

# Rouge River

## State of the Watershed Report



### Introduction

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## CHAPTER

# 1

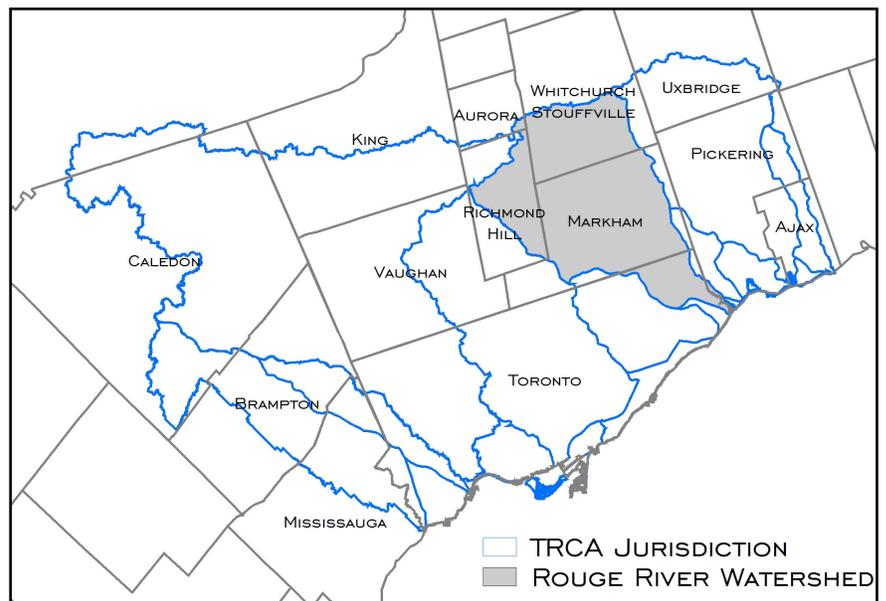
## INTRODUCTION

### 1.0 INTRODUCTION

The Rouge River watershed lies in the south-central portion of the Greater Toronto Area (GTA), draining an area of 336 km<sup>2</sup> from its headwaters in the Oak Ridges Moraine (ORM) to its mouth at Lake Ontario (See Figure 1-1). The watershed is unique, as it contains “the most significant system of linked natural areas along any of the lower river valleys draining into northwestern Lake Ontario” (Varga *et al.*, 1991). The lower Rouge valleys were in fact recommended as a “natural park and wildlife sanctuary” as early as 1956 (Department of Planning and Development, 1956), although it wasn’t until 1995 that the Rouge Park was established. The watershed also supports a mix of agricultural, urban and rapidly urbanizing land uses with their associated management challenges. Despite a plethora of available management plans and tools the Toronto and Region Conservation Authority (TRCA) and the Rouge Park Alliance identified the need for additional data and updated watershed management direction that could further inform the available plans and provide guidance for emerging issues.

Figure 1-1: TRCA Jurisdiction

In addition, the provincial government’s *Oak Ridges Moraine Conservation Plan* (ORMCP, 2002) required municipalities to prepare watershed plans and incorporate their recommendations into official plans in advance of major development approval. For these reasons, the TRCA and Rouge Park Alliance, in cooperation with the multi-stakeholder Rouge Watershed Task Force, undertook the development of an integrated watershed plan for the Rouge River watershed.



This “State of the Watershed” Report represents the first major document in the development of the updated watershed plan. The report presents a characterization of watershed systems and evaluation of current conditions according to a set of watershed goals and objectives. It has been prepared with the latest available technical information (primarily as of 2002, or more recent in some cases) and input from a multi-stakeholder review. Based on this work, current and anticipated future stresses on the watershed and possible management approaches were identified for subsequent analysis and plan development. The following sections of Chapter 1.0 provide additional introductory context for this planning study, and present the watershed management goals which formed the framework for this state of the watershed assessment.

## 1.1 Global Watershed Context

The challenges of managing land and resource use pressures in the Rouge River watershed mirror, *and contribute to*, those issues found throughout the Great Lakes Basin and in many other parts of the world. In fact, the solutions needed to address global calls for action must be locally based. For example pressures for urban growth in the Rouge River watershed, like in other Toronto Region watersheds, present potential changes to local water quality and quantity, in-stream erosion rates among other concerns. However, there are also more far reaching impacts of the growth of city regions such as the effects they have on the regions that service them. This broader context was considered in the determination of the Rouge study scope.

One way of considering the impact of a community on natural resources and ecosystems is to consider its ecological footprint: the land area and the natural capital on which it draws to sustain its population and production structure (Wackernagel and Rees, 1996 in Roseland, 2000). York University studies have suggested an urban region is dependent on the resources of an area 700 times its size. Toronto covers an area of 240 square miles, but requires the resources of areas covering 168,000 square miles around the globe to survive. It does indeed have a global impact (McLean, 2004). Cities appropriate carrying capacity from other regions, or conversely they export ecological degradation or unsustainability (Roseland, 2000).

Individual behaviour is one factor that contributes to unsustainability. Canadians are among the world’s most wasteful in terms of excessive energy consumption, water use, and greenhouse gas emissions (Boyd, 2004). Although improvements have been made in some indicators, progress has slowed overall due to increased consumption patterns and population growth. Increased fuel efficiency has been overshadowed by the increased numbers of vehicles on the road and the distances travelled. Advances in waste reduction have been offset by consumer lifestyles that demand convenience and disposable products. Modifications of these behaviours together with changes in the design of city region systems will be necessary to achieve sustainable development, more recently referred to as “sustainability”.

*Agenda 21*, the *Earth Charter* (United Nations, 1992) and various international conventions ratified by the Canadian government highlight watershed management as a vital tool, protection of ecological integrity as a primary objective, and adopting new patterns of production and consumption that protect the regenerative capacities of nature as an important underlying concept to sustainable development. *Agenda 21* was strongly reaffirmed at the

World Summit on Sustainable Development (“Rio” + 10) held in Johannesburg, South Africa in 2002 (United Nations, 2002). Since the Johannesburg Summit, sustainable development is regarded as “improving the quality of life for everyone without increasing the use of natural resources beyond the earth’s carrying capacity”. In a recent report of the David Suzuki Foundation, sustainability is simply defined as “living within the Earth’s limits” (Boyd, 2004). The Suzuki Foundation states that “our quality of life is fundamentally dependent upon the environment. Clean water, fresh air, a stable climate, and ecological processes are prerequisites to healthy communities and a vibrant economy.

The greater Toronto city region is one of more than 300 city-regions around the world with 1 million or more people (Scott *et al.*, 2001) and is the largest city region in Canada. In order to address global calls for sustainability in city regions, TRCA has adopted the Living City vision:

The quality of life on Earth is being determined in the rapidly expanding city regions. The Living City is a new kind of community - a place where human settlement can flourish forever as part of nature’s beauty and diversity.

The Living City is the most recent evolution of integrating watershed management with the concept of sustainable communities at a city region scale. In order to provide practical guidance for implementing the Living City vision and ensuring that local land and resource use decisions contribute to global sustainability, the Rouge watershed planning study has established goals, objectives and targets that define ecological sustainability for the watershed. The study has broadened its analysis beyond the natural ecosystem components, in order to consider inter-relationships with social and economic systems and identify creative management approaches. This effort has required an integrated approach.

## **1.2 Rouge River Watershed Planning Process**

Many jurisdictions have long endorsed the watershed as the most effective unit for water management, and have increasingly recognized the need for integrated watershed planning and management as an important basis for sustainability. Integrated approaches address interdependencies among a comprehensive range of watershed systems, including environmental, social and economic systems, and develop management strategies in collaboration with all partners.

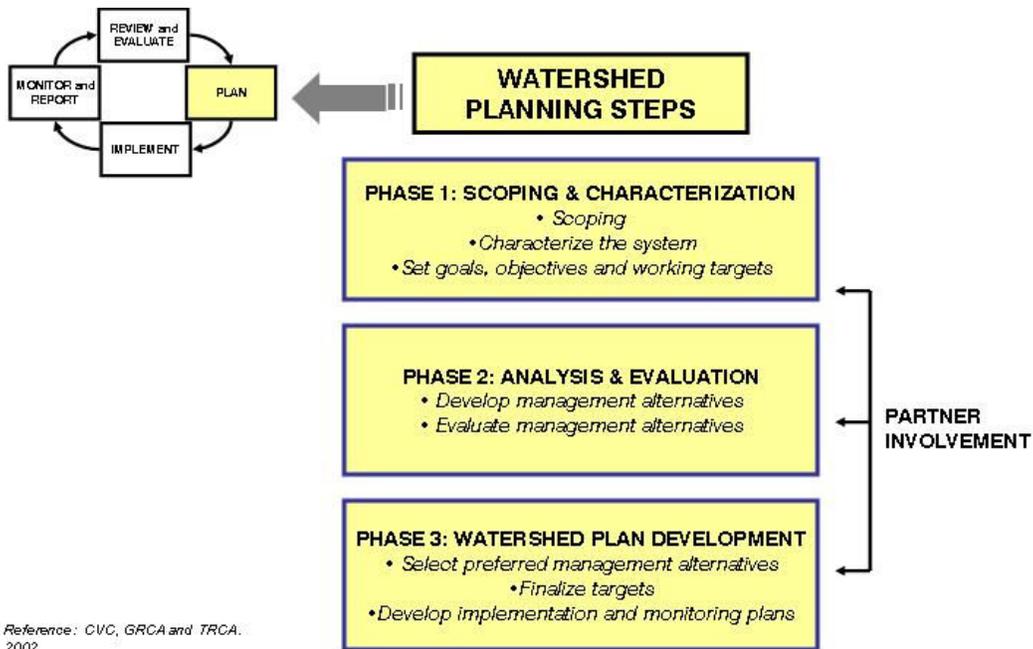
A history of innovative approaches undertaken by agencies, municipalities and community leaders in the Rouge River watershed has positioned the Rouge to meet the challenges of a more integrated approach. TRCA has developed extensive expertise in watershed planning, since its first watershed strategy was prepared for the Rouge River watershed in 1990 (MTRCA, 1990). This initiative led to the Authority’s commitment, under its 1989 Greenspace Strategy, to prepare a watershed strategy for each of the nine watersheds within its jurisdiction. To date, watershed management strategies have been completed in seven of the nine TRCA watersheds. The most recent, the Duffins and Carruthers Watershed Plan (TRCA, 2003) is regarded by the province as a model for watersheds draining from the Oak Ridges Moraine. The current planning initiative for the Rouge, represents the first “major update” of a 14 year old watershed plan, and has been designed to build upon the successes and lessons learned

from past experience.

Building on previous experience and consistent with the approach followed by other Conservation Authorities (CVC, TRCA and GRCA), the planning process for the Rouge River watershed study was carried out in three phases (Figure 1-2). The Scoping and Characterization Phase established a detailed understanding of watershed systems, their interdependencies, current conditions and issues. Management goals, objectives, and associated indicators and working targets were also developed in this phase, such that they could be used to guide further analytical work. The findings from Phase 1 are the subject of this State of the Watershed Report. In the Second Phase, current and anticipated future land use scenarios and management approaches were analysed through modelling studies and expert workshops. Information arising from the first two phases of study contributed to the development of the watershed plan, which constituted Phase 3. A list of all documents produced as part of this watershed planning study is located on the back cover of this introductory chapter.

A Rouge Watershed Task Force comprised of elected municipal officials, government agencies, non-profit organizations, and citizen representatives from throughout the watershed was formed to guide the planning process. Technical staff of the TRCA and Rouge Park in cooperation with municipal partners and consultants carried out the technical studies that formed the basis for this work. A process of public and stakeholder consultation was followed to ensure the completeness of the work and foster partnerships for implementation.

**Figure 1-2: Rouge River Watershed Planning Process**



Reference: CVC, GRCA and TRCA. 2002.

### 1.3 Guiding Documents

Over the years, numerous studies and plans have focused on issues within the Rouge River watershed or larger regions of which it is a part. A few of these previous studies adopted the entire watershed as their study area or attempted to address a comprehensive range of issues:

- Rouge Duffin Highland Petticoat Valley Conservation Report (Ontario Department of Planning and Development, 1956)
- Comprehensive Basin Management Strategy for the Rouge River Watershed (MTRCA, 1990)
- Toronto and Region Remedial Action Plan (OMOE, 1994)
- Toronto Wet Weather Flow Management Master Plan (City of Toronto, 2003)
- Rouge Park Management Plan and Rouge Park North Management Plans (OMNR, 1994; Rouge Park Alliance, 2001)

Watershed visions, goals and targets articulated in these documents were considered in the updated management framework established in this watershed planning study. These studies also contain data and information that contribute to an understanding of present conditions along with the additional data collected and interpreted in this study. Many of these efforts are considered to represent significant milestones in the evolution of technical and partnership approaches that attest to the innovation among the municipal, agency and community leaders operating in the Rouge River watershed.

### 1.4 Rouge River Watershed Management Goals

Based on a review of goals and objectives in other recent, local watershed and municipal plans relevant to the Rouge River watershed and additional considerations, the Rouge Watershed Task Force defined management goals and objectives for the Rouge River watershed.

**The overall goal for the management of the Rouge River watershed is:**

**To work towards a healthy, sustainable Rouge River watershed by protecting, restoring, and enhancing its ecological and cultural integrity within the context of a regional natural heritage system.**

**A set of nine inter-related goals support the overall goal:**

1. **Surface Water Quantity and Quality:** Surface waters of a quality, volume and naturally variable rate of flow to
  - protect aquatic and terrestrial life and ecological functions;
  - protect human life and property from risks due to flooding;
  - contribute to the protection of Lake Ontario as a domestic drinking water source;
  - support sustainable agricultural, industrial, and commercial water supply needs;
  - support swimming, fishing and the opportunity to safely consume fish; and
  - contribute to the removal of Toronto from the Great Lakes list of Areas of Concern.

2. **Groundwater Quantity and Quality:** Groundwater of sufficient quantity and quality to support ecological functions, aquatic habitats, native fish communities and sustainable human needs, including drinking water, agricultural, industrial, and commercial uses.
3. **Stream Form (Fluvial Geomorphology):** Natural, stable stream banks and channels that provide hydrologic flow regulation, support diverse aquatic habitat, limit sediment loading, and protect human life, and property from risks due to erosion and slope instability.
4. **Aquatic System:** A healthy aquatic system that supports a diversity of native habitats and communities and provides sustainable public use opportunities.
5. **Terrestrial System:** A healthy terrestrial system that supports a diversity of native habitats and communities, a more natural watershed hydrology, cleaner air, and sustainable public use opportunities.
6. **Air Quality:** Air of a quality that protects human health, natural ecosystems and crops, and contributes to the reduction of global climate change.
7. **Cultural Heritage:** Recognition, preservation and celebration of cultural heritage in the Rouge River watershed to increase awareness and understanding of human relationships with the environment.
8. **Nature-based Recreation:** Opportunities for public enjoyment that are compatible with and raise awareness of, the watershed's natural and cultural heritage.
9. **Land and Resource Use:** A healthy watershed with a mosaic of land and resource uses (at watershed and community scale) that are compatible with the protection and improvement of ecological health. Land and resource uses include: Rouge Park, urban and rural settlements, agriculture, golf courses, aggregate extraction, and transportation and utility corridors.

Specific objectives associated with each goal are introduced within each chapter of this State of the Watershed Report.

## **DEFINITIONS**

### ***Protect, Restore and Enhance***

*The dictionary says protect is “to shield or defend against danger, injury, etc.” and in this plan “protection” is meant to be applied to those areas of the watershed, which currently meet or exceed the defined management targets. Restore is “to bring back to a healthy state”. Restore often implies a return to an original state, if that state is known. In this watershed planning application the targets will define the expected level of restoration, believed to be an accepted healthy state. Enhance is “to increase, add to in quality” and suggests a direction of improvement toward the targeted healthy state (Larousse, 1972).*

### ***Integrity***

*The dictionary says integrity means “wholeness, completeness, the quality or state of being unimpaired” (Larousse, 1972). Parks Canada’s website states: “ecosystems have integrity when they have their native components intact, including abiotic components (the physical elements, e.g. water, rocks), biodiversity (the composition and abundance of species and communities in an ecosystem...) and ecosystem processes (the engines that makes the ecosystem work (e.g. fire, flooding, predation).”*

### ***Sustainability***

*Living within the Earth’s limits (Boyd, 2004)*

## **1.5 Organization of the State of the Watershed Report**

Chapter 2 describes the overall physical setting of the watershed study area and Chapter 3 provides an overview of the Regional Watershed Monitoring Programs that contribute valuable information upon which this assessment of current conditions is based.

Each of the core chapters in this report (Chapters 4 to 13) is dedicated to one of the watershed management goals, except for the surface water quantity and quality goal which is addressed over two chapters. Following a brief introduction to the chapter is a description of the basic concepts needed to understand the subject and its role in the watershed (“Understanding” section). The next section presents data collection methods and sources of information used to measure conditions (“Measuring”), followed by a discussion of the current conditions (“Existing Conditions”). Each chapter indicates where there is interaction among various systems and provides cross-referencing to other chapters where appropriate.

A set of objectives and associated indicators, measures and targets accompany each goal and these are summarized in the “objectives” section of each chapter (See Box for Reporting Framework definitions). The “ecological targets” set out in this report should not be confused with additional management criteria or targets that may be associated with the management strategies in the Watershed Plan.

A rating has been assigned for each objective, as a means of describing the extent to which current watershed conditions meet the targets, and thus establishing a baseline “Report Card”, from which progress can be measured. Ratings are based on quantitative and qualitative analysis and best professional judgement of TRCA staff following a review of all available information.

The rating system is defined as follows:

<b>Rank</b>	<b>Percent of Target Achieved</b>
Excellent	better than 80
Good	between 70 and 79
Fair	between 60 and 69
Poor	between 50 and 59
Fail	below 50
TBD	Further study required; baseline data not available or insufficient

The final section of each chapter is a summary of results and their management implications (“Summary and Management Considerations”).

***REPORTING FRAMEWORK DEFINITIONS***

<i>Goal:</i>	<i>A desired outcome or endpoint.</i>
<i>Objective:</i>	<i>A general statement of intended management approach and directions.</i>
<i>Indicator:</i>	<i>A fact or device that provides specific information about the objective of interest.</i>
<i>Measure:</i>	<i>Quantitative or qualitative ways to measure the state of the indicator.</i>
<i>Target:</i>	<i>A numerical threshold or directional aim, associated with a measure, and chosen as the minimum (or maximum) state necessary to achieve the desired objective.</i>

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