

# **Community-Based Biodiversity Strategy for the Port Franks Area**

## **DRAFT**



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## **Preface**

The Port Franks area is an amazing place. It supports a rich diversity of plants and animals, some of which are rare, and some of which have been designated as at risk, provincially and federally. The uniqueness of the ecosystems within Port Franks has long been recognized, and consequently many agencies, organizations and individuals have worked to conserve and enhance the biodiversity in the Port Franks area. This includes the Nature Conservancy of Canada, Carolinian Canada, Lambton Wildlife Incorporated, Lambton County, Municipality of Lambton Shores, St. Clair Region Conservation Authority, Ausable Bayfield Conservation Authority, and many private landowners. Several management plans for various properties within the Port Franks area therefore, exist. Many of these reports have recommended that the property plans inform a more comprehensive strategy for the Port Franks area. It is therefore the goal of this project to develop, in consultation with other agencies, organizations, and the community of Port Franks, a biodiversity strategy for the Port Franks area.

## **What is biodiversity?**

Biodiversity is a term that refers to the variety of species and ecosystems within a particular area, as well as their associated ecological processes (Environment Canada 1995). Rainforests are a good example of an ecosystem rich in biodiversity as these ecosystems consist of many different species of plants and animals. Biodiversity is often measured at an ecosystem scale but can also be measured at the species and genetic scales.

## **Why is biodiversity important?**

Besides the intrinsic value of each species, biodiversity is important for several reasons. Species survival is tightly linked to biodiversity, as it is this variety that helps species survive threats (e.g., disease) and pressures (e.g., climate change).

As a society we are supported by biodiversity; society derives ecological, economical, cultural and spiritual benefits from the environment. Healthy ecosystems help sustain healthy people and the economy (Ontario Biodiversity Council 2008). Despite the importance of biodiversity we continue to see widespread degradation and destruction of habitat as a result of human impacts.

## **What is a biodiversity strategy?**

Biodiversity strategies are developed to conserve and manage the biodiversity of a particular region or area. The overall success of such plans can be closely linked to community involvement and project scale. It is beneficial to have the plan created cooperatively by both the community and local agencies, as a variety of stakeholders often own the land being considered and therefore make the management decisions.

Scale can also be crucial to the success of the plan. The US EPA (1997) has noted that watershed plans that are produced but that do not get implemented, are not implemented because they were done at too large a scale and the people that need to implement the plans are not involved in the planning process. Watershed plans are often completed for areas > 50 miles<sup>2</sup>, however, plans should be done for areas that are 2 to 15 miles<sup>2</sup>. Conservation goals for large geographic areas can be difficult to attain, while narrowing in on smaller areas allow for the goals to remain more focused. Furthermore, public and agency engagement is more easily facilitated as specific, relevant issues can be better addressed at a smaller scale.

One example of a similar type of plan is the Management Plan for the Old Ausable Channel Watershed (Killins 2008). This plan was developed by the Grand Bend community in conjunction with the Ausable Bayfield Conservation Authority (ABC) and the Pinery Provincial Park. A series of community meetings resulted in the development of a plan that summarized management issues and recommendations for the Old Ausable Channel (OAC) – a unique ecosystem that provides habitat for many species at risk. The success of the OAC plan demonstrates the importance of community involvement in protecting key habitats.

### **Why focus on the Port Franks area?**

The Port Franks area (Figure 1) is located at the northern edge of the Carolinian zone, and as a result supports a wide variety of flora and fauna, some of which are designated as species at risk (e.g., dwarf hackberry and Karner blue butterfly). The uniqueness of this area is evident by the many natural areas managed by environmental agencies or organizations (Figure 2). These include the Port Franks Forested Dunes and Wetland Complex Area of Natural and Scientific Interest (ANSI), the L Lake Management Area, the Ausable River Cut Conservation Area, the Karner Blue Sanctuary, the Watson Property, and the Lambton County Heritage Forest. As noted in Figure 2, much of the area is also privately owned. One important strategy to protect and enhance this area, and the species within it, is the ongoing coordination of the efforts of these local organizations and agencies with community interests and objectives.

### **Goals and Objectives of the Biodiversity Strategy for Port Franks**

The goal of a long-term biodiversity strategy for the Port Franks area is to provide informed and efficient recovery actions with community support that will help to enhance and protect the many species at risk and their habitat in this area.

The objectives of this biodiversity strategy for the Port Franks area are to:

- (1) Provide a comprehensive summary of the background information regarding species at risk and their habitat;

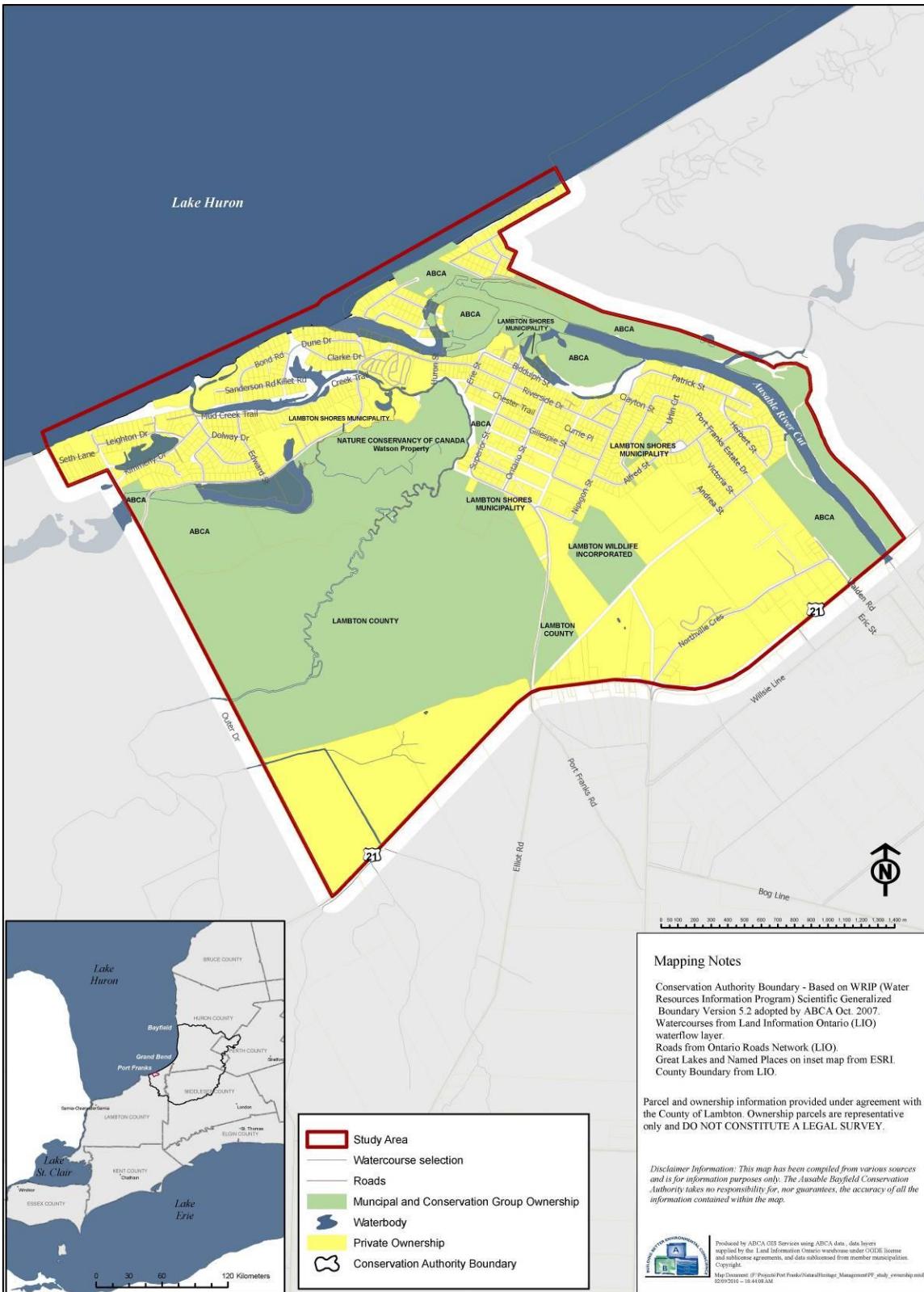
- (2) Document important community environmental and socio-economic issues for this area; and
- (3) Provide relevant management recommendations.

It is hoped that in addition to summarizing our current understanding of species at risk habitat, this biodiversity strategy for the Port Franks area will:

- (1) Provide a platform for developing a unified vision for management for the different agencies and local community;
- (2) Identify long-term actions for the ongoing protection and enhancement of biodiversity in the Port Franks area;
- (3) Identify education and recreation opportunities;
- (4) Provide guidance for land use activities; and
- (5) Promote protection and conservation of significant species and habitat.



**Figure 1: Location of the Port Franks Biodiversity Study Area.**



**Figure 2: Land Ownership in the Port Franks Biodiversity Study Area.**

## **Strategy Approach**

In August 2009, representatives from the environmental agencies and organizations, as well as the Municipality of Lambton Shores were invited to attend a technical committee meeting. Terms of reference for the project were discussed, and management recommendations that had been lacking from previous documents were identified.

A public meeting with 140 people was held in September 2009. The community was provided with some background information, and the goals and objectives of this project. They were also given the opportunity to participate in small group discussions which provided insight into the conservation interests and issues of the landowners. Community members were also sought to sit on an advisory committee to help guide the development of the biodiversity strategy.

The first advisory committee meeting was held in December 2009, during which members had more focused discussions on species at risk, their habitat and threats, and the leading community issues (*i.e.*, water quality, phragmites and native plants).

## **Strategy Format**

After this introductory section, this document has two main sections. The first section is an overview of the Port Franks area that provides a brief geographical description of the Port Franks area, such as location, topography, physiography, etc. The second section of the document summarizes existing natural heritage information and highlight several rare, or species at risk within those ecosystems (a more comprehensive list of species is included in Appendix 1), documents current local community environmental interests and issues, and suggests possible management approaches. These actions are also summarized in table format at the end of the document.

This second section is summarized into three ecosystem types: 1) Coastal Dunes; 2) Carolinian Forest; and 3) Aquatics. People may live in the Dunes or in the Forest ecosystem. Some people have elements of both ecosystems on their properties. Because there are so many aquatic systems in the area, people may also live adjacent to water. These overlapping ecosystem types are the reality in the dynamic area of Port Franks.

## **Study Area Description**

### ***Location***

The Port Franks area (1060 ha) is located along the eastern shore of Lake Huron (Figure 3). It is bounded on the east by the Ausable River Cut (including Armstrong East), on the west by Outer Drive, and on the south by Highway 21. This area includes the town of Port Franks, which has 800 permanent residents and 750 seasonal residents (NCC 2005). The Port Franks area lies within the Municipality of Lambton Shores, within Lambton County, and is under the

jurisdiction of the Ausable Bayfield Conservation Authority (ABCBA). An Area of Natural and Scientific Interest (ANSI), as well as an Environmentally Significant Area (ESA) encompass many of the natural areas that make up the Port Franks area. Settled areas exist along the lake and along the river.

### ***Topography***

The Port Franks area exhibits variable topography which includes low lying areas along the shoreline and a series of wetlands which exist within the interdunal areas. The highest elevations occur along the dunal ridges which run parallel with the lakeshore (Figure 3). This mixed topography creates varied habitats which results in species richness.

### ***Physiography***

Sand plains represent the major physiographic type in the Port Franks area. Small areas of till plains and peat/muck exist along the Highway 21 study area boundary (Figure 4).

### ***Soils***

Rapidly draining sand soils dominate the Port Franks area, while sandy loam exists in areas of the small lakes and wetlands. A small portion of clay is present on the south side of the study area along Highway 21, which has slower drainage capabilities (Figure 5).

### ***Land Use***

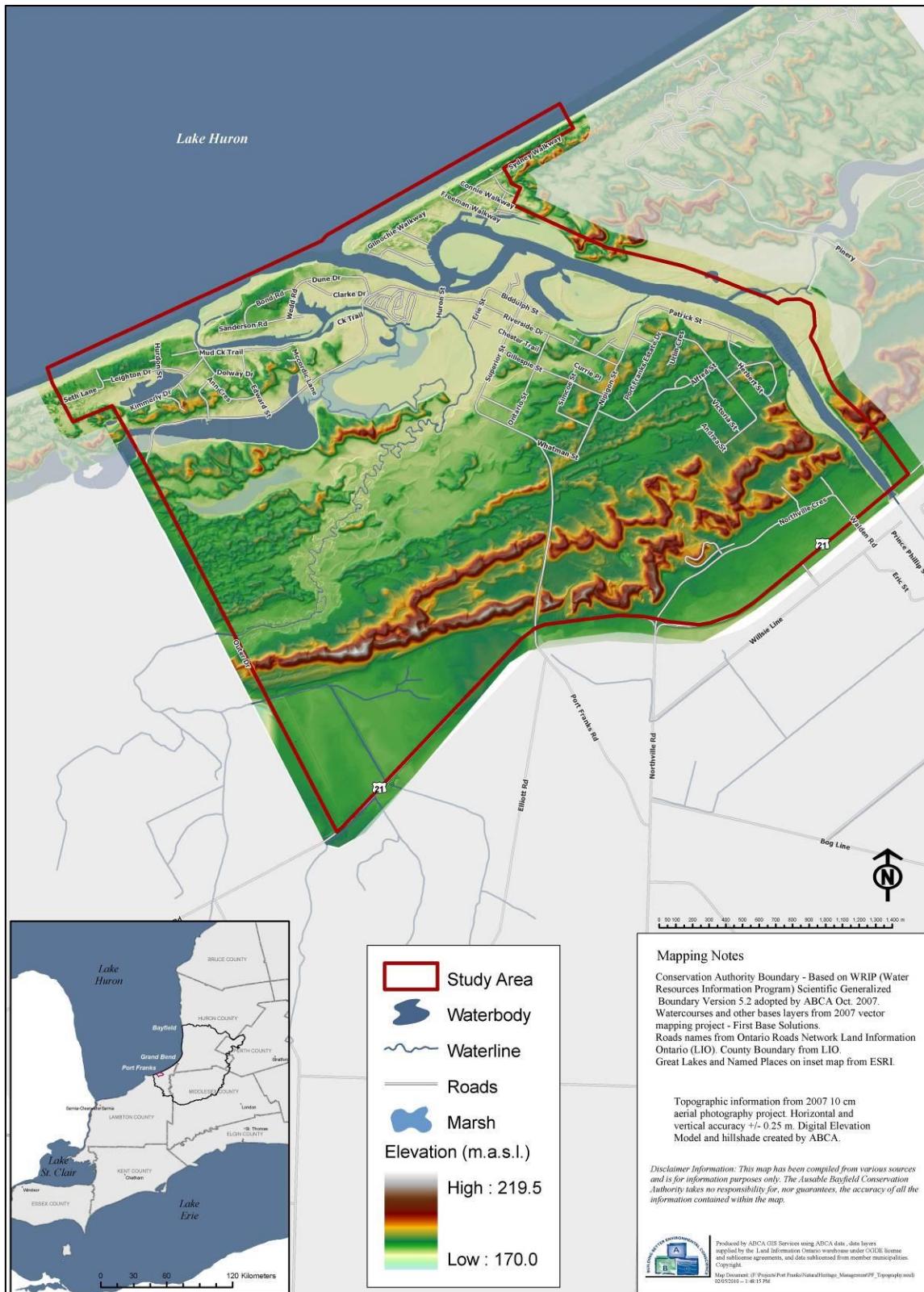
The predominant land use in the Port Franks area is natural environment, which comprises approximately 56% of the total area (Figure 6). This natural environment designation includes things such as open spaces, forests, and wetlands. Residential areas make up 25% of the land use which is concentrated along the lakeshore and south of the Ausable River Cut. Agriculture, which consists of portions of a few cash crop fields, makes up 8%, while commercial uses contribute 6% of the land use. Four per cent of the current land base is slated for future development, with parcels located just north of Highway 21 and south of the town of Port Franks. Portions of this land south of Port Franks are within the ANSI boundary. Industrial and institutional land uses comprise the remaining land use types.

### ***Natural Areas***

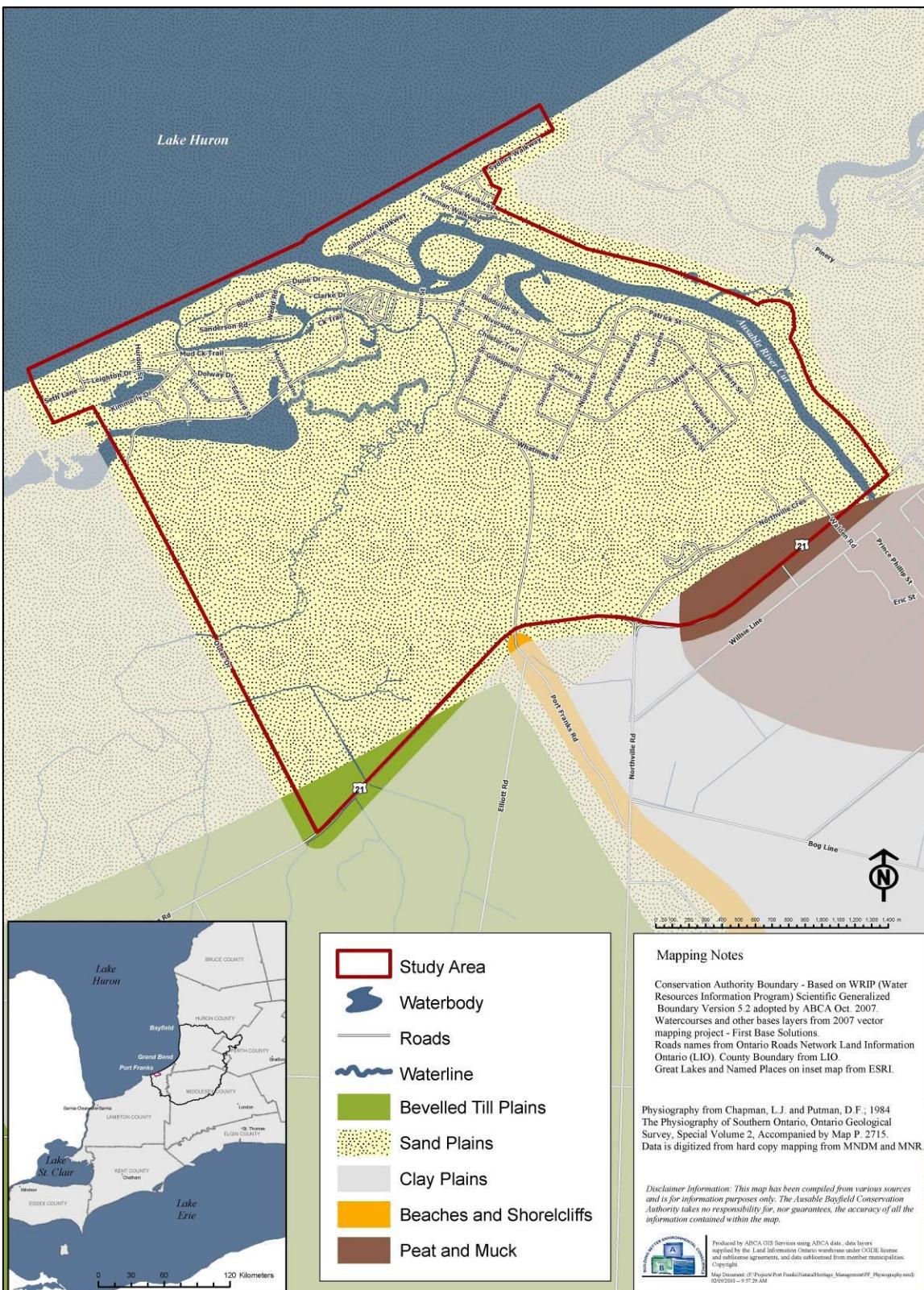
Several natural areas exist within the Port Franks area, some of which are classified as regulated wetlands, Environmentally Significant Areas (ESAs) or exist within the ANSI boundaries (Figure 7). These areas include:

- Lambton Heritage Forest (owned by Lambton County; managed by St. Clair Region Conservation Authority - SCRCA)
- Watson Property (owned by Nature Conservancy of Canada (NCC) and managed by Lambton Wildlife Incorporated - LWI)
- Karner Blue Sanctuary (owned and managed by LWI)
- L Lake Management Area (owned and managed by ABCA)

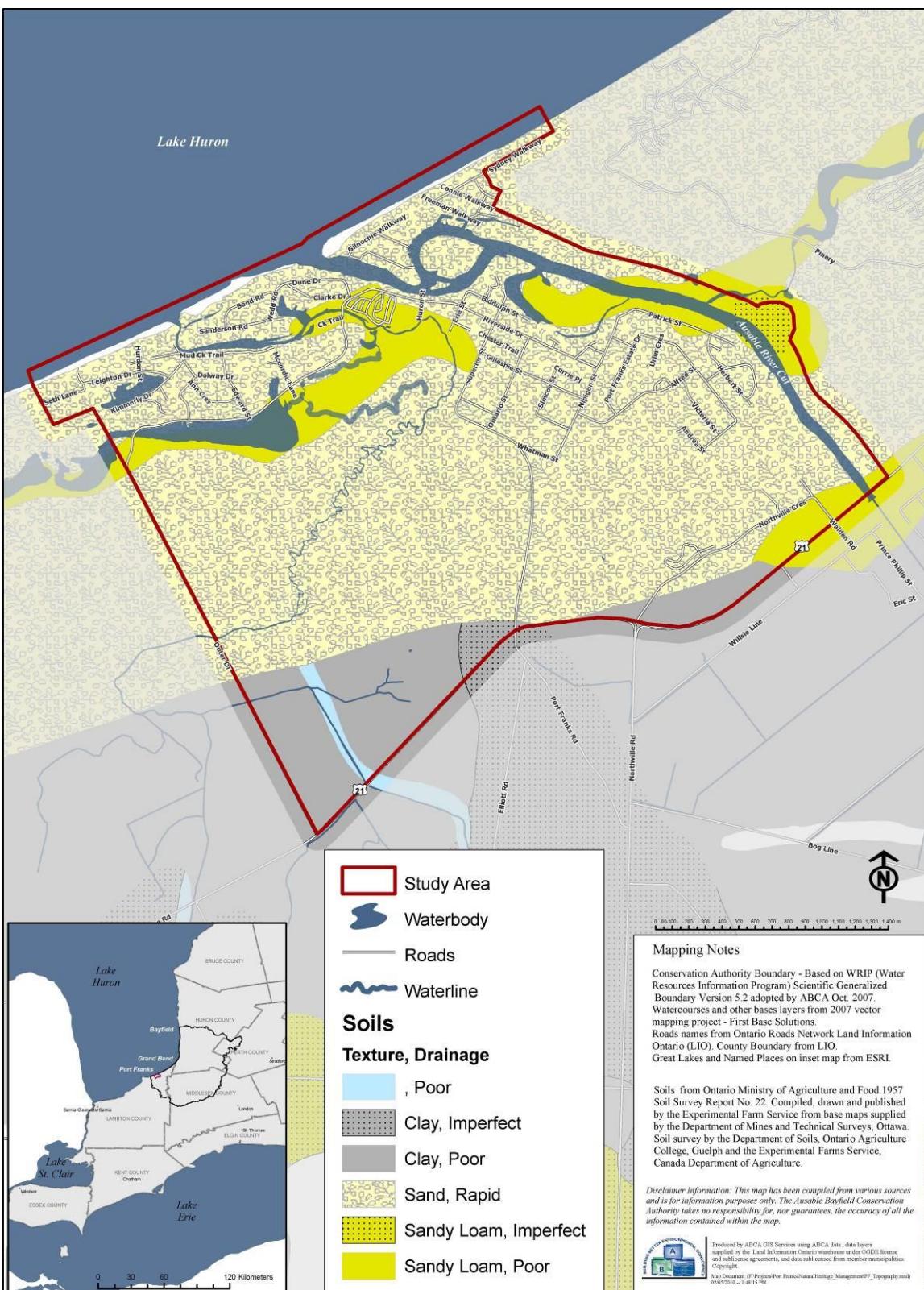
- Ausable Cut Conservation Area (owned and managed by ABCA)



**Figure 3: Topography of the Port Franks Biodiversity Study Area.**



**Figure 4: Physiography of the Port Franks Biodiversity Study Area.**



**Figure 5: Soils of the Port Franks Biodiversity Study Area.**

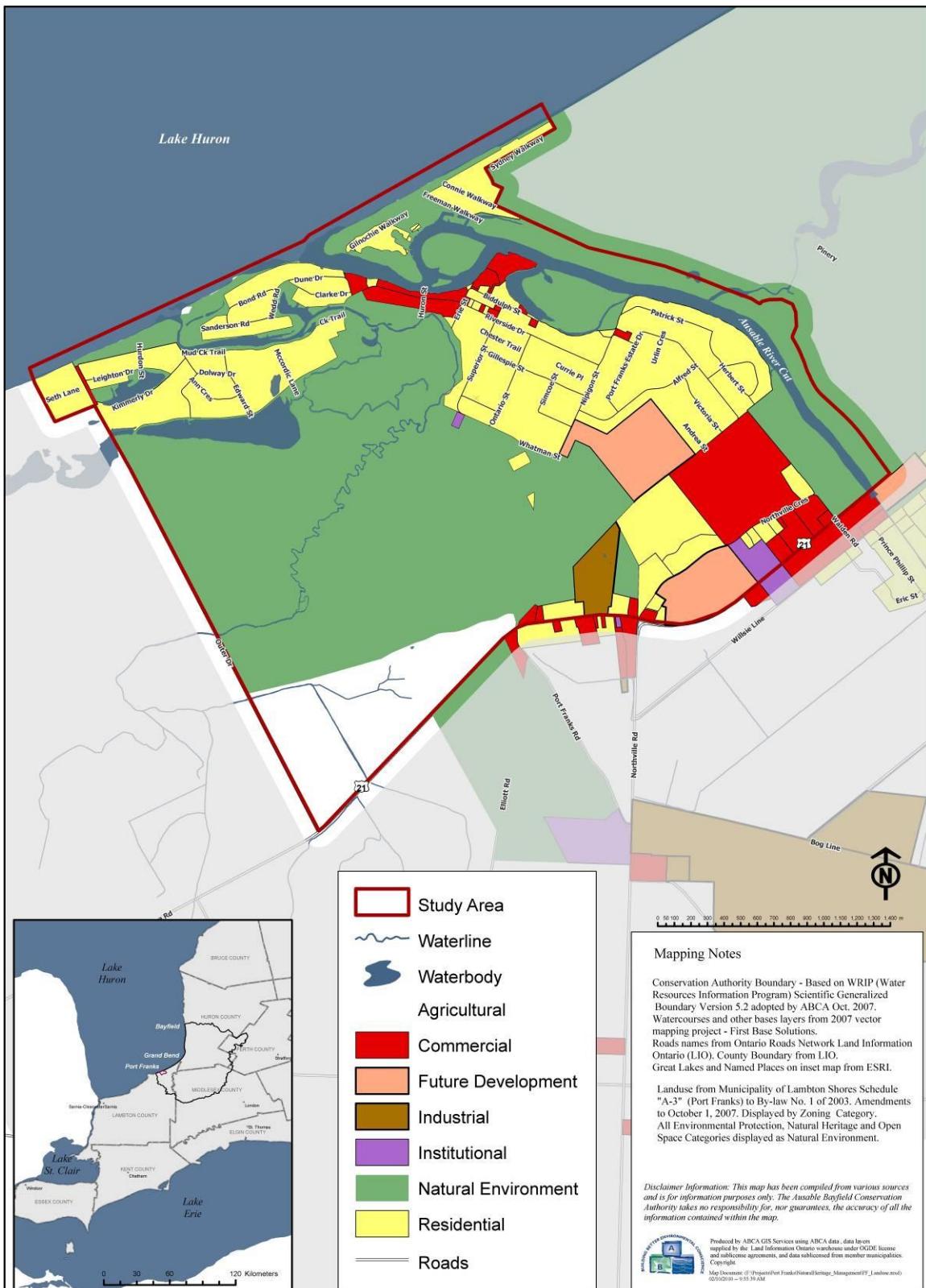
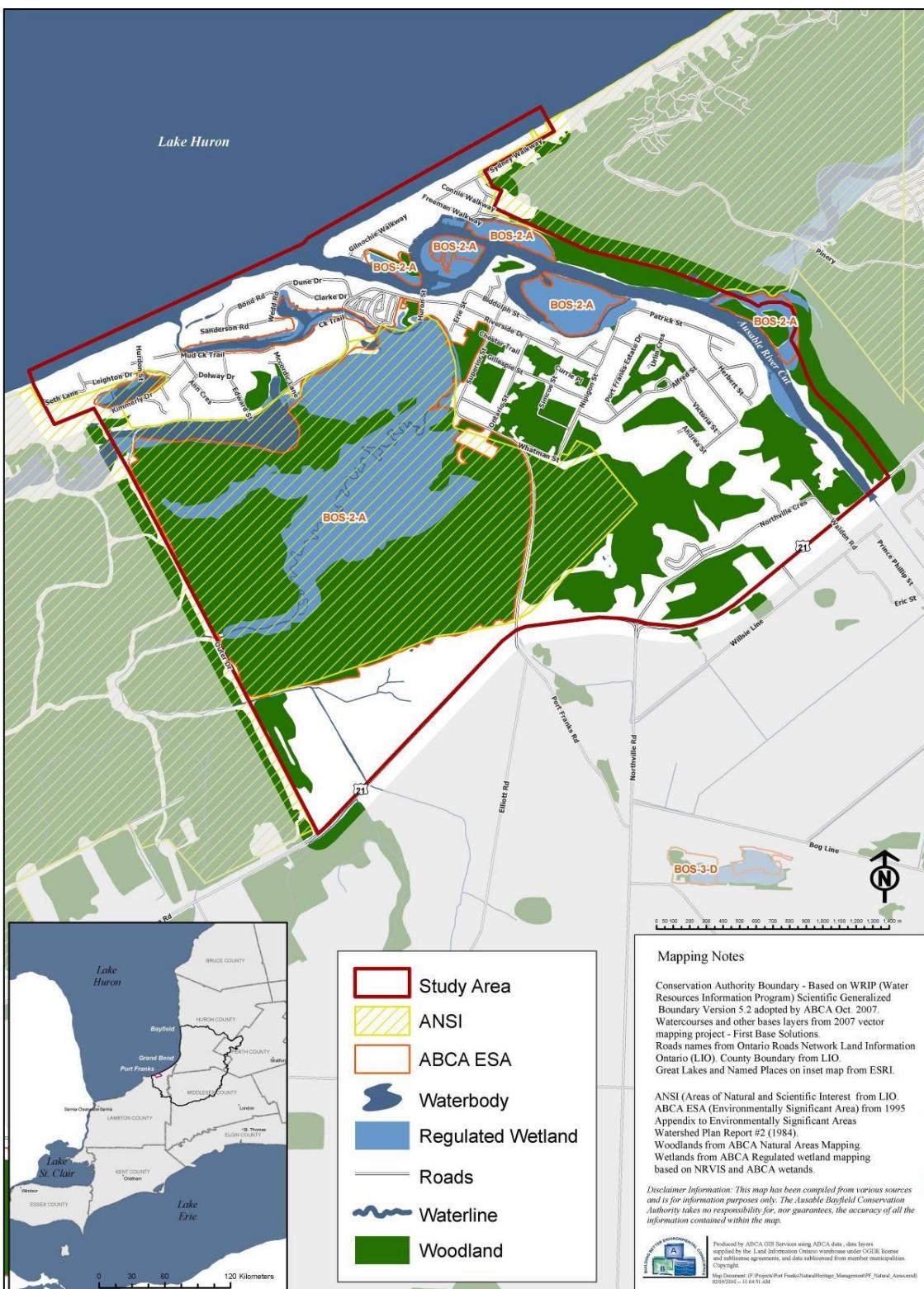


Figure 6: Land Use in the Port Franks Biodiversity Study Area.



**Figure 7: Natural Heritage Features in the Port Franks Biodiversity Study Area.**

## **Biodiversity of the Port Franks Area**

The Port Franks area is located at the northern edge of the Carolinian zone, and as a result supports a wide variety of flora and fauna, some of which are designated as species at risk (e.g., dwarf hackberry and Karner blue butterfly). The study area (Figure 1) is approximately 1060 ha and consists of coastal dunes, forested dunes, several wetlands, a river (Mud Creek) and the lakeshore. For the purposes of this strategy, the habitats listed above have been categorized into the following ecosystems: Coastal Dune, Carolinian Forest (savanna, woodlands, forest), and Aquatic (wetland, river, lake).

### **A. Coastal Dune Ecosystem**

Dunes refer to mounds or ridges formed by the deposition of wind-borne sand, and result when an abundance of sand combines with wind, vegetation and geography. As the glacial lakes began to recede, dunes were formed by post-glacial lake deposits (Peach 2008).

The coastal dune ecosystem is made up of several zones, which include the beach, the dune ridges and interdunal wetlands which consist of shallow ponds located in between dune ridges. The foredune (*i.e.*, the first ridge behind the beach) is often colonized by dune grasses which stabilize the sand and provide habitat for other vegetation by increasing the soil's capacity to retain both water and nutrients (Michigan DNRE).

Because dunes are composed of sand, they are extremely vulnerable to erosion which occurs with storm waves, wind and improper usage. Dunes rely on the beach for replenishment of lost sand, while the beach relies on the dunes to provide sand during high water levels and storm events. It is this dynamic nature of the beach-dune ecosystem that provides important shoreline protection and economic value (Peach 2008).

In addition to the important role dunes play in shoreline processes, dunes are one of the rarest ecosystems in Canada. Furthermore, dunes provide habitat for many species at risk and rare species, which help stabilize the dunes through their root systems and sand trapping abilities. One such species is the Pitcher's Thistle (*Cirsium pitcheri*) which is designated as endangered both provincially and federally. The Pitcher's Thistle exhibits a very limited range, with only 38 plants observed in the Port Franks area during a 2007 survey. Habitat requirements include open, windblown dune systems, which are sparsely vegetated, yet have some degree of grass stabilization (Peach 2008).



**Endangered Pitcher's Thistle in the more common rosette stage (G. Peach) (left) and in the flowering stage ([pitchersthistle.ca](http://pitchersthistle.ca)) (centre); Provincially rare Long-leaved Reed Grass (Peach 2008) (right).**

Another important dune stabilizer is the provincially rare Long-leaved Reed Grass (*Calamovilfa longifolia*). This species is endemic to Lake Huron, and in Canada it is restricted to the Lake Huron shoreline. Long-leaved Reed Grass tends to grow in areas with reduced sand deposition, as it is less tolerant of sand burial than some other dune species such as American Beachgrass (*Ammophila breviligulata*) (Peach 2008).

The dominant threat to these dune species is habitat loss, which can result from development and recreation. Development, as well as shoreline modifications, can exert a high level of stress on this fragile environment through the use of heavy machinery and construction disturbance. Such activities can result in the removal of plants and the elimination of its habitat.

Recreational disturbances also threaten the existence of these plants. Excessive beach use and recreational vehicles not only cause trampling of the plants, but can be extremely destructive to habitat.

The vegetation mentioned above, as well as the other species at risk mentioned throughout this strategy may have provincial and/or federal at risk designations. As such, these species and their habitats are afforded certain degrees of protection. These pieces of legislation are not discussed in detail in this document however, they are important tools in protecting these species. If you are conducting work on your property, or in or around water on your property, please contact the Ontario Ministry of Natural Resources as you may require an Endangered Species Act permit.

### ***Community Interests and Issues for the Coastal Dune Ecosystem***

During a community consultation in 2009, residents of the Port Franks area recognized they live in a unique place. A more difficult realization is that this place is a dynamic ecosystem, which means it is constantly changing. This

refers to the coastal dune processes described above, in which the beach and dunes give and receive sand. Without this natural shoreline protection, erosion becomes a serious risk to lakeshore dwellings.

### ***Management Approach for the Dune Ecosystem***

Protect the coastal dunes to ensure continued shoreline protection.

#### ***Recommended Actions***

##### **1. Direct development away from sensitive areas.**

The Municipality of Lambton Shores should strengthen existing land use policies to direct development away from the coastal dune ecosystem. If development does take place, contractors need to be aware of the sensitivity of the area, and strive to reduce their impact as much as possible (Peach 2008). Development activities along the lakeshore may require a permit from the Ausable Bayfield Conservation Authority under the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 147/06).

##### **2. Do not disturb the dunes.**

Although the dunes may be perceived as an impediment to beach use and lake viewing, they need to be acknowledged for their value in providing natural shoreline protection. Disturbance or removal of the dunes and their vegetation may result in long-term erosion issues. The following stewardship practices will help ensure the dune vegetation remains undisturbed so that the coastal ecosystem is better able to withstand erosion pressures.

- Use boardwalks or railed pathways to access beach.
- Restrict vehicle access; if necessary, limit the amount of time these vehicles come in contact with coastal dunes, and the area they come in contact with.



G. Peach

Peach 2008

- Use one access path to beach; narrow, s-shaped paths help reduce exposure to wind therefore reducing erosion (Peach 2008).



Peach 2008

lakehuron.ca

### **3. Monitor local invasive species.**

Invasive species such as the Common Reed or phragmites (*Phragmites australis*) is becoming a big problem, especially along the coastal environment as it threatens coastal plants as well as their habitat. A partnership could be formed between the community of Port Franks and the Provincial Phragmites Working Group in order to develop some appropriate actions for the Port Franks area. For information on phragmites control, refer to the Field Guide for the Control of the Common Reed (*Phragmites australis*) on Lake Huron Beaches (Lake Huron Centre for Coastal Conservation 2007).

### **4. Create Individual Property Plans (Stewardship Guide for the Lake Huron Coastline).**

Landowners in the Port Franks area may wish to take some environmental actions on their property, but may be uncertain of what can be done to protect and enhance the natural environment around them. Staff from agencies such as the ABCA can visit property owners to help them understand their property and point out opportunities to improve the natural environment. Funding opportunities can also be identified to help cover the cost of certain environmental actions.

- It is important to keep your waterfront property as natural as possible. Do not remove the dunes or their vegetation, and plant only native plants. If a manicured garden is desired, provide a buffer between the garden and the dunes (Peach 2008).



The young cedars and newly planted dune grass will help stabilize this landowner's property, while still providing a view and also being visually appealing.

### B. *Carolinian Forest Ecosystem*

In the Port Franks area today, forest is the dominant ecosystem. Mainly dry oak and oak-pine forest communities occur on well drained dunes with mesic associations in lower interdunal swales and along floodplains. Carolinian forests are ecological communities of trees and shrubs that include species that are limited by climate to the Carolinian zone of southern Ontario and often prefer well drained, sandy, acidic, soils (Carolinian Canada). Carolinian species that are found in the forests of Port Franks include tulip-tree, sassafras, black oak, chinquapin oak and shagbark hickory. Locally, the various forest communities are grouped together and referred to simply as the 'Carolinian Forest'.

Interspersed in the forest communities area areas of oak woodland and more open oak savanna. Savanna is a term applied to open, grassy, natural areas that have widely-spaced trees. They develop on sites that are subject to environmental disturbances (e.g., fire, drought, flooding, and warmer than normal temperatures), and in the Carolinian region of Canada, savannas exist on very sandy soils. Woodlands, and especially savannas are extremely rare in eastern North America and may have been more common in Port Franks prior to European Settlement and fire suppression.

Much of this area is owned and managed by the ABCA, SCRCA, Nature Conservancy of Canada (NCC), Lambton County, and Lambton Wildlife Incorporated (LWI). The remainder of the land (*i.e.*, Port Franks proper and some properties along Highway 21) is under private ownership. The majority of the terrestrial ecosystem also lies within the ANSI boundaries (Figure 7).

Many of the terrestrial ecosystems found in the Port Franks area, similar to the coastal dune ecosystem, are extremely rare, and provides habitat for many at

risk, or rare, species (Appendix A). This includes the threatened dwarf hackberry (*Celtis tenuifolia*), which is a shrub or small tree. Dwarf hackberry inhabits dry, sandy sites with open woodlands along the shore of Lake Huron (COSEWIC 2003). One of its main threats is habitat succession, which refers to a change in the composition of a biological community over time. As woodland succession occurs and results in increased canopy cover, dwarf hackberry becomes shaded out. Before the settlement of Port Franks, this process of succession was limited by the natural occurrences of fires. Other threats include development and fragmentation, plant competition, and recreational activities (i.e., trampling, ATV use, trail maintenance) (Draft Recovery Strategy 2009).



Dwarf hackberry (M. Oldham)

Two at risk reptiles also live within the Carolinian forest ecosystem, which include the five-lined skink (*Eumeces fasciatus*) and the Eastern hog-nosed snake (*Heterodon platirhinos*). The five-lined skink (Carolinian population), which is Ontario's only lizard species, is listed as endangered in Ontario, and at the federal level. These lizards prefer wooded habitat with sandy soils and ground cover. The key threat to this species is habitat loss, while illegal collection, domestic animals and road mortality also pose threats (ROM 2008).



Juvenile five-lined skink (*Eumeces fasciatus*);  
colours fade with maturity (G. Nafis)

The other reptile, the Eastern hog-nosed snake, gets its name from its upturned snout. When threatened, this non-venomous snake may rear back and flatten its neck like a cobra. Eastern hog-nosed snakes prefer sandy soils such as beaches and dry woods however, they also require access to wet areas in order to hunt for frogs, toads and lizards. Habitat loss and persecution are the main threats to these snakes (ROM 2008), which are threatened both provincially and federally.



**Eastern hog-nosed snake (*Heterodon platirhinos*) (Ontario Parks)**

One of the many bird species of the Port Franks area is the hooded warbler (*Wilsonia citrina*), which is designated as special concern in Ontario, and as threatened on the federal level. This bird prefers large areas of mature deciduous forests in which canopy openings have allowed for dense growth of understory shrubs. Habitat loss and the specificity of its habitat requirements threaten this species (ROM 2009).



**Hooded Warbler (*Wilsonia citrina*)**

### ***Community Interests and Issues for the Carolinian Forest Ecosystem***

When asked how they wished their community to look in 20 years, many residents of the Port Franks area were concerned about balancing developmental needs and ecological conservation. Many residents expressed interest in passive recreation activities such as birdwatching and hiking, while there was also interest in knowing more about native species and gardens. The ABCA, along with the Port Franks Garden Club will be working together to produce a native plant demonstration garden at the Optimist Centre.

One issue that has been identified by other management plans is that of fire. Before settlement, the Port Franks area would undergo natural fires, which would prevent habitat succession. Now that we have suppressed this formerly natural process, the savanna and woodland ecosystem, and its associated species (e.g., Dwarf Hackberry), are at risk of disappearing.

### ***Management Approach for the Terrestrial Ecosystem***

Protect areas of provincial and regional significance.

#### ***Recommended Actions***

##### **1. Direct development away from areas of provincial, regional and local significance.**

At the first opportunity the Municipality of Lambton Shores should strengthen existing land use policies and direct recreation and residential development away from areas of provincial, regional, and local significance, especially the Port Franks Wetlands and Forested Dunes ANSI.

In areas where recreational trails exist, ensure appropriate structures and signage to discourage use by unauthorized vehicles. Trails should be clearly labeled, and any areas no longer in use, blocked off.

##### **2. Re-evaluate the Port Franks Wetlands and Forested Dunes ANSI boundary.**

Through the process of developing this biodiversity strategy for the Port Franks area it became evident that there is a need for clarification with regards to the Port Franks Wetland and Forested Dunes ANSI boundary. It is therefore recommended that the Ontario Ministry of Natural Resources re-evaluate this boundary.

##### **3. Develop restoration plan for the savanna and woodland habitats.**

Fire is a key component to maintaining these ecosystems, and controlled burns have been used as a management tool throughout Ontario (e.g., Pinery Provincial Park). There are obvious concerns with a controlled burn, and it is therefore necessary to investigate its feasibility in the Port Franks area, and identify alternate options (e.g., selective cutting, or the combination of a low-

intensity burn and the former). Removal of exotic and invasive vegetation is recommended to restore terrestrial habitats.

#### **4. Created Individual Environmental Property Plans.**

Landowners in the Port Franks area may wish to take some environmental actions on their property, but may be uncertain of what can be done to protect and enhance the natural environment around them. Staff from agencies such as the ABCA can visit property owners to help them understand their property and point out opportunities to improve the natural environment. Funding opportunities can also be identified to help cover the cost of certain environmental actions.

- One of the largest contributions landowners can make to restoring the natural environment on their property is through gardening and landscaping. Expand existing habitat through naturalizing your gardens. By utilizing native plants, not only will you be providing habitat, but you will save on water and fertilizer.
- A native plant guide entitled *Living with Nature – A Landowners Guide to Native Vegetation for the Grand Bend to Port Franks Corridor* (Jean and Jean 2009) is available to landowners at the Port Franks library.

#### **C. Aquatic Ecosystems**

The aquatic ecosystems within the Port Franks study area consist of wetland, river, and lake components. There are five aquatic systems that have been identified as part of this biodiversity strategy: Mud Creek, L Lake, Richmond Lake (also known as Mouth Lake), the Ausable River Cut and the near shore area of Lake Huron at Port Franks (Figure 8).

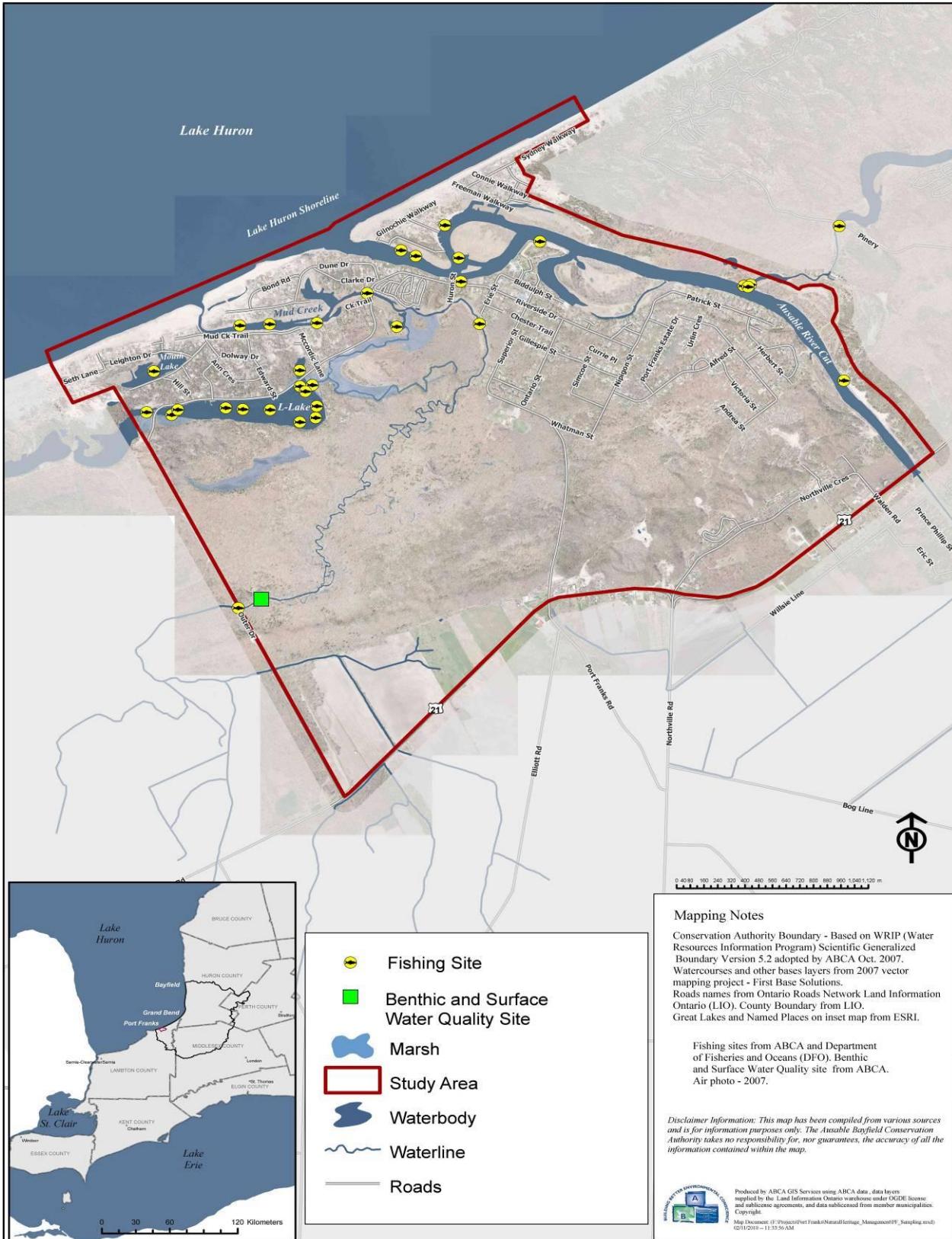
Mud Creek, L Lake and Richmond Lake are all part of the Mud Creek sub-watershed (Veliz *et al.* 2006). Mud Creek flows through Port Franks emptying directly into Lake Huron. Its upstream reaches are dominated by row-crop agriculture and orchards. Port Franks is the largest urbanized area in this small watershed. Approximately 25 per cent of this watershed is forested, most of which occurs in the dunes between Highway 21 and Lake Huron (Veliz *et al.* 2006). L Lake is located in Lambton County approximately 2.5 km west of Port Franks. It is an oxbow wetland, and is the only one of its type in Lambton County (Ausable Bayfield Conservation Authority 1990). It is characterized by still, clear water and dense aquatic vegetation. Richmond Lake is a small wetland pond located inland from Lake Huron in the Port Franks subdivision known as Richmond Park. It is characterized by still, clear water and dense aquatic vegetation.

The Ausable River Cut (downstream end of the current Ausable River) flows directly into Lake Huron at Port Franks. The Ausable River Cut and its mouth at the lake are part of the Dunes subwatershed (Veliz *et al.* 2006). The Dunes subwatershed area was created by sand deposits derived from lakeshore

processes occurring over thousands of years. This watershed is an internationally important example of dune succession and a very unique ecosystem (Veliz *et al.* 2006). Historically, the Ausable River used to flow north to the town of Grand Bend, where it abruptly swept south, creating the “grand bend” for which the town was aptly named. This was the path of the Ausable River until 1873. At this time the Canada Company, who purchased all the land in the area from the Crown in 1826, began construction of what is known as the “The Ausable River Cut” to relieve flooding (Dixon 1963). This “Cut” was excavated from a point east of Port Franks where the river was flowing northward, to the river mouth at Port Franks. As a result, the present outlet of the Ausable River empties directly into Lake Huron at Port Franks.



Ausable River Cut out-letting to Lake Huron  
in early spring. Port Franks on left (A. MacKenzie)



**Figure 8: Water Quality & Fisheries Monitoring Sites within the Port Franks Biodiversity Study Area.**

### **Water Quality**

Within the boundaries of the Port Franks study area, surface water quality monitoring has been limited to Mud Creek. Sampling has included benthic macro-invertebrates collection (since 2001) and surface water collection (since 2003) at one location on Outer Drive (Figure 8).

Sampling the benthic (*i.e.*, bottom-dwelling) animals is a commonly used method to determine aquatic environmental quality. Benthic macro-invertebrates are animals without backbones and include organisms such as fly larvae and worms. Each benthic macro-invertebrate species has a different tolerance to environmental stressors and/or pollutants. Thus, the presence and abundance of benthic macro-invertebrates at a given site reflect the environmental quality at that site. The presence of pollution-intolerant species generally indicates a healthy aquatic environment, while pollution-tolerant species are generally found at impaired sites (Veliz *et al.* 2006).

The Outer Drive site location on Mud Creek has been sampled in 2001, 2003, 2005, 2008 and 2009 for benthic invertebrates. In order to use the benthic macro-invertebrates collected from this location to derive an environmental quality score and water quality grade, a modified version of Hilsenhoff's (1988) Family Biotic Index, or FBI, (Mandaville 2002) was employed (Table 1). Results from the benthic invertebrate sampling at Mud Creek indicated poor water quality when compared to the average FBI value in the general ABCA watershed area which indicated fair water quality (Table 2). It is planned that this sampling will continue as a part of the ABCA benthic monitoring program.

**Table 1: Surface water quality scoring grid for benthic invertebrates.**

Benthic Score (modified from Hilsenhoff 1988)	Grade
<4.25	A
4.26-5.00	B
5.01-5.75	C
5.76-6.50	D
>6.51	F

Briggs *et al.* 2003

**Table 2: Benthic invertebrate scores for Mud Creek (2001, 2003, 2005, 2008) and the average score from the entire ABCA watershed (2000-2005).**

Year	Benthic Score	Grade
2001	6.97	F
2003	8.44	F
2005	8.42	F
2008	7.55	F
2009	data not yet available	-
<b>Mud Creek Average</b>	<b>7.85</b>	<b>F</b>
<b>ABCA Average (2000 – 2005)</b>	<b>5.60</b>	<b>C</b>

Monitoring of Mud Creek's surface water at Outer Drive has occurred from 2003 to 2009 (Figure 8), and will continue as a part of the ABCA enhanced water quality program. Monthly grab samples were collected between March and November each year for the following indicators: total phosphorus, total dissolved phosphorus, total ammonia, nitrate, nitrite, total Kjeldhal nitrogen (TKN), total suspended solids (TSS), and *Escherichia coli* (*E. coli*). In addition to these indicators, temperature, pH, conductivity, dissolved oxygen, and total dissolved solids (TDS) were also measured using a YSI multi-parameter probe. *E. coli*, total phosphorus, nitrate/nitrite and total suspended solids have been analyzed for Mud Creek as well as a site outside of the Port Franks study area on the Lower Ausable River at Bog Line, and the general ABCA watershed to compare differences in indicator objectives (Table 3 and Figure 8).

The water quality data demonstrates that bacteria (*E. coli*) and TSS levels in Mud Creek and the Lower Ausable River are below the objectives established to protect aquatic health. However nutrient concentrations in Mud Creek and the Lower Ausable River are greater than the objectives established to protect aquatic health (Table 3). Although some water quality indicators suggest Mud Creek and the Lower Ausable River have better conditions than the ABCA general area, there is still room for improvement to meet aquatic health objectives.

**Table 3: Selected water quality indicators, objectives and results from 2003-2009 sampling at Mud Creek and the Lower Ausable River (geometric mean for E. coli, 75<sup>th</sup> percentile concentration for total phosphorus, and means for other indicators) and the ABCA watershed average (PEQO – Provincial Water Quality Objective; CWQG – Canadian Water Quality Guideline for protection of aquatic life).**

Indicator	Mud Creek 2003-2009	Lower Ausable River 2003-2009	ABCA 2000-2005 <sup>†</sup>	Objective/ Guideline	Reference
E. coli (cfu/100mL)	91	75	233	100	PWQO
Total Phosphorus (mg/L)	0.11	0.10	0.08	0.03	PWQO
Nitrate-Nitrite (mg/L) as Nitrogen	5.29	4.79	-	2.93	CWQG
Total Suspended Solids (mg/L)	13	34	-	80	European Inland Fisheries Advisory Committee - for maintaining good fisheries

<sup>†</sup> This data is routinely collected, however it is typically summarized for subwatersheds and not for the entire ABCA watershed.

### ***Fisheries and Fish Habitat***

The Port Franks area aquatic ecosystems sustain unique and diverse fish communities. All of the aquatic ecosystems provide warm-water fish habitat, however each one offers different habitat characteristics. Mud Creek and the Ausable River Cut provide lotic ecosystems (*i.e.*, flowing water), while L Lake, Richmond Lake and Lake Huron provide lentic ecosystems (*i.e.*, still water). For the purposes of this biodiversity strategy, fisheries information and recommendations will be divided into these two ecosystem types. Fisheries information has been collected in four of the five aquatic systems that this strategy identifies (Figure 8). The ABCA nor its partners have collected fisheries information near the shoreline of Lake Huron at Port Franks. There are two known species at risk (SAR) fishes in the Port Franks area: the endangered lake chubsucker and the special concern grass pickerel.

### ***Mud Creek and the Ausable River Cut:***

In 2001 a fish survey was conducted on the upstream portion of Mud Creek at Outer Drive by the ABCA. In 2007 fish surveys were conducted by Fisheries and Oceans Canada (DFO) and the ABCA at various sites in the lower reaches of Mud Creek. These surveys combined found 25 different species of fish living in Mud Creek (Appendix 2). This included a special concern grass pickerel which was found closer to the town of Port Franks in 2007. The ABCA and DFO have

also conducted fisheries surveys in the Port Franks study area portion of the Ausable River Cut in 2004, 2007 and 2009. These surveys have identified a total of 38 species of fish (Appendix 2). The Ausable River Cut is also providing an important route for migratory fish species from Lake Huron to access Ausable River spawning areas at different times during the year.

**L Lake and Richmond Lake:**

In 2007 fish surveys conducted by DFO and the ABCA found 14 different species of fish in L Lake (Appendix 2). Previously unknown populations of two species at risk fishes were found as part of this study: the endangered lake chubsucker (*Erimyzon suetta*) and the special concern grass pickerel (*Esox americanus vermiculatus*). These fish are only known to occur in one other location in the ABCA's watershed, and in very few other locations in the province of Ontario. The ABCA and DFO also conducted a fish survey in 2007 in Richmond Lake, which identified four species of fish living in this small pond area (Appendix 2).

The most common fishes found in each of the four aquatic ecosystems can be found in Table 4; refer to Appendix 2 for a complete known fish species list.

**Table 4: Selected common fish species present in the Port Franks area aquatic systems.**

Common Fish Species	
Mud Creek	Black Crappie, Creek Chub, Gizzard Shad, Common Shiner
Ausable River Cut	Northern Pike, Walleye, Emerald Shiner, Smallmouth Bass
L Lake	Bowfin, Blacknose Shiner, Largemouth Bass, Yellow Perch
Richmond Lake	Bluegill, Brown Bullhead, Pumpkinseed, Rock Bass

**Species at Risk Fishes in the Port Franks Study Area:**

L Lake is one of two known suitable habitats within the Ausable River watershed for the lake chubsucker and grass pickerel. These species have also been found in the Old Ausable Channel - a disconnected portion of the Ausable River near Grand Bend. The Ausable River Recovery Team has recommended that L Lake be designated as critical habitat for the lake chubsucker. Once designated in a recovery strategy or action plan, critical habitat is protected under the federal Species at Risk Act (SARA). These species are listed under the federal Species at Risk Act (SARA) and the provincial Endangered Species Act (ESA).

Presence of these species at risk fish indicate high quality aquatic habitat.

### **Lake Chubsucker (Endangered)**

Remaining populations of lake chubsucker have only been documented in the drainages of the Niagara River, and lakes Erie, St. Clair and Huron in southwestern Ontario. The preferred habitat of the lake chubsucker is clear, still, well-vegetated waters of rivers and lakes. The lake chubsucker is intolerant of turbidity and high levels of siltation caused by poor land practices. Siltation, increased turbidity and loss of habitat are among the factors contributing to the decline of the species (Crossman and Holm 2005).



Lake chubsucker – Adult (top) and juvenile (bottom) (DFO)

### **Grass Pickerel (Special Concern)**

The grass pickerel occurs within Canada only in extreme southwestern Quebec and southern Ontario. This species prefers still, shallow, clear water with extensive floating, submergent and emergent aquatic vegetation (Crossman and Holm 2005). The overall decline of this species appears to be related to degradation and loss of habitat due to channelization and dredging operations in still waters/wetland areas that it prefers. Loss of aquatic vegetation and increased turbidity are the primary threats to this species (Crossman and Holm 2005).



Grass Pickerel captured in L Lake

### **Turtles and Turtle Habitat**

The Port Franks study area provides habitat for aquatic turtle species. Some of these turtles are species at risk, listed both federally and provincially. Turtle species in the Port Franks area face common threats such as: road and boat mortality; habitat loss; persecution; illegal capture for pet trade and nest predation. Some monitoring has recently been conducted to gain information on turtle species abundance and distribution in the Port Franks study area.



Photo: Christina Davy

**Snapping Turtle – a special concern species at risk**

### ***Community Interests and Issues***

#### ***Water Quality:***

Improved surface water quality in local tributaries and Lake Huron was one of the most important community concerns that came out of the biodiversity strategy development process. Improvements to local water quality conditions are challenged by the fact that Port Franks is located at the outlet of two water bodies, the Ausable River and Mud Creek. Unmaintained and under-sized septic systems as well as upstream agricultural surface runoff are two examples that may be contributing to water quality impairment. Inputs of sediments, nutrients and other potential contaminants from various sources could degrade habitat quality and may be especially detrimental to sensitive species at risk fishes.

#### ***Management Approach – Improve water quality.***

#### ***Education and Awareness:***

The Port Franks community expressed the need for education about stewardship practices that can be put into place to improve water quality.

Many members of the community are not aware of the fish living in the aquatic ecosystems of the Port Franks area. Education and information sessions were requested by local residents.

Habitat loss, degradation and fragmentation as well as road mortality, boat mortality, predators, and illegal collection all threaten the Port Franks area turtles. Area residents have shown an interest in learning more about how to identify and protect turtle species and their habitat.

***Management Approach - Provide education and awareness to local residents to protect and enhance habitat.***

***Invasive Species:***

Invasive vegetation, specifically phragmites is a big concern identified by the local community. Phragmites is an invasive wetland grass that takes over the shoreline and prevents aquatic turtles from accessing bank habitat. This vegetation is also impacting recreation by impeding boat access.

***Management Approach – Develop a strategy to manage invasive species.***

***Dredging***

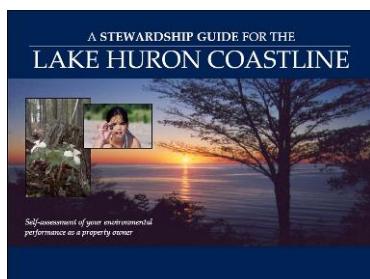
At the public meeting in September 2009 some members of the community identified the need to have waterways available for boating. In some places, some of the community wanted to dredge pre-existing channels. The community was informed at the meeting that dredging channels in the area would require permits from agencies such as the ABCA, the Ministry of Natural Resources and Fisheries and Oceans, Canada. Issues such as timing, location and mitigation would be addressed through the permitting process.

***Recommended Actions***

**1. Create individual Environmental Property Plans**

As poor water quality is often due to an accumulation of many small sources of pollution, there are many actions that can help to make improvements.

Environmental stewardship is the primary way in which surface water quality can be maintained and improved. Workshops for lakeshore residents in the past have focused on the Stewardship Guide for the Lake Huron Coastline.



*This stewardship guide can help landowners create environmental property plans*

Contact the ABCA for more information  
(519-245-2610 or 1-888-286-2610).

Environmental Property Plans can help a landowner identify ways that they can help the natural environment including: maintaining your private septic system; and protecting stream banks from erosion by vegetating areas along the watercourses to prevent erosion and filter potential contaminants.

## **2. Surface Water Monitoring**

More sampling locations would help inform the community on the status of the water quality in the Port Franks area. Water quality monitoring will continue in 2010 in Mud Creek, as a part of the ABCA enhanced water quality program. However the community has expressed interest in sampling other surface water locations in the Port Franks study area. This would allow for tracking changes to the water quality over time, which is important to assess land activities. It is recommended that water sampling be conducted at the Lake Huron beaches as well as L Lake and Richmond Lake.

Improving water quality by preventing excessive amounts of soil and nutrient runoff from entering waterbodies can help to improve habitat. Monitor the water quality in L Lake is important to maintaining quality habitat for species at risk fishes.

## **3. Upstream Management**

Improvements to local water quality conditions are challenged by the fact that Port Franks is located at the outlet of two water bodies, the Ausable River and Mud Creek. Creation of a management plan for the entire Mud Creek subwatershed will help to address upstream sources of water quality impairment. It should also be recognized that improvement will take time, as it is often many poor practices that add up and contribute to poor water quality.

## **4. Provide educational and information opportunities**

Public information sessions would greatly benefit the aquatic species found in the Port Franks Area. With more knowledge, local residents can protect and enhance habitat.

## **5. Implement a turtle monitoring program**

More information regarding presence, habitat, and range of SAR turtles in the Port Franks area is needed. A community-based monitoring initiative would help provide this baseline information.

## **6. Implement low impact development**

Development is important from a socio-economic standpoint. However, if done without regard for fragile natural systems such as the Port Franks area, there can be negative long-term consequences. Low impact development should be considered for this area, which aims to reduce stormwater volume, and keep that stormwater out of watercourses. Low impact development includes things such as green roofs and rain gardens to retain water, rainwater harvesting through rain

barrels, and green parking lots/driveways that use permeable and semi-permeable materials that allow stormwater to percolate through the soil.

## **7. Invasive Species Control**

Form a working partnership between agencies and the community with the Provincial Phragmites Working Group to develop recommendations to address this issue in the Port Franks area.

DRAFT

## **Concluding Remarks**

The Port Franks area is a unique natural place with three significant ecosystem types; coastal dunes, Carolinian forest and aquatic areas. The variety of ecosystem types combined with the amount of undisturbed natural areas provides habitat for many species, including numerous species at risk. Three broad recommendations have been identified for the ecosystems found in the Port Franks area:

1. Direct development away from sensitive areas
2. Implement good stewardship practices on individual properties
3. Implement invasive species control planning

In some regions within the ABCA jurisdiction, development should be directed away from areas of provincial and regional significance. Development that does occur should incorporate measures to buffer the development. However, in the Port Franks area, the existing development is more than enough for this ecosystem and further development is not recommended. Furthermore, people living and recreating in the existing developed area should attempt to naturalize their properties to enhance the natural heritage features of the area. Looking into options to control invasive species, such as Phragmites, will also help preserve the unique natural characteristics of the Port Franks area.

The area is also home to over 1500 summertime residents. Most people that live in the area have chosen to because of the natural amenities that the area provides. Similar to other regions in the ABCA jurisdiction, Port Franks is a natural area with developed portions. As in other areas there is an ongoing need to balance protecting the natural environment and the community living in and using the area. A balance between the environment and the community should be sought, with the protection of nature as priority. Protecting the ecosystem will not only benefit the natural environment, it will also indirectly provide longer-term economic benefits to the Lambton Shores by ensuring this area remains natural and beautiful. The natural heritage features of the area attract people to live and recreate in the area. However, as development occurs it is that very drawing point that may eventually be degraded. The community should be actively protecting the integrity of the Port Franks ecosystem, while recognizing that recreation and tourism are important to the local economy.

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**Appendix 1: Species at Risk and Rare Species within the Port Franks area (note this is not finished – more species to be added)**

Species		Status (COSEWIC)	Threats	Management Options
Amphibians/Reptiles	Five-lined skink	END	- Habitat loss - Illegal collection - Domestic animals - Road mortality	1. Direct development away from areas of provincial, regional and local significance. 2. Re-evaluate the Port Franks Forested Dunes and Wetlands ANSI boundary. 3. Develop a restoration plan for the savannah and woodland habitats. 4. Create individual Environmental Property Plans.
	Eastern hog-nosed snake	THR	- Habitat loss - Persecution	
	Stinkpot turtle	THR		
	Snapping turtle	SC		
	Blanding's turtle	THR		
	Spiny softshell turtle	THR		
	Map turtle	SC		
			- Habitat loss - Road mortality - Boat mortality - Predation - Illegal	1. Create individual Environmental Property Plans. 2. Monitor surface water quality. 3. Upstream management of Mud Creek 4. Provide educational and information opportunities. 5. Implement a turtle monitoring program. 6. Implement low impact development. 7. Control invasive species.
Fish	Lake chubsucker	END	- Siltation - Increased turbidity - Habitat loss	1. Create individual Environmental Property Plans. 2. Monitor surface water quality. 3. Upstream management of Mud Creek 4. Provide educational and information opportunities. 5. Implement a turtle monitoring program. 6. Implement low impact development. 7. Control invasive species.
	Grass pickerel	SC	- Loss of aquatic vegetation - Increased turbidity	

**Appendix 2: Fish species present in the Port Franks area aquatic systems (**bold** = species at risk).**

	Ausable River Cut	Mud Creek	L Lake	Richmond Lake
bigmouth buffalo	X			
black/smallmouth buffalo	X			
black crappie		X	X	
blackchin shiner	X		X	
blacknose shiner			X	
blackside darter		X		
bluegill	X	X	X	
bluntnose minnow	X	X		
bowfin			X	
brook silverside	X			
brook stickleback		X		
brown bullhead	X	X		X
central mudminnow	X		X	
channel catfish	X	X		
common carp	X	X		
common shiner	X	X		
creek chub		X		
emerald shiner	X	X		
gizzard shad	X	X		
goldfish	X			
golden redhorse	X	X		
golden shiner			X	
<b>grass pickerel</b>		X		X
greater redhorse	X			
greenside darter	X			
least darter		X		
iowa darter			X	
johnny darter	X	X		
<b>lake chubsucker</b>	X			X
largemouth bass	X	X	X	
logperch	X			
mimic shiner	X			
pumpkinseed	X			
northern pike	X			X
quillback	X			
rock bass	X	X		
round goby	X	X		X
shorthead redhorse	X			
silver redhorse	X		X	
smallmouth bass	X			
spotfin shiner	X			
spottail shiner	X			
striped shiner	X			
tadpole madtom		X		
walleye	X			
white bass	X			
white crappie	X	X		
white perch	X			
white sucker	X	X		
yellow perch	X	X	X	
<b>Species Richness Total</b>	<b>38</b>	<b>25</b>	<b>14</b>	<b>4</b>