

Introduction

Objective and scope of the report

The State of the Rideau River report is an initiative of the Research and Monitoring Committee of the Rideau Roundtable. The Rideau Roundtable is an association of individuals, community organizations, businesses, educational institutions, municipalities and government agencies working together to protect water quality and biodiversity and restore wildlife habitat throughout the Rideau and Cataraqui watersheds. This report focuses on the Rideau River between Smiths Falls and Ottawa.

The goal of state-of-the-environment (SOE) reporting is to promote “environmental sustainability”, whereby a balance is maintained between human impacts and the ability of the natural environment to accommodate these impacts. Sustainable practices are those which conserve and protect natural systems and processes, as well as maintaining resources for future generations. SOE reports allow us to monitor environmental change, assess management efforts, provide information to the public, and provide a tool for policy formulation and decision-making.

The State of the Rideau River report has been designed to provide current, reliable and relevant information about the Rideau River, for a broad audience. This information is drawn from several recent and ongoing environmental monitoring programs and research initiatives focused on the Rideau River. It is based largely on data collected within the past five years, but includes historical data where available. This report represents a first attempt at developing a set of indicators that will help in monitoring and evaluating environmental change over the long term. In addition, this report identifies gaps in knowledge about the condition of the River, stressors on the River and our collective management responses to these challenges.

This report focuses on current physical and biological conditions of the Rideau River, providing information on water quality, biodiversity, and aquatic habitat. It also provides information on various sources of stress on the Rideau River. Current “baseline” conditions are reported for each indicator and trends over time are identified whenever sufficient data are available. Unfortunately, few rivers in Ontario have been studied in sufficient detail to provide a basis for comparison with the Rideau River. Follow-up reports in future years will report changes in these indicators, and add information on management response indicators.

Framework of the report

Environment Canada has developed a framework for state-of-the-environment reporting (Environment Canada, 1996). The Condition-Stress-Management Response model, which has been adopted for this report, describes environmental change using three types of indicators that illustrate what is happening in the environment, what is causing degradation or changes in the environment, and what we are doing to minimize stresses and improve environmental quality.

- **What is happening?**

“Condition” indicators evaluate the condition or health of the environment. Measures of water quality and assessments of biodiversity are examples of condition indicators.

- **What’s causing it?**

“Stress” indicators are indicators of human activities that stress the environment. Trends in human population growth, or the use of pesticides are examples of stress indicators.

- **What are we doing about it?**

“Management response” indicators track policies, programs and initiatives designed to reduce, remove, or mitigate environmental stress. Improvements in sewage treatment facilities, or the creation of protected areas are examples of management responses.

Background information and a trend and/or a benchmark has been provided for each indicator in the State of the Rideau River report. The background explains the importance of the indicator and its relationship to the issue of concern. A figure, table or statement is used to describe the state or trend of the indicator along the course of the River, and (if possible) over time. Regulatory standards, guidelines or objectives are provided where available, to illustrate whether the current condition is good or needs improvement. Limitations of the indicator may be discussed, if applicable. In the recommendation section of the report, information gaps are discussed, and other potential indicators are identified, in order to guide future scientific and community-based monitoring efforts.

Method

The outline of this report was based on a review of the common elements of SOE reports produced at municipal, provincial, national and international levels, as well as reports focused on particular issues such as water quality or biodiversity. A preliminary list of indicators was drafted, based on the frequency of their use in these reports. Indicators were selected, after assessing their usefulness according to criteria listed below. In addition, the list of indicators was reviewed by a panel of experts drawn from the University of Ottawa, the Canadian Museum of Nature, the Ontario Ministry of Natural Resources, Parks Canada, the Rideau Valley Conservation Authority, the City of Ottawa and private consultants. The availability of data (either baseline or historical) was also a prime consideration in the selection of indicators.

What Makes a Good Indicator?

- **Is the indicator relevant and understandable?** An indicator should say something meaningful about the state of the environment, and be easily interpretable by the target audience.

- **Is it comparable?** A good indicator can be compared to a reference point, such as a historical level, a policy target, or a regulatory standard.
- **Is the indicator at an appropriate scale?** To be meaningful, the indicator should be at a scale that is appropriate to the area of study. In the case of this report, it should reflect conditions at the watershed or river scale.
- **Is it responsive to change?** Condition indicators should be chosen which could be expected to respond to changes in stresses or to management initiatives.
- **Are time-series data available?** Indicators for which a historical trend is available are preferred.
- **Is long-term monitoring feasible?** Indicators should be able to be monitored over time at a reasonable cost, and long-term monitoring should be expected, to ensure that the indicator is useful in tracking trends in the future.

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Table 1 State of the environment indicators used in this report.

CATEGORY	INDICATOR	PARAMETER REPORTED
Water quality indicators	Total phosphorus (TP)	concentrations - trend
	Nitrate + nitrite nitrogen	concentrations - trend
	Dissolved oxygen	concentrations - trend
	Suspended algae (chlorophyll a)	concentrations – trend types of algae
	Metals	# exceedances of PWQOs
	<i>E. coli</i>	concentrations – trend # beach closures
Biological indicators	Species diversity	# species of various plant and animal groups
	Species at risk	# species at risk
	Aquatic plants	# species, abundance (% cover)
	Harvest of aquatic plants	annual harvest (tons)
	Zebra mussels	abundance, trend
	Fish	# species, abundance (CUE)
	Contamination of fish tissue	fish consumption restrictions
Stress indicators	Human population	watershed population, trend
	Urban development	area of urban development, density of urban development
	Municipal wastewater treatment	% of population served, treatment facility performance
	Boat traffic	# boats through locks
	Water-taking	# permits to take water, volume of water permitted
	Water level regulation	rate of fall draw down, fish kills
	Agricultural activities	# and area of farms area of land with fertilizer, pesticide, irrigation use # livestock