Perspectives on Protected Areas

William J. Crins
Senior Conservation Ecologist
Planning & Research Section, Ontario Parks, OMNR

The theme of the plenary session today was "Ecological Integrity and Protected Areas". In the session, we heard varying perspectives on this theme, including scientific considerations on the meaning of the concept, its application in the National Parks system in Canada, the protected area system in Australia, and a visioning exercise for improving core natural cover and connectivity in southern Ontario, and finally, human dimensions of ecosystem-based planning. Within Ontario's protected areas program, the concept has not been articulated explicitly as such, but many of the objectives, targets, guidelines, and standards developed during the 1970s, and built upon over the past few decades, were intended to address various components of what is now referred to as "ecological integrity".

Before commenting on some aspects of the presentations from the plenary session that impinge on the ways in which ecological integrity is, or is not, addressed in Ontario's protected area system, the definition of ecological integrity now used by Parks Canada is provided for context:

> *"An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes."* (Parks Canada Agency, 2000).

In terms of importance or priority, the first considerations for a protected area system should be its representativeness and adequacy with regard to inclusion of natural features. This implies both the inclusion of the full range of natural features (composition and structure of ecosystems, species occurrence and population viability, and supporting ecological processes) as well as the inclusion of *enough* of each of these features to be sustainable in the long term. In Ontario, approaches to the selection of representative protected areas are relatively well developed and have evolved over the years. The approaches to gap analysis that are now used for earth and life science features (Crins and Kor 1998a,b, 2000) are direct descendants and enhancements of the approaches originally developed in the 1970s and 1980s (Beechey, 1980; Davidson, 1981). Ontario's ecological land classification system serves as the natural region context for setting representation targets for life science features (particularly the ecodistrict level of the hierarchy, but also the ecoregion level to some extent; Crins, 2000; OMNR, 1992).

Ontario has done a less thorough job of ensuring the ecological adequacy of its system. Although the gap analysis methods mentioned above are able to focus area selection on natural features that exist on the land base at a given point in

time, they do not account for the temporal component of ecosystem change. Many of its protected areas are too small to ensure that natural ecosystem processes, such as natural disturbance regimes and other components of ecosystem change, hydrological functions, or gene flow within populations of native species, will be sustained within their boundaries. This is true, not only for the protected areas in the heavily settled and developed southern part of the province, but also for many areas on the Precambrian Shield.

Unfortunately, for those protected areas that already exist, it will be difficult to deal with adequacy issues. In most cases, the land use allocations already have been made, and adjacent lands have been allocated for more consumptive uses. Where the adjacent lands are privately owned, the opportunities for supportive landscape management may be extremely limited. However, stewardship opportunities should always be pursued, in an attempt to minimize the effects of activities outside of the protected areas on the features contained within, and to support trans-boundary ecosystem processes. On the Crown land base, opportunities should be greater for supportive landscape management adjacent to the boundaries of the protected areas, and throughout. Although improvements are always required, there are many practices and guidelines in place already that contribute to certain aspects of habitat maintenance and ecosystem processes.

In protected areas of any size, maintenance and support of its natural features should be an objective. Even in the smaller protected areas, critical habitats for species at risk, representative ecosystems, and some ecological processes can be maintained, through control of access, zoning, and placement of facilities in the least sensitive locations. Combined with these approaches, there must be a philosophy of learning from actions taken; that is, there must be a monitoring program with a built-in feedback loop, so that future plans will be informed by the results of previous actions, and remediation, mitigation, and/or corrections can be made. Another fact to keep in mind is that information and knowledge about ecosystem components and processes continues to accrue, so that actions that may have been fully justified based on existing knowledge at the time may be seen to be disruptive to certain natural features in the future. That is why an adaptive management approach within protected areas is required, so that resource planning and management decisions always will be made with the best, most current information available.

This argument can be extended to areas outside of protected areas, as well. In fact, protected areas should have an important role to play in overall landscape planning and management. Since they should contain representative examples of the ecosystems and other natural features of each ecodistrict, they should provide "control" sites for a properly designed monitoring program. Permanent monitoring plots within sites that are not undergoing active resource management should provide comparative information for similar sites outside of protected areas where more active forms of resource management are occurring. A properly designed

monitoring system, then, could provide useful information both for within-protected area needs and for the larger landscape context. A well designed, focused monitoring program should provide an early warning system, a means of reporting on the state of natural features within the protected area system, and a scientifically defensible source of comparative information for the rest of the land base.

The need for a monitoring program should be obvious. Equally obvious should be the need for basic inventories. In many ways, inventories of species and vegetation communities within the protected areas are a prerequisite for a full-fledged and properly designed monitoring program. Many of the protected areas established before 1999 have had some level of basic inventory. However, almost all of the new protected areas established through "Ontario's Living Legacy" Land Use Strategy (OMNR, 1999) have received no species-level inventories. Such inventories are required before management plans can be developed for these protected areas. Even in protected areas with a long legacy of inventory and research, such as Algonquin Provincial Park, little inventory effort has been directed toward the most diverse groups of organisms with them, particularly insects and fungi. It is becoming increasingly apparent that many insects and other invertebrate taxa are valuable indicators of ecosystem quality and integrity. Therefore, it will be important to include the monitoring of some species in these taxa to properly assess the health of some ecosystems (terrestrial and aquatic).

There will be a continuing need for detailed research on ecosystem composition, structure, and function. Protected areas have an important role to play as research sites, both for basic research on ecosystem attributes and for comparative research on unmanaged and managed examples of ecosystems (analogous to, but more detailed than, the monitoring program discussed above). In particular, some of Ontario's protected areas have the potential to support long-term ecological research. Ontario Parks, as an organization, should provide guidance with regard to its research priorities, and should encourage research of relevance to individual protected areas or to the system as a whole. This has been done in the past, but a more proactive approach is desirable.

Finally, in many areas, ecological integrity within protected areas cannot be fully achieved, as noted above, because of the landscape context in which those protected areas are situated. Thus, it is absolutely essential that stewardship activities continue on the adjacent land base. Land use planning projects and other land management agencies need to be informed of the implications of adjacent land uses on natural heritage features within the protected areas and elsewhere on the landscape. Likewise, activities within the protected areas may have implications for natural heritage features outside of their boundaries, particularly where use is heavy. Stewardship inside and outside of protected areas can often involve knowledgeable and dedicated volunteers, and these activities should be encouraged. One such current monitoring and inventory initiative that involves nearly two thousand volunteers (so far) and that will benefit both the protected areas and the adjacent

land base is the Ontario Breeding Bird Atlas project. Other stewardship activities that will assist in improving the ecological integrity of landscapes include the restoration and rehabilitation actions that are occurring in the Great Lakes drainage.

Although the Parks Research Forum of Ontario focuses on research and monitoring activities within and adjacent to protected areas in the province, it is worthwhile remembering one thing. Parks and protected areas are necessary, but they are not sufficient to do the entire job of biodiversity conservation. Therefore, we need to maintain a larger landscape perspective, and to acknowledge the conservation activities that are occurring on the entire land base.

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