A **STEWARDSHIP GUIDE** FOR THE
LAKE HURON COASTLINE

Self-assessment of your environmental performance as a property owner

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PART III – ACTION PLAN

THANK YOU!

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- Ausable Bayfield Conservation Authority
- Lake Huron Centre for Coastal Conservation
- University of Guelph
- Friends of the Bayfield River
- Huron Stewardship Council

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Lake Huron Centre for Coastal Conservation

Canadian Water Network

Great Lakes Aquatic Habitat Fund

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TD/Canada Trust Friends of the Environment Foundation

University of Guelph

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The Lake Huron Stewardship Guide

Introduction

What is the purpose of the Lake Huron Stewardship Guide?

The overriding goal of the Lake Huron Stewardship (LHS) program is to protect the quality of our water – 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 water quality, you are also protecting your investment as a property owner or resident in this landscape. You will notice that being a water quality steward and working with the environment will result in savings of 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 water quality.

Is this guide for you?

This Guide is intended for non-farm residents, cottagers and property owners along the Canadian shore of Lake Huron from Tobermory in the north to Sarnia in the south. The focus is on the communities and landscapes west of Highways 21 and 6. This swath of land stretches over part of Bruce County, Huron County, and Lambton County.

Introduction *continued*

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. The Environmental Farm Plan[1] has both identified the need and laid the foundation for a non-farm resident plan.

The Lake Huron Stewardship Guide program is a response to this awareness. This program has been developed and run by volunteers – people like you who live in the Lake Huron landscape. As a result, this program specifically addresses the risks, challenges and benefits of living along or near the coastal region of Lake Huron.

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.

[1] *www.omafra.gov.on.ca/english/environment/efp/efp.html*

How to use the Lake Huron 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 the risks to precious natural resources.

The LHS Guide has three parts – an **Introduction to Local Ecology**, a **Workbook** and an **Action Plan**.

The Workbook

The Workbook includes twelve Worksheets to help you rate your activities on your property. A glossary is located after each worksheet to help you with terminology.

Pick out the worksheets that apply to your property. Read the introductory page and 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 don't know how you rate, mark the box with a question mark to remind yourself to find out the 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. If you circle 1 or 2, 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.

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** part of the Guide. 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 at the end of this manual.

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 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 Landscape West of Hwy 21 and Hwy 6: A *Water* Place

Cultural and Physical Geography

The Lake Huron watershed and shoreline contains some very significant cultural and ecologically-rich features and places. These places are the result of thousands of years of evolution, glacial activity and human development, interacting over time. The following is a brief description of how this landscape came to be.

•••••••••

As the lobes of the glacier that covered most of North America began to melt about 14 000 years ago, the melt water formed an enormous lake known as Lake Warren, a lake with a water level 34 metres (112 feet) higher than present-day Lake Huron. Lake Warren formed the flat land that we see west of Lucknow, Carlow or Dashwood as we drive towards the lake. This flat land, draining towards the lake, has led to the development of many ravines and gullies that have formed along the lakeshore. After Lake Warren, Lake Algonquin formed the longest-lived post-glacial lake in the Huron basin, and was about 8 metres (26 feet) higher than present-day Lake Huron. Lake Algonquin left behind remnants of a shoreline in the form of a distinct bluff feature north of Amberley and south of Grand Bend. Following Lake Algonquin, other lakes occupied this area, including Lakes Stanley, Nipissing, and Algoma. It is only within the last two thousand years that Lake Huron, as we know it, has existed.

Lake Huron is the 2nd largest of the 5 Great Lakes, and the 5th largest lake in the world. It includes Saginaw Bay, the North Channel and Georgian Bay. Water flows from Lake Huron into Lake Erie through the St. Clair River, Lake St. Clair and the Detroit River.

The shores of Lake Huron have been shaped by wind and waves and the geology of the shoreline. The shoreline's high energy waves, resulting from its exposure to predominantly westerly winds, have created many of the coastal features we see today.

When French explorers Samuel de Champlain and Etienne Brule arrived on the shores of Lake Huron in the early 1600s, they observed a landscape that was heavily forested with sugar maple, beech, elm and basswood. Near the shoreline, cherry, butternut, oaks and birch predominated, sheltering streams and rivers that were so large, they were navigable (Scott 1966).

The landscape began to change considerably during the 1820s when a settlement campaign was launched and European settlers arrived to farm this area. The nearby presence of Lake Huron created a climate favourable for agriculture.

As the vast forest was felled and cleared for agriculture and the wetlands were drained, the landscape of this area was radically changed. Gentle slopes and the wet, clay soils near the lake resulted in the on-going agricultural drainage of the land. A shift towards livestock occurred during the 1850s due to a changing economy. This was coupled with the extension of rail lines northward from Buffalo, giving farmers access to the American market. By 1880 the area was fully settled in the pattern that predominates today.

Today, the land along Lake Huron continues to be a working landscape while it continues to undergo change, incorporating recreational and estate-residential land uses and activities.

For a detailed history of this landscape, read *The Settlement of Huron County* by James Scott. 1966. Toronto: The Ryerson Press.

Where do you fit in?

Broad Scale - A Watershed Perspective

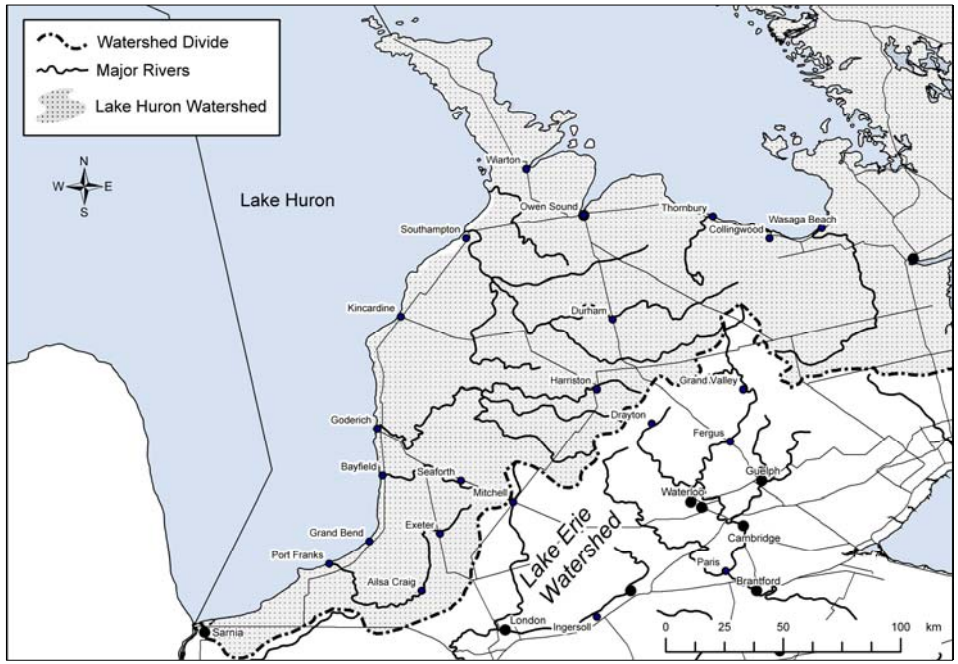
What is a Watershed?

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.

The Lake Huron watershed forms part of the larger 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?

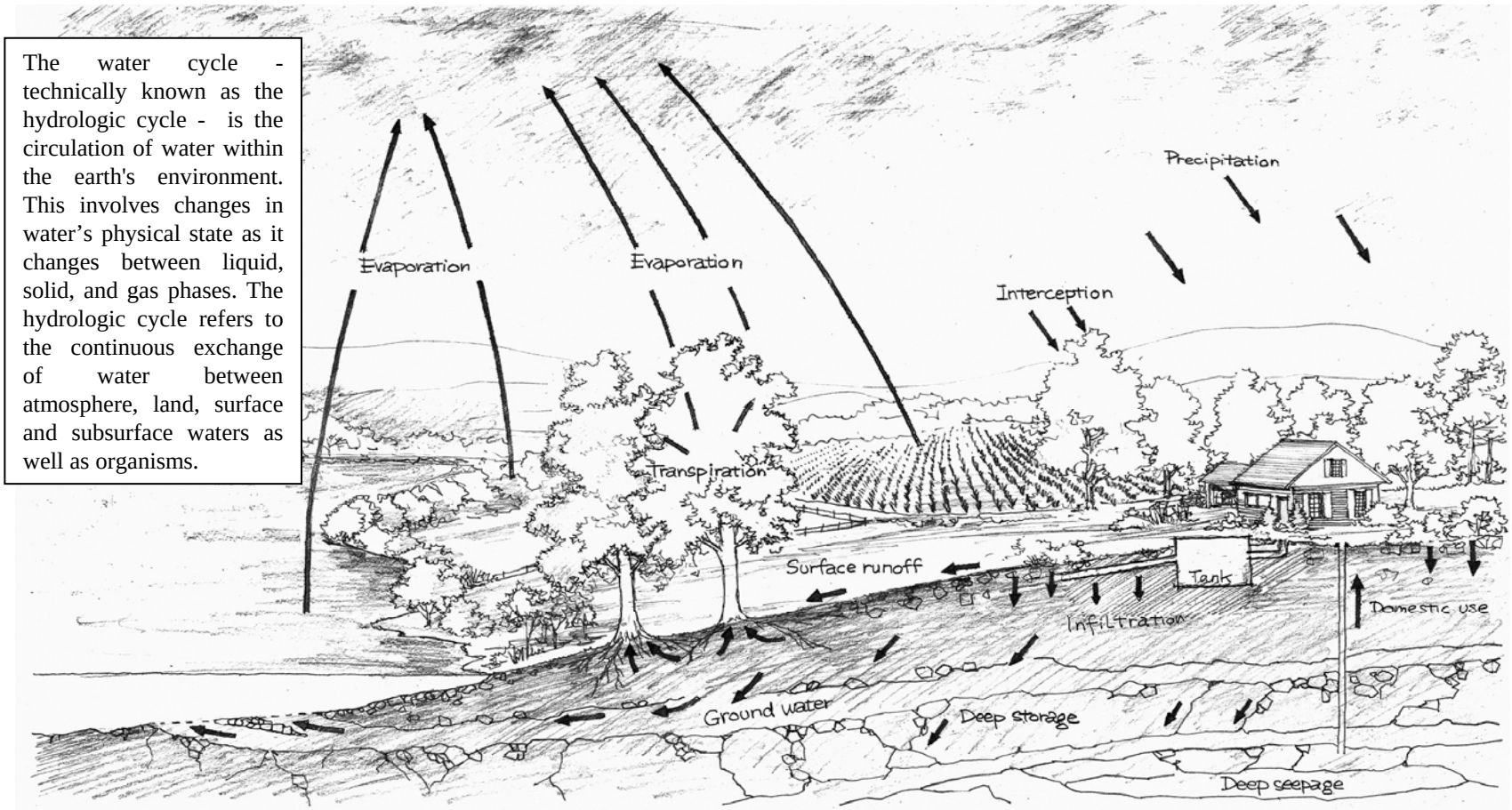
- Precipitation, evaporation and temperature largely determine the quantity of water in a watershed.
- The amount of water moving through the various landscape features at any given time determines the amount of water available for ecosystems and for human use.
- **YOU** live in the Lake Huron Watershed. 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 changes between liquid, solid, and gas 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 - The coastal features of this watershed

Dunes

nature's shoreline protection

- Dunes are rare along Lake Huron, but they can be found at Pinery/Ipperwash, north of Point Clark, Inverhuron, Saugeen Shores and Sauble Beach.
- Human activity places great stress on these rare and highly sensitive shoreline features.
- 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.
- Dune formation prevents the landward movement of sand.
- Dunes lower the impact of large waves during storms, and prevent them from washing over the land.
- Sandbars also provide protection for the shoreline from wave activity.
- Through natural processes of erosion, dunes provide beaches with sand during high lake levels and storms.
- The dunes that you can see are thousands of years old and cannot be rebuilt within our lifetimes.

Beaches

nature's partner to dunes

- Beaches are dynamic features that change according to wave action and sand availability.
- When water from breaking waves surges onto the beach, it deposits sand.
- 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.
- When lake levels are low, there is a great amount of dune formation. When lake levels are high, there is dune erosion.

Where do you fit in?

Local Scale - The coastal features of this watershed

Sand Dune, Huron County

Where do you fit in?

Local Scale - The coastal features of this watershed

Changing Water Levels
the coastal ecosystem engine

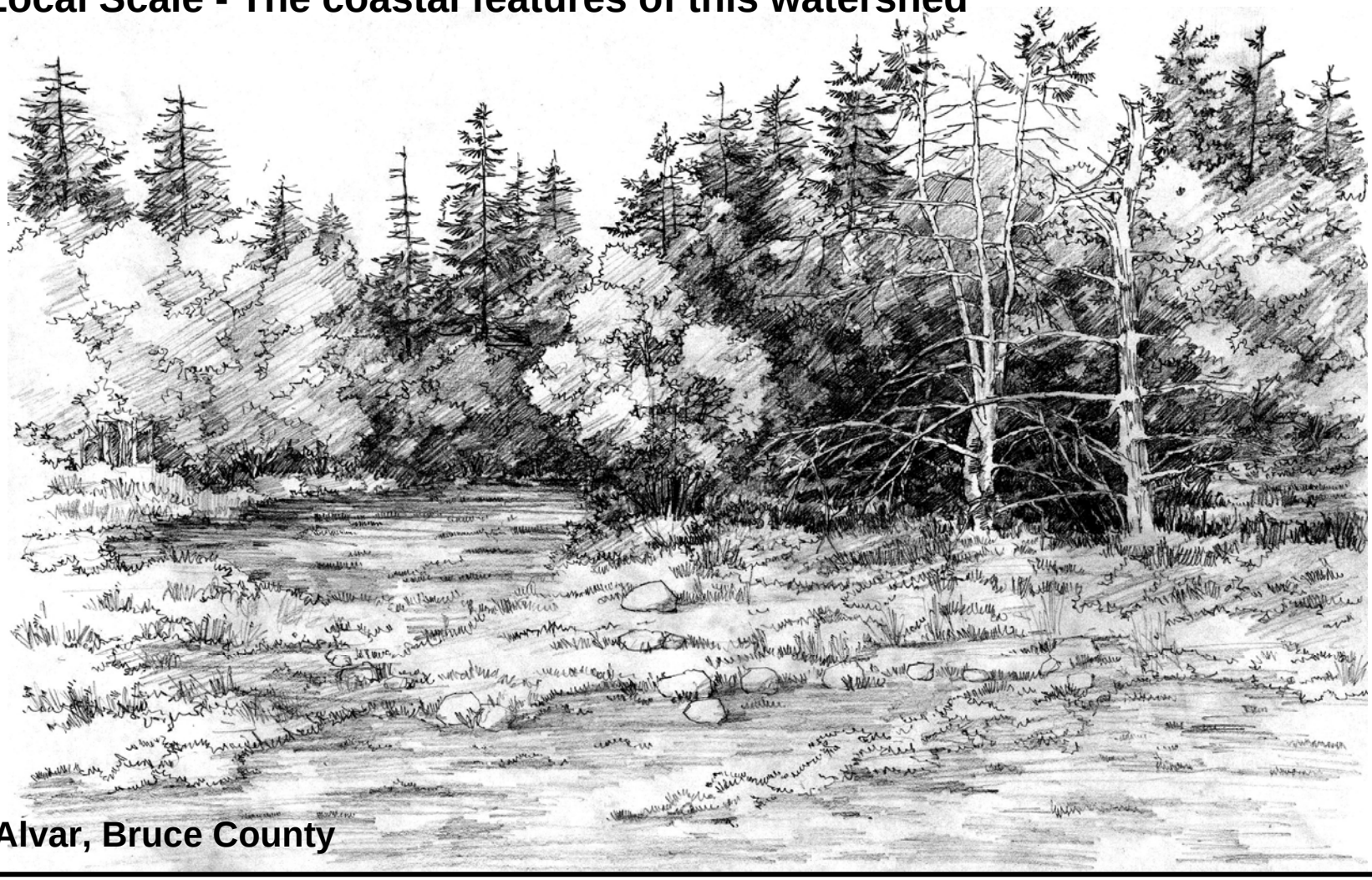
- Water levels in the lake can change quickly. Short-term fluctuations are usually caused by wind-related phenomena such as wind set-up and seiche/storm surge.
- Seasonal and/or annual fluctuations are due mainly to precipitation, evaporation, groundwater flow and runoff into the Lake.
- Coastal features are continuously changing due to natural processes such as wind and wave action.
- Coastal features interact. For example, dune erosion helps protect the beach during storms by dampening the energy of waves. Inland deposits of wind-blown beach sand create dunes.
- 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.

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.
- Along the Lake Huron shoreline, alvars are concentrated in the Bruce Peninsula but also occur in the river valleys of the Ausable and Maitland Rivers.
- 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 - The coastal features of this watershed



Alvar, Bruce County

Where do you fit in?

Local Scale - The coastal features of this watershed

Bluffs/Cohesive Shores
a land feature that's on the move

- Bluffs are continuously changing. Natural erosion is an element of bluff dynamics and a normal part of a shoreline environment.
- The materials that make up a bluff determine how vulnerable the bluff is to erosion or slumping. As a bluff erodes, the shoreline recedes.
- The toe of the bluff is where most of the erosion occurs, depending on the force of the waves and the bluff material.
- As waves hit the bluff, material is removed (eroded). Long shore currents deposit this beach material at Grand Bend to Kettle Point, which is an area of sand deposition.
- The beach at the toe of the bluff protects the bluff from further erosion because beaches absorb wave energy.
- While some areas are inherently erosion-prone and unstable, natural bluff erosion increases in areas with little vegetation, narrow sandy beaches and steep offshore slopes.
- The presence of groundwater within a bluff can cause instability and slope failure.

Coastal Wetlands
where land meets lake

- Different types of wetland are influenced by the fluctuating levels of Lake Huron. They can be broadly categorized as swamp, bog, fen, or marsh.
- Not all coastal wetlands are located adjacent to the lake; some are located behind barrier beaches or beach ridges.
- Wetlands are rich and diverse habitats for animals and plants. More than 2/3 of all lake species reproduce in them, including endangered or threatened mammals, birds, reptiles, and amphibians.
- Wetlands act like water purifiers, cleaning surface and groundwater before it can enter shore waters.
- Seasonal lake-level changes are necessary if coastal wetlands are to remain at their optimum productivity and diversity.
- These characteristics apply to both inland and coastal wetlands.

Where do you fit in?

Local Scale - Inland features of this watershed

Wetlands
nature's filtering sponge

- Inland wetlands are some of the most ecologically diverse and productive ecosystems on earth.
- The Georgian Bay and the northern Lake Huron shorelines are dominated by erosion-resistant bedrock. These shorelines do not have shallow, soft river bottoms for coastal wetlands. Consequently, wetlands occur inland, behind the dunes-beach system.
- There are four types of inland wetlands: swamp, marsh, bog, and fen.

Upland Riparian areas and Forest Corridors
connections in the landscape

- This plant community is different from that along the shoreline. Upland, or up-slope, there is better drainage that allows for larger trees to grow.
- The roots of these larger trees stabilize the soil and the slope.
- Foliage buffers the wind and provides shade and increased humidity that protects against summer drought.
- These features capture significant water runoff, and recharge water resources within the watershed.

Riparian Areas and Ravines
protective buffers

- 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.
- Trees, shrubs and grasses act as filters, preventing pollutants from getting into surface water and trapping sediment that can otherwise affect water quality.
- Ravines and riparian areas serve as important ecological corridors, providing habitat and connecting important natural landscape features.
- Ravines are also important spawning grounds for aquatic life within the watershed.

Where do you fit in?

Local Scale - Invisible features of this watershed

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 impenetrable layer of soil or rock.
- Water that is moving downward through the soil and rock reaches an impermeable layer 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.

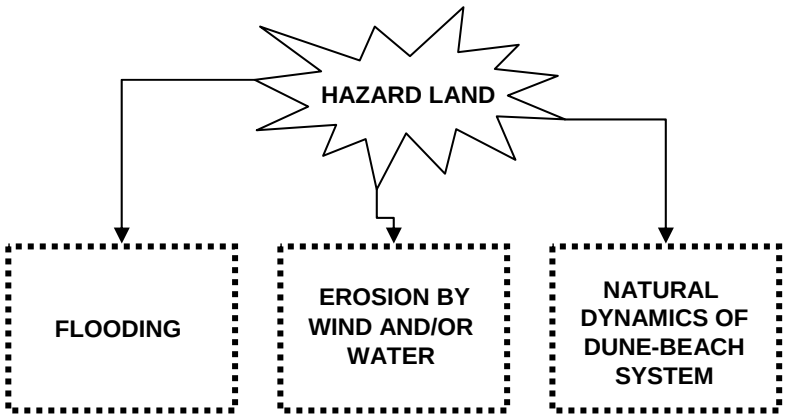
Natural Hazards and How They Can Affect You

Risks and Challenges

Why should you be concerned?

The areas adjacent to a lake shore or water body may fall within or contain a ***natural hazard area***. This results in risks and challenges for property owners and residents of these hazard lands.

There are 3 processes that can comprise a hazard land:



Deciding to live adjacent to, or near, a water body or water course involves living with natural processes. This has direct consequences for any development or activity within these areas.

Are there any natural hazards on your property? Mapping out your property and its features can be a helpful way to understand the risk and challenges involved.

Glossary

Lake Huron: Physical and Cultural Landscape

Alvar: 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.

Aquifer: An underground layer of rock and sand that can store water, and lies above a layer of clay or other impermeable material that does not allow water to flow to lower depths. Aquifers can be present at various depths depending on the location of the impermeable material. They are an important source for wells.

Beach: A band of variable width, typically of sandy material located adjacent to the lake. The sand is deposited and removed by the action of waves and currents.

Bluff: A high, steep bank at the water's edge. Along the Lake Huron shoreline, bluffs are typically composed of glacial till (predominantly clay and silt).

Bog: A highly acidic type of wetland that is fed by precipitation and is characterized by peat-filled depressions, sphagnum moss mats, and low shrubs. Bogs are rare in southern Ontario.

Cohesive Shore: Shore made up of partially consolidated glacial till. Sand, silt, clay and some gravel/cobbles deposited at the end of the last ice age, stuck together with the weight of material. However, erosion easily destroys this cohesive state and such shores cannot be reconstituted.

Conifer/Coniferous: An evergreen tree or shrub that bears cones and has needle or scale-like leaves. Examples include pine, spruce, cedar, juniper, and fir.

Dune: A large dune is a mound or ridge formed by the deposition of sand.

Dune Formation: The process of adding sand to a dune through wind and wave action, thereby increasing its size. This generally occurs when lake water-levels are low.

Evaporation: The conversion from a liquid to a gas. For example, the process of rainwater becoming water vapour (clouds).

Fen: A peat-land where the water table is at or close to the surface and water drainage is very slow. It is dominated by sedges, mosses, and some grasses. Trees are few and are typically coniferous and stunted. Fens are rare in southern Ontario.

Great Lakes – St. Lawrence Watershed: One of three primary watersheds in the province of Ontario. The other two primary watersheds are the Hudson's Bay and the Nelson River Watersheds.

Groundwater: Fresh water that has seeped through the soil and rock on the earth's surface and naturally collects forming a reservoir, the top of which is referred to as the water-table. This water supplies wells and springs and is the source of most people's drinking water.

Habitat: The environment that provides what an organism requires for survival and reproduction.

Lake Huron: Physical and Cultural Landscape

Karst/ karstic: Carbonate bedrock that dissolves when it comes in contact with water. This results in the creation of underground sinks or caverns that are often referred to as sink holes.

Marsh: A type of wetland that is periodically or permanently flooded. It is characterized by non-woody emergent vegetation such as cat-tails, rushes, reeds, grasses, and sedges. Vegetation ranges from shrubs in drier areas to floating-leafed or submerged plants in open water.

Riparian Area: The transition zone from aquatic to a terrestrial habitat that exists near and along the bank of a natural watercourse or water body (e.g., river, stream, or lake). It is rich in density, diversity, and productivity of plant and animal species.

Seiche: The combination of wind set-up and sudden changes in atmospheric pressure creates this short-term, oscillating standing wave. The height of the surface water decreases with each oscillation until the surface level stabilizes. Impact on coastal features such as wetlands is minimal.

Slumping: A term used to describe the sudden slope failure of a bluff.

Spawning ground: The place where female fish lay their eggs and males fertilize them.

Surface water: Any open or exposed body or flow of water including springs, streams, rivers, ponds, lakes, etc.

Swamp: This is the most diverse type of wetland and it is often flooded in the spring and drains throughout the dry season. It is dominated by shrubs and trees.

Water table: The boundary between the saturated soil (where all the soil pore spaces are filled with water) and the unsaturated soil (where soil pore spaces are filled with air, roots, soil organisms and some water).

Wetlands: Areas that are permanently or temporarily submerged, or saturated for at least part of the year. Unlike upland wetlands, coastal wetlands do not transition into drier communities.

Wind set-up: A weather phenomenon whereby strong, persistent winds blow over the lake, they can push the water level up at the downwind shore of the lake. Consequently, this causes the water-level to decrease by the same amount at the opposite, upwind shore. The height of the waves increases with the wind; waves as high as 2.5 metres (8 feet) have been recorded on the Great Lakes. This phenomenon is also known as storm surge.

Resources List

Lake Huron: Physical and Cultural Landscape

For more information…

Conservation and Stewardship

Fisheries and Oceans Canada
Referrals Coordinator, Fish Habitat Management Program
867 Lakeshore Road
Burlington, ON L7R 4A6
referralsontario@dfo-mpo.gc.ca

Factsheets/Leaflets:
- Working Around Water? Factsheet #13: "What you should know about Fish Habitat and Fluctuating Water Levels on the Great Lakes".

Ontario Stewardship
www.ontariostewardship.org

Huron Stewardship Council
www.huronstewardship.on.ca

The Lake Huron Centre for Coastal Conservation
P.O. Box 178,
Blyth, Ontario Canada
NOM 1H0
Phone: (519) 523-4478
Email: coastalcentre@lakehuron.on.ca
www.lakehuron.on.ca

Books:
Dobson. C., and Beck, G.G. 1999. Watersheds. Willowdale, ON: Firefly Books Ltd.

Cultural History

Ontario Public Libraries
Search their website to find your local library:
www.culture.gov.on.ca/english/culdiv/library

Books:
Scott, J. 1966. The Settlement of Huron County. Toronto: The Ryerson –Press.

General contact information

Ministry of Natural Resources

The Ministry of Natural Resources (MNR) is the provincial-level government body that is responsible for the management and protection of provincial natural resources.

To learn more, go to the MNR homepage or contact your local MNR office.

www.mnr.gov.on.ca

local offices:

Clinton
100 Don Street, Box 819,
Clinton, ON N0M 1L0
(519) 482-3428

Ministry of Health and Long-Term Care

local offices:

Huron County Health Unit
Health and Library Complex
Highway 4 South R.R. 5,
P.O.Box 1120
Clinton, ON N0M 1L0
(T): (519) 482-3416
(F): (519) 482-7820
www.huroncounty.ca/healthunit

Grey Bruce Health Unit
920 1st Ave. West
Owen Sound, ON N4K 4K5
(T): (519) 376-9420 or 1-800-263-3456
(F): (519) 376-0605
www.publichealthgreybruce.on.ca

Lambton Health Unit
160 Exmouth Street
Point Edward, ON N7T 7Z6
(T): (519) 383-8331
(F): (519) 383-7092
www.lambtonhealth.on.ca

Conservation Ontario
Natural Champions

Conservation Ontario is an umbrella organization that represents the 36 Conservation Authorities within Ontario. To learn where you local CA office is, go to:
www.conservation-ontario.on.ca

Ausable-Bayfield Conservation Authority
R.R. #3 Exeter, ON N0M 1S5 E-mail: info@abca.on.ca
• Shoreline Management Plan
www.abca.on.ca

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(F): (519) 371-0437
Email: admin@greysauble.on.ca
www.greysauble.on.ca

Saugeen Conservation Authority
R.R. # 1. Hanover, ON N4N 3B8
(T): 519-364-1255 (F): 519- 364-6990
Email: publicinfo@svca.on.ca
www.svca.on.ca

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(T): 519-245-3710 (F): 519-245-3348
www.scrca.on.ca

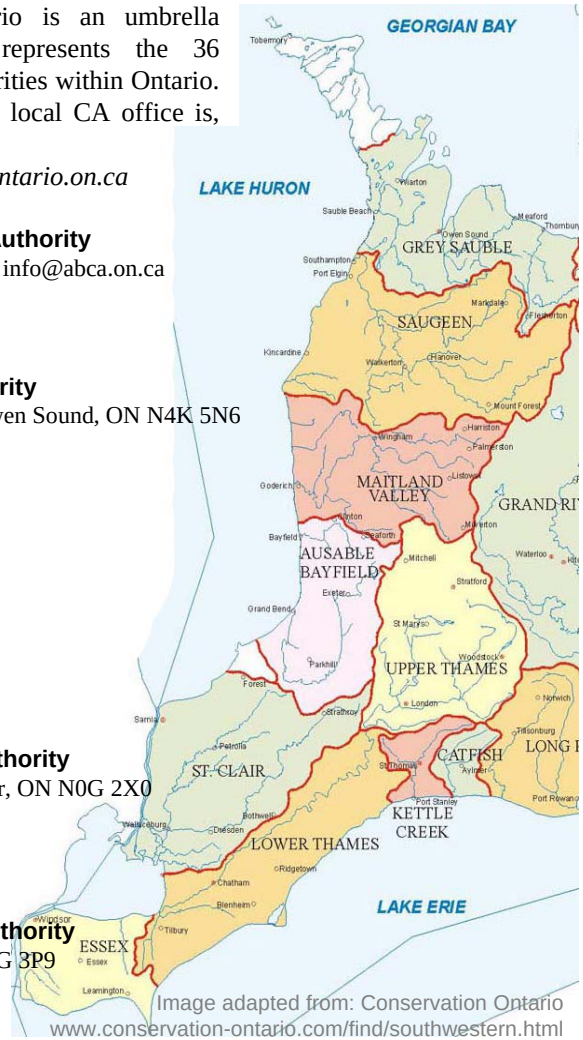


Image adapted from: Conservation Ontario
www.conservation-ontario.com/find/southwestern.html

Worksheet #1 - Buying a Rural Property

Why should you be concerned?

- Rural life is different from city living and can involve more active participation in monitoring the immediate environment for your safety.
- Your property may fall within a hazard zone that is governed by particular regulations.
- Your new property may have a private well and a septic system. You will need to know where these are on the property and how to maintain them properly so as to avoid water contamination.

What can you do?

1. Consider noise, odours and traffic from nearby properties and activities (such as farming and industry) and consider the inconveniences, maintenance and legal restrictions that come with rural/hazard land ownership.

2. Altering a shoreline has legal implications for the owner. If the property is along a shoreline, have the current shoreline assessed by a representative from your local Conservation Authority and budget for improvements and maintenance.

3. If purchasing a 'legal non-conforming' property, check to make sure you can obtain any necessary future permits, i.e., septic building.

4. Want an open view to the lake? Choose a property that already offers one instead of clearing existing trees and shrubs. Alternatively, contact a certified arborist to help design selective breaks in tree canopies.

5. Visit the property during and immediately following a major rainfall event. Note drainage patterns and any evidence of flooding.

Be sure to also read the worksheet section *Getting to Know your Rural Property* for more information.

Purchaser Checklist

Supplementary Questions for Seller Property Information Statement-Residential.

Adapted, in part, from: On The Living Edge: Your Handbook for Waterfront Living. © 2003. Sarah Kipp and Clive Callaway.

Anyone who is considering purchasing rural and/or hazard land property should ask the seller the following questions in addition to those in the *Ontario Real Estate Association's* *Seller Property Information Statement-Residential*. This list is only a guide and may not include all possible considerations.

	yes	no	unknown	N/A
Is the property serviced by a private well or is water obtained from a surface supply?*				
If YES in either case:				
Do you have records of water quality tests?	☐	☐	☐	☐
Do you have well records?	☐	☐	☐	☐
Is the well properly sealed?	☐	☐	☐	☐
Is there an underground cistern?	☐	☐	☐	☐
Is there a seasonal variation in the well water level?	☐	☐	☐	☐
Has the well ever run dry?	☐	☐	☐	☐
Do you know what the normal rate of flow is?	☐	☐	☐	☐
Do you know what the draw down data for the well capacity is?	☐	☐	☐	☐
Is the property serviced by a septic system?				
If YES:				
Is there a permit for the system?	☐	☐	☐	☐
Is the leaching bed over 30m (100 ft) from surface water or a well?	☐	☐	☐	☐
Has the tank been pumped in the last 3 years?	☐	☐	☐	☐
Does the tank adequately serve the dwelling(s) size?	☐	☐	☐	☐
Is there an effluent lift pump?	☐	☐	☐	☐
Is there a second leaching bed or space for it?	☐	☐	☐	☐
If the property is serviced by a septic holding tank, are there any cracks or holes in the tank?	☐	☐	☐	☐
Is a community or municipal sewer system planned in the next 3 years?	☐	☐	☐	☐
Are there any unregistered easements or unregistered rights-of-way?				
If YES:				
Does access to the property require any unregistered means such as historic use, handshake agreement unregistered easement, etc?	☐	☐	☐	☐
Does anyone else have unregistered access across the property?	☐	☐	☐	☐
Are there any adjoining road allowances for public water access, including any old shoreline road allowances?	☐	☐	☐	☐
Are there conservation easements on the property?	☐	☐	☐	☐

	yes	no	unknown	N/A
Erosion				
Are you aware of any erosion problems or instability?	☐	☐	☐	☐
Are you aware of any neighbours with erosion problems?	☐	☐	☐	☐
Are there erosion control structures or buffers on the property or nearby?	☐	☐	☐	☐
Are there any runoff control measures (culverts, water-bars) in place?	☐	☐	☐	☐
Are there any culverts/creeks that drain onto the property?	☐	☐	☐	☐
Is the location of the 100- year erosion limit known?	☐	☐	☐	☐
Does the property fall within a dynamic-beach?	☐	☐	☐	☐
Access to water				
Is there access to water?	☐	☐	☐	☐
If so, is it within a reasonable distance for your plans?	☐	☐	☐	☐
If there is a dock, is it pulled out seasonally?	☐	☐	☐	☐
Water levels				
Is any of the property within the 100 year floodplain?	☐	☐	☐	☐
Is the basement, crawl space, or main floor 0.3 m (1 foot) or more above the floodplain and in compliance with regulations?	☐	☐	☐	☐
Is the 100-year flood elevation and wave reach known?	☐	☐	☐	☐
Zoning				
Are there any special zoning regulations, setbacks, or shoreline protection bylaws?	☐	☐	☐	☐
Does all existing development on the property conform to local zoning bylaws?	☐	☐	☐	☐
Are all existing buildings/structures located fully on the property?	☐	☐	☐	☐
Have previous /current land-uses of the property and adjacent properties been disclosed?	☐	☐	☐	☐

	yes	no	unknown	N/A
Plumbing				
Is the existing plumbing system built for year-round use?	☐	☐	☐	☐
Other				
Are there any registered or unregistered ancient burial sites or archaeological relics?	☐	☐	☐	☐
Are motorized sports allowed on any nearby water body?	☐	☐	☐	☐
Are there any environmentally significant areas (ESAs) or areas of natural and scientific interest (ANSIs)?	☐	☐	☐	☐
Is the lake or water body heavily used?	☐	☐	☐	☐
Is any beach sand naturally occurring?	☐	☐	☐	☐
Are you aware of any mineral claims on the property?	☐	☐	☐	☐
Are there any temperature inversions which bring smoky air down to the ground?	☐	☐	☐	☐
Are there occasional odours and/or noise from nearby farming or industry?	☐	☐	☐	☐

Worksheet #1

Worksheet #2 - Before & During Construction…

Use this worksheet to assess potential opportunities and constraints about construction.

Why should you be concerned?

- Your property is part of a larger landscape, so any project you undertake may not only affect your immediate neighbours, but also have important consequences for land and water farther away.
- There may be existing legislation, regulations, and zoning that affect your project plans. Check with your municipal office, local Conservation Authority or MNR office to ensure that your project is permissible.
- Shorelines are protected under Federal legislation such as the *Fisheries Act*. Under this legislation, the onus falls upon shoreline property owners to ensure that they do not "harmfully alter, disrupt, or destroy" fish habitat. Offenders may be substantially fined or face criminal charges, and face restoring the shoreline to its previous state.
- Investigate who owns the shoreline area of your property – it may not be you. If it is owned by the Crown, the Public Lands Act will apply, and a permit may be required for any development – even a restoration project. Only activities permissible under this legislation will be allowed.

What can you do?

1. Make a plan including an inventory of existing plants, features, and structures. *See Worksheet #3.*

2. Start early and be organized – the permit process may take more than several months.

3. Protect yourself: keep records, including permit applications. These can be useful if disputes should arise with agencies or neighbours in the future.

4. Be a land steward: contact your local MNR office if you witness or observe shoreline alteration or potential environmental damage. You can call the MNR toll-free reporting line (24 hours, 7-days a week) or for anonymity, contact Crime Stoppers. See *Resources* list for information.

Before Construction: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PERMITS & REGULATIONS					
1 **Knowledge and understanding of application process**	Planning begins the summer before work is to begin.			No planning involved. Expect immediate start.	☐
	Check with local municipality and Conservation Authority to determine if a permit is required.			***Necessary permits are not obtained.**	☐
PREPARING A SITE PLAN					
2a **Knowledge of existing natural features of the property**	Thorough understanding of natural features, including long-term history of water levels.	Identification of existing and/or sensitive natural features or areas.	General idea of existing natural features	No knowledge of existing natural features or sensitive areas	☐
2b **Knowledge of effect of construction on existing natural features of the property**	Construction does not impact existing features.	Awareness of the potential for construction impact and precautions taken.	Awareness of the potential for construction impact.	Disregard of potential for construction impact. No precautions taken.	☐

tip

Make sure you review an updated, legal survey of your property before you begin construction. Erosion or deposition processes may have occurred over time and may be misleading as to where your property ends.

** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #2

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PREPARING A SITE PLAN *continued*					
3 Size and location of various activity areas.	Intensively used areas and paths are concentrated and located at least 30 m (100 ft) from surface water and away from steep shoreline slopes.		Intensively-used areas are not near surface water but in locations contributing to increased erosion, such as at the top edge of steep slopes.	Intensively-used areas are near surface water and in locations contributing to increased erosion, such as at the top edge of steep slopes.	☐
4 Wind and sun	All outdoor living areas are sheltered from the prevailing wind.	Where possible, outdoor living areas are sheltered from the prevailing wind.		No consideration given to the prevailing winds and sheltering outdoor living areas.	☐
	Window locations are placed to allow for maximum winter sunlight.	Where possible, window locations are placed to allow for maximum winter sunlight.		No consideration given to the sun exposure in winter.	☐
	Evergreen trees are kept/planted on the northwest face for wind protection, **AND** deciduous trees are kept/planted on the southwestern face for summer shading.	Evergreen trees are kept/planted on the northwest face for wind protection, **OR** deciduous trees are kept/planted on the southwestern face for summer shading.	Landscaping design attempts to use trees strategically to improve energy conservation to a small degree.	Tree placement does not consider climatic factors.	☐

tip

Consider adding a natural wind break or snow fence to your design.

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.	Only the area necessary for the project is cleared.	Large areas are cleared but vegetation is restored.	Entire property is cleared at once.	☐
	Buffer strip of natural vegetation wider than 30 m (100 ft) retained along shoreline or surface water.	Project site requires minimal removal of trees and shrubs in buffer strip.		Buffer strip is bulldozed clear of all existing vegetation.	☐
	Project does not interfere with existing surface runoff patterns.		Project interferes minimally with existing surface runoff patterns.	Project interferes with existing surface runoff patterns.	☐
	Disturbed areas are replanted as quickly as possible with native species.	Disturbed areas are replanted as quickly as possible with non-invasive species.	Bare soil is covered immediately with burlap or mulch.	Bare soil is left exposed.	☐
	Use of machinery is minimal, **AND** machinery used is appropriate to job size.			Heavy machinery is used excessively.	☐

tip

Protect all soil/sand piles from erosion and avoid construction during heavy rains.

tip

Place straw bales or silt fence around vulnerable existing features such as wetlands.

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
DURING CONSTRUCTION *continued*					
6 Location of construction facilities and access	All construction materials are stored away from downspout openings, **AND** at least 30m (100 ft) from the shoreline or watercourse.	All construction materials are stored away from downspout openings.	Only hazardous construction materials are stored away from downspout openings, open water or any watercourse.	Construction materials are stored without regard to runoff patterns.	☐
	Concentrate and restrict vehicle access to minimize soil compaction.	Vehicle access is kept away from bluff edges, shorelines, slopes, or other sensitive areas.	Concern about compaction is limited to septic leaching bed.	Vehicles are parked or driven throughout site, contributing to soil compaction.	☐
	Toilet facilities are available.			Toilet facilities are not available.	☐
	Coastal features are not interfered with by the location of facilities and access.			***Location of facilities and access interfere with coastal features or runoff patterns.**	☐

tip

Fence or rope off all areas that are not to be disturbed.

*** These conditions may violate provincial legislation or municipal by-laws.*

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
DURING CONSTRUCTION *continued*					
7 Protecting existing features	Check if there is a municipal by-law that protects the trees on your property. Design or plan accordingly.	Develop a plan or design first and then check if there is a municipal bylaw that protects the trees on your property. Proceed accordingly.		***Cut trees down on your property without checking if a municipal tree-cutting bylaw exists.***	☐
	Protect trees from damage caused by digging and heavy machinery. **AND** remove no trees for construction	Protect trees from damage caused by digging and heavy machinery, **AND** clearly mark those trees that need to be felled to avoid unnecessary tree removal.	Trees are not protected during construction but any damage incurred is immediately and appropriately handled.	Damage to tree trunks, limbs, and roots is left unattended.	☐
	Soil grade is not altered. **AND** soil around trees is not compacted .	Soil grade is not altered within 3 metres (10 feet) of dripline of any tree to be preserved. **AND** there is minimal soil compaction near dripline.	Soil grade is partially altered in sections within dripline **AND/OR** materials are stored within dripline for limited periods.	Soil grade level within the dripline is permanently altered from pre-construction level. **AND/OR** soil is compacted around trees.	☐
	Septic bed, well(s) and environmentally sensitive features such as wetlands and rare trees are protected, **AND** distance requirements are respected.	Septic bed, well(s) and environmentally sensitive features such as wetlands and rare trees are protected from construction activity.	Septic bed and well are protected from construction activity.	***Distance requirements are not considered in protecting septic bed, wells, or environmentally sensitive features.***	☐

tip

Check with your local municipality if there is a tree by-law that protects the trees on your property

tip

Plan to be on site any time trees are to be removed.

*** These conditions may violate provincial legislation or municipal by-laws.*

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating

DURING CONSTRUCTION *continued*

8 Purchasing and location of soil or fill

No use of off-site soil or fill.

Limited use of off-site soil and/or fill,

AND awareness of the source of soil or fill,

AND no excess or unnecessary fill is used,

AND approval is obtained.

Limited use of off-site soil and/or fill,

AND no awareness of the source of soil or fill,

AND approval is obtained.

No consideration for the non-renewable nature of soil.

OR excessive use of off-site soil or fill,

OR fill is dumped in any fill-regulated area such as a shoreline.

☐

tip

It is dangerous and illegal to deposit fill in flood-prone or regulated shoreline areas.

9 Construction materials

Local non-hazardous materials used where possible,

AND obtained in a responsible and appropriate manner.

Non-hazardous materials used where possible.

AND no use of oil-based paints or varnishes.

Minimal use of hazardous materials where necessary.

Hazardous materials are used.

AND/OR materials sourced unnecessarily from far away or from environmentally-damaging production practices.

☐

tip

Know where your topsoil or fill is coming from – it may bring contaminants and invasive species onto your property.

*** These conditions may violate provincial legislation or municipal by-laws.*

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
DURING CONSTRUCTION *continued*					
10 Construction waste	Your local municipality is contacted before construction to learn how to properly sort and dispose of construction waste. **AND** it is ensured that contractors dispose of waste appropriately.	Reputable waste removal/disposal company is hired to remove and appropriately dispose of all hazardous waste.	Care is taken to at least prevent paint or solvents from getting into waste water or septic system, or open surface water.	***Waste material or excess fill is dumped into open surface water.*** ***OR waste material is burned (including burn barrels).***	☐
	Waste containers are clearly and appropriately labeled , **AND** waste materials are recycled when possible.	Waste containers are clearly and appropriately labeled.		Waste is not sorted. **AND** recycling of material is not a priority.	☐
	Absolutely no concrete or construction wash water flows into open surface water, towards trees or into septic system.			***Concrete or construction wash water flows into open surface water, or is drained into septic system.***	☐

tip

Paint (any kind) is a hazardous substance. Take it to your local hazardous waste depot. It is illegal to pour paints or thinners into runoff channels or surface water.
Inform your painting contractor of your need for compliance.

*** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #2

Glossary

Before and During Construction…

Terms you need to know for Worksheet #3

Bluff: A high, steep bank at the water's edge. Along the Lake Huron shoreline, bluffs are typically composed of glacial till (predominantly clay and silt).

Building permit: A municipally-issued document that regulates construction and enforces Building Code compliance.

Burlap: A coarse, canvas-like fabric made from the fibers of jute, hemp or cotton plants.

Coastal Feature: A distinctive or characteristic element or part of the coastal landscape.

Compaction (soil): Compression of soil that decreases the spaces between soil particles. This hinders the movement of air and water into and through the soil. Consequently the soil holds less water and surface runoff, and erosion occurs. Soil compaction may be caused by ongoing pedestrian traffic, one time or ongoing vehicular traffic, construction equipment or the storage of materials.

Conservation Authority: Localized government body that is responsible for the management of a watershed and especially the floodplains within that watershed.

Conservation easement: A legally binding agreement not to develop part of a property, but to leave it "natural" permanently or for some designated period of time. The property still belongs to the landowner, but restrictions are placed both on the current landowner and on subsequent landowners. The easement becomes part of the land deed so that all future property owners are bound by the terms of the easement.

Contaminant: Anything which can cause pollution. Septic systems, stored pesticides, fuels, pet wastes, furnace oil, paints and cleaners are all possible contaminant sources. Contaminants may be colourless and/or odourless.

Crime Stoppers: A partnership of the community, the media and law enforcement to protect human safety and the environment. All information is kept anonymous. See Resources list.

Crown land: Publicly owned land, typically under the jurisdiction of the provincial and/or federal government and administered on behalf of the people.

Deciduous trees: Trees that shed their leaves in the fall.

Deposition processes: The geological processes whereby material is added to a landform. The material is eroded and transported from elsewhere by wind, water or ice. Also referred to as sedimentation.

Downspout: A vertical conduit used for draining water from the roof gutters of a building.

Glossary

Drainage pattern: The network of water courses (streams and rivers) that drain a watershed(s) into a lake or water body. *Contrast with runoff pattern.*

Dripline: The outer extent of a tree's branches.

Easement: *See* Conservation easement.

Erosion: Movement and loss of soil caused by wind or water (rain, surface water runoff, or direct contact with a water body).

Evergreen trees: Trees that retain their leaves or needles year-round.

Fill: Material that is brought from elsewhere and added to the existing landscape, such as soil, gravel, sand or loam. Fill regulations exist and are administered by your local Conservation Authority.

Fish habitat: "Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes". (Canada Fisheries Act, Sec.31.5)

Fisheries Act: A federal law administered by the Department of Fisheries and Oceans and Environment Canada to protect fish and fish habitat. It prohibits the destruction or damage of fish habitat and the discharging of substances that may harm fish or fish habitat.

Legal Non-Conforming: Buildings or structures which existed before the current municipal zoning by-law was passed. When existing uses do not conform to the regulations in a new zoning by-law, their prior legal existence ensures their continuation as a lawful use. This means that some variations of use can legally exist without requiring an amendment to the zoning by-law.

Legislation: Law or set of laws made by a law-making body. Also referred to as Statutes or Acts.

Liability: A person or situation that causes problems or puts something at risk.

MNR: Ministry of Natural Resources. See Worksheet #1 *Resources*.

Municipal by-laws: Local legislation enacted to consider natural heritage, land use, environmental protection and hazard policies.

Mulch: Loose, organic materials such as woodchips, bark, and straw, or a mixture thereof. When applied around a plant, mulch protects the plant, suppresses weeds and retains moisture. Re-apply as mulch breaks down over time.

Non-invasive: A plant with a low potential to spread quickly or become difficult to control or eradicate. Local native plants are typically not invasive.

Non-renewable: Something that cannot be replaced by nature once it is used up, or that regenerates only over a very long period of time.

Passive solar heating/ lighting: The natural heating/ lighting of buildings or rooms by capture of direct sunlight. Buildings can be designed with large windows in south-facing walls and small windows in north-facing walls, to reduce the need for electricity and fossil fuel energy as a source of heat and light.

Permit: A document granting legal permission.

Glossary

Prevailing wind: Wind that blows in an area most frequently.

Public Lands Act: Legislation protects the integrity of public lands and waters for all citizens of Ontario. It requires that property owners obtain work permits for activities on shore lands adjacent to navigable waters.

Regulation: A binding rule of law. Regulations are not made by Parliament but rather by persons or bodies that have received authority from Parliament to do so.

Runoff pattern: The arrangement of how rain or water flows over an area. This is determined by the land form; water will flow down slope to the lowest elevation points due to gravity. *Contrast with drainage pattern.*

Sensitive natural feature: An environmental element of the landscape that is readily affected by or responsive to external influences or change.

Septic leaching bed: Part of the septic system. Together with the septic tank, it treats household sewage. It is comprised of rows of perforated pipes set at a specific distance apart and above a stone layer. The area above a leaching bed should have a good grass cover and should be kept free of trees, shrubs, and structures such as patios, pools, and sheds, and vehicles including snowmobiles. Any compaction of the soil reduces leaching bed performance and crushed leaching bed pipes can cause backups into your home.

Septic system: Consists of a separate tank to settle the solids out of the wastewater, followed by a leaching bed in which the wastewater is treated and distributed into the soil.

Shore/ shoreline: Public or private land adjacent to a water body, and also land that is seasonally inundated with water.

Silt fence: A temporary barrier stretched across an area to trap sediment and prevent runoff water from moving it off-site during construction.

Soil grade: The elevation of the ground surface. Grade may also refer to the steepness or slope of the surface.

Solvent: a liquid that can dissolve another substance. (e.g., paint thinner, mineral spirits, and water).

Steward: An individual with a personal commitment to care for the land and the surrounding landscape in order that it may be preserved or enhanced for future generations.

Survey: A map document made by a licenced surveyor that illustrates and describes the measurements and layout of a parcel of land including its size, boundaries, location, elevations, the dimensions and position of any structures and indicates any easements, rights of ways, etc.

Wash water: Water that is used in the cleaning or rinsing process.

Watercourse: An open flow of water including a stream, spring, channel or river.

Wetland: Areas that are permanently or temporarily submerged, or saturated for at least part of the year. Unlike upland wetlands, coastal wetlands don't transition into drier communities.

Zoning: The division of a municipality by legislative regulations into areas (zones) that control the use of the land by specifying the uses allowable for the real property in these areas.

Resources List

Before and During Construction

For more information…

Building Permits

- Local municipality's Chief Building Official (CBO)
  see Blue Pages

- Ministry of Municipal Affairs and Housing
  Building and Development Branch
  777 Bay St. 2nd floor
  Toronto, ON M5G 2E5
  (T): 416.585.6666 (F): 416.585.7531

- Ontario Building Code (OBC)
  - regulates design, construction, operation, & maintenance of on-site septic systems and new building/structure construction
    www.obc.mah.gov.on.ca
    email: codeinfo@mah.gov.on.ca

Burning

- *Before you burn grass and debris…*Brochure. Ministry of Natural Resources. 5 pp. ISBN 0-7729-5716-9.

- *Open Burning*. Information Sheet. Ministry of Environment (MOE). PIBS 631b.

Landscape Design

- Stevens, J. (ed.) 1994. *Living Near the Water: Environment Design for Shoreline Properties*. Burnstown, Ontario: General Shore Publishing House.

- Henderson, C.L. *et al*. 2000. *Landscaping for Wildlife and Water Quality*. St.Paul, Minnesota: Department of Natural Resources.

Resource Violations Reporting

- CRIME STOPPERS at 1-800-222-8477. (1-800-222-TIPS)

- MNR toll-free reporting line: 1-877-847-7667
  www.mnr.gov.on.ca/MNR/csb/news/2005/sep27bg_05.html

Construction Wastes

- Local municipality
  see Blue Pages

Worksheet #3 - Getting to Know Your Property

Why should you be concerned?

- In rural areas, you are your own WATER QUALITY STEWARD!
- Upstream practices WILL affect your property.
- Many important regulations exist to protect our shorelines and waterways, and these can affect the ways that you use your property.
- Provincial regulations and municipal bylaws may restrict development of any kind and affect how you can use your property.
- A property's soil and land form can influence water quality by influencing surface water and groundwater contamination, erosion of soil by water and wind, and soil compaction.

What can you do?

1. You or your legal representative can contact the local Ministry of Natural Resources or Conservation Authority office to learn of any alteration restrictions (especially shorelines) and how these may affect any future property projects.

2. Talk with long-time residents to learn more about how the property may be affected by natural processes and potential hazards.

3. Make a map of the property. Identify physical characteristics such as soil type and depth to water table, and learn how these can affect the vulnerability of your property to natural hazards. Accept these natural conditions and modify your activities accordingly to protect yourself and your property.

4. Determine if current services (e.g., water and sewage) are adequate for your planned/intended use of the property.

5. Look beyond property boundaries. This is important for you to be able to analyze the potential for surface water contamination, wind and water erosion, and groundwater contamination.

Making a Map of Your Property

Why make a map?

A map can help you identify the areas or aspects of your property that pose the greatest risk to water quality and determine what requires immediate attention. It is an important tool for the future management of your property and can help you protect yourself against the risks that come with living in hazard areas.

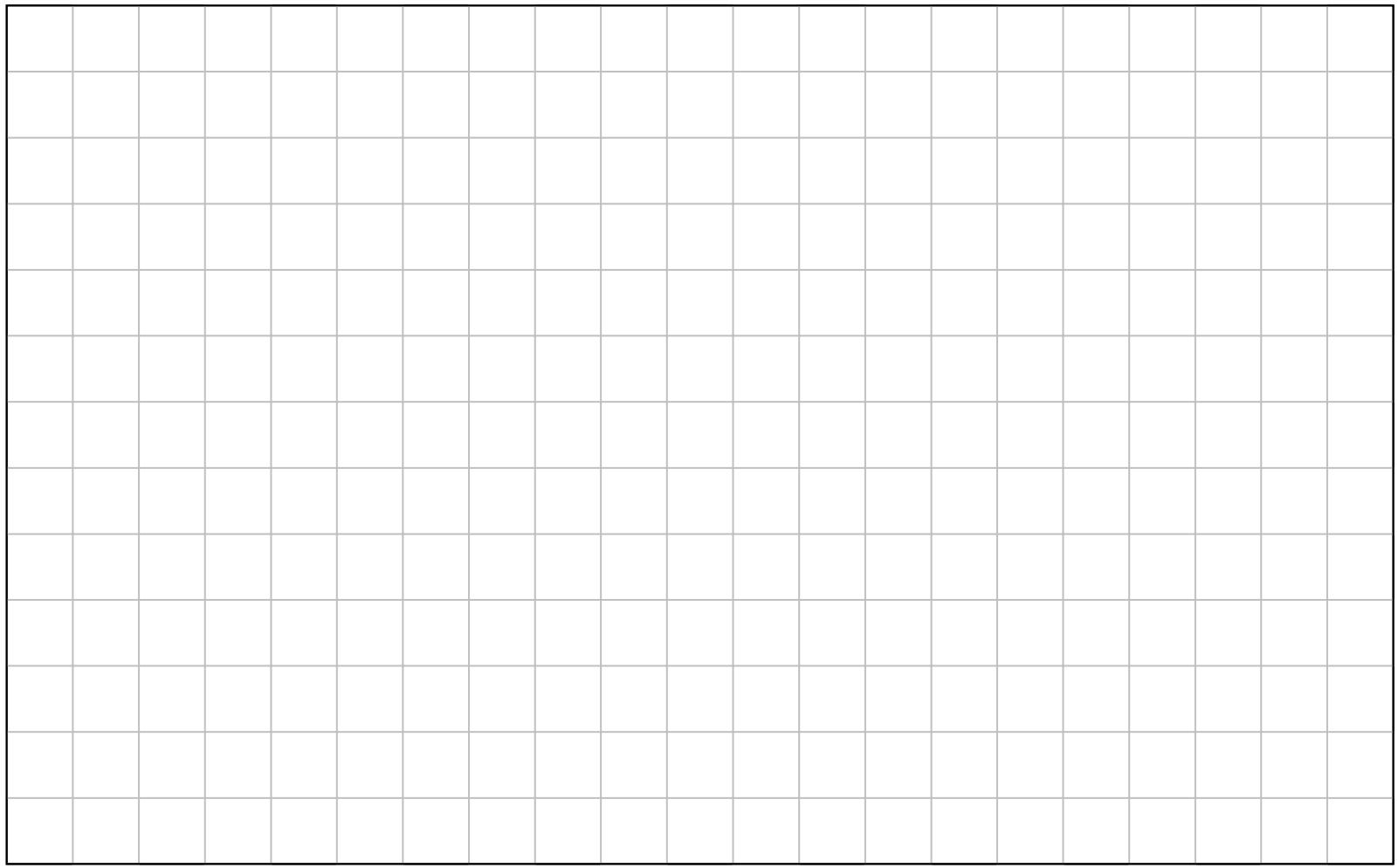
tip

Exposed or buried oil tanks, septic systems, dumps, gas stations and other potential contaminants on adjacent properties can contaminate your groundwater. Be sure that you know where any of these are located on your property. Make sure to investigate the area around your property and include this information on your map.

What you should include:

- any buildings or structures
- roads, driveways, parking and/or other impervious surfaces
- sewage system leaching bed, outhouses
- foundation drains and outlets
- drainage tile outlet
- all drinking wells (including dry or abandoned wells)
- eaves trough drains and direction of drainage from them
- sump pump drains
- swimming pool backwash drain
- area used for swimming pool or hot tub drainage water
- lawn area(s)
- nearest open/surface water (stream, pond, lake, etc.)
- drainage ditches
- dog house/dog run/kennel/pen/corral
- pesticide/herbicide storage
- hazardous materials storage (paints, solvents, pesticides, etc.)
- any underground or aboveground storage tanks of fuel oil, gasoline, or other petroleum product
- trees, flower beds, vegetable garden(s) or any cultivated area(s)
- burn barrels
- area for snow piles and snowmelt
- orientation of all living spaces (sunlight/shadows)
- environmentally sensitive areas (rare trees, wetlands, etc.)
- any buried cables or underground infrastructure

Making a Map of your Property



date: _____

Worksheet #3

UNDERSTANDING RISK AND PHYSICAL CHARACTERISTICS

Use this page to help assess your property's vulnerability to water contamination.

	LESS RISK ⟷ ***MORE RISK***			
Soil type	Mixture of clay-silt-loam	Mixture of silt-loam	Mixture of silt-loam-sand	Either gravel, sand or clay.
Soil depth	Greater than 4 metres (13 feet)		1-4 metres (3-13 feet)	Less than 1 metre (3 feet)
Bedrock	Non-permeable and solid. No direct access from the surface.	Semi-permeable limestone or sandstone. No direct access from the surface.	Any kind. Direct access from the surface.	Fractured bedrock. Any kind.
Depth to water table	Greater than 14 metres (46 feet).	5 - 14 metres (16-46 feet).	1-5 metres (3-16 feet).	Less than 1 metre (3 feet).

tip

To find soil depth, bedrock, or depth of water table, check your well-drilling records, or ask a neighbour with a well or call a local well-drilling company or the local Conservation Authority.

tip

The risk of pollution is greater in areas where the groundwater table is near the surface or in highly porous soils (e.g., sand, gravel)

UNDERSTANDING RISK AND PHYSICAL CHARACTERISTICS

Use these worksheets to help assess your property's vulnerability to natural hazards.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
HAZARD LANDS – DETERMINING RISK					
1 Knowledge of dynamic beach/dune/lake processes and hazards.	Understand dynamic nature of shoreline and plan accordingly, with long-term outlook and flexibility for change.	Understand dynamic nature of shoreline. No long-term planning for natural change.	Limited understanding of dynamic nature of shoreline. Property management attempts to control any naturally-occurring change	No understanding of dynamic nature of shoreline. Attempt to control any naturally-occurring change	☐
	Understand potential hazards affecting your property **AND** have your own plan to deal with any eventualities.	Understand potential hazards affecting your property.	Limited understanding of potential hazards affecting your property.	No understanding of potential hazards affecting your property.	☐
2 Development and natural hazards	No development or disturbance within 30 m (100 feet) of dunes/beaches/water, or the erosion hazard limit for bluffs.	Minimal disturbance or structures near dunes/beaches/water/bluff edge, constructed in a proper manner and elevated.	Disturbance or structures near dunes, beaches, water, or bluff edges constructed in a proper manner and elevated.	Development or disturbance within 30 m (100 feet) of dunes, beaches, water, or the erosion-hazard limit for bluffs.	☐
	Know whether or not buildings may be relocated or raised.			No knowledge of whether or not buildings may be relocated or raised.	☐

tip

Existing shoreline protection structures are a sure indication that erosion and flooding are a concern.

Worksheet #3

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
HAZARD LANDS – DETERMINING RISK *continued*					
3 **Buffers and potential for erosion**	Large expanse of naturally-occurring beach located along lakefront end of property.	Moderate expanse of naturally-occurring beach located along lakefront end of property.	Narrow, natural beach located along lakefront end of property.	No natural beach located along lakefront end of property. .	☐
	Large expanses of well-established native species including trees and shrubs adjacent to shoreline or wetland, and dune vegetation on dunes.	Large expanses of well-established native species including trees and shrubs adjacent to shoreline or wetland although punctured with small cleared areas.	Narrow expanses of well-established native species including trees and shrubs adjacent to shoreline or wetland.	No natural vegetation buffer present.	☐
	No development on a bluff. **AND** natural vegetation is undisturbed within the 30 m (100 foot) setback area.	Development set behind the erosion-hazard limit for bluffs, **AND** natural vegetation is undisturbed within the 30 m (100 foot) setback area.	Development on a bluff set behind the erosion-hazard limit for bluffs, **BUT** natural vegetation is disturbed within the 30 m (100 foot) setback area.	Development on a bluff set within the erosion-hazard limit for bluffs, **AND** natural vegetation is disturbed within the 30 m (100 foot) setback area.	☐
4 **Home Insurance**	Know whether potential damage to property can be covered by insurance.			No knowledge.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
HAZARD LANDS – DETERMINING RISK *continued*					
5 Legal considerations	Municipal zoning bylaws and Official Plan checked to know how property is zoned. **AND** property land use is in accordance with this zoning.	Municipal zoning bylaws and Official Plan checked to know how property is zoned.	No regard to whether intended use of property is in accordance with Official Plan or Zoning bylaws.	No regard to whether intended use of property is in accordance with Official Plan or Zoning bylaws. **AND** property land use is not in accordance.	☐
	Exact knowledge of actual property limits, setbacks, conservation easements, floodplain restrictions and right-of-ways. **AND** Conservation Authority regulations are observed.	General idea of actual property limits, setbacks, conservation easements, floodplain restrictions and right-of-ways.		No knowledge of actual property limits, setbacks, conservation easements, floodplain restrictions and right-of-ways.	☐
	Vendor provides a notarized statement of the condition of the property.	Vendor provides a Seller Property Information Statement.		Vendor refuses to provide a Seller Property Information Statement.	☐
	Knowledge of ownership of any streams that run through property.			Assumption of ownership of all natural features within property boundaries without inquiry.	☐
	Ensure that there are no fuel tanks buried or otherwise on the property.			No knowledge of fuel tanks buried or otherwise on the property.	☐

tip

Typically, septic systems are not included in home inspections. Make separate arrangements for this.

tip

If a buried, abandoned fuel tank is found, the property owner is responsible for any costs associated with removal or contamination. This is typically not covered under home insurance.

tip

Be careful about where you think your property ends. Government retains ownership of land to the high water mark. Erection of fences or other obstructions below this point is illegal.

Glossary

Getting to Know Your Property

Terms you need to know for Worksheet #3

Buffer: An area of natural vegetation that runs along the shoreline, stream or bluff.

Conservation Authority (CA): Localized government body that is responsible for the management of a watershed and especially the floodplains within that watershed.

Conservation easement: A legally binding agreement not to develop part of a property, but to leave it "natural" permanently or for some designated period of time. The property still belongs to the landowner, but restrictions are placed both on the current landowner and on subsequent landowners. The easement becomes part of the land deed so that all future property owners are bound by the terms of the easement.

Contaminate/Contamination: Alteration of a material by the introduction of a chemical or other substance so that the material is unfit for a specified use.

Dynamic beach setback: The legal minimum distance that development must be set back from a beach, which is a continuously changing hazard land. The setback distance is determined by the combined influence of flooding and a dynamic beach allowance and is defined in the Provincial Policy Statement, under the authority of the Planning Act.

Easement: *See* Conservation easement.

Erosion by water: Movement and loss of soil caused by rain or surface water runoff.

Erosion by wind: Movement and loss of soil caused by the wind.

Erosion-hazard limit: A setback distance determined by considerations that include the 100 year erosion rate (the average annual rate of recession of a bluff extended over a one-hundred-year time span), plus an allowance for slope stability and an erosion allowance.

Floodplain: The area adjacent to a water body or water course that becomes covered with water during high water levels . Often this occurs following snowmelt or an extreme rainfall event.

Groundwater: Fresh water that has seeped through the soil and rock on the earth's surface and naturally collects forming a reservoir, the top of which is referred to as the water-table. This water supplies wells and springs and is the source of most people's drinking water.

Hazard land: An area prone to flooding or erosion such as properties located within a floodplain, on beaches, dunes or bluffs, or subject to wind setup, wave activity, etc. Includes features such as quickly-draining sandy soils or sinkholes.

High water mark: *See* Normal high water mark.

Glossary

Infiltrate/ Infiltration: Refers to the passage of water into and through the soil from an outer surface. Also *percolate/ percolation.*

Loam: Soil containing a mixture of clay, silt and sand, that is typically loose, well-drained and rich in organic matter. It is considered best for the growth of most plants. The exact ratio of sand, silt, and clay determines texture and other soil characteristics.

Ministry of Natural Resources (MNR). *See* Worksheet #1, Resources.

Natural process: A series of changes or actions that occur within an ecosystem to maintain its health or regulation.

Normal high water mark: The level or elevation along the shore of a federal historic canal, lake or river that marks government ownership and administration. Also known as the upper controlled water elevation.

Official Plan: A municipal policy document that outlines basic principles to guide future development within an area. Available at the municipal office or community library.

Percolate/ Percolation: Refers to the flow of water through the soil. Also *infiltrate/ infiltration.*

Restriction: Refers to legislation that ensures that activities do not harmfully affect aquatic habitat or water quality.

Right-of-way (includes Easements): A legal agreement that confers on an individual, company or municipality the right to use a landowner's property in some way. It also therefore partially restricts an owner's use of those portions of land affected by the right of way/easement. Right of ways are typically registered on the certificate of title to the property and are automatically transferred from one owner to another as the land is sold. They remain on the title until the holder of the easement discharges their rights from the certificate of title.

Risk: The potential for disaster and loss.

Seller Property Information Statement: A non-legally binding document that outlines what the current owner of the property knows about the property. Also known as a Disclosure Statement.

Setback: *See* Dynamic beach setback.

Sinkhole: A closed depression that is formed by the dissolution of underlying soluble bedrock, which that connects surface and bedrock groundwater. These features are circular or elliptical with walls that range from nearly vertical, through cone and bowl shapes to shallow dish-like shapes.

Soil compaction: Reduced pore space in the soil due to human or equipment traffic. Compaction makes it difficult for water to infiltrate and for roots to penetrate the soil.

Soil depth: The depth of soil influences the potential for groundwater contamination. Deeper soils are typically more effective at filtering out contaminants before they can reach groundwater.

Glossary

Soil type: The material(s) that a soil is made of affect its ability to percolate water and other substances (including pollutants). Sand and gravel soils provide the fastest infiltration and therefore increase the potential for groundwater contamination. Conversely, clay soils are slow to allow water to infiltrate and may cause water to runoff the surface rather than infiltrate. This can encourage erosion and surface water contamination.

Steward: An individual with a personal commitment to care for the landscape in order that it may be preserved or enhanced for future generations.

Surface water: Water that moves through:

a) a natural or artificial channel that carries water intermittently or continuously throughout the year, and that may support vegetation that requires or prefers the continuous presence of water or continuously saturated soil;
b) a lake, reservoir, pond or sinkhole;
c) a wetland, such as a swamp, marsh, bog or fen;
d) a grassed waterway; or
e) roadside ditches.

Vulnerability: Capacity to be open or exposed to harm.

Water table: The boundary between the saturated soil (where all the soil pore spaces are filled with water) and the unsaturated soil (where soil pore spaces are filled with air, roots, soil organisms and some water).

Wind setup: A wind-related phenomenon that can cause substantial inundation of a beach over a short period of time.

Zoning bylaw: Municipal legislation that describes the exact use for a specific parcel of land including permissible buildings, size, building heights and setbacks from lot lines.

Resources List

Getting to Know Your Property

For more information…

Soils

Ontario Ministry of Agriculture, Food and Rural Affairs Publications:

Soil Erosion Manual, 1986 OMAFRA

Soil survey reports and maps may be ordered for $15 online from:
www.gov.on.ca/OMAF/english/products/soils.html
or call (519) 826-3700 or toll-free 1-888-466-2372
or e-mail products@omafra.gov.on.ca

Best Management Practices series:
Soil Management, 1994 and Buffer Strips, 2004
Order No. BMP 15 (with Agriculture and Agri-Food Canada)

Factsheets/Leaflets:

- Control of Soil Erosion –Order No. 95-089
- Soil Erosion – Causes and Effects – Order No. 87-040
- Soil Compaction –Order No. 88-082

Conservation Authorities

Ausable-Bayfield Conservation Authority
R.R. #3 Exeter, ON N0M 1S5 E-mail: info@abca.on.ca
• Shoreline Management Plan
www.abca.on.ca

Grey Sauble Conservation Authority
237897 Inglis Falls Road R.R. #4, Owen Sound, ON N4K 5N6
(T): 519- 376-3076
(F): (519) 371-0437
Email: admin@greysauble.on.ca
www.greysauble.on.ca

Saugeen Conservation Authority
R.R. # 1. Hanover, ON N4N 3B8
(T): 519-364-1255 (F): 519- 364-6990
Email: publicinfo@svca.on.ca
www.svca.on.ca

Maitland Valley Conservation Authority
1093 Marietta Street, Box 127 Wroxeter, ON N0G 2X0
(T): 519-335-3557 (F): 519-335-3516
Email: maitland@mvca.on.ca
www.mvca.on.ca

St. Clair Region Conservation Authority
205 Mill Pond Cres. Strathroy, ON N7G 3P9
(T): 519-245-3710 (F): 519-245-3348
www.scrca.on.ca

Resources List

Ontario Ministry of Agriculture, Food and Rural Affairs

Agricultural Information Contact Centre at 1-877-424-1300
www.omafra.gov.on.ca

Local Conservation Authority

Publications:

- Flood and Erosion Hazard Maps of sections of Lake Huron. Lines on maps show 1:100 year flood and erosion lines for various stretches of shoreline. These maps may be viewed at Conservation Authorities, offices of the Ministry of Natural Resources, or at Environment Canada's Information and Geomatics Office.

Videos:

- Flooding & Erosion Part 1: The Hazards
- Flooding & Erosion Part 2: Avoiding the Hazards

Environment Canada

Edgett, R. 1995. Buyers Guide to Shoreline Property: Great Lakes and St. Lawrence River. Conservation Association of Ontario/Environment Canada: Burlington, ON.

Ontario Woodlot Association

www.ont-woodlot-assoc.org

Ontario Ministry of Environment

Public Information Centre
135 St. Clair Ave. West, Toronto, ON M4V 1P5
Toll-free: 1-800-565-4923
www.ene.gov.on.ca

Publications:

- Environmental Living Vol. 3: Protecting the Environment when Building or Buying your Dream Cottage. (ISBN 0-7778-1071-9)

Lake Huron Centre for Coastal Conservation

P.O. Box 178,
Blyth, Ontario, Canada
N0M 1H0
Phone: (519) 523-4478
Email: coastalcentre@lakehuron.on.ca
www.lakehuron.on.ca

Ontario Forestry Association

www.oforest.on.ca

Worksheet #4 – Private Well Water Supply

Use this worksheet to assess the condition of your well(s) and water supply.

Why should you be concerned?

- Wells can provide a clean and safe supply of water, pumped from aquifers below the ground. If you use a private well, you must manage your own water quality.
- If a well is not constructed or maintained properly, or if a contaminant is spilled within the capture zone of a well, the quality of the water supply could be at risk.
- If your groundwater becomes contaminated, it can affect the health of your family. It may also affect the quality of groundwater supplying other wells, lakes or streams in the area. Your neighbours and community may all be affected. Everyone's well is connected.
- It is much easier and cheaper to prevent contamination than to try and clean it up. Treating contaminated water, constructing a new well or getting water from another source are all inconvenient and expensive.
- Whether you use a private well or a municipal system, everyone plays a role in source water protection.
- Some cottages still take drinking water from Lake Huron.

What can you do?

1. Make sure the water you drink and the groundwater that supplies your well are protected from contamination. Test your water regularly in spring and fall, on a seasonal property, and after all periods of heavy rainfall.

2. Know where your septic system and well are located, as well as those of your neighbours.

3. Handle fertilizers, pesticides and other potential contaminants carefully.

4. Assume that your entire property recharges your groundwater and contains the capture zone for your well(s).

5. Contact a licensed well professional or your Health Unit to assist with items that get a "2" or "1" rating in this worksheet.

Calculate Your Household Water Use

The chart below shows the average amount of water used in the average household. Calculate the average amount of water used in your house for a typical day or week.[1]

Fixture	Typical Ontario water use	Water use in my household	Water efficiency measure installed	New water use
Toilet	20 litres (5.3 gal.) per flush (standard toilet)	____ litres (_____ gal.)	Install toilet water displacement device in the tank – as simple as a plastic bottle filled with sand. Install a water efficient, 6 litre/flush toilet at a cost of $150-$300.	4 litres (1 gal.) per flush 14 litres (3.7 gal.) per flush
Shower	10 to 30 litres (2.5 to 8 gal.) per minute	____ litres (_____ gal.)	Install water-efficient showerhead at a cost of $10-$40.	9.5 litres (2.5 gal.) per minute
Bath	60 litres (15 gal.)	____ litres (_____ gal.)		
Clothes Washer	208 litres (55 gal.)	____ litres (_____ gal.)	Do less laundry or buy a water-efficient clothes washer.	100 litres (2.5 gal.) per load
Dishwasher	40 litres (10 gal.)	____ litres (_____ gal.)	Install water-efficient dishwasher.	26 litres (7 gal.) per load
Faucets (toilet and kitchen)	15 litres (4 gal.) per minute	____ litres (_____ gal.)	Install a kitchen faucet aerator at a cost of $3.	9.5 litres (3.3 gal.) per minute
Leaks	25 litres or more (6.6 gal.)	____ litres (_____ gal.)		
Other (Domestic)	6 litres (7.9 gal.)	____ litres (_____ gal.)		
Total	394 litres (104 gal.)	**____ litres (_____ gal.)**	Conversion Factor: Litres x 0.22 = Imperial Gallons	

[1] Source: Government of Alberta Ministry of the Environment. 2001. (*www3.gov.ab.ca/env/water/Conservation/residential.cfm#LandscapeWaterUse*)

Worksheet #4

Private Well Water Supply: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
LOCATION OF WELL					
1 **Position of water well in relation to potential sources of contamination**	Upslope from all sources of contamination, **AND** all surface water moves away from well.	Upslope from, or level with any source of contamination, **AND** surface water runoff does not reach well.	Level with most sources of contamination, **AND** some surface water runoff may reach well.	Downslope from any source of contamination so that surface water reaches well, **OR** water ponds at and around well.	☐
2 **Distance from well to potential sources of contamination**	Greater than 90 m (300 ft)	• 24-90 m (76-300 ft)** (drilled well) • 47-90 m (151-300 ft) (bored/dug well)	• 15-23 m (50-75 ft)** (drilled well) • 30-46 m (100-150 ft) (bored/dug well)	• *** Less than 15 m (50 ft) (drilled well)** **OR** • ***Less than 30 m (100 ft) (bored/dug well)**	☐
CONDITION OF WELL					
3 **Condition of casing**	Good condition. No defects visible, **AND** checked annually by certified inspector.	No defects visible, **AND** checked every one to two years by certified inspector.	No holes or cracks visible, **AND** checked every three years or more by certified inspector.	Holes or cracks visible, **OR**, can hear water running into well, **OR** never inspected.	☐

** Note: Drilled wells must have at least 6 m (20 ft) of watertight casing below ground level. If less than 6 m (20 ft), treat well as a bored/dug well.

tip

Always maintain as great a distance as you can between a potential contaminant source and wells or surface water.

** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #4

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
CONDITION OF WELL *continued*					
4 **Condition of well cap**	Excellent condition, commercially manufactured, vermin proof, and tightly secured.	Fair condition, commercially manufactured, vermin proof, and tightly secured.	Commercially manufactured, vermin proof cap is loose or needs repair.	No commercially manufactured vermin proof cap.	☐
5 **Condition of well venting**	Screened vent in excellent repair.	Screened vent in good repair.	Well vented but not screened.	No well vent.	☐
6 **Condition of surface material around well casing**	Surface material raised above normal ground level beside well casing, **AND** no space between well casing and surrounding surface material.	No settling of the surface material around well casing, **AND** no space between well casing and surrounding surface material.	Can see settling of surface material around well casing, **AND** no space between well casing and surrounding surface material.	Can see settling of surface material around well casing, **AND/OR** visible space between well casing and surrounding surface material.	☐
7 **Casing Depth**	More than 45 m (150 ft) below ground level.	31-45 m (101-150 ft) below ground level.	15-30 m (50-100 ft) below ground level.	Less than 15 m (50 ft), **OR** no casing.	☐
8 **Casing height above ground level**	40 cm (16 in) or more above normal ground level.			***Less than 40 cm (16 in) above normal ground level, in pit or in basement.**	☐
9 **Age of well**	Less than 20 years old.	Less than 40 years old.	40-60 years old.	More than 60 years old.	☐

**These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #4

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
MANAGEMENT OF PRIVATE WELL WATER SUPPLY					
10 Type of well	Drilled. - Casing terminates above ground, approved well cap.	Drilled. – Casing terminates in a well pit.	Sand point.	Bored or dug.	☐
11 Backflow prevention	Anti-backflow devices (such as check valves and vacuum breakers) installed on all faucets with hose connections, **AND** air gap of at least 15 cm (6 in) maintained.	Anti-backflow devices installed on some faucets with hose connections, **AND** air gap of at least 15 cm (6 in) maintained.	No anti-backflow devices, **AND** air gap of at least 15 cm (6 in) maintained.	No anti-backflow devices, **OR** air gap not maintained.	☐
12 Unused or abandoned wells	No unused or abandoned wells.	Unused wells capped, properly protected and maintained, **AND** abandoned wells properly plugged and sealed.		***Unused wells not capped or protected,** ***OR abandoned wells not properly plugged and sealed**.	☐
13 Water testing	Water tested for bacteria more than 3 times a year (including once in the spring) and more than once a year for other parameters (e.g., nitrate levels), **AND** bacteria, nitrate, and other tests (health related) always meet Ontario Drinking Water Standards.	Water tested 3 times a year for bacteria and once a year for other parameters (e.g., nitrate levels), **AND** bacteria, nitrate, and other tests (as needed) usually meet Ontario Drinking Water Standards on the first test and always on the second test (the follow-up check) if first test fails.	Water tested less than 3 times a year for bacteria and not tested for other parameters (e.g., nitrate levels).	Water is not tested, **OR** does not meet Ontario Drinking Water Standards on first test or on second test (follow-up check).	☐

tip

Your local Health Unit is a valuable resource in helping you manage the quality of your drinking water. Ask your neighbours what their tests reveal.

**These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #4

Glossary

Private Well Water Supply

Terms you need to know for Worksheet #4

Abandoned well: A well that has been permanently plugged and sealed.

Air gap: An air space (open space) between the hose or faucet and the level of liquid. This is one way to prevent backflow of liquids into a well or water supply.

Anti-backflow device: Check valve, vacuum breaker or other mechanical device that prevents liquids from flowing backwards through a water supply pipe to a well or surface water source. Also called an anti-back siphoning device.

Backflow: The unwanted reverse flow of liquids in a piping system.

Bored well: Large diameter well constructed by using specialized earth boring equipment. Casing material is usually concrete or corrugated steel. These wells are typically 60 to 90 cm (24-36 in) in diameter.

Cap: *See* Well cap.

Casing : *See* Well casing.

Capture zone: *See* Well capture zone.

Contaminant source: Anything which can cause pollution. Septic systems, stored pesticides, fuels, pet wastes, furnace oil, paints and cleaners are all possible contaminant sources. Contaminants may be colourless and/or odourless.

Drilled well: Well not dug or driven. These wells are normally 10 to 20 cm (4 to 8 in) across.

Dug well: Large-diameter well often constructed by power shovel, back-hoe or by hand.

Ontario Drinking Water Standards: The minimum water quality standards set by the Ontario Ministry of the Environment to protect public health. It is advisable that drinking water meets these standards.

Sand point wells/ driven wells: Wells constructed by driving assembled lengths of pipe into the ground. These wells are usually smaller in diameter (5 cm or less) and less than 15 metres (50 feet) deep. They can be installed in loose soils, such as sand.

Source Water Protection Plan: A plan devised by the Ontario government to ensure that every watershed in the province has an action plan to protect its water resources.

Surface Material: Refers to soil, lawn, or other ground material that surrounds the well.

Glossary

Unused well: A water well that is not currently used or is used occasionally. All water wells regardless of use must be properly maintained or they must be properly abandoned (plugged and sealed).

Vent: *See* Well vent.

Well cap: A commercially manufactured device used to cover the top of a well casing pipe. This cap prevents surface water, vermin, or solid material from entering the well.

Well capture zone: The area of land that replenishes water to a pumped well or a group of wells. Determining the size of a capture zone is complex and expensive. Knowing its area may not be necessary if the entire property is treated as the capture zone for the well(s) and potential contaminant sources are managed properly.

Well pit: Lined, shallow excavation around the top of the well casing of a drilled well.

Well casing: Steel, fibreglass, plastic pipe or concrete tile, installed when a well is constructed, in order to strengthen the well bore hole so it does not collapse. It also prevents contaminants from entering the well and allows placement of a pump or pumping equipment.

Well vent: An opening in the well cap or well seal that makes the air pressure inside the well the same as outside. It also lets gases escape. The vent should always have a screen to prevent dirt, vermin, or other materials from getting into the well. A screened pipe may extend from the vent up above ground level to prevent flooding of the well.

Resources List

Private Well Water Supply

For more information…

Ontario Ministry of Agriculture, Food and Rural Affairs

Agricultural Information Contact Centre at 1-877-424-1300
www.omafra.gov.on.ca

Factsheets/Leaflets:
- Private Water Well Owners – Dealing with Water Shortages (order no. 99-025)
- Water Quality for House and Barn (order no. 87-026)

Videotapes:
- Water Wells (produced by Town & Country Ontario Television)

Ontario Ministry of Environment

Public Information Centre
135 St. Clair Ave. West, Toronto, ON M4V 1P5
Toll-free: 1-800-565-4923
www.ene.gov.on.ca

Factsheets/Leaflets:
- Green Facts: Important Facts About Water Well Construction PIBS no. 3788e01, 2003
- Green Tips: Managing Your Water Well in Times of Shortage PIBS no. 3784e, 1999
- Green Facts: The Protection of Water Quality in Bored and Dug Wells PIBS no. 3962e01, 2003
- Green Facts: The Protection of Water Quality in Drilled Wells PIBS no. 396e01, 2003
- The Protection of Water Quality in Jetted or Driven Point Wells PIBS no. 4505e, 2003

Videotapes:
- Well Aware – A Well Owner's Guide

Publications:
- Information on the Use of Home Water Treatment Devices
- *Ontario Water Resources Act*
- Ontario Regulation 903 (Water Wells). This regulation governs how wells must be constructed in Ontario. It includes construction standards, distances required from contaminant sources, and licensing requirements for well contractors.
- Best Management Practices series: Water Wells, 2003 (with Agriculture and Agri-Food Canada)

Ontario Ministry of Health and Long-Term Care

MOHLTC INFOline
Toll-free: 1-800-268-1154
www.health.gov.on.ca

Contact the local Health Unit for these Information Sheets:

- Get Acquainted with Your Well
- Keeping You Well Informed
- Pathogens and Your Well Water
- Putting Your Well Water to the Test
- Choosing a Water Treatment System
- Disinfection Instruction Sheet
- Keeping Your Well Water Safe to Drink (Poster)

Worksheet #5 - Wastewater & Septic Systems

Use this worksheet to determine whether household water is treated safely on your property.

Why should you be concerned?

- In urban areas, household wastewater is treated at a treatment plant before it is discharged into the lake.
- In rural areas, people use a septic tank or similar system to treat household wastewater. All the water that flows down your drains ends up in your septic system. It must be able to safely handle all the wastewater to prevent contamination of ground and surface water.
- Household wastewater contains disease-causing bacteria and viruses, household chemicals, and excess nutrients. All of these contaminants can cause serious health problems.
- Your household water should be tested regularly for total coliform and E-coli. If present, these bacteria indicate that the water is not safe for drinking or food preparation. Your septic tank system could be one source of contamination.
- If your home treatment system has to handle too much wastewater, it will not be as effective and may cause premature failure. Increased use of water, through additional appliances or a second bathroom will increase the load on your septic system.
- Not only can septic system failure be highly inconvenient, it can also be very expensive. In addition, new regulations and higher standards may mean that the system may have to be replaced instead of being repaired or upgraded.
- Facilities such as outhouses and chemical toilets can be effective and environmentally responsible. Contact your local Health Unit or municipality to learn more.

What can you do?

1. Make sure your septic system is large enough to meet your needs. Look for ways to reduce the amount of wastewater that enters the septic system.

2. Protect your health and the quality of your drinking water by disposing of contaminants properly.

3. Keep your septic system in good repair. Pump the septic tank out regularly (every 3-5 years).

4. Keep trees and shrubs out of your septic field.

5. Consider renting a portable privy when hosting large gatherings.

Wastewater & Septic Systems: How do you rate?

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
QUANTITY OF WASTEWATER					
1 **Efficient water use affects septic function**	Conservative water use (less than 180 litres/40 gal. per person per day).	Moderate water use (180-270 litres/40-60 gal. per person per day).	High water use (271-360 litres/61-80 gal. per person per day).	Very high water use (greater than 360 litres/ 80 gal. per person per day).	☐
2 **Fixtures and maintenance**	Water-conserving fixtures throughout house, **AND** fixtures are inspected regularly, **AND** leaks fixed immediately.	Some water-conserving fixtures throughout house, **AND** some fixtures are inspected regularly, **AND** some leaks are fixed immediately.	No water-conserving fixtures in house, **OR** fixtures are not inspected regularly. Problems are fixed when found. **AND** some leaks are fixed immediately.	No water-conserving fixtures. **OR** leaks are not fixed immediately.	☐
QUALITY OF WASTEWATER					
3 **Solid waste**	No use of garbage disposal unit in kitchen sink.			Daily use of garbage disposal unit in kitchen sink.	☐
4 **Dissolved waste**	Minimal use of environmentally unfriendly household detergents and cleaners (0.2 litres or cups per week), **AND** no disposal of household solvents and cleaning agents into plumbing system.	Careful use of household detergents and cleaners (0.5 litres or pints per week), **AND** minimal disposal of household solvents and cleaning agents into plumbing system.	Moderate use of household detergents and cleaners (1 litre or quarts per week), **OR** moderate disposal of household solvents and cleaning agents into plumbing system.	High use of household detergents and cleaners (4 litres or gals. per week), **OR** frequent disposal of household solvents and cleaning agents into plumbing system.	☐

tip

Install faucet aerators and use low-flow shower heads.

tip

Using less water helps your septic field perform better.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
QUALITY OF WASTEWATER *continued*					
5 Water softener discharge	Water softener does not discharge to septic tank.	Water softener discharges to septic tank but the system is properly designed to accommodate discharge water.		Water softener discharges into septic tank not designed to accommodate discharge water.	☐
6 Grease and oils	No disposal of household grease or oils into plumbing system. **AND** household wastes only.	Minimal disposal of household grease or oils into plumbing system and oil and grease wiped from cooking utensils before washing.	Moderate disposal of household grease or oils into plumbing system, OR no attempt to reduce disposal of grease and oil from household.	Frequent disposal of household grease or oils into plumbing system.	☐
WASTEWATER TREATMENT SYSTEM					
7 Design and construction	Has Building Permit or Certificate of Approval, **AND** system adequately sized, **AND** system installed by a licensed installer.			***No Building Permit or Certificate of Approval,** ***OR system not sized according to regulatory requirements,*** ***OR system not installed by a licensed installer.***	☐

tip

All septic systems eventually need replacing but with proper maintenance your system can last 15 years or longer – even with *year-round* use.

tip

Don't park or drive any vehicle or any heavy equipment on the leaching bed of your septic system.

** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #5

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
WASTEWATER TREATMENT SYSTEM *continued*					
8 **Knowledge of septic system**	Excellent knowledge of overall septic system size, location, and operation.	Good knowledge of overall septic system size, location, and operation.	Limited knowledge of overall septic system size, location, and operation.	No knowledge of overall septic system size, location, and operation.	☐
LOCATION OF WASTEWATER SYSTEM					
9 **Distance from wastewater treatment system to nearest surface water**	Greater than 150 m (500 ft)	61-150 m (200 - 500 ft)	15-60 m (50-199 ft) for: • septic tank • leaching bed • holding tank • other treatment unit	***Less than 15m (50 ft) for:** • ***septic tank*** • ***leaching bed*** • ***holding tank*** • ***other treatment unit***	☐
10 **Distance from wastewater treatment system to a well**	Greater than 90 m (300 ft)	For leaching bed or holding tank: • 24-90 m (76-300 ft) (drilled well) • 47-90 m (151-300 ft) (bored/dug well)	For leaching bed or holding tank: • 15-23 m (50-75 ft) (drilled well) • 30-46 m (100-150 ft) (bored/dug well) For septic tank or other treatment unit: • 15-23 m (50-75 ft) (drilled well) • 15-46 m (50-150 ft) (bored/dug well)	***For leaching bed or holding tank:** • ***less than 15 m (50 ft) (drilled well)*** • ***less than 30 m (100 ft) (bored/dug well)*** ***For septic tank or other treatment unit:*** • ***less than 15 m (50 ft) (all wells)***	☐

tip

Always maintain as great a distance as you can between a potential contaminant source and wells or surface water.

**These conditions may violate provincial legislation or municipal by-laws.*

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating

COLLECTION OF WASTEWATER

11 Source and amount

Best 4: All wastewater is collected for treatment,

AND there is no loss of wastewater that should be treated,

AND no clear water is collected and directed to the septic system,

AND no clear water enters the septic system by infiltration through joints, access ports, etc.

tip

To keep your septic system operating at peak performance, don't let unnecessary clear water enter the system. This means fixing leaks and conserving water.

Good 3:

tip

All downspouts should be diverted away from sewage system disposal areas. An average size home will deposit 11 400 litres (3000 gallons) of water onto the ground after an 8 centimetre (3 inch) rain storm.

Fair 2: ***Some wastewater does not reach septic system because of leaks,***

OR some wastewater is diverted away from the septic system,

OR clear water is getting into the septic system.

Poor 1:

Your Rating: ☐

WASTEWATER TREATMENT SYSTEM

12 Subsurface distribution of wastewater *(septic or other treatment systems)*

Best 4: Pressure or dosed distribution to leaching bed.

Good 3: Gravity-fed distribution to leaching bed.

tip

If on clay soil, plant grass over the leaching bed. If on sand, plant beach grass or leave without a ground cover.

Fair 2:

Poor 1: ***Drainage directly into septic field, with no septic tank***

OR piped to anywhere but a septic or other approved treatment system.

Your Rating: ☐

*** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #5

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PRETREATMENT SYSTEM					
13 **Septic tank**	Two compartment tank, **AND** septic tank checked every 3 years and pumped as required, **AND** good maintenance - baffles and tank checked , and no leaks.	Two compartment tank, **AND** septic tank checked every 4-5 years and pumped as required, **AND** some maintenance, and no leaks.	Single compartment tank, **OR** septic tank checked every 6-10 years and pumped as required, **OR** no maintenance, but no leaks.	Single compartment tank, **OR** seldom pumped out –last time more than 10 years ago, **OR** no maintenance, no checks, and leaks from tank.	☐
14 **Other treatment system**	Regular maintenance program followed, **AND** no mechanical failures, **AND** loaded at rate below design capacity.	Regular maintenance program followed, **AND** no mechanical failures, **AND** loaded at rate near design capacity.	Regular maintenance program not followed, **OR** occasional failures (once every 2 years).	No maintenance program, **OR** frequent system failure, **OR** system overloaded.	☐
OR					
15 **Holding tank - no leaching bed connected**	Capacity is higher than design requirements, **AND** tanks checked - no leaks **AND** working alarm system.	Capacity meets design requirements, **AND** tanks checked - no leaks **AND** working alarm system.	Loaded at design capacity. **OR** tanks not checked for leaks **OR** alarm system not working .	***Capacity does not meet recommended guidelines,** ***OR leaks and overflow from tank,** ***OR no alarm system.**	☐

*These conditions may violate provincial legislation or municipal by-laws.

Worksheet #5

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PRETREATMENT SYSTEM *continued*					
16 **Leaching bed location and vegetation**	Located more than: • 5 m (16½ ft) from any building or structure. • 3 m (10 ft) from any property line.	Located: • 5 m (16½ ft) from any building or structure. • 3 m (10 ft) from any property line.	**tip** Keep trees or shrubs out of the septic leaching bed.	***Located less than:** • ***5 m (16½ ft) from any building or structure.*** • ***3 m (10 ft) from any property line.***	☐
17 **Leaching bed surface water drainage**	Surface water drains away from leaching bed area.			Surface water drains onto leaching bed area.	☐
18 **Depth to water table or bedrock from trench bottom**	More than 1.8 m (6 ft).	0.9-1.8 m (3-6 ft).		***Less than 0.9 m (3 ft).***	☐
19 **Leaching bed loading (visual inspection)**	Soil always firm, **AND** no odours.	Ground is seldom wet, or spongy, **AND** no odours.	Ground is frequently wet, or spongy, **OR** odours noticed occasionally.	Ground is always wet or spongy, **OR** strong odours noticed frequently, ***OR pooling or bubbling of wastewater noticeable on surface.***	☐
HAULED SEWAGE					
20 **Disposal of pumpage from septic tanks, other treatment systems, and holding tanks**	Regulated, certified disposal by a licensed hauler.			***Disposal is not done by a licensed hauler.**	☐

** These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #5

Glossary

Wastewater and Septic Systems

Terms you need to know for Worksheet #5

Baffles: Inlet and outlet devices in a septic tank, designed to reduce the transfer of solids to the leaching bed. They also prevent fats, oils, and grease from discharging to the leaching bed. They increase the amount of solids retained, prevent plugging of inlets and outlets, and prevent rapid flow of wastewater through the tank.

Clear water infiltration: Entry into a septic system by water that does not need treatment, such as rainwater or sump pump.

Coliform organisms: Harmful bacteria usually found in polluted water. If they are found in a water sample, it indicates that the water may not be safe for drinking or food preparation.

Design capacity: The total daily sanitary sewage flow that the septic system is designed to handle. The Ontario Building Code (OBC) determines wastewater flows.

Downspout: A vertical conduit used for draining water from the roof gutters of a building.

E-coli: Harmful bacteria that comes from human and animal feces. If E-coli is found in drinking water, it is not safe for drinking, food preparation or bathing. Water with any levels of E-coli should not be used for any purpose.

Faucet aerator: A round case at the mouth of the faucet that contains a mesh-like disk, through which the water flows. Low-flow faucet aerators save water as well as any energy used to heat that water

Health Unit: A provincial health agency that administers health promotion and disease prevention programs through local offices. This may also be enforcement pf Part 8 of the Ontario Building Code. There are 36 Health Units in Ontario.

Household chemicals: Any chemicals normally used within the house such as detergents or cleansers.

Household waste: Waste that is commonly generated in the average home.

Leaching bed (trench type): Consists of trenches of buried distribution pipe. Each pipe is set in a bed of stone in a trench. Wastewater leaves the septic tank and flows through the distribution pipe into the soil through perforations in the pipe.

Leaching bed loading: Refers to the volume of wastewater in relation to the capacity of the leaching bed. Increased household water use can overload the system

Glossary

Loading: *See* Leaching bed loading.

Low-flow shower head: A shower head that restricts the flow of water and forces it through very small apertures. It uses 8-9 litres (about 2 gallons) per minute while a conventional showerhead uses 15 -19 litres (3-4 gallons) or more per minute. It is easy to install and can be fitted to most standard shower arms.

Nutrients: Human waste contains nutrients that, when available in excess, can become a pollutant.

Other treatment systems: Includes biofilters, packaged aerobic systems, sand filter systems, etc. See the Ontario Building Code (OBC) for approved systems.

Pressure or Dosed distribution: A septic system that utilizes a pump to load shallow, rapidly-changing, distribution lines in doses.

Pretreatment: First step in treating wastewater to make it suitable for further treatment or disposal. For example, the septic tank retains most of the sludge from the wastewater, making further treatment in the leaching bed more effective.

Septic system: Consists of a tank to settle the solids out of the wastewater, followed by a leaching bed in which the wastewater is treated and distributed into the soil.

Septic tank: A watertight vault in which sanitary sewage is collected to remove scum, grease, and solids from the liquid without the addition of air. This is where solids settle and anaerobic digestion of the sanitary sewage takes place.

Subsurface distribution: Underground discharge of household wastewater to a leaching bed after pretreatment in a septic tank.

Surface water: Any open or exposed body or flow of water including springs, streams, rivers, ponds, lakes, or drainage ditch/drains, etc. May also refer to surface rain runoff.

Treatment: Reduction of the level of contaminations in wastewater so that they are not as harmful to human health or the environment.

Wastewater: Water of domestic origin, including water-borne waste from kitchen, laundry, and bathrooms (toilet, shower, tub).

Wastewater treatment system: A sewage system approved under the Ontario Building Code (OBC).

Water-conserving fixtures: Household fixtures and appliances designed to reduce the volume of water consumed with their use. Examples are low-flow shower heads, faucet aerators, and water-efficient toilets.

Resources List

Wastewater and Septic Systems

For more information…

Ontario Ministry of Agriculture, Food and Rural Affairs

Agricultural Information Contact Centre at 1-877-424-1300
www.omafra.gov.on.ca

Publications:
- Septic Smart, 1999 (with Ontario Soil and Crop Improvement Ass.)
  (519) 826-4214 *www.ontariosoilcrop.org*

Factsheets/Leaflets:
- Care and Maintenance of a Rural Septic Tank System
  (order no. 93-081)

Ontario Ministry of Municipal Affairs and Housing

Booklets:
- A Guide to Operating and Maintaining Your Septic System, 1999
- Septic Smart: New Ideas for Household Septic Systems on Difficult Sites, 1999

- *Ontario Building Code* Part 8

Ontario On-site Wastewater Association

Leaflets:
- Ontario On-site Sewage Systems Do's and Don'ts Guide

Canada Mortgage and Housing Corporation

www.cmhc-schl.gc.ca

Factsheets/Leaflets:
- Your Septic System
- Ontario Rural Wastewater Centre
- Household Guide to Water Efficiency

Additional Resources

Your local Conservation Authority, Medical Office or Local Government should also have information or be able to provide you with assistance.

Check the *Yellow Pages* for licensed septic system installers

Gardening and Landscaping

Worksheet #6a – Landscape Water Efficiency

Use this worksheet to learn about water efficiency in the landscape.

Why should you be concerned?

- There is a limited supply of fresh, clean water.
- As water moves through the ground, it is filtered and purified before it is stored in underground aquifers.
- If water is drawn from these aquifers at a rate faster than it can be replenished by the water cycle, we can experience severe shortages and damage to aquatic systems.
- Prolonged temperature changes, such as heat waves, make the problem worse by lowering the groundwater levels even further.
- While the fresh water supply is shrinking, demand from municipalities, industries and agriculture is always increasing.
- Whether your drinking water comes from a private or a municipal well, we're all pulling water from the same limited source.

What can you do?

1. Find out how much water you use in your landscaping and gardening.

2. Choose proper equipment that is water efficient and keep it in good condition. Repair all leaks.

3. Consider plants that grow well in local conditions without a lot of irrigation.

Landscape Water Efficiency: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
WATER MANAGEMENT AND USE					
1 Knowledge of water use in the landscape	Water use is monitored regularly and steps are taken to improve efficiency.		Water use is monitored on occasion.	Water use is not monitored.	☐
	Regular monitoring for leaks. Leaks are fixed immediately.		Leaks are repaired only when they become a problem.	Leaks are not repaired.	☐
2 Irrigation Equipment type	Irrigation equipment applies water to plant rooting area only (e.g., drip system).	Low-level sprinkler system.	Mid-level sprinkler or mobile sprinkler head.	Fixed sprinkler head.	☐
3 Irrigation design	System is properly designed and sized for the size of the garden or landscaped area.			Irrigation system too large for the garden area.	☐
	No ponding of irrigation water.	Water ponds briefly but then infiltrates soil.	Irrigation water ponds but does not run off the property.	Water runoff along the surface and into any underground drains.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
WATER MANAGEMENT AND USE					
4 Watering your plants	Good knowledge of plant water needs and limitations, **AND** soil moisture, water application rate and the volume of water are monitored.	General recommendations followed for water needs of specific plants, **OR** soil moisture, water application rate and the volume of water are monitored.	General recommendations for water needs of specific plants known but not always followed.	Water needs of plants are not known.	☐
	Watering schedule is adjusted according to rainfall, stage of plant development, use of water gauges, and plant appearance.	Watering schedule is sometimes adjusted according to rainfall, stage of plant development, use of water gauges, and plant appearance.	Monitored watering limited to when establishing new plants.	Watering is not adjusted according to rainfall, stage of plant development, use of water gauges, and plant appearance.	☐
	Water only in the early morning.	Water only in the early morning or early evening.	Water only in the late evening, thereby increasing the chance of fungal disease.	Water during the hottest hours of the day.	☐

tip

Use rain barrels or cisterns to collect irrigation water for plants.

tip

Watering in the morning (versus the evening) lowers the chance of fungal disease on plants.

Glossary

Landscape Water Efficiency

Terms you need to know for Worksheet #6a

Aquifer: An underground layer of rock and sand that can store water, and lies above a layer of clay or other impermeable material that does not allow water to flow to lower depths. Aquifers can be present at various depths depending on the location of the impermeable material. They are an important well water source.

Fungal disease: Any fungus harmful or lethal to plant growth.

Infiltrate/ infiltration: Refers to the passage of water into and through the soil from an outer surface

Irrigation: The process of drawing water from a concentrated source (well, pond, municipal water system, etc.) and applying it to your garden or landscaping.

Low-level sprinkler: Sprinkler where water stream reaches a low height; type often seen on residential properties with direct, pulsed water jets.

Mid-level sprinkler: Sprinkler where water stream reaches a moderate height; type often seen on residential properties for children's recreational use.

Fixed sprinkler head: Sprinkler head affixed in place more or less permanently.

Monitor: To become aware of the volume of water used and to measure weekly rainfall using a rain gauge.

Ponding: The process through which water collects or pools on a surface before being infiltrated into the ground.

Runoff: Snow melt or rain that flows overland rather than infiltrating through the soil/rock.

Water efficiency: The degree to which practices or devices are used to reduce the amount of water needed to do a job.

Resources List

Landscape Water Efficiency

For more information…

Capital Regional District.
Factsheet: Water Department. Straight Talk About…Landscape Care During Water-use Restrictions. Victoria, BC.
Online: *www.crd.bc.ca/water/conservation/factsheets/documents/fact5.pdf*

City of Toronto
Water Efficiency Plan
www.toronto.ca/watereff/plan.htm

York Regional Municipality
Water Efficiency Today. . .Water for Tomorrow
www.water4tomorrow.com

Gardening and Landscaping

Worksheet #6b - Natural Buffers and Shoreline Access

Use this worksheet to learn about living within natural buffer areas.

Why should you be concerned?

- Much of the Lake Huron shoreline is lined and protected by local natural buffers.
- A buffer is an area of natural vegetation that runs along the shoreline, stream or bluff. It extends from the high water mark to the water's edge.
- Natural buffers can include dunes, wetlands, beaches, forest corridors, and any native vegetation along the shoreline or bank.
- Natural buffers not only protect the stability of the shoreline, bluff, or bank, but they protect water quality by filtering and purifying water before it enters a watercourse.
- In order to visually or physically access water, people sometimes remove all or part of a buffer. This activity weakens the buffer's ability to protect against erosion or poor water quality.
- This leads to the degradation of ecological function. It can also lead to liability cases with neighbours, and criminal charges if fish habitat is harmed.

What can you do?

1. Minimize water access points, avoid locating access ways through environmentally sensitive areas (ESA's).

2. Maintain the existing buffer(s).

3. Restore buffers where they have previously been removed or degraded, in consultation with your local Conservation Authority.

4. Divert downspouts into screened rain barrels to reduce erosion.

Natural Buffers and Shoreline Access: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
1 **Puncturing the buffer**	Buffer is not punctured for access to water.	Only a small puncture in your buffer.	Buffer is punctured but vegetation is allowed to re-establish naturally, **OR** punctures are concentrated in one area.	Buffer mostly punctured or non-existent. Vegetation cleared and prevented from re-establishing.	☐
2 **Size of buffer**	Buffer is greater than 50m (165 feet) wide and in ESA areas, buffer is 150m (500 feet) wide.	Buffer is at least 50m (165 feet) wide.	Buffer is less than 50m (165 feet) wide.	There is no buffer present. Grass/lawn extends to property limit.	☐
3 **Composition of buffer**	Buffer comprises native vegetation.	Buffer comprises mostly native vegetation and some non-invasive, introduced species.	Buffer comprises some native vegetation and mostly non-invasive introduced species.	Buffer comprises no native vegetation and mostly invasive and/or non-invasive introduced species.	☐
4 **Property maintenance**	Aware of any especially sensitive buffers, including wetlands, dunes, bluffs, ESA, ANSI and active in protecting them.	Aware of any especially sensitive buffers, including wetlands, dunes, bluffs, ESA, ANSI and plans to protect them.	Aware of any especially sensitive buffers including wetlands, dunes, bluffs, ESA, ANSI. No plans to protect them.	No awareness of any especially sensitive buffers including wetlands, dunes, bluffs, ESA, ANSI and no plans to protect them.	☐
	All trees, woody debris, and leaves are left in place. No alterations.	Vegetation alterations are limited to pruning branches from trees to provide for visual access.	Trees removed to provide access are concentrated in one area. Other vegetation is not removed.	Trees are removed throughout to provide visual access.	☐

tip

A 20 metre (65 feet) wide stretch of dune is equal to approximately $80 000 in engineered shoreline protection!

Glossary

Natural Buffers and Shoreline Access

Terms you need to know for Worksheet #6b

ANSI (Area of Natural and Scientific Interest): Areas identified by the Ministry of Natural Resources as containing natural landscapes or features that have been identified as having life or earth science values related to protection, scientific study, education and natural heritage appreciation. Such designation helps to protect representative and special natural areas, plants and animals.

Beach: A band of variable width, typically of sandy material located adjacent to the lake. The sand is deposited and removed by the action of waves and currents.

Bluff: A high, steep bank at the water's edge. Along the Lake Huron shoreline, bluffs are typically composed of glacial till (predominantly clay and silt).

Coastal wetland: Areas that are permanently or temporarily submerged, or saturated for at least part of the year. Unlike upland wetlands, coastal wetlands don't transition into drier communities.

Conservation Authority: Localized government body that is responsible for the management of a watershed and especially the floodplains within that watershed.

Dune: A dune is a large mound or ridge formed by the deposition of sand.

Erosion: The process by which soil or rock are removed worn away by water, wind, or other forces or processes.

ESA (Environmentally Sensitive Area): Designation given to an area with valuable ecological features or habitat that need special protection due to its surrounding landscape, wildlife or historical value.

Forest corridor: a linear remnant of a forest community. It is too narrow to be viable as habitat but can have the important role of connecting other larger isolated or separate areas of forests, creating the effect of contiguous forest. This allows animals and other species to travel through disturbed landscapes.

Invasive species: A species, either native or non-native, which typically spreads quickly and may be difficult to control or eradicate. These species are of concern because they can be detrimental to other species and threaten ecosystems.

Native vegetation: A cumulative term to describe any and all plants that are adapted to and occur naturally in a specific location. Also referred to as indigenous.

Puncture: An area of change or disturbance within a natural community such as a buffer. It is often created by a change in land use or development. The threat or damage caused by the puncture depends on its size and the type and health of the natural community or buffer it has disrupted. Punctures provide opportunity for soil erosion and for invasive species to colonize.

Vegetation: All plants including trees, shrubs, non-woody plants, lichens, mosses, etc.

Visual access: The ability to observe an environment or scene from a distance without physical entry or presence.

Resources List

Natural Buffers and Shoreline Access

For more information…

• Lake Huron Centre for Coastal Conservation
P.O. Box 178
Blyth, Ontario Canada
N0M 1H0
Phone: (519) 523-4478
Email: coastalcentre@lakehuron.on.ca
www.lakehuron.on.ca

• Huron Stewardship Council (HSC)
www.huronstewardship.on.ca

Gardening and Landscaping

Worksheet #6c: The Value of a Tree

Use this worksheet to assess trees on your property.

Why should you be concerned?

Please note that this worksheet applies to small cottage lots – not woodlots.

- Ecologically, trees provide shelter and a food source for wildlife. Their presence is critical to the health of their ecosystems and watersheds.
- The roots of trees and shrubs anchor the soil, helping to stabilize slopes and prevent the loss of soil through erosion.
- Trees remove carbon dioxide, one of the main gases involved in climate change, from the atmosphere. They also absorb and store many pollutants that are emitted into the air from industry and cars. This helps to improve the quality of air that we breathe.
- Trees can be natural air conditioners. If planted strategically around windows, doors and outdoor activity areas, trees (especially larger, mature ones) can provide shade from the hot summer sun.
- Similarly, in winter, evergreen trees can provide shelter from cold winds. This can lower the heat loss from buildings and help reduce heating costs.
- From a real-estate perspective, trees add value to a property. They not only help to create an established feeling in a neighbourhood or property, they also improve the appearance.

What can you do?

1. Protect existing trees from animal browsing, insect and disease infestation and physical damage from machinery or weather events.

2. Plant appropriate trees where possible. Check with *Worksheet #6d - Plant Selection and Use*, or your local Conservation Authority to ensure that you are not planting invasive species. Native plants are best suited to local conditions.

3. Identify mature and rare trees that you want to protect. Include these in a long-term management plan.

4. Don’t plant tree buffers on dunes. Dunes are very important and highly sensitive landscape features.

The Value of a Tree: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
TREE ECOLOGY					
1 **Understanding and appreciation for the role of trees in ecosystem health**	Proper instructions followed when planting trees, **AND** tree species selected to suit existing site conditions, **AND** priority given to native species and Species-at-Risk.	Trees planted following proper instructions, **AND** tree species selected to suit existing site conditions.	Non-invasive, exotic species are planted.	No consideration given to tree ecology in selection of new trees, **OR** invasive species are planted.	☐
	Standing, dead trees are left in place to provide habitat. Only hazard trees are felled and left to rot in place.	Both standing and hazard dead trees are felled and left to rot in place.	Some wood is left to rot and provide habitat while some is removed.	All felled wood is removed from your property.	☐
	Trees and shrubs on bluffs and other slopes are protected and never removed. Dead trees are carefully felled and left to rot.	Only some trees (e.g., hazard trees) are removed from bluffs and other slopes. Great care is taken to ensure that slope stability is not compromised.	Many trees are removed from bluffs and other slopes. No care is taken to ensure that slope stability is not compromised.	All natural vegetation is removed from bluffs and other slopes, ***OR tree limbs that overhang water ways or shores are cut**.	☐

tip

Before clearing or trimming trees on a slope, get a certified arborist to help you with your plans.

tip

Before you cut a tree down, consider the time it took for it to grow to its current size, and check local tree bylaw requirements.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #6c

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
TREE MANAGEMENT					
2 Tree maintenance and care	All trees are protected against browsing, injury, and potential diseases, **AND** no healthy Trees are removed.	Trees in shoreline and Watercourse buffers are protected, **AND** no healthy Trees are removed.	Trees are not protected, **OR** some healthy trees are removed.	Lot is generally cleared.	☐
	Branch pruning is done properly and at the right time to provide lake views from a distance.	Branch pruning is irregular but is done properly.		Trees are pruned carelessly or without regard for tree health and vigour.	☐
	Trees are watered properly and regularly for a minimum of three years after planting. **AND** mulch is properly piled at least 3 inches from tree trunk.	Trees are watered during hot, dry periods for the first three years after planting. **AND** mulch is properly piled at least 3 inches away from tree trunk.	Trees are watered irregularly, **AND** mulch is properly piled at least 3 inches away from tree trunk.	Watering is inadequate during the first three years following planting, **OR** mulch is piled too close to the tree trunk, causing damage to bark.	☐
3 Knowledge of issues related to tree health	Have knowledge of potential insect and disease problems in your area, **AND** a certified arborist is hired to assess tree health and development and to develop a long-term management plan.	A certified arborist is hired to assess tree health and development and to develop a long-term management plan.	Existing trees are checked periodically for disease or insect infestation.	No consideration is given to tree health or insect problems in your area.	☐

tip

Protect trees during construction by ensuring that there is no disturbance within the dripline.

tip

Be aware of the source of new trees when purchasing and ensure they are infection-free before planting.

tip

If necessary, ensure trees are properly staked after planting and that stakes are removed after 2 years.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
TREE MANAGEMENT					
4 Tree root system	Tree rooting zone has adequate soil volume and conditions appropriate to the tree species	Tree rooting zone is adequate but may need supplemental feeding.	Tree rooting zone is not less than 60% of appropriate volume and may require supplemental watering during dry spells.	Soil volume and growing conditions of rooting zone are inadequate for the tree species selected.	☐
5 Soil	Tree species selected is well suited to existing soil conditions especially soil structure and moisture availability.	Tree species selected is tolerant of existing soil conditions.	Tree species selected will survive existing soil conditions with occasional supplemental feeding and watering.	Tree species selected is unsuited to existing soil conditions, especially moisture availability.	☐

tip

Most tree roots extend beyond the drip line of the tree.

tip

Cues for proper species selection can be gained by looking at nearby native or non-invasive trees that are thriving in the same conditions as your property.

tip

Never pile mulch too close to the trunk of a tree. This can damage the bark, possibly girdling and killing the tree.

Glossary

The Value of a Tree

Terms you need to know for Worksheet #6c

Arborist: *See* Certified Arborist.

Atmosphere: The layer of air surrounding the earth that is primarily composed of nitrogen and oxygen, and held in place by to gravity.

Buffer: An area of natural vegetation that runs along the shoreline, stream or bluff. It extends from the high water mark to the water's edge. Also referred to as a buffer strip, filter strip or riparian zone.

Browsing: A mode of feeding by herbivores, such as deer or rabbits, in which leaves and outer shoots are removed from trees and shrubs.

Carbon dioxide: A colourless, odorless gas occurring naturally in the atmosphere, but also released through the burning of fossil fuels.

Certified Arborist: A professional trained in the planting, care and maintenance of individual trees and a current member of the International Society of Arboriculture.

Climate change: The gradual change in global temperatures which in turn causes changes in climate around the world. It is caused by the emission of gases that trap the sun's heat in the Earth's atmosphere. Gases that contribute to global warming include carbon dioxide, methane, nitrous oxides, chlorofluorocarbons (CFCs), and halocarbons (the replacements for CFCs). Carbon dioxide emissions are primarily caused by the use of fossil fuels for energy.

Dripline: The outer extent of a tree's branches. The dripline is used as a rule-of-thumb indication of the extent of a tree's root system, though most roots in fact extend beyond the dripline.

Dune: A dune is a mound or ridge formed by the deposition of sand through wind or wave action.

Evergreen trees: Trees that retain their leaves or needles year-round.

Erosion: Movement and loss of soil, generally caused by water (rain or surface water runoff), wind, or human activity.

Exotic (plant): An exotic species (also known as an introduced species) is an organism that is not indigenous to the place or area where it resides and instead has been accidentally or deliberately transported to the new location by human activity. Exotic species can often be damaging to the ecosystem to which they are introduced.

Hazard tree: A tree or any component of a tree that has sufficient structural infirmity to be identified as having a high risk of falling and causing personal or property damage.

Invasive species: A species, either native or non-native, which typically spreads quickly and may be difficult to control or eradicate. These species are of concern because they can be detrimental to other species and threaten ecosystems.

Management Plan: A (typically) paper document that outlines the guidelines and recommended practices to be implemented over a full rotation cycle in order to achieve current and future goals of the owner.

Native species: Plants and animal species that have evolved in a specific area over a period of time prior to human activity. Also referred to as naturally-occurring species or indigenous.

Non-invasive species: Any species, either native or not native, that does not exhibit the characteristics of an invasive species (see above).

Resources List

The Value of a Tree

For more information…

General Tree Ecology / Advice

- Local Ministry of Natural Resources office (*see Blue Pages*)
- Local Conservation Authority (*see Blue Pages*)
- Local Naturalist Clubs
- Ontario Forestry Association
  www.oforest.on.ca
- Management Forest Tax Incentive program
  Contact local municipal office or
  ontariosforests.mnr.gov.on.ca/mftip.cfm
- Huron Stewardship Council
  www.huronstewardship.on.ca
- Ontario Woodlot Association
  www.ont-woodlot-assoc.org

Pruning and Cutting

- Local arborist (*see Yellow Pages*)
- Local municipal office (*see Blue Pages*)

Advice on Seed / Plant Source

- The Forest Gene Conservation Association
  www.fgca.net
- The Society for Ecological Restoration (Ontario Chapter) - Native Plant Resource Guide. Order online: *www.serontario.org/publica.htm*
- Local Conservation Authority (*see Blue Pages*)
- Lake Huron Centre for Coastal Conservation
  lakehuron.on.ca

Worksheet #6c

Worksheet #6d - Plant Selection and Use

Use this worksheet to help select appropriate plants for your landscape.

Why should you be concerned?

- Native plants have evolved as part of a greater ecological community. They are well adapted to local conditions, and generally have few disease or insect problems.
- Using native species helps to integrate your property into the greater landscape context.
- Native plants are a valuable food source for insects and native wildlife. They also provide valuable habitat for many kinds of species including 'Species-at-Risk'.
- Invasive species can spread into other areas and are difficult to eradicate. They can also introduce disease and require more maintenance such as watering and fertilizing.
- Avoid extensive lawns because they reduce biodiversity.
- Extensive lawns also contribute to erosion and increase the potential for slope instability.

What can you do?

1. Inform yourself of the plant community in which you live and select plants with the help of your local Conservation Authority, Naturalist Club, or a reputable nursery.

2. Never plant invasive plants on your property and understand which invasive species already exist in your area.

3. Know your soil type and depth. Some areas along Lake Huron have very shallow soils.

4. Reduce your lawn area to only what is needed for particular activities and keep it as far as possible from any water-body or shoreline.

5. Use low-maintenance plants that don't require watering or fertilizing.

Plant Selection and Use: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
1 Plant selection and control	No use or presence of invasive plants on property.	No new planting of invasive plants. **AND** measures taken to eliminate existing invasive plants.	No new planting of invasive plants.	Continued use of invasive plants.	☐
	Complete eradication and proper disposal of existing invasive plants on your property.	Long-term management plan for the eradication of existing invasive plants.	Short-term management plan for the eradication of existing invasive plants.	No attempts to eradicate invasive plants.	☐
	Match plant selection to your soil conditions, **AND** only native plants used.	Plant selection suits local soil and climate conditions, **AND** non-invasive plants selected.	Occasional addition of nutrients to support non-invasive plants.	Plant selection does not suit local soil and climate conditions.	☐

tip

When selecting any plant, consider its size at maturity and determine if this is appropriate to the space available.

tip

When planting in a floodplain, ensure that plants can tolerate seasonal flooding conditions.

tip

Test your soil for nitrogen, phosphorous and potassium levels before adding nutrients. Contact a soil testing lab for more details on soil sampling. See the *Yellow Pages* for a listing near you.

tip

At the Nursery: what you should ask...

1. What native, local plants do you have?
2. Are they nursery grown or were they harvested from the wild?
3. Is there potential for invasion?
4. How can you control or eradicate it if necessary?
5. What are the nutrient and water requirements?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
2 Garden monitoring	Regular checks to ensure that invasive species have not established in gardens, **AND** once spotted, invasive plants are immediately disposed of in an appropriate manner.	Regular checks to ensure that invasive species have not established in gardens.	Occasional checks to ensure that invasive species have not established in gardens, **OR** once spotted, invasive plants are immediately disposed of in an inappropriate manner.	No checks to ensure that invasive species have not established in gardens, **OR** once spotted, invasive plants are not disposed.	☐
3 Lawns	No traditional lawn.	Lawn is limited to area over the septic bed with no use of pesticides, fertilizers or irrigation.	Lawn is kept to a minimum size and at a maximum distance from any shoreline or bluff edge.	Much of property is given over to lawn, **OR** lawn is used to the water's edge.	☐
	Learn about appropriate alternative groundcovers from local experts and plant them, **AND** encourage local nurseries to stock native groundcovers.	Allow for a mix of native and non-invasive plants that tolerate some mowing and drought.	Non-invasive plants used that tolerate some mowing and drought.	Species used require extensive use of irrigation, fertilizer or pesticides. **OR** use of invasive species.	☐
		Sod is used to establish new lawn.	Establishment of new lawn with seed, subject to erosion.	Bare soil.	☐

tip

If planting a traditional lawn with a non-native grass, choose a grass that is hardy, pest resistant and non-invasive.

tip

During hot, dry weather, allow grasses to go dormant.

tip

To gradually remove or reduce the size of your lawn, stop mowing. Gradually, native plants will return.

Dangerous Beauty!....*the problem with invasive species*

Be aware of the plant that can grow anywhere…

A well-intentioned 'gift' from a friend or neighbour may end up taking over your garden and spreading into nearby plant communities where it can have a disastrous impact on the health of that ecosystem. Being invasive depends on site conditions. It is possible that a well-contained plant in your garden may run rampant in a friend's garden.

Never accept or give plants if you are unsure. The following is a partial list of invasive plants that are of concern in Ontario. Check with your Conservation Authority to learn if additional plants are invasive in your area.

AVOID THE USE OF THESE PLANTS!

Trees

- Norway maple (*Acer platanoides*)
- Horse chestnut (*Aesculus hippocastanum*)
- European birch (*Betula pendula*)
- Russian Olive *(Elaeagnus angustifolia)*
- Autumn Olive *(Elaeagnus umbellata)*
- White mulberry (*Morus alba*)
- Scots pine/Scotch pine (*Pinus sylvestris*)
- White poplar/Silver poplar (*Populus alba*)
- Black locust (*Robinia pseudoacacia*)
- European mountain ash (*Sorbus aucuparia*)
- Siberian Elm *(Ulmus pumila)*

Shrubs

- Japanese barberry (*Berberis thunbergii*)
- Oriental bittersweet *(Celastrus orbiculatus)*
- European privet (*Ligustrum vulgare*)
- Japanese honeysuckle (*Lonicera japonica*)
- Multiflowered rose (*Rosa multiflora*)
- Glossy Buckthorn (*Rhamnus fragula*)
- European mountain ash *(Sorbus aucuparia)*
- Wayfaring tree *(Viburnum lantana)*
- European highbush cranberry (*Viburnum opulus*)

Dangerous Beauty!....*the problem with invasive species*

Name: *Coronilla varia*
Common name: Crown vetch
Colours: Light rose flowers, medium green leaves.
Size: Can reach 2 m (6.5 ft).
Type: Perennial vine

Name: *Aegopodium podagraria*
Common name: Goutweed
Colours: Insignificant white flowers, medium green or variegated leaves
Size: Height 15 cm (6 in).
Type: Common groundcover

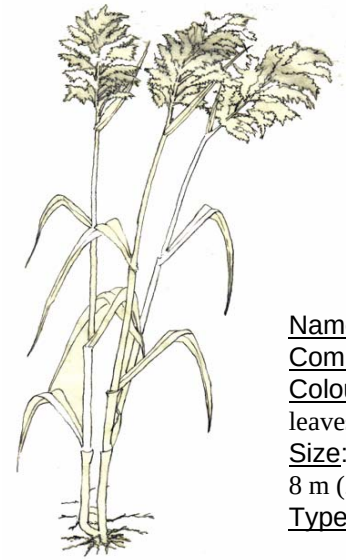
Name: *Hesperis matronalis*
Common name: Dame's Rocket
Colours: Medium pink or light blue flowers, medium green leaves.
Size: Height 75 cm (30 in), spread 60 cm (24 in).
Type: Upright perennial

Name: *Hedera helix*
Common name: Common English Ivy
Colours: Dark green, glossy leaves. Occasionally, white striations visible along veins.
Size: Height 10m (30 ft), spread 5m (15ft)
Type: Vigorous, evergreen self-clinging climber or groundcover

Worksheet #6d

Dangerous Beauty!....*the problem with invasive species*

Name: *Vinca minor*
Common name: Periwinkle
Colours: Violet-blue flowers, dark, glossy green leaves.
Size: Height 10 cm (4 in).
Type: Common groundcover



Name: *Phragmites australis*
Common name: Common reed
Colours: Bronze-purple tufts, light green leaves.
Size: 2 to 4 m (6.5 to 13 ft), can go up to 8 m (26 ft).
Type: Perennial grass

Name: *Polygonum cuspidatum*
Common name: Japanese knotweed
Colours: Light white to pale pink tufts, medium green leaves.
Size: 75 cm to 1.8 m (2 1/2 to 6 ft)
Type: Perennial

Name: *Lunaria annua*
Common name: Silver Dollar
Colours: Medium pink flowers, medium green leaves.
Size: 30 to 90 cm (1 to 3 ft)
Type: Biennial

Worksheet #6d

Tips about cosmetic pesticides & their alternatives…

Why should you be concerned?

- Research studies have found that many cosmetic pesticides are toxic and may cause serious health problems for humans and ecosystems immediately after exposure or many years later.
- The presence of pesticides in surface and groundwater may make it unsuitable for drinking.
- When contaminated surface water runs into streams and lakes, it reduces the quality of the water and may harm fish, wildlife and humans.
- Pesticides must be handled very carefully to prevent them from getting into any water source.
- Below tolerance levels (set by the government) have been found in Ontario's drinking water. We don't know the effects of repeated exposure to very small amounts over a long period of time. Chronic health problems may not appear for many years.

What can you do?

1. Inform yourself of alternative non-toxic or lower toxicity chemicals to deal with the problem.

2. Read and follow instructions carefully. Note if weather conditions may affect application.

3. Avoid storing pesticides for long terms. Buy only the amount you need and make sure you have a safe storage area. Dispose of empty pesticide containers and rinse water safely.

4. Never pour leftovers down the drain, storm sewer or storm drain or into open water.

5. Don't apply on windy days or when it is raining.

Tips about cosmetic pesticides & their alternatives…

Alternatives

Successful landscapes rely on preventative measures and careful monitoring, just like your health. Timely effort saves you time and hassle later on – and your garden will thank you for it!

- Learn about your garden's current situation, such as nutrients, soil type and moisture/shade conditions. Add only what is needed, and work with what can't be changed.

- Keep your lawn fed (compost/manure/fertilizer), aerated, de-thatched and maintain adequate soil moisture. Most problems can be avoided if your lawn is in good shape. Lawn grasses go dormant naturally in the last days of summer and will green up with fall rains.

- Try old-fashioned remedies for pests, such as borax sprinkled around ant nests, insecticidal soap for sap-suckering insects, and baking soda or sulphur for fungal diseases.

- To make plants less appetizing, use a garlic spray (10 cloves of garlic in 1 litre (4 cups) of water and heated for 5 minutes.

- Bring in reinforcements. Create suitable habitat for birds that will eat insect pests.

These are just a few ideas – more abound in literature, the web and your local nursery or plant club. Just ask about pesticide alternatives!

Lawn Care: How to have a healthy, low-maintenance lawn

tip

When to water? How much?

- In hot, dry weather and during water shortages, allow grass to become dormant. Water 7-12 mm (0.25- 0.5 in) every 2 or 3 weeks. Grass will look brown but it is dormant, not dead.
- Encourage deep rooting by watering infrequently but thoroughly. Your lawn needs no more than 1 inch of water per week.

tip

Fertilizing

- Leaving grass clippings on the lawn can increase soil fertility up to 50%.
- If you do use a fertilizer, choose a slow-release product. The nutrients are released slowly, preventing 'lawn burn' and groundwater contamination.

tip

When to mow? How?

- Mow when the grass is as dry as possible.
- Leave your grass at least 8 cm (3 in) long. This encourages root growth and lessens moisture loss.
- Aerating your lawn improves rooting conditions.

tip

Dealing with weeds

- Remove unwanted plants from lawn by hand using long handled tools. It is easier to remove weeds when the ground is damp. Alternatively, pour boiling water over the exposed roots of unwanted plants.
- Spread a layer 8-10 cm (3-4 in) thick of natural mulch overtop your garden. This will prevent weed seeds from germinating.
- If you do use a pesticide, directly spray only those plants that you want to get rid of. Avoid spraying the entire lawn.
- Appropriately dispose of invasive plants. Check the Resources List for information on the control of invasive species.

Glossary

Plant Selection and Use

Terms you need to know for Worksheet #6d

Contaminate/Contamination: Alteration of a material by the introduction of a chemical or other substance so that the material is unfit for a specified use.

Ecosystem: A complex, natural system created and maintained by the interaction and interdependency between all living organisms and their particular environment. Any action taken at any level in this interacting system has a potential domino effect on every other organism or element within the ecosystem.

Groundwater: Fresh water that has seeped through the soil and rock on the earth's surface and naturally collects forming a reservoir, the top of which is referred to as the water-table. This water supplies wells and springs and is the source of most people's drinking water.

Habitat: The environment that provides what an organism requires for survival and reproduction. Specialist species have the ability to live in only one type of habitat, eat only a few types of food, or tolerate a narrow range of climatic or environmental conditions.

Invasive: A non-native species which typically spreads quickly and may be difficult to control or eradicate. These species are of concern because they can be detrimental to other species and threaten ecosystems.

Lawn: A mown or smooth expanse of vegetation typically comprised of one or more grass species.

Native plant: A plant that is adapted to and occurs naturally in a specific location. Also referred to as indigenous. Exotic plants are foreign species that are brought in from elsewhere.

Perennial: A type of herbaceous plant that completes its lifecycle over more than 2 years

Pesticides: A general name given to toxic chemicals used to eliminate or control unwanted insects, diseases, plants or other organisms. Pesticides include insecticides, herbicides, and fungicides.

Pesticide-alternative: Generally any pesticide derived from natural sources and/or that does not require a license to apply. Considered gentler than conventional pesticides, alternatives do not degrade the environment.

Plant community: An ecologically integrated collection of plants existing in an area.

Slow-release fertilizer: The type of synthetic (inorganic) fertilizers that break down using bacteria, fungi or other soil micro-organisms in the soil, or that are coated to reduce solubility. As a result, the nutrient nitrogen becomes available for plants over time. While it is typically more expensive than quick-release fertilizers, it does lower the chance of 'burning' plants when over-application occurs and has less potential to leach into ground or surface water. It is also referred to as Water Insoluble Nitrogen (WIN).

Resources List

Plant Selection and Use

For more information…

Planting for Nature

Ministry of Natural Resources
Information Centre, Toronto (T): 416-314-2225

- Landscaping for Wildlife. Booklet.
- Shrubs for Wildlife. Pamphlet.

Books

Deacon, G. 2006. *Green Tips: How to Save Money and the Planet.* Toronto, ON: Green Living Enterprises.

Rubin, C. 1990. *How to get your Lawn and Garden off Drugs: Pesticide-free Gardening for a Healthier Environment*. Madeira Park, BC: Harbour Publishing.

Weeds and Invasive Species

- Canadian Wildlife Education
  www.cwf-fcf.org
  Invasive Species in Canada database

- Weed Control Act (Ontario)
  www.e-laws.gov.on.ca/DBLaws/Statutes/English/90w05_e.htm

- OMAFRA Weeds in Ontario
  www.omafra.gov.on.ca/english/crops/insects/weeds.html

- Disposal
  gardening.wsu.edu/text/nvproblm.htm
  (also contact your local government, MNR office or Conservation Authority)

Gardening and Landscaping

Worksheet #6e - Nutrients

Use this worksheet to learn about the importance of nutrients in the landscape.

Why should you be concerned?

- Nutrients have an important and beneficial role in plant growth and soil amendments. As plant roots take up nutrients from the soil over time, the soil may become depleted, resulting in less vigorous plant and lawn growth.
- Over-application of fertilizers can result in fertilizer running off the garden or lawn. This can contaminate both groundwater and surface water and encourage algae and algal blooms.
- Our activities both inland and along the shoreline affect the nutrient-loading of our rivers and lakes.
- Water quality protection includes nutrient management and the appropriate use of fertilizers.
- We can all potentially contribute to harmful **eutrophication**, reducing water quality and thereby recreational pleasure.

What can you do?

1. Test to find out the nutrient level in your soil before adding any nutrients.

2. Effectively manage nutrients in an environmentally responsible manner.

3. Reduce your nutrient application volume.

4. Plant species of shrubs and plants that require little or no fertilizing.

N-P-K

Nitrogen (N) for leaf development and vivid green color.
Phosphorous (P) for root growth.
Potassium (K) for root development and disease resistance.

Nutrients: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
FERTILIZER USE AND APPLICATION					
1 **Understanding of plant requirements and fertilizer use**	Good understanding of plant nutrient requirements, **AND** soil is tested to determine nutrient requirements before fertilizing. Fertilizer used accordingly.	Good understanding of plant nutrient requirements, **AND** plants are monitored regularly to detect nutrient deficiencies. Fertilizer used accordingly.	Basic understanding of plant nutrient requirements, **AND** occasional monitoring for plant nutrient deficiencies. Fertilizer used regularly.	No consideration for soil condition or plant nutrient requirements. **OR** excessive use of fertilizer.	☐
	Fully-composted manure and yard waste are used appropriately to amend soil.	Fully-composted manure and yard waste are used appropriately to amend soil, **OR** controlled spot use of fertilizer if necessary.	Occasionally apply fertilizer over the entire garden and/or the lawn.	Over-application of nutrients, **OR** poor care taken in following package instructions.	☐
	Locally-produced, well-rotted compost or manure is used.	Local, well-rotted compost or manure is used, **OR** slow-release synthetic fertilizer is used.	Well-rotted compost or manure is used but not obtained from local sources, **OR** a quick-release fertilizer is used but the nutrient composition is appropriate to the situation.	A quick-release synthetic/commercial fertilizer is over-used.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
2 Application practices and water access.	Nutrient application is a minimum of 30 metres (100 feet) from wells, water intakes, streams and water courses, **AND** a permanently vegetated buffer, greater than 3 metres (10 feet) wide runs between the area of nutrient application and any well, water intake, stream or water course, **AND** check to ensure that heavy rain or thunderstorms are not forecast for at least 24 hours following application.	Nutrient application is a minimum of 30 metres (100 feet) from wells, water intakes, streams and water courses, **AND** check to ensure that heavy rain or thunderstorms are not forecast for at least 24 hours following application.	Nutrient application is a minimum of 30 metres (100 feet) from wells, water intakes, streams and water courses.	Fertilizer, compost or manure applied to frozen or saturated soils, or on slopes where surface run-off is likely, ***OR closer than 30 metres (100 feet) to wells, water-intakes, streams and water courses.**	☐

tip

NEVER compost invasive species unless you are sure that there are no seeds present and that composting will effectively kill the root system.

COMPOST MANAGEMENT

3 Composting practices	Household compost is rodent proof, **AND** compost composition is monitored and mixed regularly, **AND** compost is used on-site.	Compost composition is monitored and mixed regularly, **AND** compost used on-site.	Household compostable waste is sent to local composting facility.	Compostable material not composted.	☐

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #6e

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
4 Water features and ponds	There is no artificial water feature or pond on the property.	Water feature and landscaping are designed to minimize the amount of light falling on water feature, **AND** water is continuously moving in water feature. **AND** water feature(s) are located as far from waterways or open natural water as possible.	Water feature(s) are located as far from waterways or open natural water as possible.	Indiscriminate design, placement and chemical treatment of artificial water features.	☐

tip

If you are experiencing problems with algae in your water feature or pond, be sure to properly diagnose the cause of the problem before attempting treatment.

Glossary

Nutrients

Terms you need to know for Worksheet #6e

Amendment (soil): Organic or inorganic material that is added to the soil for the purpose of improving its texture, nutrients, moisture-holding capacity and infiltration rates.

Buffer: An area of natural vegetation that runs along the shoreline, stream or bluff. It extends from the high water mark to the water's edge. Also referred to as a buffer strip, filter strip or riparian zone.

Compost: Organic material resulting from the natural breaking down or rotting of plant and animal material by bacteria, fungi, and other organisms. It is used to enrich soil.

Compostable: Items that will decompose naturally and enrich soil, such as food and yard wastes.

Eutrophication: A process by which a water body becomes rich in dissolved nutrients. The nutrients encourage algal blooms and plant growth which depletes the water of oxygen, threatening aquatic life. This process can be accelerated by human activity.

Fertilizer: Any organic or inorganic substance that is applied to the soil in either liquid or granular form to improve plant growth and vigour.

Groundwater: Fresh water that has seeped through the soil and rock on the earth's surface and naturally collects forming a reservoir. This water supplies wells and springs and is the source of most people's drinking water.

Inorganic fertilizer: A synthetically-made chemical mixture that is applied to plants to promote growth. Plant nutrients are immediately available for plant roots to absorb. Consequently, the risk of over-application or 'burning' is higher.

Manure: Any animal or plant material that is used to fertilize soil but is not yet broken down or decomposed by bacteria, fungi or other micro-organisms.

Mulch: Loose, organic materials such as woodchips, bark, and straw, or a mixture thereof, that when applied around a plant, protects the plant, suppresses weeds and retains moisture. Re-apply as mulch breaks down over time.

Nutrient management: The responsible and appropriate application of nutrients (especially nitrogen) to plants, with the purpose of improving plant growth and soil conditions, in such a way as to protect surface and groundwater from nutrient contamination.

Nutrients: Any element needed for plant growth. Usually refers to elements added to the soil or garden as fertilizer. Commonly used nutrients are nitrogen (N), phosphorus (P), and potassium (K).

Organic fertilizer: A product that promotes plant growth that is derived from animal or vegetable matter such as compost. Nutrients are released at a slower rate that facilitates plant absorption and therefore are less likely to be carried away by surface runoff or leached into groundwater.

Glossary

Quick-release fertilizer: Type of synthetic (inorganic) fertilizer that is immediately available for plant roots to absorb. There is a high 'burn' potential if too much is applied and the potential for it to leach into ground and surface water is high causing algal blooms and eutrophication. It is also referred to as Water Soluble Nitrogen (WSN).

Saturated (soil): Soil in which all the pore spaces are completely filled with water and no additional water can be stored.

Slow-release fertilizer: The type of synthetic (inorganic) fertilizers that break down using bacteria, fungi or other soil micro-organisms in the soil, or that are coated to reduce solubility. As a result, the nutrient nitrogen becomes available for plants over time. While it is typically more expensive than quick-release fertilizers, it does lower the chance of 'burning' plants when over-application occurs and has less potential to leach into ground or surface water. It is also referred to as Water Insoluble Nitrogen (WIN).

Vegetated buffer: A permanent strip of vegetation along the side of a watercourse that reduces soil erosion and surface water contamination.

Water feature: Any constructed landscape feature that holds or has water spill over it. This includes artificial small ponds, artificial waterfalls, and artificial streams.

Well-rotted manure: Any animal waste that is used to fertilize soil and has undergone decomposition by bacteria, fungi or other micro-organisms for a minimum of 6 months. Its odour is no longer pungent but is often sweet, its colour is dark or black and its texture is crumbly.

Resources List

Nutrients

For more information…

Organizations

Composting Council of Canada
(T): 1-877-571-GROW
www.compost.org
info@compost.org

Ontario Horticultural Association
www.gardenontario.org

People

Local Master Gardener representative (T): 905-309-3959

Local Horticultural Society

Books

Smillie, J. and G. Gershuny. 1999. *The Soul of Soil* (4th Ed.) White River Junction, Vermont: Chelsea Green Publishing Company. ISBN 1-890132-31-4

Soil Testing

For a soil testing lab near you, see the *Yellow Pages*

Websites

- Montreal Botanical Garden (Fertilizers and Soil Amendments)
  www2.ville.montreal.qc.ca/jardin/en/info_verte/fertilisation/besoins_nutritifs.htm

- North Shore Recycling Program (Compost)
  www.nsrp.bc.ca/naturalyard/composting.html

Worksheet #6e

Worksheet #7 - Waste Management

Use this worksheet to learn about how you can help manage your waste.

Why should you be concerned?

- The millions of tonnes of garbage produced in our communities every year quickly fill up existing landfill sites.
- It is increasingly difficult to place new landfill sites. No one wants to live near one.
- If a municipality's landfill site is full and a new nearby location cannot be obtained, residents must pay more to have their waste transported elsewhere.
- Recycling saves natural resources, energy and water by using already manufactured items instead of more natural resources.
- Durable products may initially be more expensive but they are generally a better investment in the long run and they stay out of landfill sites longer.
- There is the potential that leachate from landfill sites may contaminate groundwater.
- Open burning of garbage in barrels, woodstoves, fireplaces, outdoor furnaces or open pits releases a large number of pollutants. Burning of garbage at home, cottage and farm is one of the largest known sources of dioxins and furans in Ontario.

What can you do?

1. Consider how you can personally generate less waste.

2. Inform yourself of initiatives and companies that are redesigning products, packaging, and manufacturing processes to reduce waste. Support them through your purchasing power.

3. Recycle effectively. Contact your local municipality to learn what items can be recycled in your community and how you should prepare them for recycling (i.e.: rinse, bundle, sort, etc.).

4. Compost food and yard wastes. Don't use kitchen sink garbage disposals such as garborators.

5. Use refillable and reusable containers and products as much as possible and purchase durable products that won't need short-term replacement.

6. Watch for Hazardous Waste Disposal Days in your community. Encourage your local municipality to have them, green tags and support recycling programs.

Waste Management: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
MINIMIZING THE WASTE THAT COMES 'IN'					
1 Purchases	Instead of buying, always attempt to borrow, rent or share any items possible, **OR** purchase used items.	Purchase or use only what you need and avoid accumulating unused products.	Purchase more than is necessary, **AND** recycling as much as possible, including donating items.	Purchase more than is necessary, **OR** throw unwanted items into regular household garage.	☐
	Preference given to items that are durable, reusable, and/or recyclable and can be recycled locally. **AND** take-out or disposable food/beverage containers are seldom used.	Preference given to items that are durable, reusable, and/or recyclable and can be recycled locally. **OR** cottage recyclables stored and taken home to recycle.	Disposable or single serving items purchased even when alternatives available **AND** minimal effort made to recycle or reuse.	Frequently purchase disposable, or single serving items, **OR** no effort to recycle or reuse.	☐
	Choose items that have no packaging, **AND** always re-use carry-out grocery bags or bring a reusable tote bag.	Choose items that have minimal packaging, **OR** always re-use carry-out grocery bags or bring a reusable tote.	Choose items with packaging that is recyclable in your municipality.	No consideration given to product packaging, **OR** plastic carry-out bags are accepted and then discarded.	☐

tip

Items that bear the *EcoLogo* symbol are manufactured in a way that minimizes the use of hazardous by-products.

tip

Use your purchasing power to help minimize waste and protect water quality.

MINIMIZING THE WASTE THAT GOES 'OUT'

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
2 Re-using and recycling	Reduce the number of items you use.	Reuse as many items as possible.	Recycle as many items as possible.	Garbage is taken to local landfill.	☐
	Both sides of a sheet of paper are used, **AND** all paper is recycled.	Both sides of a sheet of paper are used, **OR** all paper is recycled.	Most paper is recycled and all paper purchased contains some recycled content.	Paper is not recycled.	☐
	Check with local municipality to learn what items are recyclable and how they should be prepared for recycling, **AND** comply with all applicable recycling practices in your community.		Most recyclable items are recycled.	Little or no attempt made to participate in local recycling programs, ***OR waste is burned / a burn barrel is used.***	☐
	Food scraps and yard wastes are properly composted regularly, on site.		Food scraps and yard wastes are composted occasionally.	Food scraps or yard wastes are thrown in regular household garbage **OR** a garborator or garbage disposal is used.	☐

tip

To reduce packaging, buy larger volumes (more product for less packaging) bulk or concentrated products.

tip

Redirect or place your subscriptions on hold while you are away from home.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Appendix

Garbage Management

Know your numbers….

PETE
beverage and food bottles

HDPE
beverage and food bottles, detergent and ice cream containers

V
Clear deli food packaging, vegetable oil bottles

LDPE
carry-out grocery bags, bread bags, frozen food bags

PP
margarine and yogurt containers

PS
foam cups, trays, and foam take-out containers

OTHER
Bottles containing several resins

Check with your municipality to learn which numbers can be recycled in your local program. Look on the bottom of plastic containers to learn what number they are.

Worksheet #7

Glossary

Waste Management

Terms you need to know for Worksheet #7:

Burn barrels: Open burning of household waste in barrels that results in very high levels of toxic chemicals emitted in the smoke.

Contaminate/Contamination: Alteration of a material by the introduction of a chemical or other substance so that the material is unfit for a specified use.

Dioxins: A group of chlorinated organic chemicals with similar chemical structures. Dioxins have no uses. They are formed unintentionally and released as byproducts of human activities such as waste incineration, fuels combustion, chlorine bleaching of pulp and paper, or pesticide manufacturing. They are also formed by natural processes such as forest fires and volcanoes.

Furans: A family of chemicals that are formed during combustion. They are extremely toxic.

Garbage: A general term used to describe household items that are no longer desired. It can include packaging, plastics, treated wood, old furniture, even newspaper and junk mail. Also called trash.

Garborator: A type of garbage disposal system that function through the kitchen sink. Food scraps go into the municipal water or septic system**.**

Groundwater: Fresh water that has seeped through the soil and rock on the earth's surface and naturally collects forming a reservoir, the top of which is referred to as the water-table. This water supplies wells and springs and is the source of most people's drinking water.

Hazardous wastes: Substances that can be dangerous to humans or animals and must be disposed of in a manner as to not pollute groundwater.

Landfill: A site specially engineered for the permanent disposal of solid waste on land, constructed so that it will reduce hazard to public health and safety.

Leachate: Liquids that have percolated through soil and carry contaminants.

Recyclable: Materials that can be collected, sorted, and processed back into raw materials that are used to make new products. Typical recyclables include glass and selected metal, paper and plastic products.

Reusable: Items that can be used again in their current state by another individual or for another purpose.

Waste: Another general term for items that are no longer desired.

Resources List

Waste Management

For more information…

Waste Reduction

Ontario Ministry of Environment (MOE)
416-323-4321
1-800-565-4923
www.ene.gov.on.ca

- Be a Garbage Transformer. Brochure. For children aged 9-11.
  PIBS 1013b.
- Closing the Loop: The 3Rs of Waste Management. Booklet.
  ISBN 0-7729-6931-0. PIBS 1012b.
- Ontario's Waste Reduction Action Plan: Backgrounder. Information sheet.
  PIBS 1600b.
- The Road to a Conserver Society. Booklet.
  PIBS 1630b.
- The Waste Reduction Office. Information sheet.
  PIBS 1717e.
- Your Seven Day Waste Reduction Diary. Booklet.
  PIBS 2189e.
- A Down-to-Earth Guide to Composting and Vermicomposting. *in* Environmental Living: Protecting the Environment… in Your Lawn and Garden. Vol.2.
  ISBN 0-7778-1070-0, PIBS 2316e
- Environmental Living: Protecting the Environment… in Your Home. Vol. 1.
  ISBN 0-7778-1069-7, PIBS 2315e

Recycling Facilities

- Local municipality (*see Blue Pages*)

Waste Burning

- Local municipality about regulations (*see Blue Pages*)
- *www.burnbarrel.org*
- New York State Department of Health
  www.health.state.ny.us/nysdoh/environ/trash.htm
- Canadian Centre for Pollution Prevention
  www.c2p2online.com
- Great Lakes Trash and Open Burning Website
  www.openburning.org

Ecological Labeling

Environmental Choice Program
c/o TerraChoice Environmental Marketing
1280 Old Innes Road, Suite 801
Ottawa, Ontario K1B 5M7
Call toll-free: 1-800-478-0399
fax: 613-247-2228
www.environmentalchoice.com

Worksheet #8 - Storage & Proper Handling of Fuels, Pesticides, and other Typical Household Chemicals

Use this worksheet to learn about best management of fuels and chemicals.

Why should you be concerned?

- Petroleum products contain toxic compounds, such as benzene, which can cause cancer.
- Some toxic chemicals are colourless and odourless and can go undetected in water that has not been tested for contamination.
- Contaminated water or soil greatly devalues land property and is very expensive to clean-up. Clean-up may not even be possible in some cases.
- A property owner may be held liable for contaminating any water source.
- Vapours from some chemicals such as fuels can ignite or cause explosions.
- Pesticides have been found in amounts below the tolerance levels set by the government in Ontario's drinking water. We don't know the effects of repeated exposure to very small amounts over a long period of time. Chronic health problems may not appear for many years**.**

What can you do?

1. Inform yourself of alternative non-toxic or lower toxicity chemicals to deal with the situation.

2. Avoid storing chemicals. Buy only the amount you need and make sure you have a safe storage area. Contact your local municipality to learn how you can dispose of empty chemical containers and rinse water safely.

3. Never store fuel or any chemical on your property where it may come in contact with water.

4. Read and follow instructions carefully. Note if weather conditions can affect application.

5. Never pour chemical leftovers down the drain, storm sewer, storm drain or into open water.

CHEMICALS: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
FUEL CHEMICALS					
1 Vehicles and machinery	Regular checks to ensure vehicles and machinery are not leaking.		Irregular checks to ensure vehicles and machinery are not leaking.	Never check to ensure vehicles and machinery are not leaking.	☐
	Any fluid spills are cleaned up immediately. Rags are disposed of appropriately.	Any fluid spills are cleaned up immediately.	Some fuel spills are cleaned up immediately.	Drips and spills are not cleaned up.	☐
	Used oil, antifreeze, and other wastes are appropriately recycled.	Used oil, antifreeze, and other wastes are disposed of at landfill.	Used oil, antifreeze and other wastes are allowed to accumulate on your property.	***Used oil, antifreeze, and other wastes are dumped down the storm-sewer, in a ditch or on the ground.**	☐
	There are no unused or decommissioned vehicles on the property, **AND** no dirty car parts, wastes or chemicals.	There are no unused or decommissioned vehicles on the property, **AND/OR** dirty car parts and vehicle wastes/chemicals are kept out of reach of storm water runoff.	There are unused or decommissioned vehicles on the property, **AND/OR** dirty car parts and vehicle wastes or chemicals are left on unpaved areas outside.	There are unused or decommissioned vehicles on the property, ***AND/OR *Car parts and vehicle wastes or chemicals are left near water courses.***	☐

tip

Keep your vehicles regularly serviced to check for oil, antifreeze or gas leaks.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #8

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
FUEL STORAGE					
2 Portable fuel storage	All fuel is used up regularly so that storage is not required anywhere on the property.	A minimal amount of fuel is stored in safe, approved, original-sale, and clearly labeled containers, **AND** liquid fuel containers have a spout to prevent spills.	Fuel is stored in safe, approved, original-sale, and clearly labeled containers.	Fuels are stored in unmarked, open or unapproved containers.	☐
	Distance between petroleum storage and nearest surface water is greater than 150 metres (500 feet).	Distance between petroleum storage and nearest surface water is 61-150 metres (200-500 feet).	Distance between petroleum storage and nearest surface water is 30-60 metres (100-199 feet).	***Distance between petroleum storage and nearest surface water is less than 30 metres (100 feet).***	☐
	Distance between petroleum storage and well(s) is greater than 90 metres (300 feet).	Distance between petroleum storage and well(s) is 24-90 metres (76-300 feet) for a drilled well, **OR** 47-90 metres (151-300 feet) for a bored/dug well.	Distance between petroleum storage and well(s) is 15-23 metres (50-75 feet) for a drilled well, **OR** 30-46 metres (100-150 feet) for a bored/dug well.	***Distance between petroleum storage and well(s) is less than 15 metres (50 feet) for a drilled well,*** ***OR less than 30 metres (100 feet) for a bored/dug well.***	☐

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #8

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
ABOVE GROUND FUEL TANK STORAGE					
3 **Gasoline and diesel fuel tanks**	No fuel tanks are present above or below ground anywhere on the property.	All tanks are made of steel and have a protective, anti-corrosive coating, **AND** ULC approved.		***Steel tank with no protective coating,** ***OR fibreglass tank,** ***OR not ULC approved.***	☐
	Tanks are regularly checked for leaks.		Tanks are tested monthly for leaks.	Tanks are not checked for leaks.	☐
	The water table is located more than 3 metres (10 feet) below the surface, under the fuel tank.		The water table is located consistently 1.5 metres (5 feet) to 3 metres (10 feet) below the surface.	The water table is located consistently less than 1.5 metres (5 feet) below the surface.	☐
	Inactive tanks are decommissioned and properly removed.			Inactive tanks are abandoned.	☐
	Tanks sites are checked for contamination. If found, it is immediately reported.			Tanks sites are not checked for contamination, **OR** if found, not immediately reported.	☐

tip

If a spill or leak occurs, report it immediately to the Spills Action Centre at the MOE by calling: 1-800-268-6060

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #8

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
ABOVE GROUND FUEL TANK STORAGE *continued*					
4 Heating oil tanks	All types of tank(s) are located more than 3 metres (10 feet) from any building.	Tank(s) with a capacity of less than 2500 litres (550 gallons) are located 3 metres (10 feet) or less from any building.		Fuel tank is located inside a building, ***OR tank(s) with a capacity of greater than 2500 litres (550 gallons) are located less than 1.5 metres (5 feet) from a building.***	☐
	Tanks are ULC approved, monitored for leaks, and proper vent pipe used, **AND** protective coating maintained.			***Tanks are not ULC approved, OR monitored for leaks, OR no vent pipe used, OR protective coating not maintained.***	☐
	Tank less than 5 years old.	Tank less than 10 years old.	Tank less than 20 years old.	Tank more than 25 years old, **OR** age of tank unknown.	☐
	Fuel delivery system between fuel storage and appliance is installed by a registered contractor and inspected annually for leaks.			***Fuel delivery system between fuel storage and appliance is not installed by a registered contractor, OR not inspected annually for leaks.***	☐

tip

If you have underground storage of fuel, you are not in compliance with regulations.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #8

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
COSMETIC PESTICIDES, HOUSEHOLD CLEANERS AND NON-FUELS					
8 Cleaning products	All household cleaning products are non-toxic and non-harmful to humans, **AND** minimal quantities are used.	Most household cleaning products are non-toxic and non-harmful to humans.	Typical chemical cleaners are used properly, **AND** minimal quantities are used.	No consideration given to a product's toxicity, **OR** more than is necessary is used.	☐
9 Total amount of pesticide and other non-fuel chemicals stored	No chemicals stored any time.	Chemicals are not stored longer than immediate use period.	Small amount of chemicals stored for longer than immediate use period.	Large quantities of chemicals stored for longer than immediate use period.	☐
10 Distance from chemical storage to nearest surface water source	Greater than 150 metres (500 feet).	60 -150 metres (200-500 feet).	30 - 60 metres (100-199 feet).	less than 30 metres (100 feet).	☐
11 Distance from chemical storage to well	Greater than 90 metres (300 feet).	23 – 90 metres for a drilled well (76-300 feet), **OR** 46-90 metres for a bored/dug well (151-300 ft).	15-23 metres for a drilled well (50-76 feet), **OR** 30 -45 metres for a bored/dug well (100-150 feet).	less than 15 metres for a drilled well (50 feet), **OR** less than 30 metres for a bored well (100 feet).	☐
12 Chemical solution mixing	Chemicals are mixed in well ventilated area, on an impervious surface, and far from any open drain or open water source.			Chemicals are not mixed in well ventilated area, **OR** surface is not impervious, **OR** mix far from any open drain or open water source.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
COSMETIC PESTICIDES, HOUSEHOLD CLEANERS AND NON-FUELS *continued*					
13 Chemical storage area and containers	Stored in a water-proof, locked cabinet or storage container. The container itself stored in a garage or shed with a concrete floor that does not contain any drains.	Stored in a garage or shed with a concrete floor that does not contain any drains.		Stored with human or animal food, **OR** stored in residence, **OR** stored in a garage or shed with a concrete floor that contains drains.	☐
	Sill installed in cabinet to contain any spills.	No sill installed in cabinet.		No sill installed in cabinet. **AND** garage or shed has floor drain that leads to surface water source, etc.	☐
	Garage or shed is well ventilated to outside.			Garage or shed is not ventilated to outside.	☐
	Emergency numbers are posted nearby.			No emergency numbers are posted nearby.	☐
	All chemicals are in clearly marked containers.			Containers not labeled.	☐
	Storage/use of chemicals before the expiration date.			Chemicals not stored or used beyond expiration date.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
COSMETIC PESTICIDES, HOUSEHOLD CLEANERS AND NON-FUELS *continued*					
14 **Disposal of pesticide sprayer rinse water**	Sprayer rinse water is applied only to plants listed on the label, **AND** more than 9 metres (30 feet) from surface water source, **AND** more than 61 metres (200 feet) from well.	Sprayer rinse water is applied only to plants listed on the label, **AND** more than 9 metres (30 feet) from surface water source, **AND** 45-60 metres 150-200 feet) from well.	Sprayer rinse water is applied only to plants listed on the label, **AND** less than 9 metres (30 feet) from surface water source, **OR** less than 45 metres (150 feet) from well.	Sprayer rinse water is applied to plants other than those listed on the label, **OR** open water source, **OR** dumped near a well.	☐
15 **Return, rinsing and disposal of chemical containers**	Use of returnable or refillable containers, **AND** rinse water is used as per label instructions.	Triple or pressure rinsed containers or empty bags taken to municipal landfill. **AND** rinse water is used as per label instructions.	Appropriate disposal of triple/pressure rinsed containers. **BUT** rinse water is allowed into septic system or storm drain.	***Inappropriate disposal of un-rinsed containers including burning them.**	☐
16 **Emergency plan and clean up equipment for spills**	Emergency plan easily accessible, outlining actions to be taken in case of spill, leak, fire or explosion, **AND** cleanup equipment available.	Emergency plan easily accessible, outlining actions to be taken in case of spill, leak, fire or explosion.	Emergency phone numbers posted nearby, **AND** general plan in case of emergency.	***No emergency plan prepared,** ***OR no spill cleanup equipment ready nearby.***	☐

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #8

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
DISPOSAL OF ANY CHEMICALS					
17 Disposal of hazardous chemicals or materials	No unused vehicle batteries stored on the property.			Vehicle batteries are stored on the property.	☐
	Expired household batteries are taken to a hazardous waste facility.		Expired household batteries are thrown in the regular garbage and taken to a landfill.	Expired household batteries are not disposed of.	☐
	Disposal is unnecessary because appropriate amount of chemical purchased and used up.	Leftover hazardous substances are given to others in proper and clearly labeled containers for appropriate use as soon as possible.	Chemical waste is properly disposed of at a hazardous waste facility.	***Hazardous substances are poured down the drain, on the ground burned, or taken to a landfill.**	☐

tip

If you have leftover chemicals such as paint or turpentine, ask your neighbours or friends if they need it for a current project.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Appendix

Storage & Handling of Chemicals

Typical Hazardous Household Chemicals:
(Taken directly from *Home-A-Syst*, 1997)

Household Waste

- Ash/sludge from burned household waste
- Light bulbs/lamps (contain mercury)
- Waste motor oil
- Plastic wraps and containers (hazardous only when burned)
- Pesticide or solvent containers
- Empty containers from other product categories listed here

Clothing and Fabric Care Products

- Mothballs
- Dry-cleaning fluids
- Spot removers (solvent based)
- Shoe-leather polishes

Hobby and Recreation Products

- Artist paints and solvents
- Charcoal lighter fluid
- Strong acids/bases*
- Bottled gas
- Household batteries (may contain mercury or cadmium)

Pesticides

- General use and 'restrictive use' pesticides
- Old and/or unwanted pesticides

Building/Wood Cleaners and Repair Products

Any building and wood cleaners with the following ingredients:
- wood polishes
- products for wood floor and panel cleaning

Building and equipment maintenance products:
- Strong acids/bases*
- Lead-based paint
- Oil/alkyd paints and primers
- Marine and exterior paints containing mercury and/or pesticides
- Aerosol paint products
- Stains and finishes
- Roof coatings and sealants
- Rust removers
- Silicon and other lubricants
- Adhesive removers
- Paint and finish preparation products
- Adhesives (glues, caulk)
- Wood-preserving products
- Products for brush or spray-gun cleaning
- Water repellents for wood and cement
- Solvents such as those used in degreasers, paint thinners, stains and varnishes

Vehicle Maintenance Chemicals

- Antifreeze, oil and grease, transmission fluid
- Solvents for oil and grease removal/disposal
- Engine/car parts cleaners such as carburetor and brake cleaner
- Paints and paint preparation products
- Lead acid batteries
- Tire cleaners
- Rust removers
- Ignition wire dryer
- Gasket removers
- Aerosol paint and primer products

NOTE:
** A strong acid/base can be identified by noting if there is a hazard warning label that recommends using skin protection or to avoid breathing in vapours or aerosol mists. Also, if the product is intended for commercial use or if is intended to manage difficult stains or dirt on hard surfaces.*

Glossary

Storage & Handling of Chemicals

Terms you need to know for Worksheet #8

Approved containers: A portable container made of metal or other material that has been approved for use by the Underwriter's Laboratories of Canada (ULC), the Canadian Standards Association (CSA), or Transport Canada. An approved container must have a certification label such as jerricans - CTC-5L, BTC-5L, ICC-5L, DOT-5L, TC-5L

Bored well: Large diameter well constructed by using specialized earth boring equipment. Casing material is usually concrete or corrugated steel. These wells are typically 60 to 90 cm (24-36 in) in diameter.

Burning: The controlled use of fire to dispose of paper or cardboard containers. Smoke from the fire must be directed away from buildings, highways, roads or public outdoor areas and must not affect people or animals. Municipalities may have burning bylaws that prevent such fires or regulate how they must be carried out.

Clean up equipment: Includes absorbent materials (e.g., sawdust, soil or kitty litter) to soak up spilled liquids, and shovel, broom, empty pails to gather solids and absorbed liquids.

Contaminate/Contamination: Alteration of a material by the introduction of a chemical or other substance so that the material is unfit for a specified use.

Disposal: Getting rid of hazardous material safely. Puncture or break up empty containers and bury under at least 20 in of soil far away from any watercourse or water table or deliver to a municipal landfill or drop off on Hazardous Waste Days.

Drilled well: Well not dug or driven. These wells are normally 10 to 20 cm (4 to 8 in) across.

Dug well: Large-diameter well often constructed by power shovel, back-hoe or by hand.

Emergency plan: A plan of action to deal with an emergency. The plan should include: location of emergency equipment, emergency telephone numbers, cleanup methods, and steps to follow in case of spill or fire.

Exposure: Contact with a gas, liquid or solid. Exposure can happen by swallowing (oral), skin contact (dermal) or breathing in dust or vapour (respiratory).

Fuel: A material that can be transformed into usable energy.

Hazardous: A thing or situation that has the potential to cause harm.

Impervious surface: A solid surface that that does not allow a liquid to pass through or penetrate it.

Glossary

Municipal landfill: The designed site for a community to permanently dispose of their non-hazardous, solid waste. The site is specially engineered to reduce hazard to public health and safety.

Non-toxic: A substance that is not poisonous or will not cause harmful health effects.

Pesticide (cosmetic): A general term used to describe any chemical or biological agent used in a non-farming context to kill plant or animal pests. Herbicides, insecticides, fungicides, bactericides, etc., are all types of pesticides.

Pressure rinse: One method to properly rinse containers. Spray water under high pressure against all inside surfaces of the container.

Pesticide Storage: The legal requirements for pesticide storage can be found in the Ontario Pesticides Act.

Protective Coating: A paint or other coating material designed to prevent rust.

Registered Contractor: A person registered by the province of Ontario to install and repair petroleum storage tanks.

Rinse water: Wastewater from cleaning the inside of a product container or applicator.

Sill: A lip or catch under the spout of a container that effectively catches any drips from the mouth of the spout.

Storm sewer: A system of underground pipes (separate from sanitary sewers) that collects and carries only water runoff from building and land surfaces to a discharge point (e.g., infiltration basin, receiving stream, treatment plant).

Surface water: Any open or exposed body or flow of water including springs, streams, rivers, ponds, lakes, tile drain inlets, ditches, etc.

Triple rinse: One way to properly rinse containers. Fill the container 10% full of water or other diluent, cap and shake the container, then add the rinsate to the spray tank. Repeat two more times.

ULC approved: Approved for safety by the Underwriter's Laboratories of Canada. ULC approval should be marked on a storage tank.

Water table: The distance between the ground surface and the aquifer is referred to as the depth of the water table.

Resources List

Storage & Handling of Chemicals

For more information…

Ontario Ministry of Agriculture, Food and Rural Affairs
Agricultural Information Contact Centre at 1-877-424-1300
www.omafra.gov.on.ca

Environmentally Responsible Cleaning Products

- Nature Clean 416-282-1107 *www.franktross.com*
- ECOgent 1-877-994-9908 *www.ecogent.ca*
- Simply Clean *www.simplyclean.ca*

Alternatives to Pesticides

See Worksheet #6d

Abandoned Vehicles

Local municipal office (*see Blue Pages*)

Fuel Tanks

- Technical Standards and Safety Authority (TSSA)
  14th Floor – Centre Tower, 3300 Bloor St. W., Toronto, ON M8X 2Z4
  (T): 416-734-3347 (F): 416-231-7525
  Toll-free: 1-877-682-8772
  www.tssa.org
  - Fuel Oil Regulation Code
- Ontario Petroleum Contractor's Association (OPAC)
  705-735-9467
  www.opcaonline.org
  - Provide assistance in finding a petroleum equipment mechanic (PM2)

Spills

Ministry of Environment (MOE)
- Spills Action Centre 1-800-268-6060

Worksheet #9 - Lake Recreation

Use this worksheet to learn about enjoying the lake in a sustainable fashion.

Why should you be concerned?

- Nearness to the lake or waterfront is probably the reason why you purchased your property so it is important that everyone do their part to ensure water quality in the lake is safe for all.
- Fuels, wastewater and other hazardous or toxic chemicals associated with motorized recreational watercraft can contaminate the lake, destroying fish habitat and making the water unsuitable for use.
- Invasive species are easily transported between water bodies and can quickly invade, out-competing native species and destroying ecosystems and causing property damage.
- Waves from the wake of motorized recreational watercraft can cause shoreline and channel erosion and damage water nesting areas.

What can you do?

1. Operate an engine-less water-craft such as a canoe or kayak, or use a 4-stroke engine boat.

2. Reduce boat wake and its effects on shorelines, channels and aquatic nesting areas by decreasing your speed on the water.

3. Rinse off your craft (with water) every time it is hauled out of the water. This will prevent invasive species from being transported and spreading to other water bodies and water courses.

4. Never dispose of waste (including fish guts) in the water. Dispose of them properly on land.

5. Don't expand your beach by removing vegetation and/or dumping sand.

6. Don't build docks or boathouses. Not only do they damage sensitive ecosystems along shorelines, they are not practical because of high intensity waves and water level fluctuations on Lake Huron. Use a public boat launch or marina instead.

Lake Recreation: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
BOATING					
1 Boat engine and maintenance	Boat/water-craft does not have an engine.	Boat has a four-stroke engine that meets or exceeds emissions standards, **OR** use an electric motor on board with a battery* and an outboard propeller.	Boat has a modern direct injection two-stroke engine.	Boat has an older two-stroke engine.	☐
	Boat has a portable fuel container that is filled far from any open water.	Boat is refueled on board but great care is used to prevent spills or overfilling. Any spills are cleaned up immediately.	Little care is taken to prevent fuel from getting into open water.	No care is taken to prevent fuel from getting into open water, ***OR fuel is dumped into open water.***	☐
	Bilge is cleaned out at an approved local marina bilge pump-out service.	Disposable cloths are used for cleaning bilge. These and any fuels from inside the bilge are properly disposed of at the local hazardous waste facility.	Bilge cleaners (including biodegradable ones) are rarely used.	Bilge pumps are used regardless if the bilge water is contaminated, **OR** bilge is cleaned without regard to the potentially hazardous nature of bilge fluids.	☐
2 On-board waste	All garbage is kept on board in a designated area until it can be properly disposed of or recycled back on land.		Food scraps are rarely thrown overboard, **AND** plastic waste is never thrown overboard.	***Black or grey water is discharged into the lake or water body instead of an approved pump-out facility.***	☐

tip

Check your engine regularly for any leaks, including the fuel line, clamps and filters.

tip

Keep a tray under the battery to catch any acid spills.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #9

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
BOATING					
3 Boat use	Within 150 metres (500 feet) of shore, means taken to reduce wake from watercraft, **AND** turn off propellers when in shallow waters to avoid stirring up lake bottom.	Within 30 metres (100 feet) of shore, speed of any power-driven vehicles reduced to 10 km/h (5.4 knots or 6.2 mph).		No consideration given to the noise your craft makes, **OR** boat near nesting birds or other wildlife near or on the shore, ***OR operate motor craft at any speed regardless of the distance from shore.**	☐
4 Water-craft launching and hauling	Water-craft and trailer are not stored in the water, **AND** when launching the water-craft, trailer is submerged for as little time as possible.	Water-craft and trailer are stored in the water for use period, **AND** water-craft and trailer are checked for any plants/wildlife/fish that may be clinging to the water-craft or trailer.		Water-craft and/or trailer sits in water for longer than use period, **OR** clinging plants/wildlife/fish are not removed from water-craft or trailer, and disposed of properly.	☐

tip

Take any oils or boat craft fluids to your marina or local municipal hazardous waste collection site. *See Module 10.*

tip

The speed limit and the type of water-crafts permissible on a water body can be changed. Petition your municipality to apply to the Ministry of Natural Resources for a change in designation under the Ontario Boating Restrictions Regulations.

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #9

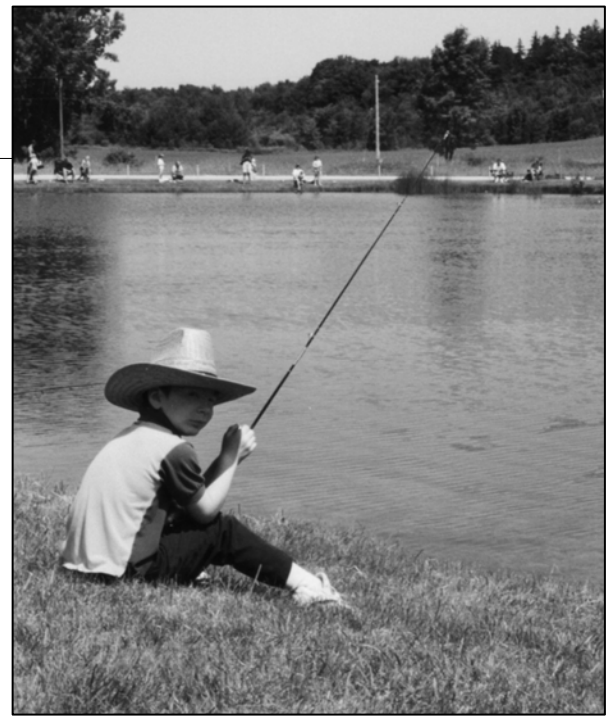
Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
FISHING					
5 Permits and regulations	Fishing license obtained, **AND** check with your nearest MNR office for local catch regulations, **AND** are familiar with the Recreational Fishing Regulations Summary, **AND** when possible, fish from the beach or off piers.			***No fishing license obtained,** ***OR quota is exceeded.**	☐

tip

To prevent the spread of invasive species, never dump your bait bucket remains in the water if it contains water from another water body.

tip

Teach children to respect the natural environment. Encourage them to help with recycling, weeding and conservation. Help them understand how your actions influence the world around you.



***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #9

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
ACTIVITIES ALONG THE SHORE					
6 Beach access	Contact your local Conservation Authority about appropriate ways to access beaches, **AND** access along the shoreline is minimal.	Access shoreline or trails using specific locations, **AND** keep to the trail to avoid trampling.	Access shoreline or trails using several locations, **OR** trails or stairs are built without consulting the local authorities first..	Plants, wildlife or other natural elements are removed or disturbed from most of beach access, **AND** trails or stairs are built without consulting the local authorities first.	☐
7 Minimizing disturbance	Never remove or move wildlife or natural artifacts such as logs, vegetation, shells, or nests, **AND** waste is disposed of properly.	Natural artifacts or wildlife are seldom removed or moved. **AND** waste is disposed of properly.	**tip** Avoid hiking or using any all-terrain vehicle or snow-mobile on bluffs, banks, and along shorelines, especially during the spring thaw.	No regard or consideration for ecosystem or slope disturbance, **OR** waste is not disposed of properly.	☐
8 Campfire safety	Check with your local municipality regarding campfires, **AND** always exercise caution with any fire.	Check weather conditions and local fire bans before starting a campfire.	**tip** Check for beach postings before you go swimming and don't go in water if you can't see your feet from the waist height of an adult. E.coli levels may be high.	Ignite an outdoor fire without consideration of bylaws or restrictions, **OR** burn wood products or wood covered or soaked in hazardous chemicals.	☐

Glossary

Lake Recreation

Terms you need to know for Worksheet #9

4-stroke engine: Boat engine constructed similarly to that of a car. Its emissions are cleaner, it is quieter, more durable and has better fuel economy than a 2-stroke engine.

Bilge: The lowest part inside a boat's hull or frame where water, fuel, oil and other hazardous chemicals can collect.

Biodegradable: The ability of a substance or material to break down into harmless substances by living things like microorganisms and bacteria.

Bluff: A high, steep bank at the water's edge. Along the Lake Huron shoreline, bluffs are typically composed of glacial till (predominantly clay and silt).

Boat wake: The wave(s) that spreads behind a boat as it moves forward through the water.

Ecosystem: A complex, natural system created and maintained by the interaction and interdependency between all living organisms and their particular environment. Any action taken at any level in this interacting system has a potential domino effect on every other organism or element within the ecosystem.

Emissions standards: Emission standards limit the amount of pollution that can be released into the atmosphere from sources such as industry, power plants, vehicles and small equipment such as lawn mowers.

Garbage: A general term used to describe household items that are no longer desired. Also referred to as trash.

Grey water: wastewater from household uses such as dishwashing or bathing.

Hazardous: A thing or situation that has the potential to cause harm.

Invasive species: A plant, animal or aquatic organism which typically spreads quickly and may be difficult to control or eradicate. These species are of concern because they can be detrimental to other species and threaten ecosystems.

Jig: A fishing lure designed to resemble a small fish with one or more hooks that is jerked up and down in the water.

Normal high water mark: The level or elevation along the shore of a federal historic canal, lake or river that marks government ownership and administration. Also known as the upper controlled water elevation.

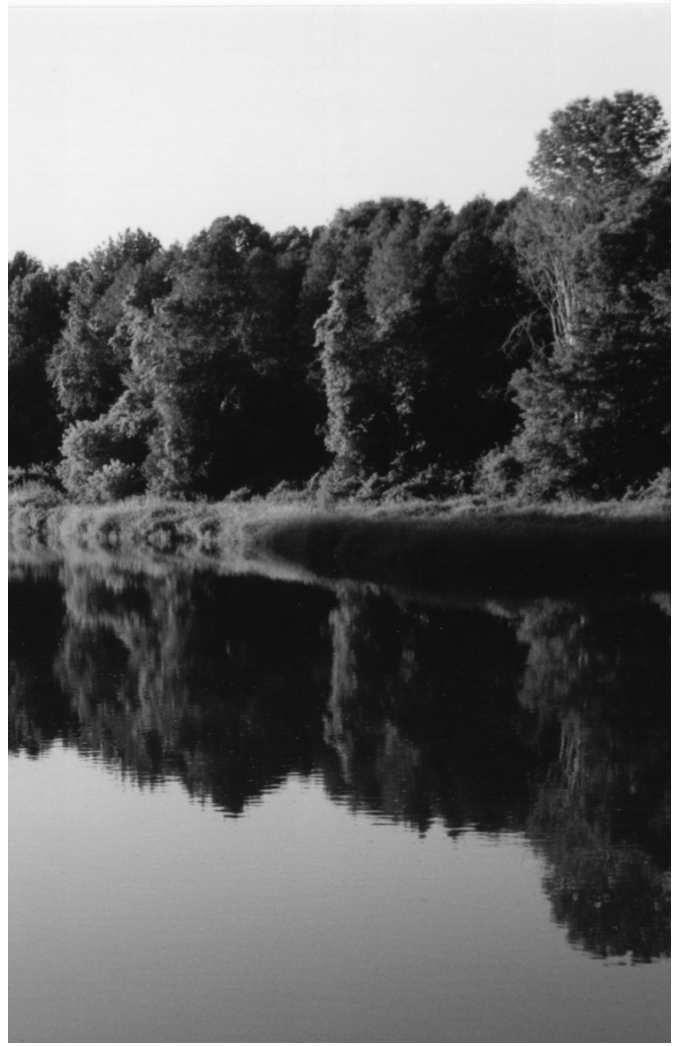
Glossary

Portable fuel container: A portable container made of metal or other material that has been approved for use by the Underwriter's Laboratories of Canada (ULC), the Canadian Standards Association (CSA), or Transport Canada to transport and store fuel.

Sinker: Small metal weight, traditionally made of lead, that is attached to fishing lines and is part of the lure. Lead sinkers are not-permissible in some water bodies and alternatives such as brass, tungsten, steel, and bismuth are used instead.

Slope: Refers to land surface steepness. It is measured as a number of centimetres rise in a 100 cm (1 m) horizontal length (for example, a 2% slope equals 2 cm rise across 100 cm horizontal length).

Water-craft: Used here to describe a vehicle designed to float on and/or move across water for recreational purposes.



Resources List

Lake Recreation

For more information…

Boating Information

- Boating Regulations and Information. Booklet. Ministry of Natural Resources. ISSN 0840-8521.
- Don't Rock the Boat (10 Tips on Better Boating). Brochure. Ministry of Natural Resources. ISBN 0-7729-5776-2.
- The Enviro-Boater Guide: A Guide to Environment-friendly Boating. 1995. Canadian Power and Sail Squadrons. *www.cps-ecp.ca*
- The Safe Boating Guide. 2000. Canadian Coast Guard. *www.ccg-gcc.gc.ca/obs-bsn*

Fishing

- Recreational Fishing Regulations Summary. Ministry of Natural Resources.
  www.mnr.gov.on.ca/mnr/fishing

Access (steps and trails)

- Conservation Authority (*see Blue Pages*)
- Lake Huron Centre for Coastal Conservation
  Phone: (519) 523-4478
  Email: coastalcentre@lakehuron.on.ca
  www.lakehuron.on.ca

General Cottage Life

- Drake, J, and A. Love. 1993. Kids Cottage Book. Toronto, Ontario: Kids Can Press Ltd.
- Cottage Life Magazine, Cottage Life.
  Published 6 time per year.
  (T): 416-599-2000 (F): 416-599-0800
  e-mail: clmag@cottagelife.com
  web: *www.cottagelife.com*
- Take the Plunge: Stewardship of Ontario's Waters
  Federation of Ontario Cottagers' Associations (FOCA)
  239 McRae Dr. Toronto, ON M4G 1T7
  (T): 416-429-0444 (F): 416-429-4944
  e-mail: info@foca.on.ca web: *www.foca.on.ca*
- Waterfront Living, The Living by Water Project – Ontario
  The LandOwner Resource Centre
  Box 599, 5524 Dickinson St. Manotick ON
  (T): 613-692-3571

Worksheet #10 - Living with Wildlife

Use this worksheet to learn about living alongside wild nature.

Why should you be concerned?

- It is important to accommodate wildlife on your property, they're part of the reason why you enjoy the setting of your home or property.
- It is also important to ensure that wildlife don't become a problem, preventing you from enjoying your property.
- Learn about local wildlife; they can be very beneficial and even indirectly decrease your property maintenance, costs and efforts (e.g., songbirds can decrease insect pest populations).
- Protecting local wildlife is key to a healthy ecosystem and watershed.
- There is incredible wildlife diversity along lakeshores and other water courses. Coastal biodiversity is increasingly threatened by human activities and development.

What can you do?

1. Protect natural habitats and species that depend on specialized conditions.

2. Ensure that any buildings or structures on your property are appropriately built and sealed to prevent wildlife from moving in.

3. Learn about Species-at-Risk and take a proactive role in protecting and expanding the quality of their habitat in the landscape whenever possible.

4. See the landscape as an integrated whole and support initiatives that connect important wildlife habitat areas together.

5. Provide space and resources for wildlife in specific areas so that they don't become a nuisance in human activity areas.

6. Work with neighbours to create contiguous habitat along shorelines and water courses.

Living with Wildlife: How do you rate?

Rating	Best 4	Good 3	Fair 2	Poor 1	Your Rating
RESOURCES FOR WILDLIFE					
1 Familiarity with local wildlife	Thorough understanding of wildlife in your area and their seasonal patterns, **OR** continually seek to learn how you can provide habitat for local wildlife, especially Species-at-Risk.	Good understanding of wildlife in your area and their seasonal patterns.	Basic familiarity with local wildlife, **AND/OR** general idea of wildlife seasonal patterns	No knowledge, **OR** no consideration for wildlife on your property, **OR** immediately take action to exterminate without sufficient knowledge.	☐
2 Wildlife habitat planning	Development and implementation of a wildlife habitat plan that enhances habitat resources for desired wildlife, **AND** plan seeks to link habitat on property with the larger landscape using ecological corridors.	No formal plan exists but property management includes wildlife habitat enhancement, **AND** property management links habitat on property with the larger landscape using ecological corridors.	Property provides some wildlife habitat and this is protected and preserved.	Property is managed with no regard to wildlife habitat requirements.	☐
	Trees, shrubs and other plants on your property provide for food for birds.	Bird seed is available but vermin are kept out of feeders.	Birds are expected to forage elsewhere beyond your property.	Bird feeders are readily accessed by vermin.	☐

tip

There is less chance of trapping wildlife in sealed crevices if you construct seals at the end of the summer.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
RESOURCES FOR WILDLIFE					
3 Providing wildlife habitat	Extensive buffers are created or conserved beside wet areas and the property contains several woody and herbaceous plant species, offering a large range of wildlife habitats including wetlands.	Numerous buffers are created beside wet areas and the property contains several woody and herbaceous plant species, offering a range of wildlife habitats and good water quality protection.	A few buffers are present but contain no woody species, offering a limited range of wildlife habitats but do offer some water quality protection.	No buffers present.	☐
	Natural bird-food sources, nest boxes and perches are strategically placed and managed to include species that provide specific 'services' (e.g., fly, mosquito, or garden insect control), **AND** are cleaned regularly, **AND** are all more than 1.5 metres (5 feet) above the ground.	Natural bird-food sources, nest boxes and perches are available but not strategically placed and only managed for species that provide specific 'services' (e.g., fly and mosquito control).	Natural bird-food sources such as berry-bearing shrubs are provided.	Natural bird-food sources, nest boxes, or perches are not present.	☐
	Change bird bath water at least 3 times per week **AND** Screens placed on water catching items.	Screens are placed over rain-barrels and other water-catching items to prevent wildlife drowning.	There are no water opportunities for wildlife.	Stagnant water is present near the house or outdoor living areas, **AND/OR** rain-barrels are not screened.	☐

tip
Adhere predatory bird silhouettes onto windows into which birds commonly fly.

tip
Don't leave indoor lights or yard lights on at night. They attract animals and insects.

tip
To control mosquito larvae, introduce some fish into small pools or water features, but after the problem is dealt with, do not release these fish into the wild.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PREVENTING ACCESS					
4 Sealing your buildings	All crevices, openings, conduits, pipes, seams and soffits are properly sealed, **AND** checked regularly.	Most crevices, openings, conduits, pipes, seams and soffits are properly sealed, **AND** checked yearly.	All doors and windows have a tear-free screen.	Seals are not checked or maintained.	☐
AVOID ATTRACTING NUISANCE WILDLIFE					
5 Food and waste scraps	All food/waste (including pet food and birdseed) is stored indoors (including garage or shed) in insect/rodent-proof containers.	Garbage is stored outside, but in insect/rodent-proof containers.	Compost-free garbage is stored outside but all empty food/drink containers are rinsed.	Compost is in-appropriately maintained, **OR** insect/rodent-proof containers are not used.	☐
6 Preventing unwanted browsing on plants	Wrap chicken wire around the trunk of young trees. Check the tree every year to ensure the wire isn't girdling the tree.	Use plastic coil around trunk of young trees.	No protection used but damaged tree left in place .	No protection used, **AND** damaged trees are removed. It is likely that with food gone, wildlife will browse another tree.	☐

tip

Keep your BBQ clean to avoid attracting wildlife!

tip

Yellow exterior light-bulbs near windows/doors decrease the chances of insects from entering.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
PET MANAGEMENT					
7 **Controlling access**	Cats are kept indoors, **AND** all cats and dogs wear their license tags and have up-to-date rabies shots, **AND** dogs are confined to a fenced run.	Cats are belled and kept on a leash.	Pets are allowed outside unleashed but are supervised.	Pets are allowed to roam freely outside and are unsupervised.	☐

tip
Cats can be disastrous for hatchlings and other wildlife. Don't let them outside.

tip
If bitten by an animal, including domestic pets, seek medical attention and notify your local Health Unit.

DEALING WITH NUISANCE WILDLIFE

tip
Be cautious: never approach an animal if you are not sure of its behaviour.

Control measures for nuisance wildlife are regulated by provincial legislation. Contact the nearest Ministry of Natural Resources (MNR) office if you have questions or concerns regarding nuisance wildlife.

Managing the interactions between wildlife and residents will continue to be a challenge. The significant contribution that residents are making toward the conservation of biodiversity will continue to be a key in preserving our natural landscape and in protecting the quality of our water.

FINDING A DEAD ANIMAL

tip
Notify your local Health Unit upon discovery of any dead birds where cause of death is not immediately apparent.

If you find a dead, injured, abandoned or nuisance animal (including birds, fish and other aquatics) on your property or elsewhere, contact the nearest Ministry of Natural Resources (MNR) office for advice and to report the incident. Be prepared to provide information regarding the location, condition and number of animals/fish.

Leave wild animals alone and never feed them.

Glossary

Living with Wildlife

Terms you need to know for Worksheet #10

Browsing: A method of feeding by herbivores in which the leaves and outer shoots are removed from trees and shrubs.

Buffer: An area of natural vegetation that runs along the shoreline, stream or bluff. It extends from the high water mark to the water's edge. Also referred to as a buffer strip, filter strip or riparian zone.

Contiguous: Connecting without a break.

Ecological corridor: An area of vegetation, typically linear that is similar or the same in nature as wildlife habitat areas, allowing wildlife to move between habitat areas. These ecological corridors connect habitat areas. The size of the corridor determines its effectiveness as a safe means of movement.

Herbaceous: Non-woody plant material or vegetation. A herbaceous plant goes dormant or dies back every year.

Nuisance or Problem wildlife: Any wildlife that causes damage to your property or is a potential threat to health and safety.

Species-at-Risk: A general term to describe the state of a species population. This term is further organized into 5 categories of risk: Special Concern, Threatened, Endangered, Extirpated, and Extinct. The usual causes for a species to be at risk include habitat destruction, genetic and reproductive isolation, the suppression of natural occurrences such as fire, environmental contamination, over-harvesting, climate change, disease, and the presence of invasive species.

Stagnant water: Water that is motionless or ceases to flow.

Wildlife: Any non-domesticated insect, fish, amphibian, mammal or plant.

Woody species: A plant that produces woody stems such as a tree or shrub.

Resources List

Living with Wildlife

For more information…

- Ontario Society for the Prevention of Cruelty to Animals
  (T): 1-888-ONT-SPCA
  www.ospcs.on.ca
  info@ospcs.on.ca

- Ontario Ministry of Natural Resources
  Contact your local office or,
  Natural Resources Information Centre
  (T): 1-800-667-1940

- See Animal Control, your local Health Unit or local municipality in the *Blue Pages* for regulations and information

Worksheet #10

Worksheet #11 - Lowering Your Energy Bill

Use this worksheet to find out how to improve your energy efficiency.

Why should you be concerned?

- Increasing energy costs means that the average home owner will have to pay more to be comfortable.
- As the world's demand for energy continues to increase, so will the cost of energy. To protect yourself against growing costs, invest in homes, vehicles, appliances, electronics and practices that consume less energy.
- Greenhouse gas concentrations are increasing, leading to alterations in average temperatures known as climate change. Emitted gases also threaten air quality and have resulted in a record high number of 'Smog Days'.
- Climate change can cause an increase in extreme weather events such as droughts, ice storms, floods, and hurricanes.
- The cost of owning and operating a typical car is approximately $7000 per year. Alternatively, public transportation if available, can be used for an entire year for approximately $1000.

What can you do?

1. Realize that small changes can have a cumulative effect in protecting our environment, including air and water quality.

2. Ensure that your home is tightly-sealed, properly insulated and that all mechanical systems such as heating and cooling are operating efficiently. Have a professional conduct a home energy audit of your house and ensure that heating/cooling systems receive regular maintenance.

3. Choose energy-efficient appliances and electronics such as those with the EneryStar label.

4. Reduce the amount of driving that you do, especially in urban areas, and choose the most fuel-efficient vehicle for your needs.

5. Reduce the amount of greenhouse gases that you produce annually.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
BUILDINGS					
1 Heating and cooling units	Use the most energy efficient heating and/or cooling units for your needs, upgrading if necessary, **AND** choose a unit that carries the EnergyStar label.	Use the most energy efficient heating and/or cooling unit for your needs, upgrading if necessary, **OR** choose a unit that carries the EnergyStar label.	A window air conditioning unit is used but it is removed during the winter, **OR** if it is fixed in place, it is sealed with caulking or tape and covered with an airtight, insulated jacket.	Heating or cooling unit is inefficient and no upgrading planned, **OR** older than 15 years.	☐
	Heating and cooling units are serviced yearly by a licensed heating contractor, **AND** furnace filters are cleaned or replaced every two months and air conditioner filters are replaced monthly (central air filters are cleaned or changed at the beginning of the warm season each year).	Heating and cooling units are serviced yearly by a licensed heating contractor, **OR** furnace filters are cleaned or replaced every two months and air conditioner filters are replaced monthly (central air filters are cleaned or changed at the beginning of the warm season each year).	Heating and cooling units are serviced immediately when malfunctioning or when a problem is suspected.	Heating or cooling units are seldom maintained, **OR** filters are not changed as per energy efficiency recommendations.	☐
	Regularly check that vents, air intakes and chimneys are not blocked and that seals around them are intact, **AND** retrofit fireplaces or older woodstoves with a new advanced combustion model.	All chimneys are cleaned and inspected annually, **AND** pilot lights of gas fireplaces or wall heaters are turned off in the summer.	Occasionally check that vents, air intakes and chimneys are not blocked, **OR** retrofit fireplaces or older woodstoves with a new advanced combustion model.	Fireplace dampers are left open when not in use, **OR** heat inefficient fireplaces or older woodstoves are used regularly.	☐

tip

Seal and insulate warm air ducts.

tip

In winter, naturally warm your home by ensuring that sunlight can enter through all south-facing windows. Close drapes or shutters in the evening.

In summer, close windows and doors during the day, especially those along the south and south-west facing wall. Open in the evening to catch cool breezes.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
BUILDINGS *continued*					
2 Lights	Minimize light-bulb use by maximizing the use of natural lighting, **AND** all incandescent light bulbs are replaced with Energy-star-qualified compact florescent light bulbs.	Lights are turned off when not in use, **OR** motion detectors or automatic timers are installed on outdoor lights.	Attempt to minimize light bulb use, **AND** Energy-star-qualified compact florescent light bulbs used in the most commonly used areas.	Everyday practices do not attempt to minimize light-bulb use, **OR** lights are left on for a prolonged period of time such as overnight or while occupants are away.	☐
3 Building components	Hire a professional to conduct an energy audit and develop an energy plan of your home (see resources section), **AND** inform yourself of alternative energies such as solar power and wind energy.	Check regularly for drafts or leaks around doors, windows, baseboards, ducts, attic – hatches, window air conditioning units and electrical outlets/switches, **AND** immediately take the appropriate action to fix the situation.	Check occasionally for drafts or leaks throughout the building.	Seldom check for drafts or leaks, **OR** condensation or frost appears on windows.	☐
	All duct work is located in heated and/or cooled space within the building, **AND** weather-stripped.	All duct work is located in heated and/or cooled space within the building.	Some duct work is located in unheated and/or un-cooled space (e.g., attic, garage), **AND** insulated.	Ducts are not insulated, **OR** ducts have no weather-stripping around joints.	☐

tip

Locate working spaces and high activity areas that need light near south-facing windows.

tip

Install storm windows and doors over single-pane windows and use weather-stripping around all joints.

Alternatively, install double-glazed windows that carry the EnergyStar label.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
BUILDINGS *continued*					
4 Building design	Construction uses R-2000 building practices and technologies.	Energy efficiency is an important factor in building design and layout.	Passive solar heating used where possible.	Building is difficult to heat in winter, and difficult to cool in summer.	☐
5 Heating and cooling practices	Use a programmable system and in the winter, lower your thermostat at night and while you are away during the day, **AND** in the summer, naturally cool the building by closing blinds/shutters/ drapes, and using awnings and strategically-placed shade trees outside.	Use a programmable system and in the winter, lower your thermostat at night and while you are away during the day, **AND** use a ceiling fan, especially in rooms with high ceilings or with electric baseboards to help circulate the air. In winter ensure that blade direction pushes warm air downwards.	In the winter, lower the thermostat at night and while you are away during the day, **AND** in the summer, set your air conditioner to 24ºC (75ºF) while you are at home and raise it when you leave.	Heating and cooling systems are not adjusted to time of day or activity within the space, **OR** no attempt is made to adopt practices that minimize energy use.	☐

tip
Every 1ºC that a thermostat is lowered results in a 2% savings in energy costs. The most cost-effective change is to lower it by 3ºC.

tip
24ºC (75ºF) is the most cost-effective setting for cooling.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
WATER HEATING AND USE					
6 **Hot water use**	Most laundry is rinsed using cold water and hot water is seldom used for laundry.	Length of showers is minimized and a low flow shower-head is used.	Hot or warm water is left running while bathing or washing dishes or produce.	Clothes are often washed or rinsed using hot water, **OR** no attempt to minimize amount of hot water that is used.	☐
7 **Water heaters**	Choose a high-efficiency water heater unit that heats water only when it is necessary, **AND** water heater is turned off when building is not in use for a prolonged period of time.	Non-plastic hot and water pipes are insulated for the first two metres of pipe from the water heater.	An electric water heater is used, but it is insulated.	Water heater is left on year-round regardless of use, **OR** water heater tank is inefficient or not insulated.	☐
8 **Hot tubs and pools**	Location optimizes use of natural wind shelter or shade from climatic factors, **AND** there is no pool or hot-tub.	Water is heated with solar panels, **AND** water is covered with a thermal blanket to trap heat.	Water is not heated with solar panels, **AND** pump timers are used to regulate the temperature and duration of water heating.	No actions taken to ensure that heat energy is not lost from water when air temperatures are drop, **OR** pump timers are not used for pools/hot tubs.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
APPLIANCES AND ELECTRONICS					
9 **Energy efficiency**	Always purchase high energy efficiency EnergyStar appliances, especially the refrigerator, oven, dishwasher, and laundry washer/dryer **AND** electronics such as computers and printers that go into 'Standby' mode when not in use.	Always turn off and unplug appliances that are not in use, especially older, inefficient appliances, **AND** minimize the use of appliances and electronics.	Locate the refrigerator or freezer away from heat sources (including other appliances) or windows, **AND** keep the refrigerator between 1.7°C (35°F) and 3.3°C (38°F) and the freezer unit at -18°C (0°F).	Energy efficiency is not considered when purchasing appliances or electronics, **OR** no action is taken to improve the energy efficiency of appliances or electronics.	☐
tip Choose front-loading washing machines or water-efficient, top-loading models with the EnergyStar label.					
tip Set your computer to use its energy-saver mode when not in use.	During hot weather, all baking, washing, drying, and ironing are done early in the morning or in the evening, **AND** whenever possible, clothes are hung to dry.	Dishwasher is used but always runs full and is set to the 'no-heat' or 'air-drying' option, **AND** clothes washer/dryer are almost always run full and cold settings are used most of the time.	Dishwasher is used but always runs full, **AND** clothes washer/dryer are almost always run full and cold settings are used often.	No consideration given to actions or practices that minimize energy waste.	☐
10 **Maintenance**	Check appliances regularly to ensure that seals remain in good condition, especially refrigerators and freezers.		Appliances rarely checked to ensure that seals remain in good condition, especially refrigerators and freezers.	Appliances never checked to ensure that seals remain in good condition, especially refrigerators and freezers.	☐

Glossary

Lowering Your Energy Bill

Terms you need to know for Worksheet #11

Air intake/ventilation: A permanent opening that allows outside air to flow into a heating and cooling system. It is critical that there is adequate air intake and that the air that is brought and distributed through the building is not contaminated and not polluted.

Block heater: An electric heater that heats the engine of a car so that it is easier to start in cold weather. This also reduces pollution because cold engines have much higher emissions.

Carpooling: The shared use of a vehicle typically to commute to work, often by people who each have a car but travel together to save costs and decrease pollution.

Condensation: The process by which water vapor becomes a liquid.

Dampers (fireplace): A metal flap-like device that when closed, prevents outside air from entering the house and heated air from escaping. When in the open position, it allows smoke and heat to flow up the chimney. A traditional damper is located where the firebox and the flue meet. Alternatively, dampers can be mounted on top of a chimney and this type is more energy efficient, although they can not be used with gas fireplaces or wood stoves.

Duct: A tube or conduit, usually made of sheet metal that carries cooled or heated air from one place to another in a building.

Energy audit: A thorough assessment of how much energy a building uses, conducted by an energy audit professional. It pin-points the areas where the building is losing energy, and includes suggestions on how to improve energy efficiency.

Energy Consumption: The amount of energy that is used. This is affected by the energy efficiency of all objects and materials in a space.

EnerGuide: A rating system managed by Natural Resources Canada that helps consumers compare the energy efficiency between appliance models and buildings.

EnergyStar: An internationally recognized symbol for energy efficiency. In Canada, the international EnergyStar symbol is monitored and promoted by Natural Resources Canada's Office of Energy Efficiency.

Energy Efficiency: Reducing as much as possible, the total amount of energy used to complete an activity. The most effective way to determine the energy efficiency of a building is to have a home energy audit done by a service professional (see resources section).

Emissions (vehicle): Pollutants such as unburned gases and smoke that are produced during combustion in an engine and released into the air.

Glossary

Ethanol-blended fuels: Ethanol is a high octane, non-toxic, biodegradable alcohol produced from renewable resources such as grain or wood. It is usually blended with gasoline as a 10 per cent mix to create a fuel called gasohol. Ethanol blended fuels are approved under the warranties of all automobile manufacturers. Some even recommend ethanol use for its clean burning benefits. Ethanol also helps prevent winter-related problems by acting as gas line antifreeze.

Fuel economy: A description of the amount of fuel required to move a vehicle over a given distance.

Incandescent light bulb: A glass bulb that contains a glowing wire filament that, when heated to white-hot by electrical resistance, generates light. Tends to lose 95% of energy to the air as heat.

Passive solar heating: The natural heating of buildings or rooms by maximizing the capture of direct sunlight. Buildings can be designed with large windows in the south-facing walls and small windows in the north-facing walls in order to reduce the need for other heating sources such as electricity or fossil fuels.

Pilot light: A small flame that stays lit all the time (in a hot water heater, boiler or furnace) and ignites the burner flame.

R-2000: A building technology designed in Canada and recognized internationally for energy efficiency and indoor air quality. Every R-2000 home is certified by the Government of Canada and the R-2000 rating is managed by the Canadian Home Builders' Association and Natural Resources Canada's (NRCan's) Office of Energy Efficiency.

Solar power: Energy from the sun's radiation that is converted into heat or electricity.

Storm windows: An extra pane of glass or plastic added to the outside of windows to provide additional insulation and wind protection.

Water heater: An appliance that typically uses gas or electricity to heat water. A water heater also stores the heated water until it is used.

Weather stripping: Strips of resilient material, typically rubber or plastic, used to plug air leaks around doors and window frames in order to prevent cold air or water from coming indoors.

Wind energy: Energy that is obtained from wind-powered turbine engines.

Resources List

Lowering Your Energy Bill

For more information…

Energy Efficiency

- R-2000 Residential Buildings
  r2000.chba.ca

- Natural Resources Canada Office of Energy Efficiency
  oee.nrcan.gc.ca/energuide/home.cfm

- Green Communities Canada
  www.gca.ca

Climate Change

- Government of Canada Climate Change
  www.climatechange.gc.ca

- Science of Climate Change
  www.ec.gc.ca/climate/overview/science-e.html

Worksheet #12 - Water Runoff Management

Use this worksheet to assess how well your property minimizes the potential for water runoff and property damage.

Why should you be concerned?

- Surfaces such as roofs, paved areas, bare soil, and sloped lawns all contribute to the volume of water runoff because they impede water infiltration into the ground.
- Runoff carries soil, pet faeces, salt, pesticides, fertilizers, oil and grease, fuels, leaves, litter and other possible pollutants into streams, ponds, wetlands, lakes and oceans.
- Water that flows into storm drains or ditches is transported and discharged eventually into Lake Huron, untreated.
- Polluted water runoff degrades the lake, rivers, and wetlands. Soil makes the water murky and damages fish habitat. Nutrients such as phosphorus encourage algae that can crowd out other aquatic life and change the chemistry of the water.
- Water runoff is not only a problem for water quality. It can also flow into basements and cause extensive property damage including erosion, slope instability, flooding, decreased property value and disrupt recreation.
- Erosion can reduce property value and cause significant property damage.
- Without vegetation at the shoreline, contaminants flow directly into the lake

What can you do?

1. Minimize the amount of water runoff from your property.

2. Minimize the area of your property that is used as a path or driving surface and use water permeable materials for driveways and pathways.

3. Do not locate any impermeable surface near the shoreline or adjacent to any water course.

4. Foundation tiles and municipal drain outlets should not be in erosion-prone areas.

5. Reduce the amount of potential pollutants on your property that can be carried by water runoff.

6. Encourage the use and infiltration of storm water within your property boundaries.

Water Runoff: How do you rate?

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
SURFACES					
1 **Surface permeability**	All driving/parking/walking and patio surfaces are water permeable, **AND** gravel and woodchips are used to surface walkways. Minimal compaction.	Porous paving such as interlocking bricks used to surface driveway and lanes. Additional parking spaces are not paved.	Paved surfaces are located far from any water course.	All paths, parking, driveways, and outdoor patios are paved, regardless of nearness to watercourse, **AND** walking surfaces not restricted to paths. Foot-traffic compaction throughout.	☐
2 **Extent of impervious surfaces and slope**	Drive is minimal and follows natural contours, **AND** there are no other impervious/compacted areas.	Drive is minimal but does not follow natural contours.	Drive extensive but follows natural contours.	Extensive drive and surfaced areas that does not follow natural contours, **OR** compacted and/or paved surfaces run straight down slope.	☐

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
SURFACES					
3 Areas of bare soil	No areas of bare soil.	Grass or non-invasive groundcover planted immediately to prevent erosion.	Non-invasive groundcover planted immediately to prevent erosion.	Bare soil left uncovered and unplanted.	☐
	Temporary bare areas are mulched, **AND** straw bales, diversion ditches and silt fences used to trap sediment.		Some areas are mulched to prevent erosion.	No regard given to sediment loss through runoff.	☐
	All plant beds have minimum 8 cm (3 in) depth of mulch.	Plant beds have 2.5-5.0 cm (1-2 in) depth of mulch.	Most plant beds are mulched to a depth of 2.5 cm (1 inch).	No plant beds are mulched.	☐

tip

Cover newly-seeded lawns lightly with straw mulch to a cover of 50% to prevent erosion.

tip

Organic material, like leaves, swept or blown into street sewers possibly provide a breeding spot for mosquitoes over winter.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
POTENTIAL POLLUTANTS					
4 **Car washing**	Cars and trucks are occasionally washed at commercial car wash.	Cars and trucks taken to commercial carwash or spray booth.	Cars, trucks, or other items are washed on a lawn or gravel driveway.	Cars, trucks, or other items are washed on a driveway, street, or other paved area.	☐
5 **Application and use of pesticides, fertilizers, de-icers and salts, pool and other outdoor chemicals**	Spills are cleaned up immediately, **AND** applications are delayed until after rain.	Spills are cleaned up immediately on paved surfaces.		Spills are not cleaned up, **OR** applications are not delayed to avoid rain.	☐
6 **Grass clippings, leaves and other yard wastes**	Grass clippings, leaves, and other yard wastes are swept off paved surfaces and away from water flow routes, **AND** plant material is not placed on bluff slopes or over the top of banks where it can kill slope vegetation and cause slope instability, **OR** leaves and other yard wastes are composted.	Leaves and other yard wastes are left to compost on site.	Leaves and other yard wastes are collected in appropriate containers and left for municipal collection.	Grass clippings, leaves and other yard wastes are left on driveways, streets, and other paved areas to be carried off by stormwater, **OR** yard waste is burned on-site.	☐

tip

Ensure that your winter snow pile is not close to any shoreline or water course. Melt water may cause erosion and contamination.

tip

To avoid sending dirty, soapy water into a water course or lake, wash your car on the lawn, or better yet, take it to a commercial car wash or spray booth where the dirty water goes to the treatment plant.

Topic	Best 4	Good 3	Fair 2	Poor 1	Your Rating
POTENTIAL POLLUTANTS *continued*					
7 Pet and animal wastes	Animal and pet wastes are flushed down the toilet, **OR** contact local municipality to determine most appropriate means of disposal.		Animal wastes are left to decompose on grass or soil. Wastes are scattered over a wide area.	Animal wastes are left on paved surfaces, concentrated in pen or yard areas, or dumped down a storm drain or in a ditch.	☐
DRAINAGE					
8 Downspouts, gutters and drains **tip** Use rain barrels to catch rainwater that can later be used to water gardens during low rain-periods. Cover the rain barrel with a screen to prevent mosquito breeding.	Roof gutters, downspouts and basement drains installed and cleaned regularly, **AND** downspouts drain onto gravel or grassed surfaces to a safe and adequate drain.	Downspouts are not directed at or into nearby gullies. **tip** Clogged gutters on a single house can produce over one million mosquitoes a season.	Downspouts direct drainage onto impervious surfaces. **OR** downspouts are not directed at or into nearby gullies.	Roof gutters, downspouts and/or basement drains not checked/cleaned regularly, ***OR downspouts and roof gutters are aimed at adjacent properties without an intercepting swale or ditch in between, onto septic tile beds or into nearby gullies.***	☐
9 Surface water drainage	All surfaces are sloped away from the house at a minimum of 2%.	Any paved surface is sloped away from the house at a minimum of 2%.		Paved or compacted surfaces do not slope away from the house by a minimum of 2%.	☐

***** *These conditions may violate provincial legislation or municipal by-laws.*

Worksheet #12

Glossary

Water Runoff Management

Terms you need to know for Worksheet #12

Contaminate/Contamination: Alteration of a material by the introduction of a chemical or other substance so that the material is unfit for a specified use.

Erosion: The process by which soil or rock are removed worn away by water, wind, or other forces or processes.

Impervious: Not allowing water or other substance to pass through.

Infiltration: Allowing water or other substances to pass through pores or spaces in a material(s).

Paved surface: A hard surface that is impermeable to liquid substances such a rainwater.

Runoff: Snow melt or rain that flows overland rather than infiltrates through the soil/rock.

Storm water: Water from rain or melting snow that does not infiltrate into the ground.

Wastewater treatment plant: Municipal public facilities that treat water that is collected from home, businesses and industry.

Resources List

Water Runoff Management

For more information…

General Shoreline Information
- Living by the Water website: *www.livingbywater.ca*

Estimating Slope
- See end of Manual

Flood Protection
- Conservation Authority – *see Blue Pages*
  www.conservation-ontario.on.ca/profile/consareas
- Municipal Office – *see Blue Pages*
- Ministry of Natural Resources (MNR) - *see Blue Pages* for local office (T): 1-800-667-1940
- Fisheries and Oceans Canada (DFO) (T): 1-800-667-3355

Locating High Water Mark
- Municipal Office – *see Blue Pages*
- Registered Land Surveyor – *see Yellow Pages*

Shoreline Restoration
- Minnesota Shoreland Management Resource Guide
  www.shorelandmanagement.org

Soil Bioengineering
- Ontario Ministry of the Environment
  www.on.ec.gc.ca/doc/cut_factsheets/soil-bioeng-e.html
- Understanding, Living with, and Controlling Shoreline Erosion. A Guidebood for Shoreline Property Owners. 1997. D. Fuller. Tip of the Mitt Watershed Council. Conway, Michigan.
  www.watershedcouncil.org/shore.htm
- Ontario's Stream Rehabilitation Manual. 2002.
  M. Heaton, R. Grillmayer, J. Imhof. Belfountain, Ontario.
  www.ontariostreams.on.ca/online.html

Sample Action Plan

This is an example of a short-term action and long-term action that you could take based on your worksheet rating. Find your Action Plan form on the following pages.

Worksheet and Topic Number	Page	Worksheet Theme	Rating	Short-term Action	Long-term Action
6d - 1	84	Plant selection	2	• Remove existing very invasive species • Contact nursery about other options • Check worksheet resources list for more information.	• Request local nursery to stock native groundcovers. • Next spring plant native groundcover • Monitor for invasive plants

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.

Worksheet and Topic Number	Page	Worksheet Theme	Rating	Short-term Action	Long-term Action

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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.

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