



Southern Georgian Bay

SHORELINE STEWARDSHIP GUIDE



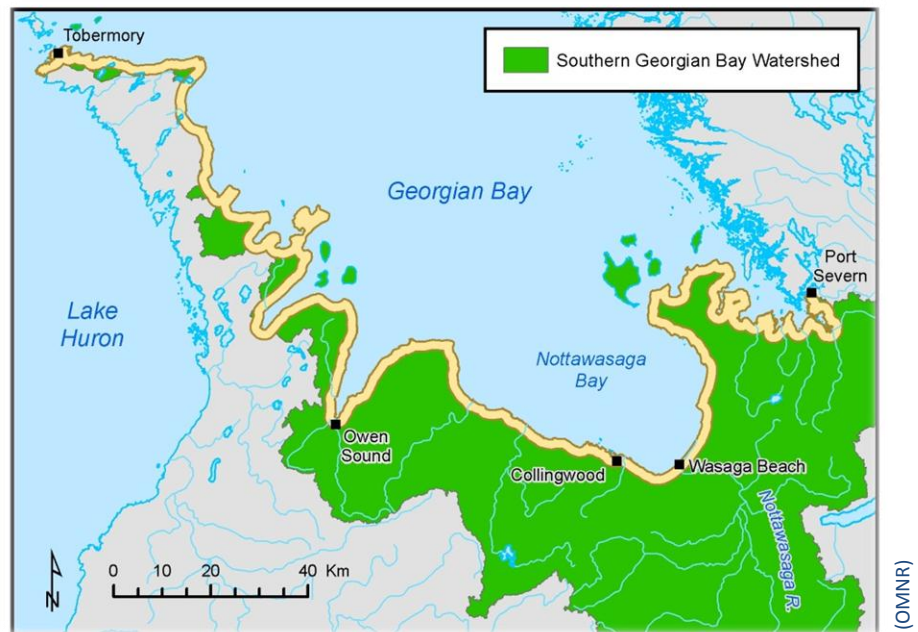
ABOUT THIS GUIDE

The southern Georgian Bay shoreline is under stress. Communities are expanding and expectations for water access and beach use are heightening. Adapting to these changes, while providing the Bay and its communities with a sustainable future, requires a renewed sense of understanding and a commitment to shoreline stewardship.

This **Stewardship Guide** is intended for all who have an interest and a passion for the beaches and bays, dunes and wetlands, bedrock and river mouths. This guide is focused on the area between Tobermory and Port Severn along southern Georgian Bay.

The **Guide** provides background information to understand the unique shoreline processes and natural environments that have formed along southern Georgian Bay. It provides science-based information on these topics to enable informed decisions about how important the role of individual property stewardship plays in safeguarding southern Georgian Bay as a whole.

We hope that you will find this **Guide** enlightening, inspiring and full of helpful stewardship tips to benefit the Bay and its residents.



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TABLE OF CONTENTS

Pressing concerns affecting the shoreline and why we need you to help

Learn about how the shoreline is changing daily due to wind, waves and other natural shoreline processes

Five main shoreline types and important factors and characteristics for each

Lots of information about shoreline friendly practices for anyone working, living or using the shoreline environment

The agencies and regulations influencing shoreline development and who can help you through the permit process

Shorelines are “Living Systems”

<i>Why Stewardship?</i>	5
<i>Shore Values</i>	7
<i>Threats to the Health of Our Shoreline</i>	8

Beach Basics

<i>Currents and Waves</i>	10
<i>Sand Movement</i>	11
<i>Ice Movement</i>	12
<i>Changing Water Levels</i>	13
<i>Managing Expectations</i>	14
<i>Water Quality</i>	15
<i>Shoreline Management</i>	15

Different Shores – Common Concerns

<i>Bedrock Shores</i>	18
<i>River Mouths</i>	20
<i>Sand Beaches</i>	22
<i>Cobble Beaches</i>	24
<i>Coastal Wetlands</i>	26

Caring for our Beaches – How to Maintain a Healthy Georgian Bay Shoreline

<i>You are Important</i>	28
<i>Rethink Dredging</i>	29
<i>Natural Shorelines</i>	30
<i>Healthy Properties</i>	31
<i>Native Plants</i>	33
<i>What YOU Can Do For The Lake</i>	
<i>The Basics</i>	34
<i>Around Your Home</i>	35
<i>At The Shore</i>	38
<i>Enjoying the Lake</i>	41

Rules, ‘Regs’ and Permits

<i>Tips on Getting Permits, Advice & Direction</i>	44
<i>Planning a Project</i>	45
<i>Agencies</i>	46
<i>Additional Resources & Information</i>	48

The intent of the **Guide** is to provide residents and municipalities with an understanding of the complexities of the shoreline and how sensitive it is to human-induced changes. Altering the shoreline should be attempted only after careful consideration of implications and personal reflection of your expectations and needs. It is also important to consider the needs of your neighbours, your community and your shoreline ecosystem.

Shorelines are “Living Systems”

When you think of southern Georgian Bay, does it conjure up images of sandy beaches and serene, gentle waves lapping along the shore? Or does it make you think of a powerful storm with waves crashing onto the beach? Georgian Bay’s shoreline is a complex web of interacting features, natural processes and ecological communities working in a delicate balance, providing us with a rich diversity of life and ecological services for all to enjoy.

Southern Georgian Bay is made up of ecosystems unlike any others in Ontario, from majestic limestone cliffs and sand beaches to placid wetlands and flowing river mouths. It is the result of 10,000 years of evolution that has developed these features and life forms with unique adaptations to the shoreline environment. Cliffs, bluffs, beaches of cobble and sand, dunes, wetlands, woodlands, and nearshore waters each contribute to a diverse, abundant and unique ecosystem.

Southern Georgian Bay is alive with people, plants, fish and wildlife. Living within these ecosystems and managing and developing our shore requires a careful understanding of how each ecosystem functions. Shorelines are constantly moving, changing and evolving in response to winds, currents, storms, or high and low water levels. Shorelines usually change gradually, but occasionally changes are dramatic and unpredictable. They provide habitat to a remarkable diversity of plants and animals. These exist in a sensitive balance, and if this biodiversity is to endure, greater care must be taken to protect our Bay’s natural and cultural resources.

Taking an informed and sustainable approach to shoreline management means that we prevent damage from happening in the first place. Reacting after the fact simply passes along future restoration costs onto our community.



(Coastal Centre)

*Southern Georgian Bay has
the world’s longest
freshwater sand beach set
between two World
Biosphere Reserves*



(Environment Canada)

Alterations and development that do not consider natural processes, habitats and species can destroy the very features that the community values and that attract people to the Bay in the first place. These costs to society include such things as:

- ◆ Poor water quality
- ◆ Conflicts between shoreline users
- ◆ Loss of beach use
- ◆ Reduction in property values
- ◆ Decline of aquatic habitat and species
- ◆ Diminished recreation and tourism options

Take Care of the Bay!

As a resident of southern Georgian Bay, you are part of a community that cares deeply about the shore.

You understand this unique privilege, experiencing each day the grandeur and beauty of the southern Georgian Bay.

Be A Bay Steward!

WHY STEWARDSHIP?

People love to live, play and relax where water and land meet. Unfortunately, some of the natural elements and beauty that attract people to these shores are often casualties of development. Trees, shrubs, and dunes are cleared while wetlands are filled to make way for marinas, large developments, houses, lawns, and open views. Hardened shores intended to control erosion instead displace beaches, remove species, and cause erosion below the water line. Removal of native shore vegetation allows contaminants to flow directly into the lake. As beaches and vegetation are replaced by lawn and concrete, prime wildlife habitat disappears, taking with it birds, beneficial insects, and fish.

Shoreline development and alteration has taken a particularly heavy toll on coastal wetlands. Sustained low water levels have resulted in extensive dredging by landowners to gain access to the water.

There are competing interests by shoreline property owners, tourists and naturalists who strive to conserve sensitive habitats and species. This competition and potential conflict is increasing under the strain of population growth, more and larger waterfront homes, larger boats and the demand for improved water access.

Humans will continue to shape our shoreline. However, there is an obligation to protect and restore our shoreline biodiversity and the natural resiliency (an ecosystem's capacity to respond to disturbance and recover).



Fishing Tournament (OMNR)



Indian Head Cove (Parks Canada)



(Coastal Centre)

A Time for Stewardship

Shoreline stewardship must ensure that social, economic and environmental values are balanced and the shoreline is protected for future generations of shoreline users and residents.

Governments cannot do the job alone.

Individuals, communities and local businesses play a critical role as partners, guardians and watchdogs. They are the most effective champions to achieve environmental sustainability in their own backyards and shoreline communities. These groups should work together collaboratively, where local knowledge and concerns are shared and information put into the hands of the community for their stewardship use; moving communities from the role of the observer to active participant to initiate and sustain a shoreline stewardship ethic.

We need to collectively invest in shoreline conservation, protection, and restoration – a time for stewardship is upon us.

(For information about a Framework for Community Action, go to LakeHuronCommunityAction.ca)

SHORE VALUES

Southern Georgian Bay is unique, with natural treasures that benefit everyone's quality of life. We are all responsible for the well-being of our shoreline, regardless of ownership and jurisdiction. We all share in the responsibility for protecting the Bay's unique ecosystems.

Here are a few reasons why you should care for the shore:

Bluewater Beach (Coastal Centre)



Water Quality

There is no substitute for clean water; it is our most valuable resource and the Great Lakes are a world-class asset. It sustains healthy fish and wildlife populations and people depend on quality water for drinking, fishing, farming and swimming. Unaltered shorelines and wetlands help moderate storms and are the last line of defence from inland pollution.

Economic Prosperity

The Bay is a primary economic driver for the region through tourism, community development, transportation, food and local fisheries.

Sustenance

The Bay provides us, as well as fish and wildlife species, with food and habitat.

Recreation

Fishing, swimming, boating, and sailing are some of our most popular recreational activities. Lake-related tourism is an important economic industry.

Property Values

Real estate prices reflect the value we place on shores. Stewardship helps protect this value. A decrease in the health and beauty of the natural shore can lead to decreased property values.

Cultural Identity

Natural shorelines have enormous aesthetic and spiritual value. First Nation and Métis peoples and long-time shoreline residents recognize their connection to the water. Songs have been written, stories told and landscapes painted to illustrate the value of shoreline heritage.

(Canadian Wildlife Service)



(OMNR)



THREATS TO THE HEALTH OF OUR SHORELINE

More People, Same Coast

Population growth and development can bring economic benefits, however more people mean greater demand for water access, more potential pollution, and more stress on the species and habitats of the shore. A balance is needed between the socio-economic demands, resident's expectations, and conservation to ensure the shoreline is wisely managed for existing residents and future generations.



(A. Crowe)

Water Pollution

Water runoff from land, whether from a rain storm, car washing or watering crops and lawns, can pick up oil, salt from roadways, agricultural chemicals and fertilizers, and toxic materials, and carry them towards the lake.

Public Health and Safety

Our activities affect the natural shoreline processes both physical and chemical, that in turn affect public health and safety. These include beach postings caused by elevated pathogenic bacteria from faulty septic systems, garbage from beachgoers ingested by wildlife, erosion damage and a poor understanding of water risks (e.g. the dangers of rip currents to swimmers).



E. Coli Warning (A. Crowe)

Invasive Species

Invasive species can overtake and choke-out native plants and animals altering the natural shoreline balance. Many types of invasive plants are introduced unknowingly by gardeners. Others are hitch-hikers brought in by boats, all-terrain vehicles or equipment. *Phragmites australis* is arguably the most problematic exotic invasive species on our Great Lakes shores.



Phragmites (A. Crowe)

Beach Note:

Phosphorus is a key water quality concern for the Great Lakes. While some phosphorus is normal and required to support a healthy aquatic ecosystem, too much of it leads to excessive growth of plants and can cause algae blooms. As all these plants decompose they use up oxygen in the water, reducing the amount of 'dissolved oxygen' that fish and other aquatic species need to survive.

Altered Shorelines

When natural shores are replaced with hardened shores such as seawalls and steel sheet piles, rip-rap, or other structures, sand movement changes and habitat is damaged or lost. Beaches can disappear, as can wildlife, plants and fish populations.

Dredging of shoreline sediments, as well as sediment disposal (filling) and relocation (side-casting), can result in the loss of fish and invertebrate habitat. It can also negatively alter lake chemistry by suspending toxics or sediment in the water.

Cumulative Impacts

The clearing of a single waterfront property may have little effect on surface runoff to the Bay. A seawall hardens and straightens only a small portion of the shore, however, over time, all these small seemingly insignificant impacts, when combined with all those of other shoreline users, can become a large cumulative impact.

A Changing Climate

Less ice cover, greater evaporation, changes in precipitation patterns and high summer temperatures may mean sustained lower water levels. We can also expect more intense storms, and larger waves. People need to adapt in a sustainable way to these changing conditions, or risk the loss of shoreline health, vitality and aesthetic appeal of southern Georgian Bay forever.

Things we do that alter the natural rhythm of the coastline's physical and natural processes matter. What you do may seem minor; but collectively, everyone's changes add up to a significant change.



Hardened Shoreline (S. Mackey)



Aerial photo showing dredged channels
(© Queens Printer for Ontario 2013)



(S. Mackey)



Algae on beach (A. Crowe)

Beach Basics

The shoreline is a dynamic area, always changing. It undergoes continuous change under the action of wind, waves and currents. The shore responds by the movement, removal, and deposition of sand, pebbles and cobbles in the shallow waters, or nearshore (also termed the 'littoral zone'). Exposure to wind, currents, waves, flooding, ground water, surface runoff and moving ice contribute to the processes of change. Living within the safe and sustainable limits of these physical forces and natural hazards will help maintain the quality of our beaches and shorelines.

Being mindful of how the shore 'works' will help you succeed with your stewardship actions.

There are 4 main natural shoreline processes:

- ◆ *Currents and Waves;*
- ◆ *Sand Movement;*
- ◆ *Ice Movement; and*
- ◆ *Changing Water Levels*

◆ CURRENTS & WAVES

Waves are the primary energy source shaping the shore. By the time they reach shore, waves can "pack a punch" and that can cause serious erosion and flooding. The force of the waves is a result of three things: (1) the wind speed, (2) the fetch (the distance over water that the wind blows), and (3) the duration (how long the wind blows). The size of the waves can vary widely along southern Georgian Bay from the shelter of Colpoys Bay or Penetanguishene Bay, to the exposed beaches of Wasaga Beach or eastern Bruce Peninsula.

Currents and waves can move large amounts of sand. Sand moves along the shore like a conveyor-belt. If the conveyor is cut-off or altered by structures built out into the water, such as groynes or docks, it can have serious effects like causing the gradual loss of sand to the beaches on the downdrift side of the structure.



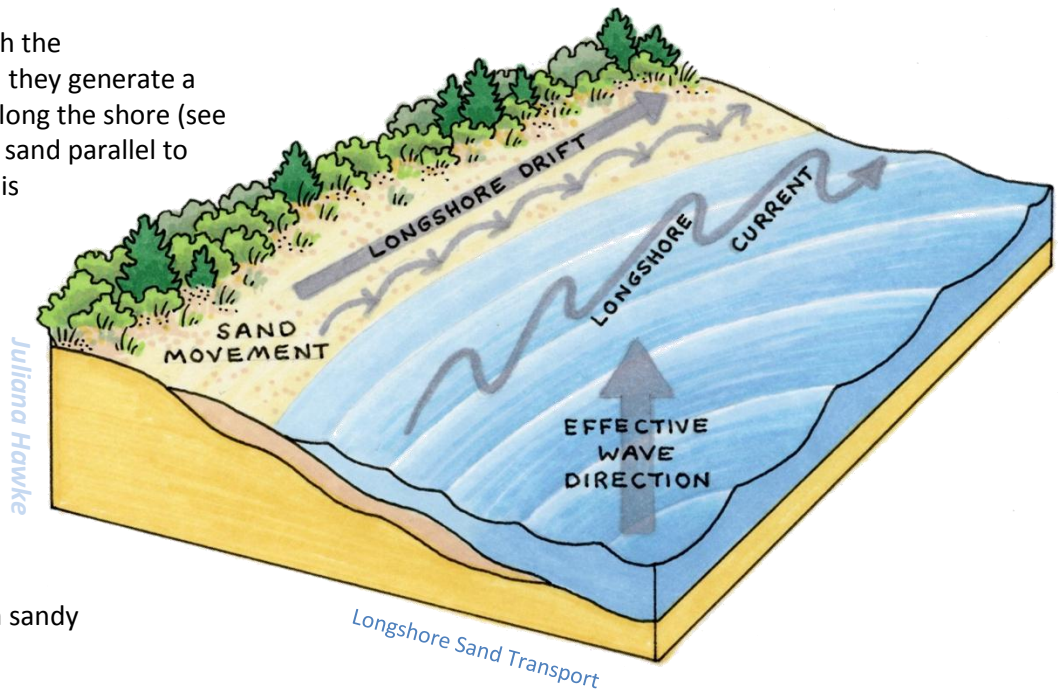
Potential Sand Movement along Nottawasaga Bay

💧 SAND MOVEMENT

Given the dynamic nature of the shore, sand movement is complex and varied. Where sand is available to be moved by the Bay, it can move either alongshore, cross-shore, or both.

Longshore Currents

Two forces create the movement of sand “along the shore”; longshore current and erosion. Most waves approach the shore at an angle. As they do, they generate a longshore current that runs along the shore (see diagram). This current moves sand parallel to and down the shore where it is deposited. The second force, erosion is the main source of sand forming our beaches. It comes from river mouths such as the Nottawasaga River and smaller creeks, as well as from bluff erosion such as those at Spratt Point north of Woodland Beach. Sand usually collects in protected bays and may form sandy points, called “spits”.



Cross-Shore Currents

Cross-shore current moves perpendicular to the shore. Although longshore transport is responsible for more overall sand transport, cross-shore transport is a more immediate process during storms. The seasonal storm cycle creates conditions wherein sediment is removed lakeward during winter storms and then slowly replaced landward during summer storms.

Movement in Multiple Directions

On most shorelines, wave and current direction change with each season and with each storm. For this reason the same sand may be transported past one point several times during the course of a year. However, the balance of sand moved in one direction (net sediment transport) is determined by the predominant wind direction. In southern Georgian Bay that wind direction is northwest. The amount of beach material being moved is determined by its availability, the size of the material (sand is more easily moved than cobbles) and the size, or energy, of the waves and currents that reach the shore.

Beaches act like conveyor-belts; continuously moving and redistributing material in different directions, forms and shapes along the shore.

💧 ICE MOVEMENT

During the winter freeze-up along the coast, ice may form and provide a protective barrier from the winter storms. Ice ridges and ice formations, appearing like sculptures, create unique landscapes that are limited only by the wind, waves and temperature.

- “*Shore-Fast*” ice, (ice frozen to the shore), can help protect shorelines from the impacts of winter storms and related wave activity.
- “*Ice Rafting*” (ice sheets moving over each other) during spring thaw can cause damage given the extreme forces involved with wind and waves.

Historically, ice movement has created challenges for shoreline management especially where structures extend into the water (such as a dock or wharf).

Recent changes in both average annual air and water temperature appear to be reducing ice cover on Lake Huron, including Georgian Bay due to a changing climate. Also, the increased open water conditions in the winter bring other challenges related to an increase in inland snow squalls and shoreline erosion. The open water provides an abundant source of available moisture that evaporates into the air to form snow. This reduction in ice cover and additional open water is also expected to increase shoreline erosion caused by waves hitting the ice-free shore.



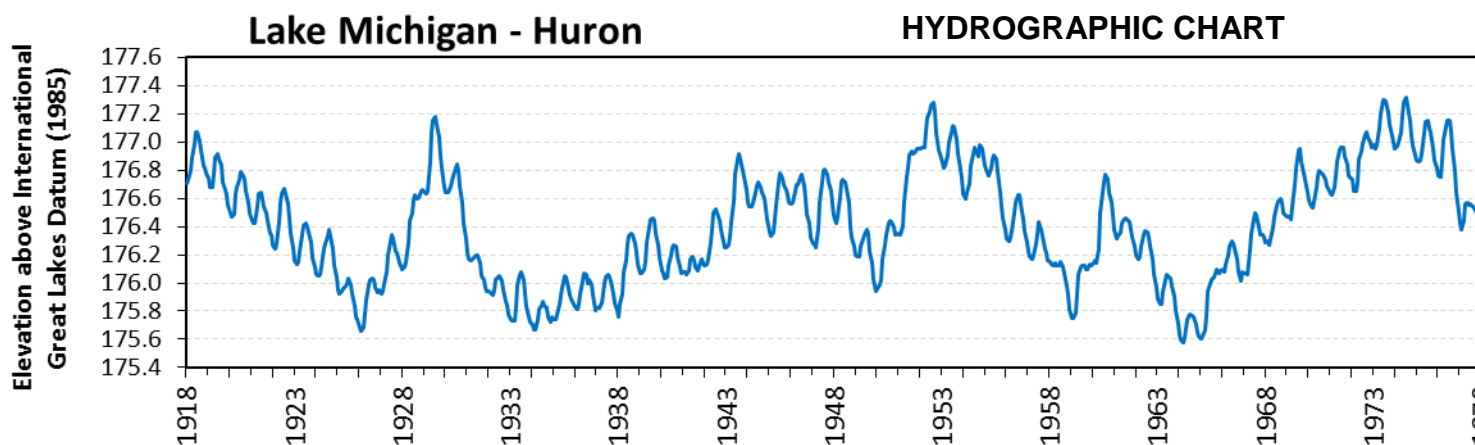
Ice impact on a shoreline cottage, 1974

(OMNR)

The Earth is Moving!

Another natural influence on water levels is *glacial isostatic rebound*. The earth’s crust was depressed under the weight of the continental glaciers covering most of North America 10,000 years ago. After melting of the glaciers, the earth’s crust continues to adjust. Specifically in the Georgian Bay area, both the land and the lakebed is rebounding faster than the southern parts of Lake Huron where the lake outlet is located, thereby impacting water levels.

Some portions of the land surface between Collingwood and Parry Sound have been rising at rates approaching 20 cm per century relative to the outlet of Lake Huron at Sarnia (that is twice the height of this text box). Theoretically, that means that even if lake levels remained static, a dock or other feature built along the shoreline would be 5 cm higher after 25 years relative to the outlet of the lake, making it “appear” as though the water level had gone down 5 cm.



💧 CHANGING WATER LEVELS

Great Lakes water levels have been changing since the retreat of the last glaciers some 10,000 years ago and present levels occur in accord with the Great Lakes regional climate. Historic Georgian Bay water levels, believed to be 50 metres lower than present, would have enabled early inhabitants to walk across much of the Niagara escarpment between modern day Tobermory and Manitoulin Island. This submerged feature now forms a ridge beneath the waters of Georgian Bay (refer to the fold-out bathymetric map on page 50). We need look no farther than Wye Marsh at the site of the Sainte Marie among the Hurons to appreciate historic water levels. It was here 350 years ago that Jesuit missionaries recorded water levels 3.4 metres (11 feet) higher than current water levels in the Severn Sound area.



17th Century Waterway with Locks at Sainte-Marie among the Hurons.

(Photo courtesy of Sainte-Marie among the Hurons)

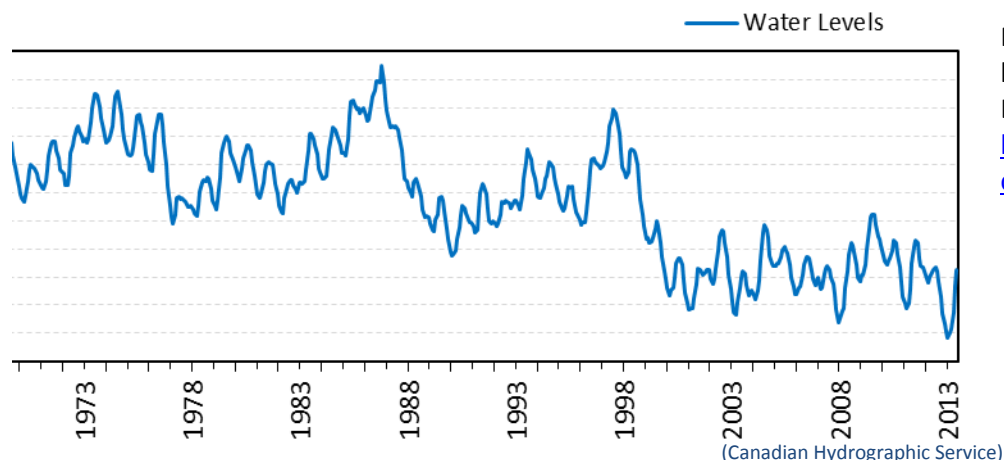
Historic and Seasonal Changes

Records at the Canadian Hydrographic Service dating back to 1918 show that average monthly water levels for Lake Huron have fluctuated within a range of about two metres, with the record high in 1986 and the record low in January 2013 (see hydrographic chart below). Note that similar low water level periods were experienced in the 1930's and 1960's.

Each year there is a seasonal lake level change of about 40 cm (16 inches) between high and low water levels. Lower levels experienced in the fall and winters are due to increased evaporation and a decrease in surface water runoff from the watershed in late fall and winter months. Short-term fluctuations are caused by wind and storms, but rarely last longer than a day or two. In the Collingwood area a storm "surge" can be as great as 0.68 metres (2 feet).

Range of Water Level Changes

Normal changes to water levels occur at different scales including long-term (multi-year), seasonal (within 12 months), and short term (hourly and daily). These changes are essential to maintaining the natural physical processes, habitat diversity, and ecological functions. Under natural conditions, plant communities will adapt to high and low water by migrating upslope, downslope or laterally while maintaining their ecological benefits. Coastal wetland seed banks exposed by low lake levels fuel the re-establishment of wetland plant communities. However, sustained low water levels also provide opportunities for invasive species that could alter biodiversity and disturb natural ecological functions.



For monthly Great Lakes water level information see the Great Lakes Water Level Bulletin at http://www.waterlevels.gc.ca/c&a/bulletin_e.html

MANAGING EXPECTATIONS: The “New Normal”

Adapting to future climate change impacts, such as fluctuating water levels, will require an increased understanding by residents and co-ordination of southern Georgian Bay communities and management agencies in addressing extreme water levels in Georgian Bay.

We are creatures of habit; accepting change does not come naturally. But we must adapt to changing conditions if we expect to protect communities, ecosystem values and economic interests. This will mean greater focus on adaptive management, keeping expectations that are in harmony with changing conditions, and ensuring shoreline residents and municipalities keep responsible management of our shores at the forefront.

A report titled, *An Adaptive Management Plan for Addressing Extreme Water Levels* (Final Adaptive Management Task Team Report to the IJC, May 2013 – refer to the IJC website for report availability – www.ijc.org) concluded that, “there was strong evidence that in the future, we will likely experience more extreme water levels – both high and low – that are outside the historical range experienced over the past century”

Water level extremes can be addressed in two ways, either by managing water levels through dams or other structures, and/or by managing how we respond to the impacts of those water level changes. Adaptive management offers an approach that helps address the uncertainties of an evolving future associated with climate change and considers the potential for extreme water levels and associated impacts.

Our Adaptation Actions must include:

- ◆ awareness of the importance and benefits of water level fluctuations to our ecosystems;
- ◆ expectation that water level fluctuations will continue to occur in extremes in the future;
- ◆ during low water levels, maintenance of newly exposed lakebeds as natural areas and not new development areas;
- ◆ during high water levels, preservation of native wetland plants, fish and aquatic species to serve as a refuge or seed bank for re-establishment of coastal wetlands when water levels recede again;
- ◆ protection and enhancement of fragile and relic dune systems that help to maintain the sand balance that gives us quality beaches;
- ◆ maintenance of a diverse and balanced fish community for anticipated changes in water levels; and
- ◆ management of invasive species through wise property stewardship, monitoring and appropriate control programs.



(S. Mackey)



(Cottage Life magazine)



(A. Crowe)



Located at the north end of Woodland Beach in Tiny Township near Tamarack Trail, “King’s Rock” has been used for generations as a benchmark to compare annual water levels.

WATER QUALITY

Phosphorus is a key water quality concern for the Great Lakes, generally and southern Georgian Bay, specifically. While some phosphorus is normal and required to support a healthy aquatic ecosystem, too much of it leads to excessive growth of plants and can cause algae blooms. As all these plants decompose, they use up oxygen in the water, reducing the amount of ‘dissolved oxygen’ that fish and other aquatic species need to survive.

Other contributing factors to poor water quality include faulty or poorly managed septic systems, surface runoff that includes household hazardous waste and pesticides washed from roads and laneways, and combined sewer runoff through municipal sewer systems.



Historically, some beach communities have altered their shorelines by building groynes extending into the lake during times of high water levels. These structures, originally intended as shore protection, now form barriers to water circulation. Low lake levels combined with restricted water circulation, faulty septic systems and degraded beaches have now contributed to a “perfect storm” of conditions resulting in poor water quality in certain areas.

SHORELINE MANAGEMENT

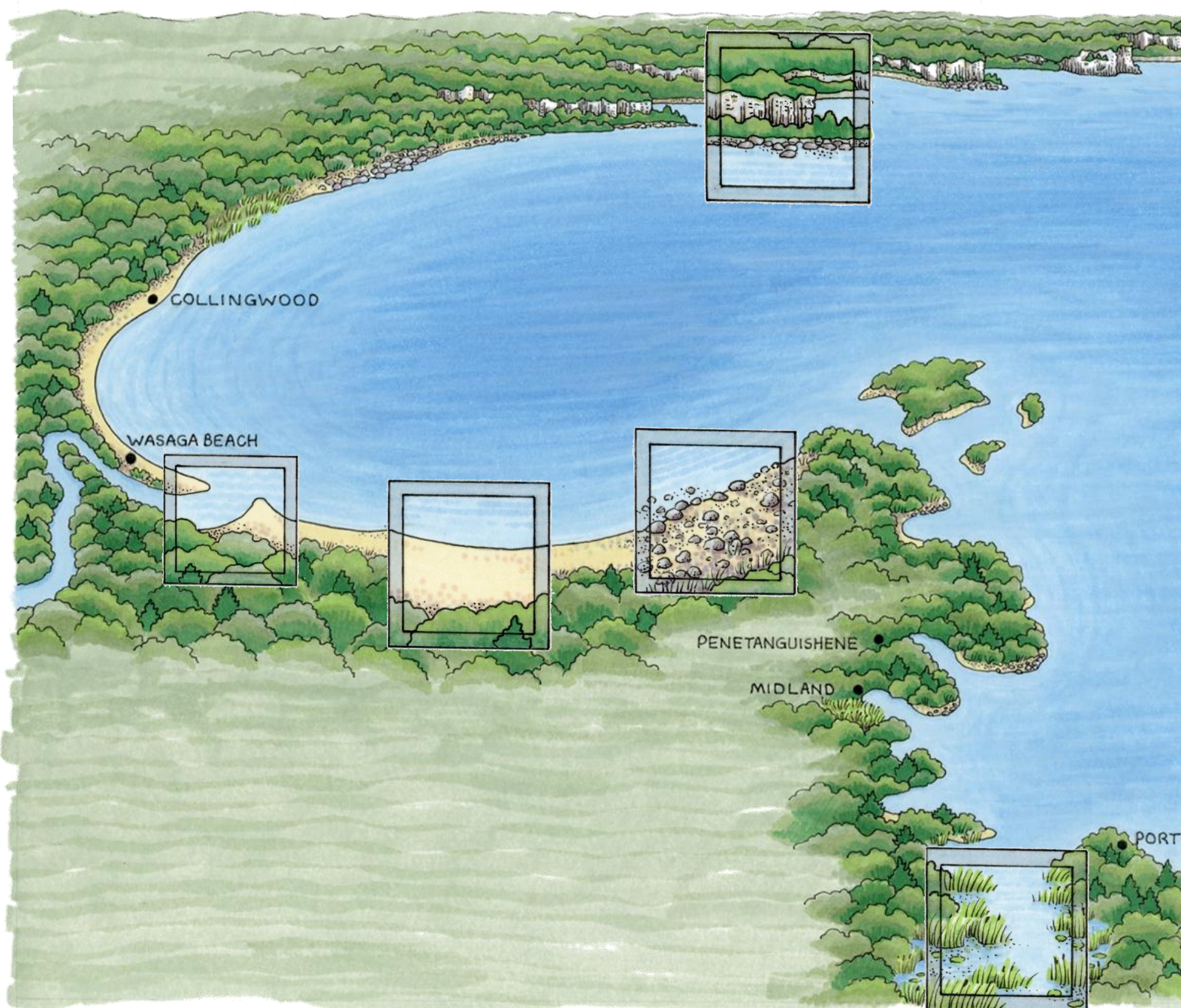
Land use and human activity should be done in a way that considers the full range of observed and expected water levels. Trends such as dredging for boat access, altering beaches for aesthetic reasons and unwise development can interrupt natural shore processes. They can also limit the ability of plant, fish and wildlife communities to adapt to fluctuating water levels. Water level fluctuations can temporarily restrict fish access to shallow water, reduce the spawning of wetland fish and impact the use of nursery habitats. Sustained low water levels may increase seed banks for wetlands but may also provide opportunities for invasive species that could alter biodiversity and interrupt ecological functions. All these factors need consideration for wise management.

Different Shorelines – Common Concerns

In the previous chapters, we learned that in order to live by the shore, we need to understand the impressive power of wind and waves, and the delicate balance of plants and animals that live under the influence of these systems.

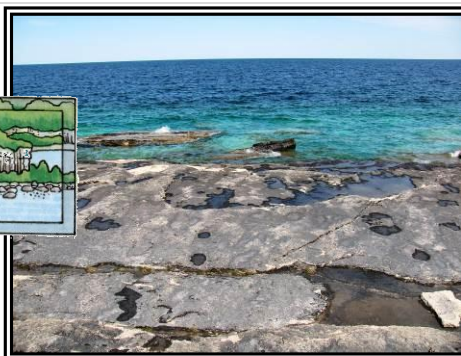
It is also important to know that there are different types of shorelines and that each type has a different ability to accommodate natural change and human disturbance. Some are stable and robust; others are fragile and easily destroyed. Getting to know the nature of shorelines will help individuals make wise property management decisions for the safe and sustainable enjoyment of the southern Georgian Bay. This section explains the development sensitivities, natural, physical, and biological elements of five different shoreline types.

Juliana Hawke





(S. Mackey)



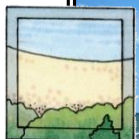
BEDROCK SHORES are usually very stable and resistant to erosion.



(AeroCamera Services Ltd.)



RIVER MOUTHS form estuaries where river currents and lake currents meet creating deltas and sand bars.



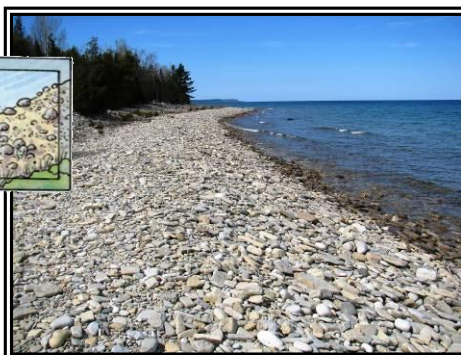
(S. Mackey)



SAND BEACHES are one of the most vulnerable ecosystems. Many are in decline due to human overuse that damages the vegetation or structure of the dunes.



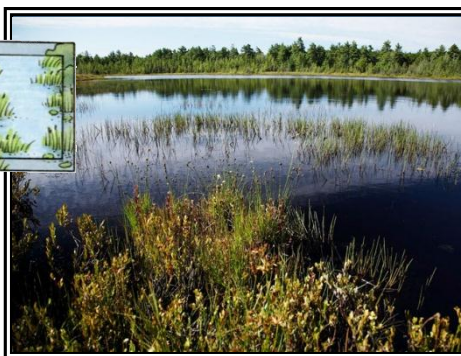
(S. Mackey)



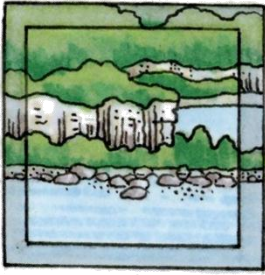
COBBLE BEACHES typically occur on high-energy shores, where they withstand wave impacts due to the cobbles providing a protective armouring to the shoreline.



(OMNR)



COASTAL WETLANDS respond to changing lake levels and provide habitat for over half of Georgian Bay's native fish populations.



BEDROCK SHORES

The Niagara Escarpment dominates the Bruce Peninsula with limestone rock outcrops and cliffs. Other smaller areas of bedrock are found in the headlands of Tiny Township and in the extreme eastern portions of Severn Sound where the influence of the Canadian Shield is found.



(S. Mackey)

The Niagara Escarpment is an internationally recognized landform that stretches from Niagara to Tobermory and is designated as a UNESCO World Biosphere Reserve.

Natural Physical Features

Rocky coasts are typically resistant to erosion. On the Bruce Peninsula, however, this rocky coast undergoes continuous erosion by strong northerly winds and winter storms that can loosen and reduce slabs of carbonate rock to coarse pebble and cobble gravel. Continuous cobble beaches are found in many areas and winter storm waves commonly create gravel or cobble bars up to four metres in height inland from the water's edge.



(S. Mackey)



Caspian Tern (National Park Service (NPS))

Species & Habitats

These areas are inhabited by plants and animals that rely on the thin and rocky soils which dominates this biological community.

- Ancient cedar trees that grow by clinging to the steep cliffs of the Bruce Peninsula are hundreds of years old.
- Narrow areas of exposed rock less than a metre above the lake are generally moist and support mosses, liverworts, and scattered plants.
- Very small 'microhabitats' created in the spaces between rocks contribute to species diversity and provide shelter for a variety of species.
- Cliff shores provide nesting habitat for the threatened Peregrine falcon, protecting their nests from other predators.
- Limestone cliffs and ledges support a high diversity of plants, some of them provincially rare. Harebell, Wild Columbine and Canada Blue Grass are found here, as well as Smooth Cliff-brake, Sticky Goldenrod and White Camas.
- Shaded cliffs and cave entrances provide habitat for Bublet Fern, Slender Cliff-brake and occasionally Green, Maidenhair and Wallrue Spleenworts.
- The Massasauga Rattlesnake has also been observed on the shorelines of the Bruce Peninsula.
- Alvars are a unique ecosystem that can form on bedrock outcrops given specific conditions. The rare vegetation that manages to grow in the cracks and crevasses are fragile and sensitive to disturbance.



Spleenwort (OMNR)

Development Sensitivities

Rocky shores are generally very stable and are considered feasible areas for development in selected areas along the lower edge of the escarpment. However, development can be hazardous along the lower edge of the escarpment where falling debris occurs from the cliffs above.

Not all bedrock shores are stable. Some areas consist of Karst formations, unstable bedrock sites where water flows over and through cracks in the limestone and dolomite bedrock. These formations create sinkholes, trenches and caverns which can be dangerous if they collapse.

These and other natural hazards are managed by the local conservation authority and their input and approval is required to safeguard any new development.

The escarpment is unique, designated as a UNESCO World Biosphere Reserve and for that reason the "Niagara Escarpment Commission" exists to review development plans in these areas (refer to page 46).

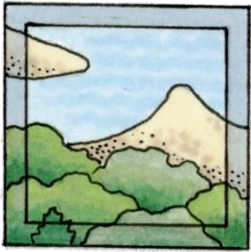
Healthy Shore Tips



Stay on the path and avoid trampling the sparse and fragile vegetation in these areas.



Ensure you are not introducing invasive species into these areas.



RIVER MOUTHS

River mouths are the mixing zones that occur where river ecosystems meet lake ecosystems. Also called “estuaries”, Great Lakes river mouth ecosystems have long supported communities because of their importance as marine harbours, sources of water, food, and navigation, the provision of fish and wildlife, water quality protection, flood control, and other economic benefits. The convergence of the many rivers and creeks with Nottawasaga Bay, Colpoys Bay, Owen Sound and Severn Sound creates a unique and important environment that must be cared for and respected.

(Environment Canada)



Beach Note:

*Sand bars are positioned to, and generally move in and out parallel from, the coastline, depending on wave conditions. A **sand spit** feature, by comparison, is *attached* to the shore at one end, shrinking and growing in length depending on sand supply. If it attaches to shore at both ends, it can completely eliminate access to a river mouth. In this case, it is referred to as a **baymouth bar** that seals off the river from the main body of water.*

Natural Physical Features

River mouths exist at the end of the river—the final reach where waters flow down into the Bay. River water is warmer and less dense than lake water. The mixing of the two freshwater systems contributes to lake “turnover”, being the mixing of the waters of a lake that have different water temperatures and densities. These ecosystems are characterized by the frequent mixing of river and Bay water, water chemistry, energy and materials, from the various rivers that empty into the Bay.

River mouths are characterized by having high rates of sediment deposition, either within the river mouth where deltas may form, or moving farther out into the nearshore of the Bay, forming a plume. The plume shape leaving the river can vary greatly depending on the wind and wave conditions. Lake depths, river mouth shape, and typical wind patterns all determine the timing and extent to which the plume influences the nearshore area.

Nottawasaga River Mouth (Marinas.com)



The Nottawasaga River contributes substantial amounts of sediment and nutrients to southern Georgian Bay. For example, the river is rated slightly higher than the provincial objectives for phosphorus indicating the need for continued efforts to control sources in the watershed. Overall, phosphorus entering Nottawasaga Bay is high, averaging 47 tonnes annually. Phosphorus reductions will not only benefit the Bay but also the river.

Species & Habitats

Like their saltwater counterparts, freshwater estuaries contain biologically productive areas that provide critical habitats for the life-cycles of many species.

- The shoreline between Tobermory and Port Severn has many small to medium-sized rivers to Georgian Bay that are critical for fish production and diversity. The mouths of these rivers provide spawning areas for fish and nesting areas for birds.
- The *Severn River* historically provided spawning habitat to a variety of species. The outlet to Severn Sound currently provides important spawning habitat for walleye.
- The *Sturgeon and Coldwater Creeks* feed into Severn Sound and support strong spawning populations of native Brook Trout.
- The *Nottawasaga River* is unobstructed (no dams) from the river mouth upstream to Alliston (approximately 75 km) and supports one of the few stable river-based population of Lake Sturgeon in southern Ontario.
- The *Sydenham, Beaver, and Bighead Rivers* host several species of trout and salmon as well as bass and other warmwater species in their lower sections.



Sturgeon (OMNR)

Beach Note:

The 1 in 100 Year Flood Event has historically been the “worst case scenario” flood, and the minimum design flood criteria standard in Ontario. It is defined as the peak flood flow with one chance in one hundred of occurring in any given year. Climate change research has suggested this standard may need to change to reflect the changing conditions.

Development Sensitivities

River mouths and associated aquatic habitats such as coastal wetlands experience the highest stress from human uses when compared to other aquatic habitats. They are among the most heavily populated areas. As a result, many river mouths are suffering degradation by many factors, including:

- Sedimentation from soil erosion caused by development and poor farming practices upstream;
- Overfishing;
- Drainage and filling of wetlands;
- Eutrophication due to excessive nutrients from sewage and animal wastes;
- Pollutants; and
- Damming for flood control or water diversion.

River mouths have complex flooding characteristics. These areas can flood from both sides creating greater vulnerability and risk; from both the rivers flowing downstream and from waves in the Bay washing up the channel.

All shoreline development is susceptible to flooding and wave uprush events. The flood plain hazard area along southern Georgian Bay shore is a combination of the 1 in 100 year flood level (178.0 metres above sea level) plus an allowance for wave surge and an additional horizontal safety allowance of 15 metres. Remember, wave uprush occurs along all shorelines subject to wave action and winds can drive high water farther inland, well beyond the flood limit.

Healthy Shore Tips



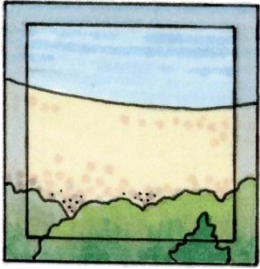
Leave it be. Don't channelize, armour, dredge or remove vegetation from your shoreline.



Eliminate the use of fertilizers as they eventually end up in the water and feed the growth of algae.



Municipalities should consider lessons learned from other areas where piers, jettys and dredging projects have interrupted natural shore processes with negative economic, social and environmental consequences.



SAND BEACHES

Our sandy beaches are popular places for recreation, relaxation, nature appreciation and a great source of serenity. Yet they are extremely vulnerable to human impacts. Sand beach ecosystems at Wasaga Beach and the Penetanguishene Peninsula include the sand dunes and native vegetation, together with the beach and the sandy lakebed, operating as one unit. If we damage the dunes, we ultimately damage the quality of the beach.



(S. Mackey)

Beaches are part of a system that includes the beach we sit, walk or run on, but it also includes the sand dune, and the sandy lakebed and sand bars. They all operate together. If we mess with one part, we mess with them all.

Dune vegetation holds dunes in place. Without vegetation there would be no dunes - period.

Natural Physical Features

Southern Georgian Bay's sandy beaches and dunes are considered to be "relic" sand deposits formed by geologic processes millennia ago. This makes it a finite resource and places a greater sense of urgency and need for good beach stewardship. Allowing our beaches to degrade and disappear would be a catastrophic loss, in economic, social, and ecological terms to all our communities, residents and visitors.

Sand dunes are simply an extension of the beach; a reservoir of sand that the lake 'borrows' from time to time during storms when the waves erode the dune and carry the sand into the lake to form protective sand bars. The sand bar acts as a temporary protective berm,

absorbing wave energy that would otherwise reach the shore potentially causing erosion to the beach and dune. Once a storm subsides, the gentle waves gradually return the sand back to the shore and re-deposit it on the beach. Wind blows sand from the beach back into the dunes. If this cycle is disrupted, our beautiful sandy beaches will erode away.



Beach in the winter (R. McCue)

Species & Habitats

Sand dunes contain an impressive diversity of plants and animals. Many species are rare, or a Species at Risk and need help to survive. Dunes are special places for plants, animals and people. Maintaining a higher diversity of species gives them greater resiliency to changing conditions.

- Native dune vegetation significantly influences the size and stability of dune areas. Dune grasses, like Marram, Wild Ryegrass and Great Lakes Wheat Grass are examples of some of southern Georgian Bay's most important dune stabilizers.
- Wasaga Beach and dune systems provide breeding and nesting habitat for the endangered Piping Plover.
- Many fish depend on sandy nearshore areas for feeding and spawning.
- Shorebirds rely on the processes of waves depositing biotic material to enable foraging for insects.

The sandy beaches and dunes of southern Georgian Bay are particularly vulnerable because they are a finite resource and are susceptible to eroding away if not properly looked after.



Piping Plover adult below (NPS), and chick above (Coastal Centre)

Development Sensitivities

While sand beaches and dunes provide great social and economic value to communities, they are often taken for granted. As demand for beaches increases, we place greater stresses on them.

Building near the shoreline may not be permitted. This is because sandy shores are dynamic and sensitive to human activity, particularly activities that disrupt sediment processes. Check with your municipality or local conservation authority before making any plans.

- The bugs and beetles (also referred to as “benthos”) found in the water and inhabiting the lake bottom, provide food for fish. They are one of the first groups of organisms impacted by dredging. Water quality can also suffer from dredging due to improper sediment control.
- Removing sand and lowering the beach elevation can impact groundwater flow and septic system functions. Plan to work with the landscape, not change the landscape to suit your plans.
- Beach vegetation needs to stay intact as it protects against erosion of inland (backshore) areas. Also, beds of submerged aquatic vegetation are sensitive to boats wakes, propellers, dredging and land runoff of pollutants. Once disturbed, it is difficult to re-establish these important fish and wildlife habitats.
- Driving vehicles on beaches is destructive as it crushes vegetation and the insects and other fauna that live on and within the beach sand.
- Planning staff and public health authorities will need to consider the cumulative impacts of development decisions given our changing climate.

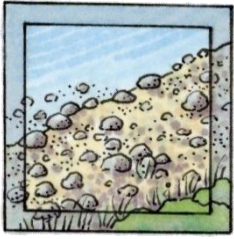
Healthy Shore Tips



Use designated pathways to cross the dunes and avoid trampling vegetation.



All-Terrain Vehicles destroy dunes and can leak fluids. Keep them off the beach.



COBBLE BEACHES

Cobble beaches (also called “boulder beaches”) are generally regarded as beaches made up of smooth rocks and pebbles or a mixture of cobbles and sand. Cobble shores were formed mainly through the accumulation of material that was originally scraped off bedrock as glaciers moved and now are shaped by wave and ice erosion.



Long shore currents or wave action in embayments has created some spectacular cobble beaches, like at Cabot Head and Cape Dundas. Most of the cobble beaches in southern Georgian Bay are found along the shoreline of eastern Bruce Peninsula, Meaford, Christian Island and the Penetanguishene Peninsula.



Monarch Butterfly (K. Holland)

(G. Mayne)

Natural Physical Features

Cobbles provide durable ‘armour’ to the shoreline, protecting it from erosion. Cobble beaches form in a dynamic, high-energy environment of storm wind and waves. Storm waves regularly disturb the beaches, reconfiguring the stones and removing finer clay, silt, and sand particles from eroded glacial tills, resulting in the formation of a cobble layer with finer till material underneath. During the winter, shoreline ice freezes to the lake bottom and cobbles can be plucked loose during storms, further eroding and changing the lake bottom.

Beach Note:

There are few remaining natural cobble beaches left in southern Georgian Bay. Lack of awareness of the value of these beaches presents a serious threat to these places.



(C. Allan)

Species & Habitats

Cobble beaches are home to a variety of plant species, several of which are threatened or endangered, both provincially and globally. Shallow accumulations of small cobble with moist sand or loamy soil support dense, diverse, and relatively stable plant cover, while deep accumulations are often un-vegetated as a result of dry conditions.

These shores:

- Provide valuable seasonal spawning and migration areas for fish.
- Serve as nesting areas for the Piping Plover, a bird species listed as endangered in the Great Lakes basin in both Canada and the United States.
- Are extremely rich in aquatic invertebrates, which are valuable feeding grounds for shorebirds.
- Have low biodiversity in areas where the beach material is mobile, and higher diversity in more protected areas that are more stable.
- Can develop a stable, diverse mix of shrubs and groundcover where undisturbed bluff slope vegetation exists. Their network of roots greatly helps bluff stability.
- Provide bird habitat, ranging from gulls and terns to plovers and dunlins to egrets and hawks.
- Provide white fish and lake trout spawning and larval habitat in their nearshore area. Lake Sturgeon typically spawn over lakebed comprised of clean cobble and rock rubble.



Great Egret (Canadian Wildlife Service)

Development Sensitivities

Unwise shoreline development has resulted in increased disturbance including the removal of cobble and sensitive habitat. Shoreline management objectives should include the protection of these Great Lakes cobble beaches and safeguarding their quality to maintain biodiversity and protect rare species. Otherwise, we might lose them entirely.

A major threat to cobble beaches is the use of all-terrain vehicles, which can damage habitat and introduce invasive species, like Phragmites.

Another key threat is people moving stones both in the water and on shore to clear paths for walking and swimming, and for boat anchoring sites.

Often, people will pile the cobbles to form a groyne-like structure that extend into the nearshore waters. This reduces the flow of water along the shore, leading to poorer water quality and the accumulation of algae and debris.



Groyne (S. Mackey)

Healthy Shore Tips



Leave the cobbles where they are, as they are natural shore protection from storm waves.



Resist the urge to “tidy up”; let organic debris like beach logs and fallen trees act as a natural seawall.



Don't disturb the native vegetation; many of these species are rare.



COASTAL WETLANDS

Coastal wetlands are the most productive and diverse communities of plant, fish and wildlife in the Great Lakes basin. Extensive wetlands are found along Matchedash Bay, Wasaga Beach and the western coast of the Penetangishene Peninsula, as well as in the Coldwater River watershed. We are gradually losing coastal wetlands, mainly replaced by urban development and related activities. The Silver Creek coastal wetland complex near Collingwood is the last remaining intact coastal wetland on the shores of southern Georgian Bay and continues to be under development pressure. It's the irony of building by the lake to enjoy its fresh waters, only to potentially see water quality decline.



(Meg Wallace Photography)

Matchedash Bay in Severn Sound is the largest coastal wetland in southern Georgian Bay and one of the largest coastal wetlands on Lake Huron. This extensive marsh has been recognized as a wetland of international importance (www.ramsar.org).

Natural Physical Features

Anyone observing coastal wetlands over a period of time will notice that they are dynamic environments. They change in size and extent as water levels change seasonally and over several years. Highs and lows in water levels also affect vegetative composition and wetland-dependent wildlife such as birds, fish, reptiles and amphibians. Coastal wetlands provide us with many natural values and ecosystem services including:

- ◆ Filter pollution from water;
- ◆ Help prevent flooding through slow release of water and by absorbing wave activity;
- ◆ Reduce erosion, as plants collect and bind soil;
- ◆ Recreation, such as canoeing, fishing, and bird watching;
- ◆ Carbon storage in soil and vegetation to help temper the impacts of climate change;
- ◆ Educational opportunities for schools;
- ◆ Spiritual enrichment; and
- ◆ Provide essential habitat that fish and wildlife require for at least part of their life cycle.



Wood Duck (National Park Service)

Species & Habitats

Coastal wetlands provide a home for diverse communities of wildlife (both plants and animals) in southern Georgian Bay as well as the remainder of the Great Lakes' basins.

- A rich variety of amphibians and reptiles require wetlands for breeding, growth, foraging, hibernation and refuge.
- Critical staging and nesting areas for over 100 waterfowl and other avian species during their reproductive and migration seasons. Wetlands provide cover for marsh birds like the American Bittern and Virginia Rail
- Coastal wetlands are also home to many at-risk reptiles like the Massasauga Rattlesnake, Blanding's Turtle, and the Five-lined Skink.
- Coastal wetlands provide habitat for invertebrate species such as Mayfly and Caddisflies that form the base of a complex food web. These food sources, along with the wetland plants, support a large diversity of fish, reptiles, amphibians, birds and mammals.
- Over two thirds of the fish species living in the Great Lakes depend on coastal wetlands for feeding, cover, spawning, and nursery habitat, like the Longnose Gar and Muskellunge. Wetlands also provide habitat for cool and warm water nearshore fish like Northern Pike, Walleye and Sunfish.



Five Lined Skink (OMNR)

Development Sensitivities

Given their ecological importance and rare status, many wetlands are provided extra protection from development and site alteration. In addition, wetlands are considered to be natural hazards given their locations in flood prone areas and attributes of unstable soils that are unsuitable for building foundations and other similar excavations.

Human disturbance is one of the greatest threats to the sustainability of these wetlands and the survival of the plants and animals that depend on this unique habitat. Shoreline development, alteration, dredging, hardened protection methods, and constructing roadways each interfere with the natural cycle of coastal wetlands.

Poor agricultural practices and cumulative impacts upstream can degrade wetlands in several ways, including nutrient enrichment from fertilizers, increased sediments from erosion, increased surface runoff from drainage ditches, introduction of agricultural non-native species (e.g. reed canary grass), destruction of inland wetland features, and the over application of herbicides.

Urban and residential development often includes hardening and altering the shoreline for docks and boat slips, filling wetlands, removing vegetation and installing septic systems. These and other activities result in increased sediment and nutrient runoff into the lake, causing degradation of water quality and fish habitat. In many urban settings, complete wetland loss has occurred along the shoreline.

Protecting coastal wetlands and their inland links to rivers and watersheds will also protect and possibly improve, water quality.

Community conservation initiatives and collaborative efforts will reap many rewards when focused on valuable shoreline resources such as wetlands. Working together to preserve and protect these features is wise management.

Healthy Shore Tips



Maintain natural vegetation along the coast. It is crucial to the health and quality of the lake water.



Keep your private septic system well maintained. Malfunctioning systems can pollute the lake.

Caring for Our Beaches

How to maintain a healthy Georgian Bay shoreline

Practicing good stewardship when living on, using, or managing shoreline property makes good sense. Property values will benefit. It's also critical to the health of southern Georgian Bay. The goal is to protect, restore, and enhance the health and function of the shoreline. Stewardship involves communities and governments working in collaboration and should seek options to restore and naturalize altered shoreline, preserve existing natural areas, and seek softer engineering options. When this Guide uses the term "restoration," it does not mean returning southern Georgian Bay to its pre-development condition. Rather, it refers to restoring specific beneficial ecological processes and shoreline features (refer to the fold-out map showing southern Georgian Bay features on page 49).

Let's Work Together

It's only through working with your neighbour, your community and local conservation groups that stewardship goals will be accomplished.

YOU ARE IMPORTANT

The way you live on and manage your shoreline property will shape the shore, either positively and negatively. Through stewardship practices, restoration, education and monitoring, individuals and organizations can preserve or improve the quality of our shores.



Planting dune grass (Coastal Centre)

As a shoreline property owner, you have likely watched, cared for, and enjoyed your property for many years. You have seen the changes that happen over the course of years, or after a sudden dramatic storm. Your connection to the shore embodies a special responsibility to act with care and caution, respecting not only your own property, but also those of your neighbours and your beach community.

TOP THREE FUNDAMENTALS OF SHORE LIVING

1

Live within the limits of the ecosystem

Understand and respect the natural physical processes of the lake.

2

You are not alone

Many different birds, fish and animals rely on the habitat your shoreline provides and your actions may impact them and your "human" neighbours.

3

Shoreline stewardship produces worthwhile results

Good quality shorelines, beaches and water are essential for a healthy community and to maintain property values.

RETHINK DREDGING

Dredging (the removal of bottom sediment from the lake bottom) for boating access and for water supply intakes has become a common practice along the shoreline in response to lower water levels. However, these actions are not sustainable.

Alternatives exist such as communal boardwalks and docks, mooring boats offshore, using a public marina and/or marine railways. A smaller boat requiring less draft or water depth is also an option.

Municipalities may also need to consider options such as providing a municipal water supply, communal facilities for boat launching / boat storage and shared access routes to the lake.

The negative impacts of dredging are considerable:

Bugs in the Mud (or 'Benthic Habitat')

Dredging modifies the lake bottom and disrupts or destroys benthic habitat and communities. It is difficult to compensate for completely altered bottom substrate habitat. This causes short and long term changes in the food chain impacting plant, fish and invertebrate communities.

Sedimentation

Sediment plumes from the re-suspension of sediment during dredging will cause short term changes to water quality. Toxic materials bound to sediments can be re-suspended in the water and ingested by filter-feeding organisms while sediments that settle to the bottom can smother bottom-dwelling organisms. Water chemistry can be altered, affecting animals and people.

Contaminants

Sediments with attached contaminants can be re-suspended and carried large distances from the dredging activity.

Habitat Loss

Nearshore and river mouth habitat can be affected by dredging associated with shoreline excavation, infilling and shoreline stabilization works. Being mindful of the life-cycles of fish species and working outside of the time they are most active is imperative so fish spawning and migration periods aren't disrupted.

On-going Costs — (since dredging is seldom done once!)

Expect to maintain the channel repeatedly over time as it continues to fill in.



Dredged Channel (S. Mackey)



(© Queens Printer for Ontario 2013)



Owen Sound Harbour (A. Mckee)

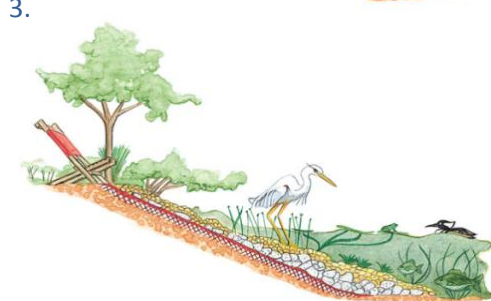
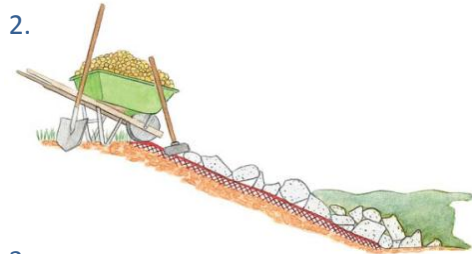
If you have no other option and must dredge (i.e. for a water intake), make sure approvals are obtained which will stipulate proper erosion and sedimentation control measures, schedule work to minimize impact on fisheries (MNR timing windows), and expect continual maintenance costs.

NATURAL SHORELINES

Instead of concrete and steel sheet-pile, shoreline best management practices use a combination of vegetation plantings, gravel, stone, logs, and slope modification to protect against shoreline erosion. It's important to set structures back far enough to preserve the natural shoreline and vegetation.

Natural shorelines offer the following benefits:

- ✓ They maintain shoreline stability while substantially improve habitat for fish and other wildlife;
- ✓ They allow for improved water access for homeowners and guests, making swimming and shoreline enjoyment easier;
- ✓ They offer a softer, more natural shore that can enhance views by adding variety and seasonal interest; and
- ✓ They retain or improve land value offering a better return on sale due to their aesthetic beauty and compatibility with nature.



(Images: Fisheries & Oceans Canada)

1. Existing retaining wall
2. Creating a natural shoreline slope
3. Allowing a shoreline to naturalize benefits fish and wildlife species.

Natural Shore Protection (e.g. soft engineering)

Options for more natural shore protection include soil bioengineering, re-grading slopes to mimic the natural shoreline, rock and boulder revetments. These techniques utilize vegetation to help bind the soil and augmented with other materials, will provide a more natural shoreline that can create fish habitat and improve water quality given their filtering properties. All methods should be fully investigated with qualified professionals before you consider using them in your specific situation. Answering the question “What are you protecting?” will direct the scale and type of protection.

Retaining Wall Removal

The Bay and your property will benefit from the removal of an existing retaining wall (made of concrete, wood, steel, etc.) and the creation of a more gradual and natural connection between the Bay and your property. These hardened shorelines are the least environmentally considerate shore protection techniques. Many of these structures were hastily constructed during the high water level period (1986 was the record high level). Many did not take into account interruption of shoreline processes nor the impact on natural habitats. Given current low water levels and improved designs, there are plenty of opportunities to improve the shoreline health and improve the water's edge. Keep in mind that the opinion of a qualified coastal professional should be sought to ensure such a change in shoreline conditions is done properly and does not create undue risks.

HEALTHY PROPERTIES

Surface Water Runoff

Every property in southern Georgian Bay drains water to the Bay. Therefore, the water runoff from your property, the stormwater management facilities of your municipality, and the non-point source pollution from inland farms will all play a part in water quality. Slow it down, soak it up, and keep it clean are the three messages for wise water management on your property. Conserve water when possible, use a rain barrel for watering outdoor spaces and replace pavement with permeable surfaces. Stormwater should not be directed to a naturally dry beach. Doing so may create gullies and allow the area to be invaded by the invasive plant *Phragmites*.



Storm water discharging onto Beach (A. Crowe)

Low Impact Development (LID)

Green infrastructure, natural landscaping, and a few other topics which come under the heading of LID, all assist to improve ecosystem health. These approaches are considered to have a “low impact” on the environment and include such considerations as permeable pavements allowing water to soak in on your driveway and surfaces around the home. *Rain gardens* containing native plants will absorb and use the excess moisture that would otherwise flow to storm sewers that may already be at capacity.

Maintaining Sand Dunes

Dunes are your insurance policy for the next high water period. They store sand for when it is needed to feed storm waves that would otherwise start eroding or damaging properties. Dunes also maintain an equilibrium regarding beach elevation. If beaches are lowered (called deflation) by sand removal, bulldozing or other mechanical means, they risk becoming wet beaches where dry sand is uncommon. Wet beaches in residential areas serviced by septic systems have been shown to have high concentrations of E.coli and pathogens that get into the groundwater and eventually into the Bay at the shoreline.

Beach Note:

Sand dunes work in unison with beaches to remove sand during storm waves, store sand in offshore sand bars and then return sand to the dunes after the storm passes. Dunes are natural shore protection.



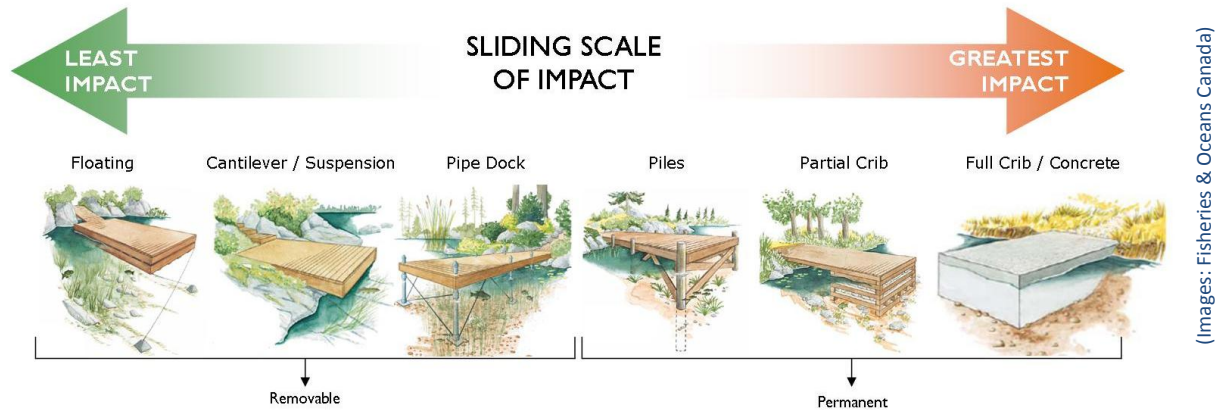
(A. Crowe)

BE THE CHANGE

Community groups, environmental non-government organizations and government agencies are collaborating on projects designed to naturalize shorelines and improve habitat. Seek out opportunities in your community!

Better Docks

Despite their construction over water, docks can cause damage underneath to aquatic life either during construction, caused by shading of the shallow waters beneath, by leaching preservatives used to maintain the dock and from poor management practices associated with loading and refueling watercraft. If constructed more permanently with piles, cribs or concrete, they can also disrupt sand transport. Limit your impact; assess your needs and expectations. Collaborating with your neighbours or using a community marina will lessen your impact and costs.



Choosing a Shoreline Professional

Shorelines are complex areas and most projects will require technical assistance with designing, permitting, construction and maintenance. Hiring the right professionals may help make the whole project run smoothly. Assess the scale of the work and determine what portion you need help with. An experienced coastal engineer may be needed for larger projects. Professional advice should include options and alternatives that will work with the shoreline type and conditions. Don't rely on just one person's advice; get a second opinion if necessary.

Beach Note:

Great Lakes freshwater dunes are considered to be globally rare. In Ontario, beach and dune coasts represent only 1.5% of our Great Lakes shorelines.



Bluewater Beach dunes (Coastal Centre)

NATIVE PLANTS

Native species of vegetation are indigenous to a particular area of the shoreline. They are hardworking, ecologically appropriate and adapted to local conditions. They require fewer inputs, such as water, fertilizer and pesticides and may provide habitat benefits for wildlife (e.g. birds, butterflies, beneficial insects and fish). Since native species often have deeper root system, less watering is required. Local nurseries should be able to assist however there are naturalist groups and native plant advocates who will know your ecosystem needs.

Some native plants to use around your home or cottage:

UPLAND TREES AND SHRUBS

Eastern White Cedar (*Thuja occidentalis*)
 White Birch (*Betula papyrifera*)
 White Ash (*Fraxinus americana*)
 Basswood (*Tilia americana*)
 Sugar maple (*Acer saccharum*)
 Big-Toothed Aspen (*Populus deltoids*)
 Trembling Aspen (*Populus tremloides*)
 Hop hornbeam (*Ostrya virginiana*)
 Choke Cherry (*Prunus virginiana*)
 Common juniper (*Juniperus communis*)
 Red Osier Dogwood (*Cornus sericea*)
 Staghorn Sumac (*Rhus typhina*)

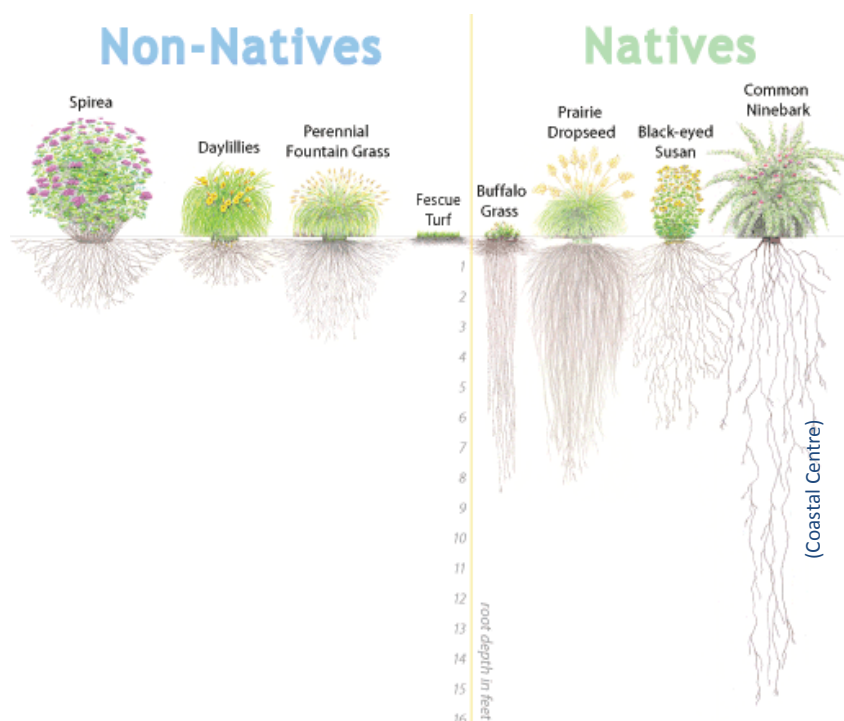
UPLAND GROUNDCOVERS

Wild Strawberry (*Fragaria Vesca*)
 Wintergreen (*Gaultheria procumbens*)
 Bunchberry (*Cornus canadensis*)
 Running Euonymus (*Euonymus obovatus* Nutt.)
 Wild Geranium (*Geranium maculatum*)
 Bearberry (*Arctostaphylos uva-ursi*)
 Foamflower (*Tiarella cordifolia*)
 Wild Ginger (*Asarum canadense*)

DUNE PLANTS

Marramgrass (*Ammophila breviligata*),
 Great Lakes Wheat Grass (*Elymus lanceolatus*)
 Little Bluestem (*Schizachyrium scoparium*)
 Canada Wild Rye (*Elymus canadensis*)
 Smooth Wild Rose (*Rosa blanda*)
 Beach Pea (*Lathyrus japonicas*)
 Bearberry (*Arctostaphylos uva-ursi*)
 Sand Cherry (*Prunus pumila*)
 Willow (*Salix spp*)

See the Coastal Centre's 'Dune Planting Guide' for a more complete list of native dune species – available online.



Wild Rose (OMNR)

Plant native species –they are better for you and better for our environment.

WHAT YOU CAN DO FOR THE LAKE

The Basics

Learn

- ✓ Read this guide and learn about the different shoreline types and the physical and ecological lake processes!
- ✓ Learn to recognize species-at-risk and the habitats on which they depend. Each one is important to protect. They provide a barometer as to how well we are managing our environment in which both humans and these species rely for survival. They can be an early indicator of problems.

Share

- ✓ Share your knowledge with your friends, neighbours, cottage renters or even strangers, about the rarity and ecological importance of each of the special shoreline zones.

Participate

- ✓ Volunteer with a local conservation group! There are many activities you can assist with that will benefit the lake, including controlling invasive species, shoreline naturalization, native species planting and even garbage pickup.



Monitoring the Piping Plovers (OMNR)

Around Your Home

More Information

Can I make my lawn

“greener”?

- ✓ Let your lawn grow a bit longer – Longer grass will require less watering and cutting. There are also commercial seed mixes available with species that will require less maintenance and watering.
- ✓ Consider doing without the grass. Turf grass, or lawn grass, is another non-native, invasive species that can easily invade natural shoreline areas. This grass can also attract Canada Geese that will graze on the lawn grass and contribute high amounts of phosphorous to the shore from their waste.
- ✓ Eliminate the use of chemical fertilizer; it can flow by surface runoff and groundwater to the water where it feeds the growth of algae. All plants, including algae, need nutrients to grow.
- ✓ Maintain the natural vegetation along the shore. Native shoreline vegetation is crucial to the health and quality of the lake given the natural water filtering characteristics, soil binding properties and micro-climate they provide.

Organic Lawn Care (TRCA)

LivingByWater.ca

What’s that smell??

(psst. It’s your septic system!)

- ✓ If you are using a private sewage system, keep your sewage system well maintained. Malfunctioning systems can pollute the lake with bacteria, viruses and nutrients like phosphorous. Pump the tank regularly – every one to three years, depending on use.



Signs of a failing septic system

- ✓ Your septic tile field should be located as far from the shore as possible. The tile field should drain away from the shore.
- ✓ Keep the amounts of water flowing into the septic system to a minimum. This allows it to work most efficiently without overloading the tank or drain field.
- ✓ Avoid septic additives, and never pour caustic cleaners and chemicals (including anti-biotic soaps) into the system; they only kill the helpful bacteria in the tank and field.

Septic Smart (Conservation Ontario)

Natural Landscaping

- ✓ Water only as needed. Try *xeriscaping* (planting native drought friendly plants), which helps conserve water.
- ✓ Use biological control agents or eco-friendly products instead of fertilizers, herbicides and pesticides. Leave grass clippings to decompose or compost them.
- ✓ Planting trees can save you money. Plant shade trees on the south and west sides of your house (summer shade) and evergreen trees on the north side of your house (to block winter winds), and you can reduce your energy bill.
- ✓ Choose native vegetation around your house or cottage. Native species are hard-working and adapted to local conditions and therefore tend to require less irrigation, fertilizers or pesticides. The reduced maintenance required will save you time and money.
- ✓ Consider planting a *Rain Garden* to help maintain the natural water cycle.

LEAF –
www.yourleaf.org

Fact Sheets
(TRCA)
-Rain Gardens
-Organic Lawn
Care
-Naturescaping
www.trca.on.ca

Stop the Alien Invasion!

- ✓ Leave your healthy, vegetated shoreline areas alone. In doing so, you are contributing to a healthy shoreline ecosystem and enable it to take care of itself.
- ✓ A natural area can prevent intrusive non-native invasive species that grows aggressively like Phragmites, Spotted Knapweed or Sweet White Clover and overtake your beaches. (Beach and dune areas where native vegetation has been disturbed or removed provide the conditions that are ideal for invasive plants to encroach and take over.)
- ✓ Monitor your garden and beach areas. Invasive, non-native plants can spread to other properties or onto shore areas as they ‘escape’ from gardens and lawns.
- ✓ Be alert. Learn what species are invasive, and keep an eye out for them. Garlic Mustard, Periwinkle, Sweet White Clover, and Goutweed are just some of the invasive plants to watch out for.

Ontario Invasive
Species Council
www.ontarioinvasiveplants.ca

Ontario’s Invading
Species
Awareness
Program
www.invadingspecies.com

Call the Invasive
Species Hotline to
report sightings
1-800-563-7711



(A. Crowe)

Don't make it harder!

- ✓ Keep paved and other hard, impervious surfaces to a minimum (this includes driveways, pathways and patios). These 'hardened' areas can speed up the flow of surface runoff that contributes to erosion, as well as preventing critical groundwater recharge. Use gravel or paving stones that allow water to seep into the soil.
- ✓ Direct roof gutter, and other runoff to gravel or sandy soil to drain safely; never discharge water at or over the top of a bluff or bank.
- ✓ Evaluate natural drainage patterns and avoid blocking the drainage route.

On the Living Edge
LivingByWater.ca

Down the drain... ... into the Lake

- ✓ Don't ever flush paints, thinners, and oil and petroleum products down the toilet or sink, and especially NOT into a ditch, stream or storm drain. One way or another, they end up in the lake. Consult your municipality for proper disposal.
- ✓ Go easy on fertilizers and avoid using herbicides and pesticides on lawns and gardens; they end up in runoff and eventually flow into the lake.
- ✓ Use environmentally friendly household cleaners, personal hygiene products, soaps and detergents. There are effective alternatives (i.e. vinegar or baking soda), as well as phosphorus-free products available for purchase. Avoid harsh chemicals such as solvents, bleach or caustic cleaners at home, on the dock or in the boat.



(A. Crowe)

At the Shore

More Information

My shore is washing away

- ✓ Help nature do its job in preventing erosion. Leave rocks and logs along the shoreline and keep natural vegetation in place. Plant additional native grasses, shrubs and trees that will help hold the soil and support the shore.
- ✓ When planting alone is not enough, try “bio-engineering” approaches that use natural materials such as logs, living stakes and brush bundles called wattles, to control erosion.
- ✓ Where erosion is severe, more radical measures may be needed. Consult a coastal professional before spending money on shore structures.
- ✓ Plant deep-rooted vegetation species above and behind your shoreline treatment to fill the voids and increase its effectiveness and life span.
- ✓ Stay away from gabion structures or vertical retaining walls. They often deflect wave energy that can cause wave scouring and collapse of the wall.

On the Living Edge
www.livingbywater.ca

The Shore Primer (DFO)


The “weeds” are taking over my beach!

- ✓ A weed is a plant in the wrong place. Get to know your plants as they are not all weeds or invasive species and some may be native and beneficial for beach health. Beach raking to remove plant material should be avoided or at least carefully considered since it may eliminate the food source for many birds and other animal species.
- ✓ Don’t be fooled by images of plant-free beaches that you often see in resort brochures. Beaches are places where plants must grow. When a beach lacks vegetation, this unnatural condition can take a lot of effort and money to maintain. By allowing natural vegetation to grow, you are allowing the beach to take care of itself as it has done historically, while investing in the future health of the shore.
- ✓ When turf grass is maintained too close to the dunes, it creates the opportunity for common weeds to ‘escape’ into the beach and dune area. Not only do these weeds change the appearance of the beach, they can also prevent native dune plants from growing. Turf grass also attracts geese that love to graze on it.

Controlling Aquatic Plants (DFO)



Beach Vegetation
(A.Crowe)

<p>The “weeds” are taking over my swimming area!</p>	<ul style="list-style-type: none"> ✓ Leave the aquatic plants alone. These aquatic plants growing in the water provide food and shelter for fish spawning and bird nesting activities. Never remove rare, threatened or endangered species. ✓ Chose to swim at public beach areas or naturally sandy / rocky areas. ✓ If you must remove some plants, take only what is required, remove the plants by hand, do not use chemicals, and be sure to follow regulations. Be aware that permits may be required, and there may be restrictions to the time of year the work is done. (Contact DFO/MNR) 	<p>Fish Habitat and Controlling Aquatic Plants (DFO)</p>  <p>(OMNR)</p>
<p>‘Buffer’ the shore</p>	<ul style="list-style-type: none"> ✓ Buffer strips are vegetated areas of land adjacent to shorelines that help minimize direct runoff to the lake or stream. The most effective buffer strips include a variety of low plants, shrubs, and trees, preferably native or existing vegetation. Buffers improve water quality, wildlife habitat and erosion control. ✓ Resist the urge to cut and mow right to the shore edge! Keep a healthy undisturbed buffer of native vegetation – dune grasses, shrubs and trees. A width of 15 to 30 metres is ideal, but every bit helps. ✓ Prune trees and shrubs rather than remove them if you are trying to create a better view of the lake. ✓ Remove only non-native, invasive plants that choke out native shore species. 	<p>On the Living Edge LivingByWater.ca</p> <p>Green Shorelines http://www.govlink.org/watersheds/8/action/greenshorelines/</p>
<p>Steep bluffs and slopes</p>	<ul style="list-style-type: none"> ✓ Rocky bluffs rarely pose a problem, but steep slopes of loose soils, clays or soft, sedimentary rock may be prone to erosion, sloughing or sliding. If you’re concerned about the stability of your slope, seek the advice of a geotechnical specialist. ✓ Avoid adding weight-bearing structures (buildings, stairways, parking or storage areas) close to the edge of bluffs or banks. ✓ Don’t dump rocks, leaves or garden debris over the edge of a bluff thinking that you will stabilize the surface. Often the added weight simply makes the erosion worse. ✓ Prune rather than cut trees to improve the lake view or to build a trail or stairway. 	<p>Lake Huron Bluffs Stewardship Guide (Coastal Centre)</p>

Trying to
control the
shore

- ✓ Leave it be! Do not channelize, armor, or remove vegetation from your shoreline. Existing habitat complexity can be reduced by the destruction of depositional areas and the hardening of shoreline (i.e., replacing vegetated shorelines with seawalls or other structures), as it will reduce water quality, and can create barriers to upstream and downstream movement which will reduce fish production.
- ✓ Avoid dredging and channelization as this destroys fish habitat, reduces water quality and alters flow regimes.

The Shore Primer
(DFO)



(A. Crowe)

Woodland Beach, 1955 – mid range of lake levels - see page 12



(Coastal Centre)

Woodland Beach, 1963 - low range of lake levels – see chart on page 12

Enjoying the Lake

More Information

What happens on the beach...



(F. Dobbs)

- ✓ Don't leave garbage on the beach. If you bring it, take it home with you.
- ✓ Leave logs and natural debris alone unless they threaten your property. Logs washed up by high water levels and storms play an important role in stabilizing the backshore and providing a base for vegetation to establish.
- ✓ Keep motorized vehicles off beaches.
- ✓ Take great care not to damage dune vegetation. No vegetation = no dunes, No dunes = no beach

Stewardship
Guide for Lake
Huron Coast
(Coastal Centre)

The route to the Beach

- ✓ Limit beach access points to just one or two footpaths, to protect the rest of the shore from damage and trampling.
- ✓ Stay on designated pathways, vegetation in these areas is sparse and fragile and easily destroyed.
- ✓ In dune areas, give your path an 'S' shape to help prevent wind erosion. Put stairs on pilings rather than cinching them to stumps and trees. Avoid cutting into the bank except to pour or install pilings.
- ✓ On very steep slopes or in sensitive areas (e.g., dunes) that may be destabilized by a trail or stairs, look for alternatives – like sharing with a neighbour whose property may have an easier route, or construct a boardwalk.

Stewardship
Guide for Lake
Huron Coast
(Coastal Centre)

Docks and Boathouses

- ✓ Consider alternatives to building a personal dock that requires a lot of maintenance and upkeep. Share with a neighbour or use public launch facilities instead.
- ✓ Don't use designs that require fill or dredging; docks should protect habitat and allow the free flow of water beneath them.

The Dock Primer
(DFO)

Fixing the Dock

- ✓ There are many new environmentally sensitive and biodegradable cleaners and products, usually found in stores that sell natural or organic products.
- ✓ Remember that any chemical applied to your dock may end up in the lake, no matter how careful you are.
- ✓ Consider decking material that does not require maintenance such as metal, fibreglass, plastic grating or naturally rot-resistant wood.

The Dock Primer
(DFO)

I'm on a Boat!

- ✓ Ensure you are not creating a wake when you are close to shore. Not only can this irritate your neighbours, but it can damage the shoreline.
- ✓ Be extremely careful when refuelling or changing oil on or near the water, as even a small spill could be toxic to aquatic life.
- ✓ Make sure your propeller is not stirring up sediment in shallow inlets or bays.



Wise Recreation

- ✓ Observe wildlife from a distance— avoid going too close. Slow down and reduce your wake/wash and noise levels.
- ✓ Do not disturb sensitive areas like sand dunes or wetlands, avoid walking on vegetation, and do not discharge any sewage, grey or bilge water from your boat.



(S. Mackey)

“Some” Terrain Vehicles?!?

- ✓ Keep motorized vehicles off the beach. They destroy dunes, wetlands and other sensitive shoreline areas because of their tendency to leak fluids, transport invasive plants or seeds in the tire treads and disturb the natural ecosystem.
- ✓ The definition of “all terrain” vehicles should not include beach and wetland “terrains”. Some Ontario municipalities have passed by-laws under the Municipal Act making the use of these vehicles illegal in ecologically sensitive lands such as wetlands and beaches.

Damaging Wheels
(Coastal Centre)

All-Terrain
Vehicles, Fish
Habitat, and You
(DFO)

Rules, 'Regs' and Permits – It's Complicated!

If you are planning to develop or alter the shoreline, you will most likely need approval from at least one agency, and possibly several different agencies depending on the nature of the work. This process can be confusing and a bit daunting. One or more agencies may have to review and provide approval to ensure your project proceeds safely and does not negatively impact the aquatic environment, water quality, endangered species and any adjacent properties. Understanding the roles of each agency can help you appreciate their perspective when they review your file.

This multi-layered, multi-agency permitting process is necessary because each agency is focused on protecting different aspects of Georgian Bay and the shoreline. Rules, regulations, and permit processes are in place to keep people and their investments safe and protect the environment. By keeping development out of the hazard zone, you reduce the vulnerability to shoreline hazards and the need to "protect" your investment by hardening your shoreline, etc. This in turn provides additional opportunities to maintain a more natural shoreline.

Regulatory Jurisdiction Along the Southern Georgian Bay Shoreline

Tobermory		Owen Sound			Collingwood			Severn Sound				
Fisheries and Oceans Canada												
Ministry of Natural Resources - Midhurst District												
Owen Sound Area						Midhurst Area						
	Grey Sauble Conservation Authority					Nottawasaga Valley Conservation Authority		Severn Sound Environmental Association **				
Niagara Escarpment Commission NEC					NEC							
County of Bruce		County of Grey				Simcoe County						
Municipality of North Bruce Peninsula	Municipality of South Bruce Peninsula	Township of Georgian Bluffs	City of Owen Sound	Municipality of Meaford	Town of The Blue Mountains	Town of Collingwood	Town of Wasaga Beach	Township of Tiny	Town of Penetanguishene	Town of Midland	Township of Tay	Township of Georgian Bay

** Severn Sound Environmental Association does not have regulatory authority, but can provide information and assistance.

Note: First Nations and Métis communities may have Aboriginal or Treaty rights that might be negatively impacted by a proposed shoreline alteration. These rights may vary depending on the community but often include hunting and fishing. The regulatory agencies may consult with these communities to determine how to address their concerns. Should the impact be considered severe enough your project might not be approved.

TIPS ON GETTING PERMITS, ADVICE AND DIRECTION:

- ✓ Contact staff from the approval agencies as early as possible in the planning stage of your project to determine project feasibility, if permits are required, and the approximate timeline for permit issuance.
- ✓ Submit everything at once, and make sure your application is complete and accurate.
- ✓ Most agencies have application packages that outline what items must be submitted with a completed application form. Taking time to read these carefully, and being aware of what will be required from each agency for your project may save you time and unnecessary frustration. Additionally, submitting a complete application will allow your application to be processed as efficiently and quickly as possible. Submission of incomplete or inaccurate applications is one of the main reasons approval processes may take longer than expected.
- ✓ Apply for permits well in advance of when you wish to do your work. The permit processes from various agencies can take time, and may involve site inspections or further consultation.
- ✓ Although staff will help ensure a coordinated review by letting you know which other agencies you will need to apply to and circulating approvals, keep in mind that the landowner is ultimately responsible to ensure all permits are in place prior to conducting work.

These rules and regulations change over time to reflect changes to the environment and government policy. Therefore, consulting the experts on the following list (pages 46 & 47) for information, advice and direction is time well spent.



Cave Point (Parks Canada)

PLANNING A PROJECT

How Do I Ensure My Shoreline Project is Sustainable?

Before starting a project, ask whether work is absolutely necessary, what alternatives are available and if it's better to do nothing or just keep it natural. It's best to not undertake changes to the shoreline unless you are attempting to restore the shore.

If work is absolutely necessary, follow the 5 step process to prepare and submit your application.

Step ONE Contact Agency Staff	<ul style="list-style-type: none"> ✓ Contact Conservation Authority (CA) and/or Ministry of Natural Resources (MNR) staff to obtain advice on how to proceed before designing your project and submitting your application. ✓ This should be done well in advance of your planned start date as some sites will have specific timing windows for construction (refer to bottom of page).
Step TWO Design Project	<ul style="list-style-type: none"> ✓ Make sure to design all work on your property and do not interfere with your neighbour's use and enjoyment of their waterfront. Better still, include your neighbour in your discussions. ✓ Consider alternatives (relocate, redesign, mitigate) to lessen impacts. ✓ Consider your shoreline type and alternatives that will result in the least impact to the physical and natural processes.
Step THREE Complete & Submit Application	<ul style="list-style-type: none"> ✓ Complete appropriate application(s) and provide contact information, location and project description. ✓ Prepare site plan and location map. ✓ Provide project details and supplementary information. ✓ Submit complete application with copy of deed or latest tax bill. ✓ Prepare the site for a visit by staking the location and perimeter of all proposed works so it can be easily located and reviewed.
Step FOUR Agency Review	<ul style="list-style-type: none"> ✓ Your application is reviewed by the CA and/or by MNR staff and field inspections may need to be conducted when there is no snow and ice cover. ✓ Depending on the results of their review and the presence of fish habitat, the CA or MNR may require you to forward your application package to the Fisheries and Oceans Canada (DFO). DFO will determine if a Fisheries Act Authorization is necessary. ✓ If the project is approved, a permit will be issued with conditions to be followed. ✓ Review the permit with your contractor, work within the time line allowed and keep a copy of the permit on site during construction.
Step FIVE Mitigation & Construction	<ul style="list-style-type: none"> ✓ Install construction mitigation measures and apply other permit conditions. ✓ Make sure to construct all work according to your plan and permit conditions.

Note that applying for a permit doesn't mean you will receive approval even if a permit was given in the past.

Timing Windows – (Timelines for fisheries concerns) Restricted activity timing windows are applied to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life history stages. The Ontario Ministry of Natural Resources (MNR) has the responsibility for setting timing window guidelines for southern Georgian Bay. Many in-water activities are prohibited in the spring, and depending on property location the work window may be further restricted in the summer and fall. Contact the MNR to confirm the timing restrictions.

AGENCIES

Federal Authorities

FISHERIES AND OCEANS CANADA (DFO)

<http://www.dfo-mpo.gc.ca>

Fisheries Protection Program

867 Lakeshore Road, P.O. Box 5050

Burlington, ON, L7R 4A6

Phone: 1.855.852.8320

Fax: 905.336.6285

Email: FisheriesProtection@dfo-mpo.gc.ca

If your work or activity has the potential to

negatively impact fish habitat, you may

require Authorization under the Federal

Fisheries Act. During low water levels in

Georgian Bay, it is important to note that

DFO considers all shoreline habitat equal to or below the elevation of 176.96 metres above mean sea level

(International Great Lakes Datum) to be fish habitat, whether it is wet or dry. DFO has partnership agreements with

the Grey Sauble and Nottawasaga Valley Conservation Authorities whereby the Conservation Authorities can

provide assistance and carry out the initial review of projects on behalf of DFO. DFO's project review process can be

viewed at www.dfo-mpo.gc.ca/habitat/habitat-eng.htm



Pike (Andy Metelka)

TRANSPORT CANADA / MARINE SAFETY <http://www.tc.gc.ca/eng/marinesafety/oep-nwpp-framework-250.htm>

28 Waubeek Street, Parry Sound, ON P2A 2X4 Phone: 705.774.9095

Any work or structure that might interfere with the public right-of-way of navigation may require approval from Transport Canada under the Navigable Waters Protection Act (for example a very long dock extending into Colpoys Bay could impact boating activities).

Provincial Authorities

ONTARIO MINISTRY OF NATURAL RESOURCES (MNR) www.mnr.gov.on.ca

Midhurst District 2284 Nursery Road, Midhurst, ON L0L 1X0 Phone: 705.725.7500

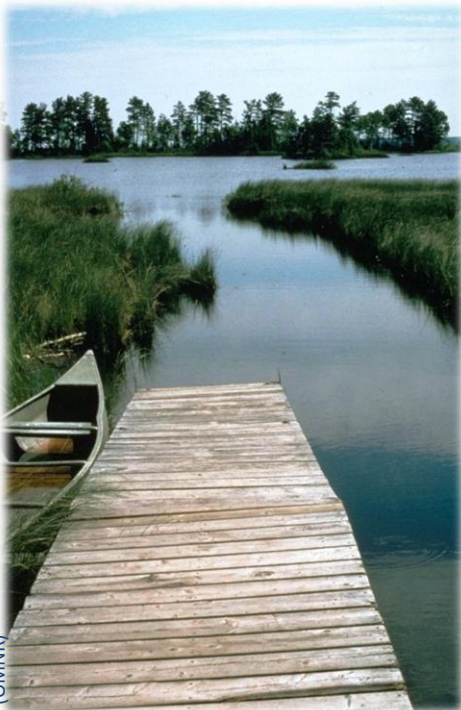
Fax: 705.725.7584

Works occurring on "shorelands" may require a permit under the Public Lands Act. "Shorelands" are lands covered or seasonally inundated with water of a lake, river, stream or pond during the previous 12 months and includes both private and publicly owned lands. This area changes as the annual water level rises and falls. This area also includes the bed of the lake. A Work Permit may be required for works occurring in this area. Additionally, changing the water flow on your property (that is diverting or increasing the flow, holding back water, or working on a dam) may require MNR approval under the Lakes and Rivers Improvement Act.

NIAGARA ESCARPMENT COMMISSION (NEC) www.escarpment.org

99 King Street East, P.O. Box 308 Thornbury, ON N0H 2P0 Phone: (519) 599-3340 Fax: (519) 599-6326

To ensure that the Escarpment's natural resources, health and ecosystems are protected, Niagara Escarpment landowners, (refer to NEC website for map), are required to get a Niagara Escarpment Development Permit or other approvals for certain types of development Your application will be evaluated to determine if it complies with the policies of the Niagara Escarpment Plan.



(OMNR)

Conservation Authorities

Conservation Authorities are based on riverine watersheds and manage the natural resources within those watersheds. You may require approval (and a permit) under the Conservation Authorities Act. Lands that are adjacent or close to the shorelines, tributaries, and wetlands of Georgian Bay that could be affected by flooding, erosion or dynamic beaches will be regulated by the Conservation Authority.

GREY SAUBLE CONSERVATION AUTHORITY

www.greysauble.on.ca

237897 Inglis Falls Road, RR 4, Owen Sound, Ontario, N4K 5N6

Phone: (519) 376-3076, Fax: (519) 371-0437

NOTTAWASAGA VALLEY CONSERVATION AUTHORITY

www.nvca.on.ca

John Hix Conservation Administration Centre, 8195 8th Line

Utopia, Ontario, LOM 1T0

Phone: 705-424-1479 Fax: 705-424-2115

Email: admin@nvca.on.ca



(OMNR)

Municipal Authorities

You may be required to get approval for site alterations. Contact your local county or municipal government office to determine if permits are required.

COUNTY OF SIMCOE www.simcoe.ca

1110 Highway 26, Midhurst, Ontario L0L 1X0

Phone: 705-735-6901 Toll Free : 1-800-263-3199

Municipalities:

- Town of Collingwood
- Town of Wasaga Beach
- Township of Tiny
- Township of Tay
- Town of Penetanguishene
- Town of Midland
- Township of Georgian Bay

GREY COUNTY www.grey.ca

595 9th Ave East, Owen Sound, Ontario N4K 3E3

Phone: 1-519-376-2205 Toll Free: 1-800-567-4739

Municipalities:

- Township of Georgian Bluffs
- City of Owen Sound
- Municipality of Meaford
- Town of Blue Mountains

BRUCE COUNTY www.brucecounty.on.ca

30 Park Street, Walkerton, Ontario N0G 2V0

Phone: 519-881-1291

Municipalities:

- Municipality of North Bruce Peninsula
- Municipality of South Bruce Peninsula



(Coastal Centre)

Additional Resources & Information

References to provide detailed guidance on how to live with nature

The Lake Huron Centre for Coastal Conservation www.lakehuron.ca

- A Stewardship Guide for the Lake Huron Coast (2006)
- Lake Huron Bluffs Stewardship Guide (2013)
- Lake Huron Dune Planting Guide (2010)
- Lake Huron's Coastal Plants (2010)



(Coastal Centre)

Living by Water www.livingbywater.ca

- On the Living Edge, Your Handbook for Waterfront Living (n.d.)

Ontario Invasive Plants Council

www.ontarioinvasiveplants.ca

- Grow Me Instead (2011)

Fisheries & Oceans Canada www.dfo-mpo.gc.ca/habitat/regions/arctic-arctique-eng.asp#c1

- The Shore Primer (n.d.)
- The Fish Habitat Primer (n.d.)
- The Dock Primer (n.d.)

Conservation Authorities www.greysauble.on.ca and www.nvca.on.ca

- Natural Hazards Reference Manual, MNR (2010)
- GSCA Shoreline Management Plan (1994)
- NVCA Planning and Regulation Guidelines (2009)

Federation of Ontario Cottagers Associations (FOCA) www.foca.on.ca

- A Shoreline Owners Guide to Healthy Waterfronts (2008)

Ministry of Natural Resources www.mnr.gov.on.ca

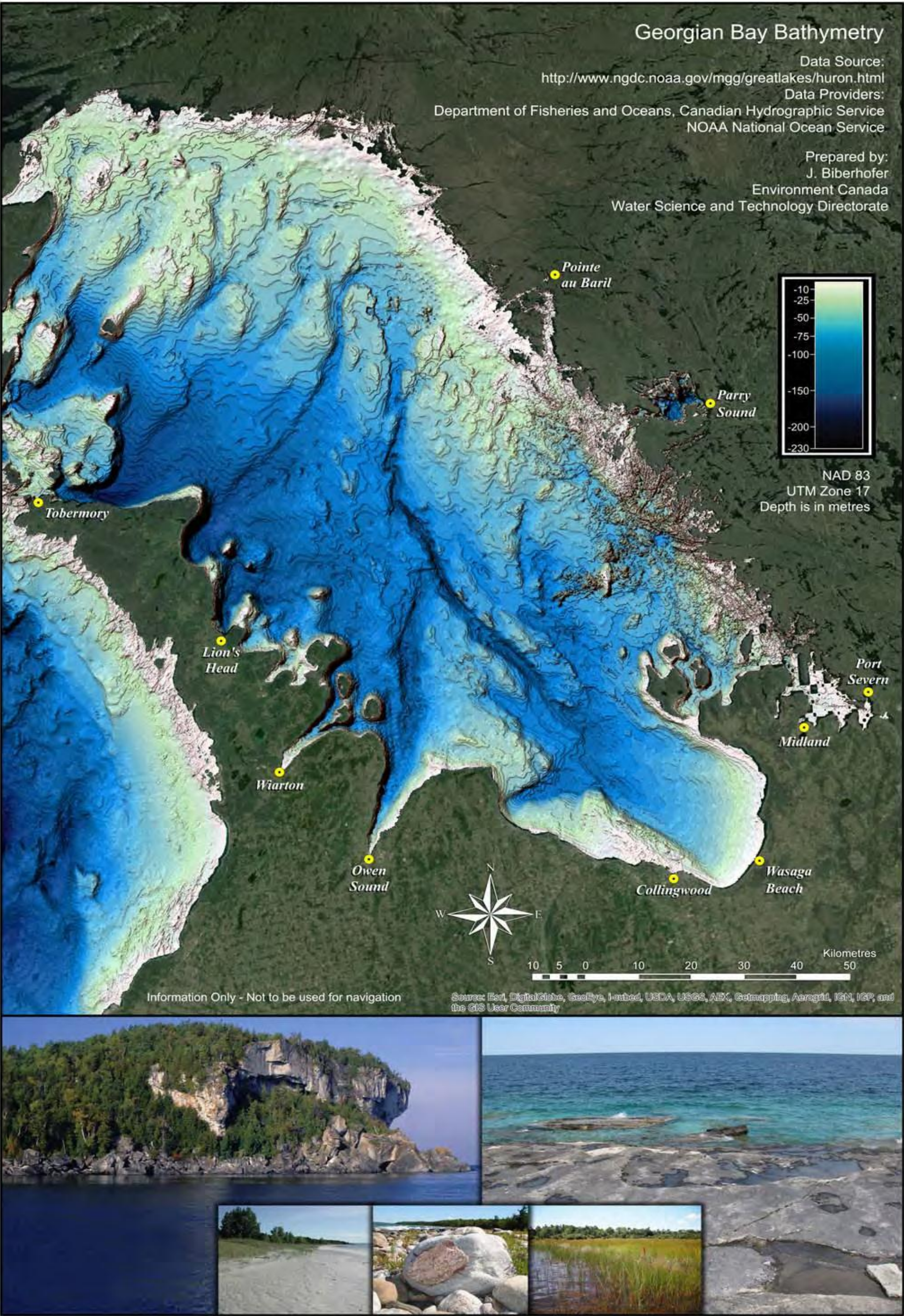
- Along the Shore – A landowners guide to healthy shoreline management for Lake Simcoe (2013)
- Ontario Species at Risk information - www.mnr.gov.on.ca/en/Business/Species

Other Documents:

- Sweetwater Sea: Strategies for Conserving Lake Huron Biodiversity (2010) www.lakehuroncommunityaction.ca/page.php?page=partnership
- Lake Huron – Georgian Bay Framework for Community Action (n.d.) www.lakehuroncommunity.ca
- State of the Great Lakes, EC & EPA (2009) http://binational.net/solec/sogl2009/sogl_2009_h_en.pdf
- Federal Species At Risk Act (SARA) www.sararegistry.gc.ca
- Natural Heritage Reference Manual (2009) http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=12714&Attachment_ID=32290
- Ontario Provincial Policy Statement, (2005). Ministry of Municipal Affairs and Housing. www.mah.gov.on.ca/Page1485.aspx
- Environmental Objectives for Lake Huron, (2007) (Liskauskas, A., Johnson, J., McKay, M., Gorenflo, T., Woldt, A., and Bredin, J.) www.glfc.org/lakecom/lhc/lheo.pdf
- Nearshore Areas of the Great Lakes (2009) http://binational.net/solec/sogl2009_e.html

Southern Georgian Bay Shoreline Features





(Photos L to R: Parks Canada, A. Crowe, G. Mayne, A. Mckee, S. Mackey)

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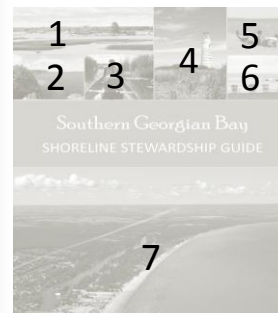
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- ❖ Artwork: Juliana Hawke
- ❖ Bathymetric map: Hans Biberhofer (Environment Canada)
- ❖ GIS mapping: Ministry of Natural Resources; The Nature Conservancy of Canada

This Guide was inspired by the Coastal Shore Stewardship Guide - British Columbia Stewardship Series and the beauty of southern Georgian Bay



Cover credits:

- 1 – Environment Canada
- 2 – OMNR
- 3 – OMNR
- 4 – Canadian Wildlife Service
- 5 – A. Crowe
- 6 – Environment Canada
- 7 – Enrique Photo Art



Our cottage on Georgian Bay has been my
'escape hatch' for more than fifty years.

When life throws me a curve ball
when I am perplexed or grieving
I go to the cottage.
The sparkling waters of Nottawasaga Bay
waves lapping the sandy shore
the glorious sunsets
all speak to my soul
and nourish my spirit.

Nowhere on Earth am I as peaceful and content.

-Linda Lockyer