



## Discussion

## Potential pitfalls of private initiatives in conservation planning: A case study from Canada's boreal forest



Dennis L. Murray<sup>a,\*</sup>, Yasmine N. Majchrzak<sup>a,1</sup>, Michael J.L. Peers<sup>a</sup>, Morgan Wehtje<sup>a</sup>, Catarina Ferreira<sup>a,b</sup>, Rob S.A. Pickles<sup>a,c</sup>, Jeffrey R. Row<sup>d</sup>, Daniel H. Thornton<sup>c,e</sup>

<sup>a</sup> Department of Biology, Trent University, Peterborough, ON K9J 7B8, Canada

<sup>b</sup> UFZ – Helmholtz Centre for Environmental Research, Department of Conservation Biology, Leipzig, Germany

<sup>c</sup> Panthera, 8 West 40th Street, 18th Floor, New York, NY 10018, USA

<sup>d</sup> Environment and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada

<sup>e</sup> School of Environment, Washington State University, Pullman, WA, USA

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## ABSTRACT

Large-scale conservation planning entails the establishment of protected area networks that retain substantive natural habitat, biodiversity, and functional connectivity, but developing such networks at the spatial extent needed for meeting global targets involves considerable logistical, political, and social challenges. Normally, governments oversee development of protected area networks, but in the absence of political leadership private initiatives may offer a reasonable alternative approach in conservation planning. We review the Canadian Boreal Forest Agreement (CBFA), a private conservation planning initiative established by forestry companies and environmental organizations that suspends permitted logging activities on roughly 29 million hectares of boreal forest in Canada. The CBFA is touted as a milestone in conservation planning, multi-stakeholder cooperation, and woodland caribou conservation. Yet, the CBFA: 1) involves public land but excludes federal, provincial and aboriginal governments; 2) is not legally binding or necessarily transferrable upon sale of forest tenures; and 3) exempts industrial activities other than logging. Covering 4.6% of the boreal region of Canada, CBFA land tenures do not include most boreal ecozones and do not conform to standard guidelines for designing effective protected area networks. Further, the CBFA does not anticipate effects of climate change, which by 2080 likely will render land tenures unsuitable for caribou, the flagship species of the agreement. We conclude that private initiatives like the CBFA may constitute positive, initial steps toward large-scale conservation planning, but their successful integration into protected area networks will require scientifically robust and transparent efforts that are more fully coordinated with public initiatives.

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## 1. Introduction

There is mounting global interest in establishing protected area networks that span biomes, ecosystems, and political boundaries, to help ensure persistence of representative portions of natural areas and their biodiversity (Chape et al., 2003; Rodrigues et al., 2004). Currently, 12.7% of terrestrial areas worldwide are protected through parks or reserves that restrict human use and exploitation; the target for the year 2020 is protection of 17% of terrestrial areas (Convention on Biological Diversity, 2010). Normally, protected areas are established through government action, and when designed using established standards in conservation planning and accompanied by appropriate governance and management, such areas can contribute substantially to conservation

objectives (Bertzky et al., 2012). However, there are daunting challenges associated with establishing truly functional large-scale (i.e., spanning multiple political jurisdictions, biomes, or topographies) protected area networks; these challenges can include a lack of political will or support for such initiatives (Knorn et al., 2012; Brandt et al., 2015). Yet, the absence of political impetus and associated resources may be overcome, at least in part, by initiatives that are spearheaded by industry, land trusts, or other non-governmental entities that either own the land or else oversee its conservation and management.

Increasingly, private protected areas (PPA) are contributing to global conservation efforts; such areas occur on all continents and across a large variety of geographical regions and landscapes (Stolton et al., 2014). In principle, PPAs should adhere to established standards in conservation planning, including protecting natural landscapes with appropriate species composition, and having large size, low edge-to-area ratio, and high functional connectivity (Gaston et al., 2008; Watson et al., 2011). All PPAs should receive some form of legal protection and

\* Corresponding author.

E-mail address: [dennismurray@trentu.ca](mailto:dennismurray@trentu.ca) (D.L. Murray).

<sup>1</sup> Senior authorship jointly shared.

management oversight. As more PPAs are established each year, they may importantly complement traditional protected areas if their design and management conform to established standards and they are integrated into existing or planned networks (Holmes, 2013). However, because PPAs are characterized by a wide range of physical and ecological features and levels of protection, their individual contribution to conservation goals is inconsistent (Stolton et al., 2014). Accordingly, given challenges in meeting global protection targets via traditional parks and reserves alone, it is crucial to assess the potential importance of private initiatives in contributing to conservation targets and large-scale protected area networks.

### 1.1. The boreal forest of Canada

The present paper reviews the design and importance of a major private initiative, the Canadian Boreal Forest Agreement (CBFA), for protecting large portions of the boreal forest of Canada. The boreal forest is among the largest biomes in the world, and in Canada it spans from the Pacific and Atlantic oceans and encompasses most of the country's landmass, extending into Alaska and northern portions of the contiguous United States (Brandt, 2009). The Canadian boreal forest is unique in possessing large tracts of inaccessible forested land that remain undeveloped (Andrew et al., 2012). The boreal region also includes the largest concentration of freshwater lakes and wetlands in the world, and provides important ecosystem services through capture and storage of carbon and moisture (Brandt, 2009; Kurz et al., 2013). Thus, the boreal forest holds substantive natural value and should receive robust protection to ensure long-term environmental benefits.

The boreal forest region of Canada is becoming increasingly industrialized, with exploitation of wood, hydroelectric, mineral, and oil and gas resources being primarily located across the region. In Canada, most forested lands are 'crown lands', with public ownership and industrial activity being authorized through government approval under a land tenure system. Overall, 56% (234.5 million hectares) of Canada's forests are classified as commercial, with 28% being actively managed for timber extraction and roughly 0.5% being logged annually, mostly in the boreal region (Schindler and Lee, 2010). Increased industrial development may threaten the integrity of the boreal forest and species residing therein (Venier et al., 2014), especially given that the boreal forest is home to unique ecosystems and endemic plants and animals. For example, woodland caribou (*Rangifer tarandus*) are uniquely adapted to the boreal environment and require large tracts of undisturbed forest to meet their ecological needs; this makes caribou iconic of the boreal forest and indicators of a healthy ecosystem (Festa-Bianchet et al., 2011). Yet, woodland caribou have undergone extensive decline and range recession in the boreal region, largely due to direct and indirect effects of industrial activity, including logging (Schaefer, 2003). Currently, woodland caribou are of significant conservation concern in Canada (Festa-Bianchet et al., 2011; COSEWIC, 2014).

There is mounting interest in establishing sustainable industrial practices that will promote persistence of biodiversity and maintain essential ecosystem services in the boreal forest, while also allowing continued economic and social benefits to be derived. To date, this has been initiated through sustainable forest management and third-party wood certification, which allows certified products to be beneficially marketed; currently, many of Canada's forests are managed according to these guidelines (Natural Resources Canada, 2014). Yet, notwithstanding the broader importance of the forest industry to Canada's economy, the value of ecosystem services provided by the boreal forest outweighs those of its wood products (Schindler and Lee, 2010). Beyond industrial activity, there are additional threats facing the boreal forest, including climate change, which is predicted to impact the boreal region disproportionately relative to most terrestrial biomes (Meehl et al., 2007; Andrew et al., 2014). Climate change could transform the boreal forest at the regional or continental scale via increased temperatures and altered hydrological and geochemical cycles (Schindler and Lee,

2010; Price et al., 2013), and thereby surpass the impact from industrial development, which can be more localized. Therefore, sustainable industrial practices alone will not ensure persistence of the boreal forest, and related socioeconomic prosperity will depend on the effective forecasting of environmental changes in the region and corresponding adjustment and mitigation of human activity.

These concerns highlight the need for effective conservation planning in the boreal forest of Canada, including the development of a robust network of protected areas. However, the boreal forest is under-represented in protected area coverage compared to other biomes (Sala et al., 2000; Andrew et al., 2014), and currently only 8.1% of Canada's boreal region is protected via traditional parks and reserves (see Supplemental Information). This is below both national (e.g., 12% Environment Canada, 2006; 20% Canadian Boreal Initiative, 2003; 50% Canadian Boreal Initiative, 2005) and global (Brooks et al., 2004; Pouzols et al., 2014) conservation targets. Further, protected area planning for the boreal forest should follow established standards by retaining biodiversity and ecosystem functionality (Moffett and Sarkar, 2006; Gaston et al., 2008; Andrew et al., 2014), which could be a challenge given the spatial extent of the biome and the diversity of species and ecosystems therein.

## 2. Canadian Boreal Forest Agreement

The CBFA was established in 2010 by 21 member companies of the Forest Products Association of Canada (FPAC) and 9 environmental non-governmental organizations (NGOs) (full list of signatories available at <http://cbfa-efbc.ca/team/>; accessed June 1, 2015). The agreement recognizes that the ecological, economic and social values of Canada's boreal forest are best managed through sustainable development and cooperation between stakeholder groups. The CBFA suspends logging activity on roughly 29 million hectares of forest in exchange for cessation of ENGO-driven negative publicity and boycotts targeted at FPAC member companies. FPAC member companies also practice sustainable forest harvest on an additional 42 million hectares of forest. Specifically, the CBFA's strategic goals are to: 1) achieve sustainable forest management through ecosystem management, adaptive management, and third party certification; 2) implement a network of protected areas representing the diversity of ecosystems in the boreal region; 3) recover species at risk in the region, including woodland caribou; 4) reduce greenhouse gas emissions accrued through forestry practices; 5) improve prosperity for the Canadian forestry sector; and 6) provide recognition benefiting forest companies and their products (CBFA, 2010). Since establishment, some of these goals were accomplished (but see Pala, 2011; Gunn, 2013), and the CBFA has become recognized as perhaps the most extensive forest conservation agreement in the world and a model for stakeholder cooperation and sustainable forest management (see Pala, 2010; Dellasala et al., 2012; Reid, 2014).

Despite these laudable accomplishments, aspects of the CBFA beg closer attention. First, the agreement excludes federal, provincial and aboriginal governments even though most of the tenured area is publicly-owned. Governments having jurisdiction over CBFA lands ultimately are expected to turn CBFA land tenures into parks or reserves, but mechanisms for this transfer are not defined in the agreement and to date none have done so (Gunn, 2013). In fact, there remains disagreement among CBFA signatories on the extent of forest protection from the CBFA and allowable activity on some land parcels, leading some signatories to withdraw from the agreement (Pala, 2011). The exclusion of Aboriginal groups is especially problematic because many CBFA tenures overlap with their lands and some have requested that CBFA provisions be removed (Pala, 2011). In light of these problems, the absence of active involvement and oversight from governments is perplexing. Indeed, it is generally understood that government engagement in conservation planning can be crucial by establishing appropriate oversight and anticipating governance and legislative needs (Pressey and Bottrill, 2009).

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