

1 **Protected Areas and Sustainable Forest Management: What Are We Talking About?**

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22 **Abstract**

23 Recent research investigating the relationship between protected areas and sustainable forest

24 management has revealed the need for clarity of language if cooperation is to move forward.

25 Here, we develop a parallel framework to compare the concepts of protected areas and

26 sustainable forest management. We address the challenge inherent in the concept of protected

27 areas as places and sustainable forest management as a process or paradigm. Our framework

28 outlines dominant values, management paradigms, and terms for the places managed under each

29 paradigm.

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31 **Keywords:** protected areas, sustainable forest management, terminology

32 **1. Introduction**

33 The Canadian forest industry has undergone dramatic changes in recent decades. An important
34 development has been the need for forest managers to actively engage with multiple sectors,
35 including managers of adjacent lands. Concurrent with the changes in the forest sector, the
36 amount of forest land set aside as formal protected areas has risen substantially, resulting in
37 increased engagement between managers and supporters of protected areas and forest managers.
38 This engagement has not always been positive (e.g., environmentalist blockages of logging roads
39 in the early 1990s), but given the shared and finite land base, forest managers and protected-area
40 managers are required to engage more and more with each other.

41 A need for a better understanding of the nature of the relationship between protected areas
42 and sustainable forest management led the Sustainable Forest Management Network (SFMN),
43 based at the University of Alberta, to support a two-year project to explore these relationships
44 (Wiersma et al. 2010). One of the main objectives of our study was to engage interested forest
45 stakeholders from across Canada to examine innovative approaches, within different knowledge
46 systems, toward understanding the relationships between protected areas and sustainable forest
47 management.

48 To this end, our project team met several times with various representatives of the
49 protected-area and sustainable-forest-management sectors across Canada during 2008. It soon
50 became clear that we could not talk effectively about issues in the relationship until we could
51 agree on what we were actually talking about. That is, we could only make conceptual progress if
52 we took a step back to clarify what we mean when we use terms such as ‘protected areas’ and
53 ‘sustainable forest management’. It was one thing to have SFMN partners articulate a need for

54 this clarification; it was quite another to delve deeply into these domains and be able to
55 understand what people meant when they used these and related terms in workshops, meetings
56 and documents. It became clear that it was even important for the five of us, coming from
57 different academic and professional-practice backgrounds, to discipline our own language as we
58 wrestled with difficult concepts and the even more complicated relationships among them.

59 Both the effectiveness and the efficiency of our conversations and writings on the
60 relationships between protected areas and sustainable forest management improved significantly
61 once we landed on agreeable definitions for our terms. The outcomes of our search for these
62 definitions are documented in the overall context of the findings of the project (Wiersma et al.
63 2010). Here, our objective is to amplify our definitional thought processes and further justify our
64 terminological choices. It is our hope that a careful documentation of how and why we arrived at
65 this particular set of definitions and concepts will lay the groundwork for broad-level agreement
66 on terms associated with protected areas and sustainable forest management so that attempts to
67 improve relationships between the two do not get bogged down in disagreement over what is
68 being talked about.

69

70 **2. Terms, Concepts and Clarifications**

71 A significant stumbling block to effective discussions on the relationship between protected areas
72 and sustainable forest management hinged on our early realization that protected areas are *places*
73 and sustainable forest management is a *process* or *approach* to, or *paradigm* for, management of
74 forest ecosystems. As we discussed this dichotomy, we realized that a key source of conflict was
75 the multiple values that people hold for forests. Much has been written about forest values (e.g.,

76 Tindall 2003; Kant 2007; Lantz 2008; Moyer et al. 2008) but among us we had rather different
77 ideas on what the term ‘forest value’ meant.

78 Forest values can be broadly categorized as either “held values” (e.g., ethical principles,
79 codes of conduct) or “assigned values” (e.g., relative worth, commercial value) (Rokeach 1973).
80 We chose to define a forest value broadly, as *a characteristic, component, or quality considered*
81 *by someone to be important in relation to a forest*. This definition is based on the definition used
82 by the Canadian Standards Association in its standard for sustainable forest management (CSA
83 2009).

84 Significant work in the social sciences focuses on categorizing and developing methods
85 for the valuation of both material (including economic and life-support values) and non-material
86 (including social/cultural, spiritual, ethical and aesthetic values) forest values (e.g., Reed and
87 Brown 2003; Tarrant et al. 2003; Tindall 2003; Lee and Kant 2006; Lantz 2008; Moyer et al.
88 2008). It is important to grapple with the issue of values, since understanding the myriad reasons
89 individuals have for valuing a forest is important for understanding people’s attitudes and
90 behaviours in relation to forest management and policy (Moyer et al. 2008).

91 Because we address forest values both within and outside the boundaries of protected
92 areas, we felt that a broad definition was a good approach. A narrower definition that placed
93 more emphasis on tangible values (e.g., value of timber products in the market) might place more
94 focus on the forest management side of the relationship. A definition emphasizing intangible
95 values might have skewed our perceptions towards the protected areas side of the relationship.
96 The danger of a broad, general definition, however, is that it loses meaning to individuals from
97 different sectors.

98 Our definition of forest value applies to the values ascribed to any particular forest
99 ecosystem, regardless of its designation. Thus, it became necessary to come to an agreement on
100 what we meant by the term ‘forest ecosystem’. The term ‘ecosystem’ has also been defined in the
101 literature in numerous ways. We applied an earlier, straightforward definition: *an ecosystem is a*
102 *defined community of organisms interacting with each other and their non-living environment*
103 (Tansley 1935). A forest ecosystem then, is any ecosystem dominated by forest cover. The
104 appropriateness of defined spatial boundaries of an ecosystem can only be judged in the context
105 of the specific functions for which the ecosystem has been delineated. In our case, the term
106 ecosystem is synonymous with ‘geographic space’ as defined by management boundaries.

107 In our discussions of the relationship between protected areas as places, and sustainable
108 forest management as a process or paradigm, it became clear that we needed a common
109 framework across which to compare the two concepts. If protected areas are places, what
110 management paradigm is applied to them? If sustainable forest management is a paradigm, what
111 do we call the places to which it is applied? We developed a parallel construct to describe the
112 dominant value, management paradigm and designation of the forested ecosystem to which the
113 paradigm is applied in both cases.

114 On the protected areas side of the relationship, we agreed that:

- 115 - the dominant value (focus of management) is *biodiversity*;
- 116 - the management paradigm is *nature protection*; and
- 117 - the ecosystem to which the management for biodiversity is applied is a *protected area*.

118 On the sustainable forest management side of the relationship, we agreed that:

- 119 - the dominant value (focus of management) is *timber*;

- 120 - the management paradigm is *sustainable forest management*; and
- 121 - the ecosystem to which management for timber is applied is a *timber-producing forest*.

122 Below we justify each choice and explain briefly the implications of adopting these definitions.

123 In proposing these definitions for discussing the relationship between protected areas and
124 sustainable forest management, we are mindful of the Canadian context. In other countries, the
125 definitions may need to be adapted to reflect locally and culturally sensitive interpretations of the
126 same words.

127

128 **2.1 Terms Related to Protected Areas**

129 **2.1.1 Dominant Value: Biodiversity**

130 Biodiversity is defined by the Canadian Biodiversity Strategy as “the variability among living
131 organisms from all sources, including inter alia, terrestrial, marine, and other aquatic ecosystems
132 and the ecological complexes of which they are part; this includes diversity within species,
133 between species and of ecosystems” (Canadian Biodiversity Strategy 1995). Protected areas in
134 Canada exist to conserve a range of values, but it is fair to say that most are dedicated, in one
135 way another, to the conservation of native biodiversity. Of course, other ecosystem components
136 are also important in nature protection. We could include here, for example, conservation of
137 ecosystem condition and productivity, soil, water, global ecological cycles such as the carbon
138 cycle, and commemorative/heritage values. As well, many protected areas in Canada have
139 explicit tourism, recreation, aesthetic and educational values. When we say ‘dominant value’, we
140 do not mean only value; we mean the value that trumps all or most others when there are value
141 conflicts. This is inherent in the new IUCN definition of protected areas (Dudley 2008), which

142 implies that if there is a conflict between conserving biodiversity and maintaining recreational
143 opportunities, biodiversity rules.

144

145 **2.1.2 Management Paradigm: Nature Protection**

146 For our purposes, nature protection is taken to mean, at the highest level, delineation of specific
147 ecosystems where biodiversity values are to be protected from various threats. Doing this usually
148 entails prohibiting the occurrence of industrial activities such as commercial logging, mining,
149 and hydroelectric development, and regulating other activities such as hunting and recreational
150 use. Similar terms that are found in the literature include ‘ecosystem conservation’ (e.g., Noss
151 1996), or ‘nature conservation’ (e.g., Lambeck 1997), or even ‘ecosystem management’ (e.g.,
152 Grumbine 1994). The term ‘nature protection’, although general, has some useful currency
153 around the world. We have also deliberately chosen not to use the term ‘preservation’, since it
154 implies preservation of a static state, which is not an appropriate paradigm for dynamic entities
155 such as ecosystems. The reason we are not calling this ‘ecosystem management’, even if it is, is
156 that, in the literature (e.g., Grumbine 1994; Duinker et al. 2003), the term has come to mean
157 ecologically sensitive management of any kind of ecosystem, whether ‘protected’ or not.

158

159 **2.1.3 Ecosystem Designation: Protected Area**

160 Sufficient for our purposes here is the IUCN definition for protected area: “A clearly defined
161 geographical space, recognised, dedicated and managed, through legal or other effective means,
162 to achieve the long-term conservation of nature with associated ecosystem services and cultural
163 values” (Dudley 2008). This definition provides a wide range of latitude in considering forms

164 and degrees of nature conservation in protected areas, and also their spatial extents. In Canada,
165 protected areas include national and provincial parks, wilderness and ecological reserves, and
166 wildlife sanctuaries, among others. The IUCN categories (I-VI) are intended to describe the
167 degree of importance of biodiversity values against other values and the level of legislation and
168 extent of regulatory restrictions. However, IUCN categories have been shown not to reflect
169 accurately the degree of human impacts (Leroux et al. in press), nor does assignment to a
170 particular category require any evaluation of management effectiveness (CCEA 2008).

171 A key question in our deliberations was whether trees can be cut in protected areas. The
172 fact is that they are - consider the commercial thinning happening in Jasper National Park of
173 Canada to reduce fire risks near infrastructure such as buildings, the cutting of dead and dying
174 hemlock trees in and near campgrounds in Kejimikujik National Park of Canada to enhance
175 public safety and aesthetics, and domestic timber cutting for subsistence use that continues in
176 Gros Morne National Park of Canada. None of these timber-harvest activities is for commercial
177 purposes but rather for the primary purpose of protecting/conserving ecological and socio-
178 cultural values. If the cut trees are actually moved into markets, this should be viewed as
179 incidental and may just reflect prudence in trying to recover the costs of cutting the trees.

180

181 **2.2 Terms Related to Sustainable Forest Management**

182 **2.2.1 Dominant Value: Timber**

183 Timber requires a general definition for our purposes here. We mean woody materials, for
184 example, logs, branches, tree tops that make their way into a wide range of products such as pulp,
185 paper, solid wood, panels, and energy materials such as stove wood, pellets, and other biomass

186 fuels. We also mean timber in the commercial sense – we are not referring to subsistence cuts of
187 small amounts of building materials or firewood.

188 About 230 million hectares of forest land in Canada, in both public and private
189 ownerships, in both large forest-management units and in small woodlots, is subject to industrial
190 logging (Drushka 2003; Natural Resources Canada 2007). Activities around industrial forests can
191 include road building, tree cutting, scarification, planting and thinning, with the primary purpose
192 of these activities centred on the growth and harvest of timber for industrial processing into
193 lumber, panels, pulp/paper, and energy materials. As with protected areas, there may be
194 additional, non-timber values in place (e.g., recreation, hunting/fishing access, berry picking), but
195 the dominant value in industrial forests is the economic value of the timber to be extracted.

196

197 **2.2.2 Management Paradigm: Sustainable Forest Management**

198 We have adopted the CSA (2009) definition of sustainable forest management as management
199 “to maintain and enhance the long-term health of forest ecosystems, while providing ecological,
200 economic, social, and cultural opportunities for the benefit of present and future generations”.

201 The definition does not imply that timber harvest is a pre-condition of sustainable forest
202 management, and could just as easily apply to the management of forested protected areas.

203 However, the concept was initially adopted in the context of timber production and the paradigm
204 evolved as a way to make management for timber more sensitive to protection or conservation of
205 a wider range of non-timber forest values (Drushka 2003).

206 Again we could have used the term ‘ecosystem management’ (*sensu* Grumbine 1994),
207 since the main principles of ecosystem management are also the main principles of sustainable

208 forest management (Duinker et al. 2003; Butler and Koontz 2005; Keough and Blahna 2006).
209 Thus, sustainable forest management can be viewed as ecosystem management applied to forests.
210 However, because ecosystem management can apply to ecosystems other than forests, and
211 because it is also a term that (in Canada at least) has been adopted within protected areas
212 management, we chose not to use the term here for fear of complicating the discussion.

213

214 **2.2.3 Ecosystem Designation: Timber-Producing Forest**

215 We could find no unambiguous and commonly used term in the literature to describe the
216 designation of lands where timber is harvested for industrial use. The term ‘industrial forests’ did
217 not seem applicable in the case of smaller-scale woodlots, and also might imply unsustainable
218 management for some people. We considered ‘working forest’, but asked “‘working for whom?’”
219 and decided that such a question implied multiple interpretations. We chose to use ‘timber-
220 producing forest’, even if not particularly creative, because it clearly describes the primary
221 activity on such parcels of land. In forests under this designation, timber is cut and moved into
222 the market for commercial use. This is in contrast to land under the protected areas designation,
223 where trees may occasionally be cut for reasons of public safety or ecological management, but
224 the main focus is not on timber harvest for markets.

225 Nonetheless, it is critical to remember that this designation does not mean that every tree-
226 covered hectare can or will experience harvest. On specific sites or areas within a timber-
227 producing forest, trees will not be harvested for a number of reasons including, non-commercial
228 tree species, unworkable ground (e.g., slopes, wetlands), or intentional bypass of commercial
229 timber to protect non-timber values (e.g., critical habitats, culturally significant sites). For our

230 purposes, we have chosen to call these areas ‘non-harvestable areas’ (Huggard 2004; Wiersma et
231 al. 2009).

232 Our conceptualization of protected areas, timber-producing forests, and non-harvestable
233 areas (detailed in Wiersma et al. 2010) mimics to some extent the TRIAD framework. The
234 TRIAD approach divides the land base into three zones: protected areas, intensive forestry and
235 extensive forestry that emulates natural disturbance (Seymour and Hunter 1992; Messier and
236 Kneeshaw 1999). However, the traditional TRIAD model implies that these are three distinct
237 categories. Our thinking has evolved to a view that all of these are managed areas, but with
238 different values driving the management paradigm (see also Hunter and Schmiegelow 2010). As
239 such, each can be viewed along a continuum of management effectiveness (Wiersma et al. 2010).

240 Thus, we envision possible scenarios where a timber-producing forest under carefully
241 implemented sustainable forest management could actually do more to conserve biodiversity than
242 a poorly managed protected area. Where management effectiveness in the different designations
243 falls along the same point in the continuum, we predict minimal conflict and maximum
244 synergies. Where effectiveness is at opposite ends of the spectrum, we envision the conflict
245 between protected areas and timber-producing forests to be greatest (Wiersma et al. 2010).

246 Consideration of IUCN categories also supports a continuum model rather than a discrete
247 zonation, strictly applied. There are examples of Category V and VI protected areas in Europe
248 where management paradigms promote multiple forest values, and where timber values are
249 realized on the same plot of land as certain biodiversity values (Pröbstl et al. 2009). So far in
250 Canada, only small amounts of forest land are designated as Category V or VI. However, if the
251 dialogue between managers of protected areas and timber-producing forests continues in a

252 positive direction, it is possible to envision additional protected areas in Canada that follow the
253 European models of Category V and VI areas.

254

255 **3. Conclusions**

256 As a signatory to several international conservation and environmental conventions, and as a
257 country with abundant forest ecosystems, Canada is obligated to manage its forests sustainably
258 and for a range of values. Most Canadian provinces/territories have pledged to increase the
259 amount of land under formal protected-area designation. At the same time, economic
260 development, particularly in rural/hinterland communities, will continue to be of importance.

261 Thus, continued dialogue between representatives of the protected-area and sustainable-
262 forest-management sectors will be important. Relationships between the two can no longer be
263 hostile or indifferent. In some cases, productive relationships have been established (see case
264 studies highlighted in Wiersma et al. 2010), but much more remains to be done. One step toward
265 better integration between the two entities is a common language and framework for discussion.
266 Our two years of research and debate on the issue emphasized the importance of (and difficulty
267 of achieving!) a common understanding of terms and a mutually agreeable framework. We hope
268 that the terms and concepts outlined here will provide a productive starting point to allow
269 representatives from both sides to talk more effectively to each other and move towards better
270 relations.

271 **4. Acknowledgements**

272

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275

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277

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