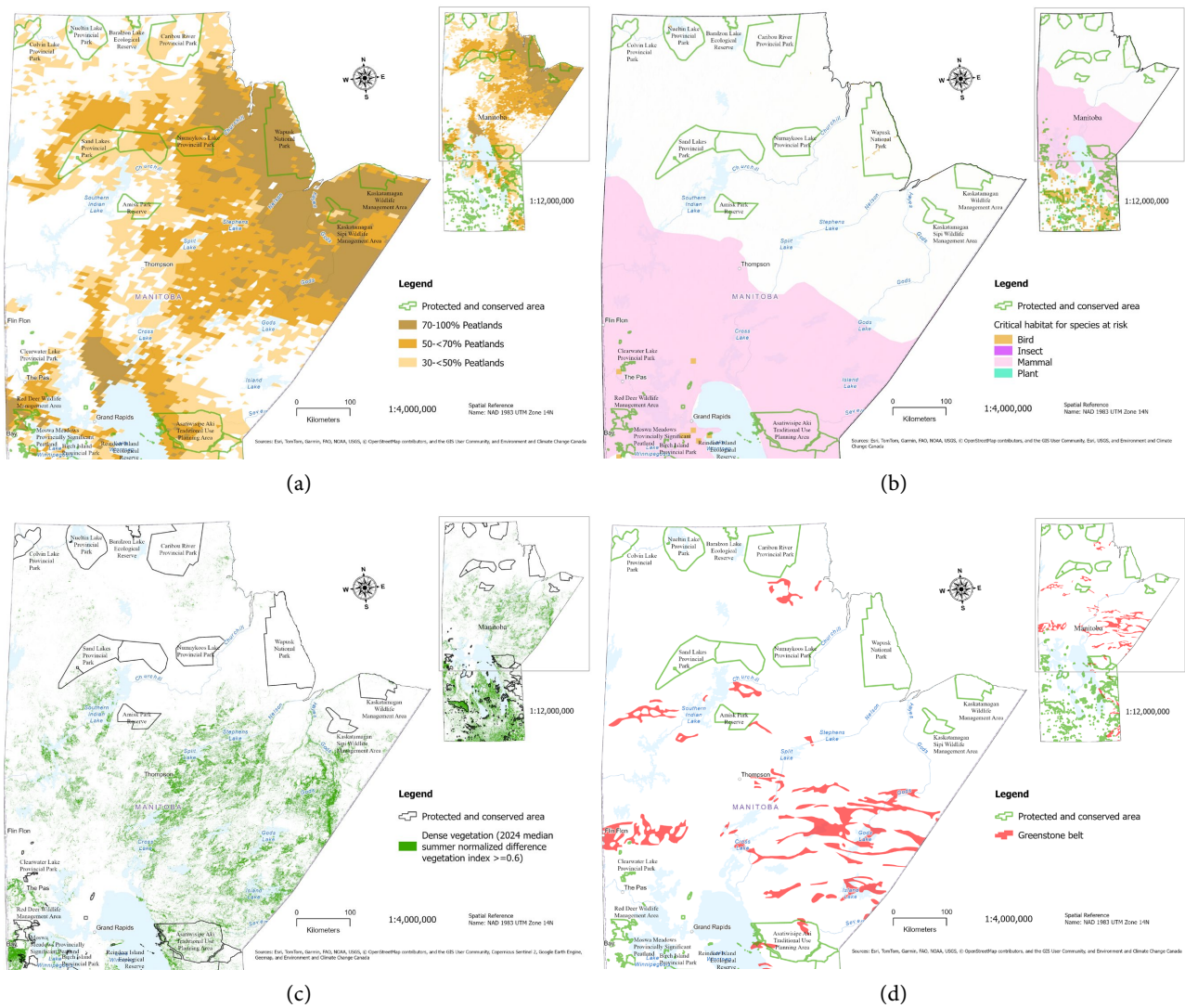
Title	Project description of the establishment project	Recipient
Manitoba Mixed-grass Prairie Securement Program	The Manitoba Habitat Heritage Corporation will protect up to 27,000 hectares of undeveloped mixed-grass prairie habitat adjacent to three community pastures and maintain the biodiversity of the mixed-grass prairie through managed grazing.	Manitoba Habitat Heritage Corporation (MHHC)
Seal River Watershed Indigenous Protected Area Initiative	The Sayisi Dene First Nation will work with local First Nations to develop permanent protection of the Seal River Watershed as an Indigenous Protected Area.	Sayisi Dene First Nation (IPCA)
Nitaskiinan: Planning to Protect our Hudson Bay Coastal Lands	The York Factory First Nation aims to establish a new Indigenous Protected Area. They will engage the Government of Manitoba, Fox Lake Cree Nation, Tataskweyak Cree Nation, War Lake First Nation, and Shamattawa First Nation in discussions about the protection and management of 4.66 million hectares bordering the Hudson Bay.	York Factory First Nation (IPCA)

**Figure 4** shows the area for these two proposed IPCAs—Seal River Watershed and Kitaskeenan, along with a third IPCA in the preliminary stage. These proposed IPCAs are planned for ecologically important peatlands in northern Manitoba's Hudson Bay lowlands. Northeastern Manitoba also holds critical peatlands, which are covered by the primary stage proposed by Tataskweyak Cree Nation. However, Anisnew Okimawin proposed an IPCA in the Island Lake region for the Canadian Government's Target 1 Challenge (*Onyeneke et al., 2024*) to protect ecologically and culturally important areas (**Figure 4**). This proposal was declined despite its strategic focus on protecting peatland and Woodland Caribou country, presumably because it covered greenstone belts, even though it avoided all mining claims.



**Figure 4.** The proposed protected and conserved area covers extensive peatland and some dense vegetation in northern Manitoba, Canada, but overlaps minimally with critical habitats for species at risk.

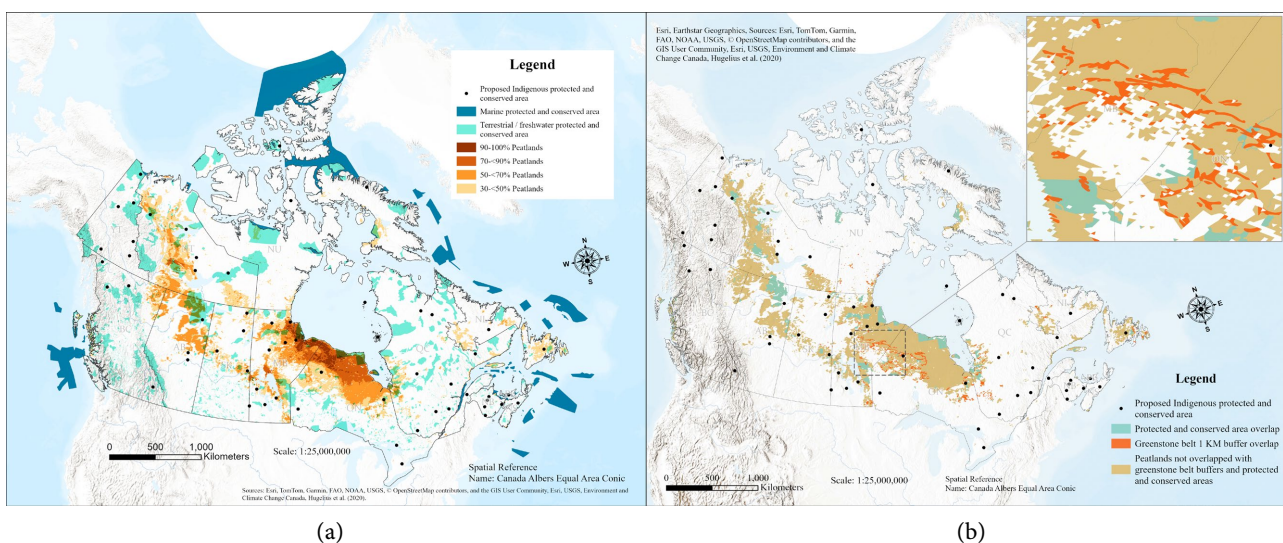
These proposed IPCAs seem to fill some of the major gaps of PCAs in Manitoba. While existing PCAs in Manitoba largely miss the opportunity to conserve biodiversity-rich ecosystems, IPCAs focus on these areas. Maps in **Figure 5** revealed that Manitoba has 51.9 million hectares of peatland (80% of the province), 25 million hectares of critical habitats for species at risk (39% of the province), and 2.5 million hectares of greenstone belts (3.85% of the province). Existing PCAs in Manitoba protect 7 million hectares (13.5%) of peatland, 2.5 million hectares (10%) of critical habitat, and 0.05 million hectares (2%) of greenstone belts. The vegetation health analysis revealed dense vegetation in northeastern Manitoba, including the Island Lake region and surrounding areas (high NDVI). This high NDVI indicates areas with largely intact tree cover, comparable to that in existing PCAs, such as Riding Mountain National Park in southwestern Manitoba.



**Figure 5.** Manitoba’s protected and conserved areas juxtaposed with (a) peatlands (top left); (b) the critical habitat areas of species at risk (top right); (c) intact tree cover/dense vegetation (bottom left); and (d) greenstone belts (bottom right).

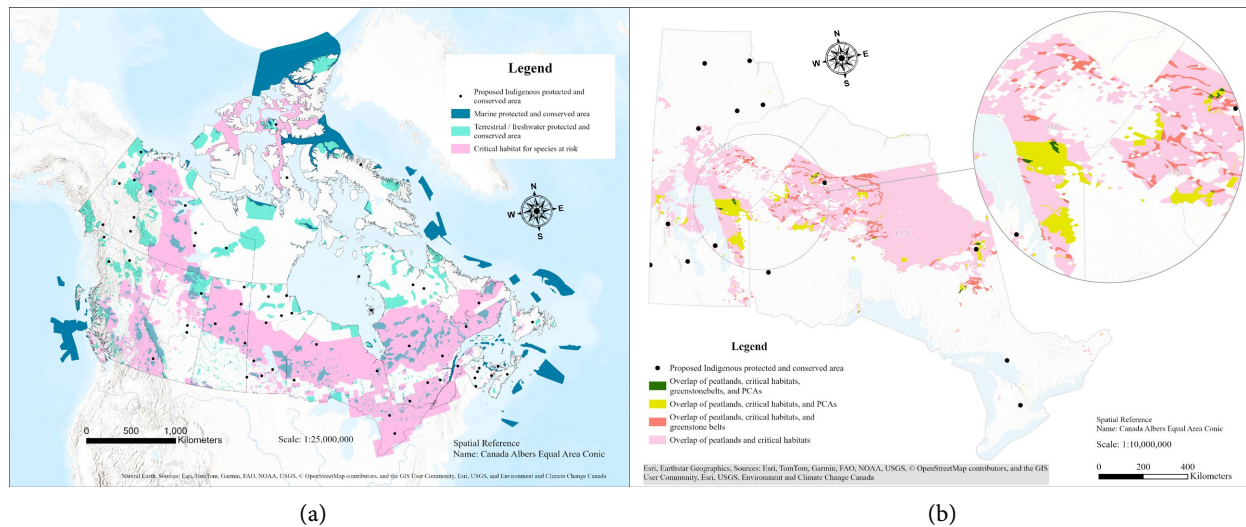
### 4.3. Canada's Peatlands

Canada has most of the world's high-density peat, which is mostly unprotected (**Figure 6(a)**). Peatlands analysis revealed Canada has 161 million hectares with  $\geq 50\%$  peat per unit land and 250 million hectares with  $\geq 30\%$  peat. However, only 13.5% peatlands (with  $\geq 30\%$  peat) are in PCAs. **Figure 6(b)** shows that peatlands ( $\geq 30\%$  peat) more often overlap with greenstone belts (10 million hectares) in northern Manitoba and Ontario, which are at a higher risk of development than PCAs. The high-density peat is mainly in Ontario, Manitoba, the north and boreal regions, and also the Northwest Territories and, to a lesser degree, Alberta's north. However, only a small fraction of 0.05% (100 hectares of Canada's 0.2 million hectares) of 90% - 100% peat is protected.



**Figure 6.** Concentrated peatlands juxtaposed with (a) protected and conserved areas; and (b) overlap with greenstone belts buffers, and protected and conserved areas.

Eighty-eight percent (88%) of the critical habitat for at-risk species in Canada is outside the current PCA network. The critical habitats dataset includes areas for terrestrial at-risk species, covering 522 million hectares. Existing PCAs protect 63.22 million hectares (12%) of critical habitats for at-risk species in Canada. Most of the habitat in the Northwest Territories and the northern areas of Alberta, Saskatchewan, Manitoba, Ontario, and Quebec supports Wildland Caribou (**Figure 7(a)**). In Manitoba and Ontario, peatlands and critical habitats overlap across 81 million hectares, which accounts for 47% of both provinces; however, only 2.6 million hectares (3.2%) are within PCAs. Additionally, 3.2 million hectares (4%) of peatlands and critical habitats intersect with greenstone belts in both provinces. Among the overlaps of greenstone belts, peatlands, and critical habitats in these provinces, existing PCAs safeguard 0.1 million hectares (4%) (**Figure 7(b)**). The proposed IPCAs are inadequate to protect the areas of peatland and critical habitat overlap in Manitoba and Ontario (see the pink areas in **Figure 7(b)**).



**Figure 7.** Protected and conserved areas: (a) in Canada, limited coverage of critical habitats; and (b) in Manitoba and north-eastern Ontario, limited coverage of peatlands, critical habitats at risk, and greenstone belts.

## 5. Discussion

Spatial analysis suggests that IPCAs in Canada offer a viable approach to protect and conserve 30% of critical habitats and high-density peatlands, while respecting Indigenous rights by 2030. This seemingly impossible goal of 30% by 2030 seems possible when Indigenous Peoples lead. Many Indigenous Nations' IPCA proposals show their priority is to protect their traditional territories, which are often massive, intact, biodiverse areas covered in peat (Wood, 2022a; Youth Advisory Council, 2025). For example, the three proposed IPCAs in northern Manitoba (Figure 4) are each close to 5 million hectares, each representing 1.6% of the 30% land target for Canada. An IPCA funding in the Northwest Territories covers 20 million hectares of land and water (Williams, 2024). With an average size of 5 million hectares, 33 IPCAs would provide 16.2% of the terrestrial land needed to fulfill the 30% target. If the mean size of the IPCA projects coincides with the mean size of the thirty proposed IPCA projects (see Table 3), which is 1 million hectares, Canada can achieve its 30 by 30 terrestrial conservation target through the implementation of 160 IPCA establishment projects. The current total of 62 target 1 challenge projects could fulfil 42% of the terrestrial target. At the current pace, 30 by 30 target is challenging; therefore, Canada needs a new approach that recognizes Indigenous leadership and supports Indigenous initiatives (Currie et al., 2025).

With a focus on land or the terrestrial target, the capacity of non-Indigenous led PCAs is limited. The 15,000 PCAs only reached 13.8% of Canada's land; however, if you subtract the IPCAs at 1.27%, only 12.5%. Further, the PCAs cannot effectively protect wildlife in most areas of Canada without large ecological corridors and without engaging Indigenous Peoples in governance. Engaging Indigenous Peoples is a requirement of PCAs in GBF, except in 96 cases that are Indigenous-governed or co-governed. These PCAs have not been effective in delisting

the Woodland Caribou to date. These PCAs also failed to protect peat, with only 13.7% of peatlands with  $\geq 50\%$  peat in Canada under PCA protection, accounting for 7% PCAs. To protect ecosystem services and the climate, more high-density peatlands need to be protected (WCS Canada, 2025). If Canada protects most of the peatlands with 50% or more peat under IPCAs, which accounts for 161 million hectares according to our spatial analysis, the 30 by 30 targets can be easily met.

### 5.1. Indigenous Governance of Protected and Conserved Areas

More ICPAs and Indigenous governance are needed for PCAs in Canada. Only 1% or 96 PCAs of the current almost 15,000 PCAs have any Indigenous governance. However, Indigenous governance of PCAs is a key aspect of the GBF, recognizing the value of Indigenous knowledge and governance.

Mapping PCA governance, we found the IPCAs in Canada are under modern treaties. Modern treaty lands show a pathway to IPCAs, but not the only path. The CPCAD has categorized PCAs on modern treaty land under self-government agreements as Indigenous owned (Tłı̨ch̓, Northwest Territories and the Government of Canada, 2003; Nordenskiöld Steering Committee, 2010; Tłı̨ch̓ Government, 2013; Vuntut Gwitchin First Nation, Canada and Yukon, 1993). Modern treaties result in Indigenous governed lands but are not a panacea for Indigenous self-determination in Canada because treaty negotiations can take a decade or more. The pros and cons need to be weighed carefully when facilitating IPCAs through the fast-tracking of modern treaties through UNDRIP implementation.

Indigenous co-governed PCAs are under the control of federal, provincial, or territorial governments, with Indigenous governments co-managing (ECCC, 2023). For provincial or federal Crown land, a Crown trustee controls the native land (Canada, 1969; Yellowhead Institute, 2021) unless agreements are made. These Indigenous-Crown agreements would have to consider that ICPA must be: 1) “Indigenous-led”, 2) establish a “long-term commitment to conservation”, and 3) “elevate Indigenous rights and responsibilities” (ICE, 2018: p. 5).

### 5.2. Ecological Services through Indigenous Protected and Conserved Areas

Protecting biodiversity, carbon sinks, and ecological services requires intact habitat. Protecting intact forests is important for ecological services. Boreal forests are home to diverse plants and animals, many of which are endangered. Boreal forest animals include caribou, bear, wolverine, lynx, wolves, fox, weasel, wood bison, moose, and more than three hundred species of birds (Anielski & Wilson, 2009). Boreal forest cycles are typically 70 to 100 years long, retaining large amounts of carbon, perhaps more than the world’s tropical and temperate forests combined (Anielski & Wilson, 2009).

The ecological services provided by the boreal forest far exceed its commercial value. For example, \$50.9 billion of market value of services was estimated in 2002 for annual boreal forest extraction (Anielski & Wilson, 2009). This study esti-

mated that much higher non-market values result from their ecological services, at \$703 billion, nearly 14 times greater. Carbon storage by forests and wetlands has the highest value of all ecosystem services at \$582 billion, followed by flood control and water filtering by peatlands at \$77 billion and other wetlands at \$33.7 billion (Anielski & Wilson, 2009). The value for cultural services and sustainable livelihoods for the many Indigenous Peoples living in Canada's boreal forest is priceless, as is the biodiversity.

Protecting Canada's peatland is crucial for enhancing carbon storage and preventing biodiversity loss (Hugelius et al., 2020a; Southee et al., 2020; WCS Canada, 2025). However, only one-tenth of peatlands are conserved under existing PCAs in Canada (Olmsted et al., 2021; WCS Canada, 2025), compared to 19% globally (UNEP, 2024). Peatlands in Ontario, Manitoba, Quebec, and Saskatchewan are vulnerable to the impacts of land-use changes due to development that is not prioritized for conservation (Hugelius et al., 2020a; Southee et al., 2020; WCS Canada, 2025). Peatland protection is a core component of GBF and climate change targets (Olmsted et al., 2021; WCS Canada, 2025).

### 5.3. Greenbelts are Avoided Mostly

With one-third of land, water, and sea becoming PCAs, the majority is not, at two-thirds of land, water, and sea. Thus, the PCAs should not be seen as creating a situation that will compromise the green economy and national security. At 30% of land and sea protected, many greenbelts are available for mining if acceptable to the Indigenous communities, with benefit agreements in place. The proposed IPCAs largely exclude Canada's critical mineral interests in greenstone belts. This approach largely avoids interfering with Canada's Critical Mineral Strategy by avoiding most peatlands (ECCC, 2022). We note that Anisiniwew Okimawin's Expression of Interest was rejected due to overlap between their proposed IPCA area and greenstone belts under provincial legislation. This seems to be a failure of the process, not clearly stating that greenstone belts, without any licenses or encumbrances, as well as exploration licenses, mining claims, and owned lands, need to be avoided for government funding (ECCC, 2022). Despite consultation and many meetings with ECCC, the idea that greenstone belts could not be included was never shared.

Mining is largely incompatible with PCAs and IPCAs. IPCA agreements require the removal of existing resource extraction claims, and key ecologically important areas could be protected from mining areas, even greenstone belts (Canada and Dehcho First Nations, 2018; Northwest Territories & Lutsel K'e Dene First Nation, 2019; Fort Good Hope Dene Band et al., 2019; Nordenskiöld Steering Committee, 2010).

Northwestern Ontario, Ontario's Ring of Fire, and Manitoba's Island Lake region are being targeted for mining (Onyeneke et al., 2024; Trethewey, 2024). These areas are home to many First Nations (Trethewey, 2024). The prioritization of mining may explain why Manitoba's Island Lake IPCA proposal was rejected, and

only two proposed IPCAs received funding in northwestern Ontario.

Land reconciliation through IPCAs continues to face resistance from settlers and governments due to Canada's prioritization of resource extraction. To colonial governments, mining is often the first and most significant use of lands, where mining law prevails over Indigenous land claims and IPCA proposals, as seen at Island Lake in Manitoba. Canadian federal, provincial, and territorial governments have a critical role in facilitating IPCAs' establishment as they hold jurisdiction over Indigenous territories and their resources, including biodiversity as Crown land (Gonzalez et al., 2025b). The jurisdictional overlap between the federal and provincial governments requires bottom-up solutions (Gonzalez et al., 2025b), where Indigenous governments can lead.

The limitation of this study is that it relies solely on spatial analysis and government databases. The methods do not assess the on-the-ground effectiveness of governance and ecological integrity of the PCAs. The application of Indigenous knowledge and Indigenous Peoples' perspectives on land protection and conservation, and on biodiversity monitoring, is needed for a complete understanding of IPCAs in Canada (Gonzalez et al., 2025a).

## 6. Conclusion

We analyzed the potential of IPCAs to meet the 30 by 30 GBF targets for Canada. To meet the GBF, governance changes are needed to consider Indigenous Peoples' key role in stewardship. The GBF advocates for local and Indigenous Peoples being part of all PCAs, yet only eight Indigenous-governed and 88 Indigenous co-governed PCAs out of 15,142 PCAs are in Canada's database. These existing IPCAs, though few, provide a diversity of models, with Indigenous governance grounded in modern treaties and Indigenous ownership. Co-governed IPCAs are also possible, but must be Indigenous-led, demonstrate a long-term conservation commitment, and elevate Indigenous rights (ICE, 2018). Given that Canada's existing PCAs are located on Indigenous lands and often adjacent to Indigenous communities, particularly in the North, the question arises as to why so few are under co-governance. To meet the GBF target, existing PCAs should undertake a shift to Indigenous co-governance.

Conserving biodiversity, including species at risk, requires protecting intact land with functional ecosystem services. An exploration of existing and proposed IPCAs indicates high ecological integrity, particularly in peatland systems and larger landscapes that can function as wildlife corridors. Peatlands and critical habitats are clearly prioritized in the proposed IPCAs, but more is needed. With an average size of 1 million hectares for the 30 proposed IPCA projects, Canada can reach its 30 by 30 terrestrial conservation target by implementing 160 IPCA establishment projects. Thus, Canada must either expand the size of these proposed IPCAs or fund more of them. Additionally, by collaborating with Indigenous governments to protect all mapped peatlands containing 50% or more peat, Canada will easily achieve its 30 by 30 GBF targets.

The IPCAs are an innovative pathway for Canada's reconciliation with Indigenous Peoples (Gibson et al., 2023; ICE, 2018; Mansuy et al., 2023; Moola & Roth, 2018; Tran et al., 2020; Wilson, et al., 2024). The IPCAs advance the 43<sup>rd</sup> TRCC call to action to implement UNDRIP in Canada. Reconciliation requires colonial governments to assist or at least stop creating barriers to Indigenous Peoples protecting their Native land (ICE, 2018: p. 37). The ICE (2018) recommends that Indigenous Nations govern IPCAs through fast-tracking modern treaties or other mechanisms, such as co-governance under Indigenous leadership. To align with the GBF, Indigenous rights for self-determination and self-government require aligning laws with UNDRIP, including the Indian Act and sections 91(24) of the Constitution Act 1867 (Bishop et al., 2024). As Indigenous Peoples hold inherent rights and responsibility to protect their Native lands in Canada, consideration of co-management of existing PCAs is important. To meet not only the GBF but also the goal of effective biodiversity conservation, Indigenous Peoples' knowledge and governance are key (Gonzalez et al., 2025a; Wilson et al., 2024).

The IPCAs promise to move conservation beyond the current ineffective, fragmented colonial approach. IPCAs provide leadership under Indigenous governance or co-management with Indigenous knowledge systems that have been highly effective at conservation. Indigenous leadership is critical for landscape-level conservation of critical habitats, intact forests, and peatlands to meet the 30 by 30 target. Spatial mapping from Manitoba and Ontario reflects the Canadian need for protecting critical habitats and peatlands. The existing IPCA establishment projects in northern Manitoba and Anisininew Nation's unsupported proposed IPCA in the Island Lake region reinforce that Indigenous Nations' leadership want to protect the critical habitats and peatlands through IPCAs. Enabling Indigenous governance of IPCAs can significantly advance biodiversity protection and area-based conservation, as well as Canada's land reconciliation with Indigenous Peoples.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- (1985). *The Indian Act, C I-5 RSC*. <https://laws-lois.justice.gc.ca/PDF/I-5.pdf>
- (2002). *Species at Risk Act, SC 2002, c 29. Schedule 1: Part 1—Extirpated species. Govern-*

- ment of Canada. <https://laws.justice.gc.ca/eng/acts/s-15.3/page-10.html>
- (2021). *Declaration on the Rights of Indigenous Peoples Act, SC 2021, c14*. <https://laws-lois.justice.gc.ca/eng/acts/u-2.2/page-1.html>
- Al-Quraishi, A. M. F., Gaznayee, H. A., & Crespi, M. (2021). Drought Trend Analysis in a Semi-Arid Area of Iraq Based on Normalized Difference Vegetation Index, Normalized Difference Water Index and Standardized Precipitation Index. *Journal of Arid Land*, 13, 413-430. <https://doi.org/10.1007/s40333-021-0062-9>
- Anielski, M., & Wilson, S. (2009). *Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems*. The Pembina Institute. <https://www.cbd.int/financial/values/canada-countcapital.pdf>
- Antonelli, A. (2023). Five Essentials for Area-Based Biodiversity Protection. *Nature Ecology & Evolution*, 7, 630-631. <https://doi.org/10.1038/s41559-023-02023-x>
- Auditor General of Canada. (2025). *Report 2: Critical Habitat for Species at Risk*. Office of the Auditor General of Canada. [https://www.oag-bvg.gc.ca/internet/docs/parl\\_cesd\\_202506\\_02\\_e.pdf](https://www.oag-bvg.gc.ca/internet/docs/parl_cesd_202506_02_e.pdf)
- Bishop, A., Roth, R., McGregor, D., Moola, F., & Nitah, S. (2024). Catalysing Transformative Change in Conservation: Lessons Learned from a Decolonial Conservation Partnership. *Conservation and Society*, 23, 24-36. [https://doi.org/10.4103/cs.cs\\_9\\_24](https://doi.org/10.4103/cs.cs_9_24)
- Bogossian, J. (2021). *Canadian Greenstone Belts*. Geology for Investors. <https://www.geologyforinvestors.com/canadian-greenstone-belts/>
- Canada (1969). *Statement of the Government of Canada on Indian Policy*. <https://nctr.ca/wp-content/uploads/2021/01/1969-The-White-Paper.pdf>
- Canada (2018). *Canada's Sixth National Report to the United Nations Convention on Biological Diversity*. <https://static1.squarespace.com/static/613fb778a76e244eef08775d/t/61c38ff0da86ab26aa8ecbdc/1640206324844/6th+National+Report+to+CBD+Final.pdf>
- Canada (2022). *The Canadian Critical Mineral Strategy*. Government of Canada. <https://www.canada.ca/content/dam/nrcan-rncan/site/critical-minerals/Critical-minerals-strategyDec09.pdf>
- Canada (2024). *The Constitution Acts 1867 to 1982*. [https://laws-lois.justice.gc.ca/PDF/Const\\_TRD.pdf](https://laws-lois.justice.gc.ca/PDF/Const_TRD.pdf)
- Canada and Dehcho First Nations. (2018). *Agreement Regarding the Establishment of Edézhzhie between Her Majesty the Queen in right of Canada, as Represented by the Minister of the Environment Who is Responsible for the Department of the Environment ("Canada") and Dehcho First Nations*. <https://dehcho.org/wp-content/uploads/2022/03/Edehzhie-Establishment-Agreement-5.pdf>
- CBD (2022). *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity: 15/4*. Kunming-Montreal Global Biodiversity Framework. <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>
- CBD Secretariat (2010a). *Global Biodiversity Outlook 3—Executive Summary*. <https://www.cbd.int/sites/default/files/2020-09/GBO3-Summary-final-en-min.pdf>
- CBD Secretariat (2010b). *Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets*. <https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf>
- Cox, S. (2023). *"It Is So Beautiful": Rare Inland Rainforest in B.C. Declared Indigenous Protected Area*. The Narwhal. <https://thenarwhal.ca/bc-raush-indigenous-protected-area/>

- Crown-Indigenous Relations and Northern Affairs Canada (2025). *Delivering on Truth and Reconciliation Commission Calls to Action*. Government of Canada. <https://www.rcaanc-cirnac.gc.ca/eng/1524494530110/1557511412801>
- Currie, J., Liang, C., & Snider, J. (2025). Protected Area Targets: Spatially Evaluating Progress and Prioritizing Areas to Reach 30 × 30 in Canada. *Conservation Science and Practice*, 7, e70087. <https://doi.org/10.1111/csp2.70087>
- Cyca, M. (2023). *The Future of Conservation in Canada Depends on Indigenous Protected Areas. So What Are They?*The Narwhal. <https://thenarwhal.ca/explainer-ipc-as-canada/>
- Department of Justice Canada (2025). *The UN Declaration Explained*. Government of Canada. <https://www.justice.gc.ca/eng/declaration/what-quoi.html>
- ECCC (2021). *Nature and Wildlife: Appearance Before the Standing Committee (March 10, 2021)*. <https://www.canada.ca/en/environment-climate-change/corporate/transparency/briefing-materials/appearance-before-standing-committee-march-10-2021/nature-wildlife.html#toc6>
- ECCC (2022). *Expression of Interest Guidance Document for Indigenous-led Area-Based Conservation (ILABC)*.
- ECCC (2023). Canadian Protected and Conserved Areas Database (CPCAD) 2023. <https://data-donnees.az.ec.gc.ca/data/species/protectrestore/canadian-protected-conserved-areas-database?lang=en>
- ECCC (2024a). *Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada*. [https://publications.gc.ca/collections/collection\\_2024/eccc/en4/En4-539-1-2024-eng.pdf](https://publications.gc.ca/collections/collection_2024/eccc/en4/En4-539-1-2024-eng.pdf)
- ECCC (2024b). *Status Report on Protected and Conserved Areas 2016-2020*. [https://publications.gc.ca/collections/collection\\_2025/eccc/cw66/CW66-1536-2024-eng.pdf](https://publications.gc.ca/collections/collection_2025/eccc/cw66/CW66-1536-2024-eng.pdf)
- ECCC (2025a). *Canadian Protected and Conserved Areas Database (CPCAD)*. <https://data-donnees.az.ec.gc.ca/data/species/protectrestore/canadian-protected-conserved-areas-database?lang=en>
- ECCC (2025b). *Critical Habitat for Species at Risk National Dataset—Canada*. <https://open.canada.ca/data/en/dataset/47caa405-be2b-4e9e-8f53-c478ade2ca74>
- Environment Canada (2012). *Recovery Strategy for the Woodland Caribou (Rangifer Tarandus Caribou), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series*. [https://www.registrelep-sararegistry.gc.ca/virtual\\_sara/files/plans/rs\\_caribou\\_boreal\\_caribou\\_0912\\_e1.pdf](https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf)
- Esri Canada (2024). *Provinces and Territories of Canada*. Esri. <https://www.arcgis.com/home/item.html?id=36502a64b0244a42baf047451f58e75d>
- Fernández-Llamazares, Á., Fa, J. E., Brockington, D., Brondízio, E. S., Cariño, J., Corbera, E. et al. (2024). No Basis for Claim That 80% of Biodiversity Is Found in Indigenous Territories. *Nature*, 633, 32-35. <https://doi.org/10.1038/d41586-024-02811-w>
- Fort Good Hope Dene Band and the Yamoga Lands Corporation and the Fort Good Hope Métis Nation Local #54 Land Corporation and the Ayoni Keh Land Corporation and the Behdzi Ahda' First Nation and Northwest Territories (2019). *Agreement to Establish Ts'udé Niljné Tuyeta as a Protected Area between the Fort Good Hope Dene Band and the Yamoga Lands Corporation and the Fort Good Hope Métis Nation Local #54 Land Corporation and the Ayoni Keh Land Corporation and the Behdzi Ahda' First Nation*

- and the Government of Northwest Territories as Represented by the Minister of Environment and Natural Resources (“Northwest Territories”).  
[https://www.gov.nt.ca/ecc/sites/ecc/files/resources/tuyeta\\_establishment\\_agreement.pdf](https://www.gov.nt.ca/ecc/sites/ecc/files/resources/tuyeta_establishment_agreement.pdf)
- Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J. et al. (2018). A Spatial Overview of the Global Importance of Indigenous Lands for Conservation. *Nature Sustainability*, 1, 369-374.  
<https://doi.org/10.1038/s41893-018-0100-6>
- Gibson, G., Ford, R., & The Firelight Group (2023). *Implementation of Indigenous Protected and Conserved Area Agreements in Canada*.  
<https://makeway.org/wp-content/uploads/2023/05/Firelight-Makeway-IPAs-April-28-2023.pdf>
- Gonzalez, A., August, T., Bailey, S., Bobiwash, K., Boersch-Supan, P., Burgess, N., Daru, B. H., Elphick, C., Freckleton, R., Frick, W. F., Hughes, A. C., Isaac, N. J. B., Jones, J. P. G., Lambertini, M., Mac Aodha, O., Madhavapeddy, A., Milner-Gulland, E. J., Purvis, A., Salafsky, N., Williams, D. et al. (2025a). *From Data to Decisions: Towards a Biodiversity Monitoring Standards Framework*. Ecoevorxiv. <https://doi.org/10.32942/X2SW7C>
- Gonzalez, A., O’Connor, M. I., Bates, A. E., Bobiwash, K., Burton, A. C., van Dam-Bates, P. et al. (2025b). A Biodiversity Observation Network to Support Conservation Action and Mainstream Knowledge in Canada. *FACETS*, 10, 1-19.  
<https://doi.org/10.1139/facets-2024-0206>
- Gurney, G. G., Adams, V. M., Álvarez-Romero, J. G., & Claudet, J. (2023). Area-Based Conservation: Taking Stock and Looking Ahead. *One Earth*, 6, 98-104.  
<https://doi.org/10.1016/j.oneear.2023.01.012>
- Hesselink, T. (2019). *Boreal Logging Scars: An Extensive and Persistent Logging Footprint in Typical Clearcuts of Northwestern Ontario, Canada*. Wildlands League.  
<https://loggingcars.wpengine.com/wp-content/uploads/MyUploads/Summary-for-Decision-Makers.pdf>
- Hill, S. L. (2020). *The Autoethnography of an Ininiw from God’s Lake, Manitoba, Canada: First Nation Water Governance Flows from Sacred Indigenous Relationships, Responsibilities and Rights to Aski*. Master’s Thesis, University of Manitoba.  
<https://mspace.lib.umanitoba.ca/handle/1993/35329>
- Hoesen, J., & Lemieux, C. J. (2025). The Role of “Bright Spots” in Elevating Conservation Success in Canada. *Biological Conservation*, 310, 111343.  
<https://doi.org/10.1016/j.biocon.2025.111343>
- Hugelius, G., Loisel, J., Chadburn, S., Jackson, R. B., Jones, M., MacDonald, G. et al. (2020a). Large Stocks of Peatland Carbon and Nitrogen Are Vulnerable to Permafrost Thaw. *Proceedings of the National Academy of Sciences of the United States of America*, 117, 20438-20446. <https://doi.org/10.1073/pnas.1916387117>
- Hugelius, G., Loisel, J., Chadburn, S., Jackson, R. B., Jones, M., MacDonald, G., Marushchak, M., Olefeldt, D., Packalen, M., Siewert, M. B., Treat, C., Turetsky, M., Voigt, C., & Yu, Z. (2020b). *Maps of Northern Peatland Extent, Depth, Carbon Storage and Nitrogen Storage*. Dryad.  
<https://datadryad.org/stash/dataset/doi:10.5061/dryad.7m0cfxprn#citations>
- Indigenous Circle of Experts (ICE) (2018). *We Rise Together: Achieving Pathway to Canada Target 1 through the Creation of Indigenous Protected and Conserved Areas in the Spirit and Practice of Reconciliation*.  
[https://publications.gc.ca/collections/collection\\_2018/pc/R62-548-2018-eng.pdf](https://publications.gc.ca/collections/collection_2018/pc/R62-548-2018-eng.pdf)
- IPBES (2019). *Summary for Policymakers of the Global Assessment Report on Biodiversity*

- and Ecosystem Services*. Zenodo. <https://zenodo.org/records/3553579>
- M'sit No'kmaq, Marshall, A., Beazley, K. F. et al. (2021). "Awakening the Sleeping Giant": Re-Indigenization Principles for Transforming Biodiversity Conservation in Canada and Beyond. *FACETS*, 6, 839-869. <https://doi.org/10.1139/facets-2020-0083>
- Manitoba Government (2011). *Provincial Planning Regulation 81/2011*. [https://web2.gov.mb.ca/laws/reg/current/\\_pdf-reg.php?reg=81/2011](https://web2.gov.mb.ca/laws/reg/current/_pdf-reg.php?reg=81/2011)
- Mansuy, N., Staley, D., Alook, S., Parlee, B., Thomson, A., Littlechild, D. B. et al. (2023). Indigenous Protected and Conserved Areas (IPCAs): Canada's New Path Forward for Biological and Cultural Conservation and Indigenous Well-being. *FACETS*, 8, 1-16. <https://doi.org/10.1139/facets-2022-0118>
- Maxwell, S. L., Cazalis, V., Dudley, N., Hoffmann, M., Rodrigues, A. S. L., Stolton, S. et al. (2020). Area-Based Conservation in the Twenty-First Century. *Nature*, 586, 217-227. <https://doi.org/10.1038/s41586-020-2773-z>
- Moola, F., & Roth, R. (2018). Moving Beyond Colonial Conservation Models: Indigenous Protected and Conserved Areas Offer Hope for Biodiversity and Advancing Reconciliation in the Canadian Boreal Forest. *Environmental Reviews*, 27, 200-201. <https://doi.org/10.1139/er-2018-0091>
- NASA Earthdata (2025). *Normalized Difference Vegetation Index (NDVI)*. <https://www.earthdata.nasa.gov/topics/land-surface/normalized-difference-vegetation-index-ndvi>
- Natural Resources Canada (2025). *Woodland Caribou—Boreal Population*. <https://natural-resources.canada.ca/forest-forestry/sustainable-forest-management/woodland-caribou-boreal-population>
- Neil, Ron, & The CPAWS Team (2024). *Launch of the Kitaskeenan*. Canadian Parks and Wilderness Society Manitoba Chapter (CPAWS). <https://cpawsemb.org/launch-of-the-kitaskeenan/>
- Nordenskiöld Steering Committee (2010). *Tsáwnjik Chu (Nordenskiöld) Habitat Protection Area Management Plan*. <https://yukon.ca/sites/default/files/env/env-tsawnjik-chu-hpa-management-plan.pdf>
- Northwest Territories & Lutsel K'e Dene First Nation (2019). *Agreement to Establish Thaidene Nene Indigenous Protected Area, Territorial Protected Area, and Wildlife Conservation Area between Lutsel K'e Dene First Nation and the Government of Northwest Territories, as represented by the Minister of Environment and Natural Resources ("Northwest Territories")*. [https://ipcaknowledgebasket.ca/wp-content/uploads/2023/05/gnwt\\_agreement.pdf](https://ipcaknowledgebasket.ca/wp-content/uploads/2023/05/gnwt_agreement.pdf)
- Olmsted, P., Sushant, Ray, J., & Harris, L. (2021). *Protecting Northern Peatlands: A Vital Cost-Effective Approach to Curbing Canada's Climate Impact [Policy Brief]*. <https://institute.smartprosperity.ca/sites/default/files/Northern%20peatlands%20policy%20brief.pdf>
- Onyeneke, C., Harper, B., & Thompson, S. (2024). Mining versus Indigenous Protected and Conserved Areas: Traditional Land Uses of the Anisininew in the Red Sucker Lake First Nation, Manitoba, Canada. *Land*, 13, Article 830. <https://doi.org/10.3390/land13060830>
- Paige.giddy\_Orix (2022). *Greenstone Belts of Canada*. Esri ArcGIS Online. <https://www.arcgis.com/home/item.html?id=e3037e20ac624785a8bdb7633634b8c1>
- Papuga, V. (2022). *Indigenous Protected and Conserved Areas Canada\_2022*. Wildlife Conservation Society of Canada, Environment and Climate Change Canada. <https://services.arcgis.com/x494PpLYsmeeZsYB/arcgis/rest/services/IPCAsTarget1/FeatureServer>

- Pettorelli, N. (2013). *The Normalized Difference Vegetation Index*. Oxford University Press. <https://doi.org/10.1093/acprof:osobl/9780199693160.001.0001>
- Protected Planet (2025). *Discover the World's Protected and Conserved Areas*. <https://www.protectedplanet.net/en>
- Rutgers, J. S. (2024a). *Devastated by Manitoba Hydro, Five Cree Nations are Working Together to Conserve Traditional Lands*. The Narwhal. <https://thenarwhal.ca/kitaskeenan-manitoba-hydro-conservation/>
- Rutgers, J. S. (2024b). *What an Effort to Preserve Cree Homelands in Northern Manitoba Means to the People Behind It*. The Narwhal. <https://thenarwhal.ca/manitoba-kitaskeenan-cree-voices/>
- Sakschewski, B., Caesar, L., Andersen, L., Bechthold, M., Bergfeld, L., Beusen, A. et al. (2025). *Planetary Health Check 2025: A Scientific Assessment of the State of the Planet* (p. 144). Potsdam Institute for Climate Impact Research (PIK). <https://doi.org/10.48485/pik.2025.017>
- Seal River Watershed Alliance (2023). *Seal River Watershed Indigenous Protected Area Initiative*. <https://static1.squarespace.com/static/623c9859859fd10054a1499e/t/63e5607d1d33f219efdab60/1675976829479/Seal-Brochure-8.0-Sept-2021-3-min.pdf>
- Sonter, L. J., Dade, M. C., Watson, J. E. M., & Valenta, R. K. (2020). Renewable Energy Production Will Exacerbate Mining Threats to Biodiversity. *Nature Communications*, 11, Article No. 4174. <https://doi.org/10.1038/s41467-020-17928-5>
- Southee, M., Richardson, K., Harris, L., & Ray, J. (2020). *Northern Peatlands in Canada (Storymap)*. WCS Canada. <https://storymaps.arcgis.com/stories/19d24f59487b46f6a011dba140eddb7>
- Tang, L., & Werner, T. T. (2023). Global Mining Footprint Mapped from High-Resolution Satellite Imagery. *Communications Earth & Environment*, 4, Article No. 134. <https://doi.org/10.1038/s43247-023-00805-6>
- Tauli-Corpuz, V., Alcorn, J., Molnar, A., Healy, C., & Barrow, E. (2020). Cornered by Pas: Adopting Rights-Based Approaches to Enable Cost-Effective Conservation and Climate Action. *World Development*, 130, Article ID: 104923. <https://doi.org/10.1016/j.worlddev.2020.104923>
- Thapa, K., Laforest, M., Banning, C., & Thompson, S. (2024). “Where the Moose Were”: Fort William First Nation’s Ancestral Land, Two-Eyed Seeing, and Industrial Impacts. *Land*, 13, Article 2029. <https://doi.org/10.3390/land13122029>
- Thompson, S., Harper, V., & Whiteway, N. (2020). *Keeping Our Land the Way the Creator Taught Us: Wasagamack First Nation*. Manitoba First Nations Education Resource Centre. <https://ecohealthcircle.com/book-lets-keep-our-land-sacred-as-the-creator-taught-us/>
- Thompson, S., Hill, S., Salles, A., Ahmed, T., Adegun, A., & Nwankwo, U. (2023). The Northern Corridor, Food Insecurity and the Resource Curse for Indigenous Communities in Canada. *The School of Public Policy Publications*, 16, 1-45. <https://doi.org/10.55016/ojs/sppp.v16i1.76032>
- Thompson, S., Thapa, K., & Whiteway, N. (2019). Sacred Harvest, Sacred Place: Mapping Harvesting Sites in Wasagamack First Nation. *Journal of Agriculture, Food Systems, and Community Development*, 9, 251-279. <https://doi.org/10.5304/jafscd.2019.09b.017>
- Tłı̄chǫ Government (2013). *Tłı̄chǫ Wenek’e Tłı̄chǫ Land Use Plan*. [https://www.tlicho.ca/sites/default/files/105-LandUsePlan\\_FINAL%20VERSION%5B2%5D.pdf](https://www.tlicho.ca/sites/default/files/105-LandUsePlan_FINAL%20VERSION%5B2%5D.pdf)

- Tłı̨chǫ, Northwest Territories and the Government of Canada (2003). *Land Claims and Self-Government Agreement among the Tłı̨chǫ and the Government of the Northwest Territories and the Government of Canada*.  
<https://www.tlicho.ca/sites/default/files/documents/government/T%C5%82%C4%B1%CC%A8cho%CC%A8%20Agreement%20-%20English.pdf>
- Tran, T. C., Neasloss, D., Bhattacharyya, J., & Ban, N. C. (2020). "Borders Don't Protect Areas, People Do": Insights from the Development of an Indigenous Protected and Conserved Area in Kitasoo/Xai'xais Nation Territory. *FACETS*, 5, 922-941.  
<https://doi.org/10.1139/facets-2020-0041>
- TRCC (2015a). *Honouring the Truth, Reconciling for the Future: Summary of the Final Report of the Truth and Reconciliation Commission of Canada*.  
[http://www.trc.ca/websites/trcinstitution/File/2015/Honouring\\_the\\_Truth\\_Reconciling\\_for\\_the\\_Future\\_July\\_23\\_2015.pdf](http://www.trc.ca/websites/trcinstitution/File/2015/Honouring_the_Truth_Reconciling_for_the_Future_July_23_2015.pdf)
- TRCC (2015b). *Truth and Reconciliation Commission: Calls to Action*.  
[https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/Calls\\_to\\_Action\\_English2.pdf](https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/Calls_to_Action_English2.pdf)
- Trethewey, L. (2024, September 30). *Inside the Fight for the Ring of Fire*. MACLEAN'S.  
<https://macleans.ca/society/environment/ring-of-fire-ontario/>
- UNEP (2024). *Global Peatland Hotspot Atlas: The State of the World's Peatlands in Maps. Visualizing Global Threats and Opportunities for Peatland Conservation, Restoration, and Sustainable Management*.  
<https://doi.org/https://doi.org/10.59117/20.500.11822/46635>
- UNEP-WCMC & IUCN (2024). *Protected Planet Report 2024*.  
<https://pp-digital-report-document.s3.eu-west-2.amazonaws.com/Protected+Planet+Report+2024.pdf>
- UNESCO, Church of England Pensions Board, Greenbank, International Union for Conservation of Nature, & World Wide Fund for Nature (2025). *Extractive Activities in UNESCO World Heritage Sites: Commitments, Risks and Investments Implications*.  
<https://unesdoc.unesco.org/ark:/48223/pf0000394614>
- United Nations (2008). *United Nations Declaration on the Rights of Indigenous Peoples*.  
[http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf)
- United Nations (2025). *The Sustainable Development Goals Report 2025*.  
<https://unstats.un.org/sdgs/report/2025/The-Sustainable-Development-Goals-Report-2025.pdf>
- Vuntut Gwitchin First Nation, Canada and Yukon (1993). *Vuntut Gwitchin First Nation Self-Government Agreement among the Vuntut Gwitchin First Nation and the Government of Canada and the Government of the Yukon*.  
[https://cdn.prod.website-files.com/645272a01ca49d5d7b6f96c1/662bf0089fb6f511c61f5f9b\\_VGFN%20Self-Government%20Agreement%201993.pdf](https://cdn.prod.website-files.com/645272a01ca49d5d7b6f96c1/662bf0089fb6f511c61f5f9b_VGFN%20Self-Government%20Agreement%201993.pdf)
- Wall, J., Moola, F., Lukawiecki, J., & Roth, R. (2025). Indigenous-led Conservation Improves Outcomes in Protected Areas. *Nature Reviews Biodiversity*, 1, 411-412.  
<https://doi.org/10.1038/s44358-025-00054-9>
- Watson, J. E. M., Venter, O., Lee, J., Jones, K. R., Robinson, J. G., Possingham, H. P. et al. (2018). Protect the Last of the Wild. *Nature*, 563, 27-30.  
<https://doi.org/10.1038/d41586-018-07183-6>
- WCS Canada. (2025). *The National Peatland Strategy: A Proposed Strategy for the Protection, Restoration, and Long-Term Stewardship of Peatlands in Canada*.  
[https://wcscanada.org/site/assets/files/6071/wcs\\_canada\\_national\\_peatland\\_strategy.pdf](https://wcscanada.org/site/assets/files/6071/wcs_canada_national_peatland_strategy.pdf)

- Williams, C. (2024). *\$375M Indigenous-Led Conservation Deal Just Signed in the Northwest Territories*. The Narwhal. <https://thenarwhal.ca/nwt-pfp-agreement-signed-behchoko/>
- Wilson, S., Smith, P., Kenchington, E., Ballard, M., Buxton, R., Bobiwash, K. et al. (2024). *Science and Knowledge Needs to Support Canada's Implementation of the Kunming-Montreal Global Biodiversity Framework*. Environment and Climate Change Canada. <https://open-science.canada.ca/bitstreams/2592a13e-c7ff-4f2a-911e-d66f6b7661ea/download>
- Wood, S. K. (2022a). *The Mamalilikulla's Long Journey Home*. The Narwhal. <https://thenarwhal.ca/ipca-mamalilikulla/>
- Wood, S. K. (2022b). *The Promise and Peril of Canada's Approach to Indigenous Protected Areas*. The Narwhal. <https://thenarwhal.ca/indigenous-protected-areas-ipca-hurdles/>
- Wu, Q. (2020). Geemap: A Python Package for Interactive Mapping with Google Earth Engine. *Journal of Open Source Software*, 5, Article 2305. <https://doi.org/10.21105/joss.02305>
- WWF (2024). *Living Planet Report 2024—A System in Peril*. <https://www.worldwildlife.org/publications/2024-living-planet-report>
- Yellowhead Institute (2021). *Cash Back: A Yellowhead Institute Red Paper*. <https://cashback.yellowheadinstitute.org/wp-content/uploads/2021/05/Cash-Back-A-Yellowhead-Institute-Red-Paper.pdf>
- York Factory First Nation (2012). *Kipekiskwaywinan (Our Voices)*. York Factory First Nation. <https://drive.google.com/file/d/1dBs55CKTJKQ89P6wwcBUHh5ZS4bPoSk2/view>
- Youth Advisory Council (2025). *Kitaskeenan kaweekanawaynichikatek—Our Land We Want to Protect*. Jane Goodall Institute Canada. <https://janegoodall.ca/our-stories/kitaskeenan-kaweekanawaynichikatek-our-land-we-want-to-protect/>
- Zurba, M., Beazley, K., English, E., & Buchmann-Duck, J. (2019). Indigenous Protected and Conserved Areas (IPCAs), Aichi Target 11 and Canada's Pathway to Target 1: Focusing Conservation on Reconciliation. *Land*, 8, Article 10. <https://doi.org/10.3390/land8010010>