

The Rural Landowner Stewardship Guide

Introduction

What is the purpose of this Guide?

The overriding goal of the Rural Landowner Stewardship Guide is to protect and enhance the quality of our natural environment – both groundwater and surface water such as streams, rivers, ravines, creeks, wetlands and lakes, and the natural landscape features that support these ecosystems.

By protecting this natural resource, you are not only conserving our natural and cultural heritage but also protecting the legacy of Ontario's clean water for future generations.

By protecting the natural environment, you are also protecting your investment as a property owner or resident in this landscape. You will notice that being a land steward and working with the environment will save you time, money, and frustration.

This Guide is an important tool designed to help individuals make a difference. It provides a framework to allow you to evaluate your property and its management. Through completion of the worksheets, you will learn what you are doing right, and where you can improve in protecting our natural environment.

This guide is for you!

If you're a rural landowner in Ontario, this guide has been designed specifically for your needs.

A Bit of Background

In 1991, farmers in Ontario recognized the need to identify and deal with environmental concerns relating to agricultural production. The Environmental Farm Plan (EFP) is the product of this farmer-driven initiative.

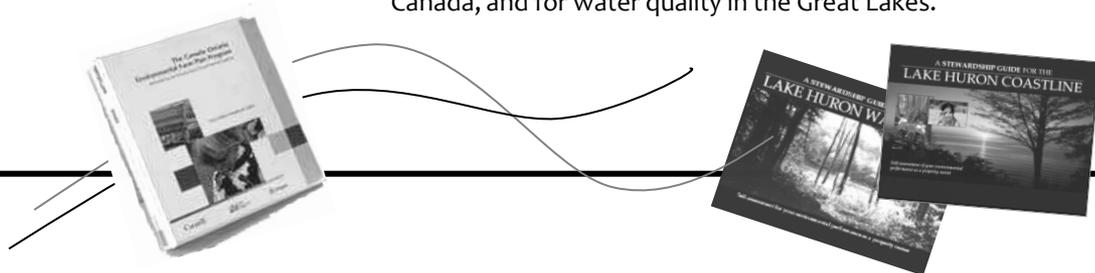
Based on the Environmental Farm Plan, the Rural Landowner Stewardship Guide Program was developed as a response to the awareness that the health of the rural landscape depends upon the actions of all rural landowners, and not of farmers alone.

The coastally-focused Stewardship Guide for the Lake Huron Coastline, published in 2006, was the first of the Rural Landowner Guides.

This program has been developed and run by volunteers – people like you who live in your region. As a result, the program specifically addresses the challenges and benefits of life in your near landscape.

No individual can single-handedly solve the issue of water quality, but collectively we can make a difference. Your actions may result in an overall improvement in the environment.

By going through the worksheets in this guide and devising an **Action Plan**, you are taking an important step for your property, your neighbourhood, your community, the environment in Ontario and Canada, and for water quality in the Great Lakes.



How to use the Rural Landowner Stewardship Guide

This Guide will help you see your property and your actions in a new way. It asks you to think about your land, the buildings and structures on your land, and how your actions affect the larger landscape, from a new point of view. It asks you to rate how you affect the environment and water quality around your property. Finally, it asks you to consider new ways of using and maintaining your property in order to decrease risks to precious natural resources, and potentially to help save you time and money.

The Guide has three parts – an **Introduction to Local Ecology**, a **Workbook**, and an **Action Plan**. These are explained in the following paragraphs. A Glossary at the back of the workbook provides a better understanding of terms used in the worksheets. Resources Lists at the end of each worksheet and Contact Information at the back of the guide will help you seek out further, more detailed information on the topics covered in the workbook.

The Workbook

The Workbook includes worksheets to help you rate your activities on your property. Pick out the worksheets that apply to your property. Read the introductory page and then use the worksheets to rate the topics that apply to you in the right hand column. For topics that don't apply, write the letters 'NA' (not applicable) in the rating box. If you still don't know how you rate, mark the box with a question mark to remind yourself to find out the missing information.

For each topic, there are four descriptions of either natural conditions or current situations. Each has a number rating:

- 4 (**Best**)
- 3 (**Good**)
- 2 (**Fair**)
- 1 (**Poor**)

The Best (or 4) rating describes conditions that protect the environment and water quality or have the lowest potential for environmental damage. The Poor (or 1) rating describes conditions that have the highest potential to affect the environment negatively and require an Action Plan.

Circle the condition that best describes your property. Mark the rating number for each topic in the matching box at the right hand side of the worksheet. The purpose of this rating system is not to tally the numbers in the right-hand column, but to identify areas for improvement on your property. A rating of 1 or 2 indicates what needs improving.

NOTES:

Bold, italic type indicates conditions that may violate provincial legislation. Federal laws or municipal bylaws may also apply. Contact your local municipal government office for more information.

REMEMBER!: If a particular worksheet does not apply to your property, you can simply skip over it. But, you could still gain some valuable knowledge by reading through it!

The Action Plan

When you have filled in all the worksheets that apply to your property, record the ratings for each topic in the **Action Plan**. Remember, some worksheet sections may not apply to your property.

Your 1 and 2 ratings indicate which areas of your property management need some changes to reduce the potential for environmental damage and water contamination.

Use the information in the Action Plan section to help analyze your potential problems and decide what you can do to solve or control them. Remember, this is YOUR Action Plan. It must suit you and your property.

An example of an Action Plan is found on the next page.

Often, the information in columns 4 and 3 can indicate how to improve your practices. As well, you can consult the **Resources List** at the end of each worksheet to find more information for developing your Action Plan.



Example of a completed worksheet question:

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
DURING CONSTRUCTION					
5 Minimizing erosion and/or compaction	Project area is subdivided into smaller projects and done sequentially.	Clear only the area necessary for the project.	Large areas are cleared but vegetation is restored.	Entire property is cleared at once.	2

The Action Plan

Worksheet and Topic Number	Page	Worksheet Theme	Your Rating	Short-term Actions	Long-term Actions
7-2	W7-3	Waste Mgmt.	2	Get another recycling bin.	Generate less garbage.
10a-6	W10-5	Forested land	1	Check worksheet resources for more info. Decide where connections are needed.	Plant trees to establish connections.
10c-2	W10-23	Wetlands	2	Talk with tenant farmer about his field requirements	If possible widen buffer and plant wildlife shrubs in it.
Etc.					

Sample Action Plan

Use this sheet to help develop your Action Plan. Fill in the relevant information, then determine what actions you can take in the short- and long-term to reach your goal of improved environmental stewardship. Make extra copies as needed.

- PART I -

Southern Ontario Ecology

Southern Ontario: A Working Landscape

Cultural and Physical Geography

The landscape of southern Ontario contains some very significant features that are both culturally and ecologically rich. These features are the result of thousands of years of interaction between evolution, geologic activity, and human development.

South of the Canadian Shield, the bedrock of southern Ontario landscape is sedimentary rock. As its name implies, this rock is created by the compression of sediments and the bodies of sea dwelling creatures deposited at the bottom of ancient seas. Over hundreds of millions of years these sediments turn into rock and form the platform of the hills and valleys, streams and lakes, forests and fields you see today.

The Canadian Shield is a different bedrock, being of ancient volcanic origin. The rocks of this landform are the result of earth-building processes during the Precambrian era, billions of years ago. These rocks are some of the oldest in the world. The sedimentary rocks of southern Ontario sit on top of the Precambrian rock located far below the surface.

Over tens of thousands of years, the bedrock has been lifted and depressed then scraped and eroded by glaciers which advanced and retreated several times. The last glaciers melted from southern Ontario 10,000 to 14,000 years ago. It is this glacial activity that left behind features such as drumlins, eskers, and moraines. They were formed by the accumulation, slow draining, and evaporation of glacial meltwater from streams, lakes, and ponds. The Canadian Shield with its much harder Precambrian rock accumulated far less of this glacial “debris” than was deposited in southern Ontario.

Following the retreat of the glaciers vegetation returned to the

landscape. Aboriginal people also repopulated the region. Their activities had relatively minimal impact and the landscape evolved into a cover of primarily continuous forest with much smaller patches of grasslands (prairie and savannah), alvars, and wetlands such as bogs and fens. Wetlands such as swamps and marshes were relatively widespread and along the Great Lakes there were extensive coastal systems some of which remain today.

Since European settlement began about 250 years ago, the landscape has seen a conversion of much of the natural landscape into agricultural, urban, and industrial purposes. Vast forests were felled and a large percentage of the existing wetlands were drained, radically changing the landscape. Today natural ecosystems occupy far less of most of southern Ontario. We live in a working landscape that is a patchwork of farms, urban areas, quarries, and industrial uses, linked by the infrastructure of roads and utilities. In some parts of southern Ontario, forest cover has been reduced to a small fraction of its original extent. There is no natural area that has not been felt by the impact of the development of the past few centuries.

We live with the history of development and continue to satisfy our need for natural resources from the landscape. There is, however, a growing acknowledgement and understanding that the health of natural ecosystems is vital to sustaining our own health.

This guide is designed to contribute to our understanding. With awareness of the need for healthy ecosystems, we can begin to restore and improve the health of the natural features on our individual properties leading to the enhanced health of today’s and future generations.

Where do you fit in?

Broad Scale – A Watershed Perspective

What is a Watershed?

A *watershed* is the entire land/water area that drains into a body of water such as an ocean, lake, river, or pond. The boundaries of a watershed are formed by the highest points in the landscape – they are like the edges of a bathtub or sink – any water that falls within it will drain downwards to the same outlet.

On its journey towards an outlet or drain, the water within a watershed can pass through different landscape features such as streams, rivers, lakes, bogs, and marshes.

Southern Ontario is within the Great Lakes-St. Lawrence Watershed.

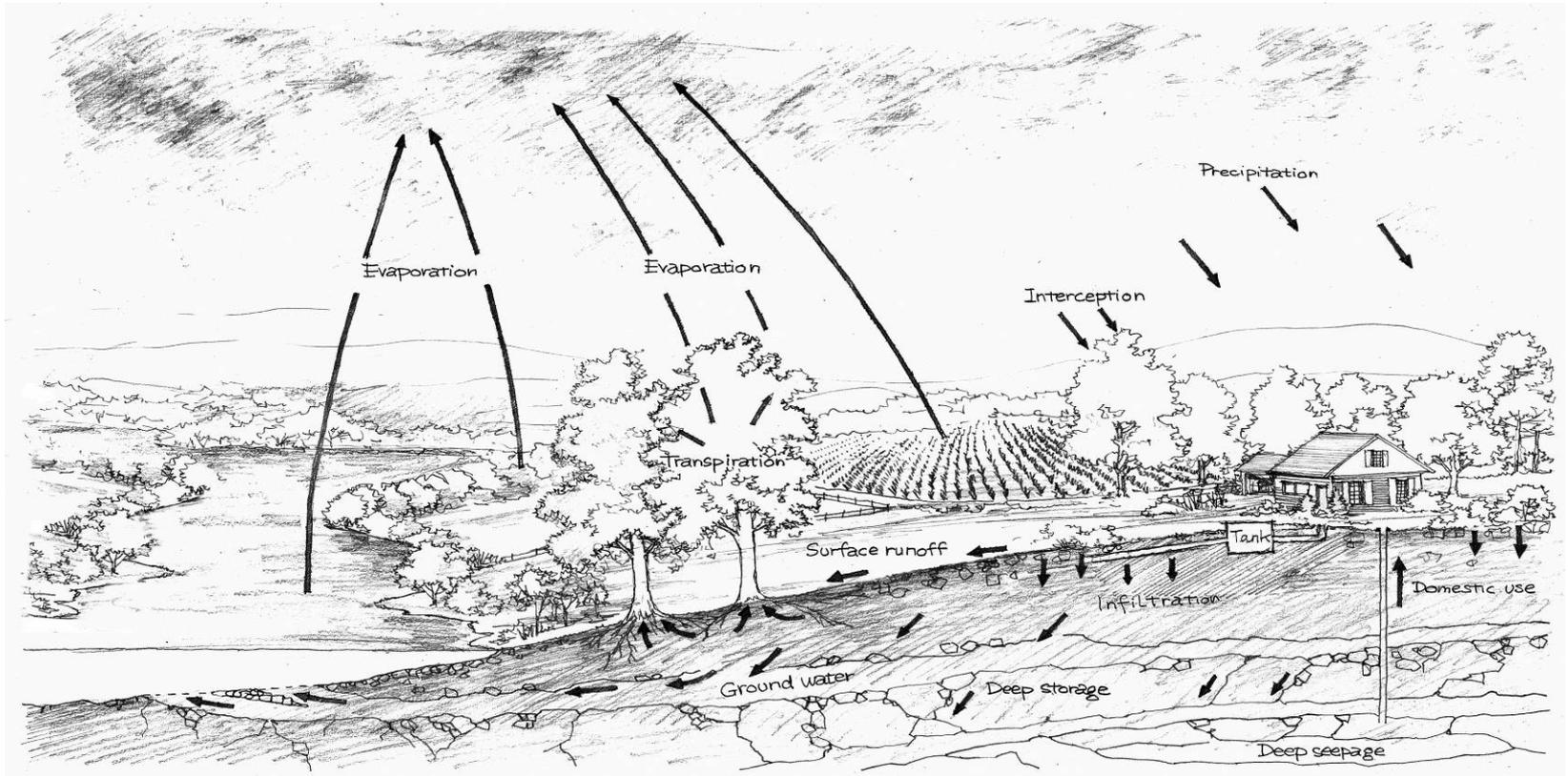
The first step in protecting water quality is to better understand your place in this watershed. Become familiar with local natural features and understand how they function in relation to this watershed and to water quality.

Why should you be concerned?

- Precipitation, evaporation, and temperature largely determine the quantity of water in a watershed.
- The amount of water moving through the various landscape features at any given time determines the amount of water available for ecosystems and for human use.
- **YOU** live in the watershed. Your actions and those of your neighbours affect water quality in this watershed.

Where do you fit in?

Broad Scale – A Watershed Perspective



What is the water cycle?

The water cycle - technically known as the hydrologic cycle - is the circulation of water within the earth's environment. This involves changes in water's physical state as it moves between liquid, solid, and vapour phases. The hydrologic cycle refers to the continuous exchange of water between atmosphere, land, surface and subsurface waters, as well as organisms.

Where do you fit in?

Local Scale – Inland Features of this Watershed

Forested Lands

Forested lands: woodlands, forests, woodlot, bush, the “back forty”, whatever you choose to call them - are perhaps one of the most characteristic features of the landscape. Virtually all rural landowners have some woodland on their property. We almost take them for granted.

Consider this:

- 90% of the forest in southern Ontario is privately owned. Forest conservation is largely dependent on the voluntary stewardship activities of rural landowners like you.
- The forest is ecologically important. It adds to Ontario’s biodiversity, absorbs pollutants, sequesters carbon, and provides habitat for wildlife. The presence of healthy forests is critical to the health of ecosystems, watersheds, and communities of southern Ontario.
- A well-managed forest can provide you with a range of benefits depending on your objectives. Developing a forest management plan can help clarify your goals and objectives. Your management plan can be as detailed or as simple as you choose.
- Learning more about your forest and developing a plan can ensure that your forest continues to be a source of enjoyment and income, now and in the future.

Riparian Corridors and Ravines: Connectors and protective buffers

- Ravines and riparian areas along lakes and watercourses serve as important ecological corridors, providing habitat and connecting important natural landscape features.
- Trees, shrubs, and grasses in and around the watercourse act as filters, preventing pollutants from getting into surface water and trapping sediment that can otherwise affect water quality.
- At the coast, the winding pattern of ravines protects the landscape from lake wave activity.
- Roots, twigs, and leaves help protect the shoreline from erosion, helping to minimize the damage caused by flooding.
- In upland areas, better drainage allows for larger trees to grow. The roots of these larger trees stabilize the soil and slope.
- Foliage buffers the wind and provides shade and increased humidity which protects against summer drought.
- Buffered riparian areas capture significant water runoff, and recharge water resources within the watershed.
- These features are also important spawning grounds for aquatic life.

Where do you fit in?

Local Scale – Inland Features of this Watershed

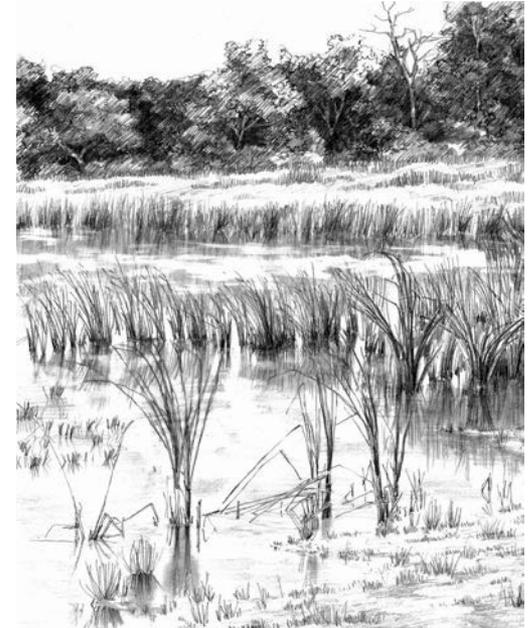
Wetlands

Wetlands are nature's water filtration and purification system. They provide enormous diversity to the natural landscape and contribute to important ecological functions including:

- Wetlands act like giant sponges, absorbing excess water and releasing it slowly. Their ability to store water can reduce the frequency and severity of both floods and droughts.
- They filter nutrients and contaminants, maintaining downstream water quality.
- They regulate water flow in streams and rivers and help to recharge groundwater supplies.
- They are important habitat for hundreds of species of wildlife and provide critical nesting areas for many of these.
- Wetlands also offer numerous recreational opportunities including fishing, canoeing, wildlife viewing, hunting, and nature photography.



Swamps are treed wetlands.



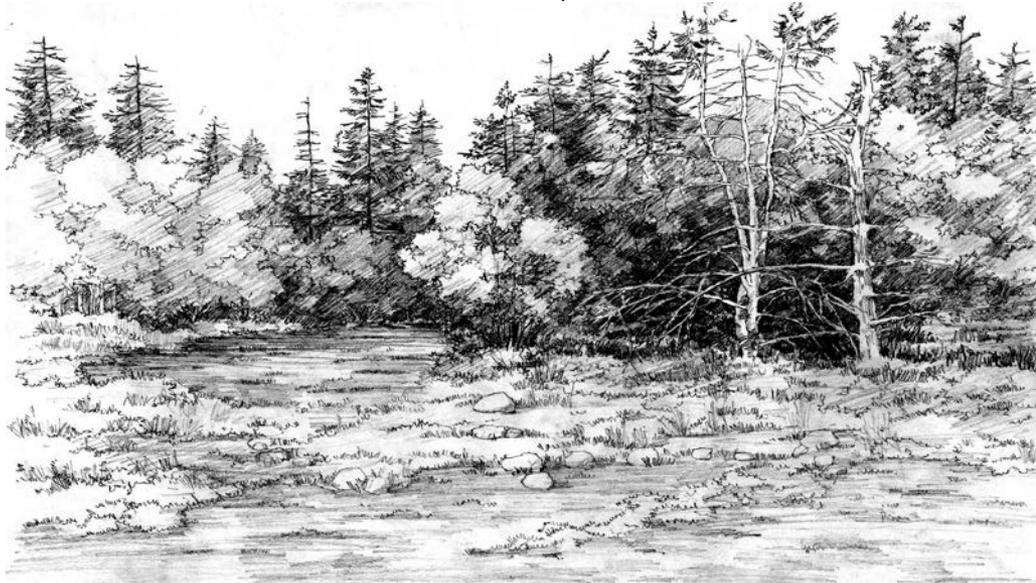
Marshes contain cattails, grasses, and sedges.

Where do you fit in?

Local Scale – Inland Features of this Watershed

Alvars: An increasingly rare ecosystem

- Alvars are natural open areas, characterized by highly specialized and diverse vegetation growing in shallow soils (less than 30 cm, or 12 in) atop flat limestone, in dry, fire-prone environments.
- Alvars provide habitat for rare or sensitive species. In southern Ontario, alvars are found on the Bruce Peninsula, the river valleys of the Ausable and Maitland Rivers, the Carden Plain east of Lake Simcoe, Pelee Island, Prince Edward County, and along the edges of the Canadian Shield. Alvars are possible anywhere there is thin soil over limestone.
- Most have been degraded to the point where they resemble old fields. Overgrazing poses the biggest threat because it removes native plant material from the alvar.
- Small, occasional fires have been a historical element of the alvar landscape.



Where do you fit in?

Local Scale – Inland Features of this Watershed

Grasslands

Many people are surprised to learn that early settlers arriving in Ontario did not encounter a landscape of endless forest. In fact, southern Ontario was once endowed with a variety of landscapes, including grasslands. Some of these grass landscapes, like tallgrass prairie and savannah, were enduring, maintained year after year by periodic fires. Others, such as meadows, were shorter-lived, resulting from disturbances such as flood and drought.

Meadows and Retired Fields: Life in abundance

- Meadows provide habitat for a wide variety of specialized plant, mammal, reptile, and bird species. As a meadow is gradually taken over by brush and then woods, meadow species require new meadow landscapes.
- Wet meadows occur in floodplain areas along rivers and streams, and in moist areas between wetlands and higher, drier land. They are maintained by fluctuating water levels and by intermittent floods, which make it difficult for trees and shrubs to become established.
- Dry meadows grow especially well on ridges and slopes, where the dry conditions prevent the establishment of many trees, which would shade out the meadow species. Each meadow type has characteristic species that are adapted to the varying moisture conditions and soils.
- As meadow and natural grass landscapes become increasingly rare in southern Ontario, many such species have come to depend on retired agricultural fields and other man-made grass landscapes for habitat.

Tallgrass Prairie and Savannah: Ontario's disappearing landscapes of fire

- Tallgrass prairie and savannah are native grasslands that are home to a diversity of grasses, wildflowers, and animal life. In Ontario, some native grasses can grow to more than 2 metres tall!
- Prairies, by definition, have few trees and shrubs. Savannahs are grasslands with a sparse cover of trees, typically oaks.
- Tallgrass prairie and savannah develop on sites that are periodically cleared by fire or other stresses that keep shrubs and trees from becoming established.
- Southern Ontario once had about 1000 km² of tallgrass. Now, less than 3% remains! Most tallgrass communities have been lost over the past 200 years as land has been converted for agriculture and urbanization, and because we have been so effective at suppressing the fires that are needed to maintain them.
- Consequently, much of the plant and animal life associated with these uncommon sites is considered rare, or even endangered in Ontario. If you have a tallgrass prairie or savannah remnant on your property, you are among a lucky few.
- A remnant prairie or savannah may not look like a grassland at all. In most of these sites, the suppression of fire has allowed shrubs and trees to take over. However, remnants can be identified by the presence of certain indicator plants. If you think you have a tallgrass remnant on your property, contact your local Conservation Authority or an organization such as Tallgrass Ontario (*see Resources List*).

Where do you fit in?

Local Scale – Inland Features of this Watershed



◀ Left:
Early summer in an oak savannah.

▼ Below:
Tallgrass prairie, mid-summer.



Where do you fit in?

Local Scale – Coastal Features of this Watershed

Coastal Features: Beaches, Dunes, Bluffs

- Beaches are dynamic features that change according to wave action and sand availability.
- As wind blows over a beach it picks up fine sand. The sand is carried landward until the wind encounters an obstacle such as a clump of vegetation, usually beach grass. The wind speed is reduced and the sand grains fall out under gravity, resulting in sand deposition. As sand accumulation continues, a dune is formed.
- Dune formation prevents the landward movement of sand. Sand that blows inland not only causes a loss of sand from the lakeshore system, it also means costly repairs and having to deal with sand drifts on roads, lawns, gardens, and in storm drains. Human activity places great stress on these rare and highly sensitive shoreline features.
- Bluffs are continuously changing. Natural erosion is an element of bluff dynamics and a normal part of a shoreline environment. The toe of the bluff is where most of the erosion occurs, depending on the force of the waves and the material of the bluff .
- As waves hit the bluff, material is removed (eroded). Longshore currents often deposit sands far away, in areas where the geography promotes sand deposition. Stones and coarser materials remain, resulting in rocky or cobble beaches, known as cohesive shores.
- The beach at the toe of a bluff protects the bluff from further erosion because beaches absorb wave energy.
- While some areas are inherently erosion-prone and unstable, natural bluff erosion is increased in areas with little vegetation, narrow sandy beaches, or steep offshore slopes.
- The presence of groundwater in a bluff can also cause instability and slope failure.



A natural sand dune.

Where do you fit in?

Local Scale – Special Features of this Watershed

Changing Water Levels

- Water levels in the Great Lakes can change quickly. Short-term fluctuations are usually caused by wind-related phenomena such as wind set-up and seiche/storm surge.
- Seasonal and/or annual fluctuations are due mainly to precipitation, evaporation, groundwater flow, and runoff into the Lake.
- If climate change patterns continue, the Great Lakes water levels are expected to lower, decreasing groundwater and surface water resources. Climate change will also increase storm frequency and severity, causing flooding along shorelines and low lying areas, and the possibility of land erosion events.

Groundwater: a limited resource

- As rain and melting snow pass through the soil and crevices in the underlying rock, the water is filtered and purified.
- Water will continue to flow downwards through the ground until it reaches an impermeable layer of soil or rock and collects, forming an underground reservoir known as an aquifer.
- Aquifers supply water to farms, homes, industry, and businesses. This groundwater is the source of drinking water for many people.
- The size of the aquifer and the movement of underground water is influenced by the type of rock and soil in the area and the amount of rain that falls in that area. If water is removed faster than it is being replenished, the amount of water in the aquifer decreases, and the height of the water table drops.
- Groundwater contamination is a serious concern. Contaminated water from over-fertilized lawns, septic tanks, agricultural runoff, and industrial discharge can seep through the ground and make groundwater unfit for human and animal consumption and use.

Where do you fit in?

Local Scale – Special Features of this Watershed

The Carolinian Life Zone

In the extreme southwestern part of Ontario, habitats and species associated with the Carolinian life zone are present. Situated south of an imaginary line between Grand Bend (on Lake Huron) and Toronto, the Carolinian life zone contains plant and animal species associated with a more moderate climate. In addition to the common tree species of southern Ontario, a few of the distinctive Carolinian species include sassafras, tulip tree, black gum, and flowering dogwood. Some plant species and animal species are found only in this region. The Carolinian Zone is less than 1% of Canada's landmass but it contains more species than any other region in the country. It is also one of the landscapes to have experienced the most heavy impact by human activity. This situation creates special conservation challenges for the region.

The Oak Ridges Moraine

Moraines are landforms created when the retreat of a glacier is temporarily stopped and the meltwater from it deposits sand, gravel, boulders, and other sediment. The Oak Ridges Moraine, stretching between the Niagara Escarpment and Rice Lake to the east, is a prominent feature of this kind. Its rolling topography of well drained hills and valleys forms the headwaters of many streams that are important sources of clean water. Forest cover and wetlands are vital components of this landscape. Located next to the burgeoning greater Toronto area, the moraine has been under intense development pressure. The Oak Ridges Moraine is now protected, as is the Niagara Escarpment, by special provisions under Ontario's land use planning policies.

The Niagara Escarpment

Running from Niagara Falls to Manitoulin Island, the Niagara Escarpment is a prominent landscape feature of beauty and unique character. The Escarpment is made of sedimentary rock laid down in ancient seas hundreds of millions of years ago. Geological events, including glaciation, have built and eroded the Escarpment to the form we see today.

The Niagara Escarpment is an important ecological corridor. It is renowned for the many species of rare ferns that grow on it and nowhere else in Ontario and, in some cases, the world. It is of natural, aesthetic, and cultural importance, recognized by the Niagara Escarpment Plan which provides for its protection from Tobermory south to Niagara.

The Dynamic Landscape: Adapting to Climate Change

What is adaptation?

Adaptation refers to activities that reduce or prepare for impacts of climate change. Adaptation complements mitigative measures to reduce greenhouse gas emissions. Mitigation and adaptation are needed in combination to fully address the global changes taking place.

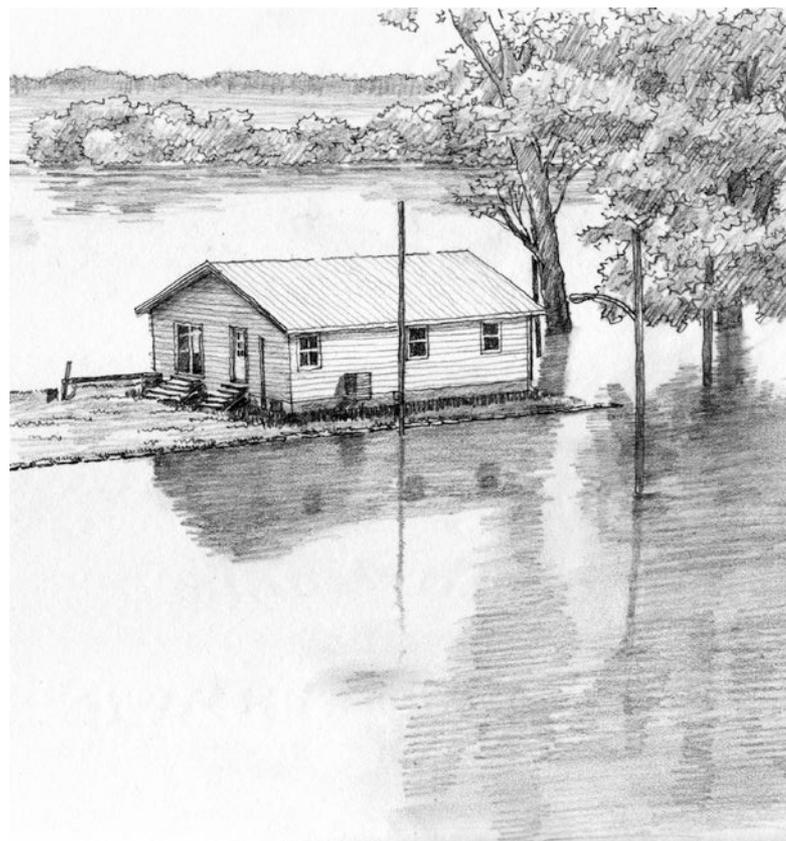
Extreme weather pattern events are becoming more apparent to rural landowners. Across Ontario, intense heat waves, rain storms, windstorms, and drought have been observed. In 2007, the Minister of the Environment appointed the Expert Panel on Climate Change Adaptation to provide the province with adaptation strategies for these impacts that affect our communities and ecosystems.

Ontario's Adaptation Strategy and Action Plan outlines five major goals and over 30 actions to help prepare us for climate change in Ontario. For further details, see the Resources List.

Did you know?

Floods are one of the most frequent natural hazards in Canada and the most dangerous in Ontario in terms of property damage, environmental disruption, and even loss of lives. Floods are typically caused by seasonal heavy rainfall, thunderstorms, and the melting of snow.

Climate change projections for Ontario show an increase in winter precipitation falling as rain. Heavy rainfall and freeze-thaw of soils will increase the probability of localized flooding.



Home threatened by flooding.

Adapting to Climate Change

Why should you be concerned?

The causes, driving forces, and impacts of climate change both socially and environmentally are now better understood through collaborative efforts between government, scientific community groups, and natural resource organizations. While our provincial and community infrastructure continues to age, many landowners postpone action to adapt their business and management activities to climate change because of perceived long term uncertainties about the future; however, the scientific concern is that change will occur and immediate action is necessary.

Ontario is working with other provinces and U.S. states to actively cut its greenhouse gas emissions through the Western Climate Initiative, a partnership that tackles climate change mitigation at a regional level. *Climate Ready: Ontario's Adaptation Strategy and Action Plan 2011-2014* puts the onus on the government to take preventative measures to help withstand climate change challenges through long-term planning of adaptation activities related to agriculture. Measures include water shortage responses, monitoring and surveillance programs for livestock and plant diseases, and examining business risk management approaches.

Preparing to cope and adapt to climate change will help minimize the negative impacts of severe weather events. Adaptive actions can protect ourselves, the environment, and our communities from the challenges caused by changing climatic conditions, as well as help us discover new opportunities that could arise through adaptation. Determining where and how you and your property may be vulnerable is a good first step in Adaptive Planning.

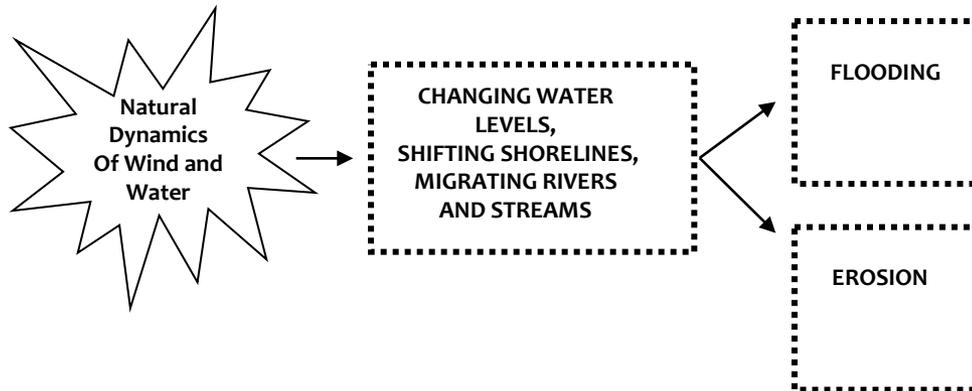
What can you do?

1. Complete the worksheets in this Guide to identify your stewardship priorities for addressing short and long term actions.
2. Learn about the control measures landowners can take to adapt to our changing climate available through online resources provided by Ontario Ministry of the Environment and Ministry of Natural Resources.
3. Be alert and follow advice from local public health units during heat waves and other health advisories.
4. Be prepared for emergencies such as floods, droughts, power outages, forest fires, and ice storms.
5. Assess where your home is vulnerable to natural disasters and contact your municipality and/or local Conservation Authority for actions that can assist in reducing those risks-
6. Be efficient with your use of utilities. Save water by adopting a water conservation approach to your landscape.
7. Use locally-harvested materials produced from renewable sources to reduce impacts to the natural environment.

Risks & Challenges of Shifting Waterways

Why should you be concerned?

The areas adjacent to a stream, river, lake shore, or other waterbody are subject to seasonal and perpetual changes, due to the dynamic nature of wind and water. Streams and rivers migrate and meander naturally; water levels rise and fall, and banks and shorelines shift with erosion. While this presents risks and challenges for property owners and residents living near waterbodies, both personal danger and costly rebuilding and restructuring efforts can be avoided if you take the time to understand, predict, and work with the natural processes that affect your property.



Ausable-Bayfield Conservation Authority

Are there any natural hazard areas on your property? Mapping out your property and its features can be a helpful way to understand the risk and challenges involved. (See **Making a Map of Your Property** in Worksheet #3.)

Resources List

Your Watershed: Physical and Cultural Landscape



Human influence is evident in the rural landscape.

For more information...

[Carolinian Canada](#)

[Conservation Authorities](#)

[Niagara Escarpment Commission](#)

[Oak Ridges Moraine Foundation](#)

[Ontario Ministry of Agriculture, Food, and Rural Affairs](#)

[Ontario Ministry of the Environment](#)

- Climate change resources available at
ene.gov.on.ca/environment/en/resources/

[Ontario Ministry of Natural Resources](#)

[Stewardship Network of Ontario](#)

[Tallgrass Ontario](#)