

Identifying specific indicators of sustainable forest management

R.A. LAUTENSCHLAGER*

INTRODUCTION

The foundation of sustainable forest management (SFM) is the *integration* of social and ecological concerns and knowledge (“specifics”) to direct management *at that time*. The Canadian Council of Forest Ministers has provided a “criteria and indicators” framework for SFM; however, the criteria and critical elements identified lack integration and seem most appropriate at broad scales. Natural resource managers, environmental interest groups, and public agencies need identifiable, measurable indicators of SFM that are integrated and appropriate at broad scales, as well as at a variety of finer scales. Previously, I have argued that if we hope to contribute to responsible natural resource use and address the most pressing environmental concerns, we must *identify the specifics*. That is, we must identify the specific environmental resource issues, which most commonly include:

- resources of concern;
- management practices that cause concern(s); or
- ecosystems in which resources and management practices are a concern (Lautenschlager 1996, 1998).

In addition, I have proposed that local (ecodistrict or smaller) “experts” could help by developing an integrated set of local natural resource concerns (social/ecological) associated with management practices and ecosystems to form a concern matrix.

THE “IDENTIFY-THE-SPECIFICS” APPROACH

Identifying what to monitor when assessing sustainability was easier when management favoured one or a few animal or plant species over a limited area. Contemporary calls to integrate and manage for several, if not all, environmental components, across scales, makes identifying where to start dramatically more difficult. Various, primarily, science-driven approaches have been proposed (Lautenschlager 1998), but few have been tested (Harms 1994). The identify-the-specifics approach:

- relies on, and seeks to integrate, local knowledge through broad-scale social or ecological “experts” (e.g., naturalists, natives, hunters, politicians, trappers, foresters, and the interested public) to establish the environmental base;
- starts from the premise that most environmental concerns are associated with concerns about specific management practices; and

CITATION —

Lautenschlager, R.A. 2000. Identifying specific indicators of sustainable forest management. *In* Proceedings, From science to management and back: a science forum for southern interior ecosystems of British Columbia. C. Hollstedt, K. Sutherland, and T. Innes (editors). Southern Interior Forest Extension and Research Partnership, Kamloops, B.C., pp. 7–9.

- leads to the development of concern matrices that identify and prioritize concerns at local and increasingly broader scales.

Local “experts” with experiential (social and ecological) knowledge and environmental interests, who represent ecosections, ecodistricts, or ecoregions (depending on the detail required), start this process by identifying and prioritizing the following local concerns.

1. Resource(s): Often a species or species group (guild), but may include biotic community, abiotic components (water, aggregates, etc.), biotic or abiotic processes, and cultural or spiritual values. Not required, but potentially helpful, would be specific resource concerns. These are commonly related to reduced abundance or reproductive output, but could include an ecological process or general concern.
2. Management: The management associated with the specific resource of concern (e.g., fire suppression, hunting, a silvicultural system, etc.), or an environmental change(s) caused by this management.
3. Ecosystem: In what ecosystem(s) is management commonly affecting this resource (e.g., riparian zones, high-elevation spruce/fir forests, etc.).

To date, experts who have participated in this exercise prefer to present generalities as opposed to specifics; however, when directed, valuable specifics were identified (Lautenschlager et al. 2000). The value of the “specifics” approach is enhanced when experts identify, and then collectively prioritize, specifics. (Although getting “experts” to agree on priorities may not be easy, consensus should be sought.)

Reviews, additions, and adjustments at each scale are based on input from knowledgeable experts from the next broader scale (ecoregion, ecozone, etc.) who have an altruistic interest in the long-term sustainability of natural resources throughout the area of interest. Including an appropriate mix of experts in discussions at all scales should ensure that both the public and political leaders accept the legitimacy and value of the priorities (indicators) identified. In addition, natural resource management agencies must truly consider the “greater good” rather than short-term economic and special-use interests. Priorities and measures of sustainability at every scale are based on feedback from the scale above. This includes recognized commonalities in resources, management practices, and ecosystems of concern from the ranked priority matrices of the scales in question.

As local concern matrices are built and adjusted, it may become obvious that specific resource concerns, or groups of concerns, are consistently associated with specific management practices or ecosystem types across a large geographical area. Or it may become obvious that, regardless of the specific resource, a particular management practice becomes a problem only when implemented in a specific ecosystem type. If so, conclusions based on these matrices could become the focus for socially and ecologically integrated indicators of SFM, as well as the effects of alternative management practices on these indicators.

When completing natural resource concern priority matrices at any scale, it is important to be as specific as possible and to identify accurately the resource(s) and associated management practices of concern. For instance, “neotropical migrant birds” would be an inappropriate concern at every scale. This entry is too broad to help identify local problems and their association with specific management practices. If several, specific, neotropical migrant species were entered, and the concern for each was population decline, then it might become clear, based on an understanding of their biology, that all required similar habitat or ecosystem types and that declines were associated with changes, management-related or successional, to critical habitats or ecosystems.

CONCLUSIONS

Ostrom (1990) argues that information from smaller organizational units is one key to developing larger organizational units that successfully manage larger “common pool” resources. The identify-the-specifics approach is based on this premise. The matrices developed provide the scale-appropriate social and ecological compass for moving toward sustainable forest management. Some have argued that we need to understand ecosystems, but that job will never be complete, and management continues. Therefore, the first priority is to identify and quantify the effects of specific management practices of concern on ecosystems through time so that inappropriate practices can be modified and alternatives developed and tested. Meaningful discussions, however, cannot begin until we have identified specific concerns. Saying that we support “biodiversity conservation,” “ecological integrity,” “forest health,” or “sustainable forest management,” will not help us identify interactions among the social needs, biota (or abiotic components), management practices, and ecosystems of greatest concern.

Identified specifics, once organized, provide the bridge from philosophical pronouncements to realistic goals and result in an integrated multiscale set of indicators of SFM appropriate for that time. Where we once discussed vague general goals, we may soon be discussing specific concerns, the management practices that lead to those concerns, or the ecosystems in which they occur. As soon as the specifics become clear, they may become appropriate indicators of SFM. Only then can we implement practices, ranging from active management to complete protection, that address concerns across various scales in an ecosystem context, and know what components to monitor to examine the effectiveness of management alternatives.

REFERENCES

- Harms, R.R. 1994. Biological diversity: from conceptual framework to practical application. *Wildlifer* 263:34.
- Lautenschlager, R.A. 1996. Identify the specifics: a biopolitical approach to establishing research priorities. *Journal of Forestry* 94(4):31–4.
- _____. 1998. From rhetoric to reality: using specific environmental concerns to identify critical sustainability issues. *Ecosystems* 1(2):176–82.
- Lautenschlager, R.A., H. MacLeod, C. Hollstedt, and D. Balsillie. [2000]. Examining the “specifics” approach to identify local indicators of sustainable natural resource management in central and western Canada. In preparation.
- Ostrom, E. 1990. *Governing the commons: the evolution of institutions for collective action*. Cambridge University Press, New York, N.Y.

AUTHOR

- * **Correspondence to:** R.A. Lautenschlager, Ontario Ministry of Natural Resources at the Ontario Forest Research Institute, 1235 Queen Street East, Sault Ste. Marie, ON P6A 2E5.
E-mail: r.a.lautenschlager@mnr.gov.on.ca