

Data Gaps

A number of potential indicators that were originally selected for inclusion in this report, were omitted because data were not available, or because research still needs to be carried out. Some of these data gaps are listed below:

Water Quality/Quantity Indicators

- **Water clarity**

The Canadian Museum of Nature measures water clarity by taking Secchi depth readings, as part of their water quality sampling program. However, these data were not available within the time frame of this report.

- **Groundwater quality and quantity**

The Ministry of the Environment has monitored a number of groundwater wells in the Rideau watershed in the past, but no data are available on these historical monitoring wells. However, a new Provincial Groundwater Monitoring Network is currently being set up. Ten monitoring wells are being established within the Rideau River watershed. Daily water level data will be accessible on-line, and water quality testing will be done twice yearly.

Biological Indicators

- **Individual species**

Apart from invasive species (zebra mussels, Eurasian water milfoil and curly pondweed), no individual species have been selected for use as biological indicators in this report. A few species were considered and rejected, because they were too rare, too common, or not present throughout the system. These included:

- Common loon - common in some areas, non-existent in others;
- Bull frog - not restricted by habitat, number may be more related to poaching, therefore not a good indicator of habitat conditions;
- Western chorus-frog - not sufficiently common or widespread;
- Two-lined salamander - too rare due to limited habitat along the Rideau;
- Painted turtle - too common;
- Northern water snake - too common.

- **Species at risk**

There is limited information available on the conditions of species at risk in the Rideau River.

Aquatic and Shoreland Habitat Indicators

- **Acreage of wetlands of various classes along the River, percent of watershed that is forested**

Wetlands and forest cover have been mapped in Ontario, but data from these maps were not available for this report due to time and budget constraints.

- **Shoreline characterization**

Shoreline development has been identified as one of the main stressors on the Rideau River. Shoreline development reduces the diversity and quality of riparian habitats as well as shallow littoral zone habitats within

the River. The number of households/buildings along the Rideau shoreline was suggested as an indicator. This information is not currently available. The RVCA is expected to begin a shoreline characterization study along the Rideau River in the spring of 2002.

Recommendations

The scope of the report

One of the chief difficulties encountered in the preparation of this report involved differences in the scale of the various indicators. Some indicators, such as water quality parameters, are clearly measurable within the boundaries of the Rideau River. However, others are not so easily constrained to within the banks of the River. Some species for example, require both aquatic habitat found within the River, and some portion of the land along its shores. Many stress indicators, such the area of land used for urban or agricultural development should be considered at a much larger scale.

Since rivers are so closely linked to their surroundings, it is clearly appropriate to consider the surrounding land area and connecting water bodies. An important goal should be to integrate the monitoring and reporting on the state of the Rideau River with that of the Rideau Lakes, the Tay and Jock Rivers and Kemptville Creek. Therefore, the Rideau River SOE report should eventually be expanded to encompass the entire Rideau River watershed.

A number of other recommendations arose during the preparation of this report. They range from general suggestions for the gathering and management of data, to specific ideas for additional indicators that should be included in future reports, and areas of research and monitoring that should be given high priority:

Data coordination, storage and management

- Work out agreements whereby the various organizations that perform research and monitoring provide information for selected indicators on an on-going basis, and arrange for the information to be organized and expressed in a manner that is consistent with the SOE reporting format. For example, rather than supplying a large database of raw data, organizations could provide a summary report, figure or table.
- Establish a location (and identify a host organization) which can house data and updated it on an on-going basis. This organization would ideally have a Geographic Information System (GIS) in which ecological and biogeographical information can be collected and analyzed.
- Coordinate timing of Rideau SOE reports to allow the incorporation of data from other source reports (ex. Fisheries Assessment 5-year summaries; Canadian Census).
- Establish better communication between agencies, authorities, etc., in order to achieve better use of resources.

Management response indicators

Management response indicators should be incorporated into future SOE reports. An important management response is the implementation of watershed and subwatershed plans. Watershed and subwatershed planning take an integrated, ecosystem approach to land-use planning based on the boundaries of a watershed. It attempts to balance environmental protection, conservation and restoration with development and other land-use practices to ensure long-term sustainability of the watershed/subwatershed and its significant natural resources. Watershed planning identifies natural resources that need to be preserved, addresses the potential impacts of existing and future land-use activities on natural systems, and identified opportunities to restore and enhance the natural system while promoting compatible land uses.

Staff of both the Rideau Valley Conservation Authority and the City of Ottawa undertake watershed/subwatershed planning for the Rideau River watershed and all other watersheds within their jurisdiction. Watershed studies for Sawmill Creek, and Jock River and Tay River have provided a comprehensive snapshot of the challenges facing these watersheds and have identified goals and recommendations, contributing the body of progressive work related to land-use planning in the Rideau River watershed. Management responses arising from watershed/subwatershed planning may include:

- Sustainable growth strategies such as infilling
- Standardized development setbacks along shorelines for municipalities bordering the Rideau
- Zoning of environmentally sensitive areas

Other possible management response indicators for inclusion in future SOE reports include:

- Stormwater management
- Storm sewer replacement
- Creation of protected lands
- Fish habitat protection or restoration work
- Changes to canal operational procedures
- Programs such as the Rural Clean Water Program and the Environmental Farm Plan

Additional indicators

- Continue to investigate the use of individual wildlife species as indicators. Assessing the condition of key indicator species, or rare species populations found in the Rideau could help to pinpoint areas requiring protection. The smallmouth bass is one potential indicator species that is found throughout the River, and could serve as an indicator of the health of the sport fishery.
- Investigate the possible use of composite indices for future SOE reports. For example, the Canadian Council of Ministers of the Environment is currently developing a composite metals index, which might simplify comparisons between different periods, and between different systems.
- Include water quantity and drought conditions within the watershed as a condition indicator.
- Expand the Rideau River SOE report to include social and economic indicators.

Research and monitoring

Research and monitoring along the Rideau River should be integrated with work being done on the other water bodies within the watershed. A number of areas requiring further research and monitoring were identified during the preparation of this report. Some of the key projects that should be given priority include:

- Shoreline characterization survey.
- Increased research, monitoring of algae, particularly in shallow littoral zone areas (toxic algae, mat-forming algae), and associated concerns such as dissolved oxygen depletion during decay of algal mats and plants.
- Research into changes in aquatic plant community in the lower Rideau (monitoring of plant growth in navigation channel; better reporting of composition of harvested plants).
- Monitoring of the distribution and abundance of other exotic species in the River, including European frogbit and yellow iris.
- Monitoring of fish habitat, including mapping of critical spawning grounds.
- Research into effects of water level manipulations on fish spawning, and on overwintering of aquatic wildlife.
- Nutrient apportionment study, to identify the major sources of nutrients to the Rideau River.