

# OUR GREAT LAKESHORE

LIVING ALONG THE ALNWICK/HALDIMAND LAKE ONTARIO SHORELINE

## Alnwick/Haldimand Lake Ontario Shorelands Project

### SUMMARY OF FINAL REPORT

September 2003

The Lake Ontario shoreline is an attractive place to live, but those who are fortunate enough to live there must recognize the hazards associated with shoreline processes and the potential impacts that human activities can have on water quality, land-based ecosystems and the nearshore habitat.

Lower Trent Conservation completed the Alnwick/Haldimand Lake Ontario Shorelands Project in 2003. The Final Report summarizes information relating to natural hazards and natural heritage along the shoreline and provides recommendations relating to setbacks, shore protection works and environmental protection. The Report provides guidance to the Municipality, landowners and the Conservation Authority so that they can make informed land use decisions along the lakeshore.

#### What is Shoreline Management?

Shoreline management combines knowledge and understanding of water impacts such as wave uprush, sediment movement, and flooding with land impacts such as drainage, slope stability, vegetation management, stewardship, and land use. Shoreline management plans are developed to ensure that sound land use decisions are made that consider both land and water impacts and factors. If not properly planned, shoreline development may result in property damage and potential risks to human life. Poorly planned development may also adversely affect the natural environment.



#### ALNWICK/HALDIMAND LAKESHORE

Compared with shoreline areas to the west, the Alnwick/Haldimand shorelands are relatively undeveloped. The bulk of the development is in the west end; some of this has been created through plans of subdivision. There is also a trailer park along the shore and a private camp with seasonal residences/cottages. The hamlet of Lakeport is located at the east end of the Township. The remainder of the study area is mainly agricultural with scattered rural residential development.

*"The beach is magic, an infinitely complex and beautiful ballet of the shore and the land, a pas de deux between change and resistance. Caught up in the dance are the animals and plants that live there. The beach is not just a strip of land: it is a community, a wild and living thing."*

—Silver Donald Cameron—

# Natural Features

Good shoreline management must consider ecological connections: the natural features and their functions in the nearshore area of the lake, along the water-land interface, and on the adjacent land. Altering the physical landscape can result in a change to natural systems and wildlife habitat. Changes in one area can affect other areas up and down the shore, as well as upstream and downstream.

## FISH HABITAT In the lake...

Generally, the nearshore habitat in the lake consists of sand, gravel and boulder deposits over bedrock. Gravel and boulder deposits are used for feeding areas for fish as well as spawning. The nearshore community consists of alewife, smelt, and suckers as well as whitefish, lake trout and pickerel.

## In the streams...

In addition to the fish that live in the lake, seasonal spawning of salmon and trout occurs in creeks along the shoreline. Migratory species, such as Rainbow and Brown trout, are found in area streams, as well as Chinook and Coho Salmon. These fish spend part of their life cycle in the lake, and part in the cold water streams that empty into the lake. Brook Trout, and some Rainbow Trout and Brown Trout, live their entire life in the streams. These are called resident species.

It is important to know about fish habitat, because any work along the shore or in and along watercourses must take migration routes, spawning areas, and feeding areas into consideration. Destruction of a beach or placing structures in the water can disrupt fish habitat. When doing work in the water, we need to take into consideration migration routes from offshore to inshore, along the shore, and up the streams as well.

## COLD WATER STREAMS ...along the Alnwick/Haldimand Lakeshore

Several streams empty into the lake along the shoreline. These streams are not only important for fish habitat – the stream corridors provide cover, habitat and migration routes for other species as well. Many birds, mammals, reptiles, and amphibians spend part or all of their life cycle in wooded areas near streams. A wide range of vegetation also grows in stream valleys.

**Cold Water Streams:**  
*groundwater-fed watercourses that remain cool enough year around to support highly sensitive species such as brook, rainbow, and brown trout.*  
From west to east:  
Barnum House Creek  
Grafton Creek  
Shelter Valley Creek  
Wicklow Creek  
Lakeport Creek

## WETLANDS

Wetlands are the half-way world between dry land and open water. They are ecosystems—communities of plants and animals that depend on the presence of water or wet soils to survive. There are a number of wetlands along the Alnwick-Haldimand shoreline.

### Provincially Significant Wetlands...

Colborne Creek Wetland and Wicklow Bay Wetland are provincially significant. This means that they have been evaluated by provincial guidelines and scored high enough to be considered significant. These wetlands are associated with the mouths of the coldwater streams. They provide fish habitat and are home to a variety of wildlife species including osprey, green herons, great blue herons and black-crowned night herons, bullfrogs and snapping turtles, as well as a variety of furbearing animals.

### Other Evaluated Wetlands...

Other wetlands along the shoreline include the Wicklow Gravel Pit Wetland, Grafton Swamp and Brookside wetland. These wetlands have not been identified as significant by the Province, but they are important parts of the ecosystem. They provide habitat for a variety of fish, birds, mammal, reptiles and amphibians.



## SIGNIFICANT NATURAL AREAS

In addition to wetlands, there are other important natural areas along the shoreline. The Waterfront Regeneration Trust completed a study of natural areas along the Lake Ontario shoreline (from Burlington to Trenton) in the early 1990's. Several key natural areas were identified as part of this work including: Spicer Lowland Woods, Grafton Undulating Woods, Chubb Point Natural Area, Lower Shelter Valley Creek, Wicklow Beach Wetland, and McGlennon Point Wetland. Some of these areas are associated with evaluated wetlands and stream valleys, but provide upland habitat as well. The areas are identified as significant based on a variety of factors including: rare vegetation communities, occurrences of rare species, the quality of habitats, diversity, size, and linkage. Diverse habitats are important for wildlife, as many species have different requirements through their life cycles. Linkages to other natural areas are also important to allow for migration and genetic diversity.



## AREA OF NATURAL AND SCIENTIFIC INTEREST (ANSI)

Also of significance along the lakeshore is the Lakeport ANSI. This feature is the best known example in Ontario of an old spit and beach shoreline from what is called the Belleville stage of the glacial lake that covered the area about 12000 years ago during the Wisconsin Ice Age. This area has been identified as provincially significant through the Ministry of Natural Resources ANSI program and is subject to special planning policies. The Ministry of Natural Resources is the best contact for more information about this feature.

## NATURAL CONNECTIONS

There are many other significant natural areas in the Township, and in the municipalities to the east and west. The watercourses connect many of these natural areas with the lakeshore habitat. Shelter Valley Creek and Barnum House Creek originate in the Oak Ridges Moraine connecting this sensitive area with the lakeshore. Protecting natural areas and keeping and establishing linkages with other natural areas is important to ensure a healthy ecosystem.

The most important thing for all of us to remember when thinking about the environment, is...

*Everything is connected to everything else!*

If you own land with natural features on it, think about how it contributes to ecosystem health. It may provide habitat for animal species, it may provide linkages with other areas, it may help hold the soil in place, or it may have a connection with groundwater resources.

When working along the shoreline we need to keep these connections in mind. The effects of altering the shoreline or nearshore area can affect fish habitat, but impacts on vegetation and the water cycle can also have detrimental affects on natural habitats and linkages along the shoreline, and inland as well.



# ALNWICK/HALDIMAND LAKE ONTARIO SHORELANDS

1000 0 1000 2000 Meters

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- Municipal Boundary
  - Building
  - Road
  - Watercourse
  - Lake
  - Marsh
  - Wooded Area
- Natural Features**
- Area of Seasonal Fish Migration
  - Area of Seasonal Fish Spawning
  - Provincially Significant ANSI
  - Locally Significant Wetland
  - Provincially Significant Wetland
  - Significant Natural Area
- Shoreline Type**
- Artificial
  - Bluff
  - Dynamic Beach
  - Low Bank



Natural Shoreline (west end)



Bluff (around Lot 30)



Cobble Dynamic Beach (Chub Point)



Barrier Beach (outlet of Shelter Valley Creek)



Haldimand Boat Launch



Sand Dynamic Beach (east of Boat Launch)



## Coastal Processes

The shore zone is an extremely dynamic area, especially on a lake as large as Lake Ontario. As a result of natural shore processes, the boundary between land and water may undergo a shift in position with time.

### EROSION

The rate at which shores erode or accrete depends on the composition of the shore zone and its exposure to erosive forces. While ground and surface water, burrowing animals and rain striking exposed bluff faces all cause erosion along the shoreline, by far, the most significant natural erosive force is wind-driven wave action. As waves approach the shoreline and break, they cause downcutting of the lake bottom at the shoreline. The downcutting action is the primary cause of shoreline recession. Changes in water levels affect erosion by changing the location where waves break on the shore. During periods of low water level, waves break offshore reducing the energy dissipated directly on the shoreline. During high water levels, the reverse is true and waves can break directly on the bank causing greater erosion.

### FLOODING

The 100-year (static) flood level is the peak water level with one chance in one hundred of occurring in any given year. It is the "worst case scenario"—almost! Along shorelines subject to wave action (like along Alnwick/Haldimand's lakeshore), winds can drive water further inland, above and beyond the 100-year flood level. This must be taken into account when considering flooding hazards along the lake.

### DYNAMIC BEACHES

Dynamic beaches are created along the Lake Ontario shoreline by the interaction of waves, wind, and ice, with the physical characteristics of the shoreline (sediment size and supply, shoreline orientation, and the alongshore and onshore-offshore form of the shoreline.)

Dynamic beaches are unstable. Beach material may erode or accumulate in these areas, depending on the long-term supply of sediments provided by the adjacent shoreline and the orientation of waves during storm events and periods of high water. The easiest type of dynamic beach to visualize is the sandy beaches at Presqu'île and Sandbanks Provincial Parks. These beaches have very deep deposits of sand which grow or shrink in any given year. Beaches and onshore dunes can be eroded away, with the sand temporarily deposited in offshore bars. Over time, the sand returns to the beach and the dune system. Many of the dynamic beaches in Alnwick/Haldimand are formed of cobbles instead of sand. Like the beaches at Presqu'île, these beaches change from year to year, but the predominant movement of granular material is in an onshore-offshore direction, rather than along-shore migration.

#### Definition of a Dynamic Beach...

- ~ greater than 0.3 metres of sediment
- ~ greater than 10 metres wide
- ~ over 100 metres in length



#### Erosion Monitoring Stations

Seven erosion monitoring stations have been established along the lake as part of the Alnwick/Haldimand Lake Ontario Shorelands Project. Regular surveys of these stations will help establish erosion rates.

#### Water Level Fluctuations and Control

Water level fluctuations and control is always a concern for shoreline residents. Today, both natural and human factors affect the lake. Precipitation, or the lack of it, is the main cause of long-term extreme fluctuations in lake levels. Of the human factors, lake level regulation (artificial control) of lakeflows has the greatest impact. Regulation of the water levels in the Great Lakes takes place on Lake Superior and Lake Ontario. To keep informed of water levels, copies of the monthly LEVELnews publication can be obtained from:  
Great lakes-St.Lawrence Water Level Information Office  
P.O. Box 5050, Burlington, ON L7R4A6  
e-mail: [water.levels@ec.gc.ca](mailto:water.levels@ec.gc.ca)  
<http://www.on.ec.gc.ca/glimr/>

## Planning Considerations

The best approach to shoreline management is avoiding the hazardous and sensitive areas to start with. When creating lots, or building on lots of record, developers should keep back from the lake and other sensitive areas such as wetlands and watercourses.

The Province has recognized that development of areas susceptible to Lake Ontario shoreland hazards can result in extensive property damage, risks to public safety, and detrimental impacts to the shoreline ecosystem. Therefore, they have included policies in the Provincial Policy Statement to direct development away from shoreline hazards. Municipalities must have regard to these policies when making planning decisions. For areas along the lakeshore, the policy defines the hazardous areas in terms of flooding, erosion and dynamic beaches.

In the Township of Alnwick/Haldimand, the shoreline exhibits a lot of variety. In some places the concern is flooding or dynamic beaches, but more often the greatest hazard is erosion. Through the Shorelands Project, the Conservation Authority has identified recommended development setbacks for different reaches along the shoreline. The reaches are identified on the centre-fold map.

**The recommended setback is always the greater of the erosion hazard limit, flood hazard limit and the dynamic beach hazard limit.**

#### The Flooding Hazard Limit

is determined by combining: the 100-year static flood level (75.7 metres above sea level) **plus** an allowance for wave uprush and other water related hazards. The resultant elevation varies across the shoreline and is listed in the Shorelands Report.

Where information is not available to calculate the allowance, a 15 metre setback is measured horizontally from the 100-year static flood elevation (75.7 metres) to determine the Flooding Hazard Limit.

The flooding hazard limit is the one that most often applies in areas where there are wetlands, beaches (that aren't dynamic) or low banks.

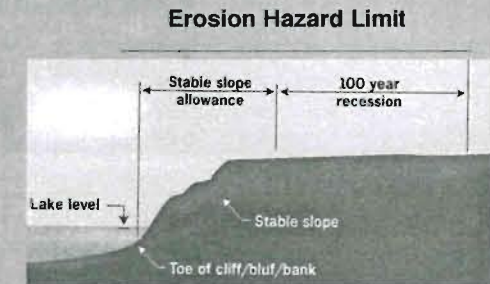
#### Dynamic Beach Limit

Sometimes dynamic beaches are backed by bluffs or wetlands. In these cases the erosion or flooding standard applies. In other areas, where there are no bluffs or wetlands, the dynamic beach hazard ranges from 10 to 30 metres, to be measured from the backside of the beach deposit.

#### Erosion Hazard Limit

The erosion hazard is determined by taking the stable slope allowance (3:1) and adding the 100 year recession rate (the average annual recession rate extended over a 100 year time span.) For Alnwick/Haldimand, a 0.3 m/year recession rate is used (that's 30 metres over a 100 year period).

The **erosion standard** (or recommended setback) ranges from 30 to 69 metres (depending on bluff height) and is measured from the toe of the bank.



The erosion hazard limit is the standard that governs for the majority of the Alnwick/Haldimand shoreline as bluffs and high banks are predominant.

Before building or submitting your development application, check with the municipality or Conservation Authority to determine the recommended development setback for your property.

# Working Around The Water

## SHORE PROTECTION

Landowners with residences that are close to the water's edge may be considering shoreline treatment. Careful consideration needs to be given to the long-term costs and benefits of the project including maintenance costs, and habitat and aesthetic benefits. Working with neighbours to develop consistent shoreline treatment over a longer reach is recommended and, where possible, bioengineering techniques should be incorporated. Possible alternatives (can the building be moved?) should also be considered. Knowing the erosion hazards can help landowners make informed decisions.

If you are planning to undertake shore protection, talk to Conservation Authority staff. The Alnwick/Haldimand Shorelands Report includes some options and recommendations.



## Permits

The shoreline is a complex and dynamic area. Alterations to the shoreline can affect the way the shoreline buffers and absorbs wave energy from the lake and can have an effect on both aquatic and terrestrial habitats. Because of the broad range of issues, several agencies and pieces of legislation apply to shoreline work.

Approval may be required for:

- work on/adjacent to navigable water
- dredging or filling activities
- work within designated fill lines
- certain construction activities (water works or sewage works)
- changes in land use
- removal of plant material

Before undertaking any work in or near the water, landowners must ensure that they have approvals to proceed from the appropriate agencies.

Most projects along the Alnwick/Haldimand shoreline will require a permit under one or more of three basic pieces of legislation.

*Lakes and Rivers Improvement Act*

Ministry of Natural Resources, 1-705-755-2001

*Public Lands Act*

Ministry of Natural Resources, 1-705-755-2001

*The Federal Fisheries Act*

Lower Trent Conservation, 1-613-394-4829

(permits may also be required under the Conservation Authority's Fill, Construction and Alteration to Waterways Regulation)

**Always call first!!**

Copies of the Shorelands Report are kept at the Alnwick/Haldimand municipal office in Grafton and at the Conservation Authority office in Trenton. You are welcome to visit the offices to view the report.

For further information, contact the Municipal or Conservation Authority office.  
And, enjoy your shoreline property!



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