Monitoring in the Great Lakes Basin Ecosystem

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Under the terms of the 1987 Canada-US Great Lakes Water Quality Agreement, the governments of the 2 countries are obliged to develop ecosystem health indicators, and to report on those indicators on a regular basis. Starting in 1994, the State of the Lakes Ecosystem Conference has been reporting on conditions in the Great Lakes Basin Ecosystem (SOLEC) every 2 years. In 1998, SOLEC began the process of developing a list of indicators encompassing the biophysical and socio-economic components of the Basin. At SOLEC 2000, the first 33 of the 80 indicators were reported.

There is a requirement for a monitoring program throughout the Basin to provide data that will be essential in populating the indicators with information to report. My talk will give an overview of the indicator selection and development process, and will highlight areas where land based information (monitoring)) is required. I will also discuss the identification of Biodiversity Investment Areas, and the role that parks can play in preserving these important areas.

Applying an Adaptive Management Approach to Ecological Integrity Monitoring at St. Lawrence Islands National Park

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St. Lawrence Islands National Park of Canada, in 1997, developed an ecological integrity monitoring program to assess ecosystem health within park boundaries, as well as within the greater park ecosystem. This program is based on a suite of indicators that targets monitoring at species/population, community and landscape levels of biodiversity. Following field testing and initial implementation of sampling protocols, the park has begun a formal review process to ensure the efficacy of the program to meet its goals and objectives. The review process includes analysis of baseline data and retrospective power analysis for specific indicators (e.g., bullfrog population demographics). This formal review represents a key component to the

adaptive management approach to managing for ecological integrity at St. Lawrence Islands National Park.

Multiple Scale Effects of Overgrazing by White-tailed Deer (*Odocoileus virginianus*) in Eastern Deciduous (Carolinian) Forests

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Large herbivores such as white-tailed deer can have a significant impact on vegetation across multiple biological scales. We examined the relationship between plant community dynamics in several overgrazed southern Ontario forest sites and ecosystem responses such as productivity, nitrogen dynamics, species diversity and ecosystem structure. Between 1992 and 1998, sites with a history of high deer densities (>50/km^2) were compared with deer exclosures and long-term ungrazed sites. Ordination analyses showed older exclosures were similar to ungrazed sites, with higher woody stem densities and dominated by plant functional types relatively high in nitrogen. Both differed from grazed sites, with lower stem densities and dominated by functional types lower in nitrogen. Reductions in deer did not result in the recovery of overgrazed sites because deer mediated changes at the ecosystem level and depletions of desirable native species from seedbanks were the major determinants of successional trajectories. These results present implications for plant species conservation and re-establishment.

Operationalizing Ecological Integrity within Ecosystem Management of Quetico Provincial Park Using Prescribed Forest Fires

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The role of fire in the ecosystem (both in protected areas and the production forest) is a subject of increasing interest to scientists and managers alike. The call to "Emulate Natural Disturbances" in the production forest and to "allow the forces of nature to function freely" in Wilderness Class Parks has lead to research and management action on both fronts.