

Oliphant Coastal Stewardship Plan



Prepared By



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

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2010

Prepared by the
Lake Huron Centre for Coastal Conservation

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Executive Summary

The community of Oliphant is located along the shores of Lake Huron, at the base of the Bruce Peninsula. The irregular, rocky coastline has several embayments where sandy dune ridges and coastal meadow marshes have developed. The offshore “Fishing Islands” protect the shoreline from the high wave energy of the lake. A gently sloping beach has evolved, and with it, a rich biodiversity.

As well as several rare plant and animal species occurring here, a number of Species at Risk are home to Oliphant’s shores. Oliphant has developed primarily as a cottage community, but a number of people have taken up permanent residence. During summer months, Oliphant has become an attraction to visitors interested in numerous water related activities.

The gentle sloping shorelands make the shoreline particularly sensitive to water level fluctuations. During periods of low lake levels, large expanses of lakebed are exposed. The driving of motorized vehicles on these shorelands has occurred, in some instances for access to nearby islands, access to the beach for recreation, or simply for joy riding. In the process, this has led to significant damage to the plant and animal habitat that occurs here.

A number of rare species and several Species at Risk make Oliphant’s coast their home. These plants and animals, and their habitats are affected. The disturbances caused by these impacts pose another threat: vulnerability to infestation from non-native, invasive species. Common Reed (*Phragmites australis*) is a European species currently invading Oliphant’s coast, and it has the capacity to alter the ecology of the coastline.

Observing the disturbing changes to Oliphant’s environment, a group of local citizens formed a volunteer organization in 2007 called Friends of Oliphant Coastal Environments (FOOCE). They sought to work collaboratively with other groups, agencies and organizations to help preserve, enhance and improve the coastal ecosystems at Oliphant. In 2008, they approached the Lake Huron Centre for Coastal Conservation for assistance in developing a stewardship plan to help guide the community in implementing sound, science-based stewardship actions for the benefit of Oliphant’s ecosystems.

The Oliphant Coastal Stewardship Plan is intended to encourage a new harmonious and balanced relationship between the ecosystems and people living and recreating along Oliphant’s coast. With proper stewardship efforts people can continue to enjoy the waterfront, and ensure the future of Oliphant’s globally rare coastal meadow marshes and dune grasslands.

This plan uses an ecosystem approach to describe the Oliphant coast, as well as interpret the threats to the ecosystems. This helps to provide the contextual basis for the stewardship approaches and recommendations that follow. There are many players who should be involved in successfully implementing this plan. While FOOCE is a key local organization with a mandate for advocating to preserve, restore and enhance Oliphant’s coastal ecosystem, there are many agencies, organizations and individuals who will need to

participate in order to meet these conservation objectives. The Town of South Bruce Peninsula, the Oliphant Camper's Association (local cottage organization), and other local community groups and beach users have important roles in the successful stewardship of Oliphant's environment.

Saugeen Ojibway Nation is an important neighbour, and every effort should be made to communicate with them about this plan and its implementation, and cooperate whenever possible. Issues like Common Reed control is a shared issue and should be coordinated jointly for best results.

Introduction

Oliphant is a small Lake Huron community situated within the Town of South Bruce Peninsula. The Oliphant shore is unique along the Lake Huron coast because of its rich biological diversity and physical character.

Friends of Oliphant Coastal Environments (FOOCE), a local not-for-profit organization, were formed in 2007 to seek to preserve the unique wetland, alvar and beach/grassland ecosystems of the Oliphant mainland community and adjacent Fishing Islands. This organization was formed by local residents who concerned about degradation of the shore environment caused by human-related activities. FOOCE engaged the services of the Lake Huron Centre for Coastal Conservation (Coastal Centre) to develop a stewardship plan that would help the local community and the Town of South Bruce Peninsula to protect the sensitive shoreline ecosystem, and encourage a sense of care and stewardship amongst the community and visitors to Oliphant.

As in other stewardship planning efforts of this nature, the Coastal Centre employed the “ABC” resource survey approach, where the **a**biotic, **b**iotic and **c**ultural elements of the coastline were analyzed to inform the most suitable stewardship approaches to be employed at Oliphant for the purposes of protecting the coastal environment. As part of this effort, the Centre retained a Professional Biologist to undertake an inventory of the plant and animal life within the Oliphant coastline. A detailed report of species and habitats present at Oliphant was prepared (see Jones, J., 2009).

The stewardship plan is intended as a science-based evaluation of the conditions present at Oliphant, and identifies a number of stewardship approaches and recommendations to protect the physical and biological systems of its coastline. Information from this document should guide the community of Oliphant and the Town of South Bruce Peninsula in wise stewardship that if implemented properly, will preserve the integrity of Oliphant’s coastal ecosystems.

Description of the Oliphant coast

Study Area

For the purposes of this plan, the project area includes the Oliphant shoreline from Chief’s Point in the south, to Stony Point in the north. This represents roughly 7.5 kilometres of shoreline. The inland extent is represented by Shoreline Avenue (north of Mary St.) and Bay Street (south of Mary St.). Stewardship recommendations in this document are intended for the shore lakeward of these roadways.

Oliphant, Ontario, Canada

Study Area



Latitude: 44° 43' 40" North
Longitude: 81° 16' 40" West
(approximate)

2006 photography (courtesy Bruce County)

Abiotic Context

Coastal Processes

The Oliphant coast is a headland-bay complex and a series of offshore islands named the Fishing Islands. The Fishing Islands and rock reefs protect a number of rocky bays from substantial wave energy. Due to this restricted wave action in the bays, the shoreline is fringed by coastal meadow marshes (also known at Oliphant as coastal fens) and narrow, low sand and gravel beaches. Coastal meadow marshes are considered to be globally imperiled ecosystems. A series of dune grassland ridges are also present along the shoreline.

These physical characteristics have led to the development of a unique and sensitive ecology that includes wetland, dune grassland and alvar-related species and habitats. Each of these coastal landforms are extremely rare in the global context. Oliphant's coast is unique in the Great Lakes because of its multiplicity of rare coastal features. However, these shores are under threat from human-related activities that, intentionally or unintentionally, alter its physical and biological make up.

Beach Features

The gently sloping beaches of Oliphant, with a general gradient less than 0.5%, are very sensitive to lake level fluctuations. For example, a 30 centimetre increase in water level can inundate 200 to 300 metres of beach. Conversely, a similar drop in levels will expose 200 to 300 metres of the lakebed.

Meadow marshes have developed on the flat, gently sloping expanses of calcareous sand plain, overlying dolomite bedrock. The hydrologic regime of coastal meadow marshes is directly linked to that of Lake Huron. As such, the water table is not stable, and is subject to seasonal fluctuations in water levels, short-term changes due to seiches and storm surges, and long-term, multi-year lake level fluctuations. In addition, they are dependent on a hydrologic regime that includes horizontal "sheet-flow" of groundwater from the east through the underlying sand sitting on impermeable bedrock.

Dune grassland ridges have also developed in some areas where enough sand has been available to form and support them. The presence of sand in the area is extremely limited, and there is no current source of sand or alongshore transport of sand in the area. Therefore, these dune ridges are considered to be relict deposits, with a poor capacity for replenishment. As such, they are particularly vulnerable to human disturbance. During periods of low lake levels when the sandy lakebed is exposed, wind can mobilize sand and carry it inland replenishing the dunes. The window of opportunity for dune replenishment depends on the duration of the low water period, and how long the exposed lakebed remains unvegetated. As a result, the dune ridges are limited

in their capacity to repair themselves due to limited sand resources available, and the limited time that any sand replenishment can occur.

Water Levels

Coastal meadow marshes are extremely sensitive to water level fluctuations, meaning that a modest change in water level can have a significant change in the position of the water's edge. The water table varies with seasonal fluctuations in Lake Huron's water levels including short-term changes due to seiches and storm surges, seasonal and long-term lake

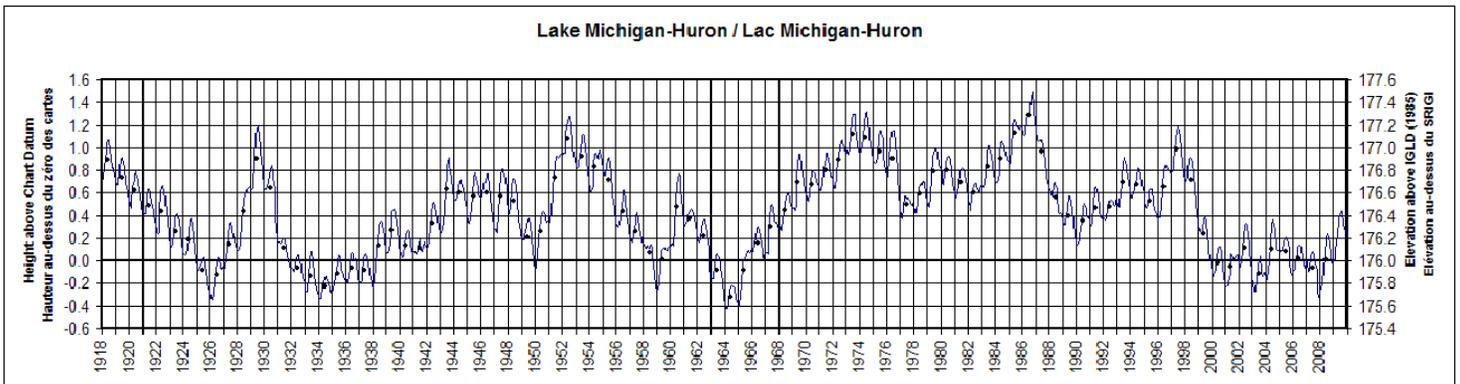
Table 1: Types of water level fluctuations and their impacts on Coastal Wetlands

Source: Environment Canada

Type	Cause	Magnitude in elevation	Duration	Impact on Coastal Wetlands
Short-term	Storms, and wind and atmospheric pressure-driven "tides" known as seiches	0.5 metres	Usually less than one day	Damage to vegetation due to high winds and waves.
Seasonal	Reflection of the yearly hydrologic (water) cycle in the Great Lakes basin. Lowest levels often occur in late summer, after evaporation has peaked.	30 to 50 centimetres	A few months	Unpredictable and variable water levels result in the highest level of plant diversity. Many plants and animals are adapted to, and depend on a highly changeable wetland environment. Low water levels in the autumn expose wetland bottom sediments which allow the seeds contained there (in the seed bank) to germinate.
Multi-year	Basin-wide, continental or global climate changes that result in different patterns of precipitation and evaporation over a number of years. Also caused by human-induced water level regulation to facilitate shipping.	Up to 2 metres during the 20 th century.	More than one year.	High water levels can eliminate large areas of wetland by flooding. Low water levels that expose mud flats with an extensive seed bank will allow wetlands to expand toward the new lake-shore.

level fluctuations. Coastal meadow marshes expand and contract depending on lake levels and location (Mortsch *et al.* 2008).

Looking back over the last century, lake levels have fluctuated as a result of the changing balance between evaporation and precipitation over the lake. Lake Huron water levels were very high in 1973-75, 1985-86 (highest on record), and 1997 and very low in 1934-35 and 1964-65 (lowest on record). Water levels dropped again from highs in 1997, in part because 1998 was the hottest year (+2.3 Celsius degrees (°C)) and fifth driest year (-8.9%) in the Great Lakes region for the 51-year period of record at that time. The drought that began in 1998 and lasted until 2002 (excluding 2000) affected the water balance of the Great Lakes significantly; summer temperatures ranged from 0.9 to 1.3°C above average while exceedingly below normal summer precipitation occurred in 2001 (-26.8%) and 2002 (-15.4%), and ranged from -1.0 to -4.3% in the other years. Lake Michigan-Huron water levels were affected the most (Mortsch *et al.* 2006).



Hydrograph for Lakes Huron and Michigan (these lakes are hydrologically connected) from 1918 to 2008. Note the highest level on record in 1986 and lowest level recorded in 1964.

Source: Canadian Hydrographic Service

Photo Chronology of Changing Lake Levels



← Aerial view of the docks at Oliphant during a low lake level period in 1960.

Photo at Sandy Bay showing lake flooding during high lake level period in 1987.



← Sandy Bay shore view in 1995.



Photo view of Sandy Bay in 2000 when levels on Lake Huron dropped after a period of high lake levels in 1997. Note the extensive sandy shore exposed as the lake level has receded. The exposed lakebed will gradually fill with plant life in the ensuing years of low levels.



Biotic Context

Significance

The physical characteristics of Oliphant's coastline have led to the development of a unique and sensitive ecology that includes wetland, dune grassland and alvar-related species and habitats. All three of these coastal landforms individually are extremely rare in the global context. Oliphant's coast is unique in the Great Lakes because of its multiplicity of rare coastal features. The study area is a long narrow corridor, but ecologically it has begun to lose some of its connectivity due to human activity. It was formerly a natural mosaic of fens, marshes, and dunes, but now many patches of natural vegetation are separated by intervening roads, disturbance, development, and lines of cedar trees. As well, the open shoreline is now mostly disconnected from the inland landscape due to the municipal road on the east side and the cottages and developed properties beyond that. There are two locations where there are significant fen patches on the eastern side of the road, and it is presumed that these are important points of connectivity, both for ground water flow and for wildlife corridors. Oliphant has a high number of native plant and animal species, and so is considered to be biologically diverse. Those species connect, and interact. Those interactions create communities and systems, and those systems provide “goods and services”, like oxygen production, pollination, water filtration and storage, pest control, food production, climate moderation through shade and moisture release, carbon storage and, flood and erosion control. The unusual physical characteristics of this shoreline have provided the conditions for this rich biodiversity to exist. Oliphant benefits considerably from this rich biodiversity.

Dune Grassland

A number of dune ridges have developed along the Oliphant shoreline. Oliphant was a significant depositional area formed historically about 5000 years ago near the end of the Nipissing transgression. The islands and rock reefs which protect the modern shoreline were submerged under the higher lake levels, giving rise to a relatively straight, exposed beach from which sediment was supplied for building the dune ridge. Dunes, which formed between this ridge and the modern shoreline during the post-Nipissing regression, are lower in height and continuity, reflecting decreased sediment supply and reduced wave exposure as the Fishing Islands emerged (Davidson-Arnott and Pyskir, 1988). Today there is no incoming supply of littoral sands, and so the existing sands that have formed and maintain the dune ridges in the study area are relict, or ancient, deposits that, if damaged, are at great risk of not being able to recover. This fact needs to be considered in management options covered later in the plan.



Alvar

Alvars are rare. They are areas of relatively flat limestone bedrock where soils were long ago scraped away by ice, wind and water. They support a distinctive set of plants —uncommon

wildflowers, mosses and lichens, many kinds of grasses and sedges, and even some stunted trees. Alvars at any location are a globally rare ecosystem, and shoreline alvars are even more rare. In the Oliphant study area, alvars are located at the south end of the study area on the Chief's Point reserve of Saugeen Ojibway Nation, and offshore on the Fishing Islands.

Many of the Fishing Islands contain areas of alvar and alvar-like habitat that lie adjacent to and often grade into wet, marshy shoreline bedrock pavements or moist sandy coastal meadow marshes. Some of the larger islands have interior patches of alvar, surrounded largely by forest.



Bedrock pavement that is completely flooded by Lake Huron and is exposed to high-energy wave action in some years is not classified as alvar, but as bedrock shoreline. Bowe's Island, Main Station Island, Frog (Indian) Island, Rowan (Rownes) Island, Smokehouse Island and Cranberry Island each have patches of open bedrock above the average high water mark.

Four different alvar community types occur on the Fishing Islands. Combined, these communities sustain a very high total of 161 vascular plant taxa, of which 137 are native to Ontario. Among the islands, the alvars at Main Station Island are the most diverse, with 87 plant taxa recorded, 82 of them native.

The greatest threat to habitats at the Fishing Islands is new cottage development, ATV use and further habitat modification around existing cottages (Jalava, 2008). Education and awareness is therefore a key factor in the protection of these areas.

For an extensive account of the Chief's Point and Fishing Island alvars, including species lists, the reader is referred to "Alvars of the Bruce Peninsula", 2008 by Jalava.

Coastal Meadow Marsh (also known as coastal fen)

Coastal wetlands are rare. They are located in dynamic environments along the Great Lakes shoreline, and are directly influenced by fluctuating water levels both seasonally and over cycles of several years. Although they share many of the same functions and values as inland wetlands, it is the influences from lake processes that differentiate coastal wetland hydrology and



vegetation structure from inland wetlands. Fluctuations in Great Lakes water levels influence coastal wetland extent, distribution, vegetation composition, and wetland-dependent birds, fishes, and other wildlife as well as determining ecological diversity and function.

Great Lakes coastal wetlands are more widely recognized as ecologically diverse and highly productive ecosystems that perform important functions by providing habitat, improving water quality, protecting against flooding and erosion, and allowing for recreation opportunities. A crucial benefit is that numerous regionally endangered and threatened birds, reptiles, fish, and amphibians 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 while many bird species rely solely on wetland habitat for nesting and rearing young. The western shoreline of the Bruce Peninsula may represent the most productive lake whitefish spawning shoals and associated larval nursery grounds in Lake Huron (Lake Huron Biodiversity Strategy reference document on coastal wetlands, March 23, 2009).

Lake Level Influence on Biodiversity

Wetland vegetation communities expand and contract along a moisture gradient with fluctuating lake levels. Variations in water levels maintain diversity of vegetation and habitat interspersed. Also, the relative abundance of vegetation communities changes as certain plant species die back and vegetation is displaced landward or lakeward in response to water level changes. For example, during low water years, landward margins of wetlands dry and mudflats are exposed as water retreats lakeward. Emergent vegetation is replaced by sedges, grasses, and shrubs that expand into areas where the water was once too deep. Submerged aquatic vegetation is replaced by emergent vegetation as germination occurs on exposed mudflats. With the return of high water levels, vegetation communities slowly retreat landward.

The plant species along Oliphant's coast 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 (Keddy and Reznicek 1986).

High water years kill woody plants which become established in low water years, which is a factor in maintaining the open conditions. In addition to fluctuating water levels, meadow marshes are also subjected to wave energy. This washes away organic accumulations, and deposits new layers of sand. Although impacted by this deposition, these coastal meadow marshes contain extremely dense seedbanks. These seedbanks allow the vegetation to replace itself during low water periods. Studies of coastal meadow marshes have identified that more than 80% of buried seeds occurred within the top 2 cm of the soil (Keddy and Reznicek 1986). This is important because soil compaction caused by vehicle use (e.g. tire treads) can

impact more than 20 cm. down into the soil. The shallow nature of the seedbanks at Oliphant make them very sensitive to compaction.

Coastal meadow marshes are rare both from a global and provincial perspective. Recent studies of rare vegetation communities by The Nature Conservancy, in the Great Lakes basin, have identified them as globally imperiled communities (G2). In Ontario, coastal fen types are ranked as extremely rare (S1). This rank is based upon considerations such as the estimated number of occurrences, the total area of the occurrences, and the range of the community within the province, along with considerations such as protected sites and threats. (Natural Heritage Information Centre, 1995; Ontario Great Lakes Coastal Wetland Atlas, 2003).

Fish Habitat

Eighty percent of the Great Lakes fish species are found in nearshore areas for some part of the year and depend directly on coastal wetlands for some part of their life cycle (eg. feeding, shelter, spawning, nursery, and dispersal of young). As previously mentioned, the western shoreline of the Bruce Peninsula may represent the most productive lake whitefish spawning

Oliphant and Fish Habitat

“Although water levels do fluctuate, the boundaries of fish habitat, as defined in the *Fisheries Act* within a body of water, do not change. Fisheries and Oceans Canada, Ontario -Great Lakes Area (DFO-OGLA) determines the boundary of fish habitat using historical long-term water levels, linking the habitat to the requirements of fish populations throughout their life cycles. This means that the extent of fish habitat is not determined by short-period water level fluctuations. For example, in low gradient shoreline areas (e.g. sand beaches and wetlands) small decreases in water level sustained over a long period of time may result in large distances created between the current water level and the levels that are more indicative of an average year. In low-water years, beaches grow significantly larger and wetland areas flourish with vegetation. The nearshore areas once covered with water may be mistakenly considered “dry” land. Although these areas appear to be dry and may have been for a year or more, historical data shows that water levels will rise again and nearshore areas will be re-submerged, providing important spawning, nursery and adult fish habitat. DFO-OGLA considers these areas to be fish habitat, and they therefore fall under the requirements of the *Fisheries Act*.”

(source: Department of Fisheries and Oceans)

shoals and associated larval nursery grounds in Lake Huron (Lake Huron Biodiversity Strategy reference document on coastal wetlands, March 23, 2009).

The dry lakebed of Oliphant's coastline is considered to be fish habitat due to the frequent changes in water levels and water's edge. This has implications to regulations affecting the dry lakebed.

Ecological Land Classification (J. Jones, 2009)

The shoreline complex at Oliphant is made up of nine vegetation communities. All are variations of three basic features: old dune ridges, rich shoreline fens, and shallow marshes. They vary in their classification depending on the dominant species, the species richness, and the amount of moisture or standing water present. In reality, on the ground, these vegetation communities frequently merge into one another. In detail, they are as follows:

Twig Rush Mineral Shallow Marsh (MAS2-3) - 40 hectares

This is the most common and widespread vegetation type present on the Oliphant shore, covering the majority of the area between the water and Shoreline Avenue. It is characterized by standing shallow water or open marl substrate with a fairly solid cover (up to 98%) of Twig Rush (*Cladium mariscoides*). There may be other graminoids present as well, such as Narrow-leaved Sedge (*Carex lasiocarpa*) or Bluejoint Grass (*Calamagrostis canadensis*). This community is not particularly species rich, but it may play a very important role in the hydrology of the overall shoreline ecosystem since it is located between the water's edge and the fens.

Graminoid Coastal Meadow Marsh (Shoreline Fen) – (MAM4-1) - 30 hectares

This is the second most common vegetation type and is the one for which Oliphant is well known. These are areas of low vegetation with very high species diversity. Graminoids are usually still the dominant species, especially Twig Rush, Little Bluestem (*Schizachyrium scoparium*), and Tufted Bulrush (*Scirpus cespitosus*), and there is a great diversity of sedges (such as *Carex buxbaumii*, *C. crawei*, *C. garberi*, *C. granulares*, *C. livida*, *C. viridula*, *Eleocharis elliptica*, *Rhychospora capillacea*, etc.). This is the vegetation that hosts the carnivorous Pitcher Plant (*Sarracenia purpurea*) and English Sundew (*Drosera anglica*) as well as attractive orchids like the Grass Pink (*Calopogon tuberosus*) and Rose Pogonia (*Pogonia ophioglossoides*). The special concern (at risk) species Tuberous Indian Plantain is found in this community as well as in some others. A more densely vegetated variant of the Graminoid Coastal Meadow Marsh is the Shrubby Cinquefoil Coastal Meadow Marsh MAM4-2 which is dominated by Shrubby Cinquefoil (*Potentilla fruticosa*) rather than by grasses and sedges. This community may be an older form of the graminoid version or perhaps the result of the graminoid version drying out. The Shrubby Cinquefoil form is species poor and has much less open substrate visible.

Open marl flats/shoreline marsh—22 hectares

Right along the water's edge, in areas that were more recently submerged or being exposed to occasional wave-wash, there is sparse vegetation. The marl or damp sand substrate is visible between occasional plants of Baltic Rush (*Juncus balticus*), Wormwood (*Artemisia campestris*), and Tickle Grass (*Agrostis scabra*). At least 60% or more of the ground may appear bare. Because of the apparent bareness and the proximity to the water's edge, this community is frequently quite disturbed with vehicle tracks.

Little Bluestem Open Dune (SDO101) - 6 hectares

Every small bay along the Oliphant shore has some old dune ridges or sand bars present, evidence of times of higher water levels many years ago. These ridges support characteristic dune species such as Little Bluestem, Big Bluestem (*Andropogon gerardii*), and Sand Cherry (*Prunus pumila*), but they are now so heavily vegetated that there is almost no open sand visible between the grasses and shrubs. The ridges are currently separated by a great distance from the zone of wave-wash that would have kept the sand movement dynamic and the vegetation a bit more sparse. The more open portions of this community would have once been habitat for the Piping Plover. If high water conditions return again, wave wash may remove vegetation and open these dunes up. Despite their vegetated state, they remain fairly diverse and rich with distinct species, and are mostly undisturbed.

The following three vegetation communities are variously present depending on the amount of water present and the hydrologic regime.

Narrow-leaved Sedge Mineral Shallow Marsh (MAS2-3) - 5 hectares

Several hectares of this marsh are present adjacent to the rich fens across from the boardwalk near Merry Street. It is a large area dominated by Slender Sedge with Bluejoint Grass and Twig Rush as components. Roughly 15 to 20 cm of standing water was present in this marsh in June. This vegetation type also occurs in smaller patches at the transition from coastal meadow marsh to Twig Rush shallow marsh.

Bulrush Mineral Shallow Marsh (MAS2-2) - 2.5 hectares

This vegetation type is present in the greatest extent where Lake Huron is shallow and there is a gradual transition from lake to shoreline marsh. It is also present in nearly all of the ditches that have been dug out of the shoreline, as well as some of the roadside ditches. The vegetation is characterized by the predominance of Hard-stemmed Bulrush (*Scirpus acutus*) and deeper, sometimes flowing water.

Bluejoint Mineral Meadow Marsh (MAM2-1) - 2.4 hectares

This vegetation community was found in one location along the south side of a road that runs from Shoreline Avenue out to a small island (about halfway between the marina and Merry Street). Perhaps the result of the change in hydrologic regime, this community has little standing water and is predominantly tall grasses. The community also forms the transition

between the cedar forest and the adjacent Twig Rush shallow marsh. It is not particularly species rich and was one of the only places where there was a significant amount of the invasive exotic Purple Loosestrife (*Lythrum salicaria*).

Twig Rush Open Fen (FEO1-1) -

This true fen community is present on the eastern side of Shoreline Avenue behind some of the houses. It is an inland community with a different species composition than the coastal fens. Although Twig Rush was the overall dominant, the community is zoned, with Slender Sedge in the open centre, then a ring of Twig Rush, then *Sphagnum* mosses and stunted trees around the outside. Plants like Small Cranberry (*Vaccinium oxycoccos*), Round-leaved Sundew (*Drosera rotundifolia*), Labrador Tea (*Ledum groenlandicum*), and White Beakrush (*Rhynchospora alba*) are present. The rare sedge Beaked Spikerush (*Eleocharis rostellata*) was found in some of these fens.

Species at Risk Identified in the Study Area

The following plant and animal species were identified in the Oliphant study area and are protected Species at Risk.

- Piping Plover (endangered)
- Tuberous Indian Plantain – (special concern)
- Dwarf Lake Iris – (threatened)
- Spotted Turtle (endangered)
- Eastern Massasauga rattlesnake (threatened)
- Monarch butterfly (special concern)

Profiles of each of these species are provided in Appendix A.



Definitions of Species at Risk

Extinct species: a wildlife species that no longer exists.

Extirpated species: a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.

Endangered species: a wildlife species that is facing imminent extirpation or extinction.

Threatened species: a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special concern species: a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Presently Oliphant provides suitable habitat for these Species at Risk to exist. Active stewardship of Oliphant’s coastal environment will be necessary if these species, and other rare plants and animals, have any chance of long term viability.

Threats to Biodiversity

At Oliphant, the primary threats to species at risk, as well as other rare species and their habitats, include:

1. Development 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. Vehicle impacts to beaches are explained in the information sheet “Damaging Wheels” included as Appendix E.
2. Genetic and reproductive isolation occurs when habitats are destroyed or become degraded, and a species' range becomes fragmented. 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 able the population can deal with change, disease or other factors and the less likely it is to survive over the long term. Impacts related to climate change may accentuate the dangers to plant populations at Oliphant, particularly those already stressed by other human related impacts.
3. Altered moisture regime caused by drainage ditches and tire ruts, can make 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. An invasive species of great concern at Oliphant is Common Reed (*Phragmites australis*). (See Appendix B for species factsheet).

Cultural Context

Coastal fens provide crucial benefits to the Oliphant community in the form of ecosystem “goods and services.” Some of these services include improvement to water quality, flood reduction and shoreline protection, recreational use, landscape diversity and carbon storage.

More specifically, ecosystem services can be summarized into four categories:

- **Provisioning services** are the products obtained from ecosystems, such as food, genetic resources, and energy (e.g. Oliphant’s shore is critical for life cycle of fish).
- **Regulating services** are the benefits obtained from the regulation of ecosystem processes, such as regulation of climate, water filtration, and flood control.
- **Cultural services** are the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, environmental education, reflection, recreation, and aesthetic experience.
- **Supporting services** are ecosystem services that are necessary for the production of all other ecosystem services. Examples include biomass production, production of atmospheric oxygen, nutrient cycling, water cycling, and provisioning of habitat.

Many of these ecosystem services have not typically been identified when valuing Oliphant’s coastline, or estimating what is at stake when the coastal ecosystem becomes damaged by human activities and invasive species. However, many of the local residents have described cultural services as one of the reasons they originally settled in Oliphant.

Land Use

By definition, “land use” presupposes that the area to be considered is land. This poses a challenge for low lying, coastal areas such as Oliphant where relatively minor changes in lake water levels mean the difference between land and water. In Oliphant, both land and water are considered in land use planning documents however the relationship of fluctuating water with both land use and land ownership is complex and often misunderstood. Therefore, this chapter will describe the documented land uses, known land ownership and provide suggestions for further work where needed.

The focus of this document is to guide management on the “beach area” west of the shore road. However, the evolution of the “interior” community of Oliphant will have implications that should be considered when planning for the future. This future will include the expected

density of cottages and residences in the remaining settlement of Oliphant. If the expectation is a higher density of development in the inland area from the beach, this will impose higher numbers of users and more pressures on an already challenged coastline. Therefore this chapter includes observations on the interior land use in addition to the coastal land use from the planning documents.

This section is divided into:

- Land use zoning in general
- Interior land use
- Coastal land use
- Land Ownership

Land use zoning in general

The use of land is designated in documents managed by the County of Bruce Planning Department and administered by the local municipal council. The comprehensive zoning by-law for South Bruce Peninsula is relatively recent updated in 2009 and includes two set of maps;

- Schedule A depicting the extent of various land uses including Environmental Hazard;
- Schedule B depicting the extent of Provincially Significant Wetlands

Oliphant is contained on “Schedule A” zoning maps 5, 6, and 7 and on “Schedule B” maps B-2 and B-4. The municipal zoning by-law lays out the land use expectations and requirements. These requirements are enforced through several means including the application processes for a change in zoning, for a minor variance or for a building permit. These three “triggers” provide the opportunity to apply the zoning by-law and impose restrictions. Without a trigger, these by-laws may not be widely known or understood. By-law enforcement staff also enforce some by-laws that relate to property standards and other uses, including dog enforcement and parking restrictions.

Interior land use

What is apparent from a preliminary review of the zoning by-law is that the community of Oliphant had previously been considered for a much larger population. Undeveloped road allowances criss-cross the landscape superimposing a grid-shaped design on the wooded lands that dominate the area. These roads allowances appear to be placed without consideration of the vast expanses of wetlands that are also plentiful in the low lying areas inland from the coast as you make your way towards the inland Spry and Boat Lakes. These wetlands all have a provincial designation which makes them a high priority for protection and makes development near them challenging. This is because the provincial wetland designation creates a 120 metre wide area of interest surrounding the wetland where any proposed development must satisfy specific requirements before development will be considered. These requirements all relate to the need to safeguard the wetlands for inappropriate activities that will threaten the form (shape) or important functions (processes) that these wetlands provide.

Coastal land use

From a cursory review of the specific land use planning maps for Oliphant, it appears that the land / water area is dominated by a zone termed Environmental Hazard (EH) that appears to include:

- The dynamic beach
- The flood plain of Lake Huron
- And provincially significant wetlands

These attributes all lend themselves to be described as Environmental Hazard which is a designation that covers most of the area outside existing residential development. However, in our review we note that the coverage of this EH designation differs from map to map.

Parking restrictions did exist which banned vehicle use and parking in the low lying lakebed area west of the shore road allowance in 2000. This bylaw stipulated that where signs were erected to inform beach users. The by-law was rescinded in 2002 and replaced with another parking bylaw that did not include the lake bed flats.

Land Ownership

Several factors play a part in determining land ownership along the Lake Huron shoreline. This chapter introduces and discusses several of the most important factors.

First Nations

The traditional territory of the Saugeen Ojibway Nation (SON) roughly extends from the northern tip of the Bruce Peninsula to the Maitland River on Lake Huron, inland to the town of Arthur, and then north to Georgian Bay, east of the city of Owen Sound. This territory includes the waters around the Bruce Peninsula, recognized by Imperial Declaration as belonging to the Saugeen Ojibway. In December 2003, SON filed a claim asserting aboriginal title to the lands under the water covering an area of Lake Huron and Georgian Bay from south of Goderich, west to the international border and north to the mid-point between the tip of the Bruce Peninsula and Manitoulin Island; then east to the mid-point of Georgian Bay and south to the southern-most point of Nottawasaga Bay. There are First Nations interests along the shoreline that should be taken into consideration, and SON should be kept apprised of plans involving the shoreline.

Water's Edge

The water's edge seems like such a simple concept when taken in isolation. However, in legal terms, it is one of the most complicated and confusing factors when property ownership is tied to it. The water's edge creates an ambulatory boundary between Crown and private land that changes with natural fluctuations in water levels. Determining the extent of property ownership depends on conditions contained in the original Letters Patent, field survey notes and original township survey. Given the scope of this management guide, we have not researched this issue further, but it may be necessary for the Town to seek legal advice to confirm ownership of waterfront lands. Regardless of ownership, certain works on shorelands may require approval from the Ministry of Natural Resources under the Public

Lands Act.

Crown Land and Water's Edge

The municipal road allowance that in part forms Shoreline Ave. and Bay St. falls under the ownership of the municipality, and the extent of that ownership will change as lake levels change. Ontario (through the Ministry of Natural Resources) has no ownership interest in any dry land above the naturally occurring water's edge in the Oliphant area west of the shore road (Shoreline Avenue and Bay Street). However, as lake levels change, the limit of the upland parcel changes position. The road allowance is riparian and will expand and contract with the changing water levels. As the width of the road allowance decreases, as a result of the rising water level, the bed of the lake increases. Ontario has ownership of the bed and therefore Ontario's ownership increases as the shore road allowance decreases. The general guideline is that if the land is dry, it falls under municipal ownership, and if it is covered with water or becomes inundated due to naturally fluctuating lake levels, the lake bed falls under provincial jurisdiction.

Public Parks and Conservation Areas

Several areas along the shoreline are under public ownership but this fact may not be widely known. The fen boardwalk for example, is managed by the Owen Sound Field Naturalists however rests on Crown Land. Portions of the Fishing Islands are owned by the Grey Sauble CA. Appendix C provides mapping that illustrates land ownership at Oliphant.

Beach Users- types of human coastal activities

According to the Census data for this area, Oliphant is a mixed age demographic that have used the area as a cottage destination for generations. Located north of the busy Sauble Beach region and off the main highway leading to Tobermory, Oliphant is a relatively quiet lakeshore community. Low lake levels at the early part of this century has attracted activity within the newly exposed shorelands. The use of motorized vehicles to access the beach, the use of all terrain vehicles, and commercial contractors accessing work sites, have all impacted the area and its ecology.

Oliphant's rich natural heritage makes it attractive for hiking, birding and environmental education to both residents and visitors. The shoreline is also used for a variety of watersports and activities including windsurfing, swimming, kayaking, canoeing, power boating, windsurfing and most recently, kiteboarding. Some conflict has occurred between user groups.

Active watersports have a history of creating conflict in their early inception. In the 1980s, catamarans would at times come into conflict with swimmers as they came to shore. In the 1990s, personal watercraft sometimes became a nuisance to swimmers which led to calls for banning or regulating the sport in some areas of Lake Huron. Kiteboarding has presented a public safety concern to swimmers and other users who could become hit or entangled in lines. These sports tend to evolve, as rules are developed and users become more sensitive to other

user groups. There will undoubtedly be other new watersports that will pose similar challenges that the community will have to sort out, and decide where these activities will be permitted and under what circumstances. The Town of South Bruce Peninsula has recently (2010) formed a stakeholders committee to investigate options for the kiteboarding sport at Oliphant.

Within the context of conserving Oliphant's coast, who uses the shoreline is not as important as *how* they use it. Responsible beach users will take measures to ensure that their impact to the coastal environment is minimal.

Threats to the Coastal Environment

Vehicle Damage to the Coastline

Vehicles driving on the ecological communities described above have become one of the most destructive impacts to Oliphant's shore. There has been a long history of people driving on the beach and exposed lakebed, particularly to access island cottages during periods of low lake levels. More recently, the practice of indiscriminate driving on the beach has increased and signifies that people generally have a poor understanding of the value and function of coastal meadow marshes and dune grasslands.

The tires of vehicles displace the muck and sand layer to a depth greater than 20 centimetres. They destroy the vegetation, and leave ruts and ditches which channel water, changing the moisture regime in the ground. Buried seeds, the bulk of which occupy the first 2 centimetres of the soil, can be damaged and displaced. Vegetation communities can be fragmented and disconnected from the myriad paths cut through the wetlands. The future sustainability of the wetland can be affected by vehicle impacts.

“In coastal meadow marshes, 80% of buried seeds occurred within the top 2 cm of the soil”

Vehicle access to the shore and vehicle parking are also causing problems. There are numerous vehicle trails from the road out to the water, many more than can be justified simply for access to nearby island cottages. In addition, vehicles park on, and subsequently kill, the vegetation wherever they end up. Lack of appropriate parking facilities, and uncontrolled access to the shoreline has been a major contributor to the degradation of the coastal meadow marsh, and threat to species at risk, at Oliphant

The vegetation community hardest hit by recreational use is the Twig Rush Shallow Marsh. Recreational and vehicle use has destroyed some marshes converting them into huge, denuded areas of shoreline. Twig Rush Marsh is a vegetation community that retains water. Removal of this vegetation changes the hydrology and causes a drying of the entire area of shoreline.

The meadow marsh is seriously threatened when an adjacent marsh becomes disturbed and dries out, and the ground moisture levels change.

Drainage

In nearly all of the small bays, drainage ditches have been dug into the substrate. Some ditches appear to have been dug to allow boats to come in closer to shore during low water conditions. Some may have been dug to try to dry out the mucky shore for swimming access. With the rise in water levels, the shoreline is now wetter than it has been in recent years.

The creation of drainage ditches or channels disturb the original vegetation, changing it to bulrushes or cattails from sedges, and change the surrounding hydrologic regime by channeling water. Thus ditches have different vegetation from the areas they flow through. Some ditches are highly disturbed and are the main locations for the invasive Purple Loosestrife and Common Reed. Drainage channels cause changes to the hydrologic regime and this has wide-reaching effects on the ecology of the coastline. Drainage channels should be discouraged, unless impacts are fully considered.

Invasive Species

Invasive species are non-native species of animals, plants, microorganisms or pathogens that displace the habitat of other species, forcing the native species to decline in population or to disappear from their natural environment. Invasive species are introduced either accidentally or intentionally by human beings or their activities. One of the ways it can spread is through driving vehicles off road where they can pick up seeds or root fragments in their tread, wheel well or body of the vehicle and transport them to other areas. Invasive plants take advantage of disturbances to the native vegetation, like those related to development, off road vehicle travel and dredging spoil.

One of the primary invasive species of concern at Oliphant is Common Reed (*Phragmites australis*). The invasive Common Reed (*Phragmites australis*) is present in varying densities throughout much of the fen and beach areas, especially at the south end of the study area. Common Reed is a very aggressive, robust, densely growing member of the grass family. Its height and density allow it to form single-species stands that out-compete most non-woody native plants. The buildup of plant litter from previous years of growth prevents other species from germinating or establishing. It is capable of occupying and degrading vast areas of important lake habitats, like dunes, marshlands and fens. Common reed vegetation communities have low plant diversity and offer poor quality habitats for wildlife.



Common Reed
(*Phragmites australis*)

Negative Effects of Non-native Invasive Species

The negative effects of invasive species on natural ecosystems may be felt through one or more of the following:

- Reducing biodiversity
- Altering hydrologic conditions
- Altering soil characteristics
- Interfering with natural succession
- Competing for pollinators
- Poisoning or repelling native insects
- Displacing rare plant species
- Increasing predation on nesting birds
- Serving as reservoirs of plant pathogens
- Replacing complex communities with single species monocultures
- Diluting the genetic composition of native species through hybridization
- Being difficult and/or costly to control

Once established, new upright stems grow from underground rhizomes and a colony begins to spread. Rhizomes spread horizontally in all directions during the growing season. Flowering begins in late June, and seeds are formed by August. In early autumn, food reserves move from leaf and stems to the rhizome system. The leaves die and fall off, with only the dead brown vertical shoots remaining. The accumulation of dead leaves and stems, as well as the pervasive rhizome system, prohibits the growth of desirable native plant species.

The displacement of native species and the formation of dense monocultures also have negative impacts on insects, birds and other species that rely on intact wetland habitats. As discussed earlier, several Species at Risk could become affected at Oliphant by the continued spread of Common Reed.

Water Quality Impairments

The shallow nearshore waters of Oliphant's coast, and the irregular "headland-bay" shoreline, make it particularly vulnerable to impairments from non-point source pollution. The primary pollution types include nutrients (nitrogen and phosphorus), and bacteria and other pathogens. The ability of shallow nearshore waters to warm up more quickly, and the nature of the irregular coastline causing entrapment of pollutants within bays, can be contributing conditions that make bacteria and algae growth prevalent if non-point sources are present.

The Grey Bruce Health Unit is the agency with the mandate to monitor recreational beaches for water impairments, particularly with respect to pathogenic pollution and risk to public

health. The Health Unit has identified what it considers to be “public beaches” within the context of the Province’s Beach Management Protocol developed by the Ministry of Health and Long Term Care. While none of Oliphant’s beaches apparently fit the criteria, the Town of South Bruce Peninsula requested the Health Unit to sample Lonely Island beach in 2009. During the sampling season, the beach was posted because of elevated bacteria levels.



It is not unusual for beaches with shallow nearshore waters, within embayments to become impaired due to lack of water circulation, and an increased capacity for nearshore waters to warm more quickly, making conditions hospitable for bacterial and plant (algae) growth. Contributions of nutrients and pathogens from nearby cottage septic systems may be entering the groundwater that flows to the lake. As cottage development increases at Oliphant, this concern could escalate.

We also note that vehicle use on beaches is a practice that contributes pollutants derived from the vehicles themselves. Vehicle fluids, road ‘gunk’, and invasive plant seeds are all things that can be contributed by motorized vehicles driving on beaches.

Climate Change

The topography and bathymetry of a wetland determine how changes in water levels affect the ability of wetland vegetation to migrate to suitable moisture and soil conditions. In the Great Lakes region, warming is projected to occur in all seasons with the greatest warming usually in winter. Annual precipitation is expected to increase, although a summer decrease in precipitation is projected. An increase in air temperature will be followed by increased water temperature, and this warming would be particularly significant in shallow nearshore areas like Oliphant. Water levels in climate change scenarios are projected to decline from 0.3 to 1.2 m. below current levels (Mortsch *et al.*, 2006).



Image shows the lower water level at 175.61 m asl and emerging lakebed (brown areas) projected by climate change models for the year 2050. (Tupman, 2004)

Long-term plant survival is determined by the maintenance of seeds or vegetative propagules such as tubers. Coastal meadow marsh plants can survive through years of unfavourable conditions like a drought. Some tubers and seeds can remain viable in the soil for 20-25 years (Mortsch, *et al.*, 2006). This makes the protection of the shorelands and lakebed from vehicle use critical to the long term health of Oliphant's coast.

Oliphant's Species at Risk have low populations and likely have a reduced ability to re-colonize the wetland area from seeds or propagules due to fewer individuals. Their hydrological vulnerability to climate change is higher than more abundant wetland plant species (Mortsch, *et al.*, 2006).

Stewardship Approaches

The preceding information provides some context as to why the environmental stewardship of Oliphant's coast is necessary. Approaches for implementing a stewardship program are provided below. These are intended to help guide the process towards an effective conservation program that helps to balance people's use of the lakeshore with the needs of the ecosystem.

A) Beach Access Control

The historical practice of using motorized vehicles on the beach, particularly during low lake periods, is one that needs to change, for the sake of Oliphant's environment. It is difficult to justify convenience over ecological destruction. As occurs in other parts of the coast, beach access should be limited to pedestrian access, and the pedestrian access should be kept to designated access routes in order to help minimize impacts to beach vegetation and the health of the ecosystem. It is important to clearly identify access routes so that they are clear defined for the beach users.

Island access during periods of low lake levels, while not ideal for the reasons discussed earlier, should only occur if limited to a specific access trail to limit damage to the shore. The island community should consider restricting this mode of island access, as vehicles may be a vector for spreading invasive species onto the islands.

In places like Sauble Beach, work has been undertaken by the local Friends of Sauble Beach to identify designated beach access routes using a combination of boardwalks, railed pathways and signs identifying access pathways in a clear manner. Use of boardwalks lakeward of Shoreline Ave. and Bay St. is likely not practical because the area is prone to flooding and wave activity. The expense of constructing a boardwalk facility is likely not warranted in this respect. Beach access at Oliphant is better suited to foot paths, guided by posts, or posts with an intermediary (like rails, rope or chain).

It may be possible to design a viewing platform or short boardwalk for physically challenged people to enjoy lake vistas. Its location should be determined with advice from the Grey Sauble Conservation Authority and Department of Fisheries and Oceans.

B) Parking Identification and Delineation

There are no formally established parking arrangements at Oliphant, other than some parking at the harbour facility. While some effort has been made to contain vehicles parking at the beach at Lonely Island beach, for the most part, beach users have had unfettered access to the shoreline with their vehicles. The goal at Oliphant should be no parking west of Shoreline Ave. and Bay St. This means that alternative parking arrangements need to be developed. Some creative approaches need to be considered by the community. The following ideas are intended to begin the conversation about long term planning with respect to parking at Oliphant.

- Use existing municipal property to develop parking facilities. According to the land ownership map (Appendix C) the Town owns several parcels in the Oliphant area. These should be evaluated to see what options are available. The Women's Institute park (south of Merry St.) has some potential to hold a limited number of cars. This will need some careful design.
- Establish a drop-off system where beach users can be driven to designated loading and unloading areas. Drivers park on interior streets or parking facilities located inland.
- Encourage greater use of non-motorized vehicles in the area.
- In a landscape planning exercise with students from University of Guelph, a suggested option was to convert Shoreline Ave. between Spry Lake Rd. and Merry St. as a one-way, allowing space for angle parking along the shore-side of the roadway.

During the process of finding a long term solution, an interim measure is suggested in order to immediately confine the impact to the shoreline. We suggest that vehicle containment should be a priority at Oliphant, before ecological damage from vehicles leads to long term damage of the coast. An approach is provided under "Recommendations."

C) Education and Awareness

Oliphant residents have a strong connection to the coast and are increasingly choosing to live or spend time near the coast to enhance their lifestyle and sense of wellbeing. This strong connection to the coast means that we must ensure the ongoing protection and management of our coastal assets. The health and wellbeing of Oliphant's coastal environment is enhanced if the community is aware of, understands, and appreciates coastal ecosystems and coastal natural heritage. An increased number of residents and users could potential lead to increased pressures on the fragile ecosystem.

Education and awareness is one of the most fundamental initiatives in a successful coastal conservation program. There are various approaches to providing education and awareness services, and no one approach should be considered sufficient to reach the targeted audiences.

Rather, a multi-faceted approach that includes both formal and informal education tools is necessary.

Stewardship communication and education needs to be a sustained effort over the long term.

Communication and education efforts will require a multi-dimensional approach, as outlined below.

Leadership should come from the municipality and local organizations like FOOCE and the Oliphant Campers Association to provide opportunities for communication and education on beach stewardship. The Coastal Centre can assist as a resource for information on coastal science and management.

Formal Education

In this context, formal education refers to the process of developing people's environmental literacy in a structured program. This includes elementary, secondary and post-secondary school opportunities to learn about Oliphant's coastal environment.

Oliphant offers a unique advantage of providing a "living laboratory" for teaching about coastal processes, geomorphology, biodiversity, water quality and climate change, and all of the topics derived from them. This area could be marketed within the educational community as a special learning environment for multi-disciplinary education.

Community workshops provide another means of education in a formal setting. Friends of Oliphant Coastal Environments (FOOCE) have already hosted several workshops on a variety of environmental themes, and this provides participants with an engaging way to learn about topics of interest. Oliphant Campers Association meetings may be another forum to present educational information.

Informal Education

There are many methods of informal education that should be considered at Oliphant. Many of these involve orienting beach users about Oliphant's unique and sensitive nature through the use of signs, literature and other media.

i) Signs

The use of informational signs is important as an educational tool, particularly since this may be the only opportunity that visitors have to learn about the coastal meadow marshes and dune grasslands at Oliphant and why their conservation is so important. Signs used for this purpose must not only be attractive and appealing to the reader, but they should also be stylized so that all signs used along the waterfront have a consistent look. Colour, lettering style and size are all considerations in an attractive and functional sign system.

"The policy framework seeks to move beyond a focus on symptoms – air and water pollution, for example – to encompass the underlying causes of environmental stresses, which are rooted in personal and social values and in organizational structures. It seeks to promote changes in personal behaviour and organizational practices that will allow us to minimize our ecological footprint, while also fostering greater community engagement in meeting that goal."

New education policy "Acting Today, Shaping Tomorrow"

Ministry of Education

a) *Interpretive Signs*

Interpretive signs are large signs placed at major entrances to the beach. They provide information to the reader about the sensitive natural environment, threats to the coastline and information on how people can help protect Oliphant’s environment. It is suggested that signs of this type be placed at the three entrances to Oliphant, or places where most people tend to congregate.

Interpretive signs provide beach users and other interested people with some more detailed information about the coastal environment. These types of signs signify to the reader that coastal conservation is an important part of the Oliphant community. They also list the partnering organizations involved in the conservation efforts, signifying to the reader that there are several organizations signed on to the effort. A sample interpretive sign is provided in Appendix D.

b) *“Sensitive Area” Signs*

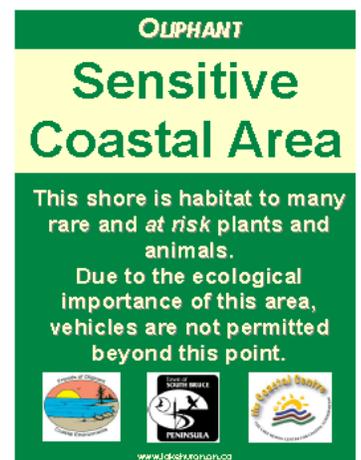
Sensitive area signs are smaller aluminum signs that can be placed at strategic locations (perhaps at trails where people have been accessing the beach by vehicle) to advise visitors of the vulnerability of the shoreline to human impacts. The objective of these signs is to ‘remind’ beach users that their participation in coastal stewardship is expected. They are designed to provide a concise conservation message. These are different from By-Law signs which are intended to advise people of regulations in force by the municipality. A sample “sensitive area” sign is provided in Appendix D.

c) *Beach Access Signs*

Beach Access signs identify the designated access routes that people are permitted to take to access the beach. Having designated routes helps reduce the myriad of pathways produced when there is no organized beach access routes planned. Wording on the signs can be as simple as *“Beach Access – Please follow the designated trail”*. It is useful to have signs at both ends of the trail so that people can return home by the same trail.

ii) **Information Literature**

Literature describing the ecological and social values of Oliphant will be an important method of providing conservation messages to the community. The Coastal Centre has produced a four-page background document called “Protecting Oliphant’s Coast,” as well as a four-page document entitled “Damaging Wheels” about the impact of vehicles on beaches. In addition, the Centre has produced an information brochure on the invasive plant *Phragmites australis*



and its threat to Lake Huron’s beaches. These are examples of the information that FOOCE and the Town of South Bruce Peninsula could share with the community to help build awareness of some of the issues.

In addition, FOOCE should consider the development of an **“Interpretive Guide to Oliphant”** that could be distributed as a self-guided resource for people to learn and understand about Oliphant’s globally rare ecosystems, rare vegetation, Species at Risk and First Nation culture. This resource could be undertaken in partnership with the Coastal Centre, Owen Sound Field Naturalists and Saugeen Ojibway Nation.

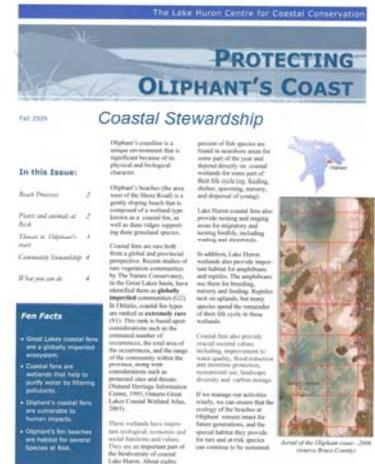
iii) **Media**

FOOCE should continue regular submissions to local newspapers and other media during the summer season highlighting various aspects of the Oliphant coastline. The objective should be the education and awareness of readers concerning the waterfront. This could include articles on dune and wetland conservation, Species at Risk, water quality, water levels, biodiversity and climate change. It could also include historical accounts, archeological information, First Nations history and other topics of interest. Short, regular weekly features would help promote the dunes, fens and alvars and their conservation, a better understanding of the waterfront and its inter-connectedness, and provide some profile to FOOCE. Similarly, Friends could pursue submitting articles to the various tourism associations in the region, highlighting the conservation work being carried out and asking visitors to share in caring for Oliphant’s special coast. Developing a close working relationship with local tourism associations and promoters of Oliphant could help visitors to Oliphant to access information about this coastal environment prior to their arrival.

The internet is an important medium for providing access to information. FOOCE has established a website dedicated to providing updated information on the Oliphant coastal environment. Many people now use the web as a first port of call for information, and it should form a part of any communication strategy to encourage particular codes of behaviour. The Town of South Bruce Peninsula should consider linking with the websites of Friends of Oliphant Coastal Environments, and Friends of Sauble Beach as partners in community stewardship within the municipality.

iv) **Municipal Council**

Keep Town Council informed about conservation issues at Oliphant. As the local government, they play a key role in stewardship efforts. Council members change for time to time, so it is important that they are provided with up-to-date information on Oliphant’s coastal environment, particularly the issues that threaten the health of this environment.



v) **Communications**

Consistent messaging is important to prevent confusion about Oliphant's ecosystems and how people can help to protect ecosystem health. Keep the messages simple, and use them consistently in all varieties of media used.

Some of the general messages recommended include:

- *Oliphant's rare coastal ecosystems are part of our common natural heritage.*
- *The coastal ecosystems are vulnerable to human disturbances.*
- *Our shorelands are habitat for rare species including Species at Risk.*
- *Dune grasslands provide a repository of sand that preserves beaches during high lake and storm events.*
- *The coastal meadow marsh filters water providing a cleaning function and therefore improving water quality.*

Some specific messages include:

- *Stay on designated trails and beach pathways.*
- *Don't drive vehicles off the municipal roadways.*
- *Tread lightly, don't pick flowers, or damage the vegetation.*
- *Your help to protect this globally rare ecosystem is appreciated.*

D) **Invasive Species Control**

Non-native, invasive plant species are a major threat to the Oliphant coastline. They pose a threat to the shoreline by displacing native vegetation and altering habitats. They can also pose an aesthetic issue, as well as a physical barrier to access. People contribute to the spread of invasive plants by operating vehicles through infested areas, by disturbing native vegetation (including dredging), and from garden 'escapes' where problem species are used in gardens and not contained properly. There have also been instances of local cottagers encroaching onto shorelands and mowing and planting non-native ornamental plants. These are all disturbances that enable the spread of invasive species.

The greatest threat from an invasive plant currently is from Common Reed (*Phragmites australis*) which has appeared at Oliphant within the last five years. It has been identified at Oliphant in abundance in the "Gut" channel and surrounding nearshore area. The Gut channel is a dredged portion of the lakebed where the dredge spoil has been deposited adjacent to the channel as a berm. The berm is where the Common Reed has formed a dense monoculture.

Common Reed has also been observed on the shore between the water's edge and the road. Currently they are in relatively small pockets which should be easy to control, provided

control efforts are undertaken rapidly and with a long term management program in mind.

Larger stands which are presently close to, or in, standing water will be more challenging to control, as methods to undertake control measures are limited where the Common Reed is near or within standing water.

Common Reed has the capacity to spread quickly. It has no natural predator or control, and dominates native habitat by crowding out native plants, and by emitting a toxin from its root system to kill off neighbouring plantlife. The displacement of native species and the formation of dense monocultures also have negative impacts on insects, birds and other species that rely on intact coastal habitats.

Early detection and control is necessary to manage the spread of this plant. The Town of Saugeen Shores has successfully managed their *Phragmites* beach infestation to the point where it is manageable.

As discussed earlier, vehicle use along beaches (ATVs, contractor equipment, public works vehicles, etc.) can spread Common Reed. Consequently, vehicles should be restricted from use on Oliphant beaches.

A disturbed soil surface where native vegetation cover has been disturbed provides an excellent seedbed for the Common Reed. Attention needs to be focused not only on dispersal vectors likely to spread the plant from one area to another, but also on preventing the creation of disturbed soils. Management practices leading to a dense native plant cover that can compete for space and light with Common Reed seedlings may represent an effective strategy for preventing the establishment of a Common Reed stand (Belzile, *et al*, 2009).

To be most effective, the timing of *Phragmites* control needs to be synchronized with the plant's life cycle. It is suggested that a multi-faceted approach be considered to address this problem.

The use of herbicide appears to have had the best results in controlling this invasive, although there are some concerns with this approach in environmentally sensitive areas. From a practical standpoint, herbicide use is one of the few effective options for large patches of *Phragmites*. In smaller patches, or for isolated plants, mechanical removal may be the best option.

Large patches of *Phragmites* may require herbicide treatment initially. This option should be undertaken in fall once native plants have gone into dormancy, and the *Phragmites* can be more easily targeted. Direct application of herbicide (i.e. hand wicking method) is recommended over spraying. Use of herbicide should only be undertaken by provincially licensed applicators and requires a letter of opinion through the Regional Director of the Ministry of Natural Resources as to whether the application of herbicide is in support of natural resource management including control of an invasive species that may be detrimental

to the health of persons or the environment or economy of Ontario.

During summer, it is recommended that seed heads be harvested from the plants, bagged and disposed or burned in the landfill. Removing seed heads will help to prevent seed dispersal and the establishment of a seed bed in the surrounding soils. Local community groups should be consulted to see if volunteers could be obtained to assist, as this will be a significant undertaking. This work should commence in mid-summer once the seed heads have fully formed on the plants. This would need to be a recurring activity, but the effort should decline as the chemical and mechanical control efforts take effect.

There may be small isolated occurrences of *Phragmites* where hand removal may be possible. It is important that the entire plant, including all root fragments, be removed and disposed or burned in the landfill. Any lingering fragment can produce another plant. Coordinating efforts with other municipalities and groups may help to slow its mobility alongshore. A regional approach may be more effective than targeting isolated pockets of *Phragmites*.

Saugeen Ojibway Nation is working toward undertaking control measures at Chief's Point. It is recommended that SON be contacted to see if joint or coordinated control efforts could be undertaken, so that *Phragmites* control efforts in the area are not disjointed.

Finally, one of the keys to controlling the spread of *Phragmites* at Oliphant will be controlling the access of motorized vehicles to the shorelands. Driving on the beach needs to be eliminated, other than for controlled island access during low lake conditions (even island access by motorized vehicle should be re-evaluated in favour of lower impact options).

E) Protection of Species at Risk

Protecting Oliphant's Species at Risk means protecting their habitat. It will be important to become informed about each species ecology and how each species functions in Oliphant's environment. The more that is understood about these species, the greater the likelihood that effective stewardship of these species and their habitats will occur.

Animals are mobile and require different approaches to stewardship than stationary plant species. Plants are relatively easy to protect: locate them, and then stay away. Animals are more difficult. The Piping Plover, for example, nested at Oliphant in 2008, but not in 2009. When it does nest, it requires a protected zone from April until July, until the young have fledged. Its nesting is restricted to the beach area, so it has a fairly well defined territory that needs protecting.

The Massasauga rattlesnake, on the other hand, is transient, and its habitat needs at Oliphant are not well understood. It requires a more adaptive stewardship approach, where people need to be 'on the lookout' and provide a wide berth when the animal is observed in the area.

Dwarf Lake Iris, Tuberous Indian Plantain and other rare coastal plants are at risk from vehicle traffic and habitat destruction, as well as invasive plants. Measures to keep vehicles off the beach and efforts to control invasive plants will help to protect plant species at risk, and other rare coastal plants.

F) Water Quality

Oliphant's irregular shoreline, with its bays and headlands, and its shallow waters, makes it particularly vulnerable to water impairments. Bacteria and excessive nutrients are two key water impairment concerns at Oliphant. Sources for these pollutants can include faulty septic systems, failure to use available washroom facilities at the beach, and wildlife droppings. Lawn and garden fertilizers can also contribute to nutrient loading.

Voluntary septic system maintenance has long been the practice, but this approach requires all septic system owners to follow a regular inspection and maintenance program. Because of local water quality concerns, a number of communities have begun embarking on septic system inspection programs to ensure that septic systems are properly maintained and are in good working order. For example, the Township of Huron-Kinloss has a mandatory septic inspection program that is intended to inspect all systems within the municipality within a seven year cycle. Septic system maintenance is important to water quality stewardship. Education and awareness is an initial activity on which FOOCE and Oliphant Camper's should consider partnering. These aspects will become even more important as additional cottage development occurs.

Beach washroom facilities are currently limited to one permanent building at the government docks, and to portable washrooms installed by the municipality during summer at Lonely Island. Washroom facilities should be located at each designated parking area.

G) Restoration

For the most part, keeping motorized vehicles off the shorelands will allow the area to heal itself and natural regeneration will occur. In some areas, it might be necessary to place snow fencing, or other barrier, to prevent human disturbance to these areas in order to aid the natural recovery process. If fencing, or other barrier, is used, signs with wording such as "*Environmental Recovery Area—Please Do Not Disturb*" should be attached to the fence. Fencing alone may be interpreted negatively unless it is accompanied with educational signs informing people why the fence is necessary. The fence should be removed once the area has successfully recovered. The use of fencing may not be appropriate where nesting shorebirds (e.g. Piping Plover) are present.

Rules & Regulations along the Lakeshore

A number of agencies administer various rules and regulations that are intended to help protect the Lake Huron shoreline. A list of some of the key agencies is provided in this section, including a brief description and contact information. It is important to contact the appropriate organization(s) prior to undertaking activities which would fall under current rules.

Federal

i. Department of Fisheries and Oceans (DFO)

The federal *Fisheries Act* provides for the protection of fish habitat. Under this Act, no one may carry out any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat, unless authorized by the Minister of Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish. Violations to the Fisheries Act can result in substantial fines. Although water levels on Lake Huron fluctuate, the boundaries of fish habitat, as defined in the *Fisheries Act* within a body of water, do not change. DFO determines the boundary of fish habitat using historical long-term water levels, linking the habitat to the requirements of fish populations throughout their life cycles. This means that the extent of fish habitat is not determined by short-period water level fluctuations. For example, in low gradient shoreline areas (e.g. sand beaches and wetlands) small decreases in water level sustained over a long period of time may result in large distances created between the current water level and the levels that are more indicative of an average year. In low-water years, beaches grow significantly larger and wetland areas flourish with vegetation. The nearshore areas once covered with water will be exposed as "dry" land. As a result, waterfront property owners sometimes propose to fill or excavate within these areas (e.g. shoreline protection works, additions to existing structures, berms, dredging). Although these areas appear to be dry and may have been for a year or more, historical data shows that water levels will rise again and nearshore areas will be re-submerged, providing important spawning, nursery and adult fish habitat. DFO considers these areas to be fish habitat, and they therefore fall under the requirements of the *Fisheries Act*.

Burlington Office

3027 Harvester Road, Suite 304 PO Box 85060
Burlington, ON
L7R 4K3

Phone: (905) 639-0188

Website: www.dfo-mpo.gc.ca/regions/central/

ii. Canadian Wildlife Service (CWS)

The Canadian Wildlife Service is responsible for the protection of migratory birds in Canada. Permits are usually required for any control programs involving migratory birds, including gulls and Canada Geese. They are also involved in the protection of the endangered Piping Plover. Species at Risk are protected by federal legislation, called the Species at Risk Act (SARA), proclaimed June 5, 2003. Three federal departments are jointly responsible for recovering listed species: Environment Canada (CWS), Parks Canada Agency and the Department of Fisheries and Oceans. The federal government works closely with the provincial government in the recovery and protection of Species at Risk.

Canadian Wildlife Service
P.O. Box 490 Lambeth Station
465 Gideon Dr.
London, ON
N6P 1R1

Website: www.on.ec.gc.ca/wildlife_e.html

Provincial

iii. Ontario Ministry of Natural Resources (MNR)

The Public Lands Act

The beds of most navigable lakes and rivers are Crown land managed by the Ministry of Natural Resources. A work permit is required for certain work projects in the water or along the shoreline, including dredging and filling. Public Lands Act work permits apply to both private and public lands that are seasonally inundated with water (shore lands).

Owen Sound Area Office, MNR
1450 7th Ave. East,
Owen Sound, ON
N4K 2Z1

Phone: (519) 376-3860

Endangered Species Act (ESA) 2007

The Ministry of Natural Resources administers this Act pertaining to the protection of species at risk in Ontario. Endangered and threatened species on the Species at Risk in Ontario (SARO) List are protected under this Act. The Act prohibits killing, harming, harassing, capturing, taking, possessing, transporting, buying, selling, leasing or trading an endangered or threatened species and also makes it illegal to damage or destroy their habitat. At Oliphant this includes the Piping Plover, Spotted Turtle, Dwarf Lake Iris and Massasauga rattlesnake. There may be other Species at Risk not yet identified at Oliphant that may be protected. A complete list of the species at risk in Ontario can be viewed on the Ministry of Natural Resources' website.

Report damage to habitat, disturbance to species at risk, and poaching to the Ministry of Natural Resources.

Midhurst District, MNR

2284 Nursery Rd
Midhurst, ON
L0L 1X0
Phone: (705) 725-7598

Website: www.mnr.gov.on.ca/MNR

iv. Ontario Ministry of the Environment (MOE)

MOE is responsible for the quality of surface and groundwater in Ontario. Enforcement officers respond to spills or other acute impairments to our surface water. The Ministry also carries out research from time to time to determine the current state of water quality along Lake Huron. A major study on nearshore water quality was completed by the Ministry in 2005 and is available on the Ministry's website.

The MOE also administers the Cosmetic Pesticide Act which bans the use of pesticides for cosmetic purposes. In the case of using it for Common Reed Grass control in environmentally sensitive areas such as shorelines, permission is required from both MNR and MOE.

Owen Sound Area Office

101 – 17th Street East
Owen Sound ON
N4K 0A5
Toll free number: 1-800-265-3783
Phone: (519) 371-2901

SPILLS ACTION CENTRE: 1-800-268-6060 *(for environmental emergencies – 24 hour line –this is for severe water impairment problems where a clean-up or investigation may be required. A designated first responder will be sent on-site typically within an hour to confirm the incident. MOE investigators will be called on scene as warranted)*

Website: www.ene.gov.on.ca

Local

Town of South Bruce Peninsula

The Town, through its Official Plan and Comprehensive Zoning By-Laws, regulates land use. They undertake this under the authority of the *Planning Act*. Land use planning services are provided through the County of Bruce. For the purposes of coastal stewardship, the Town has the authority under the *Municipal Act* to pass By-Laws that are related to protecting the natural environment.

315 George Street,
PO Box 310,
Wiarton, Ontario, Canada,
N0H 2T0

Phone: (519) 534-1400

Website: <http://www.southbrucepeninsula.com/en/>

Grey Sauble Conservation Authority

Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation 151/06

Ontario's Conservation Authorities were provided new regulations by the Provincial Government in 2006 that extended their regulatory authority to include Great Lakes shorelines. For the purposes of defining the extent of the *Regulated Area* at Oliphant, a 15 metre (50 foot) allowance is added to the furthest landward extent of the *flooding hazard*, *erosion hazard* or *dynamic beach hazard*.

Works for which permission is required under this *Regulation* may also be subject to other legislation, policies and standards that are administered by other agencies and municipalities such as the provincial *Planning Act*, *Drainage Act*, and *Environmental Assessment Act* or the federal *Fisheries Act*, among others. It is the responsibility of the applicant to ensure that all other necessary approvals are obtained prior to undertaking any works for which a permit under this *Regulation* has been obtained.

The following types of activities would typically require a permit:

- *the construction, reconstruction, erection or placing of a building or structure of any kind,*
- *any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,*
- *site grading, or*

- *the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere* (Conservation Authorities Act, R.S.O. 1990, c. 27, s. 28 (25)).
- *alterations* which would result in the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering in any way with a wetland.

Areas regulated under Ontario Regulation 151/06 have been mapped and are available through the GSCA office.

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

Phone: (519) 376-3076
Website: <http://www.greysauble.on.ca/>

v. Grey Bruce Health Unit

Injury and illness can result from bathing in recreational waters. Provincial regulations and guidelines set out minimum standards to provide clear, clean water and safe conditions for bathers in beach areas. Public health units are responsible for testing public beaches as defined under Ontario's Beach Management Protocol.

Ontario Beaches are posted with warnings of possible health risks when elevated *Escherichia coli* (*E.coli*) densities are present. The recreational water quality guideline of 100 *E.Coli* per 100 ml of water is set jointly by the provincial ministries of Environment and Health.

Escherichia coli are bacteria present in the droppings of virtually all warm-blooded animals and are the indicator bacteria for fecal contamination of surface waters.

Generally, it is up to the Medical Officer of Health for the local Health Unit to decide when a beach should be posted. Once a beach has been posted for elevated *E.coli* levels, more frequent water samples are taken by the Health Unit. Beach Postings are removed after *E.coli* levels decrease to acceptable levels.

Water at several beaches in Bruce County is sampled during the summer months to monitor bacterial levels. Beaches are posted by the Health Unit with warning signs when bacterial levels exceed standards set out by the Ministry of Health or where a risk to health is expected.

Grey Bruce Health Unit
101 17th Street East,
Owen Sound, ON
N4K 0A5

Phone: (519) 376-9420
Toll free: 1-800-263-3456
Website: <http://www.publichealthgreybruce.on.ca/Water/Recreational/>

**vi. Lake Huron Centre for Coastal Conservation
(the Coastal Centre)**

The Coastal Centre is a non-government organization dedicated to the conservation and wise stewardship of Lake Huron's coastal ecosystems. The Centre's work focuses on research, education and community outreach related to coastal issues. This is accomplished by working with municipalities, agencies, community organizations and the public toward a common goal of improving the health of the coastal environment. The Centre is not a regulatory agency, but often assists such agencies in finding practical solutions to regulations issues.

The Coastal Centre
P.O. Box 178
Blyth, ON
N0M 1H0
Phone : (519) 523-4478
Email: coastalcentre@lakehuron.on.ca
Website: www.lakehuron.on.ca

Recommendations

Recommendation #1—Parking

In the short term, it is recommended that parking be restricted to those areas that have already been impacted by vehicle parking and are therefore less likely to be priority candidates for environmental rehabilitation efforts. These areas are Lonely Island beach (this area already has posts to contain vehicles), Government Docks (established parking near the marina), Women’s Institute Park (municipally owned land) and Sandy Bay adjacent to the restaurant.

These four areas are suggested only if the parking area can be contained through the use of posts or fencing, to define the area where parking is permitted, and to help prevent vehicles from encroaching onto other parts of the beach.

Parking containment should be undertaken prior to the summer season. Wooden posts (6 x 6 inch) installed around the perimeter of each parking location will help delineate the boundaries of the parking space. The use of wood posts would be consistent with what is already in place at Lonely Island beach. In the absence of adequate funding to purchase and install posts, the installation of wood-slat snow fencing is a suggested substitute. The municipality already has this fencing available, and so this would be a practical solution until wood posts are obtained.



Along with the containment fencing, signs should be installed indicating where parking is permitted, that the beach is a sensitive environment, and that beach access by motorized vehicle is not permitted.

In the long term, it is recommended that motorized vehicles be prohibited from the beach entirely. Beach-related parking should be assigned to a planned facility on municipal land. A dialogue needs to occur with the Oliphant community to find a permanent solution to the parking issue. There are several municipally owned parcels of land in the Oliphant area which should be reviewed for potential parking sites. One with particular potential is the Women’s Institute park south of Merry St. It is currently able to accommodate several vehicles, and with some design amendments, could contain several more.

Recommendation #2—Beach Access

Access to the beach should be pedestrian access only. Vehicles should not be permitted to drive on the shoreline west of Shoreline Ave. and Bay St. The municipality has authority under the Municipal Act to pass By-Laws on public and private lands. Council has used this authority in the past, but through several iterations of By-Laws relating to vehicles on shorelands and the lakebed, only isolated areas are covered by the By-Law at Oliphant. The

general ban apparently met with some controversy as some Oliphant residents used vehicles to access their island properties during periods of low lake levels when it became possible to do this. However, many of these residents used specific pathways to access island cottages. Therefore, it should be possible to identify these routes (through the use of GPS) as exceptions to the ban, and only during periods of low lake levels. The routes would have to be clearly identified (by the use of way-markers) and signed so that both the community and visitors clearly understand that these are cottage access routes for local use only. This recognizes a historic practice that would only be available once water levels lower past a certain elevation, triggering the exception to the by-law. It should be possible to limit the number of such access routes to two or three.



Example of way-marker

Establishing **pedestrian access** points are a common way for identifying where the community and visitors should access the beach. This aids in the protection of the meadow marsh and dune grasslands ecology by focusing people to assigned pathways and preventing stray trails from becoming established because of a lack of organized access.

Pedestrian access routes should be signed at both ends of the pathway so that users are able to find the path easily. At places like Sauble Beach and Southampton, beach access routes were established using boardwalks or railed pathways. Due to the nature of Oliphant's low gradient beach, variations in lake levels make boardwalks a less practical option. Boardwalks are often used in interior wetland areas for access and interpretive purposes. Along the coast, conditions are dynamic and challenges exist for structures like boardwalks. It is recommended that boardwalks only be considered only where they are absolutely necessary. The design for shoreline boardwalks will need approvals from various agencies. It should be noted that boardwalks create impacts, and these impacts need to be considered carefully. Boardwalk construction and their ongoing maintenance have expenses that also need to be fully recognized.



Depending on the length of the access pathway, it may be more practical to use way-posts to help people stay on the proper trail. Way-posts are typically 4 x 4 inch, or 6 x 6 inch wood posts used to mark the trail. Each post should have a small sign attached with a message like *"Please Stay on the Access Trail."*

The Women's Institute Park would be an ideal location for the development of a viewing deck and related boardwalk infrastructure, for the purposes of increasing access by physically challenged people. Location and design would need to be reviewed by the Conservation Authority to ensure it would be outside of the flood and wave uprush zone. The viewing platform would also be an excellent location for interpretive education material.

Recommendation #3—Use of Signs

Interpretive/education signs - these include large signs with graphics and text that provide information to the reader about the sensitive natural environment, threats to the coastline and

information on how people can help protect Oliphant's environment. It is suggested that signs of this type be placed at the three entrances to Oliphant, or places where most people tend to congregate. A sample design has been included in Appendix D.

“Sensitive Area” signs – these are smaller aluminum signs that can be placed at strategic locations to advise visitors of the vulnerability of the shoreline to human impacts. These signs are extremely important because they act as reminders that the area is sensitive, and that the community is interested in protecting their environment. A sample design has been included in Appendix D.

Access Trail signs and Beach Access signs—the access trail signs are small signs meant to fit onto the side of the way post. They remind users to stay on the access path. As discussed earlier, they have wording like *“Please Stay on the Access Trail.”* Beach Access signs are placed at either end of the access pathway and helps identify, particularly for visitors, how to get to and from the beach. They help ensure that the user is able to easily locate and use the designated pathways.

Recommendation #4—Stewardship Education

Distribution of education and awareness literature – As discussed earlier, the Coastal Centre has produced a four-page background document called “Protecting Oliphant’s Coast,” as well as a four-page document called “Damaging Wheels” about the impact of vehicles on beaches. These documents are included in Appendix E and F. It is recommended that FOOCE work to distribute information such as this to the community and to visitors to help bring greater awareness of the environmental issues at Oliphant and the need for their participation in community stewardship.

Consistent messaging (discussed earlier) will be important. FOOCE should work in cooperation with the Oliphant Campers Association and the municipality to ensure that consistent messages about environmental stewardship is being promoted.

Media—FOOCE should continue to work with local media to promote coastal stewardship awareness. Focus should be during the summer period, and at summer events, when maximum exposure is most likely. If possible, offer news media the submission of a weekly article on various environmental themes relevant to Oliphant.

Municipality—Council and staff are charged with making decisions on behalf of the whole community. They work best when they have the assistance of the community. FOOCE should continue to provide an advisory role to the Town, keeping Council apprised of local stewardship needs and efforts. The Coastal Centre is available for coastal science and communications advice and assistance.

Communications—Conservation messaging has been suggested earlier. FOOCE should coordinate local communication efforts so there is consistent stewardship information being

presented. Information should be current, and well grounded in science. FOOCE can draw on professional support from the Coastal Centre and the Ministry of Natural Resources.

Recommendation #5—Invasive Species Control

Common Reed—The most urgent threat to Oliphant’s environment is from Common Reed. As discussed earlier, the key to managing this threat is early detection and control measures before the plant spreads beyond the point that it can be managed effectively, without great expense and impact on the environment. It is recommended that the municipality take the lead on this issue. Some areas of the mainland where Common Reed has begun to infest, are currently small manageable patches that could be controlled manually. Larger patches may require the use of herbicide application. Any herbicide use needs to be undertaken by a licensed sprayer and with the permissions of MOE and MNR. If this option is used, public awareness and public perceptions need to be carefully managed. The reason for herbicide application (protection of native habitat) will be an important message to convey to ensure residents know that this is a well thought out response to a serious situation.

A letter of opinion will be necessary from the Ministry of Natural Resources to use herbicide in natural areas. Herbicide application should be done manually (hand wick method, or injection) rather than spraying. Timing of application will be critical because of the risk to plants and animals, particularly Species at Risk. Use of herbicide in the fall season is recommended, after most of the native plants have senesced, and animals have begun their hibernation process.

Control measures need to address activities contributing to the spread of the plant as well as repairing disturbed areas to prevent seeding or re-seeding.

Common Reed control in the “Gut” channel will require expert advice and implementation. This should be reviewed by the Coastal Centre, the Town and Ministry of Natural Resources. There may be other non-native invasive species present now or in the future that may require control efforts in order to manage the threat. Residents should be vigilant, develop the capacity to identify problem species, and seek expert advice on control programs.

Recommendation #6—Protection of Species at Risk

Protecting species at risk is about protecting their habitat. Many plants and animals exist symbiotically, so they don’t need to be a species at risk to be important ecologically. Education and awareness will be fundamental to protecting Oliphant’s coastal environment. However, there may be situations when information and education has not been sufficient. If the shorelands continue to be damaged by human activities, it may become necessary to physically fence off damaged areas until they are able to recover. This can be done using snow fencing or other method of providing a barrier to access.

Enforcing a By-Law restricting motorized vehicles from driving on the shorelands will be an important method of dealing with those residents or visitors that do not comply. Education

and awareness is sometimes not effective when dealing with those who are less apt at becoming informed or educated.

Certain endangered or threatened Species at Risk are also protected under the Ontario Endangered Species Act, so knowing which species are protected, and reporting destruction to these species or their habitat to the Ministry of Natural Resources, is important. Not all Species at Risk are protected under the Act. However, the aim should always be prevention of damage to species and habitat through awareness and education.

Recommendation #7—Water Quality

As described earlier, Oliphant's irregular shoreline, with its bays and headlands, and its shallow waters, makes it particularly vulnerable to water impairments. We recommend that an education and awareness campaign on septic system maintenance be initiated. This should be combined with public awareness about the proper use of fertilizers and the potential adverse impacts on water quality. This would be a logical partnership between FOOCE and the Oliphant Camper's Association.

We recommend that the Town look into washroom facility needs at Oliphant. This should likely be combined with the long range strategic parking issue. However, the short-term parking arrangements at Lonely Island beach, Women's Institute park and Sandy Bay should include some temporary portable washroom arrangements.

The numerous embayments at Oliphant, the shallow nearshore and protective islands make this area susceptible to water impairments, particularly the growth of pathogens, and algae fouling. We recommend that the local Health Unit monitor water quality at Oliphant's swimming beaches, in light of water impairments identified at Lonely Island beach in 2009. In the absence of proper testing, all swimming beaches should be posted with the Health Unit's standard caution signs for bathing beaches.

The implementation of these seven recommendations will substantially improve Oliphant's coastal ecosystem through efforts of protection, restoration and increased public awareness. The Coastal Centre is encouraged by the level of community interest, collaboration, leadership and awareness that has already been achieved during our ongoing discussions and public meetings. We are optimistic concerning the results that can be achieved with an engaged and informed community working for the benefit of the Oliphant Coastal Ecosystem.

Recommendation #8—Ecosystem Restoration

In general, if the measures to restrict beach access by motorized vehicles is implemented successfully, the native plant communities should, with time, self-heal. Regeneration will happen with time, but it may be advantageous for an area to be fenced off to prevent further degradation and expedite the healing process. The Nature Conservancy was consulted about the need for active fen restoration. It was advised that no active intervention (e.g. planting program) is necessary, and that if vehicles can be excluded, the damaged areas will usually recover with native vegetation, though signs of vehicle tracks may be visible for a long time.

Vehicle restriction and invasive species control are the primary restoration actions necessary to aid in the recovery of Oliphant's coast.

As noted earlier, fencing may not be appropriate in areas where shorebirds are actively nesting.

Glossary

Aeolian: pertaining to wind.

Alien plants: Exotic plants which are not endemic to the local ecosystem.

Bathymetry: The measurement of the depth of large bodies of water (underwater topography).

Beach Health: term used to describe the ecological condition of a beach system. A 'healthy beach' is one that retains its bio-physical form and function, allowing the beach to respond to changing wind and wave conditions.

Biodiversity: an array of different animals, fish, waterfowl and plants in nature.

Coastal Ecosystem: an ecosystem which is found specifically within the coast or shoreline region.

Coastal Processes: Natural processes (e.g. Littoral drift, water level fluctuations, erosion) which occur within the coastal environment.

Coastal Wetland: wetlands that are controlled directly by waters of the Great Lakes and are strongly affected by lake-level fluctuations, nearshore currents, seiches and ice scour. Geomorphic features along the shoreline provide varying degrees of protection from coastal processes.

Connectivity: Allowing for the conservation or maintenance of continuous or connected habitats, so as to preserve movements and exchanges associated with the habitat.

Doctrine of Accretion: Where a boundary between land and water alters so slowly that the change is not readily noticeable, the process is known to the Common Law as the "Doctrine of Accretion". The doctrine broadly provides that "*gradual accretions of land from water belong to the owner of the land gradually added to and conversely, land encroached upon by water ceases to belong to the former owner.*" This is also known as an ambulatory shoreline.

Dune: ridges or mounds of loose, wind-blown material, usually sand held together by specially adapted vegetation.

Dune Stranding: refers to the ongoing process of aeolian sand migration outside of the natural shore system. Sand becomes stranded outside of the shore system such that waves are no longer able to reclaim the material. Stranding can occur in areas of relic beach and dune deposits where there is no sufficient source of sand to replace what is lost.

Ecosystem services: Benefits that people obtain from the lake and coast, such as fish, recreational opportunities, climate regulation, renewable energy, and spiritual fulfillment. Ecosystem services are also called nature's services.

Edge effect: The existence of more species in a region of overlap between two ecosystems than occur in either of those systems. It occurs because the overlap region supports some species from both adjacent ecosystems and some peculiar to itself. Ecologists regard the edge effect as a sign of ecological deterioration. The fragmentation of habitats causes an increase in edge areas, but a decrease in the internal areas of ecosystems, leading eventually to a loss of species from all affected ecosystems and an increase in edge species, which are usually commonplace.

Endangered: A wildlife species that is facing imminent extirpation or extinction.

Endemic species: A species native and confined to a certain region; having comparatively restricted distribution.

Endemism: Endemism may be considered on at least three levels (Riley pers. comm. 2002): 1. Site endemism, where a taxon occurs at only one site (e.g., at a single mountain range or island) in the world; 2. Geographic endemism, where a taxon is restricted to a relatively small geographic area (such as the Great Lakes basin, or a specific country); and, 3. Occurrences limited to a narrowly-defined geographically-restricted habitat type, such as Great Lakes dune or meadow marsh systems.

Foredune: The first dune feature landward of the beach, which exhibits some stabilization due to vegetation growth. Storm wave action may reach inland far enough to erode some, or this entire feature.

Graminoids: Grasses and grass-like plants, like sedges ([family](#) Cyperaceae) and rushes ([family](#) Juncaceae).

Headland: Erosion resistant point of land, either man-made or natural, extending into the lake; Sand deposits often form on the updrift side of the headland (e.g. Chief's Point, Douglas Point).

Invasive plants: Species which possess aggressive reproductive qualities that enable them to displace endemic plant species. Examples: Garlic Mustard, Purple Loosestrife, Common Reed (also see Alien Plants).

Lake Algonquin: Post glacial lake which existed about 11,000 years ago. The remnant bluff of Lake Algonquin is a prominent feature from Point Clark to Saugeen Shores.

Lake Nipissing: post glacial lake which existed about 6,000 years ago. The remnant beach ridges left by Lake Nipissing are still evident near the Oliphant Way Road.

Littoral zone: of or pertaining to the bio-geographic region between the nearshore zone (generally to 4 metre depth on the Great Lakes) and the high-water line and sometimes including the supralittoral zone above the high-water line.

Nearshore: an indefinite zone extending from the shoreline to just beyond the breaker zone. This is the area where wave energy has a profound influence on the lakebed. This is in contrast to the Offshore, where waves do not impact the lakebed.

Propagule: Any of various structures that can give rise to a new individual organism, especially parts of a plant that serve as means of vegetative reproduction, such as tubers, offsets, spores or runners.

Reach: a length of shoreline with fairly uniform onshore and offshore physical features and subject to the same level of wave energy.

Relic deposit: sand deposits which are remnants of a post-glacial lake (e.g. Nipissing or Algoma).

Rhizome: a horizontal stem, either on or just below ground, especially one that forms roots at the nodes to produce new plants. Many plants spread with rhizomes, since they can send up new stems and leaves as they grow. This way, a colony of plants may start with many of the same species in an area.

Seiche: an occasional and sudden oscillation of the water of Lake Huron producing fluctuations in the water level and caused by wind or changes in barometric pressure.

Shoals: offshore areas which are more shallow than the surrounding depths.

Species at Risk: According to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), there are currently 487 plant and animal species at risk in Canada. Species at Risk are wild species that are in some danger of disappearing from Canada. Oliphant has several Species at Risk along its coastline.

Stewardship: care of the heritage of our natural spaces and species in such a way that it can be passed on to future Canadians intact.

Strandline: the line of organic matter that is deposited by wave action along the upper part of the beach. (Also called the 'debris line').

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Appendix A

Species at Risk Species Profile Factsheets



Dwarf Lake Iris

A Threatened Species

By Geoff Peach, LHCCC

This miniature iris grows nowhere else in the world but in the Great Lakes Region. Dwarf Lake Iris (*Iris lacustris*) usually occurs close to the Great Lakes shores on sand or in thin soil over limestone rich gravel or bedrock.

It tolerates full sun to near complete shade, but flowers mostly in semi open habitats. These areas can be very long and narrow strips bordering the high water line, or large flat expanses located behind the open dunes of the Great Lakes shoreline. Many iris locations are on old beach ridges of former shores of the Great Lakes.

Flowers bloom from mid-May to early June with flowers being 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 and 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.

Threats

Since Dwarf Lake Iris is largely restricted to the Great Lakes shores, it is highly vulnerable to



Photo of Dwarf Lake Iris



Photo—OMNR

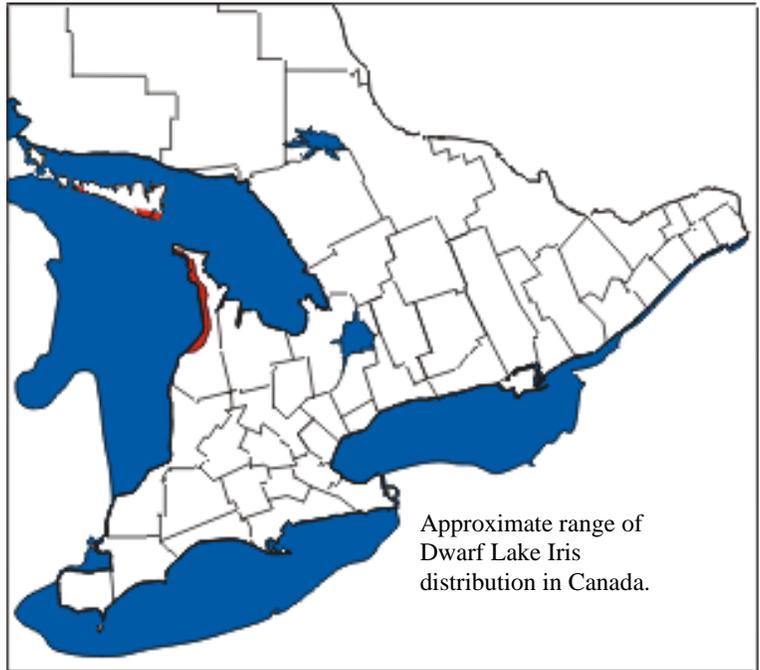


P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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ongoing shoreline development and intensive recreation.

It is very sensitive to mechanical disturbance, or removal of its soil, but can often re-colonize small disturbed areas if it flourishes nearby. All Terrain Vehicles (ATVs) are particularly destructive to its habitat.

The species is also genetically impoverished, which makes it less able to adapt as a population, and could make it especially vulnerable to disease or climate change.

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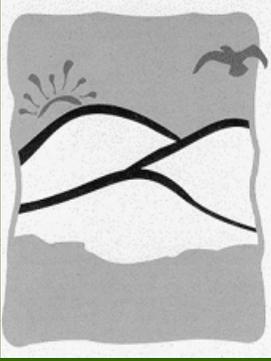
Royal Ontario Museum, www.rom.on.ca, 2009.

You Can Help Protect this Threatened Species

- Learn more about dwarf lake iris and other Species at Risk. Understand how the destruction of habitat leads to loss of endangered and threatened species and Canada's plant and animal diversity. Tell others about what you have learned.
- Grow native plants in your lawn and garden but obtain the plants from local nurseries, do not dig up native plants from natural areas.
- Keep vehicles away from these plants and their habitat. When accessing the beach, stick to designated pedestrian pathways to help minimize disturbance.
- Report sightings or poaching to the Ontario Ministry of Natural Resources. Call 1-877-TIPS-MNR (847-7667) toll-free any time or contact your local ministry office during regular business hours. You can also call Crime Stoppers anonymously at 1-800-222-TIPS (8477).



*Assistance for this project was provided by
the Ministry of Natural Resources*



Eastern Massasauga Rattle Snake

A Threatened Species

By Geoff Peach, LHCCC

The Eastern Massasauga (*Sistrurus catenatus*) is a medium sized snake (50 to 76 cm.) with a thick body. The head is diamond shaped with white stripes along the jaw. Its stubby tail has a brown, segmented rattle.

The massasauga inhabits just four areas in the province: eastern Georgian Bay area, the Bruce Peninsula, the Wainfleet bog, and the Ojibway Prairie Complex in Windsor. Some of these populations may be vulnerable to inbreeding and disease, and may be unable to recover from road mortalities or human persecution. If isolated populations decrease in size, they will continue to decline to extinction.

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.

Threats

- Habitat loss exerts a significant pressure on populations of the eastern massasauga rattle-snake, and occurs largely due to development activities. The massasauga has highly specific habitat needs, and unlike some species cannot avoid development by relocating. Rock quarries/aggregate extraction, wetland drainage, and agricultural expansion disrupt the snake's habitat and



Photo of Eastern Massasauga

(Photo: John Mitchell /© ROM)



Vehicle mortality, by car or ATV, is a major threat to this animal.

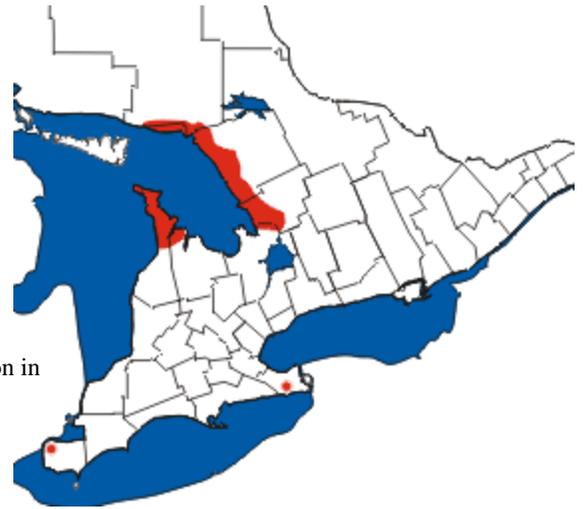
(Photo: Eastern Massasauga Recovery)



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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Approximate range of
Massasauga distribution in
Canada.

increase its risk of mortality.

- Under Ontario's *Endangered Species Act* 2007, it is illegal to harass, capture, buy, sell, possess, or kill the Eastern Massasauga. This species is also protected under Ontario's *Fish and Wildlife Conservation Act*.
- Road mortality and direct persecution are also major threats to this snake.
- An ever-increasing demand for homes and cottages has contributed greatly to habitat destruction and fragmentation.

You Can Help Protect this Species:

References

Massasauga Recovery Team,
www.massasauga.ca

Royal Ontario Museum, www.rom.ca

- Report sightings or poaching to the Ontario Ministry of Natural Resources. Call 1-877-TIPS-MNR (847-7667) toll-free any time or contact your local ministry office during regular business hours. You can also call Crime Stoppers anonymously at 1-800-222-TIPS (8477).
- Leave snakes and their habitat alone. Inform others about the plight of the Eastern Massasauga.
- Please remember that they are a legally protected species.
- Learn more about the Massasauga rattlesnake and other Species at Risk. Understand how the destruction of habitat leads to loss of species at risk and Canada's plant and animal diversity. Tell others about what you have learned.



*Assistance for this project was provided by
the Ministry of Natural Resources*



Monarch Butterfly

A Species of Special Concern

In the fall, monarchs migrate thousands of kilometres, travelling from Canada to Mexico. The annual southward migration of the eastern monarch populations begins in Canada in early August and continues through to mid-October.

Through the summer there are two, possibly 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. The generations that emerge in late summer and autumn are somehow

triggered to become migratory.

Monarchs overwinter in Mexico and mate there in early spring. On their way north, eggs are laid on fresh milkweed and the adult dies some time thereafter. A few monarchs that have overwintered in Mexico return to Ontario (during May), a journey of 3000 kilometres! However, it is the generation that is produced between Mexico and Canada that returns in numbers, mainly in June.

Monarch caterpillars ingest toxins



Photo courtesy Grant Simmie.
Taken at Oliphant, August 2007

Monarchs gather at the edge of the cedar bush bordering the shore to roost for the evening. The trees offer the monarchs protection from extreme temperatures, predators, and precipitation.



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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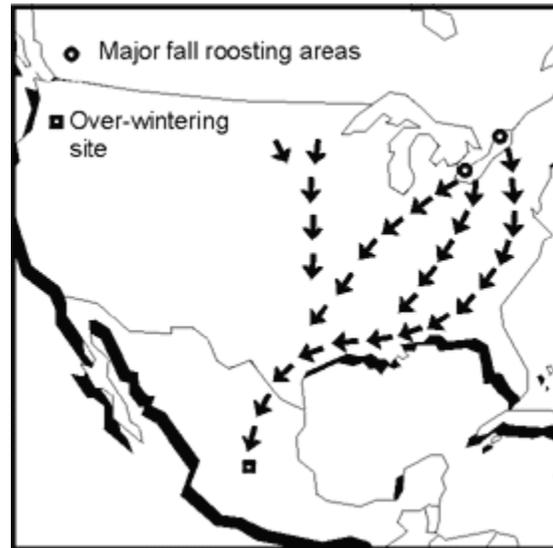
Hinterland Who's Who, Insect Fact Sheets

Insectarium de Montreal, Monarch's Without Borders

Parks Canada, Point Pelee National Park, Monarch factsheet.



Assistance for this project was provided by
the Ministry of Natural Resources



Parks Canada

(cardenolides) from milkweeds that make them, and the butterflies they develop into, unpalatable to most birds and other vertebrates.

They are commonly seen along the Oliphant shore particularly during their annual autumn migration to Mexico.

Wildflowers, which are particularly prevalent in abandoned farmlands and roadsides, are used as nectar sources by the adult butterflies and are also an important component of Monarch habitats. They are especially important during the fall migration, when sugars obtained from nectar are converted to the fat that is essential for the butterflies to complete their migration and overwinter successfully. Common Milkweed (*Asclepias syriaca*), and Swamp Milkweed (*A. incarnata*) are both key plants for the Monarch, and both occur at Oliphant. The milkweeds, goldenrods (*Solidago*) and asters (*Aster*), as well as Purple Loosestrife (*Lythrum salicaria*), are the nectar sources used most frequently by Monarchs.

You Can Help Protect this Species:

- Help to protect milkweed and other plants that are a nectar source for the monarch.
- Participate in monarch research, conservation and education projects.
- Learn more about the Monarch butterfly and other Species at Risk. Understand how the destruction of habitat leads to loss of species at risk and Canada's plant and animal diversity. Tell others about what you have learned.



Piping Plover

An Endangered Species

By Geoff Peach, LHCCC

The Piping Plover (*Charadrius melodus*) is a small, stocky, sandy-coloured bird resembling a sandpiper. The adult has yellow-orange legs, a black band across the forehead from eye to eye, and a black ring around the base of its neck.

Like other plovers, it runs in short starts and stops. When still, the piping plover blends into the pale background of open, sandy habitat on outer beaches where it feeds and nests.

Piping Plovers return to their breeding grounds in April or early May. Following establishment of nesting territories and courtship rituals, the pair forms a depression in the sand. The nest is sometimes lined with small stones or fragments of shell.

The average clutch size is four eggs.

When predators or intruders come close, the young squat motionless on the sand while the parents attempt to attract the attention of the intruders to themselves, often by feigning a broken wing.

Plovers will re-nest and fledglings from these late nesting efforts may not be flying until late August.

Plovers often gather in groups on undisturbed beaches prior to their southward migration. By mid-September, both adult and young plovers will have departed from their wintering areas.

Piping plovers may live to be 8-10 years old.

Piping plovers utilize the open, sandy beaches, barrier islands, and sand spits formed along the Great Lakes' perimeters by wave action. They do not inhabit lakeshore areas where high bluffs formed by severe erosion have replaced



Piping Plovers foraging at Sauble Beach



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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Approximate range of Piping Plover distribution in the Great Lakes.

beach habitat. They prefer sparsely vegetated open sand, gravel, or cobble beaches for a nesting. They forage along the strand line where invertebrates are most readily available.

In 2007, Piping Plovers nested at Sauble Beach for the first time in over 30 years. Plovers returned in 2008 to Sauble Beach and Oliphant, and at Sauble Beach in 2009. In 2009 three nests at Sauble Beach produced seven fledglings.

www.lakehuron.on.ca

Threats

The main threats to Piping plover include increased development and recreational use of beaches. Piping plovers are very sensitive to the presence of humans. Too much disturbance may cause the parent birds to abandon their nest. People (either on foot or in a vehicle) using the beaches where the birds nest could accidentally crush eggs or young birds. Dogs and cats can also harass and kill the birds. Other animals, such as fox, gulls, and crows, prey on the young plovers or eggs.

You Can Help Protect this Species:

- Learn more about the piping plover and other endangered and threatened species. Understand how the destruction of habitat leads to loss of endangered and threatened species and Canada's plant and animal diversity. Tell others about what you have learned.
- Join a conservation group active in local shore conservation.
- Protect natural coastal dune habitats by staying on boardwalks and existing trails. If walking your dog on a beach or in other natural areas, please keep it leashed to protect nesting birds.
- Report sightings or poaching to the Ontario Ministry of Natural Resources. Call 1-877-TIPS-MNR (847-7667) toll-free any time or contact your local ministry office during regular business hours. You can also call Crime Stoppers anonymously at 1-800-222-TIPS (8477).



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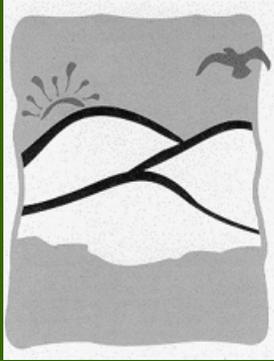
Hinterland's Who's Who, www.hww.ca

Royal Ontario Museum, www.rom.on.ca, May 2009.

US Fish & Wildlife Service, Piping Plover fact-sheet.



Assistance for this project was provided by the Ministry of Natural Resources



Spotted Turtle

An Endangered Species

By Geoff Peach, LHCCC

The Spotted Turtle (*Clemmys guttata*) is a relatively small freshwater turtle species, with adult carapace (upper shell) length typically less than 13cm. The species is recognized by its black keelless, unserrated carapace overlaid with an irregular pattern of yellow-orange spots.

Spotted Turtles occur in high organic content wetlands including acidic bogs and alkaline fens in the Eastern Deciduous/Great Lakes forest and Atlantic Coastal Plain regions of North America. The species prefers unpolluted shallow waters of ponds, bogs, fens, marshes, ditches, vernal pools, woodland streams, sedge meadows and the sheltered edges of shallow bays

These turtles are omnivorous

scavengers and generally feed in water when temperatures exceed 15°C They typically eat various grasses and green algae. They also eat animals, both live and as carrion, including earthworms, aquatic insect larvae, small crustaceans, snails, tadpoles, salamanders, fish, and birds

Spotted Turtles life strategy involves high egg and juvenile mortality, low adult mortality, and a long life. Turtle populations can sustain years of low recruitment as long as reproducing adults are not lost to death or overharvesting.

Threats

The Spotted Turtle is vulnerable to habitat alteration by humans, nest predation by raccoons, and



Photo of Spotted Turtle
Photo: John Mitchell /© ROM



Photo © Wendy Lynn Parlier, Jonathan Nguyen, Ken Robison, Matt Petrella, 2006

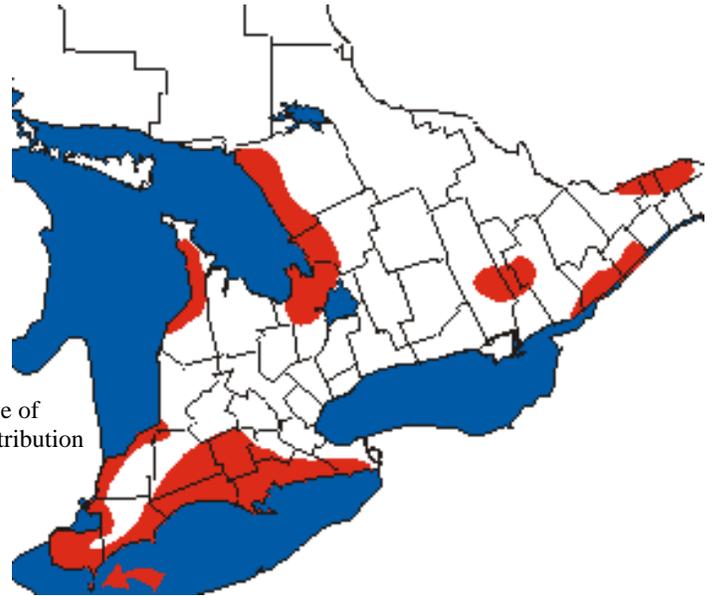


P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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Approximate range of
Spotted Turtle distribution
in Ontario.

pollution. As it produces small clutches of eggs which have low hatching success, the ability of Spotted Turtle populations to recover from declines is limited, and very slow. They are subject to illegal collection for the pet trade, and are especially susceptible when they congregate in spring and fall. The invasive non-native plant Common Reed (*Phragmites australis*) is destroying Spotted Turtle habitat and is a major threat.

You Can Help Protect this Species:

- The Spotted Turtle is listed as endangered under the provincial *Endangered Species Act, 2007*. The Act prohibits the harming, collecting, possessing, trading or killing of this species. Report sightings or poaching to the Ontario Ministry of Natural Resources. Call 1-877-TIPS-MNR (847-7667) toll-free any time or contact your local ministry office during regular business hours. You can also call Crime Stoppers anonymously at 1-800-222-TIPS (8477).
- Leave turtles and their habitat alone. Inform others about the plight of the Spotted Turtle.
- Please remember that they are a legally protected species.
- Ride ATV's only in areas designated for ATV use. ATVs can run over turtles and crush nests.
- Learn more about the Spotted Turtle and other Species at Risk. Understand how the destruction of habitat leads to loss of species at risk and Canada's plant and animal diversity. Tell others about what you have learned.

Resources

COSEWIC Status Report for the Spotted Turtle, 2004.

Royal Ontario Museum, www.rom.on.ca



Assistance for this project was provided by
the Ministry of Natural Resources



Tuberous Indian Plantain

A Species of Special Concern

The Tuberous Indian-plantain (*Arnoglossum plantagineum*), is a perennial plant 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 perennial plants reproduce only by seed. Flowers are pollinated by insects.

Tuberous Indian-plantain prefers



open sunny areas in wet, calcareous meadows or shoreline fens along Lake Huron. It occurs in Canada only in southwestern Ontario (see range map).

This species flowers in June to early July and fruits mature during August. The plant stands about one metre tall.

Threats

The main populations along the Bruce Peninsula shoreline are at risk from residential development, lawn creation and mowing, drainage and destruction from motorized vehicle use.

These populations need careful management to persist, and could suffer if conditions within their habitats deteriorate.

Photo of Indian Plantain
(Donald Kirk photo)



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

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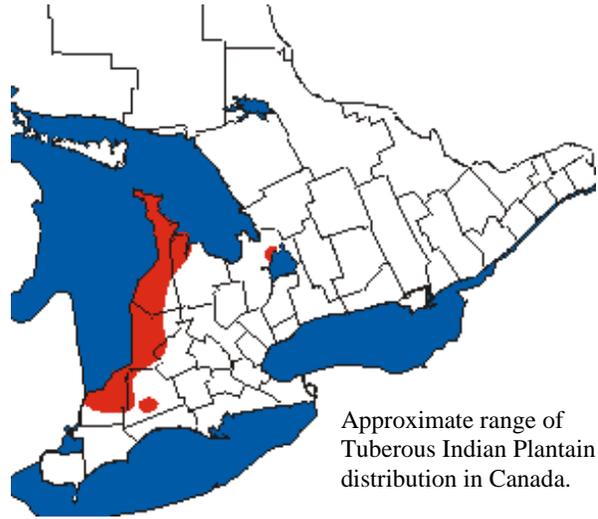
Royal Ontario Museum, www.rom.on.ca, 2009.

Tuberous Indian Plantain in flower at Oliphant

(Grant Simmie photo) →



Assistance for this project was provided by the Ministry of Natural Resources



Approximate range of Tuberous Indian Plantain distribution in Canada.

You Can Help Protect this Species

- Learn more about Indian Plantain and other Species at Risk. Understand how the destruction of habitat leads to loss of these Species at Risk and Canada's plant and animal diversity. Tell others about what you have learned.
- Grow native plants in your lawn and garden but obtain the plants from local nurseries, do not dig up native plants from natural areas.
- Keep vehicles away from these plants and their habitat. When accessing the beach, stick to designated pedestrian pathways to help minimize disturbance.



Appendix B

Common Reed (*Phragmites australis*) Factsheet

Invasive Common Reed Threatens Lake Huron's Coastal Environments

Common Reed — or *Phragmites australis* (frag-MY-teez) — is an alien, invasive plant with origins in Europe and Asia. Common Reed has recently found its way to some of Lake Huron's beaches and has raised much concern over its potential effects on the beach environment.

The invasive Common Reed creates tall, dense stands of grass which degrade coastal areas and wetlands by crowding out native plants and animals, blocking shoreline views, reducing access for swimming, fishing and hunting and, in addition, can create fire hazards from dry plant material. Common Reed typically grows on coastal beaches, interior wetlands, roadside ditches and other low, wet areas, although occasionally it has been found to grow in dry areas.

Common Reed typically colonizes a new area from seeds or small fragments of rhizomes (underground stems), dispersed by water, animals, machinery and humans. Once established, new stems grow from the underground rhizomes and the plant begins to spread. During the growing season, rhizomes spread horizontally in all directions and, when fragmented, readily grow into new plants.

Seeds — as well as rhizomes broken by natural actions such as waves, or human actions such as dredging, tilling or operating motorized vehicles along beaches — quickly spread and take root in new locations. Rapid expansion is also promoted by other disturbances that give this invasive plant a competitive edge, including soil disturbance and the clearing of vegetation.

— See other side



***Phragmites australis**

Invasive Common Reed*



P.O. Box 178, Blyth, Ontario N0M 1H0
www.lakehuron.on.ca 519-523-4478
coastalcentre@lakehuron.on.ca

Threats to the Lakeshore

Stands of Common Reed on beaches act as a physical barrier, preventing the movement and exchange of sand between the beach and the dune. Some dune plants depend on sand burial as part of their ecology.

- The organic layer produced from the decay of Common Reed could change the physical structure of the sand, creating a barrier to the flow of shallow groundwater. If the local groundwater has become affected by pollution from nearby septic systems or other sources, this could increase people's exposure to pathogens in wet sand.
- Common Reed is aggressive and can displace native beach plant populations — many of which are rare species.
- It may be confused with other beneficial vegetation. Learn to distinguish Common Reed from the critically important native coastal plants before undertaking any control program.



Controlling Common Reed

- Cutting the full-grown plant is season-sensitive: it should be cut by mid-August to interrupt its flow of food reserves between the roots and the flower.
- Care must be taken to remove cut shoots to prevent their sprouting and forming new growth. To ensure that seeds are destroyed, stalks and seed heads must be either bagged and removed from the site, or burned.
- Do not disturb the rhizomes. Breaking them up may result in an increased population and encourage its spreading.

Control is best accomplished using a well-planned approach. • Check with your municipality to see if they have a Common Reed control program in place. • Herbicide use is regarded as an option of last resort. **Note that herbicide use near open water is banned and, elsewhere, is strictly controlled.** *The Pesticides Act* allows for a municipality to seek an exception for certain natural resource management projects. In order for this exception to apply, the municipality must obtain a *written letter of opinion* from a director of the Ministry of Natural Resources (MNR). To apply for this *written letter of opinion*, the municipality must contact its local MNR district office to initiate the application process. • In response to an application, the MNR may issue a written opinion stating that the project is needed for natural resources management and that the use of a pesticide may be necessary. • The local Conservation Authority office may also be involved with a municipal program.

Funding support from the Alien Invasive Species Partnership Program 

Appendix C

Land Ownership Map



Oliphant Area Land Ownership

- ▭ Township of South Bruce Peninsula lands
- ▭ Crown Land
- ▭ Grey Sauble Conservation Authority lands
- ▭ Parcel fabric



NOTES
 Aerial data obtained from Bruce
 County GIS, 2008
 Orthorectification from Survey
 Orthorectification Project, 2006
 Projection UTM zone 17 NAD 83 datum
 © Queens Printer for Ontario, 2008



Appendix D

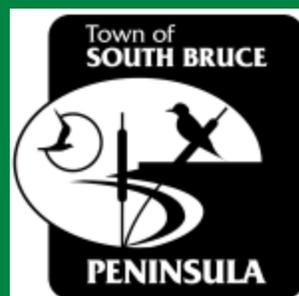
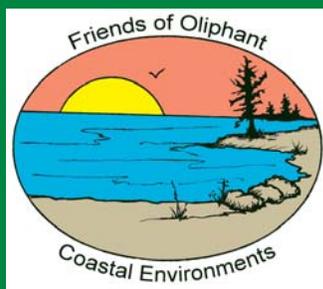
Signs—sample designs

OLIPHANT

Sensitive Coastal Area

This shore is habitat to many rare and *at risk* plants and animals.

Due to the ecological importance of this area, vehicles are not permitted beyond this point.



PROTECTING OLIPHANT

Oliphant's coastline is a unique environment along Lake Huron because of its physical and biological character. Unlike Red Bay to the north and Sauble Beach to the south, Oliphant is a coastal meadow marsh that includes sand dune ridges in some locations. Both the marsh and dune systems are exceptionally rare ecosystems on the Great Lakes.

The flat shoreline is extremely sensitive to changes in water levels. A few centimetres change in lake level could change the position of the water's edge by several hundreds of metres. During low lake levels, the newly exposed beach erupts in vegetation growth. When levels are high, flooding causes the vegetation to die off or change species composition.

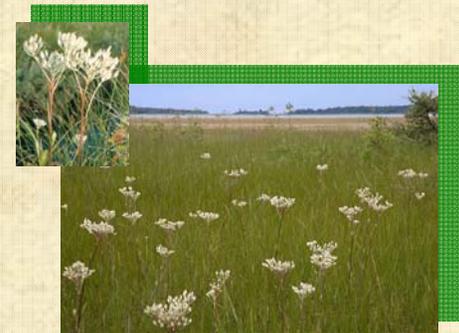
There are many rare plant and animal species that have adapted to this special environment. It provides habitat to a number of Species at Risk, including the endangered Piping Plover, the threatened Dwarf Lake Iris and Eastern Massasauga Rattlesnake, and species of special concern, like the Indian Plantain and Monarch butterfly.

Threats to the ecology of the shoreline at Oliphant include all motorized vehicles driving on the shore which kills plants and alters habitats. Invasive species are an emerging threat where native plants and animals are displaced and their habitat overtaken.

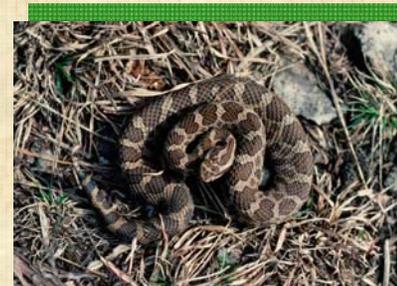
- *Stay on designated trails and beach pathways.*
- *Don't drive vehicles off the municipal roadways.*
- *Tread lightly, don't pick flowers, or damage the vegetation.*



Piping Plover



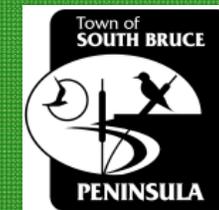
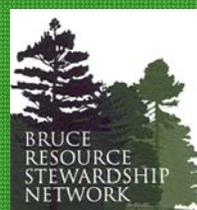
Indian Plantain



*Eastern Massasauga
Rattlesnake*



Dwarf Lake Iris



Appendix E

“Protecting Oliphant’s Coast” Information bulletin

PROTECTING OLIPHANT'S COAST

Fall 2009

Coastal Stewardship

In this Issue:

<i>Beach Processes</i>	2
<i>Plants and animals at Risk</i>	2
<i>Threats to Oliphant's coast</i>	3
<i>Community Stewardship</i>	4
<i>What you can do</i>	4

Fen Facts

- Great Lakes coastal fens are a globally imperiled ecosystem.
- Coastal fens are wetlands that help to purify water by filtering pollutants.
- Oliphant's coastal fens are vulnerable to human impacts.
- Oliphant's fen beaches are habitat for several Species at Risk.

Oliphant's coastline is a unique environment that is significant because of its physical and biological character.

Oliphant's beaches (the area west of the Shore Road) is a gently sloping beach that is composed of a wetland type known as a coastal fen, as well as dune ridges supporting dune grassland species.

Coastal fens are rare both from a global and provincial perspective. Recent studies of rare vegetation communities by The Nature Conservancy, in the Great Lakes basin, have identified them as **globally imperiled** communities (G2). In Ontario, coastal fen types are ranked as **extremely rare** (S1). This rank is based upon considerations such as the estimated number of occurrences, the total area of the occurrences, and the range of the community within the province, along with considerations such as protected sites and threats. (Natural Heritage Information Centre, 1995; Ontario Great Lakes Coastal Wetland Atlas, 2003).

These wetlands have important ecological, economic and social functions and values. They are an important part of the biodiversity of coastal Lake Huron. About eighty

percent of fish species are found in nearshore areas for some part of the year and depend directly on coastal wetlands for some part of their life cycle (eg. feeding, shelter, spawning, nursery, and dispersal of young).

Lake Huron coastal fens also provide nesting and staging areas for migratory and nesting birdlife, including wading and shorebirds.

In addition, Lake Huron wetlands also provide important habitat for amphibians and reptiles. The amphibians use them for breeding, nursery and feeding. Reptiles nest on uplands, but many species spend the remainder of their life cycle in these wetlands.

Coastal fens also provide crucial societal values including, improvement to water quality, flood reduction and shoreline protection, recreational use, landscape diversity and carbon storage.

If we manage our activities wisely, we can ensure that the ecology of the beaches at Oliphant remain intact for future generations, and the special habitat they provide for rare and at-risk species can continue to be sustained.



*Aerial of the Oliphant coast—2006
(source Bruce County)*

Beach Processes

The changing physical processes responsible for the ecological character of Oliphant's coast needs to be recognized in stewardship planning efforts.

Coastal fens are dynamic environments. Since they can experience fluctuating lake levels on Lake Huron of as much as 1-2 metres, their size and extent can change, increasing in extent during low water years, and shrinking during periods of high water.

Additionally, high water years kill woody plants which become established in low water years. This 'flooding' during high lake

levels is a primary factor in maintaining the open, meadow-like conditions.

In addition to fluctuating water levels, coastal fens are also subjected to wave energy. This washes away organic accumulations, and deposits new layers of sand. Although impacted by this deposition, these coastal fens contain extremely dense seed-banks. These seedbanks allow the vegetation to

replace itself during low water periods.

Lakeward flowing ground-water is another part of the beach hydrology that can be altered by human activity, affecting local ecology.

The changing physical processes responsible for the ecological character of Oliphant's coast needs to be recognized in stewardship planning efforts.

Plants and Animals at Risk



Tuberous Indian-plantain
(*Arnoglossum plantagineum*)
Status: Special Concern
Provincially and Nationally

Oliphant's coastal fen has an enormous diversity of plants and animals. The physical characteristics of this environment provides the ideal habitat for some of Ontario's rarest species, some of which have been designated as Species at Risk.

A "species at risk" is any naturally-occurring plant or animal in danger of extinction or of disappearing from the province.

Several Species at Risk occur on the beaches at Oliphant, including plants like Dwarf Lake Iris, Tuberous Indian Plantain, and animals like the Piping Plover, Eastern Massasauga Rattler and Monarch Butterfly.

The main threat to these species is human disturbance, including trampling, destruction from motorized vehicles, and habitat alteration from development and building structures in beach areas.



Dwarf Lake Iris
(*Iris lacustris*)
Status: Threatened
Provincially and Nationally

Piping Plover
(*Charadrius melodus*)
Status: Endangered
Provincially and Nationally



Threats to Oliphant's Coast

Since coastal fens occur in prime areas along shorelines, they are under intense pressure, primarily from cottage development and related recreational uses. However, municipal road and drainage improvements can also impact these sensitive areas.

Much of this vegetation has already been lost in Ontario to these human factors. (Natural Heritage Information Centre, 1995). At Oliphant, the wide flat expanses of the coastal fen

appears to have been mistaken as grassy fields that people would drive across to reach the shoreline. As a result, serious impacts to the fen and dunes has occurred. Much of this has happened as the result of a lack of awareness of how significant this ecosystem is, and how sensitive it is to human disturbances.

But human disturbance has occurred before...what's changed? The use of Lake Huron's coast has intensified in recent years, includ-

ing at Oliphant. More users coming for recreation and tourism purposes. Most are unaware of the vulnerabilities of Oliphant's coast. A changing, warmer climate, expected for our area, will increase the beach season, imposing greater demands on the coastal environment in the future.

In addition, invasive plants, like *Phragmites australis* (Common Reed) have appeared in and around

Oliphant's coast. Vehicle use in natural areas, with *Phragmites* seeds and root fragments getting caught in treads and transported to other areas, is one of the ways this plant is spreading.

You can help by protecting coastal vegetation by limiting access to designated beach access routes designed to minimize disturbance. Remember that this shore provides natural shore protection and is habitat for unique flora and fauna.



Access to the shore by driving across the fen can result in long term damage, destroy Species at Risk, and contribute to the spread of invasive species.



The invasive plant *Phragmites australis* grows in thick monocultures, overtaking native species. Its rapid grow rate can become hard to control once it becomes established.

Uncontrolled use of vehicles at Oliphant's beaches have been responsible for much of the degradation of the coastal fen and dunes.

Disturbance to native plants and soil provides an opportunity for invasive species like *Phragmites australis* to take over.



Tire ruts can fragment the fen ecosystem displacing plant species and changing local hydrology.



All-terrain vehicles can be very destructive to the coastal fen, and to Species at Risk. These vehicles are also responsible for the spread of *Phragmites*.



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929

Email: coastalcentre@lakehuron.on.ca

www.lakehuron.ca

Community Stewardship

Friends of Oliphant Coastal Environments (FOOCE) seek to preserve the unique fen, alvars and dune grassland ecosystems of the Oliphant mainland community and adjacent Fishing Islands. FOOCE volunteers have been dedicating their talents, time and energy to ensure that the coastal environments of the Oliphant community are preserved so they will be here for future generations to appreciate and enjoy.

FOOCE requested the services of the Coastal Centre to assist in the development of a Stewardship Plan for the Oliphant coast. The Centre employs a science-based approach to conservation planning that takes an ecosystem perspective.

Development of a stewardship plan will:

- Conduct an ecosystem survey of the Oliphant coast;
- Seek community involvement;
- Develop recommendations for future stewardship efforts at Oliphant.

Updates on this plan will be posted on the FOOCE and Coastal Centre websites (see below).

What Can You Do?

People who enjoy Oliphant's coast play an important role in beach conservation:

- Make sure you use the established pathways so that your impact is kept to a minimum.
- Take special care not to damage any beach vegetation.
- Learn to recognize species at risk. Don't disturb the plants, and don't pick their flowers.
- Recreational activity should be focused on the open, un-vegetated sandy parts of the beach, away from the beach vegetation.
- Keep your waterfront in a natural state. Nature has created a balanced equilibrium. Do not remove beach vegetation or alter the beach.
- Avoid driving vehicles onto the coastal fen or dunes. Vehicles can destroy vegetation and the habitat of numerous plants and animals that call the Oliphant beach their home.
- You are in a dynamic coastal system where natural shoreline change is normal. Interfering with this beach ecosystem can have damaging consequences.
- Make sure any garbage you create you take home with you. Animals can ingest, or become entangled in, plastics and other materials.

For more information on Oliphant Stewardship, visit:

Friends of Oliphant Coastal Environments
website—www.fooce.org

Or

Lake Huron Centre for Coastal Conservation
website—www.lakehuron.ca

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Assistance for this project was provided by the Ministry of Natural Resources



Appendix F

“Damaging Wheels” Information bulletin

Protecting Our Beaches

Beach Conservation

Damaging Wheels

Driving vehicles on beaches is a subject that has become controversial in recent years. Cottagers who have spent many years enjoying our lake will often have stories, or even photographs, of driving up and down the beach back in the 1940s and 50s.

Today, cars are not acceptable, but all-terrain vehicles and snow mobiles sometimes find their way to our beaches. Some local contractors also find the beach a convenient way access job sites with their heavy equipment. At some locations, municipalities have chosen to use beach cleaners to manage a certain aesthetic.

Is there really a problem with driving a vehicle on a beach?

The use of vehicles in beach areas is a practice that is being challenged throughout the world as a better understanding develops of beach ecology and the environmental consequences of allowing vehicles on beaches.

At first glance, a beach may look barren and lifeless. However, a closer look reveals there is life both within and on our beaches. "Strand lines", which are the lines of debris that collect where the waves wash up on the beach, often contain considerable amounts of organic matter, which the bodies of decaying insects, bacteria and fungi break down, releasing nutrients into the sand which are used by plants in the nutrient poor dunes.



Motorized vehicles can cause compaction of the sand, damage native beach plants and disturb the nesting, feeding and resting functions of shorebirds, like the sandpiper, dunlin and piping plover.

Dune plants are key to the health and stability of beaches. They gather sand, shelter birds, and withstand wind and waves. But they are very sensitive to a vehicle driving over them. All motor vehicles can kill native beach plants with a single pass, and even the wide flotation tires of quad bikes crush and destroy plants.

Impacts to Beaches

Research has identified that vehicle traffic on beaches compacts beach sand at depth, but loosens the surface of the beach, making it more susceptible to wind and wave activity. The effects of vehicle passage extends to a depth of approximately 20 cm. The sheer stresses of turning wheels loosens the sand and breaks plant roots as well as crushes seedlings of annuals and young plants of perennials like American Beachgrass.

Vehicles compact the sand, squashing small

creatures that live on or under the sand and compressing their habitat. These animals are important food for shorebirds. Vehicles can also frighten away shorebirds and other species sheltering in the dunes, and crush their nests and eggs.

Driving vehicles in beach areas has important ecological implications. It is a practice that has long lasting effects on dunes and other coastal ecosystems, and this has contributed to the need for extensive conservation efforts by local communities to turn things around. The benefits of protecting our lakeshore extend well beyond environmental. Our beaches are important to our local coastal communities, both economically and socially. Beach stewardship is about restoring the balance between how people use beaches and what our natural ecosystems need to provide the benefits they provide us.



 Vehicle access across a dune can have extensive impacts on the dune. The bare tracks provide an opening for wind erosion.

SUVs and boat trailers, ATVs, and snow mobiles are all vehicles that can damage or destroy dune systems. Dunes are simply too sensitive to withstand the effects of vehicles.



Threats to a Rare Ecosystem

On beaches, nesting shorebirds, such as the endangered piping plover are particularly at risk from vehicles. Piping plovers feed along beaches and sand flats. They feed primarily on exposed beach substrates by pecking for invertebrates one centimeter (0.4 in) or less below the surface. Primary prey for piping plovers includes worms, crustaceans, insects, and occasionally bivalve molluscs.

Their nests accidentally get crushed by passing vehicles. The presence of motorized vehicles may also cause the birds to desert the nest, exposing eggs or chicks to the hot sun and predators. Interruption of feeding may stress juvenile birds during critical periods in their life cycle.

Lake Huron's beaches are narrow ribbons of unique plant and animal life that have evolved over thousands of years. This great diversity of life is becoming more imperiled because of increases in human activities that go beyond the ability of the ecosystem to repair itself. Plants, like the endangered Pitcher's Thistle, and other at-risk species like Indian Plantain, Dwarf Lake Iris and Hill's Thistle are examples of species whose habitat is being affected by people. It is important that we regain the delicate balance between people's use of our beaches, and the needs of our beach environments.



Fledgling Plovers feeding on the beach at Sauble Beach.



Vehicles can damage feeding grounds for shorebirds, like the endangered Piping Plover, and tire ruts can impair juvenile birds mobility to feed and escape danger.



Indian Plantain
(flowers in summer)



Pitcher's Thistle (endangered)
(flowers once in its 10 year life cycle)



Dwarf Lake Iris
(flowers in spring)



P.O. Box 178
Blyth, Ontario, Canada
N0M 1H0

Phone: (519) 523-4478
Fax: (519) 523-4929
Email: coastalcentre@lakehuron.on.ca

***Providing Leadership in
Coastal Conservation***

www.lakehuron.on.ca

Spread of Invasive Plants

The invasive Common Reed (*Phragmites australis*) originates in Europe and is a very aggressive, robust, densely growing member of the grass family. Weeds, like the invasive Common Reed can be spread as vehicles pick up seeds and root fragments in their tires and chassis and carry the unwanted plant to other parts of the coastline. The spread of these invasive plants have become a costly problem for many municipalities to control.

The height and density of Common Reed allow it to form single-species stands that outcompete most non-woody native plants. The buildup of litter from previous years of growth prevents other species from germinating or establishing. It is capable of occupying and degrading vast areas of important lake habitats, like dunes, marshlands and fens. Common reed vegetation communities have low plant diversity and offer poor quality habitats for wildlife. Common Reed on beaches threaten the habitat of endangered species like the Piping Plover and Pitcher's Thistle, as well as many other rare coastal species.



Common Reed is an invasive plant that can overtake beach ecosystems. This has been declared one of Canada's most invasive non-native plants.

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the Invasive Alien Species Partnership Program.

Appendix G

Agency Factsheets

Permits Required for Shore Land Work

April 29, 2010

Shoreline areas are important habitats for fish, birds and other wildlife. Most work done along waterfront properties requires a permit from the Ministry of Natural Resources, the Department of Fisheries and Oceans Canada or a local conservation authority. Unauthorized work can lead to charges and fines under various acts and regulations.

The Ministry of Natural Resources reminds landowners that work permits are required before working in the water or along your shoreline. Among other activities, work permits are required to:

- create a beach and construct shoreline protection works, including break walls, groynes and retaining walls;
- create a boat slip, boating channel or swimming area;
- install a water line, heat loop or cable for commercial use such as for a marina, resort or large-scale development;
- remove rocks and boulders from shore lands or the bottom of a lake or stream;
- construct a dock or boathouse where the total surface area of the supporting structure placed on the bed of the water body, such as pipes and cribs, exceeds 15 square metres; and
- remove aquatic vegetation.

If in doubt about whether a work permit is required applicants are encouraged to contact their [local Ministry of Natural Resources office](#) or visit ontario.ca/shorelineworkpermit. Ministry of Natural Resources district staff can also assist you in considering more environmentally friendly shoreline protection techniques.

Fish Habitat

& FLUCTUATING WATER LEVELS ON THE GREAT LAKES

FACT SHEET

T-2

Shoreline areas provide habitat for a variety of aquatic organisms including fish. The nearshore area is where many fish species lay their eggs, feed and seek protection from predators. Changes or disruptions to these areas can threaten their survival. If you own or lease waterfront property, you can help protect the fish populations in your lake or river by protecting fish habitat along your shoreline.

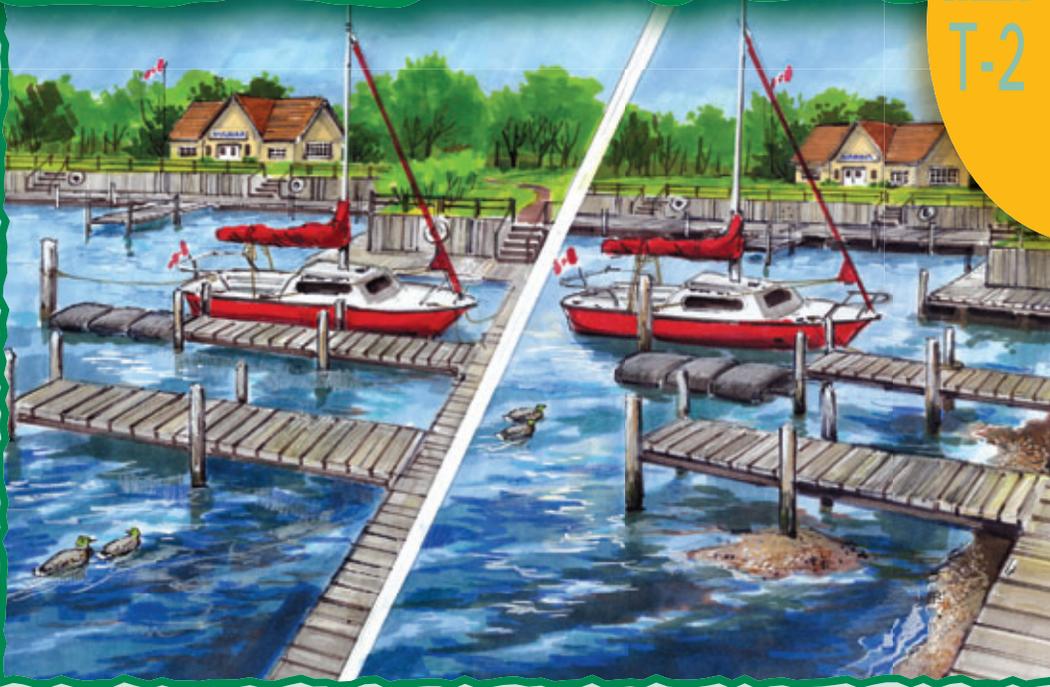
This fact sheet provides information about fluctuating water levels in the Great Lakes, how they affect fish habitat and what you should know before starting any project in or near the water.

Water level fluctuations

The Great Lakes shoreline varies from low gradient slopes where you can find wetlands or beaches to steep high gradient slopes in the form of rock cliffs or sand bluffs. Water level fluctuations are a natural occurrence and contribute to the processes such as erosion and deposition of silt and sediment that create and maintain the different shoreline types. Fluctuations in water levels have occurred in the Great Lakes since they were formed. They are the result of several natural factors and in recent time have also been influenced by human activities. The water levels of the Great Lakes depend on their storage capacity, outflow characteristics of the outlet channels, operating procedures of the regulatory structures, and the amount of water supply received by each lake. The primary natural factors affecting lake levels include precipitation on the lakes, run-off from the drainage basin, evaporation from the lake surface, inflow from upstream lakes, and outflow to downstream lakes. Human factors that also affect the water levels include diversions into or out of the drainage basin, consumption of water, dredging of outlet channels and the regulation of outflows. Outflows are regulated on Lake Superior and on Lake Ontario.

There are three types of water level fluctuations on the Great Lakes: long-term (multi-year), seasonal (one-year) and short-period (less than an hour to several days).

The long-term fluctuation in Great Lakes water levels result from persistent low or high water supplies. The seasonal fluctuation in Great Lakes levels reflect the annual hydrologic cycle which is characterized by high water



supplies to the lakes during the spring and early summer and lower supplies during the remainder of the year. Short-period fluctuations, lasting from less than an hour to several days, are caused by meteorological conditions. The effect of wind and differences in barometric pressure over the lake surface create temporary imbalances in the water level at various locations.

Additional information on each type of water level fluctuation as well as historical water level data for each lake can be found through the Fisheries and Oceans Canada - Canadian Hydrographic Service (DFO-CHS), Central and Arctic Region Web site for Tides, Currents and Water Levels at <http://biachss.bur.dfo.ca/danp/>.

Boundaries of fish habitat

Although water levels do fluctuate, the boundaries of fish habitat, as defined in the *Fisheries Act* within a body of water, do not change. Fisheries and Oceans Canada, Ontario - Great Lakes Area (DFO-OGLA) determines the boundary of fish habitat using historical long-term water levels, linking the habitat to the requirements of fish populations throughout their life cycles. This means that the extent of fish habitat is not determined by short-period water level fluctuations. For example, in low gradient shoreline areas (e.g. sand beaches and wetlands) small decreases in water level sustained over a long period of time may result in large distances

created between the current water level and the levels that are more indicative of an average year. In low-water years, beaches grow significantly larger and wetland areas flourish with vegetation. The nearshore areas once covered with water may be mistakenly considered "dry" land. As a result, waterfront property owners may propose to fill or excavate within these areas (e.g. shoreline protection works, additions to existing structures, berms, dredging). Although these areas appear to be dry and may have been for a year or more, historical data shows that water levels will rise again and nearshore areas will be re-submerged, providing important spawning, nursery and adult fish habitat. DFO-OGLA considers these areas to be fish habitat, and they therefore fall under the requirements of the *Fisheries Act*.

Be aware of the *Fisheries Act* and other legislation

The federal *Fisheries Act* provides for the protection of fish habitat. Under the *Fisheries Act*, no one may carry out any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat (HADD), unless this HADD has been authorized by the Minister of Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish. Violations to the *Fisheries Act* can result in substantial fines, and/or the risk of

imprisonment. If found guilty, then the violator may also be required to cover the costs of restoring the habitat at the site and/or be required to fulfill other court ordered remedies. Other legislation that may also be relevant is outlined in the introductory Fact Sheet: *Working Around Water? What you should know about Fish Habitat.*

Contacts and approvals

Keep in mind that approval from one government agency does not guarantee that you will be able to obtain approval from another agency. As well as the *Fisheries Act*, other agencies have legal requirements that may affect how to proceed with projects in and around water. The lead review agency for project proposals and their areas of responsibility, listed in the table on this page, will assist you in determining what other agencies need to be contacted for permits and approvals. Remember you should obtain all approvals before starting work.

Environmentally friendly practices

The following environmentally friendly practices are intended to prevent any potential harmful impacts to fish and fish habitat that may result from work in or near water:

Get advice before starting work

Seek advice from agency staff if you are unsure whether the nearshore area you plan to do work on is considered fish habitat. Even if the area appears to have been dry for more than a year, it may still be considered fish habitat under the *Fisheries Act*.

Do your homework

Before planning works in or near the water, be sure you are aware of the historical water levels for your lake so you are not surprised if water levels change significantly in the future.

Avoid dredging or blasting

Dredging or blasting to gain boat access should be your last consideration. It may be best to wait until water levels return to normal. Often, areas that were dredged during low-water conditions are quickly filled in with sediment through wind and wave energy.

Use alternatives to gain water access

Before planning projects that will have permanent and/or significant impacts to fish habitat in the nearshore area, consider alternatives such as extending a dock with temporary floating sections. When water levels return to normal, simply remove the temporary structures.

Avoid in-filling

In-filling occurs when materials or structures are placed on fish habitat, resulting in the permanent loss of fish habitat, i.e. a HADD.

Preserve wetlands

The majority of Great Lakes fish species (e.g. pike, muskellunge, bass) depend on coastal wetlands to complete their spawning, nursery, juvenile or adult stages of their life cycles. During long-term periods of low-water, wetlands flourish and increase in size, while during long-term periods of high-water, wetlands are eroded and reduced in size. The destruction of a wetland by humans is detrimental at any time. Fluctuating water levels can contribute to the long term health of coastal wetlands.

Do not remove rocks or woody material

Rocks, stumps, logs and woody material provide good fish habitat and prevent erosion. These materials should not be removed from areas under the average annual high-water mark. If any materials need to be temporarily removed, they should be stockpiled and replaced to where they came from, or to an adjacent area of similar water depth.

Working together to protect fish habitat

Help maintain the quality and quantity of fish habitat in our lakes and streams. For more advice on how to work in or around water in an environmentally friendly manner, contact local agency staff directly.

Contact information

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca/canwaters-eauxcan

Canadian Hydrographic Service
<http://biachss.bur.dfo.ca/danp/>

Canada

Cette publication est également disponible en français.

Contact information – Ontario

If the property where the work will be carried out is . . .

- in the Rideau Canal or Trent-Severn Waterway
- in a federally owned small craft harbour
- below the average annual high-water mark in a public (Crown) land or on a private water lot
- above the average annual high-water mark but within a regulatory flood plain
- above the average annual high-water mark and is on private property

Your first contact should be . . .

- Parks Canada Agency
- Fisheries and Oceans Canada (DFO) - Small Craft Harbours
- Your local Conservation Authority (CA). Where there is no designated CA, contact your local Ontario Ministry of Natural Resources office.
- Your local CA
- Approvals may be required from your local CA if the structure is within the flood plain or fill regulated area

Working together to protect and conserve Ontario's aquatic resources



Fisheries and Oceans Canada / Pêches et Océans Canada

www.dfo-mpo.gc.ca/canwaters-eauxcan



Parks Canada / Parcs Canada

www.pc.gc.ca



www.mnr.gov.on.ca



www.conservation-ontario.on.ca