

# Transforming conservation in Canada: shifting policies and paradigms

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## Introduction

Globally, precipitous declines in biospheric integrity are at or beyond planetary limits, threatening life on earth (Steffen et al. 2015; World Wildlife Fund (WWF) 2020). Immediate and transformative actions are needed to stem the declines (IPBES 2019; Open-Ended Working Group on the Post-2020 Global Biodiversity Framework 2021). Biodiversity collapse and climate change are twin crises, representing emergencies for humanity (Newbold 2018; Stralberg et al. 2020). These entwine with humanitarian crises in which impacts are disproportionately experienced across peoples and cultures (Patterson et al. 2017; Kennedy et al. 2019; Moulton and Machado 2019). The reasons for precipitous declines in biodiversity globally and in Canada are known (Woo-Durand et al. 2020; Kraus and Hebb 2020). Many ways of addressing these problems have been proposed by natural and social scientists as well as conservation advocates (Maxwell et al. 2020; Lemieux et al. 2021b). However, policies and practices at local, provincial, national, and international levels have failed to address these issues and reverse the decline for virtually all species and ecosystems (Geldmann et al. 2019; WWF-Canada 2020; UN 2021). While the science is clear, the politics is not. This special Collection—Conservation in Canada: Identifying and Overcoming Barriers—examines the political barriers to conservation as well as possible pathways forward.

The papers in the Collection address one or more of four broad themes:

1. Federalism: federal and provincial legislation dealing with biodiversity, conservation, wildlife, and species at risk in Canada, domestically and in relation to international agreements and commitments;
2. Institutional factors: political, legal, social, and institutional gaps and barriers to effective conservation;
3. Re-Indigenizing conservation: Indigenous governance, knowledge systems, rights, responsibilities, and Natural law in relation to upholding Treaties, reconciliation, and conservation (e.g., Indigenous Protected and Conserved Areas, Indigenous Guardian Programs, biocultural keystone species and stewardship); and
4. Holistic approaches: bridging ethics, science, and policy to create, incentivize, and mobilize better conservation practices in Canada.

As detailed in the following sections, the contributions encompass an interdisciplinary variety of issues. They document frustrations with bureaucracy; failure to create, implement, and enforce laws;

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an over-emphasis on ecosystem services for human provisioning at the expense of biodiversity; exclusion of Indigenous rights, voices, governance, and knowledge systems; inadequate mechanisms for species at risk; wildlife crime; and invasive species. Together, they represent a rich diversity of shared knowledge, stories, and experiences with the barriers to conservation. Crucially, they also represent hope for the future, by elucidating opportunities to overcome these barriers. Strategies range from shifts in governance and management for more effective conservation policy and practice, to educational and branding reforms and initiatives for enhanced public awareness and support for species at risk, and to transformations in worldview to break down colonial systems through re-Indigenization for all ecologies—nature and culture.

## Federalism

Federal, provincial, and territorial legislation dealing with biodiversity, conservation, wildlife, and species at risk in Canada, are important domestically as well as in relation to international agreements and commitments. Challenges arise, however, in the fragmented nature of legislation across federal mandates and provincial and territorial jurisdictions. Despite Canada's ecological and economic wealth and high governance capacity, negative trends in biodiversity persist (Woo-Durand et al. 2020; World Wildlife Fund Canada 2020). Ray et al. (2021) confront these issues in their paper, *The biodiversity crisis in Canada: failures and challenges of federal and sub-national strategic and legal frameworks*. They examine the implementation of Canada's National Biodiversity Strategy through the lens of its existing legal framework. In doing so, they find that, "while most jurisdictions claim dedicated attention to biodiversity, there is little evidence of an integrated approach within provinces and territories and across the federation" (Ray et al. 2021, p. 1044). They explain that mainstreaming considerations of species and ecosystems is necessary yet challenging within Canada because of its "unusual degree of decentralized constitutionally ascribed authority over natural assets" (p. 1056) and its "historical and continued economic emphasis on extraction of natural resources" (p. 1044), which is a conflict of interest for jurisdictions. Accordingly, Ray et al. (2021) call for a transition to "scale-appropriate planning and integrated decision-making" (p. 1058), which will require transformative change, not only to laws but to a "whole-of-government approach" (p. 1061), a "bio-centric mindset" (p. 1044), and innovative governance with Indigenous-led conservation, federal leadership, and financial investments.

Jurisdictional implementation of new laws and amendments to existing ones can introduce uncertainty and negative consequences for biodiversity, whether intended or not (Simmons et al. 2018; Lewison et al. 2019). Bethlenfalvy and Olive (2021) provide a striking example from Ontario in their paper on *Recent amendments to the Endangered Species Act and an uncertain future for species at risk: a case study of Ontario's Niagara Region*. The provincial government amended the *Endangered Species Act* (2007) through the *More Homes, More Choice Act* (2019), with implications for species at risk. As Bethlenfalvy and Olive (2021) show for their case study region, alone, as many as 37 species "could be delisted and stripped of protection under the recent changes" (p. 1168). Their findings also point to concern around the prioritization of the economics over science in the amendments, which is reflective of widespread concerns over the declining role of science in listing decisions and conservation planning and management in general, as noted within other contributions to this Collection (e.g., Lemieux et al. 2021a; Montgomery et al. 2021). Montgomery et al. (2021) directly address this issue in *The role of science advice in recovery potential assessments in freshwater fish listing decisions under the Canadian Species at Risk Act* (SARA). They find that fish species, when compared with those of other taxa, are "disproportionately less likely to be listed under SARA" (p. 1248) despite being assessed as Threatened or Endangered by the Committee on the Status of Endangered Wildlife in Canada. Through their analyses, Montgomery et al. (2021) show that the amount and type of science advice in a Recovery Potential Assessment does "not appear to be driving listing status for freshwater

fishes in Canada,” and “factors beyond scientific advice likely contribute to nonlisted species and delays in listing decisions” (p. 1247).

Increasingly recognized as crucial to an integrated governance approach and policy coherence within and across agencies is the role of environmental assessments in stemming biodiversity declines (Gannon 2021). Unfortunately, environmental impact assessments (EIA) do not adequately consider implications for biodiversity in general, wildlife, or even species at risk, especially at spatial scales and configurations relevant to species persistence (Hodgson and Halpern 2019; Gannon 2021). Despite the influence of EIA outcomes on “millions of hectares of land” in Canada, rarely do they account for the spatial impacts on habitat area and connectivity, particularly cumulatively (Raudsepp-Hearne and Peterson 2016; Venier et al. 2020). In their paper, *Perspectives from landscape ecology can improve environmental impact assessment*, Harker et al. (2021) demonstrate how core scientific principles, if integrated into the process, could impact EIA outcomes. They show that “changing the spatial extent of EIA boundaries can misrepresent cumulative impacts” and how even a “small, localized development project can disrupt regional habitat connectivity” (p. 358). They point out that approaches to address these barriers are “straightforward to implement” and “provide sensible opportunities to improve EIA” (p. 358) in Canada and elsewhere, representing a potentially substantial contribution to conservation, if broadly operationalized in policy and practice.

## Institutional factors

As acknowledged in many contributions to this Collection and others, laws and policies do not exist in isolation. There are significant social, political, and institutional factors that influence or dictate which laws and policies are conceived and established and how they are implemented and applied (Pepermans and Maesele 2016; Druckman 2017). At a high level, for example, party politics can influence environmental policies, politicizing which are implemented and which are not (Carter 2006; Dufresne and Ouellet 2019). In their paper, *The politicization of protected areas establishment in Canada*, Botchwey and Cunningham (2021) address the question of whether biodiversity conservation and protected areas are politicized. Their findings show that the rate of protected areas establishment is becoming increasingly tied to electoral politics, and that the administrations of both the Harper Conservatives and the Trudeau Liberals “instrumentalized the environment and protected areas for their own electoral benefits” (p. 1126). Botchwey and Cunningham (2021) explain that politicization can represent a barrier to conservation, such as through “greenwashing”, “poor accountability”, and fostering an “anti-conservation constituency” (p. 1161). However, they also stress that “politicization can raise the profile of conservation in public discourse, leading to greater public interest and engagement” (p. 1126).

The politicization of conservation may be an example of conservation strategies becoming more integrated into capitalism, sharing its assumptions and structures, and becoming more anthropocentric and instrumentalized (Fletcher 2014; Rogers 2021). Rogers (2021) suggests that this increasing integration into capitalization is the reason that conservation strategies are failing: “conservation is becoming a strategic specialty within capitalism, rather than an ethical challenge to its basic assumptions” (p. 195). Rogers explores this contention in *The tragedy of conservation*, drawing on Hardin’s (1968) “tragedy of the commons” and Polanyi’s (1968) distinctions between formal and substantive economics. Rogers shows how, in the case of Canada’s East Coast fishery, this strategic integration of conservation into capitalism was made by policy makers, thereby limiting the analytical capability to highlight the causes of environmental degradation. They failed to recognize the substantive importance of social relations and local institutional arrangements. Rogers’ (2021) paper highlights the crucial nature of “the social” in conservation debates and provides a “cautionary tale” for conservation strategies that “downplay the importance of ethical and social issues” (p. 195). Rogers

provides a compelling example of how conservation strategies may be shifting in ways that threaten to incorporate conservation into dominant neoliberal structures rather than confronting them.

Political, social, and institutional factors also impede or erode conservation efforts through processes such as polarization and misinformation (Bail et al. 2018; Lazer et al. 2018). Social and human dimensions are crucial to conservation, yet barriers to cooperation and effective evidence can arise (Horton et al. 2016; Hagmann et al. 2019), leading to “misplaced conservation.” In *Understanding and avoiding misplaced efforts in conservation*, Ford et al. (2021) provide examples where insufficient appreciation for cooperation and evidence have impeded efforts to conserve biodiversity. They stress that “averting misplaced conservation requires greater adherence to processes that elevate the role of evidence in decision-making and that place collective, long-term benefits for biodiversity over the short-term gains of individuals or groups” (p. 252). As shown by Ford et al. (2021) and other contributors to the Collection (e.g., Ayambire et al. 2021; Kraus et al. 2021; Tran et al. 2020b), the efficacy and success of conservation practices that benefit biodiversity and humanity will be increased through holistic approaches that enhance integration of evidence, cooperation, and human dimensions.

Throughout the various elucidations of impediments to conservation through politicization, capitalization, polarization, and misinformation, lies a common thread related to evidence, or the lack of it. Failures to consider or apply the most relevant, sufficient, and effective evidence in ways that support conservation emerge within each. Accordingly, the question arises of the nature of and extent to which evidence is used by conservation decision-makers. Lemieux et al. (2021a) address this question in “Free Fallin’? The decline in evidence-based decision-making by Canada’s protected areas managers. By comparing results from national surveys of practitioners in 2019 and 2013, they reveal “a significant and concerning decline in the use of all forms of evidence” (p. 640), including peer-reviewed literature, local knowledge, and Indigenous knowledge. Key barriers to the effective use of evidence were limited training, a lack of trust, and how to deal with uncertainty. Lemieux et al. (2021a) observe that “these challenges persist at a time when the quantity of information is greater than ever, and recognition of the value of Indigenous knowledge is relatively high (and increasing)” (p. 640). Although measures may be taken to address the more proximate barriers such as trust and training, when considering the broader systemic and high-level impediments associated with politicization, capitalism, and polarization it may be the case that more transformative changes to governance, economic, and social systems are also needed.

## Re-Indigenizing conservation

Indigenous resurgence is crucial to conservation and reconciliation in Canada and elsewhere, in line with the United Nations (UN) Declaration on the Rights of Indigenous Peoples (UN 2007) and other international and commitments specific to biodiversity conservation. The UN Convention on Biological Diversity and its associated strategic plans include targets specific to Indigenous Rights (UN-CBD 2010). The Indigenous Circle of Experts, as part of the Pathway to Canada Target 1, identified paths forward, including for Indigenous-led Protected and Conserved Areas and Indigenous Guardians Programs as part of an ongoing process of healing and reconciliation (ICE 2018). Each of these important initiatives uphold Indigenous Rights, importantly their rights to governance of their traditional lands and territories and to respect for their own knowledge systems. The next few years and beyond are crucial for transforming colonial Western systems, including conservation, to embrace Indigenous autonomy, governance, and knowledge systems in ways that respect and honour Indigenous Rights and reflect their Natural Laws, ways of thinking, and relationships of reciprocity with the land (Artelle et al. 2019; Zurba et al. 2019; Loring and Moola 2020). While many contributions to this Collection address Indigenous aspects in relation to conservation, five confront them directly as their primary focus.

Important to conservation and “reconciliation” is the recognition that biodiversity conservation and resurgence of Indigenous autonomies are mutually compatible aims (Artelle et al. 2019; Tran et al. 2020a). To work towards these aims requires significant transformation in conservation and re-Indigenization (ICE 2018; Loring and Moola 2020). Colonial systems, including conservation, have dispossessed Indigenous Peoples of their rights, territories, and livelihoods and at the same time decimated species and ecosystems (Moola and Roth 2019; Pictou 2019). In contrast, Indigenous Peoples have stewarded the land in ways that support people and nature in respectful relationship; as a result, Indigenous-governed lands, in Canada and globally, retain a large proportion of biodiversity-rich landscapes (Garnett et al. 2018; Schuster et al. 2019). In “Awakening the sleeping giant”: re-Indigenization principles for transforming biodiversity conservation in Canada and beyond, the *M’sit No’kmaq* et al. (2021) (all my relations) authorship team introduces principles for re-Indigenizing conservation. These are primarily oriented around transforming worldviews and include embracing Indigenous ecologies, languages of the land, Natural laws, correct relationships, reflection and truth, insights from diverse ways of knowing, stories and ceremony. As *M’sit No’kmaq* et al. (2021) stress, “achieving the massive effort required for biodiversity conservation in Canada will entail transformations in worldviews and ways of thinking and bold, proactive actions, not solely as means but as ongoing imperatives” (p. 839).

In line with challenging worldviews and ways of knowing, the *M’sit No’kmaq* et al. (2021) authorship team chose to honour the collective, by naming the Mi’kmaq concept of *M’sit No’kmaq* (roughly translated to “all my relations”) as the lead author. This is consistent with Indigenous teachings that all knowledge comes from the land. In an editorial titled *Community-based Indigenous knowledge* (Germida et al. 2021), which accompanies the Collection, FACETS and Canadian Science Publishing (the publisher of FACETS) provide their rationale for supporting this request. Germida et al. (2021) accept the authorship team’s rationale and acknowledge “the rights of First Nations to own, control, access, and possess their data and information” (p. 837) consistent with the principles of OCAP<sup>1</sup> (Ownership, Control, Access, and Possession; FNIGC 2014). Accordingly, they express pride in supporting the principles and honouring Indigenous knowledge by publishing the article under the authors’ preferred authorship. In this way, the norms of publication have also been challenged and decolonized.

Transforming principles, ways of knowing, and norms of practice for biodiversity conservation and resurgence of Indigenous autonomies entails “reconciling” existing systems and structures (ICE 2018; Zurba et al. 2019). Indigenizing conservation education, management, and planning models, processes, and programs is crucial (Truth and Reconciliation Commission of Canada 2015; Conservation through Reconciliation Partnership 2019). The important role of education and academia in preparing aspiring conservation practitioners to engage with Indigenous Peoples in ways that affirm Indigenous knowledge and aspirations is highlighted by Littlechild et al. (2021) in their paper, “Reconciliation” in undergraduate education in Canada: the application of Indigenous knowledge in conservation. They describe an approach to teaching that is grounded in “transformational” change (rather than “add Indigenous and stir”), how to “ethically engage” with Indigenous Peoples (more so than “knowledge of discreet facts”), and efforts to “Indigenize” the academy that emphasize “anti-racism, humility, reciprocity, and a willingness to confront ongoing colonialism and white supremacy” (p. 665). At a high level, their approach focuses on “the broad change that must occur within universities to adequately prepare students to build and maintain reconciliatory relationships with Indigenous Peoples” (Littlechild et al. 2021, p. 665). As such, their message also applies beyond universities, to all forms and levels of education.

<sup>1</sup>OCAP<sup>®</sup> is a registered trademark of the First Nations Information Governance Centre (FNIGC 2014). Learn more about OCAP<sup>®</sup> and FNIGC at [fnigc.ca/ocap-training/](https://fnigc.ca/ocap-training/).



Similar efforts are needed to reconcile or Indigenize conservation planning and management practice. [Hessami et al. \(2021\)](#) address crucial changes to the prevailing model of wildlife management for state, provincial, and federal agencies in Canada and the United States. In their paper, *Indigenizing the North American Model of Wildlife Conservation*, they point out that while the model's tenets are permeated with "colonial rhetoric," its underlying conservation values "share common ground with various Indigenous worldviews" and "Indigenous-led conservation efforts" (e.g., safeguarding wildlife for future generations, utilizing best available knowledge, prioritizing collaboration between nations, and democratizing the process) (p. 1285). They impart a refined "Indigenizing North American Model of Wildlife Conservation (I-NAM)" that "interweaves various Indigenous worldviews and conservation practice from across Canada" (p. 1285). While suggesting that working together to identify shared visions and address necessary amendments to I-NAM will advance reconciliation in the interest of nature and society, [Hessami et al. \(2021\)](#) also stress that such refinements to existing models should "coexist with" but not "replace" Indigenous-led conservation.

In a similar weaving together of Western and Indigenous-led concepts, [Clark et al. \(2021\)](#) examine the relationship between "ecological 'flagship species' in conservation efforts" and "important cultural keystone species," including those that are not hunted (p. 379). In their paper, *Grizzly and polar bears as nonconsumptive cultural keystone species*, they expand the established criteria for defining cultural keystone species to give broader recognition of the beyond-ecological and beyond-consumptive importance of these species to Indigenous Peoples, highlighting their disproportionate importance to well-being and identity. Crucially, recognizing the societal and ecological importance of such species to Indigenous Peoples "highlights the importance of Indigenous sovereignty and could facilitate the increased cross-cultural understanding critical to reconciliation" ([Clark et al. 2021, p. 379](#)).

An important way of respecting and advancing Indigenous sovereignty in relationship with wildlife and the land is through Indigenous Protected and Conserved Areas (IPCAs) ([ICE 2018](#)). While IPCAs have gained attention in Canada and globally for conserving biodiversity during a time of Indigenous resurgence, the rationale and processes for developing IPCAs from Indigenous Peoples' perspectives has received less attention ([Artelle et al. 2019](#); [Zurba et al. 2019](#)). [Tran et al. \(2020b\)](#) address this gap by summarizing the Kitasoo/Xai'xais Nation's perspectives while assisting their efforts to develop a land-and-sea IPCA. In their paper, *"Borders don't protect areas, people do": insights from the development of an Indigenous Protected and Conserved Area in Kitasoo/Xai'xais Nation Territory*, they show that IPCAs are a useful tool for the Nation. IPCAs can be used to address limitations of state protected areas, reflect the Nation's Indigenous rights and responsibilities, and "preserve cultural heritage and biological diversity while fostering sustainable economic opportunities" ([Tran et al. 2020b, p. 922](#)). The Kitasoo/Xai'xais process is based on long-term territory planning, intergenerational engagement, and stewardship capacity building. Yet, it faces similar challenges as other protected areas and with ongoing impacts of settler-colonialism. To address these challenges, [Tran et al. \(2020b\)](#) describe how Indigenous and western approaches are woven together through partnerships based in responsibility. Nonetheless, they stress that further efforts by others, including the state, are crucial to reducing management burdens and creating meaningful supports for Indigenous Nations in Indigenous-led conservation. Such efforts are necessary to respecting and advancing Indigenous Rights, providing a bridge across systemic transformations for Indigenous autonomy and biodiversity conservation.

## Holistic approaches

Bridging current and new approaches for better conservation practices in Canada is urgently needed as part of the transformative process. Crucial are ways to link ethics, science, and policy through more holistic approaches than are typically found in current Western governance, knowledge, and management systems. Within this special Collection, various ways of bridging diverse values, ways of

knowing, and management practices are presented as illustrations of how to create, incentivise, and mobilize better species conservation and land stewardship practices.

Key to creating better conservation practice is an enhanced understanding of diverse and complex values and potential conflicts surrounding the production of conservation strategies deemed acceptable by local communities (Ruiz-Frau et al. 2011; Needham et al. 2020). Meaningful engagement is often used as a management tool to advance such understanding, but how the generated knowledge might be used to better inform conservation practice is less well understood, especially in specific contexts (Grygoruk and Rannow 2017). In their paper on *Mobilizing values: using perceptions of barachois ponds in Nova Scotia to advance informed management*, Ross and Fanning (2021) assess social perceptions of stakeholders and managers and identify key perspectives and thematic issues. They find that “an increased awareness of the ecological, social, and cultural values attributed to barachois ponds by key stakeholders could play a critical role in better informing wetland management decision-making” (p. 215).

Conservation approaches grounded in meaningful engagement and enhanced understanding of diverse values are widely considered more likely to generate stronger support and buy in from Rights holders and stakeholders, and thus more likely to succeed than approaches that do not (Berkes et al. 2007; Olive and Rabe 2016). Through explicit inclusion of local values and perspectives, the underlying motivations of local peoples are likely to be embedded in various ways, including for incentivising and mobilizing conservation practice (Henderson et al. 2014; Pittman 2019). One such approach grounded in collaboration among jurisdictions and stakeholders is the Pan-Canadian Approach to Transforming Species at Risk Conservation (Environment and Climate Change Canada 2018). It aims to enhance multiple species and ecosystem-based conservation in selected biodiversity hot spots determined by the people who live and work there. In their paper on *Incentivizing stewardship in a biodiversity hot spot: land managers in the grasslands*, Ayambire et al. (2021) highlight the need to foster collaboration between land managers, nongovernmental organizations, and federal and provincial/territorial governments. They “propose a range of policy instruments and incentives that can help deliver multi-species at risk conservation on Crown agricultural lands in Saskatchewan” and stress that “a portfolio of options will have the greatest social acceptability” (p. 1307). Ayambire et al. (2021) conclude that collaboration among partners “is critical for enhanced decision-making and institutional change that reflects the urgent call for creating awareness of species at risk policies, building trust, and leveraging the local knowledge of land managers for conservation” (p. 1318).

The need for transformative and collaborative approaches for protecting and recovering species at risk are widely acknowledged, as current approaches are not up to the task (Bridgewater et al. 2019; IPBES 2019; ECCC 2018). Despite public and legislative/judicial support for protecting endangered species, wildlife continues to decline in Canada and globally (WWF 2020; WWF-Canada 2020). In *Ten bridges on the road to recovering Canada’s endangered species*, Kraus et al. (2021) confront the barriers to endangered species conservation by identifying 10 ways to change the trajectory, from wildlife loss to recovery. Barriers exist throughout Canada’s Species at Risk Conservation Cycle (i.e., assessment, protection, recovery planning, implementation, and monitoring and evaluation), and the bridges include “ecosystem approaches to recovery, building capacity for community co-governance, linking wildlife recovery to ecosystem services, and improving our storytelling about the loss and recovery of wildlife” (Kraus et al. 2021, p. 1088). Consistent with key messages in other contributions, better conservation practice entails more holistic approaches, generated through cooperative engagement, and grounded in enhanced understanding of diverse ecological–social–cultural values.

To co-create and mobilize conservation grounded in diverse values, and thereby overcome political barriers to conservation, innovative planning and management tools are needed (Gavin et al. 2018; von der Porten et al. 2019). Models and tools for reconciling social and cultural objectives with

biodiversity stewardship are crucial, yet few are applied in practice (Caillon et al. 2017; Sterling et al. 2017a, 2017b). Several offer the capability, however, such as suitability models and other multi-criteria evaluation frameworks (Polfus et al. 2014; Pyke et al. 2018). DeRoy et al. (2021) describe the co-development and application of such a model grounded in a “biocultural” approach, led by the Stewardship Authority of the Kitasoo/Xai’xais First Nation in coastal British Columbia, Canada. Together, they derived and applied “cultural predictor variables” (informed by Kitasoo/Xai’xais cultural expertise and ethnographic data) and “biophysical variables” (derived from LiDAR and photo interpretation data), finding that the cultural predictor variables were “highly influential” in the model (DeRoy et al. 2021, p. 465). In their paper, *Combining high-resolution remotely sensed data with local and Indigenous Knowledge to model the landscape suitability of culturally modified trees: biocultural stewardship in Kitasoo/Xai’xais Territory*, they show how locally led suitability modelling can support local biocultural stewardship and improve the social dimensions and evidence base of environmental management in general (DeRoy et al. 2021). Innovative models and tools such as this and others featured in this Collection show how to weave together co-generated knowledge in ways that respect multiple values and ways of knowing for conservation practices that are socially and ecologically just, bridging ethics, science, and policy.

## Concluding remarks

In total, the 17 contributions to this special Collection uncover and strategize ways around the political barriers to effective conservation governance in Canada. They provide insights that enhance understanding of key barriers, important actors, and strategies for working within and shaping policy at multiple levels of government across Canada. The Collection engages academics (including students), environmental conservation organizations, and Indigenous communities. Collectively, the contributions demonstrate and highlight the need for increased social–political awareness about biodiversity and conservation in Canada, enhanced wildlife conservation collaborative networks (in Canada more broadly) and increased scholarly and other evidence-based attention to the principles, policies, and practices of the wild.

Taken together, the papers in this Collection show the kinds of transformations of ourselves and our politics that are needed to enact what the sciences, both Western and Indigenous, are telling us. Minor shifts to the dominant political, social, and economic systems that have led to existential threats to biodiversity, climate, and humanity will not suffice to redress them. Transformational reforms to governance, economies, and societies are required. Canada is not immune to these crises. In fact, Canada’s engagement and leadership is urgently needed to address them, both domestically, within Canada, and globally, for the earth. Likewise, the policies and practices of conservation, itself, in Canada and elsewhere, are not immune to these processes. Transformations to conservation in Canada are crucial to overcoming persistent and emerging barriers and co-creating bio-culturally diverse and just ecologies, towards healing people and the planet.

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## Author contributions

KFB and AO conceived and designed the study. KFB and AO performed the experiments/collected the data. KFB and AO analyzed and interpreted the data. KFB and AO contributed resources. KFB and AO drafted or revised the manuscript.



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