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Extirpation despite regulation? Environmental assessment and caribou

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Abstract

Many caribou populations in Canada face extirpation despite dozens of provincial and federal legislative instruments designed to protect them. How are industrial developments that impact caribou justified and permitted despite governments' commitments to caribou protection? Toward an answer, this paper scrutinizes an approval process for major projects in Canada: environmental assessment (EA). We identify 65 EAs for major projects with potentially significant adverse impacts for caribou—all projects but one were approved. The results show that most projects were approved on the basis of proposed mitigation measures that promise to render adverse effects "insignificant"; yet mitigation effectiveness is largely unknown. Further, several projects were approved even though mitigation measures were insufficient, citing public or national interest. Finally, some projects' approval rested in part on scientific claims that the project area is already degraded or absent of caribou. Based on these findings, EA is failing caribou, acting as a means by which the state licenses major developments with potentially significant adverse effects for caribou, with a pretense of protection. The failure stems in part from a broader tension within the state that manifests in EA: a tension between the state's roles promoting economic growth and protecting against this growth's negative effects. Recognition of this tension needs to be more central to conservation biology.

KEYWORDS

Canada, governance, political ecology, politics and policy, the state, threatened species

1 | INTRODUCTION

Many populations of caribou in Canada have been extirpated in recent decades, or now face extirpation (Hebblewhite, 2017; Johnson, Ehlers, & Seip, 2015). 28 of 57 Canadian caribou populations are declining; in western Canada, among the Mountain caribou populations, 20 out of 25 subpopulations are in decline (Hebblewhite, 2017). The Southern and Northern Mountain populations were listed as "Special Concern" under Canada's Species At Risk Act (SARA) in 2002 (COSEWIC 2002); in 2014, two of the now three Designated Units (DUs), Central and Southern, were upgraded to "Endangered". Over three generations, the Southern Mountain DU, most of which resides in British Columbia (BC), diminished by 46% (Ray et al., 2015). These declines are of grave

concern to Indigenous Nations like West Moberly First Nations (WMFN), Saulteau First Nations, and Fort Nelson First Nation (FNFN) who are undertaking caribou recovery action plans (McNay, Cichowski, & Muir, 2013), independent management plans (FNFN, 2017), caribou maternity penning, and successful legal challenges (Muir & Booth, 2012) to stem caribou loss and promote recovery.

What is driving these declines? Scientific explanations are well-established. Land use change driven by forestry, oil, and gas and mining is the primary, if proximate, cause of caribou loss (e.g., Dyer, O'Neill, Wasel, & Boutin, 2001; Environment Canada, 2011, 2012, 2014; Johnson et al., 2015). Caribou occur at low densities in large swaths of old-growth coniferous forests and boreal peatlands, relying on vast undisturbed tracks of trees, ground lichens, grasses, and sedges. Mountain woodland caribou in particular need large stretches of old-growth forests as they live at higher elevations that render terrestrial lichen inaccessible (Hebblewhite, 2017). Industrial development is directly destroying this slow-to-recover old-growth forest habitat, and caribou exhibit large avoidance areas in human-dominated landscapes (Environment Canada, 2011, 2012). Finally, the arguably most potent direct impact of industrially-driven land use changes is that in these new landscapes, caribou are far more susceptible to predation: a case of apparent or interspecies competition (Burgar et al., 2019; DeCesare, Hebblewhite, Robinson, & Musiani, 2010; Festa-Bianchet, Ray, Boutin, Côté, & Gunn, 2011; Fortin et al., 2013; Latham, Latham, Boyce, & Boutin, 2011; Seip, 1992; Shackelford, Standish, Ripple, & Starzomski, 2018; Whittington et al., 2011; Wittmer, Serrouya, Elbroch, & Marshall, 2013).

That industrial development is driving caribou loss is, then, proven in the scientific literature. What remains to be explained is the puzzle of how the drastic declines of caribou have occurred precisely during the time when legislative and policy instruments designed to curb caribou loss and promote recovery have spread. Most caribou populations in Canada are listed under SARA. Caribou are also considered under provincial legislation—for example, in BC, under the BC Oil and Gas Activities Act, the Wildlife Act, Forest and Ranges Practices Act, Oil and Gas Activities Act, Ecological Reserves Act, Parks Act, and Land Act (BC Government no date). Some of the most potent protections for caribou also stem from Indigenous rights and title, under which the Canadian state is obliged to protect Indigenous people's access to hunting and culturally significant species, like caribou, who provide food, medicine, manufactured items, clothing, and regalia. Given this ostensibly protective regulatory apparatus, how can continued industrial development and caribou declines be explained?

This paper responds to the question through an analysis of over three decades of Canadian and BC EAs for major projects with potentially significant adverse effects for caribou, all but one of which were approved. BC is the provincial focus as there are several populations of endangered and threatened woodland caribou in the province, an array of extractive developments that undergo EAs, and clear scientific evidence linking caribou declines to these development (Johnson et al., 2015; Ray et al., 2015). EA is a project planning tool to identify and mitigate negative environmental effects of proposed major development projects like mines, pipelines, and hydro development. Based on the EA, the federal, provincial, or territorial government will issue a permit for the development to proceed, or not. The purpose of the EA is to curb negative effects of a project by implementing mitigation measures and designing the project to reduce and eliminate negative impacts. The EAs in this study are examined to shed light on how major projects with negative effects for caribou are justified and approved despite the state's policy commitment to caribou protection and recovery.

2 | BEYOND PROXIMATE EXPLANATIONS FOR BIODIVERSITY LOSS

Conservation biology excels in identifying proximate drivers of species declines, like land-use change. While less attention is placed on the political economic drivers, a cluster of scholarship is beginning to identify explanations for caribou decline beyond proximate drivers. Some scholars point to a lack of political will and a "science-policy gap," where information about caribou is not flowing to managers (Hebblewhite, White, & Musiani, 2010). Others implicate the ongoing top-down, colonial nature of caribou management (Parlee, Sandlos, & Natcher, 2018; Sandlos, 2018), even a willful ignoring of science and treaty rights (Hebblewhite, 2017; Muir & Booth, 2012). For example, in 2009, BC's Ministry of Energy and Mines approved coal mining exploration in critical habitat for an endangered caribou herd on WMFN territory, despite opposition by WMFN and government scientists, who stated the exploration was incompatible with species recovery. The Supreme Court of BC subsequently found that the approval was an infringement on WMFN's Treaty 8 rights to hunt caribou. Based on their analysis of this case, Muir and Booth (2012) argue that the industrialization of WMFN territory is discriminatory and a case of environmental racism.

The economic cost of arresting caribou loss is also cited as barrier to action in the social science literature,

reflecting a prominent argument about resource deficiencies in the broader conservation literature (e.g., Rands et al., 2010; Waldron et al., 2013). Effective caribou habitat protection in Alberta, for example, would require curbing lucrative extractive activities and foregoing oil and gas revenues to the tune of $150 billion (Hebblewhite, 2017). Another study estimates a cost of $44 billion to buy out energy leases for one caribou herd, and $162 billion for all caribou ranges in Alberta (Schneider, Hauer, Adamowicz, & Boutin, 2010).

As these enormous opportunity costs indicate, the Canadian and provincial governments are not neutral actors in industrial development processes. This is not unique to Canada: a central function of modern states is to advance economic development and secure the conditions for capital accumulation. This role is increasingly tempered by citizen demands to protect the environment. Political theorists and political ecologists have long argued that consequently, the state is a tension-ridden, contradictory institution, with conflicting mandates to be both a protector against and promoter of economic development (Hay, 1994; Song & M'Gonigle, 2001; M'Gonigle & Takeda, 2013). The state's legitimacy rests on fulfilling these dual obligations, enabling development that supplies jobs and resource rents while also protecting its citizens and natures against the destruction that development engenders.

EA is a key institution managing state tensions to develop and protect, aiming to balance obligations, and to create win–win scenarios. In Canada, it is an institution that undertakes the most rigorous scientific assessment of all resource approvals. This paper assesses EAs to understand how the state negotiates its obligation to facilitate economic development and to protect caribou and their habitat, toward improved understanding of the political economic drivers of biodiversity loss.

3 | METHODS

In Canada, EAs occur at federal and provincial/territorial scales. The dataset of this study is comprised of 65 EAs conducted federally under the *Canadian Environmental Assessment Act* (*CEAA) 1992* and *2012*, including projects across Canada; and provincially, under the *BC EA Act 1994* and *2002* for projects in BC only. In all of these EAs, caribou were considered potentially significantly negatively affected by the proposed project. All subspecies of caribou are included although 97% of the EAs in the dataset pertain to woodland caribou. This dataset was assembled using manual searches of EA documentation. Neither the CEA registry nor the BC EAO project database can be queried for projects with effects for particular species. To collect all EAs where caribou were considered, all documentation associated with every EA in the BC EAO and CEA registry was downloaded. For most project EAs, this documentation included decision statements and government responses, study documents, environmental impact statements, executive summaries, and EA reports. This documentation was systematically searched for references to caribou in English or French. In documents that were not searchable, subject headings and tables of contents were used to identify relevant sections and manually examined for references to caribou.

This search originally yielded 35 EA results under CEAA and 79 under the BC EA Act. Some of these EAs were subsequently removed from the dataset, including projects withdrawn from the EA process, in progress EAs, or EAs that mentioned caribou but not in the context of potential project impacts. The final dataset includes 29 federal EAs and 36 BC EAs—65 in total—for projects in which significant impacts to caribou were at least initially predicted to result from the proposed project. The EA decisions were issued between 1995 and 2017, with the majority issued after caribou were listed under SARA in 2002.

An inductive analysis of these data was conducted to identify how the contradiction between imperatives of caribou recovery and economic development approvals is resolved, at least temporarily, within the EA process, so that project approval is justified. A close reading of all of the documents associated with these cases focused on the nature of predicted impacts to caribou, mitigation measures proposed, the decision and especially the reasoning behind the decision. These documents were examined especially for patterns in how impacts to caribou were either rendered insignificant, or justified. Repeated points of tension in the EA around caribou (e.g., between the EA consulting companies' reports and Indigenous testimony) were also identified. The focus of this inductive analysis was less to determine how impacts to caribou are measured and more to consider how these impacts are "neutralized"—meaning impacts are recognized but do not become grounds for recommending rejection of the project.

4 | RESULTS

Of the 65 EAs in the dataset, all but one were approved. The one rejection, in 2008, was of Kemess North, a proposed gold-copper mine 450 km northwest of Prince George, BC. The project would have expanded the existing Kemess South gold-copper mine as well as constructed another open pit gold-copper mine. In the federal EA, which was conducted by Joint Review Panel,

the Proponent, Northgate Minerals, estimated a 7% loss of caribou in the project area. But Kemess North was not rejected because of concerns about these losses. In its final report, the Joint Review Panel concluded that "significant Project effects on regional caribou herds are not expected" (Kemess North Mine Joint Review Panel, 2007, p. 164). Instead, the project was rejected because of concerns about water quality. The other 64 projects were approved despite significant predicted impacts to caribou. How and why were these approvals issued despite these impacts? An inductive analysis identified three main rationales for proceeding: mitigation measures are assumed to neutralize impacts; economic or public benefits are deemed to outweigh the costs of impacts; and/or claims are made that caribou are no longer in the project area and/or that the project area is already degraded. Results are summarized in Table S1.

4.1 | Mitigation measures

A key function of EA is to identify potential negative effects, assess their significance, and devise mitigation measures that will render impacts insignificant. Impacts to wildlife like caribou are typically assessed indirectly through predicted changes in habitat. This method of impact assessment is not without its critics. In Canadian EAs, habitat models are employed with scarce guidance, no standardization, and "specious rigour" (Campbell, Kopach, Komers, & Ford, 2019, p. 11). Un-validated models (e.g., not tested with independent field data) are frequently used and are far less likely to determine a project will have significant impacts on wildlife (Campbell et al., 2019). Regardless, on the basis of these predicted impacts, proponents develop mitigation measures to minimize these impacts—usually rendering impacts "insignificant."

Almost all of the project EAs (except 5) in this study's dataset promised mitigation measures to minimize projects' negative impacts for caribou. Importantly, "insignificant" impact does not mean no impact. There are cases in the dataset where negative impacts to caribou were deemed "insignificant" even when there were effects—for example, as in Kemess North, mentioned earlier. The Brule open-pit coal mine EA (Western Canadian Coal, 2005, pp. 10–91), for another example, found "insignificant" or "minimal" impacts to caribou even through sensory disturbance from the mine meant that "the area of moderately high suitability (caribou) habitat decreases by 100% and the area of moderate suitability habitat decreases by 64.9% to 100% depending on the season" (Western Canadian Coal, 2005, pp. 10–91). While little high suitability habitat remained in the project area, the project was estimated to effectively eliminate what was left.

Mitigation measures specific to caribou vary depending on the kind of project, but often involve setting temporal or spatial boundaries: trying to reduce the project footprint in time, by avoiding construction during feeding and calving times or using sound-suppression techniques; and in space, by installing wildlife crossings or leaving a buffer between what are known or assumed to be caribou calving grounds, for example.

Do these mitigation measures work? Almost no peer-reviewed scientific research has attempted to evaluate the effectiveness of development mitigation measures for caribou. And none of this scant research evaluates the validity of claims made about mitigation measures during the EA process. What little work does exist in on the topic of mitigation shows that the effectiveness of mitigation strategies commonly proposed for caribou is largely unknown (Herrmann et al., 2014). Compounding this uncertainty about mitigation effectiveness is a well-known issue with EA: a lack of follow up. Specifically, government oversight of projects, to ensure mitigation measures are actually implemented, is lacking (O'Faircheallaigh, 2007). The BC Auditor General (2011, p. 6) reports that the BC EAO's oversight of certified projects is "not sufficient to ensure that potential significant adverse effects are avoided or mitigated." Meanwhile, downward trends in caribou populations suggest that mitigation measures are inadequate. Despite mitigation measures for oil and gas developments in Alberta, such as timing restrictions and temporary road closures, Hebblewhite (2017, p. 105) concludes "no mitigations prevented continued declines of Alberta's boreal caribou."

4.2 | Mitigation measures are insufficient, but the benefits outweigh the costs

In 8 of the 65 EAs examined, mitigation measures were deemed inadequate, with significant adverse effects for caribou, but these projects proceeded anyway, on the promise that their positive effects would outweigh the costs. Of these 8 EAs, 4 are provincial and 4 federal. Positive effects generally include jobs, tax revenues, and indirect economic benefits.

The recently approved Murray River Coal Project is a representative example of these 8 EAs. The impact statement for the project predicts significant negative effects for the endangered Quintette herd of the Central Group of Southern Mountain caribou, including habitat loss and alteration, noise disturbance, and vehicle collisions.

Catherine McKenna—Canada's Minister of Environment—concluded the project is likely to cause significant adverse environmental effects, even with mitigation. The case was referred to the Governor in Council, who concluded significant effects are "justified in the circumstances", that is the project is in the public interest because its benefits—jobs, tax revenue, and economic benefit—outweigh the costs (McKenna, 2017).

4.3 | Caribou are already gone and/or the land is already degraded

The final rationale for proceeding with major projects despite potential impacts to caribou was that the caribou habitat in the project area was already degraded and/or that caribou no longer live in the project area. This rationale was observed in 12 of the 65 EAs which predicted insignificant project impacts in part because caribou no longer use the area and/or the area is already considered degraded or disturbed. Eight of the EAs displaying this rationale were federal, and six were provincial. For example, the Lower Mattagami Hydro Complex redevelopment project, in Ontario, which underwent an EA from 2007 to 2010, involved constructing new and bigger generating stations along the Mattagami river, now all completed. A key concern was potential disturbances from construction and/or maintenance activities for caribou, particularly within their breeding and wintering ranges. But one of the key conclusions of the EA (SENES Consultants Limited, Hatch Energy, & Moose Cree Nation, 2009) was that the project area "does not contain prime woodland caribou habitat because it has been heavily disturbed (5–50); specifically, it "is not considered to be productive caribou habitat given the nearby presence of roadways and man-made structures... and extensive forest harvesting adjacent to Smoky Falls," one of the existing generating stations (6–63).

In four of these "already degraded" or "caribou not here anymore" cases analyzed, Indigenous peoples' testimony in the EA reported otherwise. In the Tazi Twé hydroelectric project documents, the Hatchet Lake Denesuline First Nation disputed that caribou are not found in the project area and expressed concern about the cumulative impacts on caribou populations (CEAA, 2015). Responding to the Midwest project, a uranium mine in Northern Saskatchewan, the Athabasca Denesuline of the Athabasca Regional Government, representing a range of First Nations in the area, officially contested the characterization of woodland caribou as absent, noting that the assessment was weak, based only on aerial survey; local elders and knowledge keepers said that the proposed project area is critical caribou habitat (Canada Nuclear Safety Commission, 2012, pp. 227–228). In the Joslyn North mine EA (Northern Alberta), the proponent did not assess impacts to caribou, citing both a lack of suitable habitat and a lack of caribou sightings. Although they eventually supported the project, the Fort McKay and the Metis Nation local # 63 asked for more assessment of the project because traditional knowledge shows caribou did use the area. For the same project, the Athabasca Chipewyan expressed concern about the lack of focus on recovery efforts (CEAA, 2011). Finally, in the Kami Ore case, the Innu-takuaikan Uashat mak Mani-utenam, the NunatuKavut Community Council, and the Naskapi Nation of Kawawachikamach expressed concern over the project's contribution to cumulative effects and its detraction from recovery of habitat. Regardless of there being no caribou at the time of these studies, they had concerns about the loss of productive and potentially viable habitat, and especially how the project would constrain caribou recovery efforts (CEAA, 2013).

5 | DISCUSSION

The results reported above indicate that EA as it is currently practiced in Canada and BC is not protecting caribou from further habitat and population loss. The EA dataset also shows the extensive effort involved in assessing, predicting, and attempting to mitigate and manage adverse effects from development: this study examined thousands of pages of documents written by consultants and government employees. These documents represent an involved process and a significant amount of labor time and use of financial resources. But this expenditure of time and resources occur alongside ongoing caribou declines. How can this be explained? A big part of the answer is that there are broader constraints currently operating within EA that keep it from achieving more effective caribou protection (see Figure 1).

The EAs in this paper's dataset are a microcosm of the tension embedded in the state to develop and protect, with continued emphasis on the former. "Public interest" is invoked as justification to proceed with projects, and is framed in relation to conventional measures of economic growth: jobs, government revenues, and economic activity. This economic imperative for development expressed in EA is, though, coupled with protection measures for caribou, like construction noise reduction, and buffer zones between projects and caribou calving grounds. But the lack of evidence about mitigation's efficacy, combined with cases in the dataset where development is approved even though mitigation is found to be inadequate, demonstrate how often the state's promoter role trumps its

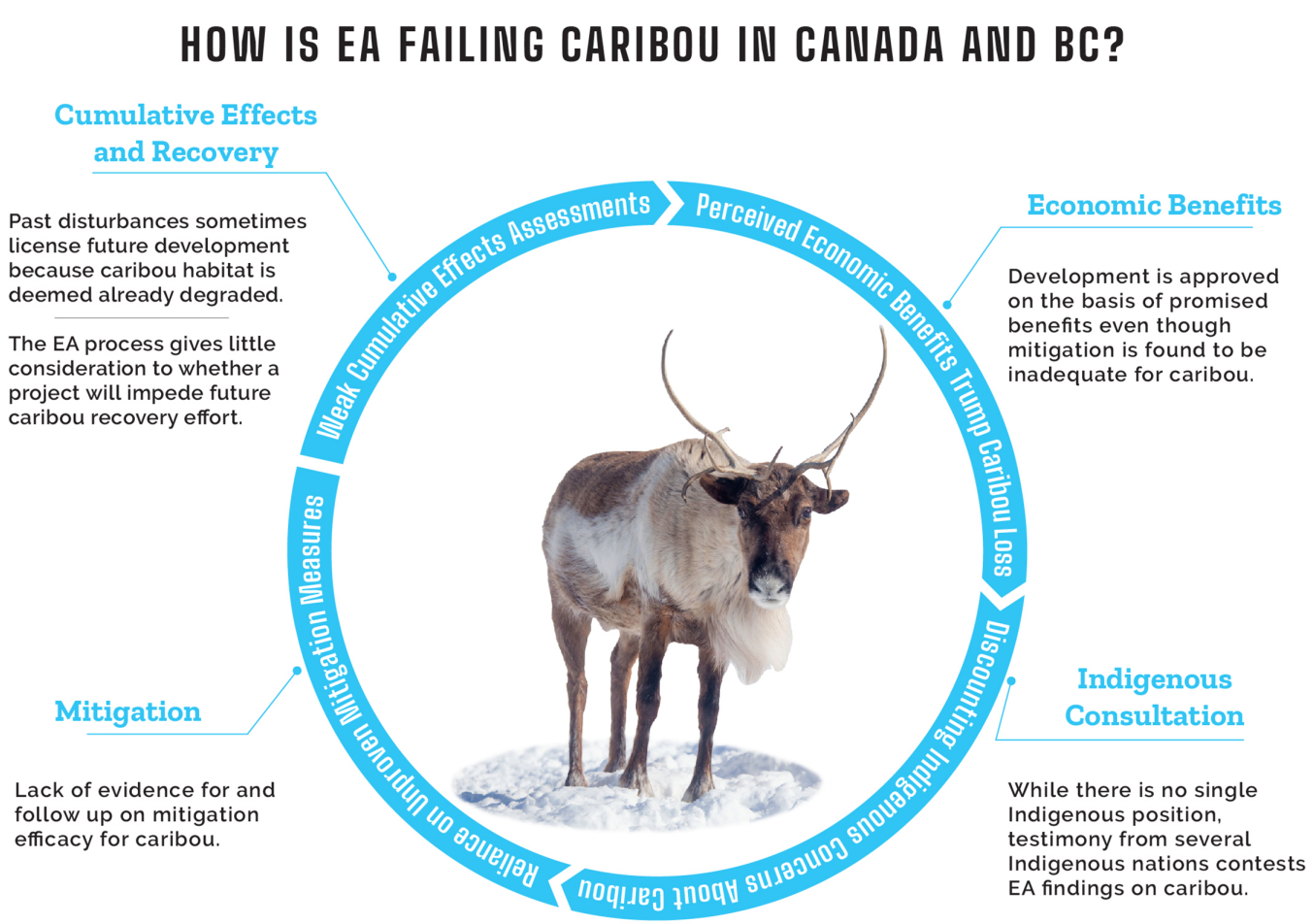

FIGURE 1 Key ways environmental assessment is failing to protect caribou. Graphic created by Hugo Tello

protector role. The findings of this paper therefore confirm existing political ecological studies that emphasize how economic growth remains the dominant priority of states, tasked with creating and maintaining conditions for capital accumulation (Hay, 1994; M'Gonigle & Takeda, 2013). In the case of caribou, this economic trumping can manifest in a "science policy gap" where state policy ignores scientific evidence, as others have identified (Hebblewhite et al., 2010; Parlee et al., 2018). But it can also manifest in a science-based process such as EA, where science is *enrolled* in legitimating developments.

For example, in several EAs examined here, science is used to determine that caribou are not present and/or that caribou habitat is already degraded as a result of previous industrial development. Proposed projects are thus found to have insignificant negative effects for caribou, because caribou are already gone, and the proposed project is in an area with already degraded habitat. But the new projects undoubtedly make recovery less likely, or at least push recovery efforts farther into the future. The EA process appears to give little consideration to whether a project will impede future recovery effort, even though this was explicitly raised as a goal and issue in some Indigenous submissions to the EA (as well as an explicit a goal of the federal SARA legislation).

This relates to a broader failure to adequately consider cumulative effects. The state requires assessment of project after project, causing enormous expense and time delays, but these projects are rarely assessed in relation to each other in space and time. That is, there is a widespread failure to meaningfully consider cumulative effects. As Sinclair et al. (2017, p. 192) conclude, "at a time when incisive assessment of cumulative effects is desperately needed to arrest the ongoing decline of ... ecosystems at large, CEA practice is woefully deficient or simply absent from contemporary decision-making on economic development." Other research concludes that cumulative effects on biodiversity are poorly addressed in Canada (Dibo, Noble, & Sánchez, 2018, p. 930) and elsewhere (Bigard, Pioch, & Thompson, 2017; Khera & Kumar, 2010; Mandelik, Dayan, & Feitelson, 2005). This study finds that even threatened, charismatic species like caribou are no exception. There is little evidence of

cumulative effects being considered in EAs with predicted negative effects for a threatened species. EA science employs a narrow temporal scope; it looks neither far into the past nor ahead into the future. Caribou are designated not-present by failing to consider past baselines, before other industrial disturbances displaced caribou and degraded their habitat. The failure to consider past baselines has effects that spill into the future, foreclosing possibilities of recovery.

The EAs also display disagreements over knowledge. While there is no single Indigenous position in these EAs, in several cases, Indigenous Nations' testimony pushes for a recognition of caribou presence, and the imperative to recover caribou. This knowledge of caribou presence, and these calls for recovery commitments to be upheld, are pushed aside or at best neutralized by promised mitigation measures in the EA process. (Governments can currently satisfy their constitutional duty to consult Indigenous Nations without securing Indigenous Nations' support for development.) The simultaneous inclusion and dismissal of Indigenous knowledge and claims is not a surprising finding given critiques of how Indigenous knowledge is extracted and also dismissed and suppressed in regulatory processes, western science, and the modern state (Cameron, 2012; Cruikshank, 2005; Hoogeveen, 2016; Song & M'Gonigle, 2001; Tester & Irniq, 2008). Specific to EA, scholars have highlighted the poor quality of expert assessment of social and cultural impacts for Indigenous people in EA (McCormack, 2016), and the fatigue that arises for Indigenous participants in an "extractive" consultation and assessment process seemingly designed to as quickly as possible secure consent or at least to create the semblance of legitimacy (Baker & Westman, 2018; Dokis, 2015).

Ultimately, scientific knowledge is privileged in the EA process and this tends to marshal support for development, even if Indigenous knowledge contests the science and the proposed development. As Song and M'Gonigle (2001, p. 987) note, building from the renowned scholar of science and technology, Sheila Jasanoff, "the use of science to reinforce the policies and agendas of the modern state tends to exclude cultures with different knowledge systems from participating and effectively challenging these ideas." This kind of inclusive-exclusion makes EA into a site of environmental injustice, in that it contravenes an increasingly important and accepted aspect of environmental justice—that of *recognition* of different ways of knowing and culture-nature cosmologies (Martin et al., 2013). More research is needed along these lines to understand how the state manages this tension between growth and protection by delegitimizing, or weakly including Indigenous knowledge: to what extent is the EA and the science it relies on, a site of producing *racialized* inequities?

6 | CONCLUSION: FROM CARIBOU TO CONSERVATION BIOLOGY

EA is meant to be a site where the state balances its obligations to promote economic development and to protect people and ecosystems. It is a paragon institution of liberal democracies, a site to achieve "win–win"—development and protection - or at least "win-almost win". Yet, in the case of caribou, and for biodiversity writ large (IPBES, 2019; IUCN, 2019), it seems the result is win-almost always lose. Species' downward trajectories suggest EA is not working to curb declines. This is not a new observation. There is a cottage industry of EA criticisms going back at least three decades or more when Hilborn and Walters (1981) called EA a form of "helicopter ecology." Recommended fixes include meaningful cumulative effects assessments, especially for biodiversity (e.g., Bigard et al., 2017). Why have these criticisms not translated into meaningful cumulative effects assessment, under governments of any political stripe?

Part of the answer, again, lies in the state, and its systemic preference for splintered, temporally-truncated assessments and weak inclusion–exclusion of Indigenous knowledges. Why this preference? For the most part, the state's "primary function... has been to provide the conditions for capitalist growth" (M'Gonigle & Takeda, 2013, p. 1,065). Or more bluntly, the "state has long been, and continues to be, the biggest developer around," and environmental law and policy be understood as a form of self-regulation in that the state will protect the environment but rarely if it impedes economic development (M'Gonigle & Takeda, 2013, p. 1,054). This is not simply because the state is captured by industry, although that can be the case. It is also because the state's very legitimacy rests on providing economic development, even if that growth erodes ecological conditions (O'Connor, 1988). And while states need to grow their economies to retain legitimacy, environmental crises like extinction do create legitimacy problems. So, as Hay (1994, 217) explains, the state tends to react to such environmental crises through a "complex repertoire of responsibility-and-crisis-displacement strategies" that allow the state to express what are arguably fundamental contradictions between capitalist growth and ecological health as less than fundamental. They address the problems on a case-by-case basis—through fragmented environmental laws and processes that *displace* the fundamental problem of relentless growth on a finite planet. EA is an example of such a displacement strategy, an approach that operates project by project, promising mitigation measures whose

effectiveness is unknown, while evading the broader structural problems.

What, then, are the possibilities for the *reform* of existing liberal institutions such as law, policies, EA, to truly protect biological diversity and promote ecological abundance? This question of reform versus radicalism is one axis of the ongoing debates about the future of conservation. Some promote the need for reform of capitalism and others find the growth imperative of capitalism incompatible with a diverse nonhuman earth (see Holmes, Sandbrook, & Fisher, 2017 for a parsing of these debates). Yet rarely centered in these debates is the problem of the contemporary state as "the biggest developer around." Meanwhile the state continues to deliver the resource approvals that erode habitat, again and again and again, while maintaining environmental legitimacy through strategies that fail to address the fundamental problems. The IPBES draft Global Assessment states that conservation and sustainability of biodiversity and ecosystem services may only "be achieved through transformative changes across economic, social, political and technological factors" (IPBES, 2019, p. 6). Analyzing EA opens a window into the need to think carefully about the limits and possibilities of not only capitalism, but also the state, in bringing forward such transformative changes.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTIONS

R.-C.C. and J.D. designed the study, drafted the manuscript, and contributed to the research. M.H. conducted the research and contributed to the study design and the text.

ETHICS STATEMENT

This study did not involve any experiments on animal or human subjects.

DATA ACCESSIBILITY STATEMENT

All data are accessible online at https://www.projects.eao.gov.bc.ca/ (BC EAs) and https://www.iaac-aeic.gc.ca/050/evaluations/index?culture=en-CA (Canadian EA registry).

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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