

A Report Card on the Health of the **HUMBER RIVER WATERSHED**

Prepared by the Humber Watershed Alliance



THE HUMBER RIVER

Kabechenong (Gathering Place to Tie Up)

***As long as Anishnabe people have lived, they remember the Humber River,
and when they lived alongside it.***

***The Great Kind Spirit made everything. The Elders speak about how
precious all of creation is.***

***They always spoke about how beautiful the river was and how it was the
largest and longest water road and how it was used for travel.***

***The Oak Ridges Moraine and the Niagara Escarpment is where this beautiful
river's journey begins and travels to beautiful Lake Ontario. Later,
Europeans also used this water route.***

***This honours the Humber River and the people who used it yesterday, and
our people today who will teach their children to love and care for it for
tomorrow's children.***

Source: Merle Assance-Beedie,
Ernestine Baldwin,
Beausoleil First Nation, 1999.

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A REPORT CARD ON THE HEALTH OF THE **HUMBER RIVER WATERSHED**

Prepared by the Humber Watershed Alliance

July, 2000



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Dedication

This report card on the Humber River Watershed
is dedicated to all those who depend upon
the health of the watershed for a place to live,
for recreation, for employment and
for spiritual fulfilment.

TABLE OF CONTENTS

	PAGE		PAGE
LIST OF FIGURES AND TABLES	v	Air	34
A MESSAGE FROM THE HUMBER WATERSHED ALLIANCE	vi	Indicator 16: Air Quality	36
EXECUTIVE SUMMARY	viii	ASSESSING THE HEALTH OF THE WATERSHED:	
INTRODUCTION	1	SOCIETY AND ECONOMY	37
Description of the Humber River Watershed	1	Heritage	37
Background on the Humber Watershed Alliance	3	Indicator 17: Heritage Resources	38
How Health is Assessed	4	Indicator 18: Heritage Events	39
How the Report Card is Organized	4	Outdoor Activities	40
ASSESSING THE HEALTH OF THE WATERSHED:		Indicator 19: Public Greenspace	41
ENVIRONMENT	5	Indicator 20: Outdoor Recreation	43
Landforms	5	Indicator 21: Trails	44
Indicator 1: Significant Landforms	6	Agriculture	46
Terrestrial Habitat	8	Indicator 22: Agricultural Land	47
Indicator 2: Forest Cover	9	Sustainability	49
Indicator 3: Wetlands	12	Indicator 23: Sustainable Use of Resources	50
Indicator 4: Vegetation Communities	13	ASSESSING THE HEALTH OF THE WATERSHED:	
Indicator 5: Wildlife	15	GETTING IT DONE	51
Groundwater	17	Stewardship	51
Indicator 6: Groundwater Quantity	18	Indicator 24: Community Stewardship	52
Indicator 7: Groundwater Quality	19	Indicator 25: Outdoor Environmental Education	53
Surface Water	20	Indicator 26: Aesthetics	54
Indicator 8: Stormwater Management	22	Indicator 27: Business Stewardship	55
Indicator 9: Bacteria	24	Indicator 28: Municipal Stewardship	57
Indicator 10: Conventional Pollutants	25	SUMMING UP: WHAT DOES IT ALL MEAN?	61
Indicator 11: Heavy Metals and Organic Contaminants	27	SUMMARY OF INDICATORS AND GRADES	63
Indicator 12: River Flow	28	GLOSSARY	65
Aquatic Habitat	29	ACKNOWLEDGEMENTS	67
Indicator 13: Benthic Invertebrates	30		
Indicator 14: Fish Communities	32		
Indicator 15: Riparian Vegetation	33		

LIST OF FIGURES AND TABLES

FIGURES	PAGE
Figure 1: Humber Watershed Base Map	1
Figure 2: Humber Watershed by Municipality.....	2
Figure 3: Area of Each Subwatershed in the Humber Watershed	2
Figure 4: Urban Development on Significant Landforms in the Humber Watershed	7
Figure 5: Forest Cover in the Humber Watershed	11
Figure 6: Evaluated Wetlands in Each Humber Subwatershed	12
Figure 7: Environmentally Significant Areas, Areas of Natural and Scientific Interest and Wetlands in the Humber Watershed	14
Figure 8: Human Intervention in the Water Cycle	17
Figure 9: Provincial Water Quality Monitoring Stations in the Humber Watershed	21
Figure 10: Stormwater Management in Urbanized Areas of the Humber Watershed	23
Figure 11: Chloride Concentrations at Five Stations in the Humber Watershed	26
Figure 12: Phosphorus Concentrations at Four Stations in the Humber Watershed	26
Figure 13: Change in Total Annual Flow at Five Stations in the Humber Watershed	28
Figure 14: Stream Quality Ratings in Humber Subwatersheds Based on the Index of Biotic Integrity.....	31
Figure 15: Stream Length with Woody Riparian Vegetation in the Humber Watershed	33
Figure 16: Woody Riparian Vegetation in the Humber Watershed Compared to	33
the Remedial Action Plan Target	
Figure 17: Public Greenspace in the Humber Watershed	42
Figure 18: Inter-regional Trails in the Humber Watershed	45
Figure 19: Agricultural Land in the Humber Watershed	48
Figure 20: High Employment Areas in the Humber Watershed	56
 TABLES	
Table 1: Development on the Oak Ridges Moraine in the Humber Watershed	7
Table 2: Development on the Niagara Escarpment in the Humber Watershed	7
Table 3: Forest Cover by Municipality in the Humber Watershed	10
Table 4: Interior Forest Cover in the Humber Subwatersheds	10
Table 5: Vegetation Communities in the Humber Subwatersheds	13
Table 6: Indicator Species in the Humber Subwatersheds	16
Table 7: Percent of Samples that Meet Provincial Water Quality Objectives for	23
Bacteria Concentrations in the Humber River (1990 - 1996)	
Table 8: Healthy and Impacted Benthic Communities in the Humber River	31
Table 9: Registered Vehicles in the Regions of Peel & York and the City of Toronto	35
Table 10: Air Quality Index Summary for Three Stations in the Humber Watershed (1997)	35
Table 11: Public Greenspace in the Humber Subwatersheds	41
Table 12: Inter-regional Trails in the Humber Watershed by Municipality	44
Table 13: Examples of Corporate Participation in Watershed Management	56
Table 14: Municipal Environmental Policies and By-Laws	58

A Message From the Humber Watershed Alliance



Humber River, Castlederg Road, Caledon.

On October 15, 1994 — the 40th anniversary of Hurricane Hazel — The Toronto and Region Conservation Authority (TRCA) launched the development of a strategy that would help them evaluate and understand the issues in the Humber watershed, and then identify a plan to protect, restore and celebrate the river and its watershed using an ecosystem-based approach.

The Toronto and Region Conservation Authority recognized that the success of developing a Humber watershed strategy lay in strong community support, and they immediately assembled a task force to guide the preparation of the document. The task force, which included thirteen watershed residents, elected officials from twelve local and three regional municipalities, representatives from five agencies and eleven interest groups, and the Chair of the TRCA, held its first meeting in February 1995.

Over the course of more than 20 months, the Humber Watershed Task Force also developed a newsletter, worked on a number of hands-on environmental regeneration projects, pursued the designation of the Humber as a Canadian Heritage River, and ultimately created *Legacy: A Strategy for a Healthy Humber* and its companion document, *A Call to Action*. These documents outlined a holistic vision and made recommendations to achieve a healthy ecosystem in the Humber River watershed.

The Toronto and Region Conservation Authority formally endorsed the recommendations outlined in *Legacy* in December 1996. With their job complete, the task force was dissolved and the TRCA embarked on an implementation strategy. A new community-based action group — the Humber Watershed Alliance — was assembled by the TRCA in 1997 to implement the recommendations in *Legacy*. The Alliance produced this report card — the first-ever *Report Card on the Health of the Humber River Watershed*.

The Humber Report Card provides an important initial assessment of the health of the watershed. It represents a baseline against which future progress will be measured.

We selected 28 indicators in three major categories — Environment, Society and Economy, and Getting It Done — to assess the health of the watershed and the progress being made to ensure the Humber will be

healthy for future generations. We used indicators such as how swimmable the waters of the Humber are, how well the fish, vegetation and wildlife are doing, how well agricultural land is being conserved, and how involved people are in stewardship activities.

We assigned ratings to these indicators ranging from very good (A) to extremely poor (F). We looked not only at how healthy the watershed presently is, but also at whether things are getting better or worse. That is why many ratings have an arrow pointing up or down.

Overall, the Alliance gave the watershed a “C” or a “fair” health rating. We believe this assessment gives reason for concern and for cautious optimism.

There is cause for concern because, although the watershed is in fair shape, it is under significant stress, and the stresses will likely increase. There are eight health indicators where action is urgently required to raise the current rating from “D” or lower (the one “F” is for management of stormwater runoff in urban areas).

The assessment gives way to cautious optimism as there are ten indicators that are showing improvement. For example, watershed stewardship measures received fair to good ratings. Many of the steps that need to be taken to ensure a sustainable future for the Humber have been identified and initiated.

This report card does more than identify the good and bad news about terrestrial habitat, water quality or public greenspace. It sets targets for 5, 15 and 25 years from now, and it proposes how to get there. We believe the targets for 2005 are achievable. The medium-to-longer-term targets (2015 and 2025) are more ambitious and will require consistent commitment, cooperation and determination to meet them.

Who is responsible for protecting, restoring and celebrating this tremendous resource? There is an important role for governments and for agencies like TRCA. However, we know that everyone must play a role – all those who live in the watershed, work and do business here, drink the water and breathe the air, and enjoy its natural beauty and the recreational and heritage activities it affords. All levels of government, businesses, community groups and individuals must work together.

We urge you to join us – the 73 people, from various stakeholder groups, who make up the Humber Watershed Alliance – to work on

behalf of the Humber. We need your help. We want to ensure that the watershed that was inherited from previous generations is passed on to future generations in as good or better shape than before, despite the pressures of urban expansion and the demands of a growing population.

As this report card shows, there is not a single, simple solution, but many small steps that cumulatively will make a real difference towards reaching our goals.

We hope this report card will help to galvanize concern and turn it into renewed commitment and action on behalf of the Humber and the Ontarians who will live, work and play here in the future. This Year 2000 report card is just the beginning. In three years, and every three years thereafter, the Alliance will report again on the progress that has been made.

Will you share this challenge with us?



Chapman Valley, Islington Avenue, Toronto.

On behalf of your neighbours, colleagues and friends on the Humber Watershed Alliance.

Signed:

A handwritten signature in black ink, appearing to read 'Lois Griffin'.

Lois Griffin
Chair,
Humber Watershed Alliance

A handwritten signature in black ink, appearing to read 'Tija Luste'.

Tija Luste
Chair,
Report Card Sub-Committee

Executive Summary

This document, titled *A Report Card on the Health of the Humber River Watershed*, was prepared by the Humber Watershed Alliance. The Humber Watershed Alliance is a community-based action group made up of residents, interest groups, agencies and elected representatives from across the Humber watershed. The Alliance was assembled by The Toronto and Region Conservation Authority in 1997 to implement *Legacy: A Strategy for a Healthy Humber*, the Conservation Authority's vision and action plan for a vital and healthy Humber ecosystem.

This report card assesses the current health of the Humber River watershed in three main categories: Environment; Society and Economy; and Getting It Done (stewardship). Within each of these main categories, there are 28 indicators that provide a more detailed picture of the existing conditions in the watershed. Each of the indicators has been assigned a letter grade and given an assessment of whether the indicator is relatively stable, in decline, or improving.

This document also identifies a series of time-linked, measurable targets for each indicator that, if achieved, will ensure the Humber River watershed has a healthier future. Specific actions are given to help achieve the targets.

Overall, the Humber River watershed has been given a "C", or fair' grade. This "C" is the average of the grades given to all 28 indicators. The grades assigned to these indicators demonstrate a wide range of health, from "A" — very good health — for outdoor recreation (*the watershed has close to 900 different outdoor facilities, including many that are highly used*) to "F" — extremely poor — for stormwater management (*much of the urbanized area within the Humber watershed has no stormwater control*). Grades also differ depending on which part of the watershed is being evaluated.

A few aspects of the Humber River watershed, including benthic invertebrate communities, publicly-owned greenspace and municipal stewardship, are relatively healthy and were assigned a grade of "B" (good health).

Most aspects of the watershed — more than 50% — are in fair health. These areas are not in critical condition, but there is definite room for improvement in each. These indicators include forest cover, wildlife, groundwater quality, trails, heritage resources and community stewardship.

Nearly one-third of the indicators are in poor health (graded as a "D" or lower). Air quality, levels of bacteria and conventional pollutants

(including phosphorus, nitrogen and chlorides) in surface water, the levels of chloride and nitrate contamination in groundwater, and the amount of agricultural land protected from development are a few of the indicators that received a "D" or lower.

The health of 75% of the indicators is either stable or improving; only 25% of the indicators show declining health.

Most of the data used to develop the grades was extracted from the files of The Toronto and Region Conservation Authority. Other sources are identified throughout the report, where appropriate. For some indicators, data was limited or not as current as we would have liked. These gaps have been identified and efforts will be made to collect the necessary information for the next report card, which will be produced in three years time.

Introduction

This report card is an assessment of the health of the Humber River watershed by the Humber Watershed Alliance. In this introduction, we briefly describe the watershed, and provide some background on the Alliance. Then we outline how we chose the 28 health indicators for the Humber, how the report card is organized, and what information is included under each indicator.

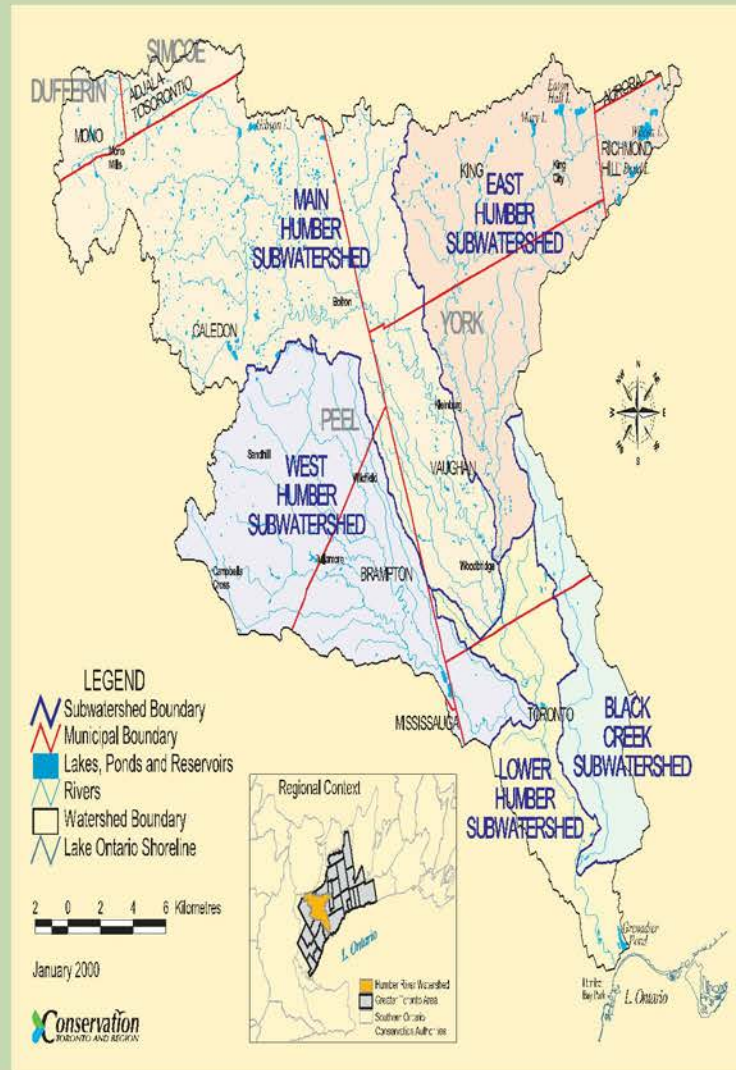
Description of the Humber River Watershed

The Humber River watershed covers 908 square kilometres and is the largest watershed in the Toronto region. (Figure 1)

The Main branch of the river flows more than 120 kilometres from its source on the Niagara Escarpment and Oak Ridges Moraine to Lake Ontario. The East Humber originates in the kettle lakes region of Richmond Hill and King Township. The West Humber begins in Caledon in the rolling hills of the South Slope, and flows over the Peel Plain in Brampton before joining the Main Humber in Toronto.

The watershed contains over 750 streams, forming 1,800 km of tributaries. There are 600 lakes, ponds and reservoirs, and a complex aquifer system that lies beneath the Oak Ridges Moraine. The kettle lakes on the Moraine were created by the retreating glaciers at the end of the last Ice Age, 12,000 years ago.

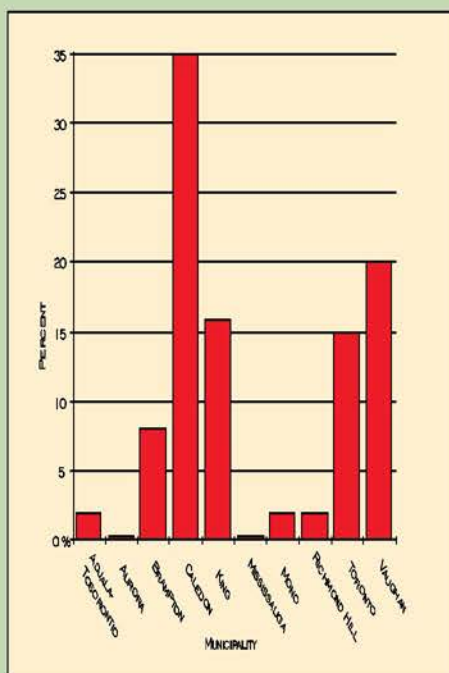
Figure 1: Humber Watershed Base Map



Land use varies across the watershed. About 15% of the watershed is developed, 30% is developing or committed to development, and 55% is rural. The lower reaches are highly urbanized. In the upper reaches, there are extensive agricultural and rural uses, as well as large natural areas.

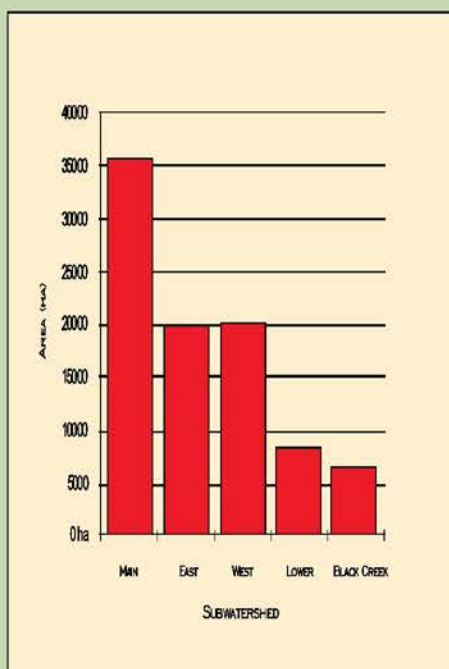
About 550,000 people live in the watershed, mostly in the highly developed cities of Toronto, Brampton and Mississauga, and in the developing areas of Vaughan and Richmond Hill. The least populated areas are in the upper reaches, in the Towns of Aurora and Caledon, and the Townships of King, Mono and Adjala-Tosoronto. The percent of the watershed in each municipality is illustrated in Figure 2.

Figure 2: Humber Watershed by Municipality



By 2011, the population of the watershed is expected to grow by about 32% to 725,000. Most of the growth will occur north of Toronto in the municipalities of Brampton, Vaughan and Richmond Hill.

Figure 3: Area of Each Subwatershed in the Humber Watershed



Because of the watershed's size and diversity, we have divided it into five subwatersheds: the Lower Humber, the Main Humber, the West Humber, the East Humber and Black Creek. (Figure 3).

Background on the Humber Watershed Alliance

On December 20, 1996, The Toronto and Region Conservation Authority (TRCA) formally endorsed the report of the Humber Watershed Task Force, called *Legacy: A Strategy for a Healthy Humber*.

The report, which was published in the spring of 1997, included 30 objectives for the management of the watershed, one of which was the creation of a Humber Watershed Alliance to facilitate the implementation of *Legacy*. Another objective was the development of a report card to monitor the health of the Humber's ecosystem.

The Humber Watershed Alliance was established by TRCA in October, 1997. Our membership of 73 people includes residents, interest groups, business associations, elected representatives from the local and regional municipalities in the watershed, agency staff, and the Chair of TRCA.

In 1998, the Alliance established a subcommittee to develop a report card. The subcommittee's job was to help research, write, edit, advise, consult and recommend a report card that describes the current health of the watershed and sets targets and actions for maintaining or improving its condition.

An important role of the Alliance is to inform and educate people on the issues and opportunities within the Humber watershed and to encourage community input. Community meetings were held in King City, Bolton and Toronto to provide information and



The Humber Watershed Alliance.

invite opinion from people about the health of the watershed. A public opinion survey was also conducted for the Humber Watershed Alliance by the Angus Reid Group. The purpose was to gather baseline information on the attitudes, level of knowledge, and environmental behaviour of watershed residents regarding the Humber. Seven hundred people were polled by telephone; 400 urban residents and 300 rural residents. The overall degree of accuracy was +/- 4%, 19 times out of 20. Results of the survey are quoted throughout the report card.

In keeping with our mandate to implement *Legacy*, the Alliance has developed community action sites and hosted special events to celebrate the Humber River. While the report card was being developed, the Alliance was also successful in getting the

Humber River designated as a Canadian Heritage River; the sixth river in Ontario to be nationally recognized for its outstanding heritage and recreation values. We use the *Humber Advocate* newsletter to spread the word about the importance of the watershed and the activities supporting it.

The Alliance adopted this report card on the health of the Humber River watershed in January, 2000.

The report card will be used to help set the future work plan for the Alliance. The plan is to issue a report every three years to show what progress has been made at achieving the objectives set out in *Legacy: A Strategy for a Healthy Humber*.

How Health is Assessed

We used various indicators to assess the health of the watershed. An indicator is a piece of information or a clue that tells us something about conditions around us. For example, to a physician, blood pressure and body temperature are indicators of the health of a patient. To an economist, Gross Domestic Product and the unemployment rate are indicators of the health of a country's economy.

We selected 28 indicators for this report card. In choosing these indicators, we asked ourselves a number of questions. Will the indicator give us meaningful information about the Humber? Is the information available, retrievable and cost-effective to collect? Will the indicator mean something to the public? Will it give us information about trends over time? Do the indicators collectively give us enough information to really assess the health of this complex watershed?

Many of the indicators relate to more than one topic. For example, the health of fish communities is related to the amount and quality of riparian (streambank) vegetation. Levels of bacteria in surface water are related to stormwater management and river flow. This overlap shows how ecosystems work and how everything is connected to everything else.

How the Report Card Is Organized

The 28 indicators are presented in three major sections:

- Environment
- Society and Economy
- Getting It Done.

Each section starts with a brief introduction to some key issues. Within the sections, indicators are grouped together, where appropriate. For example, there is a subsection on groundwater that has two indicators: groundwater quantity and quality.

Each indicator provides the following information:

- The question we asked about the indicator.
- The data used to help measure the indicator.
- The rating (explained below).
- Some current efforts that may affect the indicator.
- Good news and bad news about how effective actions have been to date and what the data tells us about the indicator.
- Targets for the years 2005, 2015 and 2025, where possible.
- Key next steps on how to reach our targets. These are not the only actions that are needed, but they are important ones, and require the efforts of all partners.

The ratings for health were assigned by the members of the Humber Watershed Alliance based on the good news and bad news.

Some ratings have an arrow to show whether the trend is up, for improving, or down, for worsening.

HEALTH RATINGS

- A is very good health
- B is good health
- C is fair health
- D is poor health
- E is very poor health
- F is extremely poor health

In two cases, a grade was not assigned because sufficient information was not available or the indicator was not yet fully developed. There will be ratings for these indicators in the next report card. In some cases, we rated indicators on a municipal or subwatershed basis in order to show the varying conditions found in different sections of the Humber River watershed. The rating reflects the existing conditions and is not a measure of the effort being invested to deal with specific conditions

Finally, the report card concludes with a summary of all the ratings in chart form and an assessment of the overall health of the watershed.



ASSESSING THE HEALTH OF THE WATERSHED: ENVIRONMENT

"We refer to the earth as Mother Earth, the giver of all life. We refer to the sun as our eldest brother and the moon as our grandmother. We consider the animal and plant life our brothers and sisters. We consider the waters of the world to be the bloodlines of Mother Earth.

Our ancestors have always understood this. This is why our ceremonies give thanks and gratitude to the spirits of the natural world."

Source: James W. Ransom
Water is Life, Assembly
of First Nations, 1995.

Landforms

The Humber River watershed contains landforms that are varied and unique, and help create a distinct sense of place. These landforms include the undulating and gravelly hills of the Oak Ridges Moraine, the ancient rock of the world-renowned Niagara Escarpment, the South Slope, the flat Peel Plain, and the Iroquois Sand Plain, as well as the valley and stream corridors.

Besides possessing unique features, these significant landforms perform vital ecological functions. For example, the Oak Ridges Moraine plays a crucial role in helping to maintain the quantity and quality of groundwater in the region. The aquifers fed by it supply drinking water for a large population and form the headwaters of more than twenty rivers including the Humber. The

large woodland areas that remain on the Moraine support many native plants and animals, and act as refuges for species displaced from more developed areas. The Niagara Escarpment has been designated a World Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization, based on many outstanding features, such as its geologic formations and biodiversity.

As the population of the Greater Toronto Area (GTA) continues to grow, so does the development pressure on the Humber's significant landforms. Development can lead to loss of woodlands, wetlands and other habitats, alterations in stream flow, loss of groundwater recharge areas, and extirpation (or local extinction) of plant and animal

species. It can also spoil the natural beauty of these areas and reduce recreational opportunities for watershed residents, now and in the future.

The indicator we selected measures how much development has occurred on the Niagara Escarpment and Oak Ridges Moraine (Tables 1 and 2). Another measure used is the extent of valley and stream corridors that are fill regulated. In the near future, the new generic regulation under the Conservation Authorities Act will be finalized. Within two years, TRCA will register revised fill regulation lines with the Province of Ontario to facilitate more effective protection of valley and stream corridors, headwaters, wetlands and other natural features and functions.

Top Photo: Eaton Hall Wetland, King Township.

INDICATOR 1: SIGNIFICANT LANDFORMS

How well are significant landforms being protected from urban sprawl?

MEASURE: The amount of development that has taken place on the Oak Ridges Moraine and the Niagara Escarpment (based on a 1994 land use study by Marshall Macklin Monaghan Ltd.). The extent of valley and stream corridors that are fill regulated. Also see Indicator 28: Municipal Stewardship.



Current Efforts:

- Landform conservation is now reflected in a wide range of provincial, regional and municipal planning documents.
- Many citizens' groups are promoting the protection of significant landforms. STORM (Save the Oak Ridges Moraine) is involved in defining a Landform Conservation System.
- The Regions of York, Peel and Durham have begun to work on a long-term strategy to guide development on the Oak Ridges Moraine, and are calling on the Province to recognize it as provincial policy under The Planning Act.
- TRCA has regulations and policies that protect the features and functions of valley and stream corridors, including contiguous natural features, from development.

- Studies by agencies and education institutions on vegetation communities, recharge zones, and aquifers are helping to guide better decision-making.

Good news:

- In a 1994 study, only 3.5% of the Oak Ridges Moraine and less than 2% of the Niagara Escarpment had been developed within the Humber watershed (Figure 4).
- 80% of Official Plans recognize the importance of landform protection.
- All municipalities in the watershed have by-laws that support the objectives of landform conservation (i.e. fill line, grading and ravine protection).

Bad news:

- In 1994, an additional 13% of the Oak Ridges Moraine was committed for development (Table 1).
- Since 1994, development on the South Slope and on the Oak Ridges Moraine has continued at a rapid pace. The cumulative environmental impact of this is not well-documented.
- Although development of a strategy for long-term protection and management of the Oak Ridges Moraine was initiated by the Province in 1991, it still does not have status as policy under The Planning Act.
- The South Slope is not officially recognized as a significant landform in planning documents.
- Not all valley and stream corridors within the watershed are accurately mapped or protected by fill and floodplain regulations.

Targets: 2005:

- Development on the Oak Ridges Moraine and the Niagara Escarpment is limited to what was already approved as of 1999 - approximately 6,200 hectares.
- Best management practices are used in all development to protect the landform and its functions.

How to get there:

- The provincial government and municipalities complete a long-term strategy for the protection and management of the Moraine, and implement it as provincial policy under The Planning Act.
- All municipalities aggressively apply policies that promote landform conservation.
- Private landowners conserve the landform features and functions on their properties.
- TRCA work with municipalities to update/expand mapping of valley and stream corridors to ensure no development within them.
- TRCA update and extend the fill regulated areas.

Top Photo: View of Oak Ridges Moraine at Glen Haffy Conservation Area, Caledon.



Eaton Hall Wetlands, King Township.

Figure 4: Urban Development on Significant Landforms in the Humber Watershed

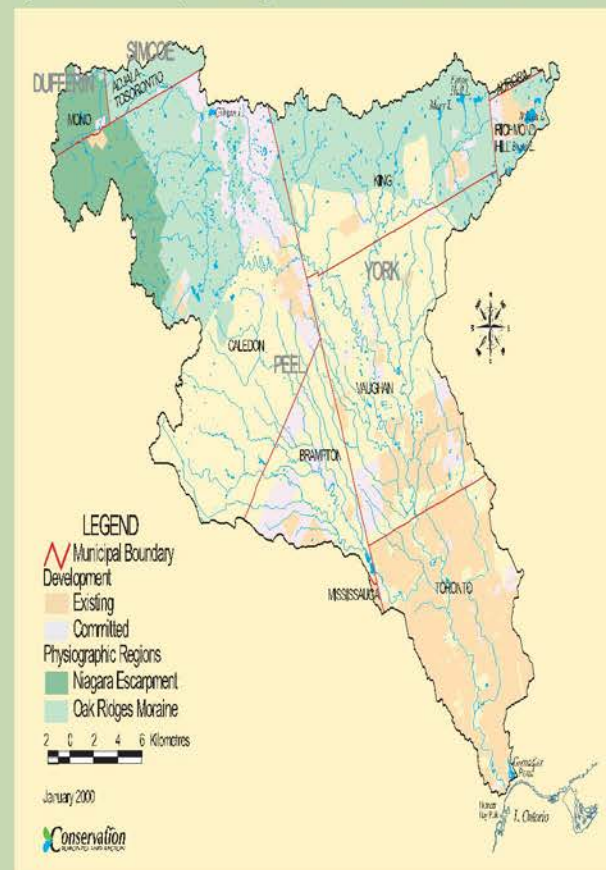


TABLE 1: Development on the Oak Ridges Moraine (ORM) in the Humber Watershed

Municipality	% of Municipality in the Humber on the ORM	% of the ORM in each Municipality that is Developed	% of the ORM in each Municipality that is Committed for Development (as of 1994)
Adjala-Tosorontio	100	0	1
Aurora	100	33	6
Caledon	45	<1	22
King	68	3	2
Mono	0	0	14
Richmond Hill	100	31	29
Vaughan	4	0	0

TABLE 2: Development on the Niagara Escarpment in the Humber Watershed

Municipality	% of Municipality in the Humber on the Niagara Escarpment	% of the Niagara Escarpment in each Municipality that is Developed	% of the Niagara Escarpment in each Municipality that is Committed for Development (as of 1994)
Caledon	16	2	<1
Mono	96	<1	5



Terrestrial Habitat

Despite the changes that have taken place over the last two centuries, the Humber watershed still has diverse terrestrial habitats. These include upland and lowland forests, marshes, bogs, swamps, grasslands and meadows. Healthy terrestrial habitats support a broad range of animal species, allow wildlife to move around easily, and provide valuable recreational opportunities for people. The largest and healthiest habitats are found in the upper reaches of the Humber watershed, most notably the East and Main subwatersheds. In the heavily developed middle and lower reaches of the river, habitat blocks are smaller, more fragmented, and often limited to river valleys. Even when habitat blocks are protected from development, their quality can be adversely affected by surrounding development.

To assess the health of the Humber's terrestrial habitats, we used four indicators:

- the amount of forest cover;
- the amount of wetland cover;
- the amount of different vegetation communities; and
- the presence of specific wildlife species.

Both forests and wetlands perform invaluable ecological functions. Forests, for example,

filter out air pollutants, provide oxygen, retain stormwater, reduce erosion, and provide habitat for invertebrates, birds and mammals. Wetlands retain stormwater, filter out pollutants from surface waters and provide habitat for a wide range of mammals, birds, fish, reptiles, and amphibians.

Biodiversity requires a full range of vegetation communities that are native to the watershed. The vegetation communities historically found in the Humber watershed have developed over 12,000 years, in response to soil, drainage and climatic conditions. Despite development, many remnant vegetation communities remain, including oak savannah, cedar swamps, cattail marshes, peatlands, as well as Boreal and Carolinian forests. Some vegetation communities such as oak savannah, meadow marsh, bog and fen require special attention because they are uncommon or particularly vulnerable to disturbance. Other communities like the sugar maple forest are widespread but suffer from continuous habitat removal, small sections at a time, resulting in a cumulative reduction in their representation.

The fourth indicator is the presence of key wildlife species chosen specifically as indicators for the Humber River watershed. Different animals have particular needs for breeding,

feeding, shelter, space, resting and migration. They also have differing sensitivity to development. Knowing whether indicator species are present in a watershed can tell us a lot about the conditions of the habitats they need for survival and therefore helps us to monitor environmental changes.

Large mammals such as black bear, wolverine, moose and wolf, have disappeared from the Humber because of human disturbance and the lack of suitable habitat. Another significant mammal, the river otter, has also disappeared, but has potential for reintroduction.

INDICATOR 2: FOREST COVER

How well are forests being protected and regenerated?

MEASURE: Total watershed forest cover, excluding urban street trees, based on interpretation of aerial photographs. Forests include natural woodlots and coniferous plantations.

RATING:



Current Efforts:

- Most municipalities in the watershed have Official Plans and policies that recognize the importance of habitat protection.
- The Region of York has tree by-laws that protect remaining treed areas.
- TRCA has initiated a Natural Heritage Strategy to identify core forest habitats and connecting links.
- TRCA and the Ministry of Natural Resources (MNR) continue to update the Environmentally Significant Areas (ESA) inventory to identify important forests (Figure 7).

Good news:

- Over four million trees have been planted on private and public lands by residents, agencies, and community groups since the 1960s.
- Large forest patches remain in the upper reaches of the watershed. A total of 11,277 hectares of forest cover are found in Adjala-Tosorontio, Mono, Caledon and King (Table 3).
- 1,851 hectares of interior forest habitat, critical for the nesting of area sensitive birds and the survival of certain amphibians, remain in the watershed. Most are found in the Main and East Humber subwatersheds (Table 4).
- The City of Vaughan has a Woodland Acquisition Program to acquire tableland woodlots.

Bad news:

- Only 17% of the watershed is covered by forest (figure 5).
- Except for Adjala-Tosorontio, all municipalities are below the Remedial Action Plan (RAP) guideline of 30% forest cover.
- Forests continue to be lost and fragmented, primarily due to urbanization; only 79 hectares of interior forest habitat remain in the West, Lower and Black Creek subwatersheds.
- In the past, forest restoration efforts have not addressed reducing forest fragmentation.
- Changes in the Development Charges Act have eliminated an important source of funding for municipalities to acquire tableland woodlots.

Targets:

- 2005:**
- No loss of forests.
 - Until a Natural Heritage Strategy is completed, adopt the Remedial Action Plan guideline of 30% forest cover.
 - The urban street tree canopy is identified as part of the watershed forest cover.
 - 60 hectares have been reforested.

How to get there:

- Municipalities enforce the retention of forest cover and pursue reconnecting woodlands with the assistance of the municipal planning process, Official Plans and tree by-laws.
- Governments, TRCA, agencies, community groups and residents reconnect, restore and expand forests through public acquisition, conservation easements and private land stewardship programs.
- Municipalities define the extent of the urban street tree canopy.

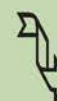


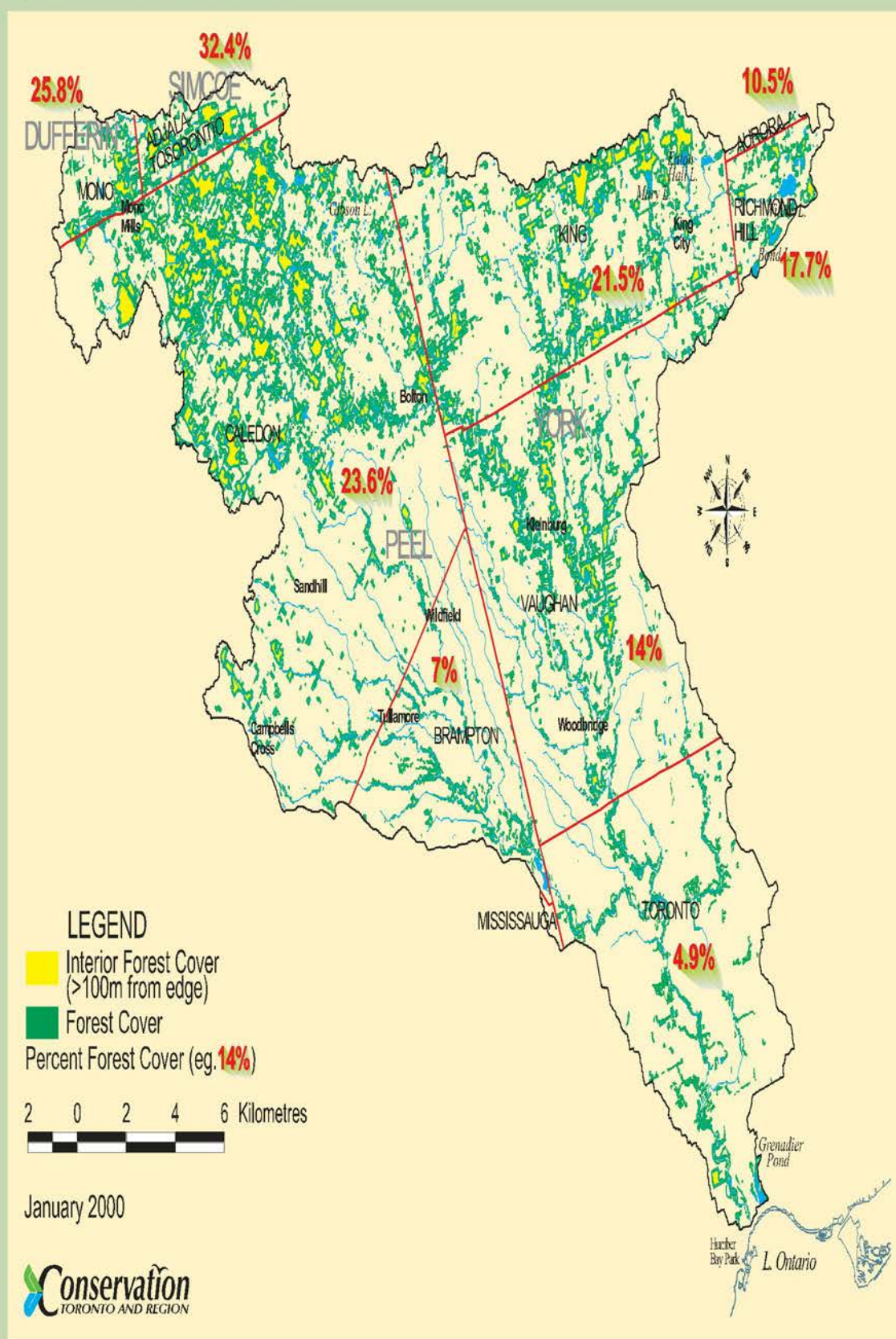
TABLE 3: Forest Cover by Municipality in the Humber Watershed

Municipality	Area ¹ (hectares)	Total Forest Cover (hectares)	Total Forest Cover (%)	Rating ²
Adjala-Tosorontio	1,994	630	32	A
Aurora	129	14	11	E
Brampton	7,107	519	7	F
Caledon	31,596	7,223	23	A
King	14,599	2,982	21	A
Mississauga	114	0	0	F
Mono	1,769	442	25	A
Richmond Hill	2,094	352	17	C
Toronto	13,730	940	7	F
Vaughan	17,985	2,517	14	D
Watershed	91,117	15,618	17	C
¹ Area of watershed in each municipality. ² Based on 25% forest cover target.				

Table 4: Interior Forest Cover in the Humber Subwatersheds

Subwatershed	Interior Forest (hectares)
Main	1313
East	460
West	65
Lower	13
Black Creek	0.6
Total	1851.6

Figure 5. Forest Cover in the Humber Watershed



INDICATOR 3: WETLANDS

How well are wetlands being protected and restored?

MEASURE: Amount of 'Evaluated Wetlands' present in the watershed, as designated by the Ministry of Natural Resources (MNR). Wetlands are areas that are seasonally or permanently flooded by shallow water, including swamps, bogs, fens and marshes.

RATING:



Current Efforts:

- MNR has designated some wetlands as Evaluated Wetlands (Figure 6).
- MNR and TRCA continue to evaluate wetlands in the upper reaches of the watershed and revise Environmentally Significant Areas (ESA) designations.
- Municipal Official Plans include policies to protect wetlands.
- Community groups are assisting with wetland restoration projects in such places as Caledon East, Bolton Mill Park, Black Creek and Claireville Conservation Area.
- Amphibian monitoring programs have been initiated to help determine the quality of wetlands.

Good News:

- There are 34 Evaluated Wetlands in the watershed.
- Large wetlands, such as those at the mouth of the Humber, still support a wide range of plants and animals.

Bad news:

- An estimated 80% of wetlands have been lost across the GTA since pre-settlement times.
- Evaluated Wetlands account for only 1.1% of the watershed.

• Only Evaluated Wetlands are protected by provincial policies. Small wetlands and those that are not designated as provincially significant continue to be degraded, become disconnected from upland habitats, or destroyed completely due to filling or draining.

• Hundreds of wetlands in the watershed have not been mapped or evaluated to determine their significance.

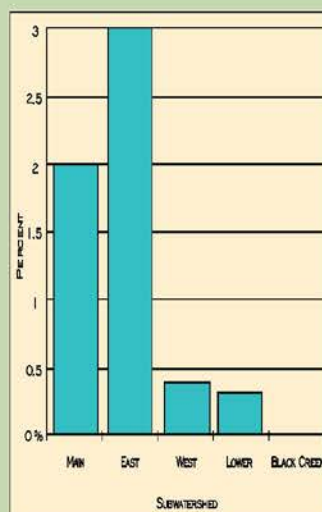
Targets:

- 2005:**
- Until a Natural Heritage Strategy is completed, a Remedial Action Plan guideline of 10% is adopted for the watershed.
 - There are 15 hectares of wetland restored, including at least one of 1 hectare in size within Toronto.
 - On completion of the wetland inventory and the Natural Heritage Strategy, revised targets are established.

How to get there:

- MNR continue to map and designate Evaluated Wetlands.
- Agencies document, protect, and enhance all remaining wetlands through the municipal planning process, public acquisition, conservation easements and land stewardship programs.
- TRCA and partners complete the Humber Natural Heritage Strategy.
- Government, agencies and community groups increase efforts to create new wetlands and restore those that have been degraded.
- Private landowners protect, restore and enhance wetlands using best environmental management practices.
- Landowners and groups participate in volunteer monitoring and Adopt-A-Pond initiatives.

Figure 6: Evaluated Wetlands in Each Humber Subwatershed



Top Photo: Centreville Creek, Caledon.

INDICATOR 4: VEGETATION COMMUNITIES

How well are different types of vegetation communities being protected?

MEASURE: Percent cover and distribution of different vegetation communities.

RATING:

Being developed.



Current Efforts:

- Vegetation community types are being inventoried and mapped by TRCA (Table 5).
- Toronto is protecting and restoring the Black Oak Savannah in High Park.
- Community groups, such as the Association for Biodiversity Conservation (ABC), are working to expand the black oak savannah habitat in the Lower Humber River sub-watershed.

Good News:

- Protection of representative vegetation communities is provided by MNR's "Provincially Significant" wetland and Areas of Natural and Scientific Interest (ANSI) designations and TRCA's Environmentally Significant Area (ESA) program (Figure 7).
- A good representation of vegetation communities is still found in Caledon and King.
- Some rare habitats are present, including remnant black oak savannah communities in Toronto, and the peatland community in the Cold Creek Conservation Area in King Township.

Bad news:

- As patches of natural habitat are destroyed or degraded, the representation, or quantity remaining, of some native vegetation communities such as hemlock forest, is being reduced.
- Invasive exotic species such as garlic mustard, dog strangling vine and purple loosestrife are displacing native plants, such as hepatica, spring beauty, and trillium.

Targets:

- 2005:**
- Percent cover and distribution of vegetation community types has been confirmed.
 - The priorities have been established for protecting and restoring diverse native vegetation communities.
- 2015:**
- The percent cover and distribution of different native vegetation communities has increased.

How to get there:

- TRCA and partners complete a Natural Heritage Strategy which will identify the extent and distribution of vegetation community types.
- Agencies protect different native vegetation communities through the municipal planning process, public acquisition, conservation easements and land stewardship programs.
- Landowners protect, restore and enhance diverse native vegetation community types using best environmental management practices.

TABLE 5: Vegetation Communities in the Humber Subwatersheds

Subwatershed	Examples of Vegetation Communities
Main	- white cedar-conifer organic coniferous swamp - tamarack treed fen
East	- fresh-moist hemlock coniferous forest - calla lily organic shallow marsh
West	- fresh-moist black maple lowland deciduous forest - winterberry organic thicket swamp
Lower	- dry black oak tallgrass savannah - cattail mineral shallow marsh
Black Creek	- dry tallgrass prairie - dry-fresh sugar maple beech deciduous forest

Top Photo: Trout Lily.

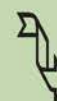
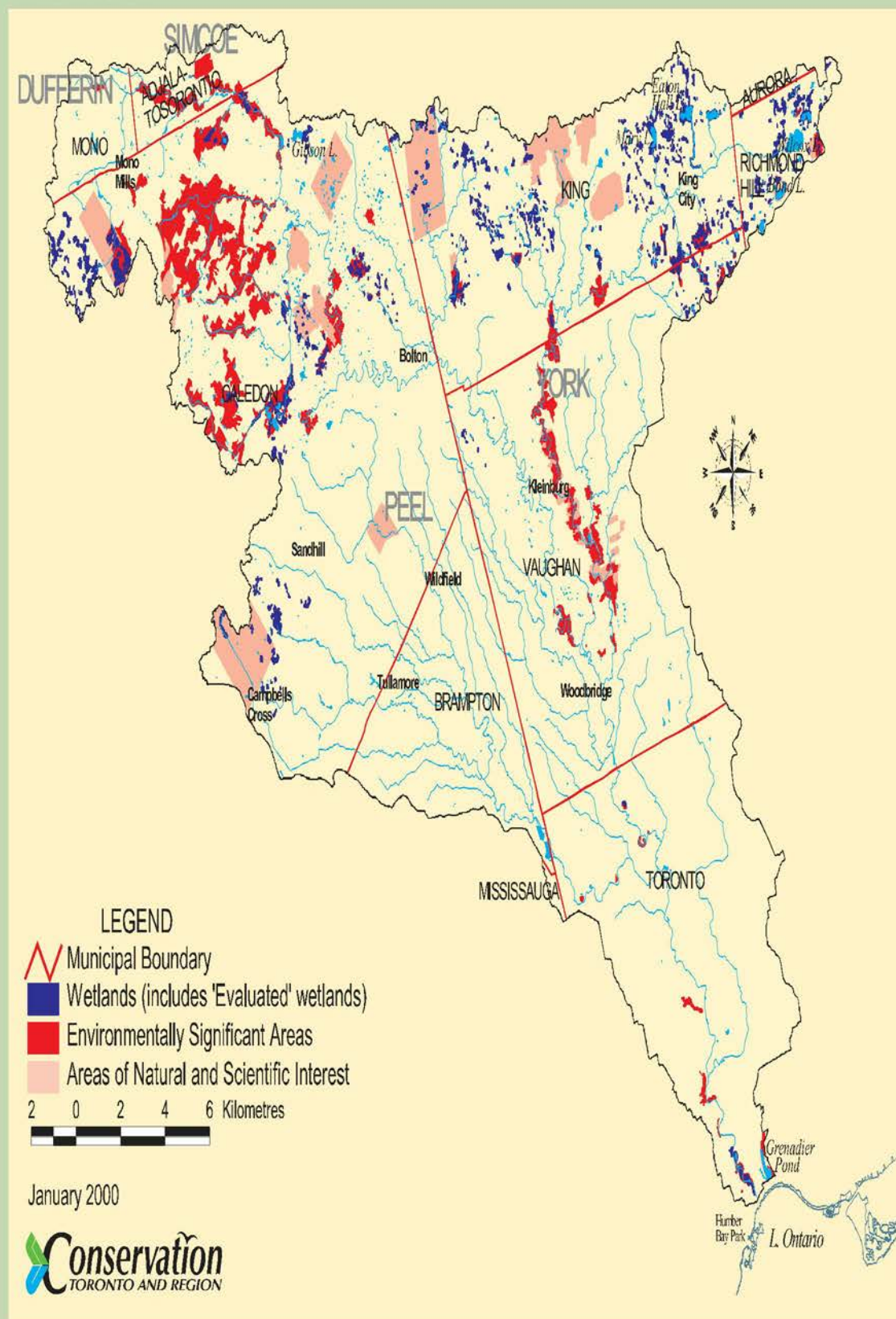


Figure 7: Environmentally Significant Areas, Areas of Natural Scientific Interest and Wetlands in the Humber Watershed



INDICATOR 5: WILDLIFE

How well is wildlife protected?

MEASURE: Presence or absence of the 25 indicator species. Indicator species are animals that indicate the condition of the environment, such as the level of pollution, habitat availability, and the size and degree of disturbance.



Current Efforts:

- Individuals, agencies and naturalist groups take part in bird surveys, such as the Christmas Bird Count, which is coordinated by the Bird Survey of Canada.
- Groups and individuals are constructing, installing and monitoring nesting structures.
- TRCA coordinates an amphibian monitoring program with the assistance of community volunteers, as a prototype for monitoring all 25 indicator species (Table 6).
- Agencies, municipalities, TRCA and private landowners are attempting to control the numbers of over-abundant wildlife species, such as Canada Geese.
- Ducks Unlimited has been conducting a waterfowl nesting survey in King and Caledon.

Good News:

- 24 of the 25 indicator species are found in the Main and the East Humber. These subwatersheds have large habitat blocks with good linkages, forests that are close to wetlands, relatively clean water, and limited human disturbance.

• 84% of respondents agree that improving the wildlife in the Humber watershed will improve their quality of life. (Angus Reid, 1999)

Bad news:

- Only 15 of the indicator species are found in the West Humber because the wetlands and forests are fragmented and because of the predominance of agricultural land use.
- Only 7 of the indicator species are found in the heavily urbanized Lower Humber and Black Creek. These subwatersheds can only support species that can survive in small, disconnected habitats and those that are relatively tolerant of disturbance and pollution.
- Urbanization, and the resulting loss of natural habitats, threatens the survival of many indicator species.

Targets:

2005:

- The 24 indicator species found in the Main and East Humber, the 15 species found in the West Humber, the 9 species found in the Lower Humber and 6 species found in Black Creek are being maintained.

2015:

- All 25 of the indicator species are present in the Main and East Humber, 18 of the 25 indicator species are present in the West Humber, and 12 of the 25 indicator species are present in the Lower Humber and Black Creek.
- A self-sustaining population of river otter has been successfully introduced in the upper reaches of the watershed.

How to get there:

- Agencies, community groups and private landowners make it a priority to protect, enhance and restore wildlife habitats as outlined in the Natural Heritage Strategy.
- Agencies and community groups raise public awareness by expanding volunteer wildlife monitoring programs and reporting results.
- TRCA, with the assistance of other agencies and community groups, will develop recovery management plans for selected species.
- All partners encourage MNR's current interest in a program to re-introduce the river otter to the watershed.





Northern Saw-whet Owl.

TABLE 6: Indicator Species in the Humber Subwatersheds

Subwater-shed	Indicator Species			Rating
Main Humber*	eastern chipmunk	mink	savannah sparrow	A
	screech owl	leopard frog	American woodcock	
	pileated woodpecker	green frog	wood duck	
	wood peewee	swamp sparrow	wood frog	
	porcupine	bullfrog	spring peeper	
	oven bird	virginia rail	gray tree frog	
	scarlet tanager	bobolink	American toad	
	ruffed grouse	eastern meadow lark	green heron	
East Humber**	eastern chipmunk	mink	savannah sparrow	A
	screech owl	leopard frog	American woodcock	
	pileated woodpecker	green frog	wood duck	
	wood peewee	swamp sparrow	wood frog	
	oven bird	bullfrog	spring peeper	
	scarlet tanager	virginia rail	gray tree frog	
	ruffed grouse	bobolink	American toad	
	chorus frog	eastern meadowlark	green heron	
West Humber	eastern chipmunk	American woodcock		C
	wood peewee	wood duck		
	leopard frog	wood frog		
	green frog	spring peeper		
	swamp sparrow	chorus frog		
	bobolink	gray tree frog		
	eastern meadowlark	American toad		
	savannah sparrow			
Lower Humber	eastern chipmunk			F
	wood peewee			
	leopard frog			
	green frog			
	swamp sparrow			
	virginia rail			
	savannah sparrow			
	American toad			
Black Creek	eastern chipmunk			F
	wood peewee			
	green frog			
	eastern meadowlark			
	savannah sparrow			
	American toad			

* The chorus frog is absent from the list. ** The porcupine is absent from the list.

Groundwater

The Humber River watershed has abundant groundwater that lies in underground aquifers. A vitally important resource, this groundwater provides the baseflow for the 750 streams and rivers that drain the watershed. It also provides drinking water for rural residences and communities such as Bolton, Caledon East, Mono Mills, Palgrave, King City, Nobleton, Oak Ridges and Kleinburg. About 40,000 residents are supplied by municipally treated groundwater from 29 deep aquifer communal wells. There are an additional 5,335 registered private wells in shallow aquifers; however, not all of these wells are currently being used. The annual consumption is 4 million m³, or 275 litres per person per day.

To assess the health of groundwater in the Humber River watershed, we selected two indicators:

- groundwater quantity (the rate of groundwater taking); and
- groundwater quality (the levels of contamination from nitrates and chlorides).

Many factors can affect groundwater quantity including deforestation, urbanization, aggregate mining below the water table, and groundwater extraction. Such activities can lead to a reduction in stream baseflow, drying up of wetlands, and loss of water in shallow wells. Between the 1970s and 1990s, withdrawals of groundwater for domestic use increased by three to four times their historic levels in places such as King City, Oak Ridges, Kleinburg and Nobleton.

Figure 8: Human Intervention in the Water Cycle

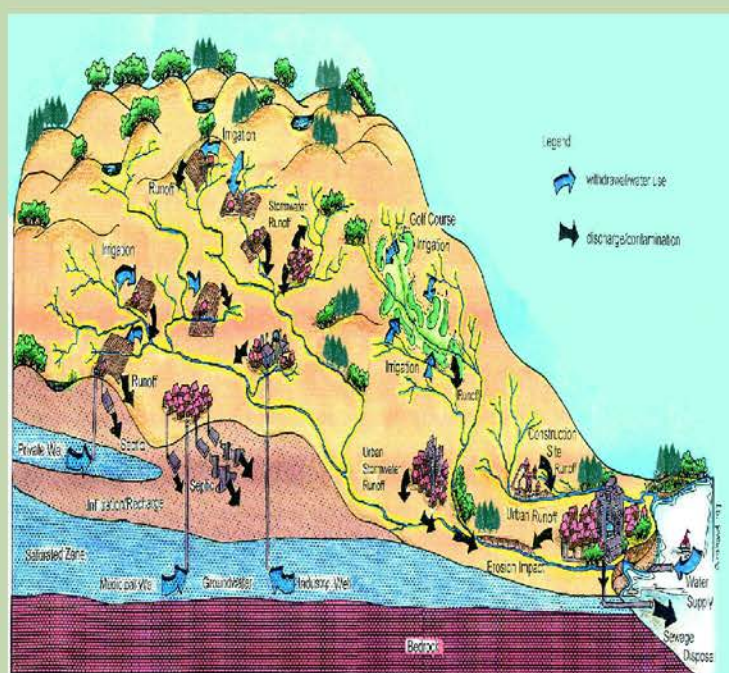


Illustration by Astrid Hood

Groundwater quality can be affected by many activities including agriculture, road salt use, stormwater runoff and industrial spills (Figure 8). In severe cases, pollution of groundwater can render it unfit for human consumption. We looked at two important groundwater pollutants - nitrates and chlorides. Nitrates come from fertilizers and septic systems and are frequently found as a contaminant in shallow aquifers in Ontario. High levels of nitrates in drinking water can lead to "blue baby" syndrome, where formula fed babies under 6 months old ingest sufficient amounts of nitrate causing a reduction of the oxygen carrying capacity of the blood. Chlorides come predominantly from road salt.

The critical groundwater protection areas in the Humber River watershed are in the Main and East Humber. These subwatersheds

provide 52% of the total water recharge area for the Humber system. This includes the major recharge zones that supply the local aquifers as well as the regional aquifer systems. These areas, where soils are highly permeable, are also responsible for most of the baseflow of rivers and streams; about 80% of the baseflow comes from 20-30% of the watershed, primarily in the upper reaches.¹

¹Communication with Paul Bowen, P. Eng., Terraprobe Consulting Engineers, August 1999.

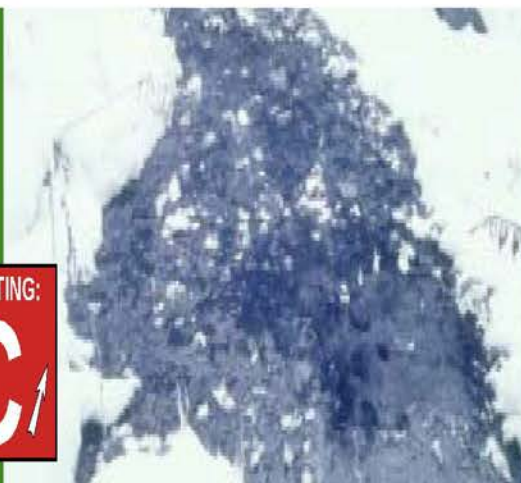
INDICATOR 6: GROUNDWATER QUANTITY

Is groundwater being used sustainably?

MEASURE: The rate of groundwater extraction. *Groundwater is rainwater that infiltrates into the soil, moves downward to the water table, and collects in aquifers.*

RATING:

C



Current efforts:

- Municipalities are working with TRCA, the Geological Survey of Canada, Ministry of the Environment (MOE), and neighbouring Conservation Authorities to develop groundwater management strategies.
- The 1991 Provincial guidelines for the Oak Ridges Moraine recognized the need to identify vulnerable discharge and recharge areas.
- Peel recognizes that groundwater is not a sustainable water source to serve projected growth in Bolton. Future growth in Bolton will be served by Lake Ontario water.
- All new development in Ontario is required to address the maintenance of groundwater function.

Good news:

- Groundwater extraction is decreasing or remaining stable in the watershed.
- There is a trend towards using Lake Ontario for water supply, thereby reducing the demand on groundwater.
- Caledon's Water Efficiency Program encourages residents to use water-saving devices and practices.
- Baseflow to streams is derived from shallow aquifers not deep aquifers, where communal wells are located.
- *86% of respondents agreed that the loss of groundwater is a very important issue in the Humber (Angus Reid, 1999).*

Bad news:

- Wells that take under 50,000 litres per day are not required to have a permit from MOE, resulting in unknown amounts of water being removed from the groundwater system.
- There is little information about the levels of the shallow groundwater resources.
- No groundwater management strategy has been completed.
- Groundwater has been used at an unsustainable rate in specific areas, such as Bolton.
- Development still leads to large areas of impermeable surfaces and reduced infiltration of rainwater into the ground.
- Retrofitting of storm-water management systems to increase infiltration of rainwater and the replenishing of aquifers will likely take many decades.

Targets: 2005:

- The rate of groundwater extraction is restricted according to targets set by a Groundwater Management Strategy.
- All new development maintains pre-development groundwater recharge rates.
- How to get there:**
 - The Province, TRCA and municipalities develop and adopt a Groundwater Management Strategy that: identifies recharge and discharge areas, identifies the level of the water table, implements protection policies, estimates pre-development recharge

- rates and baseflow in the watershed, determines the sustainable use rate for groundwater, and sets targets.
- The Province maintain better records on shallow groundwater resources.
- Agencies monitor base-flow in rivers and streams.
- Municipalities adopt water use by-laws to restrict water consumption during periods of drought.
- Municipalities introduce full-cost, user-pay pricing systems to promote water conservation and as a source of funding to support groundwater management programs.
- Residents and businesses practice water conservation.

INDICATOR 7: GROUNDWATER QUALITY

How well is the quality of our groundwater being protected?

MEASURE: Levels of chloride and nitrate contamination in groundwater. *Also see Indicator 6: Groundwater Quantity.*



Current efforts:

- Municipalities are working with TRCA, the Geological Survey of Canada, the Ministry of the Environment (MOE), and neighbouring Conservation Authorities to develop groundwater management strategies.
- Deep wells, such as those used by municipalities, are tested regularly by health authorities for contaminants.
- Shallow wells, used by households, are tested infrequently, usually when the landowner suspects that there has been contamination.
- In 1996, Peel initiated a Wellhead Protection Program for Caledon.

Good news:

- The quality of groundwater from deep aquifers generally appears to be good.
- Failing household septic systems are being replaced with sewage collection and treatment facilities in developed areas, such as Caledon East and Oak Ridges.
- *Awareness is high; 95% of respondents agreed that the contamination of groundwater is a very important issue in the Humber (Angus Reid, 1999).*

Bad news:

- Besides municipal wells, there is no comprehensive program to monitor groundwater quality.
- Approximately 30% of shallow well water samples are contaminated with nitrates and chlorides.
- As development continues, there will be increased road salt use in sensitive groundwater recharge zones.
- At present, there is no practical low cost alternative to road salt.
- Programs to assist farmers with improved agricultural practices, such as manure storage facilities, have been reduced.

Targets:

- 2005:**
- A comprehensive Groundwater Management Strategy is in place.
 - No increase has occurred in the level of contaminants in groundwater.
 - No new development is allowed in Peel Region's Wellhead Protection Areas.
 - Wellhead Protection Area policies will be initiated throughout the rest of the watershed.
- 2015:**
- Chloride and nitrate levels have decreased to safe levels, as determined by the Groundwater Management Strategy.

How to get there:

- The Province, TRCA, and municipalities develop and adopt a Groundwater Management Strategy that includes land use and zoning policies to protect groundwater quality (e.g. Wellhead Protection Areas).
- The Province monitors chloride and nitrate levels in groundwater and sets targets.
- The Province maintains better records on types of contamination, locations and frequency.
- Farmers use best management practices to reduce water contamination due to nitrates originating on their property.
- Municipalities and private landowners reduce the use of road salt by using alternative products and new technologies that deliver the product in a more efficient and controlled manner.

Surface Water

Surface water includes lakes, ponds, rivers and streams. To assess their quality, we selected five indicators:

- stormwater management in urbanized areas;
- bacteria for swimmability;
- conventional pollutants, such as suspended solids, phosphorus, nitrogen, ammonia, and chlorides;
- heavy metals and persistent organic contaminants in water and fish tissues;
- river flow.

Surface water quality varies greatly across the watershed. The same indicator might range from A to E, depending on the location.

Stormwater management is needed where urbanization decreases the amount of rainfall that infiltrates into the ground and increases the amount of rainfall that is collected and discharged to watercourses. This change in the water cycle leads to increased flooding and erosion, and reduced recharging of aquifers and baseflow in streams. Good stormwater management attempts to return the water cycle to a more natural state by reducing flows at source and retaining stormwater in ponds to be cleaned up and released at a controlled rate.

Today the swimmability of beaches is based on *Escherichia coli* (*E. coli*) levels. The swimming season extends from early June to early September at lakefront locations. Beach waters are posted as unhealthy when the count exceeds 100 *E. coli* per 100 millilitres of water. Prior to 1996 the measure was based on faecal coliform bacteria. Originating in



Lake Wilcox, Richmond Hill.

human, bird and other wildlife faeces, these bacteria end up at beaches through sewer cross connections, combined sanitary sewers, and stormwater that flows over areas of animal manure. Bacteria is often accompanied by harmful viruses and pathogens.

Conventional pollutants can have a significant impact on water quality and the ability of aquatic life to survive. Suspended sediments come mainly from soil erosion: they reduce water clarity and carry other pollutants such as metals. They can cover fish spawning areas and reduce habitat for benthic (bottom-dwelling) organisms. Phosphorus and nitrogen are nutrients that fuel plant growth in lakes. This can lead to reduced oxygen levels, and limit the ability of fish to survive. The main sources of nutrients are fertilizers,

combined sewer overflows (CSO), malfunctioning septic systems, and stormwater. The main source of chloride is road salt; at high levels it is toxic to aquatic organisms.

Heavy metals and persistent organic contaminants are of concern for their long-term (chronic) effects on humans and aquatic life. The primary toxins include pesticides such as mirex, aldrin, dieldrin, chlordane, DDT, and PCBs.

Urbanization and water removal cause rivers and streams to suffer from reduced baseflows and increased peak flows. This means there could be too little flow on average and too much when it rains. Changes in the flow rate of rivers and streams over time indicate disturbances in the natural water cycle.

Looking Forward: A Water Quality Index

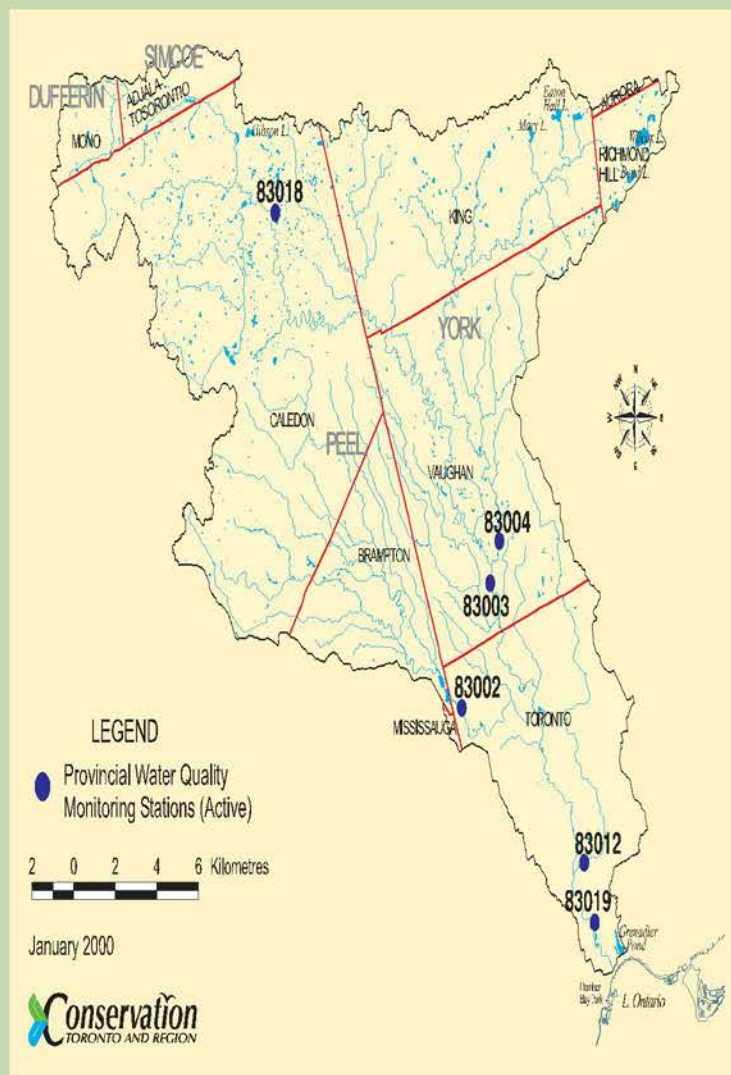
The Canadian Council of Ministers of the Environment has recently developed a Water Quality Index which combines a number of measures of water quality to arrive at an overall score for a water body. A preliminary application of the Water Quality Index to the Humber watershed, based on limited data from 1990 to 1994, yields the following grades:

Main Humber - Albion Hills	----- B
- Woodbridge	----- E
East Humber	----- C
West Humber	----- D
Lower Humber	----- E
Black Creek	----- E

Poor grades are primarily due to high levels of faecal coliform bacteria, and phosphorus. Other parameters that also influence the scores include high levels of nitrite, zinc, copper and suspended solids that exceed the Provincial Water Quality Objectives. The application of the Water Quality Index to the Humber will be refined and continued in the future as part of the Humber report card process.

Locations of Provincial Water Quality Monitoring Stations in the Humber watershed are illustrated on Figure 9.

Figure 9: Provincial Water Quality Monitoring Stations in the Humber Watershed



INDICATOR 8: STORMWATER MANAGEMENT

How well has stormwater runoff from urban areas been managed?

MEASURE: The percentage of urban areas that discharge untreated stormwater to rivers and streams.

RATING:

F 



Current efforts:

- All new development since the 1980s must use stormwater management measures to protect water quality, and reduce erosion and flooding.
- TRCA and member municipalities are undertaking a Humber Watershed Stormwater Retrofit Study.
- TRCA and community groups offer the Yellow Fish Road program which teaches people about the connections between storm sewers, rivers and aquatic life.
- Toronto is developing a Wet Weather Flow Management Master Plan focused on controlling stormwater south of Steeles Avenue.
- Toronto is finalizing plans to build treatment ponds at the confluence of Emery Creek and the Humber River.

- The Western Beaches Tunnel is under construction and there are plans to build detention tanks in the former City of York south of HWY 401.
- In an effort to reduce storm sewer flows, municipalities are promoting the disconnection of eaves-troughs from the storm sewer system and the use of rainbarrels to store water.

Good news:

- About 26% of the urbanized areas meet TRCA's stormwater management criteria for quality and quantity (Figure 10).
- *Awareness is fairly high; 63% of respondents were aware that water from storm drains goes untreated directly into the Humber (Angus Reid, 1999).*

Bad news:

- 65% of the urbanized areas have no stormwater control, including almost all of Toronto.
- 9% of the urbanized areas have stormwater quantity controls, but not quality controls.
- Current methods of stormwater control do not promote infiltration of stormwater into the ground to recharge aquifers.

Targets: 2005:

- Watershed residents' awareness of stormwater management issues has risen from 63% to 80%.
- Targets are confirmed for improving water quality and reducing erosion impacts based on the Humber Watershed Stormwater Retrofit Study and the Wet Weather Flow Management Master Plan.

How to get there:

- TRCA and municipalities complete the Humber Watershed Stormwater Retrofit Study.
- Toronto completes the Wet Weather Flow Management Master Plan.
- Agencies implement the programs and projects contained in the above two studies including those dealing with downspout disconnection, water efficiency and infiltration.
- Community groups, schools and public agencies promote awareness of actions that reduce the impacts of stormwater runoff.
- Residents install rain barrels and infiltrate stormwater into their gardens and yards thereby minimizing surface runoff from their properties.



Soil Erosion.

Top Photo: Stormwater Pond Construction at Pine Valley Drive and Rutherford Road, Vaughan.

Figure 10: Stormwater Management in Urbanized Areas of the Humber Watershed

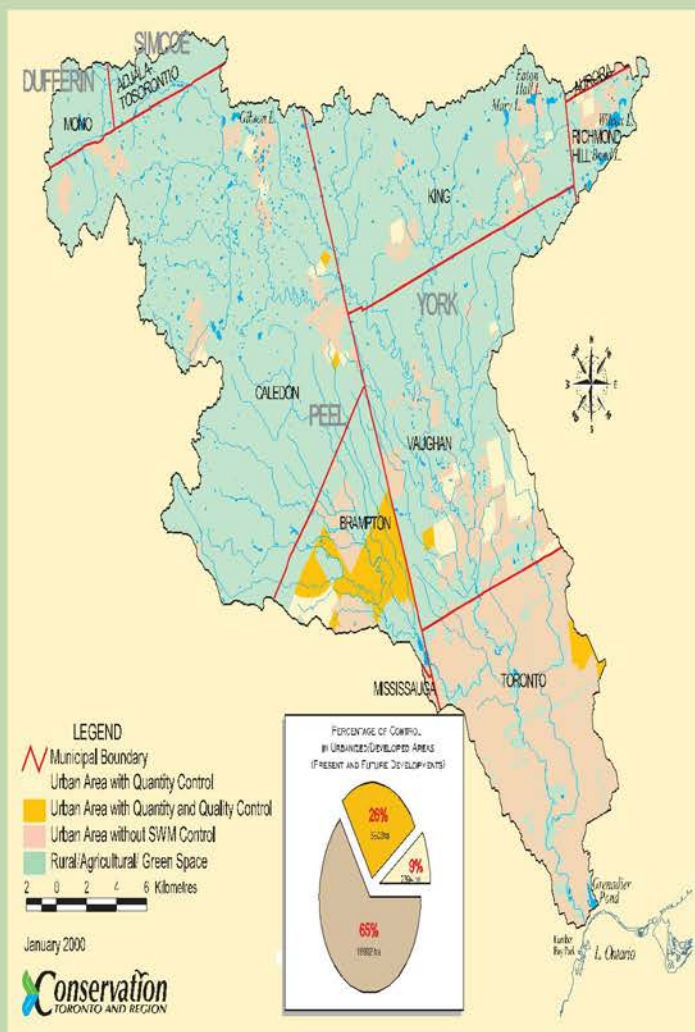


Table 7: Percent of Samples that Meet Provincial Water Quality Objectives for Bacteria Concentrations in the Humber River (1990 - 1996).

Subwatershed Stations	%	Rating
Upper Main	75	B
Mid Main	50	D
East Humber	61	C
West Humber	50	D
Black Creek	5	F
Lower Humber	0	F

Source: Ministry of the Environment

INDICATOR 9: BACTERIA

How swimmable are surface waters?

MEASURE: Level of faecal coliform bacteria in surface waters and beach closures. Also see *Indicator 8: Stormwater Management*.

RATING:

E



Current efforts:

- All new development must use stormwater management practices, which help to reduce bacterial levels.
- The Western Beaches Tunnel will help reduce bacterial loading from lake-shore Combined Sewer Overflows (CSOs). The Toronto Wet Weather Flow Management Master Plan will prescribe ways to reduce bacteria from other CSOs and stormwater runoff.
- Municipal pet "stoop and scoop" by-laws and "don't feed the geese" awareness programs are helping to reduce bacterial loadings.
- TRCA's Rural Clean Water Program and community groups like Action to Restore a Clean Humber (ARCH) and Ontario Streams work to reduce bacterial loading

from agricultural sources by controlling soil erosion, restricting livestock access to streams, and improving manure storage facilities.

Good news:

- At some of the beaches in the upper watershed you can swim most of the time during the summer.
- In 1999, the beaches on Lake Wilcox and Seneca/Eaton Hall Lake were open 92% and 90% of the season. The beach at Humber Bay Park East was open 92% of the season.

Bad news:

- Bacterial levels in surface water continue to rise due to urban growth, except in the Black Creek and Lower Humber sub-watersheds, south of Hwy. 7, where they are already at high levels. In the Lower Humber and Black Creek,

swimming is unsafe most of the time (Table 7).

- Swimming is no longer permitted at the Boyd Conservation Area in Vaughan nor at the Claireville Reservoir in Brampton because of unacceptable bacterial levels.
- Water quality at Toronto's Western Beaches is poor, except for Humber Bay Park East.
- In 1999, the beaches at Ellis/Windermere, Sunnyside and the Boulevard Club were only open 13%, 66%, and 72% of the swimming season, respectively.
- The Province has discontinued the Rural Beaches Program, which offered technical and financial assistance to landowners in rural areas to protect and improve water quality.

Targets:

2005:

- Bacterial levels in surface water are lower than 1990-96 levels.
- Beaches along the Lake Ontario shoreline are open more than 70% of the swimming season.

2015:

- Bacterial levels in the Main, East and West subwatersheds meet Provincial Water Quality Objectives (PWQO) more than 75% of the time.
- Bacterial levels meet PWQO more than 50% of the time in the Lower Humber and Black Creek subwatersheds.

2025:

- Bacterial levels meet PWQO more than 75% of the time in the entire Humber watershed.

How to get there:

- Toronto addresses Combined Sewer Overflows and stormwater management as priorities in the Black Creek subwatershed.
- Urban municipalities retrofit stormwater quality management facilities.
- Rural municipalities require that residents test and maintain septic tanks regularly.
- Municipalities enforce sewer capacity by-laws.
- Agencies, community groups and schools launch awareness programs.
- Farmers use best environmental practices to reduce agricultural sources of bacteria.

INDICATOR 10: CONVENTIONAL POLLUTANTS

How degraded are surface waters with respect to conventional pollutants?

MEASURE: Levels of suspended solids, phosphorus, nitrogen, ammonia and chlorides in surface waters. *Also see Indicator 8: Stormwater Management.*

RATING:
D



Current efforts:

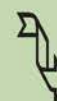
- Many municipalities have by-laws that, to some degree, can be used to prevent sediment from entering nearby water-courses. Mississauga's by-law is especially comprehensive.
- All new development must use stormwater management techniques to reduce sediment and nutrients entering water-courses.
- An increasing number of landowners are choosing alternative landscaping approaches that do not require the use of fertilizers.
- Richmond Hill and the Ministry of the Environment (MOE) are working together to reduce the phosphorus levels in Lake Wilcox.
- Many municipalities, such as the City of Vaughan, are reducing road salting through better timing and lighter applications with the help of computer technology.
- TRCA's Rural Clean Water Program, Action to Restore a Clean Humber (ARCH) and Ontario Streams are helping to reduce sediment and nutrient impacts from rural areas.

Good news:

- In the Main, West and East Humber, suspended sediment concentrations are low and within an acceptable range for aquatic habitat.
- Total ammonia concentrations have decreased or remained low, over the last 30 years.
- Chloride levels in the Main, West and East Humber are not yet of concern for aquatic life (Figure 11).
- Phosphorus concentrations have decreased across most of the watershed over the last 30 years, except in the West and Lower Humber, where they remain high (Figure 12).
- Most kettle lakes in the upper watershed have good water quality.

Bad news:

- Suspended solids are too high for good aquatic habitat about half the time in the Black Creek and Lower Humber.
- Phosphorus levels exceed the Provincial Water Quality Objective (PWQO) over half the time, except in the upper Main Humber, which has better water quality.
- Nitrate concentrations exceed the Canadian Water Quality Guideline throughout the watershed.
- Ammonia concentrations exceed the PWQO some of the time in the West Humber and Black Creek, and may be toxic to aquatic life.
- Chloride levels have been rising across the watershed over the last 30 years, except for Black Creek where they are already high. The levels may be toxic to aquatic life in Black Creek and the Lower Humber during winter.
- Many lakes have high nutrient levels which, in some cases, leads to toxic low oxygen levels in winter.



Targets:

2005:

- In the upper reaches of the watershed where development is taking place, levels of conventional pollutants have not increased beyond 1990-1995 levels.

2015:

- Levels of conventional pollutants in the Main, East, and West Humber meet PWQO or other specified criteria for at least 75% of the samples.
- In the Lower Humber and Black Creek, levels of conventional pollutants meet PWQO for at least 50% of the samples.
- Water quality is good in lakes found in the upper reaches of the watershed based on high water clarity and low chlorophyll and phosphorus levels.

How to get there:

- Agencies reinvest in regular water quality monitoring.
- Agencies continue to find ways to reduce the use of road salt.
- Municipalities enforce effective sediment control by-laws.
- Municipalities retrofit stormwater management facilities in urban areas.
- Toronto reduces combined sewer overflows and improves stormwater management in Black Creek.
- TRCA explore the use of the Canadian Council of Ministers of the Environment (CCME) Water Quality Index (WQI) as a more comprehensive measure for the future.
- Community groups aid in the collection of water quality information.

- Landowners use best environmental practices to reduce nitrate and phosphorus inputs to the watercourse, including septic tank testing and maintenance.
- Schools, community groups and others increase public education efforts on water pollution issues.

Figure 11: Chloride Concentrations at Five Stations in the Humber Watershed

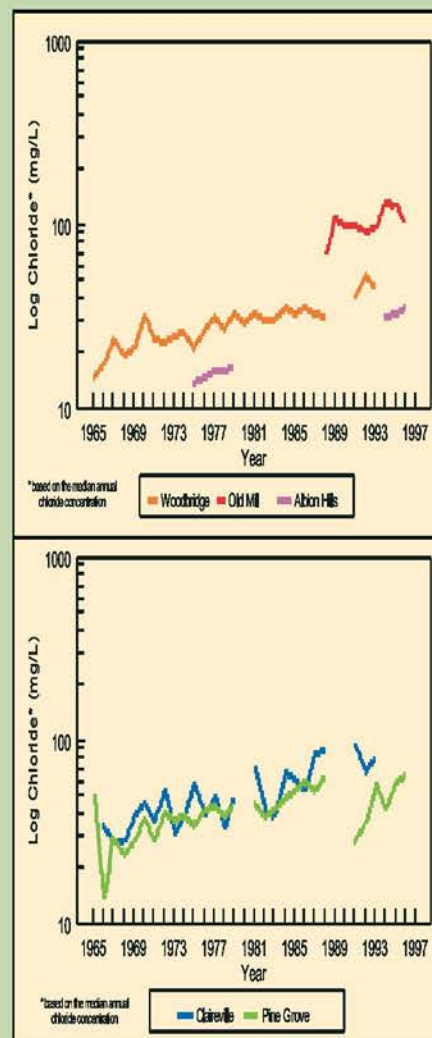
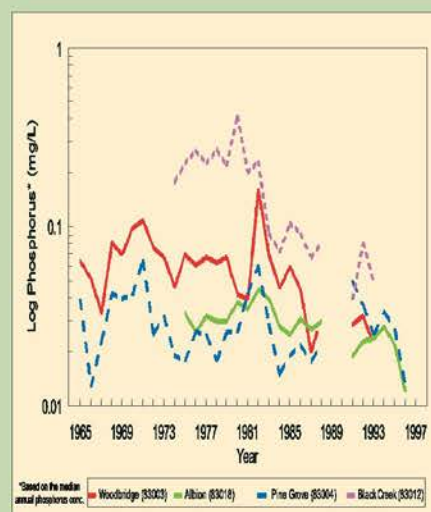


Figure 12: Phosphorus Concentrations at Four Stations in the Humber Watershed



INDICATOR 11: HEAVY METALS AND ORGANIC CONTAMINANTS

What is the condition of surface water with respect to heavy metals and organic compounds?

MEASURE: Levels of persistent organic contaminants, pesticides and heavy metals in surface waters, and in fish (young-of-the-year and adult sport fish). *Also see Indicator 8: Stormwater Management.*

RATING:

C



Current efforts:

- All municipalities have Sewer Use By-laws that restrict the discharge of contaminants to storm and sanitary sewers. Toronto is preparing a new Sewer Use By-law.
- Toronto, Peel and York Regions have pollution abatement programs that include the monitoring of sewer outfalls and the enforcement of Sewer Use By-laws.
- Many municipalities and TRCA have policies to reduce or eliminate the use of pesticides.
- Municipalities, such as the City of Vaughan, have integrated Best Management Programs that offer alternatives to pesticides.
- The Ministry of the Environment (MOE) requires all commercial and agricultural pesticide users to pass a certified course that includes information on proper storage and application.
- The Emery Creek Environmental Association promotes pollution prevention programs for industries and businesses.
- Some golf courses, such as Oakdale and Scarlett Woods, have adopted practices from the Audubon Sanctuary Program to reduce pesticide use and negative environmental impacts.

Good news:

- Levels of persistent organic contaminants have generally dropped over the last 30 years, reflecting bans on many of these substances.
- Only dieldrin, in 4% of samples, and PCBs, in 40% of samples, were found at levels exceeding Provincial Water Quality Objectives (PWQO) (from MOE study on persistent organic contaminants, 1991/92).

Concentrations of PCBs and chlordane in fish tissues have dropped since the 1980s.

Bad news:

- Levels of aluminum, cadmium, copper, iron, lead, silver and zinc exceeded the PWQO in the Lower Humber.
- PCB residues in young-of-the-year fish exceed the International Joint Commission (IJC) Aquatic Life Guideline and are much higher than levels found in fish from most other Toronto area rivers.
- Some common pesticides and herbicides (diazinon, 2,4-D, mecoprop and atrazine) were detected in the Lower Humber in a 1998 study. Diazinon levels occasionally exceeded the PWQO.

Targets:

2005:

- Priority Toxics are detected in 25% less samples than in the 1991/92 survey.
- Levels of persistent organic contaminants and toxic metals meet PWQO.
- Organic contaminant levels in young-of-the-year fish meet IJC Aquatic Life Guidelines.
- Restrictions on sport fish consumption have not increased from 1999 levels.

2015:

- There are no restrictions on consuming fish.

2025:

- Persistent organic contaminants have been virtually eliminated (i.e. present in less than 10% of samples).

How to get there:

- MOE, TRCA and community groups carry out a sampling program for metals, organic contaminants including banned pesticides and herbicides throughout the Humber River watershed.
- Municipalities enforce sewer by-laws.
- Municipalities and businesses adopt environmental management standards (i.e. ISO 14000 and 14000 focus on pollution prevention standards).
- Governments meet commitments to improve air quality, manage toxic chemicals and eliminate persistent organic contaminants.
- Residents, businesses, and agencies reduce pesticide use and dispose of hazardous wastes properly.

INDICATOR 12: RIVER FLOW

How stable are the flows in the river?

MEASURE: Total annual flow measured at five stream gauge stations.
Also see *Indicator 8: Stormwater Management*.

RATING:

C



Current efforts:

- Municipalities and TRCA have developed a Stormwater Management Program to address issues related to flooding and streambank erosion by controlling peak flows and timing of runoff.
- Revegetation and stream restoration projects throughout the watershed will help reduce erosion and runoff.
- TRCA's development review process helps to preserve the form and function of valley and stream corridors.
- TRCA's Flood Warning Program monitors flow to reduce the risk to people and property.

Good news:

- Total annual flow volume in the Humber increased only 3% from 1973 to 1997 at the Weston Road gauging station, despite rainfall remaining constant. In comparison, at the Todmorden gauging station, the annual flow volume in the Don River watershed increased 50% from 1962 to 1990.
- Moderate changes to flow is likely attributable to the limited development that has taken place in the watershed over the 24 year period (Figure 13).
- Total annual flow on the Main Humber, at Elder Mills, shows a slight decrease over the last 24 years.
- Total annual flow on the West Humber, at Highway 7, shows little change over the last 24 years, reflecting the relative lack of significant land use changes in the subwatershed over this period.

Bad news:

- Total annual flow has increased by 7% on the East Humber, 3% on the Lower Humber and 6% on Black Creek over the last 24 years.
- Development on the Oak Ridges Moraine and other upstream areas will increase flow volumes and require more public investment in stormwater controls.

Targets:

2005:

- Total flow is unchanged or decreasing based on 1999 values.
- In subwatersheds where the trend for flow is increasing due to surface runoff, agencies work towards reversing the trend.

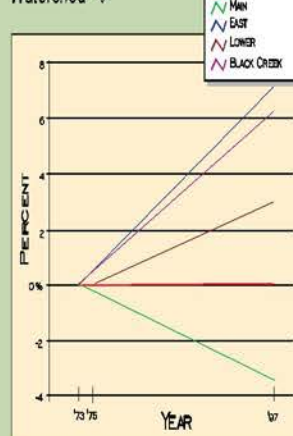
2015:

- Agencies and landowners continue to work towards reversing the trend in subwatersheds where the trend for flow is increasing.

How to get there:

- Municipalities and TRCA encourage at-source reduction of stormwater runoff (eg., downspout disconnection from storm sewers, infiltration, reduction of impervious surfaces), on-site stormwater detention and treatment, reforestation, and the reestablishment of riparian vegetation.
- TRCA and municipalities complete the Humber Watershed Stormwater Retrofit Study.
- Toronto completes the Wet Weather Flow Management Master Plan.
- Private landowners protect and expand forest cover on their properties, disconnect downspouts from the storm sewer system and install rain barrels to store water.

Figure 13: Change in Total Annual Flow at Five Stations in the Humber Watershed



2025:

- Total annual flow at all gauging stations in the Humber is stable or decreasing to the predevelopment stable levels.



Aquatic Habitat

The streams, rivers, ponds, lakes and reservoirs in the Humber River watershed provide a wide range of aquatic habitats that support many different aquatic communities. In general, the health of these aquatic habitats reflects the land use around them: they tend to become more degraded as the level of urbanization increases.

To assess the health of the Humber's aquatic habitats, we selected three indicators:

- the health of benthic (bottom-dwelling) invertebrates;
- the amount of riparian (streambank) vegetation;
- the health of fish communities.

Benthic invertebrates are the many organisms without a backbone that dwell in the bottom sediments of a body of water. Typically, these include crayfish, aquatic worms, snails, clams, and the larval stages of black flies, mosquitoes, mayflies, dragonflies and damselflies. Benthic invertebrates perform many important functions such as decomposing organic matter and are a food source for many fish species. Because they are relatively sedentary, short-lived, and have

varying tolerances to environmental conditions, they can be used as indicators of the quality of aquatic habitat. Changes in water quality lead to changes in species and community structure. Polluted areas, for example, support only a few pollution-tolerant species of benthic invertebrates. In order to identify impacts to invertebrate communities, what is often used is a measure of how different the community at a site is from the community found in similar streams that are known to be in good condition. When the composition of an invertebrate community is different from what is expected, then a water quality disturbance can be inferred. Table 8 describes healthy and impacted benthic communities.

Another key factor in the health of aquatic systems is the amount of riparian vegetation. Riparian vegetation, especially trees and shrubs, provides cover for fish and other wildlife, keeps streams cool, slows erosion and stream flow, and adds organic material to the food chain. In the past, urbanization and agriculture often led to the loss of riparian vegetation. The replacement of this vegetation is a key requirement for healthy streams and aquatic communities.

The health of fish communities is an important measure of ecosystem health. One way of assessing the health of fish communities is to use the Index of Biotic Integrity (IBI) which considers species richness and composition, local indicator species, trophic composition, and fish abundance. Fish communities that receive a high IBI score are robust, well-rounded communities. Another useful way to assess health is to use target species. Target species for the watershed have been set in the Humber River Watershed Fisheries Management Plan. Targets include a range of species from small invertebrate-eating darters to top predators such as the Atlantic salmon that once spawned in the watershed. Major limiting factors for self-sustaining populations of target species are woody riparian vegetation, water quality and the ability to migrate up and down the river. There are currently more than 110 structures such as dams and weirs that prevent or limit fish from moving up and down the rivers in the watershed.

Top Photo: The Humber River, Rutherford Road and Highway 27, Vaughan.

INDICATOR 13: BENTHIC INVERTEBRATES

How healthy are benthic (bottom-dwelling) invertebrate communities?

MEASURE: Current benthic communities, based on a 1999 survey, compared to benthic communities at sites known to be in good condition (regional reference sites).

RATING:

B



Current efforts:

- In the summer of 1999, aquatic invertebrate data was collected at 42 stations by TRCA, in order to establish base line information.
- Other community groups regularly collect data, including Action to Restore a Clean Humber and Ontario Streams.
- Water quality control facilities are required as part of any new urban development and efforts are underway to retrofit quality controls in older urban areas. Also see Indicator 8: Stormwater.
- Many small riparian streambank planting and reforestation projects have taken place, including those led by volunteer groups.

Good news:

- Overall, the water quality in the Humber, based on benthic invertebrates, is good.
- 71% of the stations sampled scored "good" in terms of the expected benthic invertebrate community. A further 10% of the stations scored "very good."
- 100% of the stations in the East Humber scored "good" or better while 78% of the stations in the Main and West Humber scored "good" or better.

Bad news:

- 19% of all stations scored "fair" to "poor".

Targets:

2005:

- Protect the existing condition of benthic invertebrate communities.

2015:

- All stations in the East, West and Main Humber score "good" or better.

2025:

- Stations in the Lower Humber score "good" or better.

How to get there:

- TRCA and MNR develop a more complete set of regional reference sites for use in future analysis in order to be able to better identify impacts.
- TRCA and municipalities continue to include stormwater quality and quantity controls in new developments and retrofit controls in older urban developments.
- TRCA's agencies, community groups and private land-owners improve stream cover by undertaking a program of woody riparian planting.

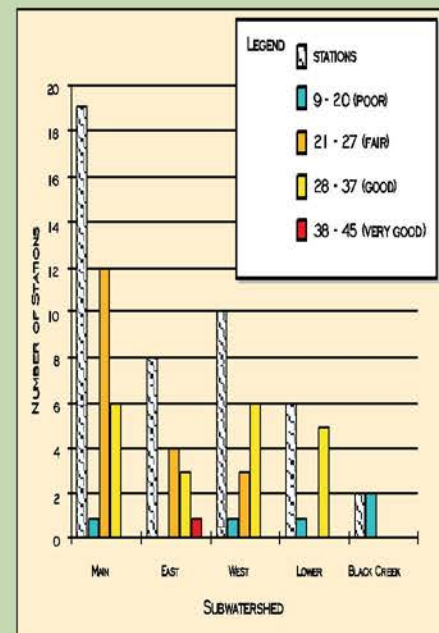
Top Photo: Mayfly Larvae.

TABLE 8: Healthy and Impacted Benthic Communities in the Humber River

ORDER	HEALTHY COMMUNITY (Upper Main Humber)		IMPACTED COMMUNITY (Lower Humber)	
	Number of Species	Number of Individuals	Number of Species	Number of Individuals
Acarina (Water Mites)	2	27	1	27
Amphipoda (Scuds)	0	0	1	1
Coleoptera (Beetles)	2	2	2	3
Diptera (True flies)	23	131	7	20
Ephemeroptera (Mayflies)	1	3	2	2
Hirudinea (Leeches)	0	0	1	1
Isopoda (Aquatic Sowbugs)	0	0	1	1
Megaloptera (Hellgrammites)	2	18	0	0
Mollusca (Molluscs)	2	2	4	5
Trichoptera (Caddisflies)	5	49	5	68
TOTAL	37	232	24	128

The data presented in the above table was taken from two collection stations within the watershed. The healthy community is from the Upper Main Humber, while the impacted community is from the Lower Humber. Of note is that the total number of species and individuals caught at the healthy community station is higher than the number captured at the impacted community station. Though impacted, the community in the Lower Humber also contains benthic invertebrates from orders generally considered to be indicative of healthy systems, including mayflies and caddisflies.

Figure 14: Stream Quality Rating in Humber Subwatersheds Based on the Index of Biotic Integrity



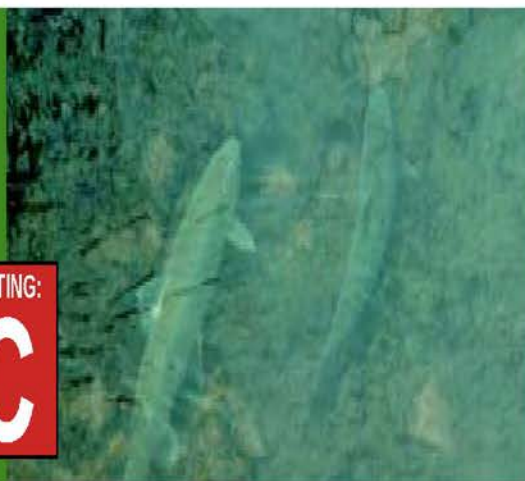
INDICATOR 14: FISH COMMUNITIES

How healthy are fish communities?

MEASURE: Index of Biotic Integrity (IBI) scores and the presence of self-sustaining populations of target fish species.

RATING:

C



Current efforts:

- A Fisheries Management Plan for the Humber River watershed has been prepared that sets targets for fish species.
- Fish passages around in-stream barriers were completed in 1998 and 1999 at the Old Mill and Raymore Park in Toronto, and Doctors McLean Park (Fundale Park) in Vaughan.
- The Ministry of Natural Resources (MNR) has been stocking brown and rainbow trout.

Good news:

- Overall, the Humber fishery is presently in fair condition. The median IBI score for the watershed is 27 "fair" and ratings for the East, West and Lower Humber are "good" (Figure 14).
- Many of the desired target species (brown and brook trout, reddsides) are present.
- Trout and salmon from Lake Ontario can migrate up the East Humber to appropriate spawning grounds for the first time in almost 100 years because in-stream barriers have been removed.

Bad news:

- IBI scores calculated from the 1999 survey of the watershed suggest that conditions have declined in the watershed in the past 10 to 15 years.
- Not all target species, notably Atlantic salmon, are present and/or self-sustaining in the watershed.
- Black Creek has poor IBI scores reflecting surrounding urban land uses, poor water quality and lack of streambank vegetation.

Targets:

2005:

- Target species are present in the East Humber and the median IBI score for the sub-watershed is "good" with 30% of stations having a score of "very good".

2015:

- Target species are present in the Main Humber and the median IBI score for the subwatershed is "good" with 30% of stations having a score of "very good".

2025:

- In-stream barriers in the Lower Humber have been removed or mitigated so that non-jumping species such as bass can travel upstream.
- Target species are present in the West Humber and the median IBI score is "good" with 30% of stations having a score of "very good".

- Target species are present in the Lower Humber and the median IBI score is "good".

How to get there:

- TRCA and MNR implement the Humber River Watershed Fisheries Management Plan and monitor its effects.
- TRCA and MNR modify barriers to fish passage including the Board of Trade site on the Main Humber in Woodbridge, McFall Dam in Bolton, the Palgrave Dam, the Albion Hills Pond on Centreville Creek, and the dam at Lake Wilcox.
- Anglers practice catch and release.
- Residents and groups help to protect and rehabilitate fish habitat by planting woody riparian vegetation.



A salmon jumps the weir at The Old Mill, Toronto.

Top Photo: Rainbow Trout, photo by Bernie McIntyre.

INDICATOR 15: RIPARIAN VEGETATION

How healthy is riparian (streambank) vegetation?

MEASURE: Percent of stream length with woody riparian vegetation.



Current Efforts:

- Riparian vegetation has been planted throughout the watershed on private and public land through stewardship programs involving TRCA, municipalities, agencies, and community groups such as the Black Creek Project.
- Through the Valley and Stream Corridor Management Program, TRCA promotes retention and establishment of

riparian vegetation in areas proposed for development.

Good news:

- Currently 43% (612 km) of the total stream length in the watershed is vegetated.
- In the Main and East Humber, 51% (342 km) and 48% (142 km) of the stream length, respectively, has woody riparian cover (Figure 15).

Bad news:

- The existing riparian vegetation does not meet the Remedial Action Plan (RAP) target of 75% (1049 km). The 75% target comes from "A Framework for Guiding Habitat Rehabilitation in Great Lakes Areas of Concern", Canada-Ontario Remedial Action Plan Steering Committee, March 1998.
- In the West and Lower Humber, only 28% (87 km) and 37% (26 km) of the stream length, respectively, has woody riparian vegetation.

Targets:

2005:

- An additional 80 km of streambank has woody riparian vegetation.

2015:

- An additional 160 km of streambank has woody riparian vegetation.

2025:

- An additional 160 km of streambank has woody riparian vegetation, meeting the target of 75% riparian cover.

How to get there:

- TRCA, agencies, and private landowners prevent further loss of riparian vegetation due to development or other activities.
- TRCA and agencies identify priority areas for riparian planting, set up well-funded programs to plant woody vegetation, and monitor the results.
- Humber residents and businesses establish and join 'Adopt-A-Stream' program to help restore vegetation on streambanks.

Figure 15: Stream Length with Woody Riparian Vegetation in the Humber Watershed

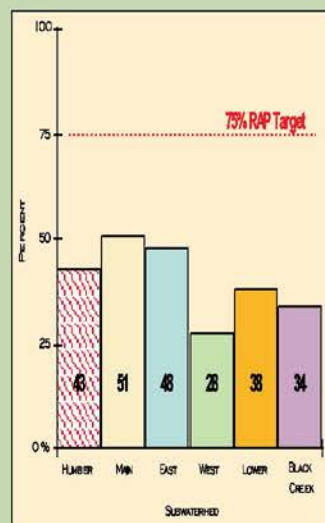
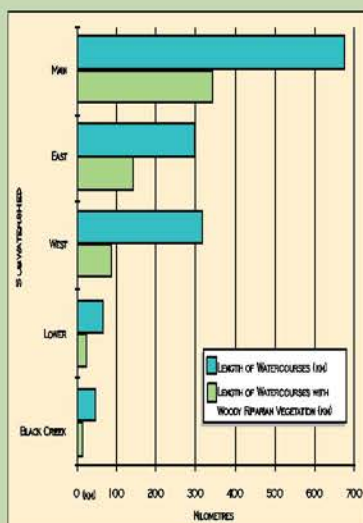


Figure 16: Woody Riparian Vegetation in the Humber Watershed Compared to the Remedial Action Plan Target

Top Photo: Humber River at Castlederg Road, Caledon.



Air

Our air quality is affected by local, regional and global factors. For example, the "atmospheric region of influence" or airshed for the GTA is estimated to extend from Hudson Bay in the north, to Georgia in the south, and from the Dakotas in the west to New Brunswick in the east. Because our airshed is so large, we have limited control over the quality of the air we breathe, yet we can make a positive contribution in many ways.

While improved emission controls on factories, incinerators, power plants and vehicles have reduced the ambient levels of many common pollutants such as sulphur dioxide and lead, smog remains a significant and growing concern in the GTA as the number of vehicles increases (Table 9). As well, about half of the smog we breathe is attributable to pollution from sources outside

the Province. Regardless, each of us has to take responsibility for helping to improve air quality.

The main ingredients in smog are ground-level ozone and inhalable particulate matter, mainly from fuel combustion, incineration, construction and metal processing. The ozone is formed when nitrogen oxides (mostly from vehicle tail pipes) react with volatile organic compounds in the presence of sunlight. Smog affects respiratory functions, causes increased sickness and death from cardiopulmonary disease, and damages vegetation.

Besides directly affecting people each time we inhale, air-borne pollutants also contaminate the Humber River. Pollutants either settle directly on the water, or fall on the land and are washed into the river by runoff.

The Air Quality Index (AQI) measures overall air quality by looking at the levels of ozone, carbon monoxide, nitrogen dioxide, sulphur dioxide and airborne particles (Table 10). The AQI has five levels: 0-15 is very good; 16-30 is good; 31-49 is moderate; 50-99 is poor; and 100+ is very poor. The most frequent cause of elevated AQI readings in the Toronto area is high levels of ozone and particulate matter. This typically occurs on hot, sunny, windless days, since these conditions favour the production and accumulation of ground-level ozone. The air quality measure we used in this report card is how often the AQI reaches 50. This is when the Medical Officer of Health issues an Air Quality Advisory or "smog alert". It should be noted that the AQI level of 50 or higher may be too high since health effects start to be felt, vegetation begins to be affected, and visibility may be reduced at an AQI reading as low as 31.

“My ancestors knew that they did not own the land, they recognized that the natural world would continue if they disappeared, but they also knew that they would not survive if the natural world disappeared.”

Source: John Hodson,
The Spirit of the Humber River, 1999.

TABLE 9: Registered Vehicles in the Regions of Peel & York and the City of Toronto

Peel, York and Toronto	Registered (MTO, 1998)
Passenger Vehicles	1,862,030
Motorcycles	22,491
Commercial Vehicles	228,966
Buses	7,841



TABLE 10: Air Quality Index Summary for Three Stations in the Humber Watershed (1997)

Station Location*	Hours AQI is Very Good (0-15)	Hours AQI is Good (16-31)	Hours AQI is Moderate (32-49)	Hours AQI is Poor (50-99)	Pollutant Responsible for AQI greater than 31
Etobicoke West	5594	2776	324	29	ozone
Etobicoke South	6085	2314	304	41	ozone
York	5616	2723	306	33	ozone

* Three of the six stations in Toronto are located in the Humber Watershed.

INDICATOR 16: AIR QUALITY

How healthy is the air we breathe?

MEASURE: Number of days each year that the Air Quality Index is 50 or more (poor) in Toronto.

RATING:

D



Current efforts:

- The Ministry of the Environment (MOE) does daily air quality monitoring. There are six monitoring stations located within or near the Humber River watershed, plus a mobile "smog rover" that monitors pollution from major transportation routes.
- The provincial Drive Clean Program requires inspection and maintenance of exhaust systems of cars older than six years.
- Community efforts to curb car pollution include Pollution Probe's annual "Clean Air Commute" contest and the Toronto Environmental Alliance's work on car pooling.
- Toronto efforts include a new anti-idling bylaw, and the work of the Healthy City Office to promote public transit, facilitate ride sharing and make cycling safer.

• Projects funded by the Toronto Atmospheric Fund are aimed at reducing greenhouse gases and improving air quality.

Good news:

- In general, air quality has improved in the Province over the last thirty years. Ambient levels of major pollutants such as sulphur dioxide are declining and are less of a health concern.
- In 1997, Ontario's Air Quality Index reported good to very good air quality readings 95.5% of the time.
- Overall, Toronto's air quality was better than that of most international cities to which it was compared. (MOE, Air Quality in Ontario, 1997)

Bad news:

- Levels of particulate matter and ground level ozone - prime ingredients of smog - remain high.
- Of the six pollutants measured, ozone was responsible for AQI readings greater than 31 at all six Toronto stations in 1997.
- An Air Quality Index reading of 50 or more in Toronto was recorded seven days in 1999 and six days in 1997.
- The number of automobiles in the Greater Toronto Area and vehicle trips per day continue to rise.
- At least 50% of smog in the GTA comes from outside the Province.
- The nine-year trend (1989-1997) for AQI readings greater than 49 decreased across Ontario until 1993; from 1993 to 1997 the trend increased, with the Greater Toronto Area showing the greatest increase.

Targets:

2005:

- The number of days per year when the Air Quality Index exceeds 50 is reduced by 25%.

2015:

- Ontario's 1998 Smog Plan has a goal of reducing nitrogen oxide and organic compound emissions by 45% by 2015.
- The number of days per year when the Air Quality Index exceeds 50 is reduced by 75%.

2025:

- There are no days in which the Air Quality Index exceeds 50.

How to get there:

- TRCA and municipalities work with MOE and Environment Canada to integrate Humber River watershed initiatives with provincial and federal air quality strategies.
- Residents reduce the use of vehicles and fuel-powered equipment, increase the energy efficiency of homes, use transit more, and reduce the use of toxic household products.
- Businesses and municipalities take part in "clean air campaigns" to reduce the use of fuel-powered equipment and promote greater use of public transit.

ASSESSING THE HEALTH OF THE WATERSHED: SOCIETY AND ECONOMY

"If we look at creation as part of our family, then the decisions we make must ensure that our family will come to no harm either today or in the future...All creation has been given instructions by the Creator to ensure harmony and peace."

Source: James W. Ransom,
Water is Life, Assembly
of First Nations, 1995.

Heritage

Human heritage in the Humber River watershed dates back to at least 12,000 years ago. Rich resources attracted Aboriginal peoples and then European settlers to live along the Humber. Surviving physical manifestations of this history including archaeological sites, burial grounds, mill sites, artifacts and heritage buildings are scattered across the watershed. Together with people's memories, ceremonies and stories, these represent our cultural heritage.

Knowing where we come from is important in deciding where we want to be. Understanding, preserving and celebrating our past helps us derive meaning in our lives, and is the foundation of land stewardship. Cultural heritage is fragile, non-renewable and increasingly scarce. Especially in a place like the Humber where change is taking place at

a rapid rate, protection of heritage resources is an important challenge.

To assess the health of cultural heritage, we selected two indicators. How well are the people who now live in the Humber watershed doing at:

- protecting our heritage resources;
- recognizing and celebrating our heritage

The protection of heritage resources is measured by the number of Listed and Designated heritage resources in the watershed. "Listed" heritage resources have been recognized by municipalities as having heritage value, but receive little or no protection by law. "Designated" heritage resources are protected under the Ontario Heritage Act. Protection of archaeological

sites under the Ontario Heritage Act involves avoidance of the site during construction or controlled excavation as per provincial guidelines.

Heritage events heighten our awareness of the cultural and historical past of the Humber River watershed. They may be sponsored by municipalities, non-governmental organizations or institutions. Some examples are local fall fairs, the re-enactment of Lieutenant Governor John Graves Simcoe's first journey up the Toronto Carrying Place Trail, Kleinburg's Binder Twine Festival, and the celebration of the designation of the Humber River as a Canadian Heritage River at Étienne Brûlé Park in Toronto.

*Top Photo: The Humber River at
Étienne Brûlé Park, Toronto.*

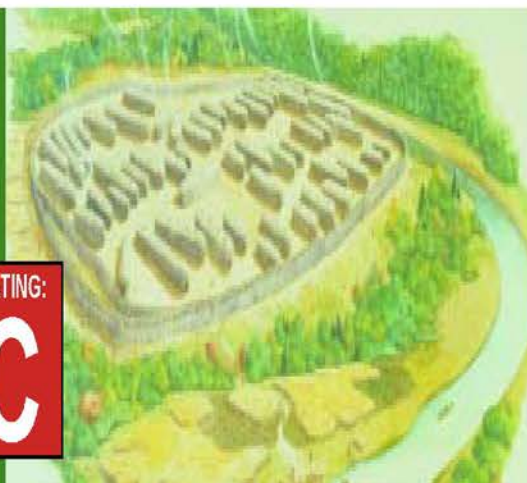
INDICATOR 17: HERITAGE RESOURCES

How well are heritage resources being protected?

MEASURE: The number of Listed or Designated heritage resources in the watershed.

RATING:

C



Current efforts:

- Municipalities recognize the importance of Listed heritage resources in Official Plans and assess the heritage potential of properties scheduled for development.
- Heritage groups, such as the Humber Heritage Committee, are taking a proactive role in raising awareness about heritage resources and protecting them.
- With the assistance of municipal heritage departments, TRCA has developed a working inventory of known heritage resources in the watershed.

Good news:

- 269 archaeological sites and 799 Listed or Designated historic buildings, cemeteries, mill sites and other historical sites have been identified in the watershed.
- The recognition of the Humber as a Canadian Heritage River in 1999 will draw further attention to the need for the conservation of heritage resources.
- Treatment and protection of known archaeological sites on TRCA property exceeds provincial requirements.
- *Public appreciation of heritage resources is high; 89% of respondents agreed that protecting archaeological sites is important (Angus Reid, 1999).*

Bad news:

- Of the 799 Listed historical sites and buildings, only 65 are Designated (and therefore protected) under the Ontario Heritage Act.
- Less than 5% of the watershed has been examined for archaeological sites; an estimated additional 4,000 sites could exist.
- Thousands of archaeological and built heritage resources have been destroyed or inadequately recorded.
- Provincial requirements are not always observed on private lands.
- Many municipalities lack incentives and funding to assess or protect most of the built heritage.

Targets: 2005:

- All known archaeological sites in the watershed are protected.
- At least five built heritage sites per municipality proceed each year from Listed to Designated under the Ontario Heritage Act.
- All mill sites along the Humber have been identified.
- Municipalities maintain inventories of historical plaques located within the watershed.
- The Ministry of Citizenship, Culture and Recreation (MCCR) makes all reports from archaeological consultants available to public agencies.

How to get there:

- Municipal heritage agencies record and categorize heritage resources.
- Municipalities provide MCCR with a list of lands scheduled for development.
- Municipalities appoint heritage officers, and enforce provincial requirements.
- TRCA continue to assess their properties for archaeological resources prior to any site alterations occurring.
- Residents and businesses support the preservation of heritage resources.

Top Image: Teiaiagon (Baby Point), Toronto.
Source: The Royal Ontario Museum.

Right Photo: The ruins of The Old Mill, Toronto.



INDICATOR 18: HERITAGE EVENTS

How well is heritage recognized and celebrated?

MEASURE: Awareness of activities or events that celebrate the heritage of the Humber.

RATING:

D 



Current efforts:

- TRCA is developing an inventory of heritage events with the assistance of municipalities and private event sponsors.
- Municipalities host and/or support local heritage events, such as fall fairs like the Woodbridge Agricultural Fair.
- Heritage groups, such as the Humber Heritage Committee, are taking an active role in ongoing events, including the re-enactment of Lieutenant Governor John Graves Simcoe walking the Toronto Carrying Place Trail.
- The Humber Watershed Alliance and City of Toronto produced a Discovery Walk to promote the heritage of the river.
- The Humber Watershed Alliance, with the assistance of municipalities, businesses, groups and residents host "Celebrate Your Watershed" events each year.

Good news:

- The Humber has been designated a Canadian Heritage River due, in part, to its human heritage.
- Local groups host and promote events that celebrate the heritage of their communities, such as the historic Binder Twine Festival in Kleinburg and the events and walks sponsored by the Toronto Field Naturalists.

• Interest is high; 77% of respondents agreed that the Humber River has a rich history and 68% wanted information about heritage features and events (Angus Reid, 1999).

Bad news:

- *Awareness is low; only 27% of respondents could name a Humber-related heritage site or event (Angus Reid, 1999).*
- Several municipalities offer no Humber-related heritage events.

Targets:

2005:

- 50% of watershed residents in a public opinion survey can name a heritage event.
- All municipalities and heritage groups offer at least one heritage event annually.

2015:

- 75% of watershed residents in a public opinion survey can name a heritage event.
- All municipalities and heritage groups offer double the number of events annually.

2025:

- All watershed residents in a public opinion survey can name at least one heritage event.

How to get there:

- TRCA, municipalities, community groups and provincial heritage agencies identify, register and produce a guide to promote heritage events.
- TRCA, municipalities and community groups market the Humber River as a Canadian Heritage River through public events, promotional advertising and publications.
- Municipalities incorporate local heritage education programs in their events.
- Residents and businesses support and participate in heritage events.
- Conduct a public opinion survey to determine if the level of environmental awareness, behaviour and degree of participation in environmental action has changed.



Canadian Heritage Rivers Designation Ceremony, September, 1999.



Paddling at the Kortright Centre for Conservation, Vaughan.

Outdoor Activities

Outdoor recreation activities, the way in which we connect with our natural heritage, are part of the Humber River watershed's rich legacy. The Humber's rivers, lakes, parks, conservation areas and river valleys provide untold opportunities for outdoor recreation, and each year hundreds of thousands of residents and visitors use these areas for fishing, canoeing, picnicking, hiking, birdwatching and nature appreciation.

To assess the health of outdoor activities, we selected three indicators:

- the amount of publicly-owned greenspace;
- extent and use of outdoor recreational facilities;
- the status of an inter-regional, multi-use trail system.

For the purpose of the report card, greenspace refers to publicly-owned valley and stream corridors, municipal parks, and conservation areas. In other applications, such as municipal plans, the definition of greenspace may be different. In this report card, golf courses and cemeteries are not included. Large parts of the watershed's natural open space areas are not in public ownership and not readily accessible.

The population in the Greater Toronto Area is expected to reach six million by 2021 - an increase of 43%. This will put increased pressure on the publicly-accessible greenspace system. The challenge is to provide an accessible and connected greenspace system that links natural features and destinations without destroying the integrity of the natural system.

The number of outdoor recreational opportunities is one measure of the "liveability" of a place. Use of these outdoor recreational opportunities is a measure of people's awareness and ability to access them.

Recreational trails allow people to walk, hike and bike through and between natural areas. The development of a system of inter-regional trails through the greenspace system has been identified as a priority. Portions of this trail system are currently in place. Completing the system will require some land purchases by public agencies, but lack of funds is a significant challenge. Other strategies such as conservation easements, bequests, donations and agreements with landowners will be needed to help connect the gaps between existing trail sections.

INDICATOR 19: PUBLIC GREENSPACE

How much publicly-owned greenspace is there?

MEASURE: Percent of publicly-owned greenspace in the watershed.
For this report card, greenspace is all publicly-owned land, including municipal parks and conservation lands, but does not include golf courses and cemeteries.

RATING:

B



Current efforts:

- TRCA, municipalities, and other partners continue to acquire greenspace in valley and stream corridors and on tableland through the land development process (Table 11, Figure 17).
- The Planning Act requires that the developer convey 5% of new developments to the municipality for parkland or other public recreation purposes, or provide an equivalent cash value.

Good news:

- 9% of the watershed is greenspace, or about 14 hectares per 1000 residents, which is equivalent to 140 m² (a small house) per person; by comparison the Don River has 15% greenspace, but with a much higher population this translates to .7 hectares per 1000 residents or 7 m² (a small bedroom) per person.
- There are 5,360 hectares of greenspace along the total length of the main branch of the Humber.

• The public values natural areas; 96% of respondents stated it was important to protect more natural areas.

Bad news:

- Publicly-accessible greenspaces are often not connected.
- Significant portions of the valley and stream corridors in the East and West Humber subwatersheds do not have publicly-accessible greenspace areas.

Targets:

2005:

- An additional 200 hectares of greenspace is acquired by TRCA.
- An additional 200 hectares of greenspace is acquired by municipalities.

2015:

- An additional 400 hectares of greenspace is in public ownership and accessible.

How to get there:

- Public agencies set priorities for the acquisition of land to link greenspace, and connect natural heritage areas to recreation and tourist attractions.
- TRCA and municipalities continue to acquire greenspace through the development process, bequests and donations.
- Where purchase is not feasible, encourage private and corporate landowners to provide conservation easements to connect greenspaces.

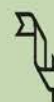
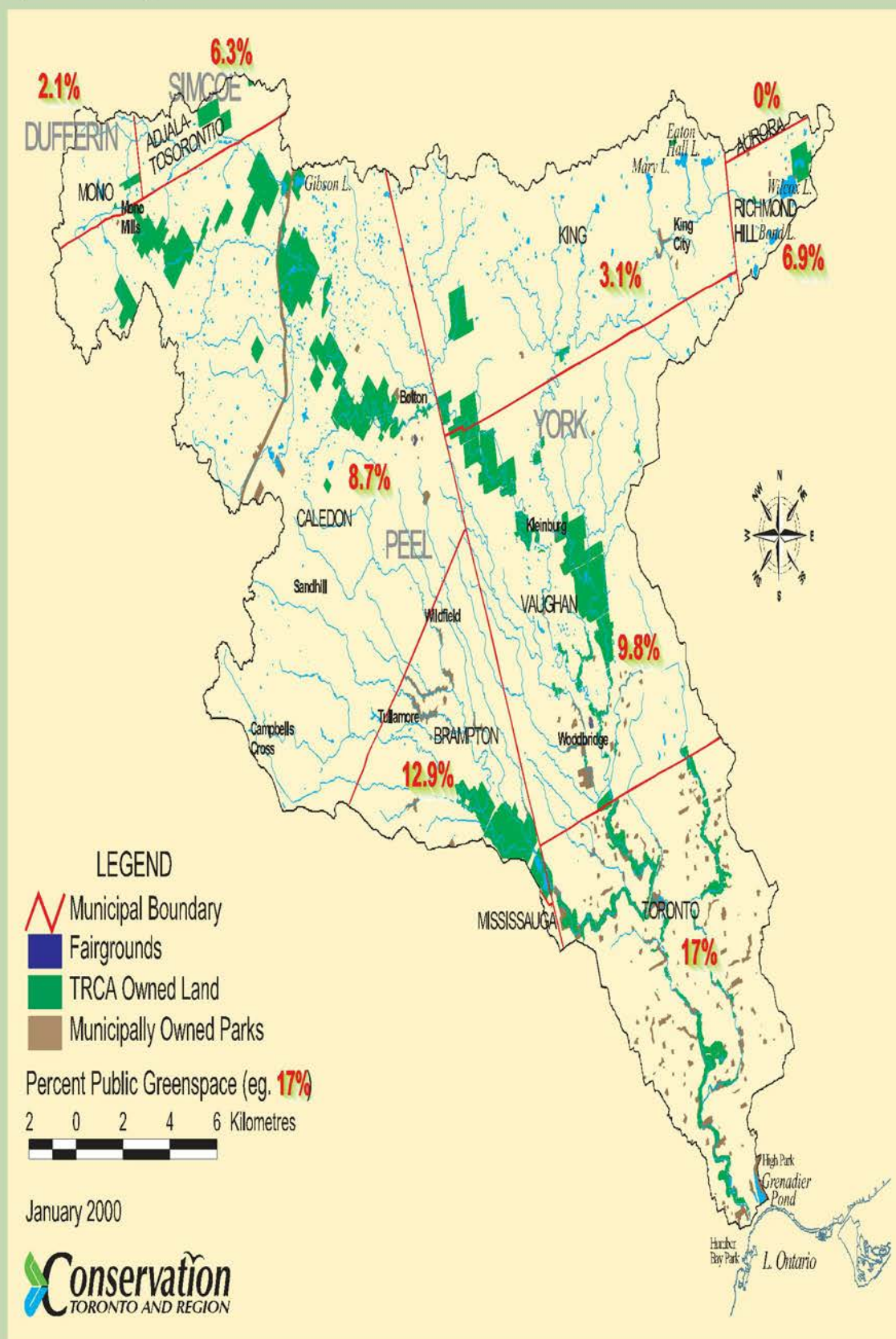


Table 11: Public Greenspace in the Humber Subwatersheds

Subwatershed	Total Area (hectares)	Greenspace (hectares)	Greenspace (%)
Main Humber	35,717	4,057	11
East Humber	20,067	1,147	6
West Humber	20,166	1,442	7
Lower Humber	8,477	1,303	15
Black Creek	6,649	608	9
Watershed	91,076	8,557	9

Top Photo: Aerial view of the Humber River.

Figure 17: Public Greenspace in the Humber Watershed



INDICATOR 20: OUTDOOR RECREATION

How extensive are outdoor recreation opportunities?

MEASURE: Extent and use of outdoor recreational facilities.

RATING:

A



Current efforts:

- There are 888 sites offering a variety of outdoor recreation opportunities ranging from passive to high impact. In addition to the many opportunities for walking, biking and fishing. There are 22 golf courses, 10 conference and retreat centres, 17 major sports complexes, a cricket facility, 5 large equestrian centres, 3 campgrounds, and a pioneer village/museum.
- Special events such as concerts, maple syrup festivals, pumpkinfests, winter carnivals, and a variety of outdoor education/recreation programs are offered by municipalities and many other agencies and community groups.

Good news:

- The Humber's natural environment is a popular recreation destination. *50% of respondents to a 1999 Angus Reid survey had visited the river and its parks; 86% for walking, 41% for biking, 31% for picnicking, 26% for jogging and 23% for bird watching.*
- The Humber has 14 of the top 50 locations for urban angling in the Toronto area.
- Golf course and campground use is increasing, and use remains constant at Wild Water Kingdom.
- Attendance has increased slightly at Black Creek Pioneer Village and the Kortright Centre for Conservation.

Bad news:

- Attendance at Glen Haffy, Albion Hills and Boyd Conservation Areas has decreased due, in part, to shifts in market demand and a lack of public reinvestment in these facilities.
- *Poll results show that of those people who visited the Humber in the last 12 months, only 7% came for fishing and 4% for swimming; 72% of respondents said they thought fish caught in the Humber River were not safe to eat (Angus Reid, 1999).*

Targets: 2005:

- Angling and fish viewing opportunities are increasing.
- Membership at TRCA facilities and conservation areas is up.
- A greater variety of programs are offered at TRCA locations, including horseback riding, and nature interpretation.

How to get there:

- Public agencies monitor and adapt to consumer trends.
- TRCA promote conservation programs and facilities through membership sales.
- The Ministry of Natural Resources (MNR), TRCA and community groups restore a sustainable migratory fishery.
- MNR, TRCA, municipalities, and groups develop programs and market the Humber River as a Canadian Heritage River.
- Agencies continue to improve the quality of the environment, promote eco-tourism, and attract increasing numbers of outdoor recreation enthusiasts.

Top Photo: Glen Haffy Conservation Area's Corn Maze, Caledon.

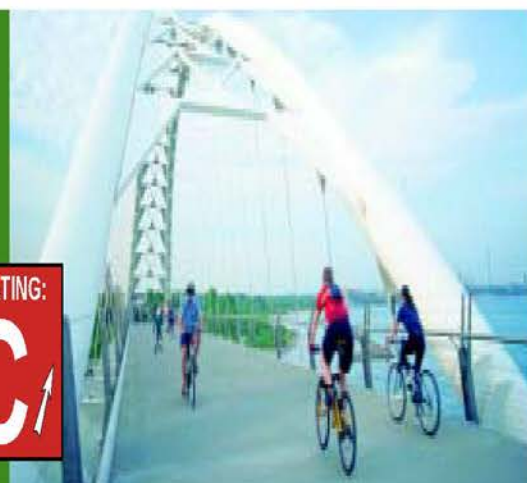
Right Photo: Canoe Races at King's Mill Park, Toronto.



INDICATOR 21: TRAILS

What progress has been made in developing a system of inter-regional trails?

MEASURE: Degree of completion of a network of inter-regional, connected trails.



Current efforts:

- Toronto continues to plan and build trails in the Lower Humber, West Humber and Black Creek subwatersheds.
- Citizen groups continue to establish additional trails such as the Humber Valley Heritage Trail (Caledon) and the Oak Ridges Moraine Trail (King).
- Vaughan and York Region are assisting with the construction of trails in the Granger Greenway on the East Humber.

Good news:

- There are at least 185 kilometres of inter-regional trails in the watershed (Table 12, Figure 18).
- There are approximately 54 kilometres of inter-regional trails in Toronto.
- The Caledon Trailway/Trans Canada Trail, and the Bruce Trail have been completed in Caledon.
- The Great Pine Ridge equestrian trail has been completed in King.

- Additional trail links are being planned in the Granger Greenway in Vaughan.
- Trail links are being developed to connect the Humber Trail and the Tommy Thompson Trail in the Lower Humber (Toronto).
- The Waterfront Trail is connected via the award-winning Humber pedestrian bridge.

Bad news:

- At least 81 km of trail gaps have been identified.
- Approximately 26 km of trails are required to provide links in Vaughan.
- There is little public land available for trail development in the East Humber subwatershed.
- There are few inter-regional trails along the portion of the West Humber within Brampton.
- Conflicts exist between trail users.

Targets:

2005:

- An additional 17 km of inter-regional trails are built across the watershed.
- Priority trail sections are linked in the Main, East, West and Lower Humber.
- Planning for priority linkages in the Black Creek subwatershed is underway.

2015:

- An additional 32 km of trails are built in the watershed.

2025:

- An additional 32 km of trails are built in the watershed completing the 81 km of trail gaps identified in the Humber Report Card.

How to get there:

- Set priorities for the locations where trail links are needed.
- TRCA, municipalities and community groups obtain trail easements on privately-owned land to connect trail sections.
- Residents form trail associations and work with agencies to build, monitor and maintain trails.
- Agencies and municipalities support trail construction projects.
- Corporations, foundations and other funding sources include trail projects as eligible activities for financial assistance.

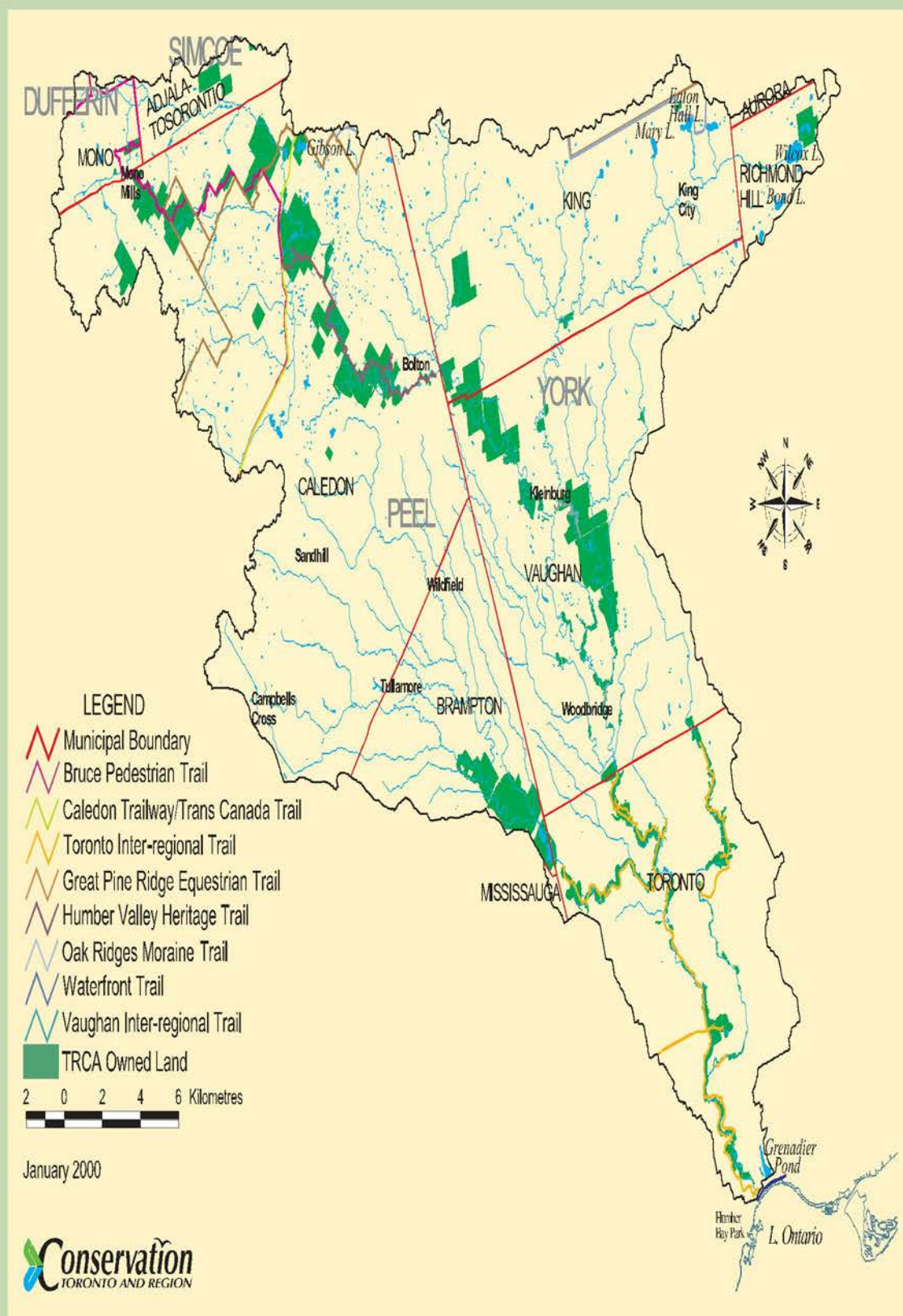
Table 12: Inter-regional Trails in the Humber Watershed by Municipality

Municipality*	Trails Completed (kilometres)
Caledon	94
King	21
Mono	11
Toronto	54
Vaughan	5
Total	185

*Only those municipalities with inter-regional trails were included in the table.

Top Photo: Humber Pedestrian Bridge, Toronto.

Figure 18: Inter-regional Trails in the Humber Watershed





Agriculture

The history of the Humber River watershed has long been linked to agriculture. Aboriginal peoples began growing crops here about 1,000 BC. For much of the 19th and 20th century, the fields and pastures of the upper and middle reaches of the Humber supplied food for the ever-growing population of Toronto. Today, agriculture remains an important sector of the regional economy, a fundamental part of the landscape, and an important way of life for many residents.

The integrity and economic viability of agricultural areas in the Humber River watershed need protection. These areas are under increasing development pressure as the population grows and urbanization progresses northward. Developed land is lost

forever for agricultural uses. Development increases stormwater runoff, reduces infiltration of groundwater, lowers baseflow in streams and rivers, and destroys aquatic and terrestrial habitats.

Prime agricultural lands are those which the Canada Land Inventory (CLI) classifies from 1 to 3 in its Soil Capability for Agriculture Classification System. These have the highest soil capability or potential to grow crops. A large proportion of the area south of the Oak Ridges Moraine is classified as CLI classes 1 to 3. Good agricultural land is usually cleared and has good drainage. This also makes it a target for urban development.

INDICATOR 22: AGRICULTURAL LAND

How well is agricultural land being conserved?

MEASURE: Amount of prime agricultural land (land having Class 1 to 3 soils) that is protected from development. *Information was gathered from Peel and York Regions; information for Mono and Adjala-Tosorontio was not available; there is no agricultural land within the City of Toronto.*

RATING:

D



Current efforts:

- The Provincial Policy Statement under the Planning Act requires municipalities to identify prime agricultural areas in their Official Plans in order to protect them for agricultural use (Figure 19).
- Provincial policy stipulates a minimum distance between agricultural land uses and urban developments to reduce conflicts between landowners.
- The Greater Toronto Area (GTA) Federations of Agriculture have completed a study demonstrating the importance of agriculture to the economy of the GTA.

Good news:

- Of the 28,000 hectares of prime agricultural land remaining in the watershed, 17,000 hectares has been identified as "Prime Agricultural Area" in the Peel and York Region Official Plans and are protected.
- *Public awareness of agricultural land use is high; 89% of respondents to a 1999 Angus Reid survey stated that the conservation of agricultural land in the watershed was an important issue.*

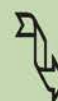
Bad news:

- Of the 37,000 hectares of the watershed classified as Class 1-3 in the Canada Land Inventory/Soil Capability Classification, about 9,000 hectares in Peel and York Regions were lost to development before 1995, leaving 28,000 hectares.
- By 1995, another 5,000 hectares of Class 1-3 land were planned or approved for urban development, mostly in Brampton and Vaughan.
- By 1995, 6,000 hectares of Class 1-3 land were not identified for protection in Official Plans; most of this land is in York Region's Rural Policy Area, which does not offer the same level of protection as land identified in the Agricultural Policy Area.

- Land within the "Prime Agricultural Area" can be removed from agricultural use for aggregate extraction, approved expansion of existing settlement areas, residential infilling, and in the case of non-residential uses, only where there are no reasonable alternative sites.
- Taxation and land prices, driven by the advance of urban expansion, threaten the economic viability of agricultural operations.

Targets:

- 2005:**
 - No new urban development takes place on the remaining 17,000 hectares of "Prime Agricultural Area", as identified in the Peel and York Region Official Plans.
 - No new development on the 6,000 hectares of prime agricultural land still unprotected within regional Official Plans.
- 2015:**
 - The existence of a healthy agricultural industry that ensures the permanent protection of prime agricultural land for agricultural uses.

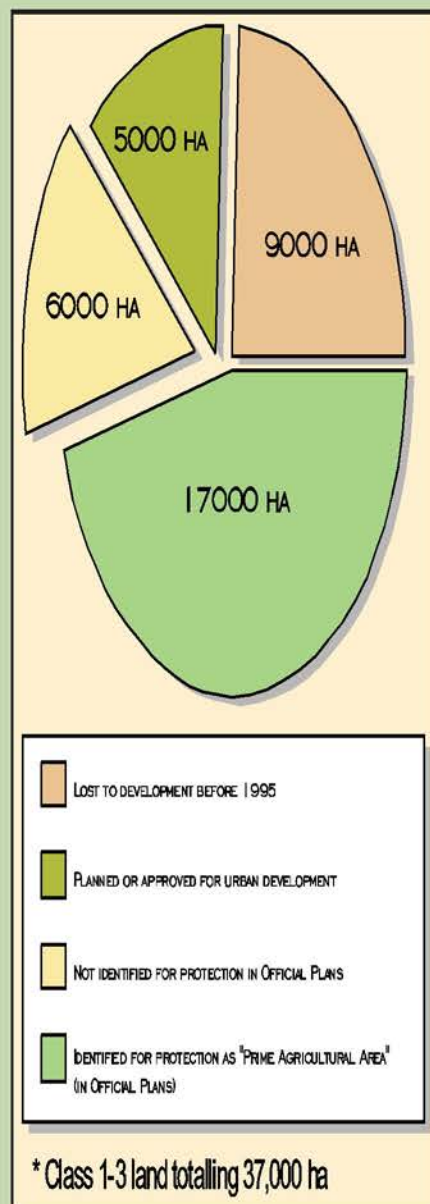


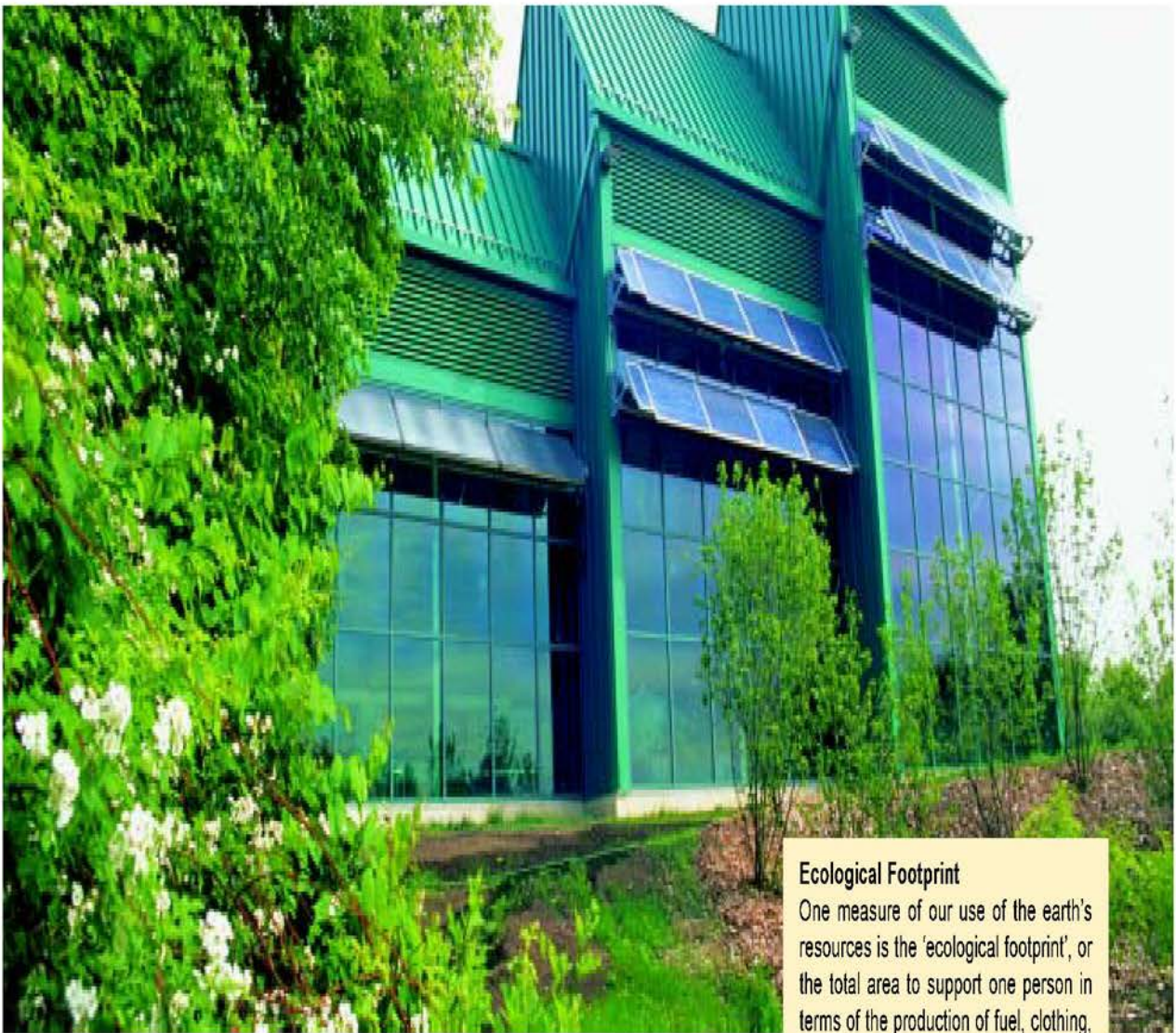


How to get there:

- Residents support local farmers by purchasing local produce.
- Municipalities expand designated prime agricultural areas to include unprotected Class 1 to 3 agricultural lands outside of the 1999 urban boundary.
- Municipalities enforce policies to protect agricultural lands in their Official Plans.
- Landowners (through the GTA Federations of Agriculture) and municipalities develop a strategy to ensure the economic viability of the agricultural industry in the GTA.

Figure 19: Agricultural Land in the Humber Watershed





Sustainability

The lifestyle of the average Humber resident is largely consumer-oriented. Success and stature is often based on the accumulation of wealth and the consumption and acquisition of goods (houses, cars, fashionable clothing). All the resources we consume use the earth's capacity, whether it's the land to grow crops, raise animals, quarry building materials,

extract fossil fuels, assimilate sewage, or absorb air pollution. The more material we consume and waste, the more of the earth we use. Ultimately, this has an impact on the water, habitat, and air in the watershed. Long-term protection of the Humber River watershed requires that we all live a sustainable lifestyle.

Top Photo: Centre for Sustainable Living at the Kortright Centre for Conservation, Vaughan.

Ecological Footprint

One measure of our use of the earth's resources is the 'ecological footprint', or the total area to support one person in terms of the production of fuel, clothing, food, and the assimilation of waste. The ecological footprint of the average Canadian is 7.7 hectares per person (1 hectare of productive sea and 6.7 hectares of land). A recent calculation for the City of Toronto revealed essentially the same figure (7.6 hectares). No calculation has been done specifically for the Humber River watershed but it is likely to be close to the 7.6 hectare figure.

Only Australians and Americans have larger footprints than Canadians do (9 hectares and 10.3 hectares, respectively). By comparison, the Japanese and Chinese have footprints of 4.3 hectares and 1.2 hectares, respectively.

INDICATOR 23: SUSTAINABLE USE OF RESOURCES

How well are people doing at using resources wisely and living a sustainable lifestyle?

MEASURE: Being developed. Also see *Indicator 24: Community Stewardship*.

RATING:
**BEING
DEVELOPED**



Current Efforts:

- Recycling and composting programs are common in urban areas, but water and energy conservation, rural recycling, and alternative transportation (bicycling and public transit) programs are not widespread nor very popular.
- Caledon and Toronto have recently offered household water conservation programs.

Good News:

- *Support for environmental improvement is strong with 90% of watershed residents saying they are supportive of efforts to protect and improve the Humber (Angus Reid, 1999). This support needs to be translated into awareness of the issues and personal actions.*
- Community stewardship has strengthened.

Bad News:

- *In general, environmentally friendly behaviour is weak. In a 1999 Angus Reid survey, only one-half of the respondents could name something they have done to improve the watershed. Of those that did something, 30% said they recycle, 20% plant trees, 19% compost, 12% conserve water and 8% do not use pesticides or fertilizers.*
- Very little promotion of a low-impact consumer lifestyle is currently being done.

Targets: 2005:

- A measure for sustainability has been developed.
- Environmental awareness and commitment to take action to conserve has increased.

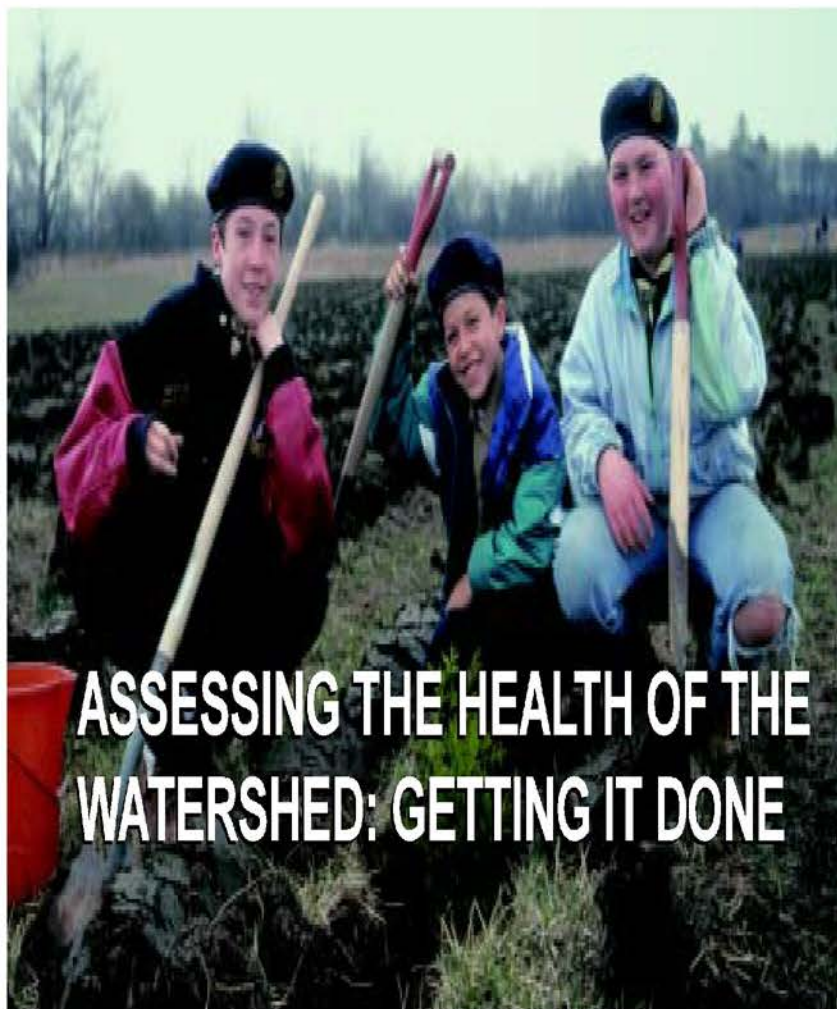
How to get there:

- Service providers reduce consumption levels by incorporating true cost accounting into such activities as transportation, waste treatment, heating and cooling, water treatment and distribution, as well as consumer goods.
- Utilities increase water and energy conservation activities through aggressive incentive programs.
- All sectors develop and implement new environmental and conservation technologies.
- TRCA develops the Centre for Sustainable Living at the Kortright Centre as an education and demonstration site that will promote other sustainable technologies, ideas and best environmental practices for all sectors of society.



Top Photo: Stream Cleanup.

Left Photo: Solar Panels.



ASSESSING THE HEALTH OF THE WATERSHED: GETTING IT DONE

"To compensate people for their physical weakness, the creator provided us with an intellect far superior to the rest of creation. With this intellect came the greatest instruction, to take care of all life."

Source: James W. Ransom,
Water is Life, Assembly of First Nations, 1995.

Stewardship

Achieving a healthy watershed will require extensive community stewardship and the involvement of individuals in activities that help improve the health of the watershed. We selected three indicators to measure community stewardship:

- the level of participation in "watershed-friendly" activities;
- the level of outdoor environmental education;
- the aesthetics of the watershed.

Inside the home, watershed friendly activities include such actions as recycling, proper disposal of household hazardous products, water conservation, and downspout

disconnection. Outside the home, stewardship includes activities such as composting, naturalizing gardens and yards, tree planting, eliminating fertilizer and pesticide use, using public transit and getting involved in stream cleanup and restoration activities.

The level of outdoor environmental education is a measure of awareness of environmental issues, and the likelihood of taking part in environmentally friendly activities such as recycling. The indicator measures only the number of students taking part in outdoor environmental education programs, not the number of the general public taking part in similar programs.

The aesthetic condition of the Humber is a reflection of the value people place on it and how much people care about it. Whether it is dirty or clean, unsightly or beautiful, aesthetics influence people's perceptions and how they use the river. Some important aesthetic measures are how much litter and garbage is found here and how much of the riverbank is natural, as opposed to concrete or gabion channels.

This section of the report card also includes indicators that measure the extent to which the business community and municipalities are participating in the protection, restoration and celebration of the Humber River watershed.

INDICATOR 24: COMMUNITY STEWARDSHIP

To what extent are people taking responsibility as stewards of the Humber River watershed?

MEASURE: Percent of residents engaged in watershed-friendly activities.

RATING:

C



Current Efforts:

- Community-based groups such as the Toronto Environmental Alliance, Action to Restore a Clean Humber, Black Creek Project, Ontario Streams, the Humber Watershed Alliance, and the Caledon Environmental Advisory Committee promotes stewardship activities such as the elimination of pesticide use, proper disposal of hazardous waste, habitat restoration, lawn naturalization, volunteer monitoring and trail construction.
- Programs and activities are offered to residents by TRCA and municipalities. Examples include downspout disconnection, yellow fish storm-drain marking, private land stewardship, water efficiency incentives, school yard renaturalization, Environment Days, Paddle the Humber, Lake Wilcox Fun Day, Adopt-A-Park and Adopt-A-Tree.

- TRCA's multicultural stewardship program is increasing awareness and involvement in stewardship activities among Somali, Sikh, West African and other ethnic communities.
- TRCA is publishing a "Caring for Valleys and Ravines" poster to promote watershed-friendly practices.

Good News:

- 79% of respondents take part in at least one activity to improve the environment (Angus Reid, 1999).
- An average of 49,200 trees and shrubs were planted annually on private lands between 1994 and 1998 as part of the TRCA's Private Land Stewardship Program.

- In 1999, 682 students painted 1,330 yellow fish near storm drains to raise awareness of the connection between dumping wastes in the storm sewer and the effects on the river.
- In 1999, community groups with assistance from TRCA, planted approximately 9,000 trees and shrubs on public lands.

Bad News:

- 44% of respondents with yards reported that they use pesticides or herbicides, and about 21% have done nothing in their house or yard to improve the environment (Angus Reid, 1999).

Targets:

2005:

- Awareness, understanding and participation in environmental stewardship activities are increasing among all watershed residents.
- 100% of watershed residents in a public opinion survey can name at least one activity that they are doing to improve the Humber watershed.

2015:

- 100% of watershed residents in a public opinion survey can name two activities they are doing to improve the Humber watershed.

2025:

- 100% of watershed residents in a public opinion survey can name three activities they are doing to improve the Humber watershed.

How to get there:

- Governments, agencies and the private sector fund education programs and social marketing campaigns (e.g. a natural lawn is a beautiful lawn) to achieve widespread behavioural change.
- Community groups, supported by public and private funding, recruit volunteers, conduct outreach, and plan and implement stewardship projects.
- TRCA maintain a database of stewardship projects.
- Conduct a public opinion survey to determine if the level of environmental awareness, behaviour and degree of participation in environmental action has changed.

Top Photo: Tree Planting by members of the Somali Community.

INDICATOR 25: OUTDOOR ENVIRONMENTAL EDUCATION

What is the extent to which young people are being educated about the outdoor environment?

MEASURE: Number of students in the watershed taking part in outdoor environmental education programs. *There are approximately 186,000 students in 256 schools in the watershed.*



Current Efforts:

- Teachers bring students to outdoor education facilities operated by TRCA including the Kortright Centre for Conservation, Boyd Conservation Field Centre, Albion Hills Conservation Field Centre and Lake St. George Conservation Field Centre.
- TRCA is currently revising lesson plans at its outdoor centres to meet the new school curriculum.
- The Toronto District School Board uses two outdoor education field centres, one in Caledon and the other in Brampton.
- Activities are offered to encourage new Canadians to become active participants in environmental actions.
- A 'Watershed On Wheels' program, operated by TRCA, visits schools on a request basis.

Good News:

- In 1998-99, almost 20,000 children attended formal outdoor education programs or classes at TRCA facilities, and 16 schools were visited by the 'Watershed On Wheels' program.
- In 1998-99, approximately 14,000 children attended Toronto District School Board outdoor education centres.
- The Humber Arboretum reaches an additional 8,000 students per year.
- According to a 1999 survey by TRCA, about one in three, or 5,268 students, from 28 schools in the Humber watershed, visited the Humber River or local natural area for environmental education in 1998/99. Schools such as Nobleton Public School, Palgrave Public School and Westwood Secondary School visit the Humber River on a regular basis.

Bad News:

- Many students are not exposed to outdoor education due to changing priorities in the curriculum, lack of classroom material and lack of assistance for teachers.
- Current outdoor education facilities are operating at capacity, yet the population is growing.
- Because the current curriculum does not support environmental studies, fewer university students in the Faculties of Education may be motivated to choose outdoor education as an area of specialization.

Targets:

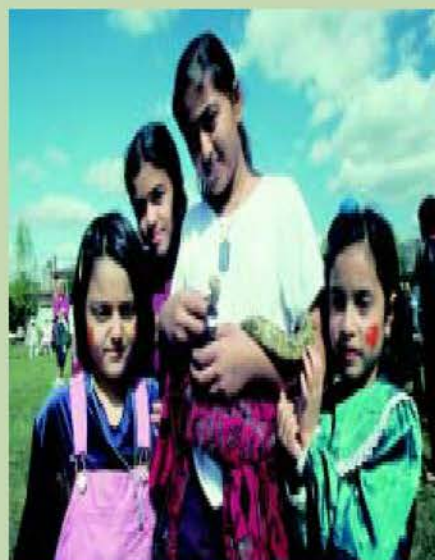
- 2005:**
- 25% of students in the watershed take part in outdoor environmental education.
- 2015:**
- All students in the watershed take part in outdoor environmental education.
- 2025:**
- Outdoor environmental education is fully integrated into school curriculum.

How to get there:

- Public and private sectors cooperate to expand outdoor education centres and programs.
- TRCA promotes the watershed program to school boards and deliver it to education facilities.
- TRCA works with schools, Boards, and post-secondary institutions to increase teacher awareness and capacity to deliver outdoor education.

Top Photo: Boardwalk at the Kortright Centre for Conservation, Vaughan.

Right Photo: Children handling native snakes.



INDICATOR 26: AESTHETICS

What is the aesthetic condition of the watershed?

MEASURE: Amount of garbage collected in community cleanup activities and the number of complaints received about the condition of the watershed. Also see *Surface Water Indicators 8 to 12.*

RATING:

C



Current efforts:

- Each spring, usually around Earth Day (April 22), schools, community groups, church groups, businesses and scouts organize cleanup events in parks and their surrounding neighbourhoods; Humber College has an annual clean up each spring.
- Municipalities sponsor annual Community Cleanup Days.
- Provincial transportation departments assist with 'Adopt-a-Highway' initiatives to help keep road rights-of-way clean.

Good news:

- Many people participate in community cleanup days; 25,000 people collected 40 tons of garbage in a spring cleanup in Brampton; 3 tons of garbage were collected in a community cleanup in Toronto.
- The amount of garbage collected from parks in the former City of Etobicoke has decreased over the last 9 years. This may be due to improved maintenance and changing attitudes towards littering.
- Municipalities have "Adopt-a-Park" programs to encourage residents to look after local parks.

Bad news:

- 66% of respondents to a 1999 Angus Reid survey said that pollution or dirty conditions were the most important issues facing the Humber River today.
- The Ministry of the Environment (MOE) received approximately fifty complaints in 1998 about the condition of Black Creek and the Main Humber within Vaughan alone. Forty of these were spills and ten were water quality complaints.
- Shopping carts and plastic bags in rivers and streams are a major aesthetic problem.
- Some remote rural areas are used as illegal dumping sites.
- There is not enough effort put into removing garbage from water-courses.

Targets: 2005:

- Participation in community cleanup programs continues to increase, while the amount of garbage collected decreases.
- The number of complaints about the condition of the Humber decreases.
- Public opinion regarding the condition of the Humber improves.

How to get there:

- The Humber Watershed Alliance works with municipalities to develop a watershed-wide cleanup event every spring, including more cleanup activities in rural areas.
- MOE documents water quality complaints on a watershed basis.
- Municipalities keep

records of the amount of garbage collected in the watershed and do community outreach to reduce littering.

- Municipalities conduct maintenance programs to clean garbage from sewer outfalls after rainfall events.
- Retail outlets near a watercourse develop proactive approaches that deter shopping cart loss.
- Public and private sectors help to provide education and awareness programs about taking responsibility for the condition of the watershed, such as Adopt-a-Park, Adopt-a-Highway, and Stream Watch.
- Residents and businesses take part in regular watershed cleanup programs.



Top Photo: Litter Cleanup, Alex Marchetti Park, Toronto.

Left Photo: Caledon East Wetland Community Action Site, Caledon.

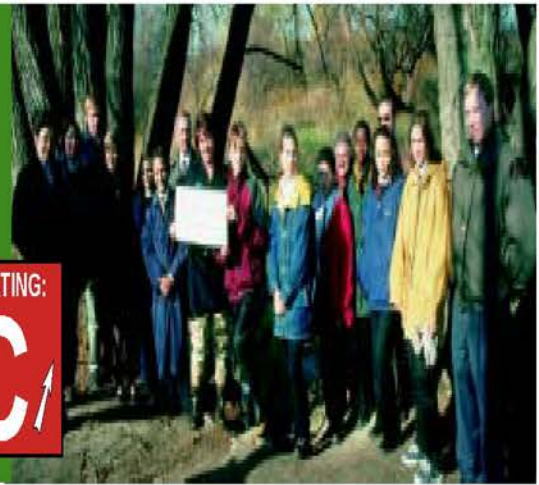
INDICATOR 27: BUSINESS STEWARDSHIP

To what extent are businesses taking responsibility as stewards of the Humber River watershed?

MEASURE: Number of business signatories to the Humber Pledge. *This is a statement of intent to uphold the ideals of the Humber Watershed Alliance and participate in environmental protection and restoration activities.*

RATING:

C



Current Efforts:

- The Humber Watershed Alliance has developed and begun to promote the Humber Pledge.
- The Emery Creek Environmental Association, a group of industry representatives, promote pollution prevention programs for local businesses.
- Business codes of practice and international standards such as ISO 14000 have been established.
- Local businesses have helped in the implementation of Community Action Sites including lot level stormwater management and habitat restoration (Table 13).

Good News:

- More companies of all sizes across the watershed are getting involved in environmental stewardship by improving their own property or practices, involving employees in environmental action days, funding a local group, or donating services.

Bad News:

- Of the thousands of businesses in the Humber watershed, only a very small percentage has been directly contacted and are actively involved in local environmental stewardship activities.

Targets:

2005:

- 100 businesses have signed the Humber Pledge and have been involved in at least one watershed management project.

2015:

- 250 additional businesses have signed the Humber Pledge and have been involved in at least one watershed management project.

2025:

- 250 additional businesses have signed the Humber Pledge and have been involved in at least one watershed management project.

How to get there:

- TRCA establish and maintain a database to record business stewardship participation.
- TRCA develop and implement a plan to secure business commitment in priority areas (Figure 20).
- Support and implement the policies and programs recommended by the City of Toronto Environmental Task Force.



Top Photo: John Bosco Catholic High School accepts Canada Trust, Friends of the Environment donation.

Husky Injection Mouldings of Bolton wins environmental award.



Figure 20: High Employment Areas in the Humber Watershed

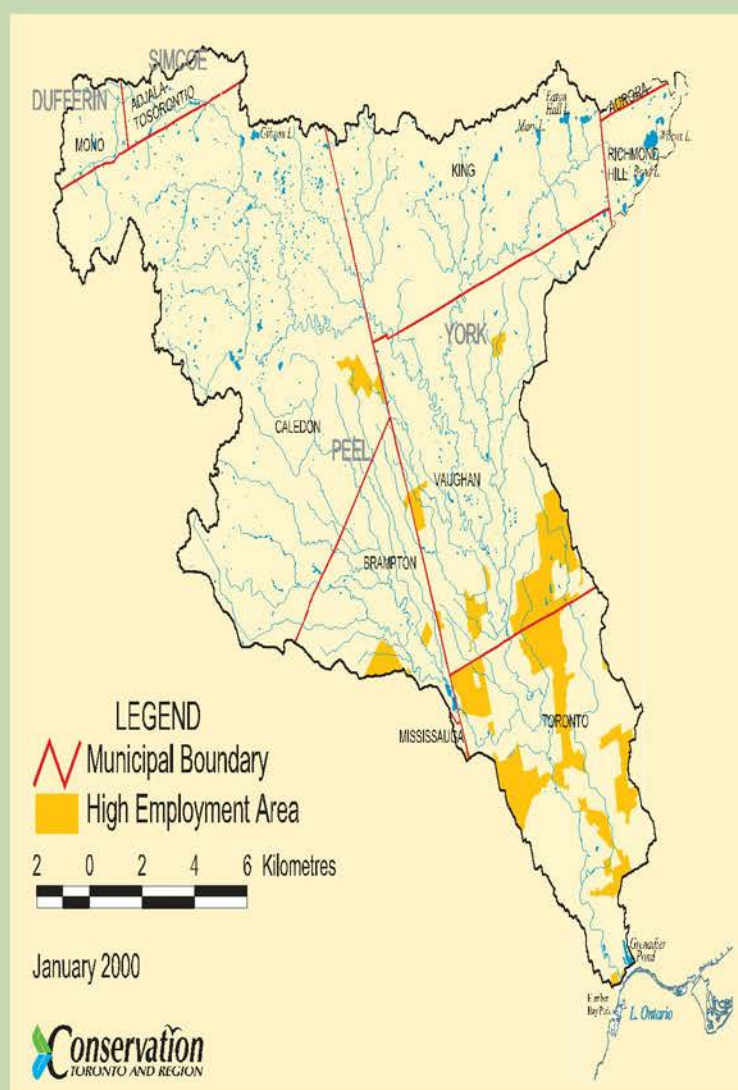


Table 13: Examples of Corporate Participation in Watershed Management

Company	Activity
Husky Injection Moldings	- sponsored 600 student visits to the Albion Hills Conservation Field Centre.
Loblaws	- refreshments at community tree planting events.
The GAP	- 75 employees planted trees.
Environics	- 25 employees participated in an educational canoe trip down the Humber River.
Canada Trust	- donations of funds for environmental projects.

INDICATOR 28: MUNICIPAL STEWARDSHIP

To what extent do municipalities take responsibility as stewards of the watershed?

MEASURE: Presence or absence of environmental policies and by-laws that contribute to the health of the watershed. *The presence or absence of policies is an interim and incomplete measure, and in no way reflects the level of implementation, effectiveness, or enforcement of the policies or by-laws. This should be measured in the next report card.*

RATING:

B



Current Efforts:

- Current municipal policies and by-laws are listed in Table 14.
- Municipal Councils are being encouraged, by residents and interest groups, to adopt more progressive environmental policies (e.g. Save the Oak Ridges Moraine Coalition and the Caledon Environmental Advisory Committee calling for stronger protection of the ecological functions of the Moraine).
- In the preparation of new policies, municipalities have obtained assistance from agencies with environmental mandates (e.g. TRCA and the Ministry of the Environment) through the review of draft documents and the provision of technical expertise.
- Municipalities are improving their environmental mandate as Official Plans and other planning documents are revised.

Good News:

- All municipalities in the Humber have policies in place to protect aquatic habitats, terrestrial habitats, and natural areas.
- All municipalities address water quality and quantity in some form; these include policies regarding stormwater management, water conservation, household hazardous waste disposal, and reduction of pesticide and fertilizer use.
- About half the municipalities have adopted fill by-laws to help control the alteration of watercourses.

Bad News:

- Less than half of the municipalities in the Humber have by-laws related to topsoil preservation, sediment and erosion control, tree and ravine protection, road salt reduction, or air quality.
- Many of the more progressive existing policies have not yet been implemented nor tested.
- No municipality has done a comprehensive assessment on the environmental impact of their policies and practices.

Targets:

2005:

- Policies and by-laws that protect significant landforms and groundwater are in place.
- All municipalities assess the environmental impact of their policies and practices.

2015:

- All municipalities have the necessary by-laws and policies necessary to protect the Humber River watershed, and commit the appropriate resources for education, monitoring and enforcement.

How to get there:

- Municipalities show leadership in adopting appropriate policies, with assistance and support from other levels of government, TRCA, interest groups, and the Humber Watershed Alliance.
- Municipalities carry out self-evaluation of policy effectiveness.
- The Province provides appropriate tools and enabling legislation.

Top Photo: Lake St. George, Richmond Hill.

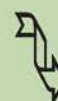


Table 14: Municipal Environmental Policies and By-laws

	Mono	Adj -Tos	Peel Reg.	York Reg.	Cale	King	Bram	Miss	Vaug	RH	TO*
PROTECT SIGNIFICANT LANDFORMS											
Official Plan policies dealing with landforms (e.g. Niagara Escarpment, Oak Ridges Moraine, and the South Slope)	Y	P	Y	Y	Y	P	Y	Y	Y	Y	(4 muns.) Y
PROTECT WATER RESOURCES - Water Quantity											
Official Plan policies to protect the form and function of the Humber River and its tributaries	Y	Y	Y	Y	Y	Y	Y	- no Humber tributaries	Y	Y	(3 muns., 1 proposed) Y
Subwatershed plans or studies required prior to approval of new developments	n/a	n/a	Y		Depends on case. (Y)		Y	Y	Y	P	Y
Fill by-law to control the alteration or interference of existing watercourse channels					Y	Y	Y		Y	Y	(1 mun.) Y
Water conservation programs in place (e.g. water efficiency retrofit kits, lawn watering, etc.)	Y		Y	Y	Y	Y	Y	Y	Y	Y	(4 muns.) Y
Official Plan policies to protect groundwater resources		(Other proposed policy documents) P	Y	Y	Y	Y	Y	Y	Y	Y	(2 muns., 1 proposed) Y
Programs to promote stormwater management BMP's (lot management techniques, e.g. downspout disconnection, rain barrels, permeable surfaces, etc.)	(Through engineering review) (Y)	(Through engineering review) (Y)	n/a	Y	Y	Y	Y	Y	Y	Y	(All) Y

Table 14 Continues: Municipal Environmental Policies and By-laws

	Mono	Adj -Tos	Peel Reg.	York Reg.	Cale	King	Bram	Miss	Vaug	RH	TO*
PROTECT WATER RESOURCES - Water Quality											
Topsoil Preservation By-law or a Sediment and Erosion Control By-law to prevent sediment from entering nearby watercourses	Y		n/a	n/a	- sediment control under fill by-law		Y	Y	- sediment control under fill by-law		
Policies or approved practices for reduction of:											(3 muns.)
a) salt				a) Y	a) Y	a) Y	a) Y	a) Y	a) Y		a) Y
b) pesticides	b) Y				b) Y	b) Y	b) Y	b) Y	b) Y	b) Y	b) Y
c) fertilizer	c) Y					c) Y	c) Y	c) Y	c) Y	c) Y	c) Y
d) oil / grease entering watercourses				d) Y		d) Y	d) Y	d) Y	d) Y	d) Y	d) Y
Staff training for proper environmental use of salts, pesticides and fertilizers	Y			Y	Y	Y	Y	Y	Y	Y	(All)
Sewer Use By-law to prevent the dumping of toxic waste into the sewer system	n/a	n/a	Y	Y	n/a		Y	Y	Y	Y	(3 muns.)
Hazardous Waste Depots to drop off hazardous waste materials (e.g. paint, oil, tires, etc.)	Y	Y	Y	n/a	n/a	use regional facilities (Y)	Y	Y	(Keele Valley Landfill) (Y)	Y	(1 mun.)
IMPROVE AIR QUALITY											
Official Plan policies to improve air quality	n/a	n/a	(Y)	Y	Y			Y		(3 muns.)	Y
Dust control plans required prior to building approval	n/a	n/a	n/a	n/a	(planning approvals may include this) (Y)			Y	(usually included in subdivision agreements) (Y)		(1 mun.)



Table 14 Continues: Municipal Environmental Policies and By-laws

	Mono	Adj -Tos	Peel Reg.	York Reg.	Cale	King	Bram	Miss	Vaug	RH	TO*
PROTECT WILDLIFE HABITATS											
Official Plan policies to protect aquatic habitats (e.g. fish habitat, wetlands, etc.)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	(4 muns.) Y
Watercourse naturalization projects in the Humber watershed	n/a	n/a	Y		Y		Y		Y		(2 muns.) Y
Ravine By-law to protect vegetation, slope stability and the discharge of water or the dumping of waste			n/a	n/a			Y			-valleylands included in Environmental Protection Areas	(1 mun.) Y
Official Plan policies to protect natural areas and terrestrial habitats (e.g. Greenlands Systems, Natural Features designations, Environmental Protection Areas, etc.)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	(All) Y
Tree By-law to control the injury or destruction of trees in specified areas (private property)	n/a	n/a	n/a	Y	P	P		P			(1 mun.) Y
Official Plan policies or approved practices to encourage naturalization in municipal parks and open spaces	n/a	n/a	Y		Y	P	Y	Y	Y		(All) Y

* The Toronto column represents an inventory of policies, by-laws and practices within the 5 pre-amalgamation municipalities located within the Humber watershed -Metro Toronto, York, Etobicoke, North York and Toronto.
The number of former municipalities with a particular initiative is indicated.

Y = Yes

N = No

P = Proposed

n/a = not applicable to this level of government

SUMMING UP: WHAT DOES IT ALL MEAN?

How healthy is the Humber River watershed? If the watershed was sitting across the desk in a doctor's office after getting a thorough check up, what would the doctor say? Do we have enough information to make a judgement about the health of the overall system? Based on the grades that were assigned to 26 of the 28 indicators, here's what can be said.

There is a wide range in terms of health.

The grades assigned to various aspects of the environment range from an "A" for Outdoor Recreation, which is very good, to an "F" for Stormwater Management, which is an undoubted failure. The ratings for many of the indicators, such as Forest Cover, Wildlife, and Conventional Pollutants in surface water, vary widely from the upper reaches of the river to the lower. This range in terms of health reflects the diverse nature of the watershed, the different land uses found here, and the different stresses put on it in different geographic areas. Environmental health is generally better in the upper reaches of the watershed than it is in the heavily urbanized southern reaches. The upper reaches of the Humber have limited development, are dominated by agricultural and rural land uses, and contain significant blocks of natural areas (woodlots, wetlands, and stream corridors).



Humber River, Raymore Drive, Toronto.

A few aspects of the Humber River Watershed are relatively healthy. Only four of the 26 indicators (15%) were graded as a "B" or higher, reflecting a good state of health. This includes Benthic Invertebrates, Greenspace, Outdoor Recreation and Municipal Stewardship. Importantly, only one of the indicators with a good rating (Benthic Invertebrates) directly measures the conditions in the natural environment.

Most aspects of the Humber River Watershed are in fair health. Fourteen of the 26 indicators (54%) measured were graded as a "C" or fair. In these areas, while things are not critical, there is room for improvement.



Some aspects of the Humber River Watershed are in poor health. Eight of the 26 indicators (31%) were graded as a "D" or lower, indicating a poor state of health. These included Wetlands, Groundwater Quality and three of five indicators for surface waters including Bacteria, Conventional Pollutants and Stormwater Management. Other indicators receiving a poor grade were Air, Heritage Events and Agricultural Land.

Some aspects of the Humber River Watershed appear to be getting worse. The grades for seven of the 26 indicators are getting worse. This includes many important environmental aspects including Significant Landforms, Forest Cover, Wetlands, Wildlife, Groundwater Quality, Bacteria and Agricultural Land.

Many aspects of the Humber River Watershed appear to be improving. The grades for ten of the 26 of the indicators show improvement. This includes three of the indicators for surface water (Conventional Pollutants, Heavy Metals and Organic Compounds, and Stormwater Management), Groundwater Quantity, Riparian Vegetation, Heritage Events, Public Greenspace, Trails, Outdoor Environmental Education, and Business Stewardship. These signs of improvement are a reflection of the efforts that have been made to address these issues.

Humber River at Boyd Conservation Area, Vaughan.



Overall, the system is in fair shape, but under significant stress. In terms of overall health, the Humber River watershed would get no more than a "C", or fair. Overall, natural environmental conditions are fair to poor, as are the indicators used to measure the economy such as agricultural land. Overall ratings for social aspects of the environment are better, as are those given to "Getting It Done" (Stewardship). In many cases, the poorer ratings for the more urbanized areas drag down the overall grade for an indicator. The number of indicators in which the grade is improving, however, is cause for optimism, as it reflects actions taken in the past to improve environmental health.

Although the system is in fair shape, some stresses will likely increase in the future. Development pressures are great on the upper reaches of the Humber, and the population is expected to grow by 175,000 people over the next ten years. This development can lead to increased impacts on water quality, air quality and terrestrial resources, depending on what form it takes, where it takes place and how it is carried out.

Having faced the doctor across the desk and heard the assessment of the health of the Humber watershed, we need to double our efforts to improve its health. We need to act now, in a focused and strategic manner to

protect those aspects that are still healthy and enhance those that are not. The actions listed in this report card under "How to get there" include some of the key steps we need to take to improve ecological health.

Working together we can achieve a healthy Humber River watershed, one that is liveable, sustainable and prosperous. Through our collective actions, we can ensure that the rich legacy of the Humber River watershed is passed on to future generations.



Sunrow Community Action Site, Toronto. Insert Photo: Eaton Hall Lake, King Township

SUMMARY OF INDICATORS AND GRADES

CATEGORY	INDICATOR	GRADE
ENVIRONMENT		
Landforms	<i>Indicator 1: Significant Landforms</i> How well are significant landforms being protected from urban sprawl?	C+
Terrestrial Habitat	<i>Indicator 2: Forest Cover</i> How well are forests being protected and regenerated?	C+
	<i>Indicator 3: Wetlands</i> How well are wetlands being protected and restored?	E+
	<i>Indicator 4: Vegetation Communities</i> How well are different types of vegetation communities being protected?	Being developed
	<i>Indicator 5: Wildlife</i> How well is wildlife protected?	C+
Groundwater	<i>Indicator 6: Groundwater Quantity</i> Is groundwater being used sustainably?	C+
	<i>Indicator 7: Groundwater Quality</i> How well is the quality of our groundwater being protected?	D+
Surface Water	<i>Indicator 8: Stormwater Management</i> How well has stormwater runoff from urban areas been managed?	F+
	<i>Indicator 9: Bacteria</i> How swimmable are surface waters?	E+
	<i>Indicator 10: Conventional Pollutants</i> How degraded are surface waters with respect to conventional pollutants?	D+
	<i>Indicator 11: Heavy Metals and Organic Contaminants</i> What is the condition of surface water with respect to heavy metals and organic compounds?	C+
	<i>Indicator 12: River Flow</i> How stable are the flows in the river?	C
Aquatic Habitat	<i>Indicator 13: Benthic Invertebrates</i> How healthy are benthic (bottom-dwelling) invertebrate communities?	B
	<i>Indicator 14: Fish Communities</i> How healthy are fish communities?	C
	<i>Indicator 15: Riparian Vegetation</i> How healthy is streambank vegetation?	C+
Air	<i>Indicator 16: Air Quality</i> How healthy is the air we breathe?	D



SUMMARY OF INDICATORS AND GRADES (CONTINUES)

CATEGORY	INDICATOR	GRADE
SOCIETY AND ECONOMY		
Heritage	<i>Indicator 17: Heritage Resources</i> How well are heritage resources being protected?	C
	<i>Indicator 18: Heritage Events</i> How well is heritage recognized and celebrated?	D†
Outdoor Activities	<i>Indicator 19: Public Greenspace</i> How much publicly owned greenspace is there?	B†
	<i>Indicator 20: Outdoor Recreation</i> How extensive are outdoor recreation opportunities?	A
	<i>Indicator 21: Trails</i> What progress has been made in developing a system of inter-regional trails?	C†
Agriculture	<i>Indicator 22: Agricultural Land</i> How well is agricultural land being conserved?	D†
Development	<i>Indicator 23: Sustainable Use of Resources</i> How well are people doing at using resources wisely and living a sustainable lifestyle?	Being developed
GETTING IT DONE		
Stewardship	<i>Indicator 24: Community Stewardship</i> To what extent are people taking responsibility as stewards of the Humber River watershed?	C
	<i>Indicator 25: Outdoor Environmental Education</i> What is the extent to which young people are being educated about the outdoor environment?	C†
	<i>Indicator 26: Aesthetics</i> What is the aesthetic condition of the watershed?	C
	<i>Indicator 27: Business Stewardship</i> To what extent are businesses taking responsibility as stewards of the Humber River watershed?	C†
	<i>Indicator 28: Municipal Stewardship</i> To what extent do municipalities take responsibility as stewards of the watershed?	B

GLOSSARY

Area of Natural and Scientific Interest (ANSI): Designated by the Ministry of Natural Resources for natural heritage, scientific or educational value.

Action to Restore a Clean Humber (ARCH): A community group involved with habitat restoration and monitoring throughout the Humber River watershed.

Aquifer: A zone of soil or rock saturated with water.

Baseflow: Streamflow derived from groundwater.

Biodiversity: The number and variety of species and habitats within a given region.

Best Management Practices (BMP): An environmentally responsible action such as using an organic fertilizer.

The Carolinian Life Zone: A warm temperate region dominated by deciduous forest. It includes much of eastern North America from the Carolinas in the south, to southwestern Ontario in the north. Carolinian habitats are among the richest in Canada, containing many species found nowhere else in the country. Toronto is located in the transition area between Carolinian (deciduous) and Great Lakes-St. Lawrence (mixed deciduous and coniferous) forest zones.

Chloride: The chemical signature of road salt, sodium chloride, as measured in water.

Community Action Site: A location where resources are focused and actions are taken to achieve the environmental, social and economic objectives of *Legacy: A Strategy for a Healthy Humber*.

Conventional Pollutants: Pollutants such as suspended solids, phosphorus, ammonia, nitrogen, chlorides, oil, and grease.

Cumulative Impacts: The sum of all individual impacts occurring over space and time.

DDT: Dichlorodiphenyltrichloroethane, a type of chlorinated hydrocarbon, or synthetic pesticide, that is extremely toxic and slow to degrade naturally in the environment.

Development Charges Act (1996): Gives municipalities the right to impose charges on developers to help pay for the new services and infrastructure needed for growth to occur. Development charges are prohibited for cultural and entertainment facilities, parkland acquisition, hospitals, tourism facilities, and administrative headquarters.

Discharge: The movement of water from a saturated underground zone to the surface where it flows into a watercourse or lake.

Ecosystem: A term used to describe the interdependence of species in the living world, both with one another and with their physical environment.

ESA: An Environmentally Significant Area, identified by TRCA, because it contains critical wildlife habitat, rare flora or fauna, or performs a vital ecological function (e.g. groundwater recharge, wildlife corridor or nursery area).

Flow: The volume of water that passes a given point per unit of time.

Forest Interior Habitat: Habitat that is at least 100 metres from the forest edge.

Fragmentation: Non-continuous patches of habitat that can limit the movement of species.

Geological Survey of Canada (GSC): An agency dedicated to geoscientific information collection and research, sustainable development of Canada's resources, environmental protection, and technology innovation.

Geographic Information Systems (GIS): A computer-based tool designed to gather, manipulate, analyse, and display data.

Groundwater: Water that enters the soil, moves downward to the water table, and collects in aquifers.

Hectare: 10, 000 square metres or 2.47 acres.

Index of Biotic Integrity (IBI): A biological rating that considers the number of species and composition, local indicator species, trophic composition, and fish abundance when determining the condition of aquatic health.

International Joint Commission (IJC): Established in 1909 to assist the USA and Canada in decisions regarding the lakes and waterways that form the boundaries between the two countries.

Instream Barrier: A structure in a river or stream that hinders or prevents the movement of fish and other aquatic organisms.



Kettle Lake: A body of water formed when a block of ice buried in a ground moraine, an outwash plain, or valley floor melts, leaving behind a steep-sided hole that is filled with water.

Local Architectural Conservation Advisory Committee (LACAC): A committee of each municipal council, appointed under the Ontario Heritage Act to advise Council on designating properties of architectural or historic interest and importance, as a measure towards preserving them. These committees also standardize heritage record keeping and categorization of built heritage resources in municipalities.

Natural Heritage Strategy (NHS): a document being developed by the TRCA to identify core habitats and corridors and provide guidelines for the protection and restoration of terrestrial and aquatic habitat.

Official Plan (OP): a document prepared by municipalities to guide long-term land use and development.

PCBs: Polychlorinated biphenyls, a group of toxic organic compounds that were once widely used as liquid coolants and insulators in industrial equipment, such as power transformers.

Priority Toxics: Persistent substances that are extremely toxic which are targeted for virtual elimination through significant reduction in their use, generation or release (e.g., banned substances such as mirex, aldrin, chlordane and DDT that are no longer manufactured but are still present in the environment).

Provincial Water Quality Objectives (PWQO): Objectives that have been established for each key water quality parameter (e.g. suspended solids, phosphorus, chloride, dissolved oxygen) in order to protect a particular use.

Remedial Action Plan (RAP): A plan developed and implemented for a designated Area of Concern (AOC) in the Great Lakes Basin to improve various conditions such as drinking water, and fish and wildlife habitat. An Area of Concern, as defined by the Great Lakes Water Quality Agreement, is a geographic area where water pollution is severe enough to endanger wildlife populations or impair beneficial water uses.

Recharge: The movement of surface water through the soil into the saturated zone (aquifer).

Sediment: Sand, silt, and clay particles derived from weathered rock.

Stewardship: The promotion and application of environmentally responsible practices (e.g. recycling, composting and native plant gardens).

Stormwater: Water that runs off urban and rural areas, flows through ditches and municipal storm drain systems, and empties into lakes and rivers untreated.

Subwatershed: Smaller units that more easily allow for the identification of problems and opportunities. The five subwatersheds of the Humber are the Main, East, West, Lower and Black Creek.

Sustainability: A philosophy that dictates that we must meet the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Report).

The Toronto and Region Conservation Authority (TRCA): A provincial/municipal partnership established in 1957, under the Conservation Authorities Act, to manage the renewable natural resources of the region's watersheds. The TRCA, with one-third of Ontario's population within its area of jurisdiction, acts in the community's interest through advocating and implementing watershed management programs.

Trophic Composition: The distribution of species within a food chain or food web (e.g. decomposers, primary producers and consumers).

Valley and Stream Corridor Management Program: Developed by TRCA in 1994 to advance the TRCA's policies for the protection and rehabilitation of the valley and stream corridors within its jurisdiction.

Watershed: All of the area that drains into a river system. The Humber River watershed is the largest of the nine watersheds in TRCA's jurisdiction, draining 908 square kilometres.

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We want to thank all the municipal councils who support the work of the Humber Watershed Alliance, and the staff of other agencies who have helped us along the way.

Finally, we owe thanks to all the individuals who attended public meetings and shared their ideas and opinions on the future of the Humber.



Humber River at Rutherford Road and Highway 27, Vaughan.

*The beauty of the trees,
the softness of the air,
the fragrance of the grass,
speaks to me.*

*The summit of the mountain,
the thunder of the sky,
the rhythm of the sea,
speaks to me.*

*The faintness of the stars,
the freshness of the morning,
the dew drop on the flower,
speaks to me.*

*The strength of fire,
the taste of salmon,
the trail of the sun,
and the life that never goes
away,
they speak to me.*

And my heart soars.

Source: Chief Dan George and
Helmet Hirschall in
[My Heart Soars](#)