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SANDBANKS PROVINCIAL PARK MANAGEMENT PLANNING BACKGROUND INFORMATION AND ISSUES 1990

Ontario
Ministry of
Natural
Resources

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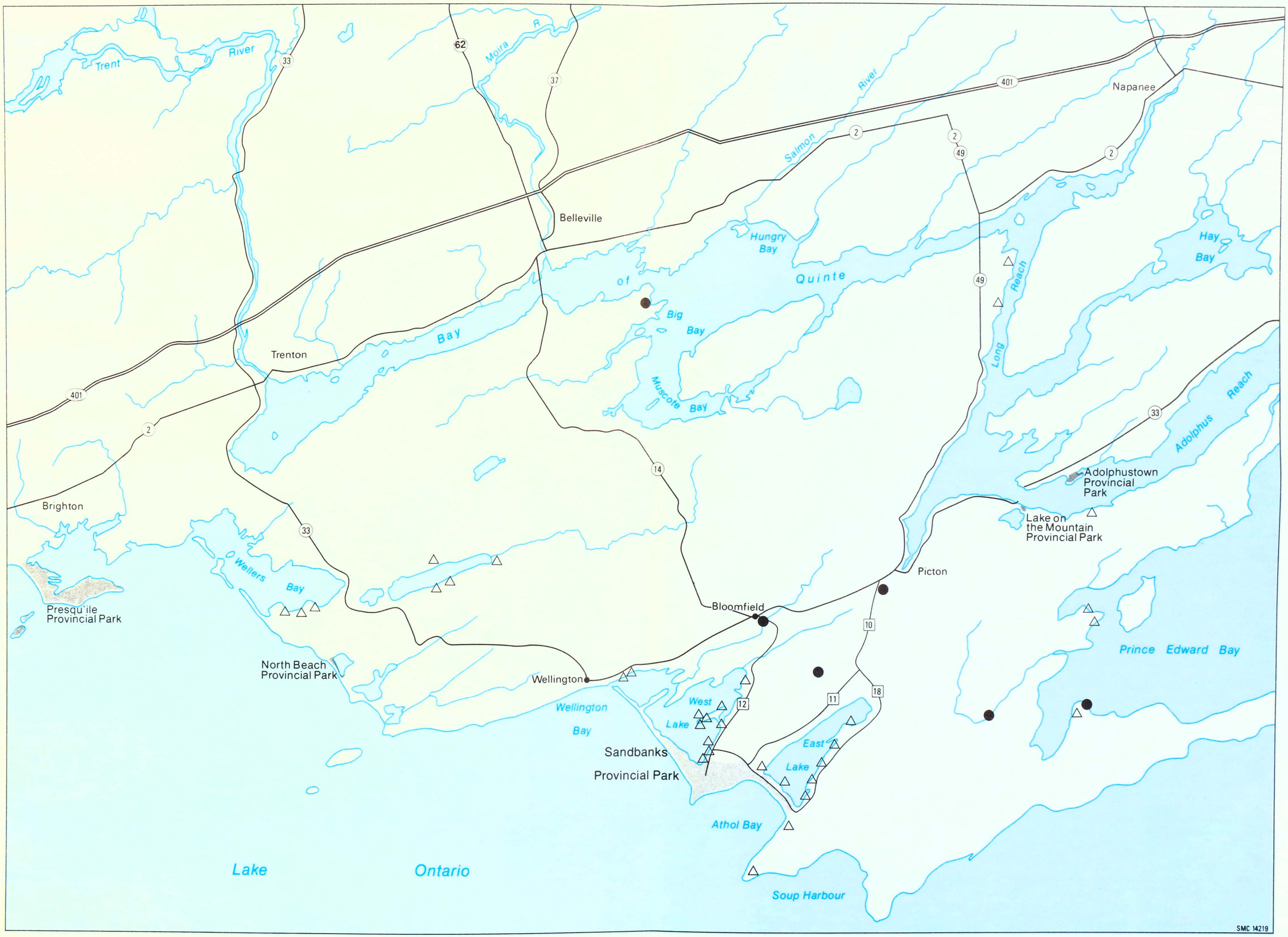

0 5 10 15 km

North

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1.0 INTRODUCTION

Sandbanks Provincial Park is located on Lake Ontario, in the townships of Athol and Hallowell in Prince Edward County. The park occupies much of the southwestern shoreline of Prince Edward County between the village of Wellington on the northeast and the hamlet of Salmon Point on the southwest. (See Figure 1.) Sandbanks Provincial Park is made up of two baymouth bar-dune formations and an intervening area of scenic rural land. It covers an area of land and water of approximately 1600 hectares.

Prior to 1979, Sandbanks existed as two provincial parks, Outlet Beach Provincial Park and Sandbanks Provincial Park. Outlet Beach was established by Ontario Regulation 117/63 and has been in operation since 1959. The Sandbanks area was established as a Forestry Station in 1921 and came under the Division of Parks in 1962. It was established as a Provincial Park by Ontario Regulation 165/70.

A proposal to purchase private land between the two parks was approved by the Ontario government in 1971. Most of this land has been acquired. The park area is shown in Figure 2.

A Master plan was prepared and approved for the park area in 1979. The Master plan recommended that the two parks and the intervening lands be brought together as one administrative unit. Through an Order-in-Council dated March 1, 1984 and Ontario Regulation 152/84, the combined area was regulated under the Provincial Parks Act as Sandbanks Provincial Park.

Management plans are needed for each of Ontario's provincial parks. The master plan for Sandbanks is now 11 years old and by Ministry of Natural Resources policy requires a public review. This background information document summarizes what is known about the park, points out significant features and discusses environmental concerns and management issues. As new information becomes available it will be reflected in subsequent planning work and documents.

There will be many opportunities for the public to become involved in the preparation of a new plan for Sandbanks. Public input and opinion will be sought at the beginning of the planning process and again before the preparation of a preliminary plan when planning options will be presented for public review. Following public review of the preliminary plan and further consideration of public opinion on its recommended policies, a final park management plan will be prepared. The final plan will be the Ministry's policy for the park and will guide park management for a 20 year period. The plan will be reviewed at least once every ten years.

2.0 REGIONAL CONTEXT

2.1 Resource Characteristics

Sandbanks Provincial Park is made up of two coastal baymouth sandbar formations and an intervening area of scenic rural land. The West Lake baymouth bar is the larger of the baymouth bars and with its dunes, forms the largest freshwater baymouth bar and dune system in the world. The East Lake baymouth bar is smaller and includes mature coniferous and mixed forests which have stabilized the dunes.

The vegetation features of the sand dunes and pannes (low, restricted, long, narrow areas which may be seasonally or continually wet) are very well developed and given their extent are provincially significant. Vascular plant species of Great Lakes shores, Atlantic coastal, southern and temperate affinities are present and locally abundant. Several species are of provincial and regional significance.

The fauna of the park includes over 200 species of birds, including records for Peregrine Falcon and

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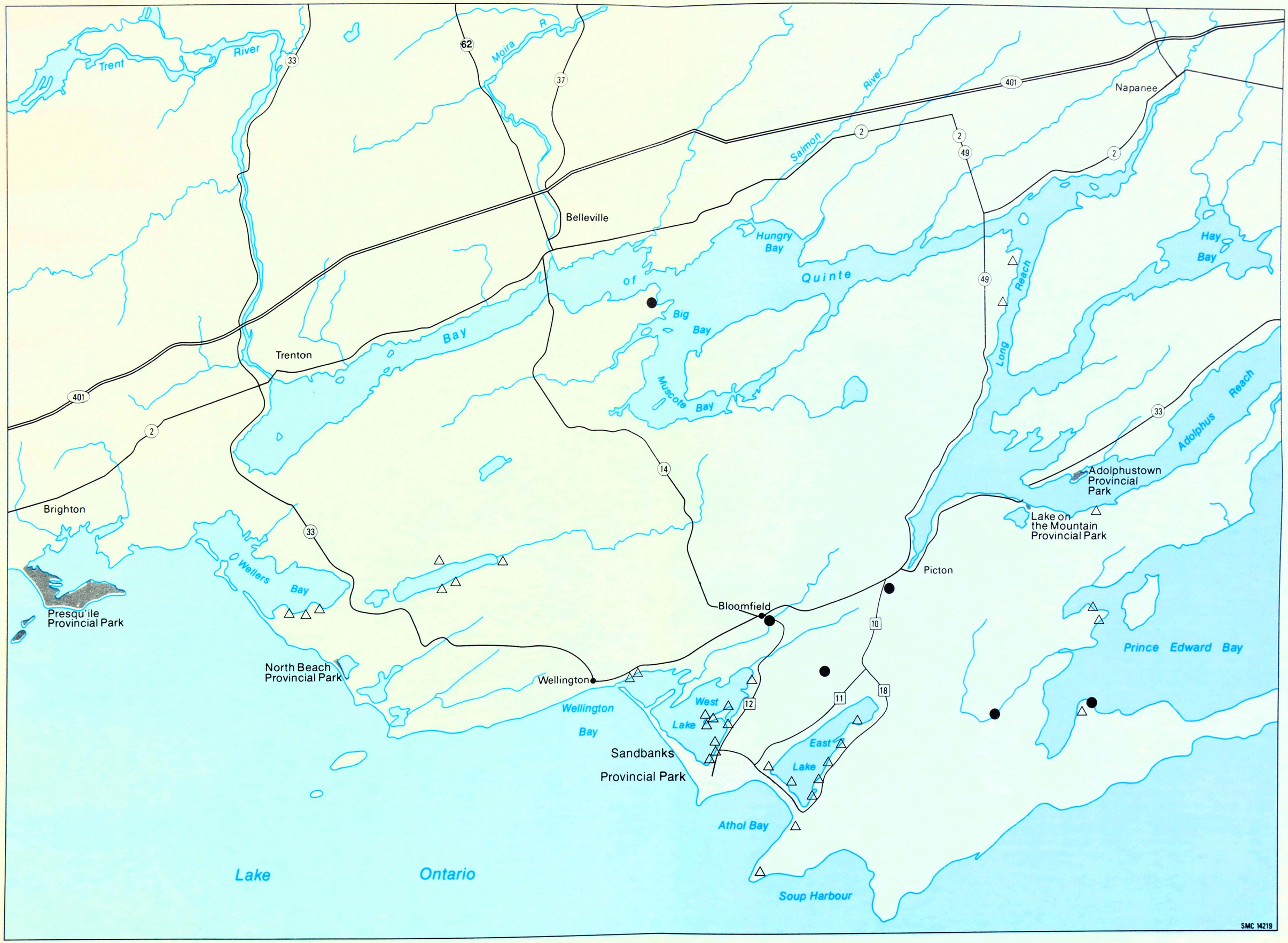

0 5 10 15 km

North

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Sharp-tailed Sparrow, neither of which breeds in the park. As well, there are notable migratory populations of passerines, shorebirds and waterfowl, including records for Wilson's Phalarope and others which stage in the protected waters of West and East lakes and along the beaches. The site also supports several reptiles and over a half dozen amphibian species, including the Jefferson's Salamander. The offshore waters of Lake Ontario, West Lake and East Lake also provide spawning sites for such species as walleye, pike and herring.

The area between the two sandbars is comprised of a series of woodlots, lands under cultivation and hedge rows. This area of the park has a rich and varied past and contains several significant prehistoric and historical sites, buildings and landscapes.

2.2 Land Use

The overall land use pattern of Prince Edward County is characterized by small hamlets, cottages, rural residential development associated with shoreline and a large proportion of agricultural and vacant land. In the vicinity of Sandbanks this pattern is expressed in commercial, resort and residential development around East Lake and West Lake and scattered permanent residences usually associated with agricultural property.

2.3 Population Centres

The population of Prince Edward County is 21,783. Almost 4200 persons live in the town of Picton, 1217 in the village of Wellington and 677 in the village of Bloomfield.

The cities of Belleville and Kingston provide most of the day use visitors to the park. Belleville (population 36,720) is 40 km and Kingston (population 62,175) is 77 km from Sandbanks. These two cities, Prince Edward County and the southern portions of the counties of Hastings, Frontenac, Northumberland and Lennox and Addington comprise the local market area.

Population increases of over 25% are being forecast for the province over the next twenty years. The population of Hastings, Frontenac, Northumberland and Lennox and Addington and Prince Edward counties is expected to grow from 349,040 to 443,390.

2.4 Access and Transportation Routes

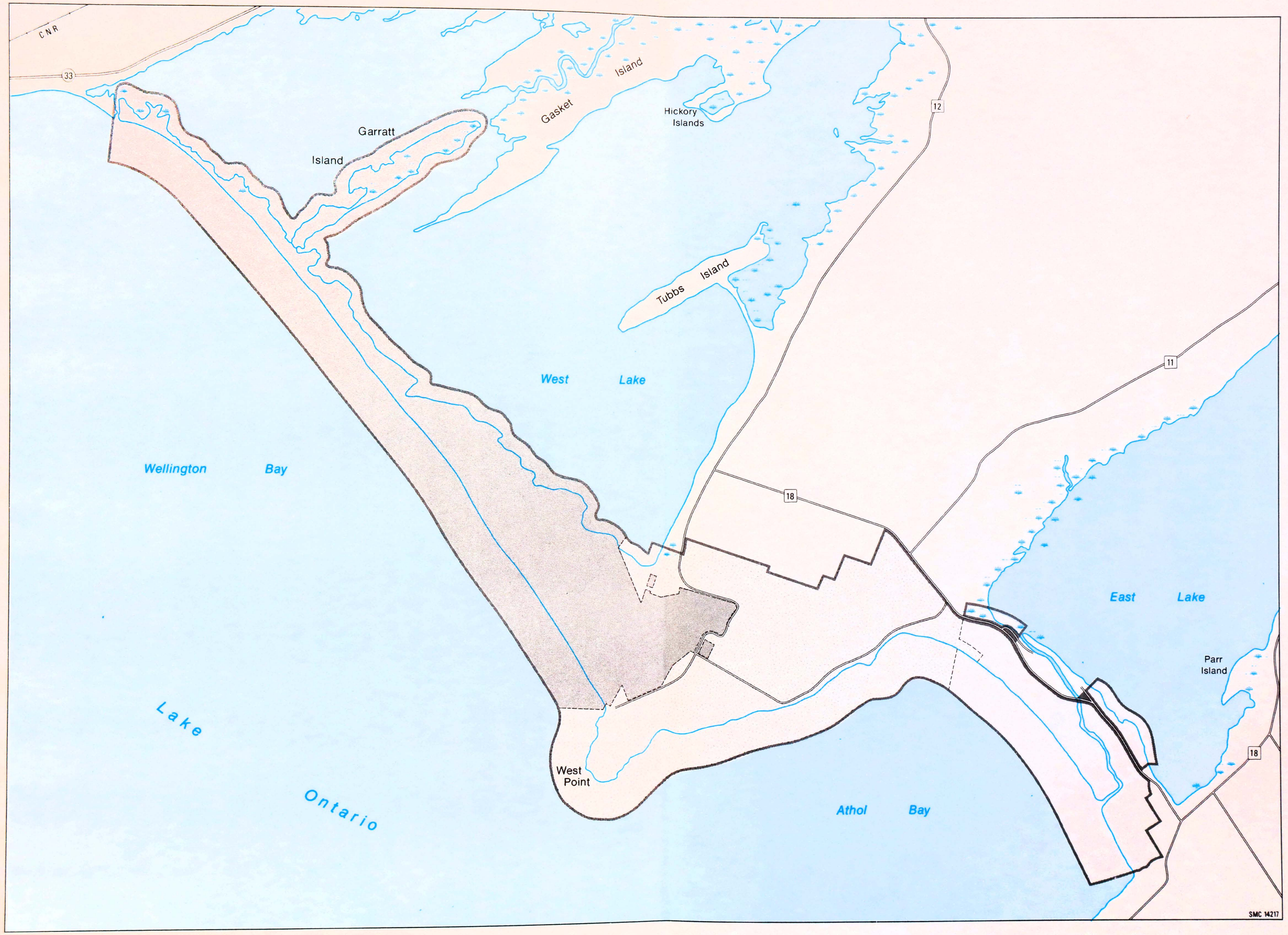
Tourists using the Highway 401 and Highway 2 corridor can reach Sandbanks on Highway 33, recently renamed the Loyalist Parkway, from Trenton or Highway 62 from Belleville to Bloomfield then south on County Road 12 to the park, or on Highway 49 to Picton and by County Road 10 and County Road 11 to the park. Access from the east is also possible via the Loyalist Parkway, the Glenora Ferry and County Road 10 and County Road 11 from Picton. The park is about 45 km from the Highway 401 and Highway 2 corridor. See Figure 1.

Railway access is feasible only to Belleville or Trenton. A public small craft airfield is located at Picton. A military airfield is located at Mountain View but is not available for public use.

The waters surrounding the County provided the best means of access in earlier days. Today, commercial links are not available but the many nearby ports host thousands of pleasure craft. Access to Sandbanks Provincial Park by boat is not expected to be significant.

3.0 PLANNING AREA

The planning area is the area within the boundary proposed for the park in the 1979 master plan. This is made up of the area regulated as Sandbanks Provincial Park in Ontario Regulation 152/84 and



0 500 1000 2000 m

North

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acquisitions of property for the park since 1984.

In this report the park planning area has been divided into three geographic sectors. Reference is made to them in various parts of the report. They are shown in Figure 2.

The three sectors are as follows.
West Lake Sector is the area between West Lake and Wellington Bay and north of the north part of County Road 12. This was originally called The Sandbanks.

East Lake Sector is the area between East Lake and the east shore of Athol Bay which is bisected by County Road 18 and the Outlet River. This was originally called The Outlet.

West Point Sector is the area between the other two areas, south of West Lake to the north shore of Athol Bay and including West Point. This was called the intervening sector in the 1979 Master Plan.

3.1 Land Tenure

Sandbanks is presently described in regulations as a Provincial Park under the Provincial Parks Act. This includes both baymouth bars, much of the West Point land and an appropriate area of water for control along the shoreline of the park. The park encompasses approximately 1600 ha of land and water.

The former Outlet Beach and Sandbanks Provincial Parks together comprised approximately 1000 ha of land and water. In 1971, a proposal to purchase land between the parks was approved and since that time approximately 350 ha of land has been acquired. This area together with 250 ha of water fronting the area on Lake Ontario now comprises the present park area. Approximately 26 ha of private land is located within the park area.

The County of Prince Edward has jurisdiction over County Road 12 where it passes through the park. In addition, the townships of Athol and Hallowell maintain roads which access cottage properties and residences on West Point and Athol Bay.

Some properties that have been acquired by the province are under interim management. Currently four land use agreements under the authority of the Ontario Provincial Parks Act allow interim agricultural use of lands and buildings acquired by the province for the park. In addition two leases, one under authority of the Public Lands Act and another under authority of the Provincial Parks Act, allow a private campground operator to use lands acquired for the park for campground and day use parking purposes.

3.2 Existing Park Development

Development and facilities in the park include 2.65 km of swimming beach, 14.5 km of interior park roads, 411 campsites, two group camping areas that accommodate a total of 80 persons, 100 ha of picnic area with 800 picnic tables and parking for 2000 vehicles and 8 wells which supply 7 pressure water systems. In addition, there are two docks, two boat launch areas, four kilometres of hydro lines, a 1.6 km nature trail and 135 park buildings, of which 84 are vault toilets. Others include office, warehouse, washrooms and concessions. Twenty-nine buildings are homes and structures associated with properties acquired since 1971.

Washrooms located throughout the park use septic tile systems. Vault toilets in the park are pumped out by a private contractor each season. A trailer sanitary station is located along the entrance road to the East Lake sector.

Central garbage stations are located in the campgrounds and disposal occurs at a dump within the park. Recycling bins to be emptied by a local recycling firm have recently been located in the campgrounds

and day use area ready for use in 1991.

4.0 NATURAL AND CULTURAL RESOURCES

4.1 Climate

Prince Edward County is virtually an island lying off the northeastern shore of Lake Ontario. The lake has a marked modifying effect on the county's climate. Winter minimum temperatures are about 6°C warmer than areas to the north and summer maximum temperatures are from 2°C to 4°C cooler. The growing season is 210 days, about ten days longer than the adjacent mainland.

Data from the Atmospheric Environment Service indicates that the county's summer season runs from May 25 to September 22, one of the shortest peak temperature seasons in southern Ontario. During this period, daily mean temperatures average between 13°C minimum and 24°C maximum. The relatively cool waters of the lake make for a shorter (100 day) swimming season than inland areas. Water temperatures average 19°C during July and August, and a peak of 21°C on average occurs in mid August.

The fall season is relatively mild and lengthy (66 days) with temperatures for October and November averaging in the 14°C range. The six weeks of spring weather offers mean temperatures averaging between 3°C and 15°C. Over the entire non-winter period, an average 7.5 cm of rain falls per month over an average of nine days, with mid summer being slightly less rainy. During the winter months precipitation averages 7.1 cm per month. Total precipitation averages 84 cm per year.

Relatively mild weather restricts activities requiring snow cover. Of the 122 day winter season (November 28 to March 29) only 70 days provide even marginally reliable snow cover. An average of 152 cm of snow falls annually, with best depth in late January. Relatively mild temperatures (daily mean average -9°C to 0°C) make outdoor activities pleasant. In addition, the area is one of the sunniest in all of southern Ontario during this season.

In general, the moderate climate, below average precipitation and low humidity combine to create a climate favourable for summer, spring and fall recreation and tourist activities. However in winter these characteristics combine to produce less reliable snow cover for winter activities than is available further north.

4.2 Geology

Upper bedrock in the area is Trenton Group medium grey limestone. This is mostly thinly bedded, often with shaley and/or fossiliferous beds.

Outcrops of this rock define Wellington and Athol Bays across which the West Lake baymouth bar and East Lake baymouth bar formed. Outcrops occur along the north shoreline of Wellington Bay from Wellington to Huykes Point in the west. Five to six metre cliffs of the same material surround the West Point headland at the south end of the West Lake baymouth bar. This rock also outcrops offshore as narrow platforms below the base of these encircling bluffs.

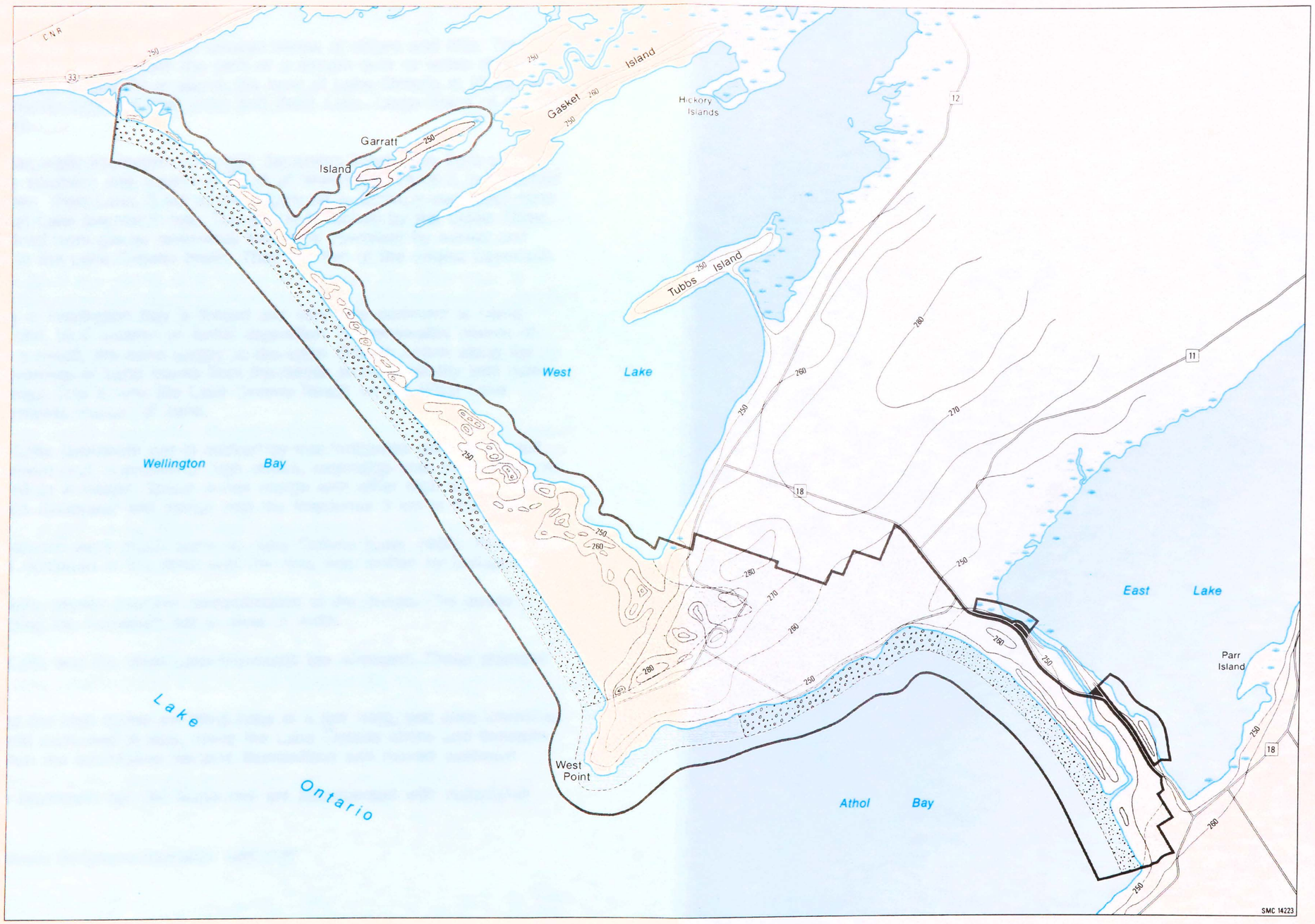
The limestone strata of Prince Edward County are almost horizontal with only a slight dip to the south and there are some faults that traverse the area from northeast to southwest. One of these passes through Picton and along the south shore of East Lake. It is responsible for the down thrust of the West Lake lowlands. A displacement of 30 m has been measured at Picton.

Glaciation during the Wisconsin Period caused differential erosion of the limestone surface and created a series of northeast to southwest parallel ridges and hollows. Along the coastline the ridges now form

Figure 3

Geology and Geomorphology

- Proposed park boundary
- Sandbar dune complex
- Limestone substrate
- Till and sand
- Sand beach
- Cobble beach
- Limestone shelves
- Contours at 10 foot intervals (A.S.L.)
- Marsh



0 500 1000 2000 m

North

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headlands and the hollows are bays, lagoons or coastal marshes.

4.3 Geomorphology

About 12,700 years ago, the last ice sheet retreated to the northeast leaving till deposits of varying depths over the underlying bedrock. Within Prince Edward County, till cover is less than one metre thick except between Picton and West Lake. In this area, patches of till are associated with drumlins and drumlinoid forms. In at least one location the till is 20 m deep and has been deposited directly onto the bedrock. Historical maps of West Lake show that it once contained drumlin islands although they are now surrounded by marsh. Below the surface of West Lake and beyond the head of the bay the drumlins have become partially buried by outwash sands and gravel. Garratt Island which lies off the West Lake baymouth bar appears to be twinned drumlins which have been eroded and reworked by proglacial and post-glacial lake wave action and currents.

Within the West Lake, Picton lowland, three eskers form an uneven series of ridges and hills. The eskers follow the orientation of the drumlins and indicate the path of a stream over or within the last glacial sheet. The eskers range in height between 62 m above the level of Lake Ontario at Picton and about 15 m at their southwesterly extremity between East Lake and West Lake. Large areas of outwash plains are associated with these eskers.

The immense West Lake baymouth bar, eight kilometres in length, separates West Lake from Lake Ontario. This bar, 1600 m wide at the southern end, tapers to 30 m at Wellington where it is breached by a breakwater-protected boat channel. East Lake, 3 km to the southeast is similarly separated from Lake Ontario by the much smaller East Lake baymouth bar. This bar is breached by the Outlet River. The sand for these two bars was derived from glacial sediments that were reworked by waves and rising water levels of proglacial lakes in the Lake Ontario basin. They are two of the largest baymouth bars on the Great Lakes.

Today, the quantity of sand remaining in Wellington Bay is limited and very little sediment is being introduced into the bay by longshore drift, bluff erosion or fluvial deposition. No renewable source of sand exists for the baymouth bar. As a result, the sand supply to the Lake Ontario beach along the West Lake baymouth bar and the movement of sand inland from the beach is considerably less now than when the dune system was created. This is why the Lake Ontario beach on the West Lake baymouth bar is now predominantly pebbles instead of sand.

The Lake Ontario beach of the West Lake baymouth bar is backed by low foredunes running the full length of the bar. At the extreme southern end, a system of high dunes, extending from West Point on Lake Ontario to West Lake, reaches 18 m in height. These dunes merge with other high dunes along the West Lake shoreline. These dunes disappear and merge with the foredunes 3 km to the north.

Around 1280 years ago the high backdunes were much closer to Lake Ontario (Law, 1989). At this time they were stabilized and forested and remained in this state until the area was settled by Europeans.

Beginning about 1878, settlement activity caused massive destabilization of the dunes. The dunes moved almost 400 m to the east causing the baymouth bar to grow in width.

Subsequently, the shoreline of West Lake and the West Lake baymouth bar changed. These changes are still occurring.

Between the foredune to the west and the high dunes on West Lake is a low lying, wet area known as the pannes. The pannes developed and increased in size, along the Lake Ontario shore and between the foredunes and the backdunes, when the backdunes became destabilized and moved eastward.

In the northern half of the West Lake baymouth bar, the foredunes are interspersed with occasional

higher dune ridges and local, low panne-like sections. Most of this area is somewhat protected by tall vegetation. However, a moderate amount of the sand is without cover.

At East Lake the baymouth bar separates East Lake from Athol Bay on Lake Ontario. The bar consists of a parallel series of similar physiographic areas. Beginning on the Lake Ontario side, there is a beach backed by a foredune system, a panne area which has been greatly affected by recreational use and development, and in the middle and southern portions, a more or less stable open dune system. Between these dune systems, which are not always clearly demarcated, lie additional panne-like areas. Behind the stable forest-covered dunes is a low lying area which grades into swamps or marshes on the East Lake side.

Between Athol Bay and West Lake at West Point the topography is quite flat as a result of the underlying limestone bedrock. (See Figure 3.)

4.4 Soils

The soil types identified within the park are described briefly here and are shown in Figure 4. For a more complete analysis, refer to Ontario Soil Survey Report Ten, "Soil Survey of Prince Edward County" by Richards and Morwick, published in 1948.

The soils of both sandbars originated from the water-sorted sands and gravels deposited during the last glacial period and have been reworked by lake and wind action to form the sandbars in the park area. The soils are classed as Eastport sands. These form the basis of the dunes which have been severely eroded on the West Lake baymouth bar and have remained relatively stable on the East Lake baymouth bar.

The East Lake baymouth bar sands support the growth of fir, cedar and spruce. The deposition of needles from these trees favours mor formation and leaching which results in a well developed podzolic soil.

Small areas of marshy soil are found at either end of the East Lake sector. These mucky, wet soils of partially decomposed organic and mineral materials are often covered by shallow water, held at the surface by underlying compact clayey subsoil or bedrock.

Five other soil types derived from glacial debris occupy the West Point sector. Brighton gravel dominates the northwestern portion of the area. This coarse material, derived from old beach deposits of sand and gravel, is low in organic content. It is extremely droughty because it is excessively drained. However, it has not been greatly affected by wind and water erosion.

Athol sandy loam occupies the western portion of the West Point lands adjacent to the West Lake baymouth bar. This soil type has not been greatly affected by erosion. It is generally a droughty soil because of its excessive drainage.

Brighton sandy loam is located approximately midway along the eastern boundary of the West Point lands. The soil type is quite porous and tends to be droughty.

Ameliasburg loam occupies the eastern portion of the West Point lands adjacent to the East Lake baymouth bar. This soil often suffers from unsatisfactory moisture conditions during the summer season.

To the north, in this eastern part of West Point is an area of Darlington loam. It is fairly deep and well drained and is an excellent soil for development purposes.

Soil depths and types are shown in Figure 4. For recreational development sandy loam soils, deeper than 1.5 m are classed as excellent; from 1.0 m to 1.5 m are classed as good with some limitations;

Figure 4

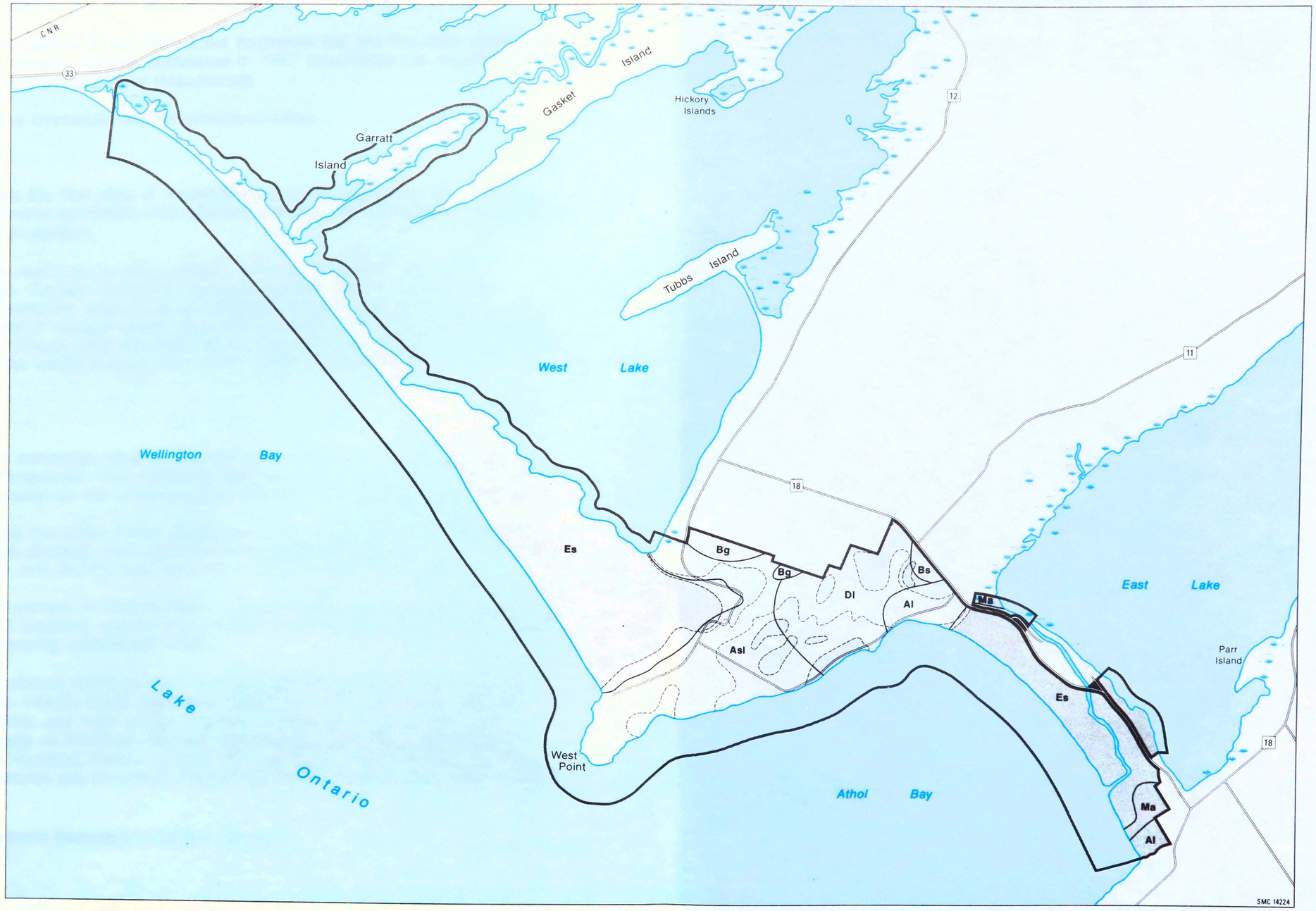
Soils

Proposed park boundary

Al	Ameliasburg loam
Asl	Athol sandy loam
Bg	Brighton gravelly sand
Bs	Brighton sandy loam
Dl	Darlington loam
Es	Eastport sand
Ma	Marsh

Soil depth

- 0.6 to 1.0 m
- 1.0 to 1.5 m
- Over 1.5 m



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from 0.6 to 1.0 m are classed as moderately poor with some restrictions for development; from 0.3 m to 0.6 m are very poor with severe development restrictions; and below 0.3 m cannot support any development. In the West Point sector about 50% of the soils are rated as good.

4.5 Vegetation

Sandbanks is situated at the southern edge of the Great Lakes-St. Lawrence Forest Region. As a consequence, the park's vegetation and flora is representative of this region but has some species more commonly associated with the Deciduous Forest Region. The park supports a number of provincially and regionally significant plant species. Several vegetation units are recognized and are summarized below and in Figure 5.

4.5.1 The West Lake Baymouth Bar

The vegetation of the sand dunes and pannes of the West Lake baymouth bar are the most significant examples at the eastern end of Lake Ontario. Studies completed in 1987 considered the vegetation of the baymouth bar to be significant at a provincial level (Macdonald).

Four vegetation units for the West Lake baymouth bar are described below.

4.5.1.1 The Foredunes

The foredunes, Area A in Figure 5, are the first sites of vegetation along the baymouth bar. Shifting sand, blowing winds and generally adverse conditions limit species to those that can produce new plants by such means as rhizomes, stolons or suckers.

Although the distribution of vegetation seems to be fairly uniform, there is a general pattern of association. Wormwood, Marram grass, Canada Wild Rye, Puccoon, Balsam Poplar and Eastern Cottonwood occupy the front of the foredunes where they are exposed to wind and wave action. The crest of the foredunes supports thickets of several beach associated willows, and Sand Cherry mingled with wild grape, Red-osier Dogwood, Canada Wild Rye and Starry False Solomon's Seal. To the rear of the foredunes, where it merges with the wetter pannes, the more common species are rushes, Silverweed and Horsetail.

4.5.1.2 The Sand Plain

A low sand plain, Area B in Figure 5, comprises most of the northern two-thirds of the West Lake baymouth bar. Drier portions support vegetation very similar to that found on the foredunes. In addition, willow and Eastern White Cedar are found on the damper sites adjacent to the shoreline of West Lake.

Large flat, low depressions occur within the plain. It is a single, extensive, continuous feature on the baymouth bar's southeastern third, and discontinuous depressions between the dunes in its northern two thirds. These areas are called pannes and are the best developed in the Great Lakes region.

Unlike the foredunes, where the sand surface is always visible, the panne has an almost continuous albeit often sparse vegetation cover. It supports species that tolerate seasonal flooding and the alkaline soils that have developed on the underlying calcareous sands.

The panne sites have dry and moist phases which support very well developed, species-rich examples of fen-like coastal communities. These include many distinctive calcicolous (calcium loving) vascular plants which form notable concentrations and have a high diversity. Among them are Great Lakes coastal and prairie habitat species, such as Northern Meadow Spikemoss, Small Flowered Gerardia, Upland White Goldenrod, Variegated Horsetail, Kalm's Lobelia, Flat Spikerush, Maritime and Meadow Arrow Grasses and others. These features are provincially significant and are well known in the scientific

and conservationist communities.

4.5.1.3 The Back Dunes

On the back dunes, Area C in Figure 5, the vegetation is related to the rate of sand movement, water table depth and aspect. The total vegetation cover excluding the plantations is about 30% and most of this occurs on east facing lee slopes, such as the shores of West Lake, and on the north facing slopes. This distribution is related to moisture availability from either ground water or from slowly melting snow and ice buried beneath the sand in the late spring.

Vegetation associations on the back dunes vary from north to south. The northern part of the baymouth bar, lacking steep backdunes, supports vegetation which is characteristic of the foredunes: willows, Eastern White Cedar, wild grape and Poison Ivy are the typical species with locally uncommon occurrences of Red Ash, Dropseed, Butterfly Weed, Cord Grass and Reed Grass along the shore of West Lake.

As the baymouth bar widens Eastern White Cedar, Common Juniper and Eastern Cottonwood are the dominant species. White Birch, Basswood, White Pine and Eastern White Spruce occur as scattered species near the water. Farther south, Cottonwood predominates with Basswood, Red-osier Dogwood, wild grape and Poison Ivy occurring on the backs and tops of the dunes. Areas of open sand support Sea-rocket, Sand Spurge, Russian Thistle and Hoary Puccoon which is found here near the eastern limit of its range.

The reforested area, Area D in Figure 5, where the dunes reach their maximum height, supports a mosaic of patches of plantations, natural open sand vegetation and remnants of an old forestry nursery (see section 4.8) which contains an abundance of "exotic" species relating to this nursery and the reforestation programmes.

4.5.1.4 Garratt Island

In the early 1900s what is now called Garratt Island, Area N in Figure 5, was three separate islands. These have been weakly joined together and in turn joined to the West Lake baymouth bar by drifting sand, lake deposited sand and mud accumulation in the marshes which lie between the former islands. Garratt Island is privately owned and about two-thirds of it has been developed as a private camp for children. The marshes around the islands contain some interesting flora including nettles and Great Lobelia.

4.5.2 The East Lake Baymouth Bar

The vegetation of the East Lake baymouth bar includes mixed and coniferous upland and lowland forests, panne meadows and river aquatics and thickets. The flora has southern, northern and Great Lakes affinities with concentrations occupying the 'panne' and coniferous forests habitats.

Notable here are the provincially rare Arrow Arum, located just beyond the park boundary on East Lake, and the regionally scarce to occasional Dwarf Mistletoe, Bluets, Hoary Puccoon and Stemless Blue Violet.

The importance of the vegetation on the East Lake baymouth bar lies in the coniferous and mixed forests which have stabilized the dunes and occupy the river flats, and the regionally and provincially significant flora. The site is considered a regionally significant natural area.

Five communities for the East Lake baymouth bar and are described below.

Figure 5

Landscape Units

- Proposed park boundary
- A — Sandbanks foredunes
- B — Sandbanks panne area
- C — Back dunes
- D — Reforested area
- E — Outlet Beach and foredunes
- F — Open dunes
- G — Forested dunes
- H — Outlet panne
- I — Outlet River
- J — West Point area
- K — Sugar bush
- L — Woodlots
- M — Agricultural landscape
- N — Garratt Island

0 500 1000 2000 m

North

Note: The figures in this report are reproductions of those used in the 1979 Sandbanks Provincial Park Master Plan and are outdated in some areas. For example, the proposed park boundary does not reflect changes since 1979 in the area of Garratt Island and the area south of County Road 18 and east of County Road 12. These changes will be reflected in later planning documents.

4.6 Wildlife

A wide variety of fauna is associated with the many diverse habitats of Sandbanks Provincial Park as shown in Figure 6. Aside from a list of mammals, amphibians and reptiles, spiders, crickets and grasshoppers that appear in Appendix B of the Environmental Inventory Report (Carlisle, Whitcombe and Harris, 1973), very little has been documented about their distribution. Mammals that occur here are representative of southern Ontario, and arachnid fauna is similar to that of the northeastern United States, as are the orders of insects reported.

More, however, is known about the park's avifauna. The park's location makes it a good area to observe birds migrating from the south to Prince Edward Point and along the shoreline to the mainland on their northwest journey. A wide diversity of resident and breeding species is associated with the great variety of habitats located in the park. Particularly good woodland bird breeding habitat is available in the site of the former Sandbanks forestry station and in the woodlots of the West Point sector. In the area of the West Lake baymouth bar, the wooded area near the main parking lot with its variety of looping trails offers excellent birding, especially during migration. It was in the camping area (Campground D) that Prince Edward County's first breeding Ruby-crowned Kinglet was found.

The East Lake baymouth bar also has a number of good birding areas. Gulls, including Herring, Ring-billed and Bonaparte's collect at the mouth of the Outlet River during the summer. Up river Cardinal, Yellow Throat, Kingbird, Marsh Wren and Northern Oriole are common. The Cedar Sands Trail area offers a variety of birdlife at all seasons. Kingbird, Northern Oriole, Song Sparrow and Yellow Throat have been found nesting along the trail.

Marsh areas, at the northern end of the West Lake baymouth bar and on the southeasterly shore of Garratt Island, provide excellent habitat for uncommon species such as Marsh Wrens and Swamp Sparrows. Studies of migrating shorebirds carried out in 1977 indicate that the West Lake baymouth bar may be of provincial significance as a stopover point for this group of birds. Further research will be required to determine whether this designation is warranted. In addition to the large numbers of single species counted, recordings were made of some species considered rare for the area e.g. White-rumped Sandpiper, a western species. Twenty-one shorebird species were observed.

The park also offers excellent waterfowl viewing opportunities. Goldeneye and Bufflehead concentrate from West Point east to the beach on Athol Bay in both spring and fall migration. Scaup and Ringnecks gather there only during spring migration. They also concentrate at the head of the Outlet River in spring. Canada geese frequently stop to feed in the corn and grain fields of the West Point area.

Productive marsh areas along the northwesterly shores of West Lake, and East Lake and both sides of the Outlet River as well as the pannes on the West Lake baymouth bar, support nesting waterfowl.

4.7 Aquatic Resources

4.7.1 Hydrology

Sandbanks fronts on Lake Ontario and backs on two inland lakes, East and West lakes, which were formerly bays along Lake Ontario or its precursor. The only water course within the park area, the Outlet River cuts diagonally across the East Lake sector and drains East Lake into Athol Bay of Lake Ontario. It has an essentially stable channel and the flow is more or less constant. Drainage in the park is good. On the sandbars in some areas, the sand has been scooped away by wind action to expose the water table. These are known as the pannes. Water levels in these areas fluctuate daily, seasonally and annually depending on the water levels of East Lake, West Lake and Lake Ontario. The West Point area has a few wet spots which are indicative of restricted drainage.

4.5.2.1 The Beach and Foredunes

The beach along the East Lake baymouth bar, Area E in Figure 5, is bare because of its exposure to wind, wave and human activity. The low foredune which stretches almost the entire length of the beach supports Heart-leaved Willow, Wormwood and Eastern Cottonwood with a ground cover of Starry False Solomon's Seal and wild grape. In the southern half of the park, the foredunes form a series of low parallel ridges interspersed with panne-like areas.

4.5.2.2 The Open Dunes

The open dunes, Area F in Figure 5, contain a number of dune ridges not covered by forest. Except for an occasional blowout, these ridges appear stable, supporting a juniper heath. Some of the open areas are occupied by a combination of Marram Grass, Starry False Solomon's Seal, wild grape, and Poison Ivy or less commonly Bittersweet, Hoary Puccoon, Canada Wild Rye Grass and Bearberry.

4.5.2.3 The Forested Dunes

The forested dunes, Area G in Figure 5, support a mixture of northern species. The dominant tree cover is comprised of White Cedar, Balsam Fir, White Spruce and White Pine, with scattered White Birch and Black Cherry. The ground cover is mainly Wild Lily-of-the-valley, Starflower, Columbine and White Trillium. A more typical local climax forest occurs to the northeast where an association of White Pine, maple and Hemlock occurs. At the south end, a Hard Maple, White Cedar forest provides a canopy for an unusual assemblage of spring flowers, including Canada Violet, Dog Violet and Downy Yellow Violet, which forms carpets particularly around the campsites.

Some regionally significant vegetation occurs in this unit. There is a small clump of White Violet (*Viola Blanda*) near the maintenance building and Dwarf Mistletoe parasitizes a few conifers.

4.5.2.4 The Pannes

In the central portion, Area H in Figure 5, of the East Lake baymouth bar is a low, moist strip of land. This remnant of the East Lake pannes is nestled between the dune ridges where the juniper heath gives way to the coniferous forest. These pannes bear some resemblance to those of the West Lake baymouth bar. The ecological conditions are similar. The differences are due to their smaller size and setting. Occurring between parallel dune ridges, they receive a greater nutrient inflow from the forest on both sides. They are, therefore, one step closer to being a wet calcareous meadow than true pannes with relatively extreme conditions. In addition to the typical panne environment species, such as *Eleocharis* spp., *Cladium Rhychospore* and *Equisetum* spp. there are some species associated with calcareous meadows such as St. John's-wort, Blue-eyed Brass and the regionally rare southern Bluets. Western prairie grasses such as Bluestem, Little Bluestem and Indian Grass, are also represented here, relics from their eastern advance during the dry period following the last ice age. Other notable species found here include Brook Lobelia, Purple Gerardia, Nodding Ladies' Tresses, Variegated Scouring Rush and a variety of sedges.

4.5.2.5 The Outlet River

The Outlet River, Area I in Figure 5, cuts diagonally across the baymouth bar and drains East Lake into Lake Ontario. A coniferous lowland forest occupies moist depressions along the Outlet River basin and has a notably boreal influence.

The river itself is slow moving, a feature which has allowed large tracts of cattail marsh together with water lilies, Pickerelweed and other aquatic vegetation to develop along its shoreline. As a result, the river and its marsh areas support a rich and diverse wildlife community.

The western shore of East Lake is not within the park except for a small part in the group campgrounds

area and another at the west corner of the lake. The shoreline slopes very gradually to about a two metre depth at about 200 m offshore and within this zone several significant features have been documented. Bulrush, Pickerelweed, White Water Lily, Wild Rice, Water Willow, Bladderwort and Duckweed frequent this shore. In the northwest corner of the lake is a Bluejoint Sword giving way to Cattail Marsh, Bulrush, reed, dodder, burreed, and Arrow Arum in deeper water. East of this area, White Water Buttercup (*Ranunculus circinmatus*) has been located. This is a very uncommon species.

4.5.3 The West Point Lands

The lands, Areas J, K, L and M in Figure 5, which link the two sandbar areas are comprised of a series of woodlots and agricultural lands which remain under cultivation. Three vegetation units for this area are described below.

4.5.3.1 West Point

West Point, Area J in Figure 5, is the most westerly area of the acquired land south of the West Lake baymouth bar. Sugar maple, Red Oak, and Hop Hornbeam occur here. Between 64 cm and 102 cm in diameter these trees lack any appreciable height because of their constant exposure to the winds off Lake Ontario. Chokecherry is taking over many of the glades. Heart-leaved Aster, Trout Lily, Mayapple, White Trillium, Waterleaf, violets, nightshade, raspberry and burdock form the ground cover. Above the storm line on the exposed two metre limestone cliffs can be found Saxifrage, Whitlow Grass, Columbine and Bluebell.

4.5.3.2 The Woodlots

Woodlots, Area L in Figure 5, occupy about 20 percent of the area between the East Lake baymouth bar and the West Lake baymouth bar. Some are very mature forests with good age ranges that are not now represented within the site district. They are predominantly Sugar Maple with scattered Red Oak, Hop Hornbeam, White Birch, White Cedar, Shagbark Hickory, Basswood, Hemlock, Balsam Fir, Blue Beech, Large-toothed Aspen, and White Oak. The forest floor has a varying species association with one or more of the following: Spotted Touch-me-not, White Trillium, Wild Geranium, Herb Robert, Mayapple, Early Meadow Rue, Yellow Violet, raspberry, Canada Yew, Jack-in-the-pulpit, Trout Lily, Yellow Loosestrife, nettle, Wild Grape, nightshade, False Solomon's Seal, True Solomon's Seal, Baneberry, Enchanter's Nightshade, Maple-leaved Viburnum, and Beech Drops.

The woodlots provide a wildlife corridor which links the two sandbar areas.

The woods, Area K in Figure 5, at the four way intersection near the entrance to the West Lake sector are composed of patches of mature forest with Sugar Maple being the predominant species. Some of the maple are 100 cm in diameter. There are several large oaks and white cedars whose diameters approach 75 cm. Since these woods were formerly managed for maple syrup production, it is not surprising that Sugar Maple form the majority. Scattered throughout, however, are a few Black Cherry, Red Ash, Green Ash and Basswood. The forest floor supports Mayapple, White Trillium, Wild Geranium, violets and Early Meadow Rue. Motherwort occurs around the woods' edge.

4.5.3.3 Agricultural Lands

Land under cultivation, Area M in Figure 5, has given its agricultural character to these areas of the park. Scattered throughout the West Point sector are fence bottoms or hedgerows along which grow a variety of species. These hedgerows are aesthetically important in breaking up large cultivated areas, where crops and weeds predominate. Areas of forest and shrubs along the shoreline are particularly valuable for migrating birds.

There are some old fields and pasture lands mainly in the West Point area which are very slow to return to forest cover due to the shallow Farmington soils.

Figure 6

Fauna

Proposed park boundary

Waterfowl staging area

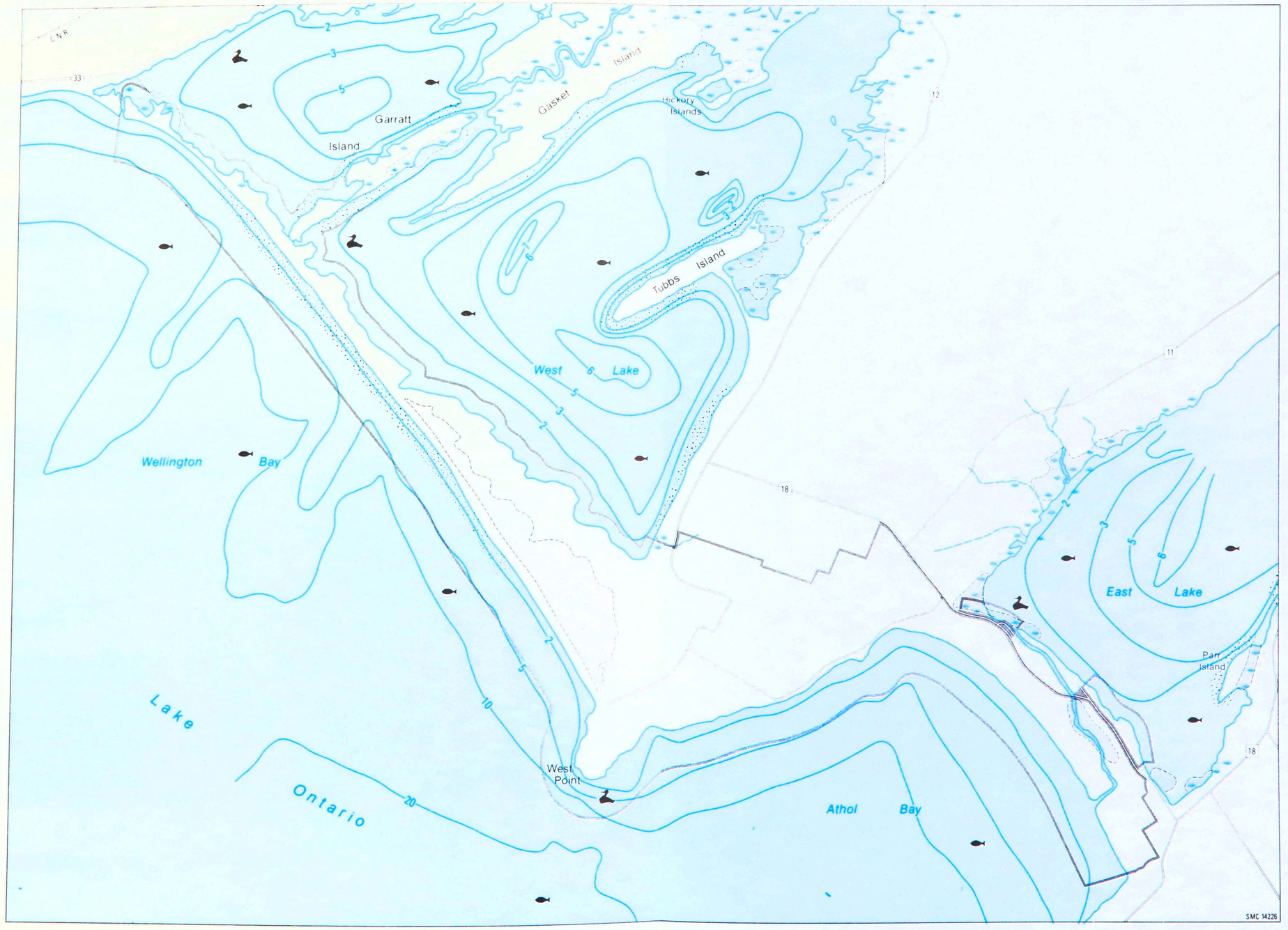
Waterfowl nesting area

Angling and seasonal commercial fishing

Spawning grounds

Intermittent stream

Water depth contours (metres)



0 500 1000 2000 m

North

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Lake Ontario is characterized by fluctuating lake levels which can affect various flood prone areas of the park. These lake flood hazard areas include the beaches, marshes and panne areas.

Fluctuating water levels in East Lake is a concern to lakeside residents and boaters. The mouth of the Outlet River becomes plugged with sand when Lake Ontario water levels begin to drop in late summer and fall. This block increases water levels in East Lake until the head of water forces re-opening in the spring. The Prince Edward Region Conservation Authority employed a consultant in 1990 to make recommendations toward managing the problem.

4.7.2 Water Quality

Both East Lake and West Lake are moderately eutrophic. Both lakes are relatively quiet and because their outlets are restricted an accumulation of organic and inorganic nutrients has occurred which has led to marsh development in both lakes. Nutrients reach the lake from natural land run off, agricultural areas and residential development.

Lake Ontario waters are subject to occasional algae blooms in response to weather and nutrient conditions in the lake. Water quality is monitored on a regular basis. High faecal coliform counts led to the first ever posting of the beaches as unfit for swimming for a 14 day period in August of 1990. In response the Ministry of Natural Resources has requested the Ministry of Environment to investigate the situation to determine possible sources of contamination and to recommend corrective actions.

Although onshore winds create accumulations of algae and sometimes dead fish, mainly alewives, on the Lake Ontario beaches, this poses an aesthetic problem rather than a health hazard. The present solution is to rake algae from the sand and truck it to a disposal site.

4.7.3 Fisheries Resources

The warm, shallow waters of East and West Lakes and the deeper, colder waters of Lake Ontario provide spawning and rearing areas for a wide variety of fish species of value to both sport and commercial fishermen.

4.7.3.1 Sport Fishery

East and West lakes provide sport fishing for provincial park visitors, cottagers and tourists. Walleye, northern pike and largemouth bass are popular targets of the serious angler. In addition many hours of recreation are provided by panfish species such as perch, sunfish and rock bass as evidenced at the bridge over the Outlet River in Sandbanks Provincial Park.

The population of chinook salmon and a variety of trout species in the open waters of Lake Ontario offshore from Sandbanks has increased significantly in recent years. Lake trout, once native to Lake Ontario, have been reintroduced through stocking programmes as part of an international commitment to rehabilitate Great Lakes fisheries. Chinook salmon and brown trout are planted to provide near-shore and offshore sport fishing. Most rainbow trout caught in this part of the lake are naturally produced fish which spawned in Lake Ontario tributary streams west of Prince Edward County.

An increasing number of anglers from as far as Toronto and Ottawa use Wellington, Brighton and Weller's Bay as bases from which to pursue offshore salmon and trout. In 1989, boat anglers spent an estimated 105,000 hours fishing Lake Ontario waters offshore from Wellington and Brighton, and harvested nearly 14,000 salmon and trout. Charter boats accounted for over 25 percent of the total fishing hours. Participation in this fishery has increased dramatically over the last few years, as evidenced by a doubling of estimated fishing effort between 1987 and 1989. The 9600 chinook salmon taken in 1989 comprised 69% of the total harvest. Rainbow trout made up 15% and lake trout 10% of the anglers' creel. Coho salmon, brown trout and a small number of Atlantic salmon accounted for the remainder of the catch.

Table I

1989 Commercial Fish Harvest in Pounds From Waters in the Sandbanks Park Area

Species	East Lake	West Lake	Lake Ontario Between Salmon Point and Scotch Bonnet Island
Bullheads	2,401	5,577	4,219
Carp	2,578	3,239	76
Channel Catfish	48	-	316
Crappie	352	3,899	47
Dogfish	374	-	-
Eels	362	368	13,829
Freshwater Drum	41	7	1,780
Herring	-	-	2,833
Rock Bass	1,673	356	5,686
Suckers	1,384	68	3,001
Sunfish	5,274	3,127	700
Walleye	-	-	1,493
Whitefish	-	-	8,503
White Perch	646	5,893	675
Yellow Perch	1,608	3,200	32,985
TOTAL	**16,741**	**25,734**	**76,143**

4.7.3.2 Commercial Fishery

Commercial fishing is a traditional activity which dates back many years in this part of Prince Edward County. Several local commercial fishermen trace their fishing heritage through three or more generations.

Commercial fishing is carefully regulated through a combination of individual quotas for fish species, restrictions on types and quantities of gear, fishing seasons and in the case of yellow perch, a minimum size limit of seven and a half inches. Fishing activity and harvests are monitored and enforced by fisheries technicians and conservation officers of the Ministry of Natural Resources.

Four commercial fishing operations presently hold six licences to harvest fish from East and West Lakes. Four licences allow the use of hoop nets to harvest fish species such as bullheads, sunfish, eels, black crappie and perch. Hoop nets are referred to as impounding gear as they capture fish alive, allowing fishermen to sort their catch and return to the water alive any fish such as game fish for which there is not a commercial quota. There are two carp licences for large-mesh net which effectively fishes only for large specimens of carp.

Commercial fishing in Lake Ontario is carried out using gill nets, trap nets (live capture impounding gear) and hooklines (for eel only). Four licences account for most of the commercial harvest from Lake Ontario waters between Salmon Point and Scotch Bonnet. Yellow Perch is the most important species to the lake fishery, followed by eels and whitefish.

The commercial harvests from waters around Sandbanks Provincial Park, as listed in Table 1, contribute to the local economy through direct employment and secondary processing. Fish from this area are generally sold to two fish buying and processing facilities in Prince Edward County or to a fish buyer at Brighton.

4.8 Cultural Resources

4.8.1 Prehistory

From archaeological work undertaken in the park, it is known that two major occupations of Sandbanks took place along with one or more minor ones. The first occupation occurred before A.D. 1000 and is called the Princess Point Culture. Princess Point pottery marks the transition from Middle to Late Woodland times. It is similar to the Owasco Culture in New York State. Princess Point people practised a seasonal round of events and economic activities such as fishing at the Sandbanks in the spring, perhaps collecting wild rice later in the summer and fall hunting. They also experimented with early corn horticulture.

The second major occupation of Sandbanks is Iroquoian and dates to A.D. 1400-1550. These people also appear to have been using the park as a fishing station and were probably of Huron affiliation.

A minor Pickering component of the Early Iroquois tradition has also been noted. This occupation dates to 800-1300 A.D.

A large archaeological site occurs in the West Point area and another has been found on the West Lake baymouth bar. Both sites are fragile.

Archaeological surveys have revealed no other sites within the park area.

4.8.2 History

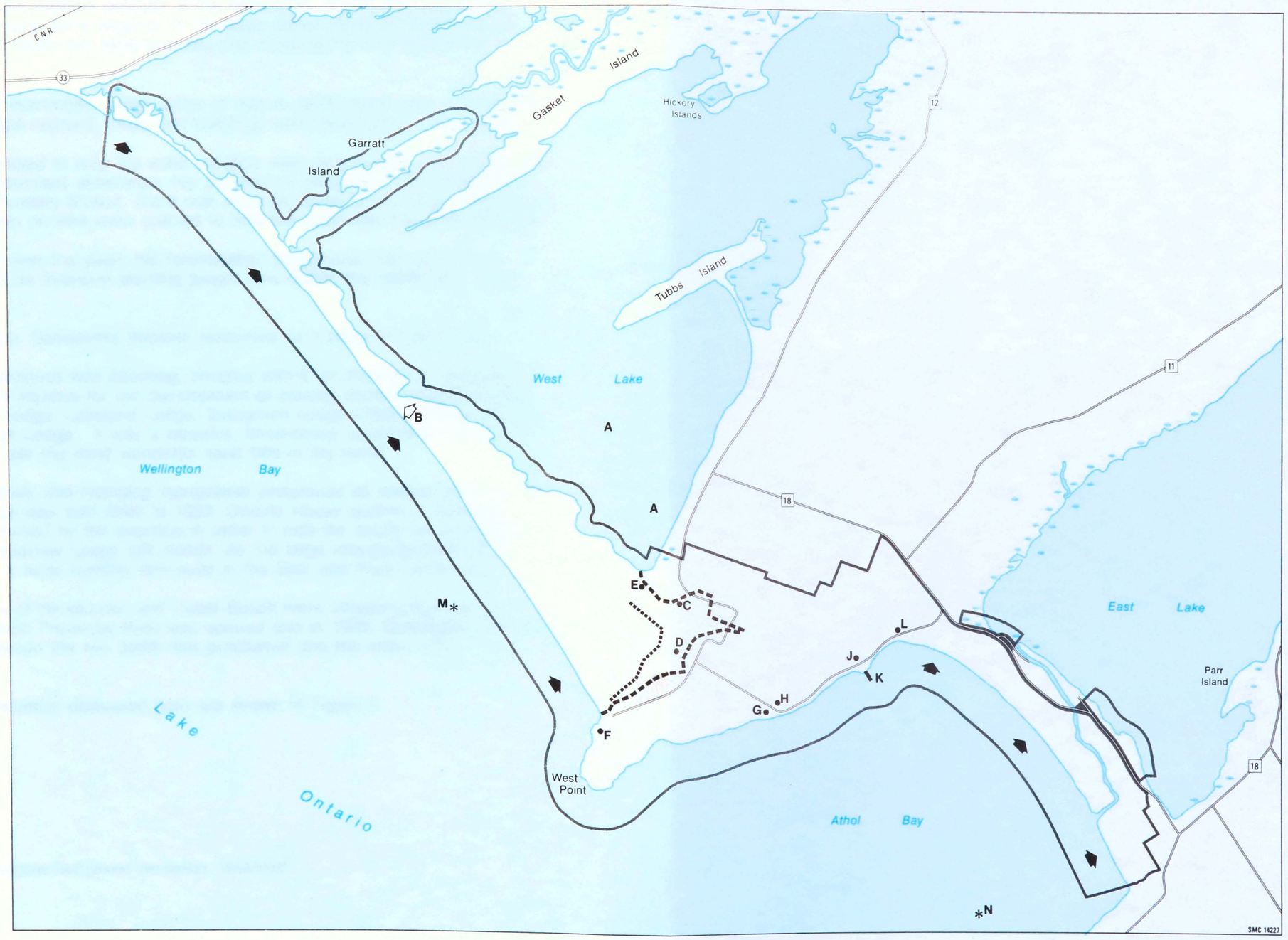
Settlement came to the area we now call Sandbanks Provincial Park during the wave of immigration to the Great Lakes Region of Upper Canada that followed the American Revolution. Agricultural development however was limited by a confusing land policy in effect at the time. In 1802, the West Lake baymouth bar and 500 acres adjoining were leased by the Crown for an annual rent of 29 shillings, six pence or eight and 34/40th bushels of wheat. Then, in 1828, these lands were given as an endowment to King's College, precursor of the University of Toronto, which leased them as a revenue source. By 1830, the area had been settled by seven tenants and 515 acres cleared for agriculture. In 1880, King's College became The University of Toronto and shortly thereafter sold its holdings in the park.

The two sandbar areas were never patented during this period of time although portions of the beaches were leased for commercial fishing purposes. Disputes with the leases did occur but an Order in Council passed in 1835 confirmed that the sandbars were Crown lands. Early in the 19th century, the lands between the two baymouth bars produced the principle cash crop of the time, wheat, most destined for export to the United States. Following the U.S. Civil War, increased taxes changed American tippling preferences from whisky to beer and the demand for Canadian barley soared. These were the "Barley Days" in Prince Edward County as every available acre of land in the county and the park was turned to barley production. Within the park, at the McDonald-Hyatt wharf, from late summer to freeze-up, barley laden schooners made as many as three trips a week to Oswego, New York.

Figure 7

Cultural Features

- Proposed park boundary
- A — Fishing derbies established in 1930s for tourism
- B — Archaeological site: pottery, sinker
- C — Site of old fire tower
- D — Site of Historic Evergreen House
- E — Remains of West Lake Brick Products Company
- F — Site of Historic Lakeshore Lodge
- G — Old Lakeview Lodge
- H — Site of Historic Shore Acres Lodge
- J — MacDonald Farm
- K — Old Wharf Site
- L — Waite House, dating to 1866
- M — Shipwreck of the Eleanor Hamilton
- N — Shipwreck of the Henry Folger (1800s), the Enterprise (1822) and others
- Old Sandbanks Nursery (1921)
- Individual fishing rights were granted along these shores until 1835 when they became public
- Present dune edge
- Approximate edge of dunes in 1852



0 500 1000 2000 m

North

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All of this settlement and agricultural activity had an unavoidable impact on the West Lake baymouth bar.

Until 1850, hills of pure sand rose abruptly from the shore of Lake Ontario to heights of 10 m to 25 m. Grass and shrubby trees grew on the lakeside slopes, while a mix of grass, vines and trees grew on the wind-sheltered opposite slopes. With the exception of some hollows between the larger dunes and areas along the West Lake shore, the baymouth bar was not densely forested. Most of the larger timber on the southern dunes had been removed by settlers prior to 1840 and with the advent of the barley days in Prince Edward County, cattle were taken from productive fields within the park and grazed on the grassy slopes and flats of the West Lake baymouth bar.

After 1850, the sand began to move, the delicate balance of the West Lake dunes upset by cutting, grazing and fire. By 1852, patches of sand were exposed in the large dunes along the Lake Ontario shore. Wind enlarged these areas and drove the sand over the rest of the dune area suffocating vegetation.

By 1881, the sand hills had gathered momentum. Large areas of mature cedar forest were inundated by sand. Fields in crop, a good sized apple orchard, roads and buildings went down before their advance.

In 1911, desperate local farmers attempted to stop the sand but they were only partially successful. One of them, Amos McDonald, sought government assistance. His persistence finally paid off in 1921 with the establishment of the Sandbanks Forestry Station. Sand was mulched, trees and cuttings planted and barrier fences of plank and lathe woven on wire were erected to hold the sand until the trees took root.

Thousands of trees were planted, but over the years the reforestation programme only slowed the advance of the dunes. It was not until an intensive planting programme during the 1950s and 1960s that the dunes were finally halted.

Beginning early in the twentieth century, Sandbanks became renowned as a place for recreation.

In southern Ontario, the agricultural business was booming, bringing with it an increase in disposable income and leisure time. This was the impetus for the development of several tourist establishments within the park. There was Lakeview Lodge, Lakeland Lodge, Evergreen Lodge, Ontario House, Shore Acres and the largest of all, Lakeshore Lodge. It was a massive, three-storey structure built in 1878 and advertised as a first class hotel near the most wonderful sand hills in the world.

Changing times, changing travel methods and changing recreational preference all spelled doom for the large vacation hotels. Evergreen Lodge was torn down in 1922. Ontario House burned in the early 1920s. The remaining four were purchased by the province in order to fulfil the needs for recreation in this part of the county. Today only Lakeview Lodge still stands. As the large resorts declined, the individual cottage came into its own. A large number now exist in the East and West lakes area.

By mid century, the beautiful beaches of Sandbanks and Outlet Beach were attracting thousands of visitors each year. In 1959 Outlet Beach Provincial Park was opened and in 1962, Sandbanks Provincial Park was created. Later the land between the two parks was purchased and the entire area amalgamated into a single park.

The various historical and cultural resources discussed here are shown in Figure 7.

Figure 8

Market Area

Three hour driving time

Two hour driving time

One hour driving time

0 10 20 40 60 80 100 km

North

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Table II

Camping Use of Sandbanks, 1980 to 1990

Year	Number of Campsites	Average Party Size	Camper Nights	Campsites Occupied	Average July August Occupancy
1980	433	2.2	112,674	29,601	93%
1981	433	2.6	109,134	30,809	89%
1982	433	2.6	109,286	30,654	87%
1983	411	3.6	113,233	31,364	94%
1984	411	3.6	114,261	31,739	95%
1985	411	3.6	116,739	31,644	96%
1986	411	3.7	119,419	31,546	95%
1987	411	3.8	127,585	32,782	94%
1988	411	3.8	123,631	31,871	92%
1989	411	3.8	121,466	31,339	93%
1990	411	3.8	116,758	30,726	94%

5.0 MARKET ANALYSIS

5.1 Market Area

Approximately 4.8 million Ontario residents live within a three hour drive of Sandbanks and constitute the park's primary market. The largest centres within the market area are Toronto, making up 43.9% of the market's total population and Ottawa-Carleton a distant second accounting for 11.6% of the total population.

Although not now a significant travel market for Sandbanks, upstate New York has a population of approximately 4.3 million and is a potential market area. Population centres within this three hour travel zone include Watertown and Syracuse.

Québec is not a major market, but portions of western Québec including Hull with approximately 140,000 people, as well as substantial portions of the counties of Pontiac (population: 20,000), Gatineau (population: 69,000) and Papineau (population: 35,000) are just beyond the three hour travel zone (see Figure 8) and could become a more important market.

Table III

Selected Responses to 1990 Camper Survey

Previous Camping Visits	
Yes	61.4%
No	35.6%
No response	2.9%

Type of Vacation	
Weekend	30.4%
Annual Vacation	67.7%

Average Number of Nights at Park	
1 night	13.1%
2 nights	21.9%
3 nights	20.7%
4 nights	13.1%
5 nights	6.1%
6 nights	14.0%
7 nights	5.2%
8 nights +	0.7%

Sleeping Shelter Used	
Tent	71.9%
Tent-trailer	14.9%
Travel trailer	3.8%
Motorhome	5.2%
Van	2.6%
Truck camper	0.8%

Reason For Choosing Sandbanks (Top 10 Responses)	
Swimming beach	51.1%
Recommended by friends	22.2%
Enjoyed previous visit	14.6%
Convenient location	14.0%
Campsites well serviced	11.6%
Good facilities	4.3%
Privacy	4.3%
Motorboating, sailing	3.8%
Park well run	2.3%
To enjoy nature	1.7%

Campers Participating in Recreational Activities (Top 10 Responses)	
Swimming, wading	86.8%
Casual play	68.4%
Picnicking	46.4%
Trail hiking	41.8%
View, photograph nature	38.8%
Visit viewpoints, lookouts	30.1%
Attend staff presentations	23.9%
Visit history, nature displays	22.8%
Bicycling	17.8%
Fishing	15.4%

5.2 Future Growth of the Ontario Market Area

Above average population growth is expected of the Ontario market area.

The population of the Greater Toronto Area (GTA) comprising Metropolitan Toronto and the regions of Durham, York, Peel and Halton is projected to grow from 3.7 million at the 1986 Census to 5.3 million by 2011. Its share of the total Ontario population will rise from 41.0% in 1986 to 44.8% in 2011.

Most areas surrounding the GTA (Simcoe, Dufferin, Wellington, Waterloo and Victoria) will continue to experience above average population growth as a result of their interaction with the GTA economy. The same holds true for counties near the Ottawa-Carleton Region, such as Prescott, Russell and Lanark.

The Ottawa-Carleton Region is projected to grow from 607,000 in 1986 to 776,000 in 2011.

Table IV

Visitor Services Contacts, 1990

Participants in Organized Activities	
Guided Hikes	902
Evening Programmes	7,834
Children's Programmes	1,329
Outdoor Recreation Programmes	243
Special Events	991
Cedar Sands Self-guided Trail Users	12,891
Visitors to Visitor Centre	11,637
Publications Distributed	
General	34,695
Park Tabloid	21,500

Growth rates for other major urban regions vary somewhat but tend to be close to the provincial average.

5.3 Camper Use

Statistics show Sandbanks to be fourth highest in camping use of all provincial parks in Ontario. In 1990, campers occupied 30,652 campsites. This number has remained relatively stable over the last ten years. A summary of camping use from 1980 to 1990 is given in Table 2.

The Ministry of Natural Resources regularly surveys users of its provincial parks. In 1990, both campers and day visitors using Sandbanks Provincial Park were surveyed. These data provide a valuable description of the characteristics of existing visitors to the park.

The survey of campers showed that:

. 51.4% were in family groups
. 70.9% were in groups of two to four persons
. 61.4% had camped at the park before, and
. 68.8% did not stay longer than four days

The survey also showed that swimming, casual play, picnicking, trail hiking, viewing and photography, visiting nature displays, viewpoints and lookouts were the most popular activities of the park's campers.

From the results of the 1990 survey, campers said they chose Sandbanks for a variety of reasons. The most cited reason was the beach which represented 51.1% of all responses. Twenty-two percent said they chose the park because it was recommended by others, 14.6% said that they chose Sandbanks because they enjoyed their last visit and another 14.0% said it was because of the park's convenient location. A more detailed description of selected camper responses is listed in Table 3.

Many visitors are still discovering Sandbanks for the first time. In 1990, only 61% of campers said they had visited Sandbanks before.

Sandbanks offers popular visitor services programmes with high attendance by campers at evening programmes, conducted hikes, displays, children's programmes, campfires and special interpretive

Table V

Day Use of Sandbanks, 1980 to 1990

Year	Daily Vehicle Permits Issued	Annual Vehicle Permits Issued	Bus Permits Issued	Total Day Users
1980	34,342	407	-	124,500
1981	36,455	517	32	138,347
1982	38,403	390	36	159,725
1983	54,404	516	39	211,444
1984	47,065	531	-	197,879
1985	50,658	449	62	212,673
1986	47,145	480	75	194,181
1987	56,835	498	37	249,151
1988	52,350	424	23	241,901
1989	50,314	372	27	222,545
1990	47,916	323	20	208,922

events.In 1990, 11,300 visitors attended personal services programmes. In addition, 11,637 visited displays at the visitor centre and 12,819 hiked the park's Cedar Sands trail. Participation in visitor services activities in 1990 is shown in Table 4.

In summary, Sandbanks seems to be an attractive place to camp for families seeking a good beach for swimming, an interesting area to explore and a variety of visitor services activities.

Camper origin data indicates that most campers travel between one to three hours to reach the park, and that of these, most are from metropolitan Toronto. Local area campers, and those from nearby Trenton and Belleville, are well represented. Other strong markets are the lakeshore corridor to the west, Ottawa-Carleton region and the Province of Québec.

In 1990, 65.7% of Sandbanks campers were on a vacation trip. A substantial 73.6% said that Sandbanks was their main vacation destination. Another 30.4% said Sandbanks was a weekend destination.

The average July/August occupancy rate for the park in 1990 was 94%. This high rate of occupancy is expected to remain constant owing to the popularity of the facilities, programmes and amenities available to campers.

5.4 Day Use

Day users arriving by auto make up about 65% of Sandbanks visitors on average. In 1990, Sandbanks day visitors purchased 47,916 day use permits. During the last five years, this figure which is highly influenced by weather has ranged from a high of 56,835 to a low of 47,145. In general, day use at Sandbanks has shown a steady increase over the last ten years. A summary of day use from 1980-1990 is given in Table 5.Asked their reasons for enjoying their visit to Sandbanks, day users suggested

good beach facilities, the picnicking opportunities, casual play, viewing and photographing plants and animals and trail hiking.

Day users participate in a wide range of outdoor recreation activities. These are shown in Table 6.

To summarize day use visitation trends, the Trenton-Belleville and more immediate local markets are

most important especially for the single day visit, while metro Toronto is also a strong contributor. As with camping use, Sandbanks attracts a notable number of day users on longer trips and from a variety of distant origins. The beach and related experiences are the major attraction for day visitors.

Many of Sandbanks' day use visitors (54.1%) are on a day trip from their permanent home. Another 45.9% however are staying at local campgrounds, cottages or resorts in the area. Table 7 lists the type of accommodations for day use visitors.

5.5 Napanee District Land Use Guidelines Recreation Supply

Sandbanks provides the following opportunities annually:

Picnicking	178,516	(27%)
Swimming	288,900	(27%)
Camping	111,930	

5.6 Other Recreation Parks in the Area

Sandbanks is the only provincial park in Prince Edward County providing camping. In addition to Sandbanks, two other provincial parks offer day use opportunities. North Beach Provincial Park on the western shore of the county offers beach-oriented day use for Belleville and Trenton area residents. In 1990, it accommodated about 27,000 visitors. Lake on the Mountain Provincial Park in the northeastern part of the county is a small picnic area which provides spectacular viewing of the Bay of Quinte. In 1990 about 81,000 people visited this park.The Prince Edward Region Conservation Authority operates six conservation areas for general recreation in Prince Edward County.

Near Sandbanks, private campgrounds have 1100 campsites available. Most of these are on East Lake and West Lake and cater to larger camping vehicles. These resorts usually offer sites for full season rental.

Across Adolphus Reach is Adolphustown Provincial Park operated by the St. Lawrence Parks Commission. It contains 109 campsites and a small day use area. West of the county, near Brighton, is Presqu'ile Provincial Park. With 400 campsites and over three kilometres of excellent beach, it accommodated 225,708 visitors in 1989 including 91,152 camper nights.

5.7 Impact of Sandbanks on Local and Provincial Economies

The management and operation of Sandbanks Provincial Park contributes significantly to the economy of the local area. In 1988-89, direct programme expenditures in the operation of Sandbanks were $670,745 while direct visitor expenditures within 40 km of the park amounted to $5,724,270.

A multiplier can be applied to park expenditures to determine the impact on Ontario's economy. Multipliers take into consideration the effect of investment and spending in surrounding areas. For Sandbanks 1988-89 expenditures, a total economic impact of $14,694,000 results. Similarly, the calculated impact of park expenditures on employment in Ontario is 324 full time jobs.

Table VI

Day User Participation in Recreational Activities, 1990

Swimming, Wading	87.3%
Picnicking	47.7%
Casual Play	44.1%
Viewing; Photographing Nature	18.9%
Trail Hiking	14.4%
Using Playground	5.4%
Visiting Viewpoints, Lookouts	5.4%
Bicycling	5.4%
Guided Hikes	4.5%
Visiting Historical, Nature Displays	4.5%

6.0 CONSTRAINTS AND CAPABILITY ANALYSIS

6.1 Significant Areas

Many special, unusual and significant features have been noted in previous sections. The location of the features is important, not only for observation or protection, but because they may impose restrictions on use, development or activities. Provincial Parks are established in part to secure for posterity representative features of Ontario's natural and cultural heritage. Sandbanks' significant areas can help meet this goal (O.M.N.R., 1978).

In resource studies in the park, the relative significance of natural or cultural features has been compared to other resources at the local (within the park or immediate area), regional (the Kingston area) or provincial levels. Important factors in assessing significance for plant and animal species or associations are occurrence (rarity), abundance or richness, seasonality relative to migration, and diversity. Plants may be rare in the province or region according to accepted authorities (Argus and White, 1976; Beschel et al 1970; Soper, 1966). Birds may be simply rare, of limited numbers; or rarely seen in the park, an occurrence outside normal range; or may be abundant in the park while unusual elsewhere. Foreign, accidental or vagrant birds also add to the list.

Earth science features are viewed relative to occurrence, degree of development, quality of representation of processes or a period in geological history, and completeness. Cultural features are related to a provincial historical theme, in view of size, condition and interpretive potential.

Life science, earth science and cultural significance were compiled to identify the significant areas shown in Figure 9. Areas of significant habitat are shown rather than specific locations of significant plant or animal occurrence. Species composition may also change as habitats evolve. Obviously, bird or animal habitat overlaps with vegetation, which may be determined by geological features, so significance may be due to several factors. In assessing significance, susceptibility to damage or disruption was not incorporated. However, the extent of present impact due to access, erosion or development has been considered. Following are descriptions of some of the significant areas.

Figure 9

Significant Vegetation

- Proposed park boundary
- Marsh
- Orchard
- Deciduous forest

Vegetation of provincial significance

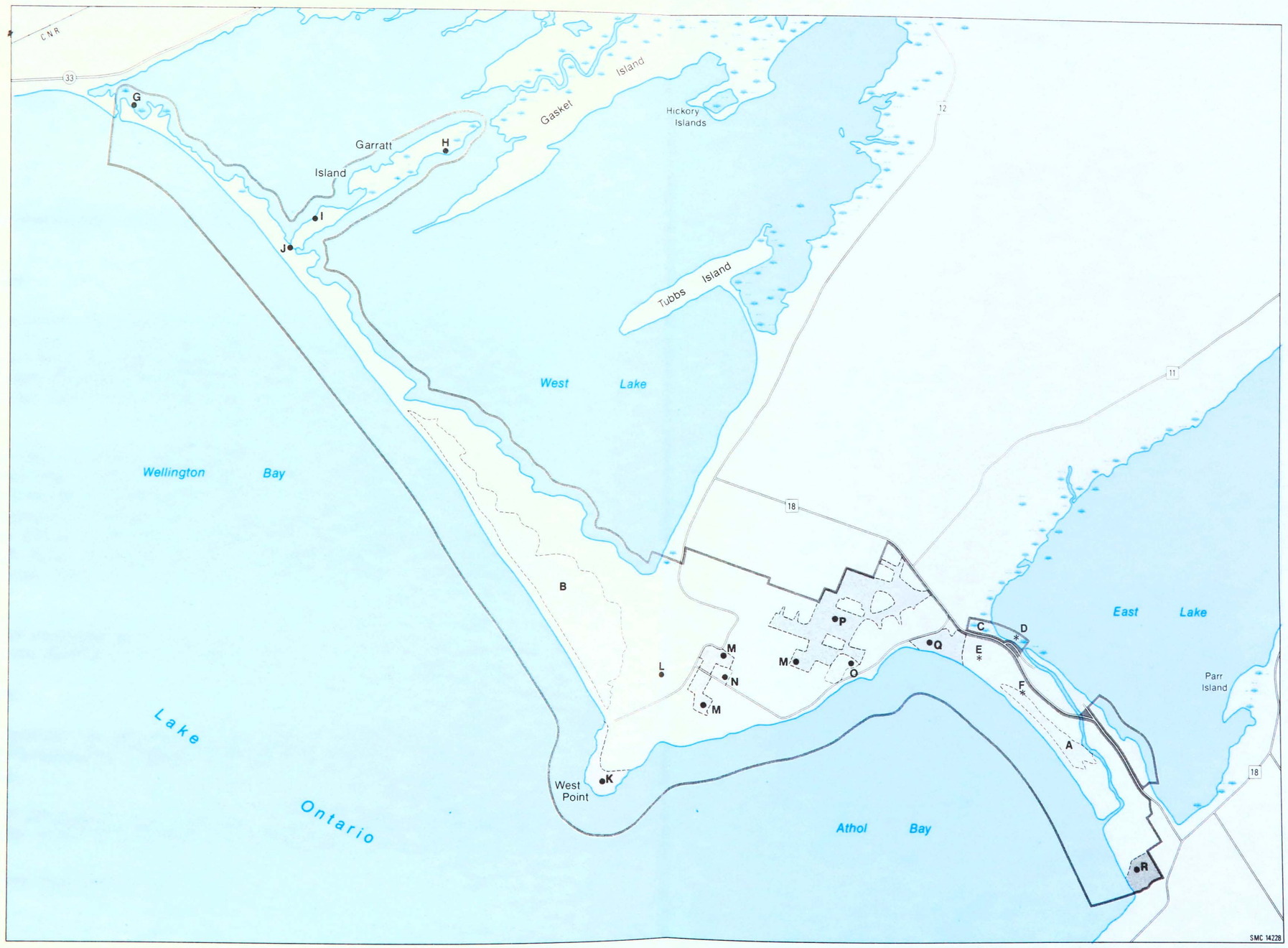
- A — Remnants of Outlet panne bluets and prairie relics
- B — Existing Sandbanks pannes
- C — Arrow arrum

Vegetation of regional significance

- D — Wild rice
- E — Northern white violet
- F — Dwarf mistletoe

Vegetation of local significance

- G — Relatively large cattail marsh (supports yellow throats and swamp sparrows)
- H — Marsh vegetation (supports long bill marsh wren)
- I — Greater lobelia
- J — Marsh grass (Phragmites communis)
- K — Ironwood (specimen 25" d b h.)
- L — Woodland bird breeding habitat: excellent viewing potential
- M — Sugar bush
- N — Cherry orchard
- O — Apple orchard
- P — Climax forest
- Q — Black cherry (specimen 23" d b h.)
- R — Black maple and sugar maple



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North

Note: The figures in this report are reproductions of those used in the 1979 Sandbanks Provincial Park Master Plan and are outdated in some areas. For example, the proposed park boundary does not reflect changes since 1979 in the area of Garratt Island and the area south of County Road 18 and east of County Road 12. These changes will be reflected in later planning documents.

Table VII

Accommodations for Day Users, 1990

Permanent Residence	54.1%
Home, Cottage of Friends or Relatives	7.2%
Hotel, Motel	7.2%
Private Campground	6.3%
Provincial Park Campsite	5.4%
Commercial Cottage, Cabin	5.4%
Resort, Lodge	4.5%
Personal Cottage	2.7%
Other	7.2%

6.1.1 The West Lake Baymouth Bar

The significance of this site lies in the excellent development of the coastal shore and sandbar landforms and vegetation, particularly in those of the sand dune and panne features, and the occurrence of its provincially and regionally significant flora. Notable among these are the following: Blue Willow (*Salix myricoides*), Beach Pea, Sea Rocket, Seaside Spurge, Beach Grass, Marsh Arrow Grass, Upland White Goldenrod, Hooded Ladies' Tresses, Twig Rush, Northern Meadow Spikemoss, Puccoon, Hybrid Horsetail and Hockberry.

The fauna includes over 200 species of birds, including records of Peregrine Falcon and Sharp-tailed Sparrow, neither breeding. There are historical records for sightings of very disjunctive accidental species including Anhinga, Long-billed Dowitcher and Little Blue Heron. As well, there are notable migratory populations of passerines, shorebirds and waterfowl, including records for Wilson's Phalarope and others which stage in the protected waters of West Lake and along the beaches. The site also supports several reptiles and over a half dozen amphibian species, including the Jefferson's Salamander. The near-shore waters of Lake Ontario and West Lake also provide spawning sites for pickerel, pike and herring.

The area presents many opportunities for interpretation and study of coastal shore and spit environments. The site is considered to be significant at a provincial level.

6.1.2 The East Lake Baymouth Bar

This site is a well developed coastal baymouth bar with dune landforms and remnants of coniferous lowland forest, panne meadows and dune vegetation. The central portion of the baymouth bar is considered to be of regional significance.

The significance of this central portion of the sandbar lies in the presence of a well developed baymouth sandbar, the coniferous and mixed forests which have stabilized the dunes and occupy the river flats,

and the regionally and provincially significant biota.

The biota is representative of the coastal sand spit natural features which include several provincially and regionally significant species. The flora has southern, northern and Great Lakes affinities with concentrations occupying the panne and coniferous forest habitats. Notable here are the following species: provincially rare: Arrow Arum; regionally scarce to occasional: Dwarf Mistletoe, Bluets, Hoary Puccoon, Stemless Blue Violet and others. The fauna of the site is restricted due to the campground activities. Nevertheless, many regionally representative species are recorded during the summer, and migratory species occur in the spring and autumn.

6.1.3 West Point Woodlots

The woodlots of the West Point lands provide a wildlife corridor which links the two sandbar areas. Some are mature forests which are considered to be of regional significance.

6.1.4 Other Sites

The site of the 1921 Sandbanks Nursery is not only of historical significance to the park area, but it is also a productive woodland bird breeding habitat which affords excellent viewing opportunities. The northerly tip of the West Lake sector and the southeasterly shore of Garratt Island provide excellent habitat for Yellowthroats, Swamp Sparrows, Marsh Wrens and waterfowl, while at the westerly end of Garratt Island regionally uncommon occurrences of Great Lobelia and Marsh Grass have been found. In the East Lake sector, Arrow Arum, considered rare in Canada, and Wild Rice, considered uncommon on a regional scale, occur in the marsh located outside of the present park boundary near the start of the Outlet River. At the northern end of the East Lake sector, occurrences of Northern White Violet and Dwarf Mistletoe have been identified while at the extreme southern end, a forest association of Black Maple, Sugar Maple, White Cedar and an extensive assortment of common and rare spring flowers occurs. Each feature is considered to be sensitive to the effects of heavy recreational use.

6.1.5 Cultural Resources

Several historical sites and cultural landscapes have been identified at Sandbanks. They are shown in Figure 7. Historical sites are related to agriculture and intensive recreational and commercial activities. Cultural landscapes reflect changing patterns in the human environment relationship at Sandbanks. These features reflect activities related to early settlement and agricultural development, reforestation and shipping.

6.2 Potential for Development and Use

Part of the constraints and capability analysis is the assessment of the suitability of land within the park for development and the relative intensity of development and human use practical in view of physical and aesthetic limitations and natural values.

Several factors are important in assessing development potential at Sandbanks. These include soil depth, soil type, permeability and parent material. Groundwater levels, drainage, slope and relief are topographic criteria. Erosion potential, especially by wind, was considered. Natural values including the importance, and susceptibility to disturbance of earth and life science features were incorporated into the assessment.

The importance of fragile earth and life science features, assessed relative to the effects which continued and possibly increased levels of recreation have on their value, establishes the baymouth bar and dune complexes as sensitive to development.

The development potential of the West Point area, though influenced to a certain extent by these

features, is most closely related to the properties of the various soils found there. Soil depth, natural drainage and response to periods of prolonged drought determine the ability of the area to support recreation, buildings, roads and waste disposal facilities.

Based on these factors, Figure 10 shows areas with similar development potential. The development potential is described by the following four categories:

High: These areas present minimum constraints to development and will generally support all types of development and a high level of human use.

Medium: These areas have some constraints on use. They can stand moderate development and moderately intense activities but require careful site planning to ensure that development and use capabilities are not overtaxed.

Low: These areas have severe constraints to their development and use. Trails and simple structures are permissible if carefully sited.

None: These areas are unsuitable for any kind of development due to unstable or hazardous conditions or the presence of fragile earth science, life science or cultural features.

Based on the foregoing analysis, the areas of best development potential are centrally located in the West Point area but are limited by the sensitivity and significance of a series of woodlots which form a wildlife corridor linking the two sandbar areas and the importance of the cultural features and landscapes predominant in this part of the park.

On the basis of the environmental analysis and the visitation records of the existing campgrounds and day use areas the following conclusions apply.

1. development has been too extensive in the East Lake sector
2. some areas of the resource are threatened by overuse
3. the resource must be protected
4. the recreational pressures on the resource are increasing
5. the West Point lands can provide for facility development provided that development is sensitively undertaken and recognizes the value of the natural and cultural features of the area
6. the sandbars and dunes should be sensitively managed for controlled recreational use

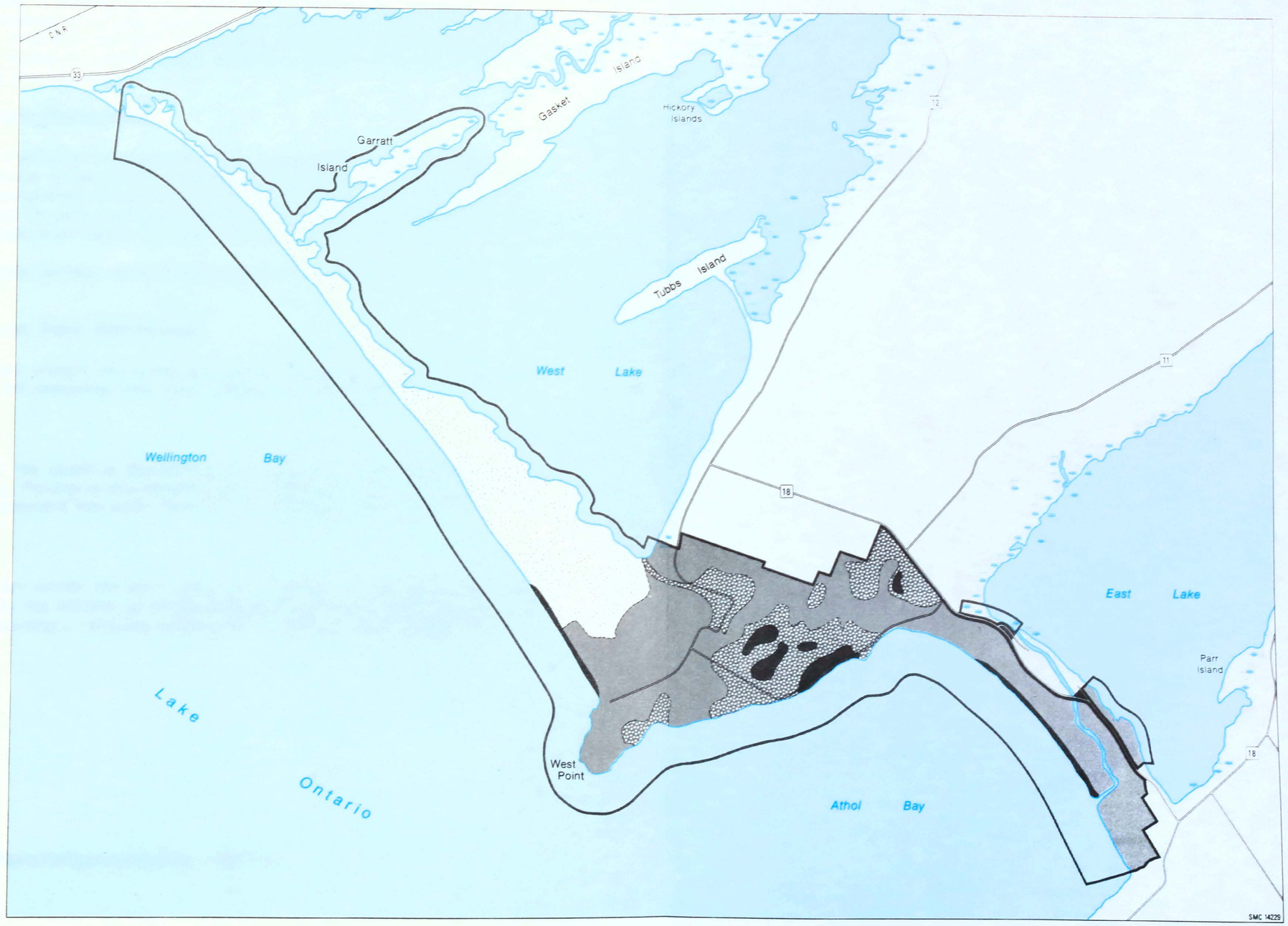
Figure 10

Development Potential

Proposed park boundary

Development potential

- High
- Moderate
- Low
- None



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North

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7.0 ISSUES TO CONSIDER

7.1 Resort Development

A 1983 study suggested that with reasonable public financial support, a family resort lodge at Sandbanks could be a viable business venture and contribute significantly to the economy of Prince Edward County. Provincial park policy allows for such facilities in provincial parks but only after a full review of proposals during management planning.

7.2 Access to Sandbanks Provincial Park

Concerns about increasing tourist traffic in Prince Edward County and specifically that destined for Sandbanks Provincial Park, were addressed in a 1988 transportation study. The study recommended among other improvements, a single multi-lane entrance into the park. This would avoid long line ups on the county road particularly on busy weekends, provide better control of use of park lands and lower costs of operating three entrances to one entrance.

7.3 Management of Heritage Resources

In 1972, the Ministry of Culture and Recreation recommended that management of park heritage resources allow the agricultural landscape at Sandbanks Provincial Park to provide the setting for new park development. This could be accomplished through continuing use of existing roads and paths; adaptive use of some historic buildings for park purposes, maintenance of present field patterns, hedgerows and fence lines, and through encouraging day use in traditional recreation areas.

Further analysis will determine how park heritage resources can best be managed using some of these recommendations.

7.4 Impact of Recreation on Park Resources

Environmental impacts of recreation are evident throughout Sandbanks, especially in the campground and day use areas. Further analysis will determine how these impacts may be lessened.

7.5 Beach Pollution

For the first time in the park's history, the beach at Sandbanks Provincial Park was declared by the local health unit as unsafe for bathing. Posting to this effect started August 10, 1990 and was lifted on August 24th. The Ministry of the Environment has been requested to investigate the situation.

7.6 Dump Site

Park solid waste now goes to a sanitary landfill site within the park. There are no other sites in Prince Edward County. The site is licensed by the Ministry of the Environment and reviewed annually by Ministry inspectors. The park will be starting a recycling programme in 1991 to reduce waste in the park.

7.7 Boat Access and Mooring at Athol Bay

Public access to the shoreline of Prince Edward County to launch or moor small boats is limited. Municipal councillors have encouraged the Ministry to consider water access facilities along Athol Bay. Water access will be considered in preparing a new management plan.

7.8 Jet Ski and Para-sailing Concessions

Requests for jet ski and para-sailing concessions have been received by park staff. The new management plan will address what sporting activities are appropriate at Sandbanks.

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