

Lake Huron's
COASTAL WETLANDS
Ecosystems of Wonder



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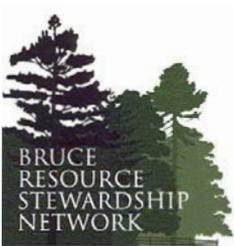
The Lake Huron Centre for Coastal Conservation

Canada

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Project Partners:

- Bruce Resource Stewardship Network
- Friends of Oliphant Coastal Environment
- the Municipality of Kincardine



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The Importance of Coastal Wetlands to Lake Quality

Great Lakes coastal wetlands are extremely productive and diverse communities of plant and animal life. They are vital to the well-being of the Great Lakes ecosystem. We've already lost about two-thirds of the original wetlands in the lower Great Lakes basin, and they continue to disappear. The estimate of wetland loss in southern Ontario is 1,000 hectares per year. As the quantity of Great Lakes wetlands shrinks, the importance of remaining wetlands becomes even greater.

The role that wetlands play in our environment is much like the way kidneys work in the human body: they act as purifiers, filtering out pollutants and other 'gunk' that could lead to poor health. The quality of Lake Huron's nearshore waters depends significantly on coastal wetlands. It's amazing, then, that we are gradually losing coastal wetlands, mainly in favour of development and related activities. It's the irony of building by the lake to enjoy its fresh waters, only to see water quality decline.

Coastal wetlands are becoming rarer ecosystems, as development (building homes, roads, drainage) takes its toll. Until only the last decade or so, wetlands were viewed by many as nuisance features that needed to be drained and converted into something 'useful.' People are generally better informed today about the role of wetland ecosystems in keeping our lakes healthy.

Anyone who observes coastal wetlands for any length of time knows that they are dynamic environments. They change in size and extent as water levels change seasonally and over cycles of several years. Although they share many of the same functions and values as





inland wetlands, the influence of Lake Huron makes *coastal* wetlands unique from *inland* wetlands. Highs and lows in Lake Huron's water levels also affect vegetative composition and wetland-dependent wildlife such as birds, fish, reptiles and amphibians.

Great Lakes coastal wetlands provide important habitat for many rare and unique plants and animals — among them endangered and threatened plants, birds, reptiles, fish and amphibians that use coastal wetlands for all or part of their life cycles. In the Great Lakes, more than two-thirds of all lake fish species spawn in coastal wetlands, and many bird species rely solely on wetland habitat for nesting and raising their young. The western shoreline of the Bruce Peninsula has been identified as the most productive lake whitefish spawning shoals and associated larval nursery grounds in Lake Huron (*Lake Huron Biodiversity Strategy, 2010*).

Protecting our remaining coastal wetlands should be an important priority for all of us. These are some of the values, or ecosystem services, that coastal wetlands provide to us:

- Home for many unique plants and animals, including species-at-risk
- 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, bird watching
- Carbon storage in soil and vegetation
- Educational opportunities for schools
- Spiritual enrichment

People often don't consider the full range of these ecosystem services when valuing our coastline, or estimating what is at stake when the coastal ecosystem becomes damaged by human activities and invasive species.



Evolution of Coastal Wetlands

Coastal wetlands along Lake Huron have developed along irregular, rocky coastlines that have a series of headlands, embayments and shallow, gently sloping beaches. Offshore islands and shoals often protect the shoreline from high-wave energy of the lake. These physical conditions make it ideal for wetland habitats to develop.

One of these wetland habitats is referred to as 'coastal meadow marsh' — a type of coastal wetland with unique species and habitats. The shoreline north of the Bruce Nuclear Power Development to McGregor Point Provincial Park, and north of Chief's Point along the Bruce Peninsula shoreline, is fringed by coastal meadow marshes and sometimes narrow, low sand and gravel beaches. The eastern shores of Georgian Bay are also fringed by coastal meadow marshes. Coastal meadow marshes are considered to be globally imperiled ecosystems.

The gently sloping shorelands of these wetlands are very sensitive to lake level fluctuations. For example, at the coastal wetlands in Oliphant (north of Sauble Beach), a 30-centimetre increase in water level can flood 200 to 300 metres of the shore. On the other hand, a drop in levels will expose 200 to 300 metres of the lakebed.

Meadow marshes have developed on the gently sloping shoreflats that change in size and composition with changing lake levels. The hydrologic regime of coastal meadow marshes is directly linked to that of Lake Huron; as a result, they are exposed to seasonal fluctuations in water levels, short-term changes due to storm surges, and long-term, multi-year lake level fluctuations. These changes in water levels influence the plant life in the wetlands.

The Water Level/Plant Life Connection

Plant species in coastal wetlands depend on fluctuating water levels to maintain periodic open sandy shorelines, and during low water years, sprout abundantly from newly exposed seedbanks. They flower, and set seed again, waiting until the next low-water year before they can sprout again.

High-water years kill woody plants (established in low-water years), which is a factor in maintaining open conditions. In addition to fluctuating water levels, meadow marshes are also subjected to wave energy, which washes away organic accumulations and deposits new layers of sand. Although affected by sand deposition, coastal meadow marshes contain extremely dense seedbanks, which in turn allow the vegetation to replace itself during low-water periods.



Coastal Wetlands are Full of Life

Plants in coastal wetlands require relatively calm waters to thrive. Coastal meadow marshes have numerous types of sedges, rushes and grasses, as well as low-growing shrubs. These plants bind the soil with tough roots and rhizomes and can grow densely in the shallows, helping to reduce the effects of waves and erosion. When water levels are high, waves can penetrate the wetland and plants can be eroded or killed by too much water. When lake levels fall, buried seeds in the soil gradually emerge. Coastal wetlands are home to many endangered and threatened birds, reptiles, fish and amphibians that use coastal wetlands for all or part of their life cycles.

Species-at-Risk

Species-at-risk are plants and animals that may not exist in the future; they need our help. Most species are at risk because of human activities and can recover if we reduce the threats to their survival. Species are assessed by experts and listed under federal and/or provincial laws if they are determined to be at risk of becoming extinct.

Why Care about Species at Risk?

All living things, big and small, have intrinsic value. All species in an ecosystem are connected to one another; each contributes to the biodiversity of the area. If an animal or plant is in decline, the causes of its decline will likely affect other species — including us. The environment looks after us all: trees provide fresh air to breathe and wetlands purify and clean our water. The presence of species-at-risk can be an indicator of the health of our environment and if they are affected, ultimately we may be as well. We need to take care of our environment so it can take care of us, and all that depend on it.

Meet Some Species-at-Risk in Lake Huron's Coastal Wetlands

There are a several plants and animals that have been designated as Species-at-Risk because their species and habitat are vulnerable to

human activities. Species that have been identified as endangered or threatened are protected by federal and provincial laws.

Here is a sampling of some of the Species-at-Risk in Lake Huron coastal wetlands:

 **Tuberous Indian Plantain** (*special concern*)

This perennial plant is in the Aster family. It grows as a flat rosette of leaves that hug the ground, but in spring sends up a tall flower stalk that produces a flat-topped cluster of white flowers by June. The seeds are wind-dispersed, aided by a 'parachute' of hairs on top of each seed. These perennials reproduce only by seed. Flowers are pollinated by

FOOCE



insects. Main populations along the Bruce Peninsula shoreline are at risk from residential development, lawn creation and mowing, drainage and destruction from motorized vehicles.

 **Dwarf Lake Iris** (*threatened*)

This miniature iris grows nowhere else in the world but the Great Lakes Region. Flowers bloom from mid-May to early June with blossoms open for about three days. Seed capsules ripen from mid-June to mid-August. Plants die back in autumn, leaving the rhizome to over-winter. Dwarf Lake Iris is small; it seldom grows taller than 10 cm, although its strap-like leaves can be up to 18 cm long. Fluctuating water levels of the Great Lakes play a vital role in opening up new habitat for Dwarf Lake Iris. During high-water years, trees and shrubs along the shoreline may be flooded out. This flooding may open up patches within the forest where the Dwarf Lake Iris may spread. Since Dwarf Lake Iris is largely restricted to the Great Lakes shores, it is highly vulnerable to ongoing shoreline development and intensive recreation.



JESSIE M. HARRIS

 **Turtles** All turtles in Ontario are at risk; all Ontario's turtles are living in a perilous time. All eight turtle species found in Ontario are in decline; six species are listed as a **species-at-risk**. Ontario turtle species

include: common snapping turtle, wood turtle, spotted turtle, musk turtle, northern map turtle, painted turtle, spiny softshell turtle and the Blanding's turtle.



 **Eastern Massasauga Rattlesnake** (*threatened*)

The Eastern Massasauga Rattlesnake is a medium-sized snake (50-76 cm.) with a thick body. Its head is diamond-shaped with white stripes along the jaw and its stubby tail has a brown, segmented rattle. The Massasauga lives in a range of open habitats, where it hunts for small mammals and birds. It shifts its home range seasonally, spending the summer in dry, upland sites, and the rest of the year in swamps (forested wetlands). In winter, snakes hibernate underground in damp or even wet sites such as caves, tree root cavities and animal burrows. Habitat loss, largely due to development activities, exerts significant pressure on populations of this snake. The Eastern Massasauga has highly specific habitat needs, and, unlike some species, cannot avoid development by relocating.



 **American White Pelican** (*threatened*)

The American White Pelican is one of the largest and most distinctive birds in North America, with a 3-metre wing span, large yellow-orange bill and throat pouch, glistening white plumage and black wing tips. Pelicans and other waterbirds rely on coastal wetlands for feeding.



 **Monarch Butterfly** (*special concern*)

In the fall, monarchs migrate thousands of kilometres, travelling from Canada to Mexico. This annual southward migration begins in Canada in early August and continues to mid-October. Throughout summer there are two — occasionally three — generations raised in Ontario. The life cycle from egg to adult can take only a month, however, most



large butterflies take about 45 days. Generations that emerge in late summer and autumn are somehow triggered to become migratory. Because monarch caterpillars ingest toxins (cardenolides) from milkweeds, once they develop into butterflies, they are unpalatable to most birds and other vertebrates. Monarch butterflies are commonly seen along the Lake Huron shore, particularly during their annual autumn migration to Mexico.

Struggling to Exist

Plant and animal species of the coastal wetlands struggle with a variety of threats. Threats to species — *and their habitats* — include:

1 • Development and recreation-related impacts (e.g. road and other construction), cottage use encroachment onto the shore, and vehicle damage to the shore. During periods of low lake levels, Oliphant's shoreline has been damaged by vehicles driving across the coastal fen.

2 • Genetic and reproductive isolation occurs when habitats are destroyed or become degraded, and a species' range becomes fragmented into smaller and smaller bits. As parcels of suitable habitat become smaller and barriers between these pockets of suitable habitat become greater, remnant populations become increasingly isolated. The more limited a population's genetic variability, the less it can deal with change, disease or other factors and the less likely it is to survive over the long term. Climate change impacts may accentuate dangers to plant populations at Oliphant and other coastal wetland areas, especially those already stressed by human activities.

3 • Altered moisture regime caused by drainage ditches and tire ruts can render habitat no longer suitable for some species.

4 • Invasive plant species can aggressively overtake native plants and their habitat, creating monocultures of the invader species. Invasive plant species, like *Phragmites australis*, are aggressive invaders that grow into dense monocultures, to the exclusion of native plants and animals. The non-native Common Reed (*Phragmites australis*) poses the latest threat to coastal ecosystems on Lake Huron; this invasive grass takes advantage of disturbed areas where people have cleared or disturbed the ground, leaving it vulnerable to non-native invasive plants. Common Reed also has the capacity to release a poison through its roots that can impair native plant growth, or kill them off entirely.



What Can Residents & Visitors Do to Protect Coastal Wetlands?

- Motor vehicles, like all-terrain vehicles, can be very damaging to coastal wetlands and their plant and animal species. It's best to keep motorized vehicles on the road, where they belong.
- Altering the shoreline by creating drainage channels, clearing rocks and boulders or erecting boat slips can destroy plant and animal habitat, alter the flow of water (leading to beach pollution), form barriers to people's use and enjoyment of the shore, and lower the value of the shore. Be mindful of the value and function of coastal wetlands, and actively participate in their stewardship. Remember, most alterations are regulated and likely require a permit. Contact the local conservation authority before you proceed.
- Species-at-risk are protected by laws. Report damage or poaching of species to the Ontario Ministry of Natural Resources; call 1-877-TIPS-MNR (847-7667) toll-free any time of day. You can also call Crime Stoppers anonymously at 1-800-222-TIPS(8477).
- Learn to recognize species-at-risk and the habitats on which they depend.
- Maintain the natural vegetation along the coast. Native coastal vegetation is crucial to the health and quality of the lake.
- Keep your sewage system well maintained. Malfunctioning systems can pollute lakewater with bacteria, viruses and nutrients.
- Eliminate use of chemical fertilizer; it can flow by surface runoff and groundwater to the lake where it feeds the growth of algae. All plants, including algae, need nutrients to grow.
- Plant native species only, and reduce or eliminate your lawn. Most lawn grasses are non-native, can attract geese (which leave 'calling cards'), and are high-maintenance. Don't like to cut grass at the lake? Plant native species. It's better for you *and* better for the environment.
- Tell your friends, family and neighbours why coastal wetlands are important, and how they can help protect them.

■ Watch for wildlife when driving. Turtles and snakes often cross roads that bisect their habitat. In May, June and early July, turtles can be found crossing roads in search of nesting grounds. Then, at the end of August until the third week of September, turtles are on the move again to go to their hibernation area.

■ Learn to recognize non-native, invasive plant species like Common Reed, Garlic Mustard, Giant Hogweed, Spotted Knapweed and Purple Loosestrife. These invasive plants can quickly overtake shorelines and be very difficult to control. For more information about these species, contact the Coastal Centre.



Common Reed is a non-native, invasive plant, European in origin. It began appearing on Lake Huron's coastline around 2003. This very aggressive grass grows tall (3-4 metres) and spreads rapidly, so it can easily outcompete native plants. Its roots produce a toxin, an added advantage in taking over habitats, inhibiting the growth of native plants.

Our coastline is so important ecologically and economically that some local municipalities have embarked on control programs. The Township of Huron-Kinloss and Town of Saugeen Shores have had remarkable success by identifying the threat early and taking action. The Coastal Centre has completed a field inventory of *Phragmites* occurrence on Lake Huron to help in co-ordination of future actions to control this invasive species on our shores.





Harmful Human Activity

During periods of low lake levels, exposed shorelands at some coastal communities are especially at risk to harmful human activity. These areas of new growth and extensions of habitat are vulnerable to the damaging results of taking all-terrain vehicles and off-road vehicles out for joy rides, or parking closer to the shoreline. Motorized vehicles can have devastating effects: crushing emerging plants and buried seeds, and running over animals or nests that might be in the area. Tire ruts can alter the movement of water, and soil disturbance can promote the spread of invasive plants like the Common Reed.

Curtailing this kind of activity, while maintaining access to the beach benefits people’s recreational enjoyment while protecting the important values of the wetlands. Local by-laws and enforcement can go a long way to protecting the quality of our shores. Motorized vehicles belong on roads.



GEOGRAPHIC HIGHLIGHT: OLIPHANT

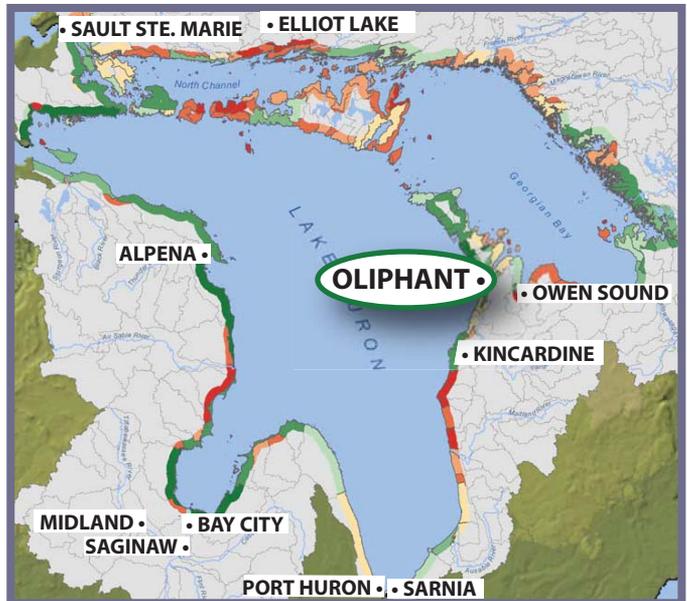
The coastal wetlands at Oliphant (north of Sauble Beach) are unique on Lake Huron. The wetlands occur to the lee (landward side) of the Fishing Islands, an archipelago along the west side of the Bruce Peninsula. Sheltered by the islands, the area has evolved into a coastal meadow marsh that possesses many rare species, including six Species-at-Risk (Piping Plover (*Endangered*), Dwarf Lake Iris (*Threatened*), Tuberous Indian Plantain (*Special Concern*), Turtles (*Endangered*), Massasauga Rattlesnake (*Threatened*) and Monarch Butterfly (*Special Concern*).

This area is also a great recreation destination for many water sports, such as swimming, kayaking, canoeing, and kiteboarding. The natural area also makes it attractive to naturalists, birders and botanists.

Current threats to these wetlands include driving and parking motorized vehicles on the wetlands, drainage and alterations, and the spread of the alien invasive plant Common Reed (*Phragmites australis*).

A local group, Friends of Oliphant Coastal Environments, is working with its local municipality and community to implement stewardship measures aimed at protecting the ecology and function of the wetlands, while still encouraging recreational use of the shore.

Green patches along the shore show location of coastal wetlands around Lake Huron.



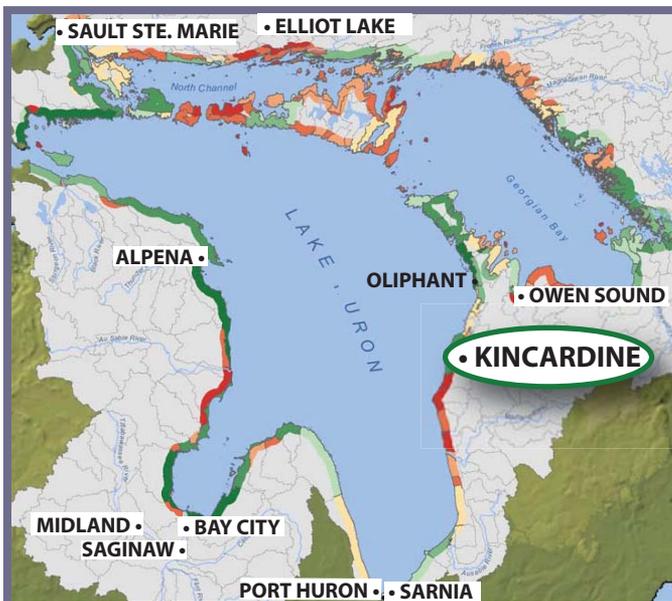
SOURCE: Lake Huron Biodiversity Strategy, 2010

GEOGRAPHIC HIGHLIGHT: BAIE DU DORÉ

Baie du Doré in Kincardine is part of a coastal wetland system extending from the Bruce Nuclear Power Development northward to Port Elgin. The wetland in this embayment is a 'Class 2 Provincially Significant Wetland' as identified by the Ministry of Natural Resources. This wetland system possesses many rare species and several Species-at-Risk, including Turtles (*Endangered*), Eastern Ribbonsnake (*Special Concern*), American White Pelican (*Threatened*), Bald Eagle (*Special Concern*), Chimney Swift (*Threatened*), Barn Swallow (*Threatened*) and Bobolink (*Threatened*).

These wetlands are a birder's paradise, due to its location as a migration flyway. Local naturalists have erected a bird viewing platform for optimal viewing of birds and other species in the area.

The current threat to these wetlands is the spread of alien invasive plant Common Reed (*Phragmites australis*).



Green patches along the shore show location of coastal wetlands around Lake Huron.

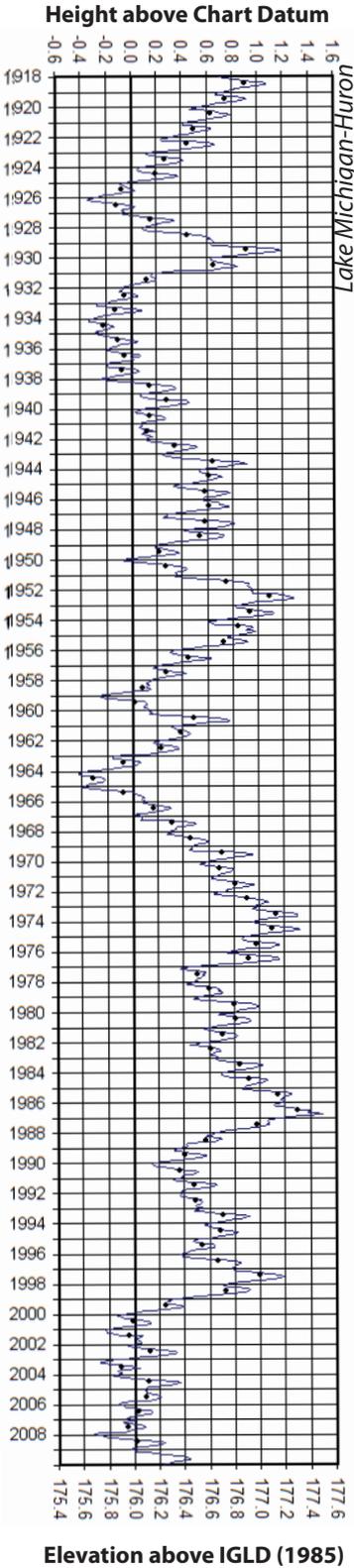
HIGH WATER: **Landward** shift of plant communities

LOW WATER: **Lakeward** shift of plant communities



Fluctuating water levels are important to the ecology of coastal wetlands. During low lake level periods, greater amounts of beach are exposed, providing an opportunity for buried seeds to germinate where water has subsided. The longer the period of low levels, the greater the diversity of plant life, as other wetland species are introduced. Woody species like trees and shrubs growing in this area would be evidence that levels have been low for a prolonged period. When high lake levels return, these plants drown. Many seeds of wetland plants will not germinate in standing water. Water levels continually alter plant community composition, ensuring that these wetlands rarely move beyond the primary successional stage.

Lake Huron Water Levels



This graph shows the recorded levels on Lake Huron since 1918.

Over the past century, lake levels have fluctuated across a range of about two metres. The highest recorded lake level on Lake Huron was in 1918, while the lowest occurred in 1964.

The graph displays the long-term changes in lake levels, but smaller changes occur seasonally — and even daily — as a result of varying weather events.

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CONTACTS

Stewardship Advice

Lake Huron Centre for Coastal Conservation
74 Hamilton Street, Goderich, Ontario N7A 1P9
(519) 955-6269

Regulations & Permits

For any alterations along the shoreline, you'll need to contact:

Fisheries and Oceans Canada
Ontario/Great Lakes Area
P.O. Box 85060
3027 Harvester Road, Suite 304, Burlington, Ontario L7R 4K3
(905) 639-0042

A permit may also be required from your local Conservation Authority, if there is one in your area.

Grey Sauble Conservation Authority
RR#4, Inglis Falls Road, Owen Sound, Ontario N4K 5N6
(519) 376-3076

Saugeen Conservation
1078 Bruce Road, #12, P.O. Box 150, Formosa, Ontario N0G 1W0
(519) 367-3040

Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, Ontario LOM 1T0
(705) 424-1479

St. Clair Region Conservation Authority
205 Mill Pond Crescent, Strathroy, Ontario N7G 3P9
(519) 245-3710

Ausable Bayfield Conservation Authority
71108 Morrison Line, RR#3, Exeter, Ontario N0M 1S5
(519) 235-2610

Contact the Ontario Ministry of Natural Resources about Species-at-Risk and to seek permission to control invasive species:

MNR Midhurst District (Huronian)
2284 Nursery Road, Midhurst, Ontario L0L 1X0
(705) 725-7500

ABOUT THE COASTAL CENTRE

The Lake Huron Centre for Coastal Conservation is a registered charity, dedicated to the conservation and wise stewardship of Lake Huron's coastal ecosystems.

The Centre was founded in 1998 to advocate for the following:

- To preserve, protect, restore and improve the natural resources and environment of Lake Huron.
- To promote shoreline conservation through demonstration projects, education programs and local stewardship initiatives.
- To promote increased dialogue, communication and co-operation among levels of government, citizens and community groups in conserving the Lake Huron coastal environment.
- To promote coastal-related academic research to be conducted along the Lake Huron shoreline.

The Centre's mission is to provide leadership and expertise, in collaboration with partners, to achieve a healthy Lake Huron coastal ecosystem.



The Lake Huron Centre for Coastal Conservation

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