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Data Sources and Methods for the Park Ecological Integrity Indicator

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1 Introduction

The Park Ecological Integrity Indicator is part of the Canadian Environmental Sustainability Indicators (CESI) program (http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=47F48106-1), which provides data and information to track Canada's performance on key environmental sustainability issues.

The ecological integrity of national parks provides an indication of the condition of Canada's protected areas. The *Canada National Parks Act* (2000) states that "...maintenance or restoration of ecological integrity, through the protection of natural resources and natural processes, shall be the first priority when considering all aspects of the management of parks." Parks Canada began to implement its ecological integrity monitoring program in 2008. A national framework is now in place and data collection is occurring in every national park.

2 Description and rationale of the Park Ecological Integrity indicator

2.1 Description

Each park has monitoring in place, which includes measures for the status and health of its ecosystems. These measures are rolled up to produce four to six characteristic ecological integrity indicators,[1] one for each major ecosystem (*e.g.* forests, lakes, etc.). Ecological integrity indicators are monitored at a park scale through the selection of strategic measures that represent key ecosystem attributes or processes.

Each ecological integrity indicator is given a rating (good, fair, poor or unrated) derived from the assessment of these monitoring measures. Trend information (improving, stable or declining) is included where sufficient information exists.

The ecological integrity indicators are summarized across all national parks to generate an overall indicator.

2.2 Rationale

The Canadian Environmental Sustainability Indicators (CESI) reports on the ecological integrity of national parks as an indicator of the condition of Canada's protected areas. Parks Canada conducts the most complete monitoring of protected areas and is responsible for the largest proportion of areas protected by any Canadian jurisdiction.

2.3 Changes since last report

Information on the status and trends of additional park ecosystems has been gathered since the last CESI report. Changes in reporting approach have changed the presentation of the data, but interpretation remains the same.

[1] Parks Canada refers to "Ecological Integrity Indicators" in its reporting. This refers to the status and trends of key ecosystems in each park. The CESI "Park Ecological Integrity Indicator", however, refers to an aggregate indicator across all parks and park ecosystems.

3 Data

3.1 Data source

Every five years, each national park produces a state-of-the-park report, and these are summarized every two years in a public report issued by Parks Canada. The Canadian Environmental Sustainability Indicators' (CESI's) reporting is drawn from The State of Canada's Natural and Historic Places 2011 (http://www.pc.gc.ca/eng/docs/pc/rpts/elnhc-scnhp/index.aspx).

The description of methods was taken from Parks Canada's 2011 *Consolidated Guidelines for Ecological Integrity Monitoring in Canada's National Parks*, which is available from the Protected Areas Establishment and Conservation Branch, Parks Canada.

3.2 Spatial coverage

Coverage is for 42 of Canada's national parks. Ecological monitoring and reporting systems are not yet complete in all parks.

3.3 Temporal coverage

Monitoring for ecological integrity formally began in 2008, and is ongoing. Summary reports for all parks are produced once every two years. Individual parks report once every five years, with different parks reporting each year. As a result, the summary reports contain a mix of old and new information. Rapid changes may not be captured for some time.

3.4 Data completeness

Data were gathered by each national park and are summarized and reported by Parks Canada. Most parks (35 of 42; see data) reported on some ecological integrity indicators in the most recent report (2011). Parks that did not report are still implementing their monitoring programs and collecting information.

The data do not include provincial or other parks, or other protected areas.

3.5 Data timeliness

Data collection is continuous, and data for individual parks are reported every five years. Parks Canada releases its State of Protected Heritage Areas report every two years, containing the most recent available information from each park. Data in the most recent report (The State of Canada's Natural and Historic Places 2011) are up to date as of 2011 and were released by Parks Canada in 2012.

4 Methods

Ecological integrity monitoring is adapted to the ecology of each individual park. For each major ecosystem occurring in a park, a comprehensive set of environmental measures is being developed, based on appropriateness, representativeness, monitoring needs and cost-effectiveness. Some examples of ecological integrity measures include wildlife surveys, estimates of plant productivity, water quality measurements and assessments of human infrastructure impacts. Data for the underlying ecological integrity measures are gathered from

a variety of sources, including on-the-ground field sampling, satellite imagery, academic and government partners, and traditional knowledge. Measured levels are compared to management thresholds, such as whether a wildlife population is near desirable levels, or water meets a water quality standard. Expert opinion, including traditional ecological knowledge, has been used when there are insufficient data to set objective thresholds. A number of ecosystems are currently unrated, pending additional sampling.

Ecosystem condition (ecological integrity indicators) are determined from the condition of the EI measures as follows: each measure is assigned a score based on its condition compared to its threshold (good = 2, intermediate = 1, poor = 0). If one third or more of the measures are scored poor, the indicator is also scored poor. Otherwise, the average score of the measures (weighted equally) determines the indicator score. Equal weighting was chosen for simplicity; alternative weighting schemes would require information on the relative importance of all measures, which has not been developed.

Trend information is included where sufficient data exist. The assessment of the overall trend of an ecological integrity indicator is driven by changes in its status. Trends in measures are difficult to quantitatively combine, due to: 1) complexities introduced with variable scales, points of origin and magnitudes of change; 2) the importance of crossing thresholds; and 3) possible discordance between measures. If there is no change in the ecological integrity indicator status, the general pattern of trends in the constituent measures is considered. Where no general pattern is apparent, the trend is recorded as no change.

An overall assessment of ecological integrity is generated by summing the number of ecological integrity indicators in each category across all park ecosystems with reported data.

5 Caveats and limitations

Ecosystems are not of equal area or of equal importance in parks; comparisons between systems or between parks must be made with caution.

Monitoring is evolving and so reporting is currently incomplete. Some parks have not yet reported, while others are basing their reports on incomplete suites of measures that reflect current data availability. Ecological integrity measures are selected using objective techniques to provide comprehensive assessments. In many cases, however, incomplete data mean that preliminary data, expert opinion and ecological principles must be used to support the selection of measures and the definition of thresholds. Information on trends requires a longer period of data collection and is therefore less complete than status information.

The equal weighting of measures may not always reflect their relative ecological importance.

Ecological integrity is reported every two years in the State of Protected and Heritage Areas Report but the underlying data are updated less frequently. Individual parks report once every five years on a rotating schedule, resulting in the blending of data that is from zero to six years old in the reported indicator.

6 References and further reading

6.1 References

Parks Canada (2011) The State of Canada's Natural and Historic Places 2011. Retrieved on 27 July, 2011. Available from: http://www.pc.gc.ca/eng/docs/pc/rpts/elnhc-scnhp/index.aspx.

Parks Canada (2011) Consolidated Guidelines for Ecological Integrity Monitoring in Canada's National Parks. Protected Areas Establishment and Conservation Branch, Parks Canada. Retrieved on 27 July, 2011.

6.2 Further reading

Parks Canada (2007) State of Protected Heritage Areas Report April 1 2005, to March 31, 2007. Retrieved on 27 July, 2011. Available from: http://www.pc.gc.ca/docs/pc/rpts/sopha-reapp/index_e.asp.

Parks Canada (2009) State of Protected Heritage Areas Report, April 1, 2007 to March 31, 2009. Retrieved on 27 July, 2011. Available from: http://www.pc.gc.ca/eng/docs/pc/rpts/edapp-sopha/index.aspx.

Parks Canada (2009) Ecological Integrity. Retrieved on 27 July, 2011. Available from: http://www.pc.gc.ca/eng/progs/np-pn/ie-ei.aspx.

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