

Special section: Protected areas and sustainable forest management in Canada

Introduction: Relationships Between Protected Areas and Sustainable Forest Management: Where are We Heading?

Yolanda F. Wiersma^{a,#}, Peter N. Duinker^b, Wolfgang Haider^c, Glen T. Hvenegaard^d,
and Fiona K.A. Schmiegelow^e

^aDepartment of Biology, Memorial University, St. John's, NL, Canada

^bSchool for Resource and Environmental Studies, Dalhousie University, Halifax, NS, Canada

^cSchool of Resource and Environmental Management, Simon Fraser University, Vancouver, BC, Canada

^dGeography and Environmental Studies, Augustana Campus, University of Alberta, Camrose, AB, Canada

^eNorthern Environmental and Conservation Sciences, University of Alberta, Edmonton, AB, Canada

[#]Corresponding author. E-mail: ywiersma@mun.ca

Abstract

The relationship between protected areas and forest management has been one that has often been fraught with conflict. New practices in the forest sector and new ecological insights have led more recently to better co-operation in some regions, although it is debatable to what extent cooperative approaches are desirable. In this introduction to the special section on the relationships between protected areas and sustainable forest management, we outline the history of the forestry and protected areas sectors in Canada, and the evolution of the relationships between them. We define key terms for the debate and offer a novel framework for understanding the relationship between the two sectors as management regimes that occur along parallel continua of sustainability. This framework is contrasted against real-world findings from across Canada, and with examples from elsewhere in the world.

Keywords: protected areas, sustainable forest management, sustainability, co-operation, Canada

INTRODUCTION

Conflicts over environmental and natural resource issues are rarely straightforward. With respect to forested landscapes, there have been debates worldwide about the use (i.e., harvest) vs conservation of forests (i.e., protected areas). Issues around forest management and forest harvest have been shown to arouse strong emotions (e.g., Buijs and Lawrence 2012). Emotions about an issue are grounded in values, and public values about forests range from anthropocentric (valuing

forests for what they can provide to humans) to biocentric (valuing forests for their intrinsic and non-material values) (Moyer et al. 2008; Wyatt et al. 2011). The range of values about, and preferences for, how forests should be managed can often create conflict. Miller et al. (2011: 948) characterise this conflict as “a strong protected areas approach (“nature protectionists”)... against more development-oriented conservationists”.

Despite its large expanses of forests, there are conflicts in Canada over the use and development vs protection of forested landscapes. Proponents of protected areas generally come more from urban centres and may be somewhat alienated from the forest industry (Bliss 2000). These individuals tend to have values that are more biocentric, while those in smaller, more remote, resource-based communities tend to have more anthropocentric values towards forests (Shin and Jackson 1997; Berninger et al. 2009). The divided opinions of the Canadian public with respect to forest management became highly visible during the clearcutting debates in the

Access this article online	
Quick Response Code:	Website: www.conservationandsociety.org
	DOI: 10.4103/0972-4923.161206

Pacific Northwest through the 1990s. In more recent years, environmental non-government organisations (ENGOS) nationally and internationally have focused attention on the boreal forest and called for increased protection of this region (e.g., Pew Environmental Group 2010; Badiou et al. 2013).

Conflict in environmental issues is often presented as something that needs to be resolved (Wallace and Hauffer 2006; Webb and Raffaelli 2008). However, Poncelet (2001) argues that a certain amount of conflict can be beneficial in helping to move environmental issues forward. Similarly, Van Huijstee et al. (2011) acknowledge that cooperation between environmental groups and industry can be challenging to undertake, and that may also have the result of requiring the ENGOS to compromise their position relative to their 'base', thus potentially inhibiting them from future support. Peterson et al. (2005) suggest that consensus approaches can privilege the existing power dynamics and compromise conservation values. A real-world illustration of the struggles that ENGOS have between conflict and compromise is Cartwright's (2003) reflection of the Ontario "Lands for Life" planning process, which aimed to resolve conflicts between the forest industry and conservation goals. Cartwright (2003) acknowledges that the ENGOS had to settle for less protected areas than they might have liked, but speculates that they likely gained more through cooperative engagement than they would have, had they behaved antagonistically towards the provincial government. Thus, there is uncertainty over how much co-operation vs how much conflict is helpful to move forward on a debate such as the one we present here open forest management vs protected areas.

In Canada there has been an attempt to move away from confrontation towards better co-operation between the various sectors with an interest in the boreal forest. For example, First Nations, industry, financial institutions, and ENGOS came together in 2003 to form the Canadian Boreal Forest Conservation Framework (for more details, see Carlson et al. This issue). In 2010, nine environmental groups and the Forest Products Association of Canada (FPAC) signed the Canadian Boreal Forest Agreement (CBFA) which set a common goal of increasing the protected areas landbase across the Canadian boreal zone (CBFA 2010). The process of negotiating and planning for protected areas and forest management practices that will promote sustainability is ongoing within the CBFA (for updates, please see the CBFA website www.canadianborealforestagreement.com), but has been viewed as a significant coming together of previously disparate groups (Paulsen 2010).

Despite progress in reconciling differences in forest valuation, and notwithstanding the fact that forest policies, practices, and regulations have undergone some significant changes in recent years, even today there is often tension in the relationship between protected areas and industrial forest management. For example, the CBFA has come under criticism by members of Aboriginal communities (Lee 2011; Smith This issue), and in late 2012, one of the signatories, Greenpeace Canada, left the CBFA citing frustration with the lack of

progress and claiming that one of the industrial partners had violated terms of the agreement (Jang 2012).

The debates and tensions between proponents of protected areas and forest management prompted the Sustainable Forest Management Network (SFMN) in Canada to call for a research project into studying the ways in which protected areas and sustainable forest management could interact more positively and productively on the landscape. We came together as members of the research team, representing different areas of expertise and academic backgrounds, to examine this issue in depth. One result of our work is this special section on the topic of the relationship between protected areas and sustainable forest management in Canada.

The purpose of this paper is to provide a brief outline of the Canadian situation with respect to protected areas and forest management. This paper serves as an introduction to this special section, which highlights different perspectives on this topic. Although the content of this special section is Canada-focused, there are similarities and differences between the Canadian situation and other parts of the world which may be informative. For example, the national sustainability strategy for Germany (*Perspektiven für Deutschland*) places an emphasis on intergenerational justice, which is a concept not as heavily emphasised in the 'three-pillar' or 'three-legged stool' (economic, ecological, and social sustainability) model commonly applied in North America (Brand 2009). Interestingly, the concept of intergenerational fairness and managing for 'seven generations' does figure prominently in First Nations' dialogue on resource management (see Smith This issue; Van Schie and Haider This issue). In Europe, there is also a larger emphasis on multiple use of forests, rather than the North American model of separation of land into parcels for extraction and conservation (Pröbstl et al. 2010). Conflicts over forest resources are also prevalent in the developing world; Szaro et al. (2000), however, suggest that the scientific capacity within these countries is not as strong as in the developed world. Despite differences in approaches and philosophies, it is hoped that this collection of papers can yield insights on the debates between how to improve the relationship between protected areas and sustainable forest management, both in Canada and in other parts of the world.

We begin by outlining our research methods and provide a brief history of the relationship between protected areas and sustainable forest management in Canada. We then follow with some definitions and an outline of our proposed framework, and provide an overview of the contents of this special section.

METHODS

The SFMN (1995-2010) was created as a Canadian Network of Centres of Excellence. Its main focus was on "discovering new solutions to some of the most perplexing challenges facing Canada's forests today..." (<http://www.sfmn.ales.ualberta.ca/>) and emphasis was placed on research that closely involved partners from across different elements of the forest sector (i.e., First Nations, government agencies, industry, ENGOS,

and academia). We came together as members of the research team, representing different areas of expertise and academic backgrounds, to examine this issue in depth. Our partners were involved in the project right from the proposal-writing stage, and were engaged in planning the research methods.

We quickly discovered that the issue was fraught with complications and that even among us, we had different ideas of what the relationship between protected areas and sustainable forest management could and should be. We spent the 2-year project consulting with project partners and practitioners across the country through workshops, conference calls, e-lectures and tele-roundtables. Thus our research method carries many of the hallmarks of the “scholarship of engagement” as outlined by Boyer (1996). Through the process we came up with a framework for the relationship between protected areas and sustainable forest management, including a set of working definitions (Duinker et al. 2010). We also discovered that despite having come to some consensus on certain aspects of the debate, there were differing perspectives within the different sectors, which our final report (Wiersma et al. 2010) did not capture. We also did not have time or space in our final report to delve into illustrative case studies in detail. Thus, this special section provides an opportunity for more detailed perspectives from different sectors, along with papers which illustrate cases which we feel have made progress in bridging the divide between protected areas and sustainable forest management.

PROTECTED AREAS AND SUSTAINABLE FOREST MANAGEMENT IN CANADA: A BRIEF HISTORY AND OVERVIEW

History and overview of forest management in Canada

Of Canada’s approximately 4.2 million sq. km of forested area, 2.4 million sq. km are considered suitable for commercial forestry, and within this, approximately 10,000 sq. km have recently been harvested each year (Drushka 2003). In the early twentieth century, sustained yield of timber was the declared mantra of commercial forestry. It meant at least two things—that timber was the central value for which forests would be managed, and that a steady supply of timber was to be sought (Drushka 2003). Sustained yield of timber was indeed incorporated into the forest statutes of many Canadian provinces, and has only recently started to fall away as a guiding tenet of modern forest management.

In the later decades of the twentieth century, Canadian forestry began to be practiced under the concept of “integrated management”—as in integrated resource management, or integrated forest management. This form of management implied that, on a landscape scale, the forest was to be managed for more than one value (e.g., timber, recreation, wildlife habitat, oil-and-gas extraction). The main themes were, first, how to get more from the landscape for the people interested in using it, and, second, how to allocate specific uses to specific times and locales within the forest. It was assumed that multiple

uses could co-exist, and that perhaps even optimal allocations of uses across the forest could be found.

The late 1980s witnessed a turning point in the paradigms guiding forest management. “Sustainable development” (Clark and Munn 1986; WCED 1987) became a kind of supermantra, and language specific to forests soon followed. While “ecosystem management” and “sustainable forestry” (e.g., Aplet et al. 1993; SAF Task Force 1993; Grumbine 1994; Maser 1994; Salwasser 1994) were more commonly used in the United States, “ecosystem-based management” and “sustainable forest management” (CCFM 1995; CSA 1996a, b) became the common appellations for a new approach to forest management in Canada (Duinker et al. 2003). The terms “ecosystem-based” and “ecosystem management” are applied to other forms of land and resource management beyond forests (Grumbine 1994). However, for the purposes of this discussion on forest management, we will take all four of these management labels when applied to timber-producing forests as roughly equivalent since they all reflect a desire for forest management that is more focused on broader ecological values and on timber harvest that does not jeopardise the long-term ecological integrity of ecosystems. For a more complete discussion of terms and definitions related to sustainable forestry, see the review by Hahn and Knoke (2010).

Sustainable forest management matured rapidly through the 1990s. The concept and the label were received warmly on many fronts, and at many levels. At the national scale, it was embraced in initiatives such as Canada’s Model Forest Program, the Canada Forest Accords and National Forest Strategies (CCFM 1992, 1998), the criteria and indicators of sustainable forest management (Duinker 2001; CCFM 2003), national state-of-the-forest reporting (Forestry Canada 1990, and annual reports since that first one), development of forest certification standards (e.g., CSA 1996a,b; FSC 2004), and creation of a university-based network of forest researchers (e.g., the SFMN, which sponsored our research). Most provinces jumped on board with profound changes to their forest management and policy regimes. For example, in 1994, the province of Ontario discarded its long outdated Crown Timber Act and brought in the Crown Forest Sustainability Act.

Some of the key attributes of sustainable forest management as it is currently practiced include more active participation and consultation with communities, partners, and stakeholders; explicit management for an array of forest values; and changes in forest practices with respect to harvest patterns, rotation times, and methods of reforestation and afforestation. This is by no means an exhaustive summary of what sustainable forest management is and can be. However, this summary should provide enough detail to set the stage against which the protected areas that also occupy the landscape can be contrasted.

History and overview of protected areas in Canada

Protected areas comprise approximately 7% of Canada’s terrestrial land (Table 1; most sites are in the IUCN Ib and II

Table 1
Protected areas (in hectares) in Canada, by IUCN categories and major agencies

IUCN category	Federal protected areas					Provincial and territorial protected areas	Other (e.g., private companies, NGOs, First Nation, etc.)
	A Parks Canada	B Environment Canada	C Department of Fisheries and Oceans	D Indian and Northern Affairs	Sum of federal protected areas (A+B+C+D)		
Ia		353,214			353,214	841,186	
Ib		10,071,162		5,374,675	15,445,837	16,383,533	
II	27,641,627	1,272,287			28,793,914	19,316,981	36,767
III		36,238			36,238	5,271,276	180,412
IV		123,571			123,571	1,550,174	14,668
V		2,350			2,350	825,952	
VI		19,224			19,224	2,526,192	2427
unclassified		0	863,723		863,723	1,603,207	540,017
Total	27,641,627	11,878,047	863,723	5,374,675	45,758,072	48,318,501	774,291

Note: This is intended as a summary. Values are calculated from “CARTS Report of Hectares of Protected Area in Canada”, Canadian Council on Ecological Areas (www.ccea.org/Downloads/en_carts_areachart.pdf). For a listing of protected areas by province, see www.ccea.org. Values have been rounded to the nearest hectare value

categories; Dearden and Dempsey 2004). There are various kinds of protected areas in Canada, reflecting a diversity of management goals, ecosystems, and levels of responsibility. These include, for example, ecological reserves, migratory bird sanctuaries, wilderness parks, and recreation areas. The IUCN Classification System provides a snapshot of the various types of protected areas, and the various categories are intended to reflect the management priority of a particular site. However, the classification system is not without controversy or confusion (see Dudley et al. 2010 for a review), as different jurisdictions apply different criteria for designation of one class over another, and the classes themselves do not depend on management effectiveness (CCEA 2008; Leroux et al. 2010; Muñoz and Hausner 2013).

Canada’s first national park was created in 1885 in the Bow Valley around Banff hot springs, and contributed to the development of the railway and expansion into the west. Early parks had a utilitarian focus—mainly in the form of promoting tourism (Campbell 2011a; Sandlos 2011), but also as areas where timber resources might be harvested in future. In the early years, Canada encouraged “the Doctrine of Usefulness” (Brown 1969) in which protected areas would be used to contribute to the national economy. Unlike in the US—where public pressure to keep the parks from being overdeveloped was much stronger—in Canada, the Parks Branch itself promoted development of tourism facilities (Sandlos 2011) and, in the early days, even felt that resource extraction could be an allowable activity (Turner and Rees 1973; McNamee 2008). In 1911, in response to the number and variety of new parks and lack of consistent management, the federal government established the Dominion Parks Branch; the world’s first national-level parks service (Campbell 2011b). Later, legislation and management policy (McNamee 2008) followed changing public attitudes about resource extraction in the national parks, and reduced or eliminated such activities.

Throughout the twentieth century, protected areas of most types have sought to balance, with varying degrees of

success, the dual mandate of its major priorities, those of protection of natural features and the provision of opportunities for recreational use and enjoyment. By the late 1980s, in legislation, policy, and management, ecological integrity and biodiversity conservation emerged as the highest priority for national parks. In 1992, the Canadian Parks and Wilderness Society successfully pressured the federal government to stop logging in Wood Buffalo National Park. Other categories of protected areas, however, continue to allow a diverse range of resource uses, e.g., dams, logging, and fishing. Starting in the 1980s, agreements were made with Aboriginal groups to manage some protected areas cooperatively, with the ability to continue traditional uses of resources (e.g., Ivvavik and Gwaii Haanas/South Moresby National Parks).

Tensions and drivers

Even though some types of protected areas continue to allow diverse types of resource uses and developments, there remains a widespread perception of parks as sacred spaces that are strictly for nature protection and which should not allow any type of human uses that may have adverse ecological effects (Dearden 1995; Locke and Dearden 2005). Threats within and outside boundaries of protected areas from tourism, human use, and resource development pressures have sparked conflicts and tensions between land managers (Miller et al. 2011). These tensions are not unique to Canada—debates over what protected areas should and should not be, and to what extent traditional livelihoods should be accommodated within the boundaries of newly established protected areas, occur worldwide (Adams and Hutton 2007; Buscher and Dressler 2007), and debates over natural resource management on public lands has echoes of the conservation vs preservation debates between John Muir and Gifford Pinchot in the United States (Turner and Rees 1973).

On one hand, proponents of protected areas are often sceptical of timber-production practices and view them

as threats to the integrity of sites with aesthetic, spiritual, recreational, and ecological values. Representatives of the forest-products industry, on the other hand, have tended to view protected areas as constraints to their operations and feel that they can conserve resources through careful management. However, a recognition that protected areas and sustainable forest management occur in proximity to each other and are ecologically linked has pushed forest and protected area managers to work more closely together. Other drivers that have pushed the two sides together include (but are not limited to) government policy (e.g., Parks Canada's requirement to engage with neighbouring land users such as forest managers as part of an ecosystem-based approach to conservation of natural resources within the park itself), international obligations (e.g., the Convention on Biological Diversity), management of species-at-risk, and social and economic pressure for the forest industry to be seen to be more "green" and more sensitive to the ecological impacts of their activities.

Ultimately, a limited landbase and the proximity of many protected areas to those with industrial and/or commercial forest harvest and management require managers of both types of land to engage with each other. Although Poncelet (2001) and Peterson et al. (2005) argue that too much conciliation between opposing camps can be counter-productive, our early consultations as part of this project indicated that there is a desire on all sides for improved relations. However, there is a great deal of uncertainty as how these two sectors could cooperate and collaborate. Part of this uncertainty appears to hinge on different understandings and of, values about the terms used in the debate. This uncertainty around terms with respect to forested areas is not unique to Canada; see Dudley and Philips (2006) and Dudley et al. (2010) for a discussion from a global perspective. Thus, a discussion of terminology is necessary.

DEFINITIONS

Early on in our research, we discovered that we could not effectively engage in discussions with researchers and practitioners across the different sectors of protected areas and forest management until we clarified terminology and came to an agreed-upon set of definitions. Details of these are summarised in this paper, and more details on how we arrived at these definitions can be found in Duinker et al. (2010). We asked all authors of papers in this special section to follow this set of terminology, or where they disagreed, to clarify points of difference.

We realised that values played a key role in people's perceptions of protected areas and sustainable forest management (Adams and Hutton 2007; Buscher and Dressler 2007). Both protected areas and sustainable forest management are value-laden concepts, but within each there are differences in how and why the concepts have values depending on the context and the individual. Similarities and differences between values for both also exist. Thus, to understand the conflict, it is first necessary to understand what is meant by the term "forest value".

With respect to forests, forest values can be broadly categorised as either "held values" (e.g., ethical principles, codes of conduct) or "assigned values" (e.g., relative worth, commercial value) (Rokeach 1973). More specifically, forest values can be categorised as material (including tangible economic and intangible life-support values) and non-material (including social/cultural, spiritual, ethical, and aesthetic values) (Moyer et al. 2008; Wyatt et al. 2011). We take a broad approach and define a forest value as a characteristic, component, or quality considered by someone to be important in relation to a specific forest area, based on the definition used by the Canadian Standards Association in its standard for sustainable forest management (CSA 2009). Thus, a forest value may be material (including "things", such as trees and wildlife, and "processes" such as carbon sequestration), or non-material (including "states" of a forest such as intactness or "quality" of experience for retreat and reflection). It can be difficult (but not impossible) to objectively measure all forest values (Moyer et al. 2008).

Throughout this paper and special section, we use the term "forest ecosystem". The term "ecosystem" has also been defined in the literature in numerous ways. For the purposes of this research, we define an ecosystem as a defined community of organisms interacting with each other and their non-living environment. Ecosystems exist across spatial extents, from the minute level of a water droplet to the entire biosphere. The scale of the ecosystem is based on the context of the functions and issues applied to it. In this special section, the use of the term "forest ecosystem" generally refers to a large geographic space—that is incorporating multiple forest stands within a larger landscape at the multiple-stand level, and across tens to hundreds of thousands of square kilometres.

For our purposes, we used the IUCN definition of a protected area, which states that it is: "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008). However, we acknowledge that there are areas that do not fit this definition that may hold similar biodiversity and protection values (for a more in-depth discussion, see Duinker et al. 2010). The dominant value (i.e., focus of management) in protected areas is assumed to be biodiversity, and management activities are focused within the boundaries of the protected area (which can include such entities as national and provincial parks, wilderness reserves, wildlife sanctuaries, and private land set aside under conservation easements). The management paradigm is nature protection.

One of the key hurdles that had to be overcome was the issue that a "protected area" refers to a place, and "sustainable forest management" refers to a practice or a process (Duinker et al. 2010). Thus, we decided that it was necessary to define the entity where forest management (mainly in the form of commercial harvest and related practices) takes place. The terms for such an area of land vary across the country, but include such entities as a forest management area (FMA) or a forest management unit (FMU), and can also refer to

forest concessions and woodlot operations. Unlike the term of the area of land under protection (“a protected area”), for which there exists a globally accepted definition (Dudley 2008; quoted above), there is no universal term for a parcel of land under forest management. We debated various terms (see Duinker et al. 2010 for details) but ultimately chose to label such an area a “timber-producing forest” and define it simply as an area of land where timber is cut and moved into the market for commercial use. The dominant management paradigm is sustainable forest management.

We also realised that the landscape was not a dichotomous division of protected areas and timber-producing forests. We recognise that there are other forms of resource activities in Canada (e.g., oil and gas development), but an examination of how these relate to the wider landscape was beyond the scope of this study. In addition, it is important to recognise that in Canada, there are large areas that are neither under formal protection nor under active resource management (Andrew et al. 2012), and yet they have the potential to play a key role in promoting forest values. The designation of parcels of lands as ‘non-harvestable areas’ (adapted from Huggard 2004) describes those pieces of the landscape which, while not falling under legislated protection, are not under active management for timber production (or any other resource) either. Non-harvestable areas may be portions of the forest that are left unharvested due to the presence of unmarketable tree species, unmerchantable wood (e.g., trees with a high proportion of rot or other internal defects), or unworkable ground (e.g., slopes, rocky terrain, wetlands). Some areas or trees may be left as intentional reserves or deferrals of commercial timber for possible future harvest. In such cases, the trees are (as yet) unharvested, but they are not designated as “non-harvestable” or off-limits in a permanent way.

A further term that requires some definition, as it recurs in many of the articles in this special section is the term “stakeholders”. The Oxford English Dictionary defines a stakeholder as “A person, company, etc., with a concern or... interest in ensuring the success of an organization, business, system, etc.” (OED online). In the context of forestry activities then, stakeholders might include employees of a forestry company, the government who has jurisdiction over the public lands which the company may be leasing (which is the common situation for forest harvest in Canada), or members of a local community with economic ties to the industry. It may also include members of the public who perceive that they may be negatively affected by forestry activities, e.g., the tourism/outfitting industry. The list of stakeholders with respect to protected areas may be very similar, and include those individuals and organisations that stand to be positively or negatively affected by the presence of a protected area. Stakeholders are a very real presence in many of the papers within this special section, but play different roles. For example, the timber company Daishowa-Marubeni International Ltd. (DMI) engages with local stakeholders to consult and inform about operations on their tenure, but the company has little influence on decisions outside their tenure

(Witiw and Wiersma This issue). Hvenegaard et al. (This issue) outline in detail how stakeholder involvement is explicitly part of the Model Forest Program in Canada, which was developed as a way to resolve conflict between different sectors with an interest in forestry issues. In the case of Prince Albert Model Forest, the list of stakeholders and the degree of involvement is quite extensive (Hvenegaard et al. This issue). Similarly, Carlson et al. (This issue) describe how the Boreal Leadership Council strives to be inclusive and includes representation from multiple stakeholders, including conservation groups, natural resource industry (forestry and energy), and financial institutions. In some cases, stakeholder involvement was not completely inclusive. Duinker et al. (This issue) describe how the Colin Stewart Forest Forum participants entered into a formal Memorandum of Understanding, and made a conscious decision not to expand participation to all potential stakeholders.

In Canada, First Nations do not consider themselves as “stakeholders” (Smith 1996; McGregor 2011) even though they may be identified as such in some of the articles in this special section. First Nations feel that they should deal with provincial and federal governments on a government-to-government basis given that they are the original occupants of the country. More detailed background on this perspective, including an overview of the role of the original Royal Proclamation of 1763 (which recognised Aboriginal occupancy), and the treaties entered into since, is given in the two articles with lead authorship by a representative of First Nations (Smith This issue; Van Schie and Haider This issue). Stronghill et al. (This issue) discuss the unique situation in British Columbia, where most First Nations have not entered into treaties. They contrast the role of First Nations in planning and establishment of conservancies (which was done on a government-to-government basis) with the more stakeholder-driven approach of Land and Resource Management Planning in the province (Stronghill et al. This issue). First Nations play a significant role in the Prince Albert Model Forest, and the Model Forest Program has helped to resolve conflicts between First Nations and protected areas agencies, empower and train First Nations forestry companies, and facilitate the creation of a cultural heritage site (Hvenegaard et al. This issue). In contrast, Duinker et al. (This issue) document why the Colin Stewart Forest Forum felt it was better to exclude participation from First Nations in Nova Scotia, since the provincial government was better positioned to carry out negotiations at this level. Their article (Duinker et al. This issue) does not record any responses from First Nations in Nova Scotia to this decision.

CONCEPTUAL FRAMEWORK

The history of the relationship between protected areas and forest management suggests that they embody distinct and mutually exclusive values and management strategies. Debates today still hinge on tensions between “strict preservationists” and “social conservationists” whose work is focused on balancing social and ecological sustainability through

conservation-oriented development activities (Miller et al. 2011). In the United States, the divide between preservation and conservation (the Muir-Pinchot debates) led to the creation of the US National Parks Service and the US Forest Service as distinct entities, with one focused on biodiversity conservation and the other on sustainable use of resources. Pinchot's work had a great deal of influence on early Canadian forest policy (Gillis and Roach 1986), and some scholars suggest that, as a result, there was not as much of a polarisation between protected areas and resource development in the early period of Canada's parks as there was in the United States, and that current conflicts in Canada are more recent (Turner and Rees 1973; Gillis and Roach 1986).

In reality, both protected areas and timber-producing forests exist to fulfil a multiplicity of values, many of which overlap. In addition, management paradigms of both types of areas have evolved and also the success of achieving values for both concepts have evolved through time to address changing demands from society. Management strategies and management effectiveness are not homogeneous across the country. Thus, rather than a polarised contrast between protected areas and timber-producing forests, we feel that it is more appropriate to view protected areas and timber-producing forests as existing together along a continuum of effectiveness at achieving multiple forest values. We shall discuss the multiple values and management effectiveness to illustrate our point.

Multiple forest values

Both legislated protected areas (as per the IUCN definition above) and forests managed for timber production under sustainable forest management are managed for a range of values, and some of these values (e.g., social values associated with recreation, cultural values associated with Aboriginal traditional uses) may overlap. In other words, a protected area may be managed for a range of values in addition to biodiversity protection (e.g., economic/tourism values, cultural values; Adams and Hutton 2007; Buscher and Dressler 2007), and sustainable management of timber-producing land may also contribute to non-timber values (e.g., biodiversity values, recreation values). For some users (e.g., berry harvesters, mountain bikers, ATV users), the distinction between the two types of areas may not be of concern, so long as there continue to be opportunities to engage in the desired activities. Some of these activities (e.g., mountain biking) may be prohibited and/or restricted in some (but not all) protected areas, and some may be less available in some timber-producing forests. The key difference in terms of management paradigms is that within most protected areas, the removal of large patches of forest overstory is generally prohibited, whereas it may be permitted in timber-producing forests.

Given the overlap in values between sustainably managed timber-producing forests and legislated protected areas, it is not surprising that some of the specific management activities may be identical and/or may overlap. Therefore, we feel it is

more appropriate to view protected areas and timber-producing forests as being along a continuum instead of as dichotomous. For example, trees may sometimes be removed from protected areas for public safety or habitat management. Parts of the timber-producing forest may be left unharvested to provide critical habitat for species-at-risk. Indeed, our third designation for land cover type (a "non-harvestable area") may bridge the perceived gap, and describes some of the middle ground of the continuum.

For example, some parts of a timber-producing forest may be explicitly designated as "non-harvestable areas" for ecological and/or other reasons, e.g., to protect non-timber values, or to render a forested landscape more similar to naturally disturbed areas (e.g., to retain residual structures, or to protect critical habitats, recreational values, Aboriginal sacred sites, and watersheds). These types of sites or areas are typically delineated in forest management plans; they are often designated with terms such as "areas of concern", and forest managers may face fines if they take timber out of such areas. However, these areas are not formally "protected" as per the IUCN definition (which refers to lands legally removed from the managed forest landbase), which is the primary reason we felt a third land-use designation was required.

In certain cases, the lines between protected areas and timber-producing forests become even more blurred, since the IUCN classification itself exists as a continuum of biodiversity protection and allowable uses. For example, IUCN Class V and VI protected areas (which fall under our chosen definition for protected area cited above) specifically allow for sustainable use of natural ecosystems (including sustainable timber harvest). In some Class VI protected areas, exploration and commercial extraction of resources are allowed as long as at least two-thirds of the area is in a natural condition, and the resource use is defined in legislation or in a management plan, and is carried out in a manner compatible with protection and maintenance of biodiversity (CCEA 2008). Canada contains very few Class V and VI protected areas (Table 1). In Europe, however, many more legislatively protected areas fall under Class V and VI, illustrating that the "protected area" and "timber-producing forest" are more explicitly integrated there than in Canada (Pröbstl et al. 2010).

Management effectiveness

Clearly defined criteria and indicators exist to identify how well timber-producing forests are meeting goals for sustainable forest management (e.g., CCFM 2003). Similar criteria have been documented for protected area effectiveness (Hockings et al. 2000). The purpose here is not to engage in a detailed discussion of criteria and indicators of management effectiveness for either protected areas or timber-producing forests. It is important, though, to emphasise that both entities are *managed* areas, and thus management effectiveness can be assessed. Figure 1 illustrates a simplified continuum of effectiveness of both protected areas and forest management.

When management effectiveness within protected areas and timber-producing forests is viewed in parallel (Figure 1),

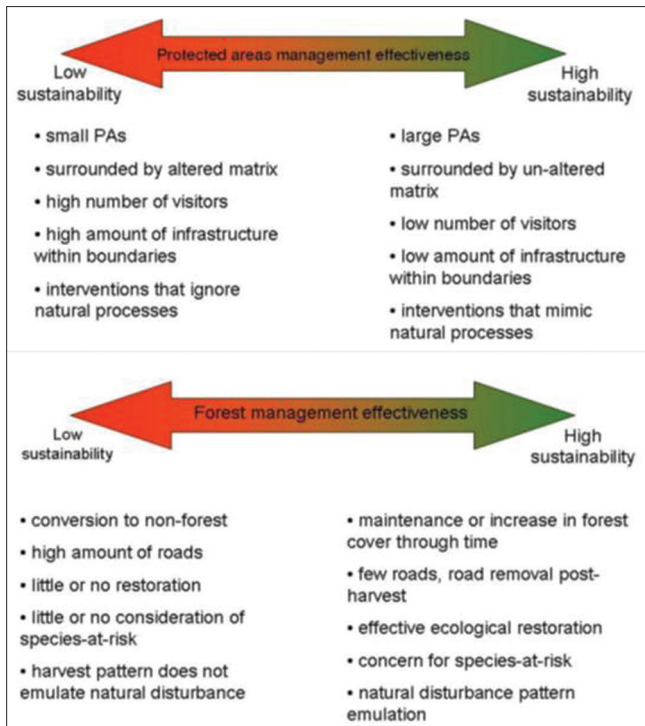


Figure 1

Two continua of effectiveness and ecological sustainability for protected areas and timber-producing forests respectively. Individual protected areas and forest tenures will fall at different places along these continua, depending on the management strategies applied within them. The criteria by which management effectiveness is evaluated are listed as examples; in reality the criteria for evaluating management effectiveness will have to be specific to particular ecosystems and contexts.

it is possible to envision cases where protected areas and timber-producing forests can at times complement each other. Where two adjacent parcels of land, one under formal protection and one under sustainable forest management, fall at similar points along the continuum of ecological integrity, conflict is predicted to be minimal. Where parcels are at opposite ends of the spectrum, increased conflict is expected.

OVERVIEW OF SPECIAL SECTION

The above description of protected areas and timber-producing forests as existing along a continuum and, in some cases, representing similar and/or overlapping values may be well and good in theory, but in reality, is it a practical and helpful framework? Is better collaboration possible (or even desirable)? We contend that it is. Part of the purpose of this special section is to highlight those cases in Canada where there has been a movement towards better collaboration between managers of protected areas and timber-producing forests. A more pressing question is whether lessons can be drawn from both successful and less-successful cases that can help move forward relationships in other parts of the country (and beyond) forward. To move forward effectively, it is necessary to take stock of the perspectives that all sectors have on the issue.

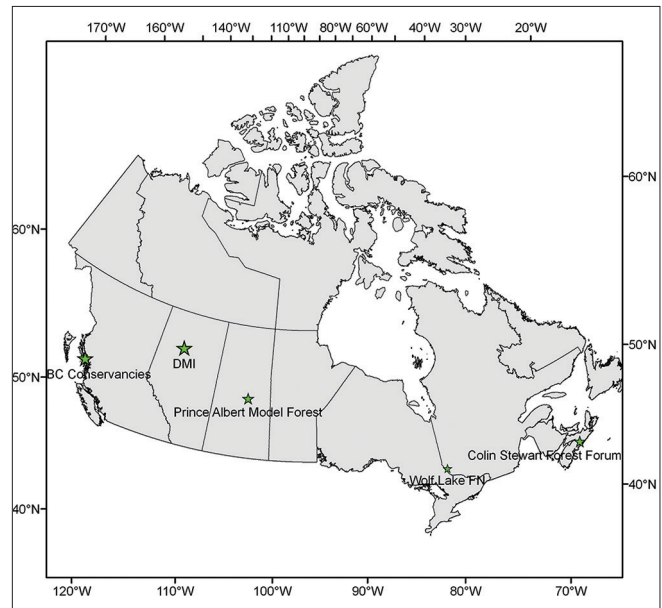


Figure 2

Locations of the 5 case studies outlined in this special section. They include the Colin Stewart Forest Forum in Nova Scotia (269,000 ha; see Duinker et al. This issue); the Wolf Lake First Nation (Rights Territory 18,056 sq. km; see Van Schie and Haider This issue); the Prince Albert Model Forest (367,000 ha; see Hvenegaard et al. This issue); Daishowa-Marubeni International Ltd. (2.67 million ha; see Witiw and Wiersma This issue); and the British Columbia Conservancies (659,808 ha; see Stronghill et al. This issue). Other papers in the special section outline broad Canada-wide perspectives and are not rooted in any specific location.

We have selected two types of papers for this special section. The first set of papers provides a broad-level perspective on the topic from the perspective of two different sectors—First Nations (Smith This issue) and environmental non-government organisations (Carlson et al. This issue). The second set of papers comprises 5 cases studies (see Figure 2 for their location) that differ in their geographic context, the lead sector, and in their spatial scale. These include the Colin Stewart Forest Forum (Duiker et al. This issue) which was a consortium of industry and ENGO groups; the Wolf Lake First Nation (Van Schie and Haider This issue), an Aboriginal community; Prince Albert Model Forest (Hvenegaard et al. This issue), which was initiated by the Federal government with multiple stakeholders as partners; DMI (Witiw and Wiersma This issue), a forest products company; and the British Columbia Conservancies (Stronghill et al. This issue), which was initiated by the provincial government working with First Nations.

The first question we attempt to address in this special section concerns forest values. We believe that the range of forest values is indeed wide, and that these values can be achieved through effective management of both protected areas and timber-producing forests. In addition, we contend that multiple (but not necessarily all) forest values can be achieved on any given parcel of forest land regardless of its designation or the primary management paradigm applied to it. However, not all sectors may agree with us. For example, Carlson et al.

(This issue) agree that there is a range of forest values to be conserved, but disagree that they can all be achieved regardless of the management paradigm applied. Rather, the Boreal Forest Conservation Framework which they outline (Carlson et al. This issue) seeks to balance competing values through a more balanced allocation of land devoted primarily to conservation through legislated protected area and to harvest.

Similarly, Duinker et al. (This issue) outline how the Colin Stewart Forest Forum developed mitigation strategies to ensure continuous wood supply despite the creation of new protected areas where harvest was restricted. One of their goals was that the “strategy would not diminish other forest values, such as biodiversity, across the broader landscape.” (Duinker et al. This issue). In the end, areas identified as having high conservation value turned out to be those with low conflict since they had low-value timber. Thus different values were largely segregated spatially, though multiple values were considered throughout the planning process. Of course, whether multiple values are achieved on a parcel of forest, as hypothesised earlier, depends partly on scale of investigation. One could argue that for both the Boreal Forest Conservation Framework and the Colin Stewart Forest Forum, multiple values *were* accommodated within a forested landscape on a wider spatial extent. Witiw and Wiersma (This issue) describe the forest planning process within the spatial bounds of a single forest-management unit under the operations of one company. Witiw and Wiersma (This issue) contend that in the DMI Peace River forest management plan, the end product reflects how management prescriptions applied within timber-producing forests and non-harvestable areas can capture values similar to those of legislated protected areas. One of the ways this is achieved at a wider landscape is through clearly defined high conservation forest areas that are set aside without harvesting timber, and thus multiple values are in fact realised across DMI’s tenure as a whole.

In contrast, Hvenegaard et al. (This issue) describe how the Prince Albert Model Forest explicitly sought to address multiple values on the landbase, and as a first step carried out research to quantify the different economic values of different types of forest use (Kulshreshtha et al. 1994; Kulshreshtha 1995; Loewen and Kulshreshtha 1995a,b; all cited in Hvenegaard et al. This issue). Stronghill et al. (This issue) describe an innovative approach in British Columbia, that of conservancies which were designed to accommodate a range of values, including sustainable use. They suggest that the Conservancies approach falls somewhere in the middle of the continuum we propose here—halfway between strict nature protection and exploitative timber extraction—and thus achieves a good balance between competing values. Similarly, Van Schie and Haider (This issue) describe a project from the Wolf Lake First Nation which seeks to create economic opportunities that are compatible with the community’s cultural and environmental values. The ability to achieve this balance among economic, cultural, and environmental values is seen as a key component of Aboriginal self-determination (Van Schie and Haider This issue; Smith This issue). However Smith (This

issue) feels there is still some distance to go in reconciling differences in valuation, and outlines how Aboriginal values are not always adequately addressed in conservation plans, even by ENGOs which purport to be sympathetic to the goals of First Nations. It is clear from this collection of papers that a discussion about forest values is important and is by no means fully resolved.

The second question that needs to be addressed to move forward on the relationship between protected areas and timber-producing forests is an assessment of whether there is broad-level agreement on the definitions and framework which we have outlined here, and indeed, whether such agreement is necessary. Some argue that mutual understanding of terms and concepts is important to help move debates forward (Casey 2007; Webb and Raffaelli 2008; Duinker et al. 2010) while others propose that a consensus approach can have unfavourable consequences (Poncelet 2001; Peterson et al. 2005). Other authors have suggested that there needs to be more acknowledgement of the role of emotions in environmental debates (Buijs and Lawrence 2012). Understanding of operational definitions can be important for previously conflicting groups (e.g., industry and environmental groups, provincial and Aboriginal governments) to start working together. We contend that where success in achieving improved relations between protected areas and sustainable forest management is evident, it has been in part due to the agreement and understanding of a common framework and set of terms. On the other hand, perhaps there are cases where parties have ‘agreed to disagree’ on terms and concepts, and yet still found a way to move forward. Or perhaps parties have come to an agreement on a framework and basic concepts that is quite different from that outlined here.

For other sectors, the definitions of terms as we have outlined them may be problematic and inconsistent with internal values and definitions. It is important to understand how and why definitions of terms vary within and between different sectors if we are to move forward. In this special section, several case studies outline how different sectors came together. In each paper, the authors highlight that coming to some kind of consensus on terms of reference, goals and objectives, and roles and responsibilities was critical. Hvenegaard et al. (This issue) outline the multi-phase process that was necessary to bring the Prince Albert Model Forest into being. Similarly Duinker et al. (This issue) emphasise that the development of a Memorandum of Understanding between parties was key to the success of the Colin Stewart Forest Forum. Carlson et al. (This issue) outline how the commitment for different groups to collaborate under the Boreal Forest Conservation Framework is articulated through a common vision and supporting principles.

In contrast, other papers in this special section highlight projects that have attempted to reconcile differences between protected areas and forest management goals but have not been fully successful, largely because a priori agreements were not achieved. Van Schie and Haider (This issue) highlight how the Wolf Lake First Nation’s project

on avoided deforestation and reforestation for carbon sequestration (and participation in carbon markets) may not succeed because of a lack of agreement between the First Nation and the provincial government. Similarly, Smith (This issue) outlines how consensus on issues between ENGOs and First Nations has not always been reflected in practice. Even if the attempts to bring parties together are not all completely successful, we feel there are still lessons to be learned from these instances.

Finally, it is important to discuss how to evaluate success. The forest industry has a set of criteria and indicators for sustainable forest management, but do these criteria fit with the criteria for success defined by representatives of protected areas? What about criteria for effectiveness of protected areas? Do they mesh with criteria for effective sustainable forest management? Finally, is it possible to conceptualise a common set of criteria and indicators for effective forest management that integrates management within and outside the boundaries of protected areas? If so, what would it look like, and how would the chains of responsibility for achieving specific objectives and criteria be allocated among the different players within a forested landscape? The concept of “whole landscape management”, which to date has been mostly applied to Europe (Macfarlane 2000; Dolman et al. 2001), may yield insights on ways to better integrate management and assessment on a wider forested landscape. Another strategy which merits further investigation is the concept of multi-tenure reserve networks which have been developed in Australia (e.g., Fitzsimons and Westcott 2008) and South Africa (e.g., Gallo et al. 2009).

Related to the question of how to evaluate success is an understanding of the future envisioned by different sectors. We envision a future where there is better integration between management of protected areas and timber-producing forests, but we have not articulated any specific details of what that future looks like. Is this future one where sustainable forest management of timber-producing forests is so effective at achieving a wide range of values, including biodiversity values, that formal protected areas are no longer necessary? Is it one where sustainably managed tracts of timber-producing forests can fall within IUCN designations? Is it one where the proportions of land allocated to protected areas, non-harvestable areas, and timber-producing forests is radically shifted from the current state? Or is the future more pessimistic and rather one where the relationship between timber-producing forests and protected areas has deteriorated from the current state? How does climate change affect forest management? In any of these potential cases or for futures that we have not yet envisioned, the questions to be addressed include how to achieve agreement on a desired future state, and the steps necessary to get there.

We have tried to move forward the discussion on these questions by asking the authors of this special section papers to grapple with some of the issues described in this article. That is, we have asked authors to speak from their positions on the issues of values, terms and framework, criteria for success, and future vision. It is our hope that lessons from these reflections

and case studies may help to improve the relationship between protected areas and sustainable forest management in Canada and possibly in other parts of the world.

ACKNOWLEDGEMENTS

We extend our sincere thanks to our project partners and workshop participants for their thoughtful discussions and insights throughout the life of this project. The opinions expressed in this article are those of the authors and do not necessarily reflect consensus amongst project partners or workshop participants. Funding was provided through a Sustainable Forest Management Network State of Knowledge grant to the coauthors. Thanks to Kim Lisgo, two anonymous reviewers, and editors for helpful comments on an earlier version of the manuscript. Yolanda F. Wiersma also thanks John Sandlos for historical insights, and Thomas Knoke and Andreas Hahn for additional global perspectives on the topic.

REFERENCES

- Adams, W.M. and J. Hutton. 2007. People, parks and poverty: political ecology and biodiversity conservation. *Conservation & Society* 5(2): 147–183.
- Andrew, M.E., M.A. Wulder, and N.C. Coops. 2012. Identification of de facto protected areas in boreal Canada. *Biological Conservation* 146(1): 97–107.
- Aplet, G.H., N. Johnson, J.T. Olson, and V.A. Sample (eds.). 1993. *Defining sustainable forestry*. Washington, DC: Island Press.
- Badiou, P., R. Baldwin, M. Carlson, M. Darveau, P. Drapeau, K. Gaston, J. Jacobs, et al. 2013. Conserving the world’s last great forest is possible: here’s how. *International Boreal Conservation Science Panel*. <http://borealscience.org/wp-content/uploads/2013/07/conserving-last-great-forests1.pdf>. Accessed on April 7, 2014.
- Berninger, K., D. Kneeshaw, and C. Messier. 2009. The role of cultural models in local perceptions of SFM – Differences and similarities of interest groups from three boreal regions. *Journal of Environmental Management* 90: 740–751.
- Bliss, J.C. 2000. Public perceptions of clearcutting. *Journal of Forestry* 98(12): 4–9.
- Boyer, E. 1996. The scholarship of engagement. *Journal of Public Outreach* 1(1): 11–20.
- Brand, F. 2009. Resilience and sustainable development: an ecological inquiry. Ph.D. thesis. Fakultät Wissenschaftszentrum Weihenstephan für Ernährung, Landnutzung und Umwelt, Technical University of Munich, Germany.
- Brown, R.C. 1969. The doctrine of usefulness: natural resource and national park policy in Canada. In: *The Canadian national parks: today and tomorrow* (eds. Nelson, J.G. and R.C. Scace). Pp. 94–110. Calgary, AB: University of Calgary Press.
- Buijs, A. and A. Larwence. 2012. Emotional conflicts in rational forestry: towards a research agenda for understanding emotions in environmental conflicts. *Forest Policy and Economics* 33: 104–111. <http://dx.doi.org/10.1016/j.forpol.2012.09.002>
- Buscher, B. and W. Dressler. 2007. Linking neoprotectionism and environmental governance: on the rapidly increasing tensions between actors in the environment-development nexus. *Conservation & Society* 5(4): 586–611.
- Campbell, C.E. 2011a. Governing a kingdom: Parks Canada, 1911–2011. In: *A century of Parks Canada, 1911-2011* (ed. Campbell, C.E.). Pp. 1–19. Calgary, AB: University of Calgary Press.
- Campbell, C.E. 2011b (ed.). *A century of Parks Canada, 1911-2011*. Calgary, AB: University of Calgary Press.
- Cartwright, J. 2003. Environmental groups, Ontario’s Lands for Life process

- and the Forest Accord. *Environmental Politics* 12(2): 115–132.
- Casey, K. 2007. Good faith in environmental alternative dispute resolution: When “any road” won’t do. *Environmental and Planning Law Journal* 24(5): 346–360.
- CBFA (The) Canadian Boreal Forest Agreement. 2010. *An historic agreement signifying a new era of joint leadership in the boreal forest. May 18, 2010*. <http://www.canadianborealforestagreement.com>. Accessed on December 9, 2010.
- CCEA (Canadian Council on Ecological Areas) 2008. *Canadian guidebook for the application of IUCN protected areas categories*. CCEA Occasional Paper No. 18. Canadian Council for Ecological Areas, CCEA Secretariat, Ottawa, ON. 66 pp.
- CCFM (Canadian Council of Forest Ministers) 1992. *Sustainable forests: a Canadian commitment*. National Forestry Strategy. Hull, QC: Canadian Council of Forest Ministers.
- CCFM (Canadian Council of Forest Ministers) 1995. *Defining sustainable forest management: a Canadian approach to criteria and indicators*. Ottawa, ON: Canadian Council of Forest Ministers.
- CCFM (Canadian Council of Forest Ministers) 1998. *Sustainable forests: a Canadian commitment*. Draft National Forestry Strategy. Hull, QC: Canadian Council of Forest Ministers.
- CCFM (Canadian Council of Forest Ministers) 2003. *Defining sustainable forest management in Canada: criteria and indicators 2003*. Ottawa, ON: Canadian Council of Forest Ministers.
- Clark, W.C. and R.E. Munn (eds.). 1986. *Sustainable development of the biosphere*. Cambridge: Cambridge University Press.
- CSA (Canadian Standards Association) 1996a. *A sustainable forest management system: guidance document*. CAN/CSA-Z808-96, Environmental Technology: A National Standard of Canada. Etobicoke, ON: Canadian Standards Association.
- CSA (Canadian Standards Association) 1996b. *A sustainable forest management system: specifications document*. CAN/CSA-Z809-96, Environmental Technology: A National Standard of Canada. Etobicoke, ON: Canadian Standards Association.
- CSA (Canadian Standards Association) 2009. *Sustainable forest management: requirements and guidance*. CAN/CSA-Z809-08. Mississauga, ON: Canadian Standards Association.
- Dearden, P. 1995. Park literacy and conservation. *Conservation Biology* 9(6): 1654–1656.
- Dearden, P. and J. Dempsey. 2004. Protected areas in Canada: decade of change. *The Canadian Geographer* 48(2): 225–239.
- Dolman, P.M., A. Lovett, T. O’Riordan, and D. Cobb. 2001. Designing whole landscapes. *Landscape Research* 26(4): 305–335.
- Drushka, K. 2003. *Canada’s forests: a history*. Forest History Society Issues Series, Forest History Society. Montreal and Kingston: McGill-Queen’s University Press.
- Dudley, N. (ed.). 2008. *Guidelines for applying protected area management categories*. Gland: IUCN.
- Dudley, N. and A. Philips. 2006. *Forests and protected areas: guidance on the use of the IUCN protected area management categories*. World Commission on Protected Areas, Best Practices Protected Areas Guidelines Series No. 12. IUCN – The World Conservation Union, Gland, CH.
- Dudley, N., J.D. Parrish, K.H. Redford, and S. Stolton. 2010. The revised IUCN protected area management categories: the debate and ways forward. *Oryx* 44(4): 485–490.
- Duinker, P.N. 2001. Criteria and indicators of sustainable forest management in Canada: progress and problems in integrating science and politics at the local level. In: *Criteria and indicators for sustainable forest management at the forest management unit level* (eds. Franc, A., O. Laroussinie and T. Karjalainen). Proceedings No. 38. Pp. 7–27. Joensuu, Finland: European Forest Institute.
- Duinker, P.N., G.Q. Bull, and B.A. Shindler. 2003. Sustainable forestry in Canada and the United States: developments and prospects. In: *Two paths toward sustainable forests: public values in Canada and the United States* (eds. Shindler, B.A., T.M. Beckley, and M.C. Finley). Pp. 35–59. Corvallis, OR: Oregon State University Press.
- Duinker, P.N., Y.F. Wiersma, W. Haider, G.T. Hvenegaard, and F.K.A. Schmiegelow. 2010. Toward terminological discipline for dialogues about protected areas and sustainable forest management. *The Forestry Chronicle* 86(2):173–177.
- Fitzsimons, J.A. and G. Westcott. 2008. The role of multi-tenure reserve networks in improving reserve design and connectivity. *Landscape and Urban Planning* 85(3–4): 163–173.
- Forestry Canada. 1990. *The state of forestry in Canada: 1990 report to parliament*. Ottawa, ON: Forestry Canada.
- (FSC) Forest Stewardship Council. 2004. *FSC principles and criteria of forest stewardship*. Forest Stewardship Council, FSC-STD-01-001.
- Gallo, J.A., L. Pasquini, B. Reyers, and R.M. Cowling. 2009. The role of private conservation areas in biodiversity representation and target achievement within the Little Karoo region, South Africa. *Biological Conservation* 142(2): 446–454.
- Gillis, R.P. and T.R. Roach. 1986. The American influence on conservation in Canada: 1899–1911. *Journal of Forest History* 30(4): 160–174.
- Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology* 8(1): 27–38.
- Hahn, W.A. and T. Knoke. 2010. Sustainable development and sustainable forestry: analogies, differences, and the role of flexibility. *European Journal of Forest Research* 129(5): 787–801.
- Hockings, M., S. Stolton, and N. Dudley. 2000. *Evaluating effectiveness: a framework for assessing the management of protected areas*. World Commission on Protected Areas Best Practice Protected Area Guidelines Series No. 6.
- Huggard, D. 2004. *Establishing representative ecosystems within a managed landscape: an approach to assessment of non-harvestable areas*. Sustainable Forest Management Network Report.
- Jang, B. 2012. Greenpeace and Resolute spar over logging practices. The Globe and Mail, December 6, 2012. <http://www.theglobeandmail.com/globe-investor/greenpeace-and-resolute-spar-over-logging-practices/article6026266/> Accessed on January 29, 2013.
- Lee, D. 2011. Windigo faces: environmental non-governmental organizations serving Canadian colonialism. *The Canadian Journal of Native Studies* 31(2): 133–153, 188.
- Leroux, S.J., M.A. Krawchuk, F. Schmiegelow, S.G. Cumming, K. Liso, L.G. Anderson, and M. Petkova. 2010. Global protected areas and IUCN designations: do the categories match the conditions? *Biological Conservation* 143(3): 609–616.
- Locke, H. and P. Dearden. 2005. Rethinking protected area categories and the new paradigm. *Environmental Conservation* 32(1): 1–10.
- Macfarlane, R. 2000. Achieving whole-landscape management across multiple land management units: a case study from the Lake District Environmentally Sensitive Area. *Landscape Research* 25(2): 229–254.
- Maser, C. 1994. *Sustainable forestry: philosophy, science, and economics*. Delray Beach, FL: St. Lucie Press.
- McGregor, D. 2011. Aboriginal/non-Aboriginal relations and sustainable forest management in Canada: the influence of the Royal Commission on Aboriginal peoples. *Journal of Environmental Management* 92(2): 300–310.
- McNamee, K. 2008. From wild places to endangered spaces: a history of Canada’s national parks. In: *Parks and protected areas in Canada: planning and management* (eds. Dearden, P. and R. Rollins). 3rd edition. Pp. 21–49. Don Mills, ON: Oxford University Press.
- Miller, T.R., B.A. Minter, and L.-C. Malan. 2011. The new conservation debate: the view from practical ethics. *Biological Conservation* 144(3): 948–957.
- Moyer, J.M., R.J. Owen, and P.N. Duinker. 2008. A forest-values framework for old growth. *The Open Forest Science Journal* 1: 27–36.
- Muñoz, L. and V.H. Hausner. 2013. What do the IUCN categories really

- protect? A case study of the alpine regions in Spain. *Sustainability* 5(6): 2367–2388.
- Paulsen, M. 2010. A détente in the boreal forest. *Pulp and Paper Canada* 111(11–12): 14–16.
- Peterson, M.N., M.J. Peterson, and T.R. Peterson. 2005. Conservation and the myth of consensus. *Conservation Biology* 19(3): 762–767.
- Pew Environmental Group. 2010. Boreal forest. http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Fact_Sheet/Boreal%20Forest%20Fact%20Sheet.pdf Accessed on January 29, 2013.
- Poncelet, E.C. 2001. “A kiss here and a kiss there”: conflict and collaboration in environmental partnerships. *Environmental Management* 27(1): 13–25.
- Pröbstl, U., M. Sowa, and W. Haider. 2010. *Sustainable forest management and protected areas: perspectives from Central Europe*. Supplement to: (Wiersma, Y.F., P.N. Duinker, W. Haider, G.T. Hvenegaard, F.K.A. Schmiegelow. 2010. Relationships between protected areas and sustainable forest management: many shades of green: A State of Knowledge Report). Edmonton, AB: Sustainable Forest Management Network. 23 pp.
- Rokeach, M. 1973. *The nature of human values*. New York, NY: Free Press.
- SAF (Society of American Foresters) Task Force. 1993. *Task force report on sustaining long-term forest health and productivity*. Bethesda, MD: Society of American Foresters.
- Salwasser, H. 1994. Ecosystem management: can it sustain diversity and productivity? *Journal of Forestry* 92(8): 6–7, 9–10.
- Sandlos, J. 2011. Nature’s playgrounds: The Parks Branch and tourism promotion in the national parks, 1911–1929. In: *A century of Parks Canada, 1911–2011* (ed. Campbell, C.E.). Pp. 53–78. Calgary, AB: University of Calgary Press.
- Shin, W.S. and R. Jaakson. 1997. Wilderness quality and visitors’ wilderness attitudes: management implications. *Environmental Management* 21(2): 225–232.
- Smith, P. 1996. Aboriginal participation in forest management: Not just another “stakeholder”. *Forestry Chronicle* 72(1): 2 and 5.
- Szaro, R.C., D. Langor, and A.M. Yapi. 2000. Sustainable forest management in the developing world: science challenges and contributions. *Landscape and Urban Planning* 47: 135–142.
- Turner, R.D. and W.E. Rees. 1973. A comparative study of parks policy in Canada and the United States. *Nature Canada* 2(1): 31–36.
- Van Huijstee, M., L. Pollock, P. Glasbergen, and P. Leroy. 2011. Challenges for NGOs partnering with corporations: WWF Netherlands and the Environmental Defense Fund. *Environmental Values* 20(1): 43–74.
- Wallace, G. and J. Haufler. 2006. Factors that influence successful collaborations between the forests products industry and environmental organizations. Final Report submitted to the American Forest and Paper Association and the National Council for Air and Stream Improvement. December 3, 2006.
- WCED (World Commission on Environment and Development). 1987. *Our common future*. Oxford: Oxford University Press.
- Webb, T.J. and D. Rafaelli. 2008. Conversations in conservation: revealing and dealing with language differences in environmental conflicts. *Journal of Applied Ecology* 45: 1198–1204.
- Wiersma, Y.F., P.N. Duinker, W. Haider, G.T. Hvenegaard, and F.K.A. Schmiegelow. 2010. *The relationship between protected areas and sustainable forest management: many shades of green*. A State of Knowledge Report. Sustainable Forest Management Network, Edmonton, AB. 58 pp.
- Wyatt, S., M.-H. Rousseau, S. Nadeau, N. Thiffault, and L. Guay. 2011. Social concerns, risk and the acceptability of forest vegetation management alternatives: insights for managers. *The Forestry Chronicle* 87(2): 274–289.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.