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Natural Resources Conservation Policy Branch
Protected Areas Section
300 Water Street
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**Re: Ecological Integrity in Ontario's Provincial Parks and Conservation Reserves: A Discussion Paper
(EBR No.: 013-1671)**

Dear Ms. McKay,

Thank you for the opportunity to provide comments to the Ontario Ministry of Natural Resources and Forestry (MNRF) on ecological integrity in Ontario's Provincial Parks and Conservation Reserves. While the official comment period on the Environmental Registry has ended, we have been informed by MNRF staff that our feedback on the discussion paper would still be welcome. We are submitting this document in our capacities as Wildlife Conservation Society (WCS) Canada scientists specializing in wildlife ecology, conservation biology, cumulative impacts, and landscape ecology in northern Ontario. We are a national organization, with our research and conservation priorities in Ontario largely focused on the Far North.

We fully support the government's intent to develop an Ecological Integrity Strategic Framework and Action Plan for Ontario's provincial protected areas and welcome opportunities to be involved in this process. Our comments are organized to support the development of this Framework and Action Plan. The first section provides high-level comments and recommendations for MNRF on key issues related to ecological integrity. The second section (beginning on p. 9) addresses most of the questions in the Discussion Paper.

Throughout our submission, we have provided multiple literature references both as a means of indicating where our ideas have been considered and applied elsewhere and to provide more information to the drafters of this strategic framework.

SECTION 1. High-Level Recommendations on Ecological Integrity in Planning and Management

1.1. Positioning Ecological Integrity in a Broader Ontario Context

Recommendation 1: MNRF deliberately designs the EI Strategic Framework within a broader provincial perspective, integrating with other relevant policies and plans, in such a way that clarifies the role of ecological integrity in provincial parks and conservation in achieving provincial-scale conservation goals

In the section on Ecological Scale (beginning on p. 12), the discussion paper aptly mentions the reality that many ecosystem processes that underlie ecological integrity extend well beyond the boundaries of individual protected areas. However, the paper then quickly talks itself out of the relevance of this scale for the issues being considered, mainly due to issues of practicality. We contend that the role of protected areas in safeguarding Ontario's biodiversity and natural systems cannot be considered in isolation, and so neither can ecological integrity in Ontario's parks. To this end it would be appropriate for the EI Strategic Framework and Action Plan to be integrated into broader conservation, management and monitoring strategies and plans adopted in the province, including (but not limited to) the Ontario Biodiversity Strategy, The Far North Land Use Strategy (pending), Broad-scale Monitoring Program (inland lakes), the wildlife monitoring framework being developed by the province (which has not been publicly released), the Climate Change Action Plan, etc.

1.2 Priority of Ecological Integrity for Protected Area Planning and Management in Ontario

Recommendation 2: Implement the Provincial Parks and Conservation Reserves Act 2006 (PPCRA) as mandated, with a clear priority placed on maintaining and restoring ecological integrity across the provincial protected areas system.

Ecological integrity is the guiding purpose for planning and management in Ontario by law. The language within the PPCRA (see below) reinforces that the legal mandate of MNRF planning and management of protected areas in Ontario is to maintain ecological integrity. The Discussion Paper notes that "Ecosystems have integrity when their lands, waters, native species and natural processes are intact." From our perspective, the PPCRA's objective is to allow people to enjoy Ontario's protected areas without damaging or destroying ecological integrity. That is, ecological integrity is the endpoint for park management and all other objectives associated with protected areas such as recreation, nature appreciation, scientific research, and economic benefits should be managed within this context. The current focus on ecological integrity also enables ministry staff responsible for administering the PPCRA¹ and the public to understand the purpose of Ontario's protected areas. It is the responsibility of MNRF to communicate to the public how well it is meeting and delivering on this mandate.

We reach this conclusion based on language in the PPCRA as follows:

Section 2(1) states the first objective of the PPCRA is:

- *To permanently protect representative ecosystems, biodiversity and provincially significant elements of Ontario's natural and cultural heritage and to manage these areas to ensure that ecological integrity is maintained.*

¹ It remains unclear why the Ontario Parks branch of MNRF does not have an overall mandate to maintain ecological integrity in a similar way to their Federal counterparts in Parks Canada.

Principles for planning and management of protected areas is clearly defined in Section 3(1) which states:

- *Maintenance of ecological integrity shall be the first priority and the restoration of ecological integrity shall be considered.*

Subsection 5(2) defines ecological integrity as:

- *A condition in which biotic and abiotic components of ecosystems and the composition and abundance of native species and biological communities are characteristic of their natural regions and rates of change and ecosystem processes are unimpeded.*

Further, subsection 5(3) adds that ecological integrity includes, but is not limited to:

- *Healthy and viable populations of native species, including species at risk, and maintenance of the habitat on which the species depend*
- *Levels of air and water quality consistent with protection of biodiversity and recreational enjoyment.*

Section 6 of the Act reinforces the legal mandate of these areas by specifying that provincial parks and conservation reserves shall:

- *Be managed to maintain their ecological integrity and to leave them unimpaired for future generations.*

Recommendation 3: MNRF address freshwater conservation in Ontario's protected areas more systematically

We remain concerned with the general lack of conservation planning attention on freshwater systems within Ontario's existing protected areas network. Freshwater ecosystems are hotspots of biodiversity, but also hotspots of human activity and use, making them among the most important and imperilled ecosystems on the planet (Strayer and Dudgeon 2010). Despite the unique nature of freshwater ecosystems, there are no explicit considerations for freshwater protection in either Canada's or Ontario's protected area targets². There seems to be an assumption that terrestrial protected areas will protect the ecological integrity of the freshwater systems within them, but this is highly unlikely to be the case for multiple reasons, namely:

- Protected area strategies typically rely on reserve design and management, yet there is limited congruence between terrestrial and freshwater biodiversity in North America (Herbert et al. 2010, Abell et al. 2011).
- Terrestrial reserves are often inadequate for conserving freshwater ecosystems because the scale of protection for terrestrial systems typically fails to consider hydrological connectivity, which is necessary for freshwater conservation (Pringle 2001, Saunders et al. 2002, Dudgeon et al. 2006).
- Terrestrial protected areas often allow for multiple uses of freshwater systems that could potentially alter aquatic habitats, including stocking of non-native fish species and fishing of native species (Pittcock et al. 2008).

² Both Canada and Ontario have targets to protect 17% of "terrestrial and inland waters", but with no explicit target for freshwater (e.g., <http://www.conservation2020canada.ca/home/> and <http://sobr.ca/targets/protected-areas-conservation-lands/>)

Freshwater needs explicit consideration and targets, and although freshwater has not traditionally been considered in protected area planning, freshwater conservation planning can benefit from the tools and systematic approaches typically applied to terrestrial conservation planning (Nel et al. 2009, Linke et al. 2011, Juffe-Bignoli et al. 2016).

Unfortunately, there is little public evidence that MNRF considers these approaches during land-use planning, or in its approval processes for permits (e.g., environmental assessment). In addition, protected areas are subject to other threats, aside from fishing and personal use and commercial harvest of live baitfish species³, such as development and water management within waterways and watersheds and climate change (e.g., Schindler and Smol 2006, Sietz et al. 2011). Addressing cumulative impacts on freshwater systems should be a high priority for protected area design and management in Ontario.

1.3. Measuring and Monitoring Ecological Integrity

Recommendation 4: Develop a robust monitoring program for protected areas to ensure that ecological integrity is being maintained.

As the Discussion Paper discusses but does not fully embrace, ecological integrity provides a framework that allows for the translation of broad protection goals into more specific and measurable endpoints, based on desirable ecological conditions. Monitoring and assessment are an integral part of managing for ecological integrity (e.g., maintenance, restoration). In general, measures of ecological integrity should be based on indicators that are useful for conveying information about the composition, structure, and function of selected ecosystems over time and across spatial scales. Ideally, indicators should provide quantitative measures of the status and trend of key ecosystem drivers and attributes, reflect the influence of natural versus anthropogenic stressors and identify the causes of environmental change at different levels of ecological organization. As is evident in the most recent federal report *Canadian Environmental Sustainability Indicators: Ecological integrity of national parks* (ECCC 2017), periodic and public assessments of status and trends of ecosystems of individual parks is a powerful tool for understanding the effectiveness of the system at large for biodiversity conservation.

It seems to us that the understandable (and overwhelming) concerns about practical and financial matters have somewhat overwhelmed the exercise of considering options for monitoring EI in Ontario's protected areas. Accordingly, the authors of the discussion paper did not spend sufficient time considering what the goals of the monitoring framework might be in the first place (and again in consideration of the role of protected areas for meeting Ontario's broader biodiversity goals) before making decisions about feasibility. Although the authors evidently did canvass other models, more could be done.

We suggest developing a conceptual model for the system that highlights targets, pathways, and threats. This model can be used to create a suite of measures of ecological integrity that in turn support a selection of indicator species, processes, etc. considering feasibility, relevance, cost, social acceptance. We suggest MNRF consider the approach developed by Parks Canada for indicator selection and monitoring approaches for ecological integrity and consider other recommended approaches, e.g.,

³ We supported MNRF's bait policy proposal to prohibit the possession of bait and commercial harvest of bait in provincial parks because doing so supports the planning and management goal of maintaining ecological integrity under PPCRA (see WCS Canada comments on **EBR No.: 012-9791**).

Wright & Stevens (2012) for BC. We recommend the indicators be selected based on the best available science and traditional knowledge where available, but also use citizen science.

As far as baseline condition is concerned, we urge MNRF not to abandon the notion of historical baselines. We have several reasons for this: 1) this is the best means by which to discern natural range of variability, which is inherent in the legal definition of ecological integrity in the PPCRA; 2) the province is already using these concepts in forest management planning, and 3) if MNRF falls back on the Quebec model as described in the discussion paper, we will inevitably fall back into a shifting (or sliding) baseline situation, whereby society quickly loses track of true change in the system. We suggest that there are other ways by which historical baseline can be estimated. For example, historic range of variation (HRV), may be derived from reference conditions, biological patterns, historical reconstruction, trends, and expert opinion and all could include traditional knowledge (Hobbs et al. 2010). One of the key assumptions is that management will be required to maintain or restore ecological integrity to keep park ecosystems within threshold conditions, especially for those parks that are heavily impacted by local human use and change or where indigenous impacts have shaped the historical structure and function of the ecosystems.

Woodley (2010) also recommended park managers could also consider the following questions to help actualize and communicate ecological integrity more practically, including:

1. Is the park losing species?
2. Are selected indicator species doing well?
3. Are ecosystem trophic levels intact?
4. Do biological communities exhibit a mix of age classes and spatial arrangements that will support native biodiversity?
5. Are productivity and decomposition operating within acceptable limits?
6. Is the system cycling nutrients within acceptable limits?

Finally, it is important for MNRF to consider how it communicates to both managers and the public about the status and trend of measures of ecological integrity, in addition to ECCC (2017) mentioned earlier. There are a number of approaches in both public reports and the scientific literature including composite indices such as the Index of Biological Integrity or similar indices. For example, drawing on work in Alberta fishery management⁴, WCS Canada recently developed and used Fish Sustainability Indices for its work in considering cumulative effects in northern Ontario. MNRF uses scorecards and dashboard and/or stoplight symbology to communicate to the public about the trends and status of indicators being monitored under Ontario's Biodiversity Strategy, which has been highly effective.

1.4. Considering Resilience to Maintain and Restore Ecological Integrity

Recommendation 5: Explicitly consider resilience in protected area planning and management.

We were encouraged to find the notion of resilience as a section in the discussion paper. To add to this, we point to the growing literature on resilience that conceptualizes the link between social and ecological systems (Walker and Salt 2006) and the application of resilience to protected area planning and management (Chapin et al. 2006, Hobbs et al. 2010). As Hobbs et al. (2010) suggest:

⁴ <http://aep.alberta.ca/fish-wildlife/fisheries-management/fish-sustainability-index/default.aspx>

“Managing park and wilderness areas for ecological resilience might emphasize retaining ecosystem function over preserving specific species *in situ*. It might require letting go of the way landscapes look today, as conditions change, and identifying key processes to retain in the face of change, such that, although many other variables shift around, core functions and processes are preserved. Recommended tools for building resilience include experimentation, active adaptive management, and structured scenario planning – “envisioning alternative futures in ways that expose fundamental variables and branch points that can be collectively manipulated to evoke change” (Folke 2002).”

We suggest this approach could also be useful in considering protected area management and warrants more critical and thoughtful assessment of where and how it has been applied in the context of protected area planning and management.

1.5. Priority of Ecological Integrity in Planning and Management of Protected Areas in Ontario’s Far North

Recommendation 6: Proactively plan for, and prioritize, ecological integrity in Ontario’s Far North, both within existing and emerging protected areas and the broader landscape.

Considering the specific protected area objective in the *Far North Act* (see below), we were surprised that the current discussion document mentions this geography only once, i.e., in relation to planning for the Whitefeather Forest *Cheemuhnucheecheekuhtaykeehn* Dedicated Protected Areas, which Pikangikum chose to be legislated under the PPCRA.

The Far North of Ontario is one of the world’s largest, most intact ecological systems including boreal forest, wetlands and peatlands, as well as natural processes such as fire and predator-prey systems. As such, the Far North ecosystems have a high level of ecological integrity right now (Far North Science Advisory Panel 2010). It stretches across the Hudson Bay Lowlands ecozone, as well as the Ontario Shield and boreal forests in Ontario’s near north, where the landscape is impacted by roads and towns, forestry, mineral exploration, mines and farms. At 452,000 km², Ontario’s Far North is a large region and contains some of the largest protected areas in Ontario (e.g., Polar Bear Provincial Park). It is also the homeland for over 40,000 First Nations who have occupied it continuously for millennia. Their communities are remote, linked only by short-lived winter roads, air and water, and modern communications.

Ontario’s *Far North Act, 2010* (Act) has two ecological objectives that depend on ecological (and cultural integrity) namely:

- Section 5(2). The protection of areas of cultural value in the Far North and the protection of ecological systems in the Far North by including at least 225,000 square kilometres of the Far North in an interconnected network of protected areas designated in community based land use plans.
- Section 5(3). The maintenance of biological diversity, ecological processes and ecological functions, including the storage and sequestration of carbon in the Far North.

MNRF has an unparalleled opportunity to consider ecological integrity in a proactive way within the context of protected area design and management of the intervening landscape. The Ministry is

mandated to maintain ecological processes and functions under the Act. Other than the unenforceable “advice” in the Far North Land Use Strategy (see below), there is no evidence that MNRF has the tools or capacity to deliver on these objectives and we have seen no evidence of a strategic approach to do so. Community-based land-use planning, while an appropriate governance structure for the Far North, is inadequate for delivering ecological integrity at the regional or landscape scale in Ontario’s Far North. At the same time, MNRF seems to have little or no role in the emerging land use projects that threaten ecological integrity in the Far North, including the Wataynikaneyap transmission line and planned proposal for three all-weather roads in the Ring of Fire⁵ that are currently underway. We suggest MNRF’s proposed Strategic Framework for Ecological Integrity should direct particular attention to protection of ecosystems in the Far North.

Recommendation 7: Support systematic, regional-scale conservation planning in Ontario’s Far North so that ecological integrity is deliberately considered in the design of protected areas

Overall, protected area planning in Ontario has been largely focused on an ecological representation approach, but this has not been particularly systematic nor based on current social and ecological conservation principles. This is particularly obvious in Ontario’s Far North, where principles such as intactness and complementarity are absent in the planning process at both the community and regional scale.

Community scale. While protected areas are emerging through community-based land use plans (CBLUP) led by MNRF under the Act, the region remains intact with the largest proportion of natural cover compared to other parts of Ontario. In an effort to meet the 50% protection target (Objective 2 of the Act), MNRF must also consider what the actual contribution of protected areas emerging in each CBLUP is/will be to conserving biodiversity and maintaining ecological integrity and whether this contribution will actually be realized or even persist over the life of the plan given the landscape context within which the protected areas are embedded.

We recommend that MNRF make clear within the context of this strategic framework for the province that the effectiveness of protected areas within any CBLUP depends on the condition of the surrounding landscape. In other words, if relatively intensive land uses, (e.g., multiple developments and associated road networks) are developed in general use zones that surround a Dedicated Protected Area, the smaller and more isolated the protected area, the less effective it will be. Similarly, significantly wider waterway protection zones will be more effective than traditional buffers (~100m) for protecting sensitive aquatic values if intended land uses in neighbouring general use areas are expected to result in increased sedimentation and runoff (e.g., logging, road building).

We suggest scenario planning and a cumulative effects assessment framework, including climate change, be applied as decision-support tools for planning. Even if details of the nature of development are not generally known at the time of planning, protected area design must account for various plausible situations to determine the size of individual areas, the location, and the overall proportional coverage of this zone in the CBLUP.

Regional scale. WCS Canada has provided consistent input on the evolution of the Far North Land Use Strategy (FNLUS) since its inception in 2014 (**EBR No: 012-0598**). Overall, this document is not a strategy, but a set of unenforceable advice that has no specific targets, and no time-bound measurables around

⁵ <http://www.timminspress.com/2018/01/25/govt-reluctant-to-rush-ring-of-fire>

key regional-scale issues that affect ecological integrity in the Far North, including protected area design and management.

The guidance on protected areas within the last draft Far North Land Use Strategy that we reviewed, while sound in a generic way, illustrated Ontario's narrow and dated approach to protected area planning, at any scale, and is too limited given the unique ecological and social systems in Ontario's Far North. Relative terms like “large” (protected area), “little” (disturbance), “important” (habitat), “compact” (shape of protected area), etc., are used without any reference points for planners to understand how large (e.g., 1,000 km² or 10,000 km² or 100,000 km²), for example. Moreover, the onus for “applying these design principles” and “consider[ing] how each area proposed for protection contributes to the creation of a Far North protected areas network and to broader provincial and global protection objectives” (p. 38) is implicitly at the scale of each emerging community-based land use plan. Yet, these scales are generally unknown because each emerges at a different spatial and temporal scale based on negotiations around the planning area of interest. At present, none of the emerging plans available for public review have been considering ecological boundaries (e.g., ecosystems, ecoregions, ecozones) in any explicit or consistent way and are often based on traplines. We remain concerned about where the provincial interest in protection in the Far North actually lies, and the lack of measurable protection objectives within community plans and the FNLUS.

Finally, a growing body of research supports the maintenance of large intact systems for the purpose of enabling adaptive capacity in species and the ecosystems vis-à-vis climate change and new industrial development, in which they function (Watson et al. 2013, Eigenbrod et al. 2015, Martin and Watson 2016). Protecting intact regions like Ontario's Far North may be more effective in providing adaptation options than trying to restore or recreate them after they have been damaged or fragmented by land use for example (Hodgson et al. 2009, Lemieux et al. 2011). More explicit actions may be more relevant depending on whether the focus is terrestrial, freshwater, or marine.

It is for these reasons that we hope that the EI strategic framework deliberately considers and integrates the Far North.

1.6. Role of Indigenous Peoples in Protected Areas Planning and Management

Recommendation 8: MNRF should examine opportunities for Indigenous governance of protected areas, including Indigenous Protected and Conserved Areas (IPCAs), particularly in the Far North, for meeting ecological integrity objectives.

We appreciate the attention in the Discussion Paper to Indigenous Peoples in their roles as stewards, their values and the importance of their traditional practices (e.g., fire), and their traditional knowledge about the land and waters that eventually became protected areas in some parts of Ontario. There is a long and contentious history between MNRF and Indigenous peoples in Ontario regarding land use planning and management, particularly for protected areas, and always in terms of jurisdiction and interpretation of Treaties. In the spirit of reconciliation, it would be useful to acknowledge this history and context more explicitly in this framework document, particularly because ecological integrity is highly correlated to cultural integrity of Indigenous peoples.

Through the *Biodiversity Strategy*, Ontario is committed to protecting at least 17 per cent of terrestrial and aquatic systems through protected area networks. Under Ontario's *Far North Act, 2010*, MNRF is mandated to protect at least 50% of the Far North through land use planning processes with First

Nations. While the first protected areas in the Far North have been legislated under the PPCRA⁶, we suggest the Far North offers an important opportunity for Ontario to consider other models for protection that explicitly include First Nations governance and can deliver on ecological and cultural integrity. There are already some good examples of Indigenous-led approaches in Canada (e.g., "Tribal parks") that should also be explored at community planning tables in the Far North and that can consider First Nations interests in watershed protection (e.g., Moose Cree First Nation and the North French watershed, Kitchenumaykoosib Inninuwig First Nation and the Fawn River watershed). In addition, we have suggested, in various comments to MNRF on planning and policies, to include or take up the IUCN recognition of Indigenous Peoples and Community Conserved Territories and Areas (ICCAs), the IUCN UNESCO guidelines for Sacred Natural Sites, and IUCN UNESCO World Heritage Sites. The IUCN also recognizes governance models for protected areas that include Indigenous Peoples⁷. We recommend that the next SOPR include a table, similar to Table 3.1, explicitly considering this governance element. These designations go beyond the Dedicated Protected Area mechanism under the *Far North Act, 2010* or PPCRA and existing withdrawal mechanisms for protection of site-based values under Section 35 of the *Mining Act* which are small (25 ha) in extent.

In terms of the processes, Federal commitment to the Indigenous Circle of Experts (ICE) through the Pathway to Target 1 offers a significant precedent and model for Ontario to consider in developing more relevant approaches to identifying and implementing protected areas that could be considered in Ontario in the context of this ecological integrity strategic framework. MNRF also should focus on elevating the role of First Nations in protecting and monitoring changes to ecological integrity in the Far North, supporting their Indigenous knowledge systems and legal traditions, and enabling alternative governance models to support conservation and protection of ecological (and cultural integrity) in the Far North. The Act provides MNRF with an important opportunity to support the identification and implementation of Indigenous Protected and Conserved Areas (IPCAs) in Ontario.

Overall, the current planning process with First Nations in the Far North could also be an important vehicle for enabling co-management and addressing jurisdiction more equitably and support Ontario's commitment to reconciliation and honouring historic Treaties. A fundamental understanding of the responsibilities, rights and interests of Indigenous peoples, should be identified as a strategic priority for MNRF and central to the maintenance and restoration of ecological (and cultural) integrity, with adequate funding allocated. In developing its Ecological Integrity Strategic Framework and Action Plan, MNRF should be guided by Aichi Target 18 under the Convention on Biological Diversity:

SECTION 2. Responses to Questions in the Discussion Paper

Please note that we have addressed some or all of a number of the questions above, and will reference our earlier recommendations where this is the case.

Question: *Given the diversity within the provincial park and conservation reserve system and the challenges described based on this diversity, do you think that the approach to maintaining and restoring ecological integrity should be the same or different for all areas and why? If different, what approach should be used?*

⁶ <http://www.ontla.on.ca/library/repository/mon/28005/313466.pdf>

⁷ http://cmsdata.iucn.org/downloads/governance_of_protected_areas___from_understanding_to_action.pdf

Recommendation 9: MNRF should consider: 1) Protected areas where ecological integrity plays a dominant role as a contribution to broader provincial conservation goals; and 2) Protected areas where ecological integrity is actively managed, including restoration.

It is challenging to answer the question in part because it isn't clear from this Discussion Paper *how* MNRF has actually operationalized ecological integrity within protected area planning and management since the PPCRA came into force in 2007 and whether and how it has been considered more uniformly in planning, management and monitoring since then. In addition, there is no available assessment (similar to ECCO 2017) about where each of the protected areas lies on the continuum of ecological integrity. We appreciate that ecological integrity was not an applied management objective in Ontario's protected areas before 2007.

As described in the Discussion Paper, ecological integrity is characterized in terms of ecological components of composition (e.g., biodiversity, species richness), structure (e.g., patch size, canopy), and function (e.g., predator-prey, herbivory, fire regimes) at multiple levels from species to landscapes (Wurtzebach and Schultz 2016). Identifying the key attributes of ecological integrity typically requires some spatially explicit designation of ecosystems or landscapes. These may or may not align with currently designated protected areas. Any assessment of ecological integrity must address the fact that ecosystems are geographically different and organized based on available energy, modified by nutrients and water as well as the colonization (e.g., land use) history and natural disturbance dynamics of the system (Woodley 2010). What isn't clear is how MNRF has evaluated, maintained, restored, and monitored ecological integrity within protected areas and whether this has been consistent and can map onto conservation objectives and targets including Aichi Targets and those under Ontario's Biodiversity Strategy, as we have recommended here.

The maintenance of ecological integrity is the priority under the PPCRA. However, we suspect some classes of parks may currently *de facto* maintain ecological integrity objectives with little active management from MNRF. For example, the first State of Ontario Parks Report (SOPR)⁸ shows Wilderness class parks have the highest proportion (96%) of core area⁹ and are embedded in ecozones with the highest level of natural cover between them (e.g., high connectivity). Ecological integrity might be easier to "maintain" in these classes of parks because of their larger sizes, remote locations, and policies that also limit use and development (e.g., Ontario Shield, Hudson Bay Lowlands). However, climate change, particularly in the Far North, which is predicted to experience greater rates of warming and extreme weather events (McDermid et al. 2015), warrants ongoing monitoring regardless of access and use, as do pressures from new developments (and associated infrastructure) that are built outside protected area. At the other extreme, recreation class parks in Ontario have the lowest percentage of core area, tend to be small in size, include infrastructure to provide a variety of outdoor recreational activities, and host large numbers of visitors. These types of parks also report having more invasive species and tend to be in the near north and southern regions of Ontario (e.g., Ontario Shield, Mixedwood ecozones). Here, we suspect active management is needed to maintain ecological integrity and restoration is likely required.

The restoration of ecological integrity "should be considered" under the PPCRA. Restoration remains an important step in biodiversity conservation and one of Ontario's Biodiversity Strategy objectives is to

⁸ Ontario Ministry of Natural Resources and Forestry. 2011. State of Ontario's Protected Areas Report. URL: <https://www.ontario.ca/document/state-ontarios-protected-areas-report>. Accessed January 19, 2018

⁹ all interior habitats at least 200 metres from land cover permanently altered by human activities.

maintain, restore and recover ecosystem functions. However, it isn't clear from the Discussion Paper what MNRF have restored to date in protected areas (apart from the couple of case studies in the report), how they have done it, and to what condition. It isn't clear how much restoration has cost nor how that cost compares to costs associated with doing nothing (e.g., losses or gains in ecosystem services based on ecological integrity). The SOPR is silent on restoration in Ontario's parks and protected areas.

Finally, while we suspect it may be more costly to restore and maintain ecological integrity in certain park classes and in certain parts of Ontario (e.g., southern), research suggests strongly that **protecting** intact northern regions is in most (if not all cases) going to be much more effective in maintaining ecological integrity, particularly given climate change, than trying to restore or recreate them after they have been damaged or fragmented by land use for example (Hodgson et al. 2009, Lemieux et al. 2011).

***Question:** While MNRF works to balance the objectives of the PPCRA by guiding which activities are allowed or not allowed in each provincial park and conservation reserve, it is often challenging to achieve balance of uses. How should MNRF balance competing needs? In situations where balance cannot be achieved, should the principle to maintain ecological integrity take precedent and why?*

As already stated in recommendation #2, ecological integrity should take precedence.

*Our Sustainable Future*¹⁰ reinforces the idea that MNRF must “balance social, economic and ecological values to deliver sustainable development”. In general, given the dual mandate that characterizes MNRF (natural resource extraction and conservation/protection), our experience is that economic values tend to outweigh protection values in MNRF's decision-making in the name of “balancing” the public interest. However, we are particularly frustrated with MNRF in its request for public input on how it should “balance” its objectives in protected areas.

We stress that protected areas are the cornerstone of MNRF's commitment to the Biodiversity Strategy in Ontario and these commitments contribute to national and international targets (e.g., Canada's Biodiversity Strategy¹¹, 20 Aichi Biodiversity targets¹²). We understand (as the discussion paper is careful to point out on p. 11) that Ontario Parks relies a great deal on revenue generated from parks visitation for most of its budget. We also support the need to provide visitation opportunities to connect people to nature. However, we contend that the visitor experience in the protected areas where this is an issue must be accommodated in such a fashion not to compromise ecological integrity, considering that there are already so many outside pressures that do this.

Protected areas represent only 9% of Ontario's land base, yet are expected to conserve habitat for many of Ontario's 2900 species of vascular plants, 160 species of fish, 80 species of amphibians and reptiles, 400 species of birds, and 85 species of mammals. While protected areas constitutes one tool for protecting species at risk, it is a significant one. Their roles include providing refugia, serving as source areas, and supplying secure habitat for species recovery efforts. According to SOPR, about one quarter of all element occurrences for all provincially tracked species, including species at risk, are associated with protected areas. In southern Ontario, they account for 15% of occurrences of provincially tracked species.

¹⁰ <http://www.ontla.on.ca/library/repository/mon/27005/322556.pdf>

¹¹ <http://biodivcanada.ca/default.asp?lang=En&n=560ED58E-1&offset=1&toc=show>

¹² <https://www.cbd.int/sp/targets/>

This same small amount of land in Ontario is also expected to deliver recreational opportunities, including camping and day use visitation, in Ontario's 112 operating parks which amounts to 10 million visitor days. In 2008-09, money spent by Ontario Parks and visitors generated about \$495 million and about 8,200 person years of employment (SOPR 2011). There is no information in SOPR or the Discussion Paper to determine if this level of human use is sustainable.

Over the decades of protected area development, different values have driven protected area design and use. However, MNRF has created the current and inadequate system, including piecemeal policies, while the PPCRA is very clear that the priority for protected areas is ecological integrity. This standard is high, but necessary if Ontario is to meet its commitments under the Biodiversity Strategy, *Endangered Species Act*, among others.

Finally, protected areas and ecological integrity will become more critical in safeguarding biodiversity in the face of climate change. We make the following suggestions to help restore the "balance" for biodiversity conservation.

- **Proactively conserving and expanding protected areas and other effective means of conservation.**

We suggest the approach to protected area design needs to go beyond representation. According to SOPR, in southern Ontario, connectivity is lower between protected areas in the Mixedwood Plains ecozone and natural cover is very low resulting in protected areas that are isolated. Actions here should include a systematic approach that includes conservation principles, identification of key biodiversity areas, as well as applying policies and regulations to reduce habitat loss and fragmentation in the broader landscapes in which the protected areas are embedded. Doing so should at least enable mobile species to move in response to climate change. We anticipate some areas will require a focus on restoration, while other existing areas could be expanded.

- **Reduction of non-climate stressors**

Reducing existing direct threats associated with development or other land uses such as habitat degradation and fragmentation, invasive species, pollution, and overexploitation can help fish, wildlife, plants, and ecosystems better cope with the additional stresses caused by a changing climate. An important action enabling species to adapt to a changing climate is to reduce the negative impacts of existing stressors. A number of these stressors are things that decision makers can deliberately control through management, regulations, and policy (e.g., over-harvesting, habitat loss, fragmentation, invasive species in some cases, development approvals). It is unclear to us how MNRF considers cumulative effects in its land use planning and regulation processes.

- **Manage species and habitats to protect ecosystem services**

Incorporating climate change information into fish, wildlife, and plant management efforts, including the assessment of new projects, is essential to safeguarding species and valued ecosystem services. Currently, there seems to be no comprehensive or integrated approach to consider climate change in species and habitat conservation and management in Ontario, particularly in the Far North, and these efforts appear to be siloed in practice.

Question: Which scale or scales should be used to evaluate, monitor and maintain ecological integrity? How could MNRF consider ecological integrity at multiple scales most effectively and efficiently.

Recommendation 10: *Ecological integrity should be assessed and understood at multiple scales, with an emphasis on the landscape but integrated into provincial conservation objectives.*

The Discussion Paper provides a good overview of the different scales at which ecological integrity should be considered given different stressors and the challenges in maintaining, restoring, monitoring, and communicating about ecological integrity in Ontario's protected areas.

While ecological integrity cannot be assessed at the scale of a single forest stand, campground, or parking lot, it can be impacted at any scale. We suggest a nested, multiple-scale approach for evaluating ecological integrity at both the ecosystem and landscape level is essential, particularly where cross-scale interactions and processes, such as large-scale disturbances (e.g., fire regimes), herbivory and predator-prey dynamics, are relevant for native biodiversity or ecological function. Ideally, the proposed framework would provide an approach to assess each park within the ecoregion and ecozone within which it is embedded and provide enough information to compare among similar classes of parks and across broader scales of ecological and management relevance (e.g., wildlife management units, the Far North and even the province). We provide some suggestions on how to assess ecological integrity in our comments above.

Question: *Considering the challenges associated with using an historical or natural state as a baseline for evaluating ecological integrity, is it appropriate to use the current condition at the start of monitoring as the baseline and why? Are there any challenges with using the current condition as a baseline? If so, what are they? Are there any other suggestions for establishing a baseline to evaluate ecological integrity?*

Recommendation 11: *MNRF should focus on historic range of variation as a baseline for evaluating ecological integrity.*

As discussed in recommendation #4 (above), ecological integrity should be assessed with an understanding of the regional evolutionary and historic context that has shaped the ecosystem (e.g., historic range of variation (HRV)). However, the interchangeable use of both natural and historic in this Discussion Paper is confusing. "Natural" is both subjective and ambiguous, especially given the influence and role of Indigenous peoples on ecological systems before colonization (Hobbs et al. 2010). For example, the concept of ecological integrity was added to the lexicon of Parks Canada management in the 1980s, specifically as a replacement to the idea of "natural" (Woodley 2010).

We acknowledge that the application of HRV given impacts associated with climate change and invasive species is challenging. For example, MNRF has already documented changes in species distribution and disturbance with potential implications for the composition, structure, and function of terrestrial and aquatic ecosystems in Ontario (e.g., Wotton et al. 2005, Varrin et al. 2007, Dove-Thompson et al. 2011, Nituch and Bowman 2013, McLaughlin and Webster 2013). HRV may also be inappropriate for irrevocably degraded systems, or systems in which restoration to HRV is not socially acceptable or feasible. However, there is no evidence from the Discussion Paper or SOPR that such a systematic or critical assessment has been made in Ontario's protected areas.

Other approaches not mentioned here include the use of reference condition sites, particularly for aquatic ecological integrity (Dubé and Munkittrick 2001, Kilgour et al. 2007). In addition, the Far North Science Advisory Panel (2010: xvi) advocated the use of a landscape-level planning approach, encompassing large core protected areas that serve as landscape-level benchmarks; site-specific protected areas, geared to protecting specific features; active management areas, where development and settlement are actively occurring; and the surrounding landscape, or “conservation matrix”, within which the other three elements are embedded, and which they support. This planning recommendation for benchmarks, which could be protected areas, has not been taken up by MNRF.

As we already discussed (recommendation #4), we do not support the use of the current condition as the start of baseline for monitoring. We suspect many areas are already experiencing “declining baselines”. Deciding to start at the current condition normalizes a process in which we become accustomed to and accepting of normal worsening conditions. Without active restoration or a commitment to maintain ecological integrity, we forget that the system was not always this way. This leads to further acceptance and further normalization (*sensu* “balance”). A framework that prioritizes ecological integrity and a commitment to monitoring remain key actions for making progress towards Ontario’s conservation and restoration goals and provides justification for such actions as adapting to climate change and dealing aggressively with invasive species in protected areas.

Question: *Different approaches to monitoring ecological integrity have been presented, along with what might be possible for Ontario’s provincial parks and conservation reserves. Considering the diverse range of objectives (e.g., protecting values and providing ecologically sustainable recreation opportunities), and staff and financial constraints, which approach or combination of approaches would be most appropriate for Ontario’s provincial parks and conservation reserves and why? Are there any other approaches MNRF should consider?*

We have addressed this in recommendation #4.

Question: *What do you think of the opportunities identified to maintain and restore ecological integrity? Are there other opportunities?*

As described above (recommendations #6 and 7), the degree of ecological integrity, large size, and intactness in Ontario’s Far North makes it a huge opportunity for maintaining ecological integrity. Given MNRF is in planning processes with First Nations and leading the creation of new protected areas, up to at least 50%, this region demands more proactive consideration in any framework on ecological integrity. We do not support the notion that the FNLUS can address ecological integrity in the Far North.

In closing, we hope our comments are useful as MNRF develops a framework for ecological integrity. As always, we would be pleased to engage in any discussions regarding our recommendations and comment and you may contact Cheryl Chetkiewicz at 807-472-1440 or cchetkiewicz@wcs.org to do so. Thank you for this opportunity to provide feedback.

Yours sincerely,



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