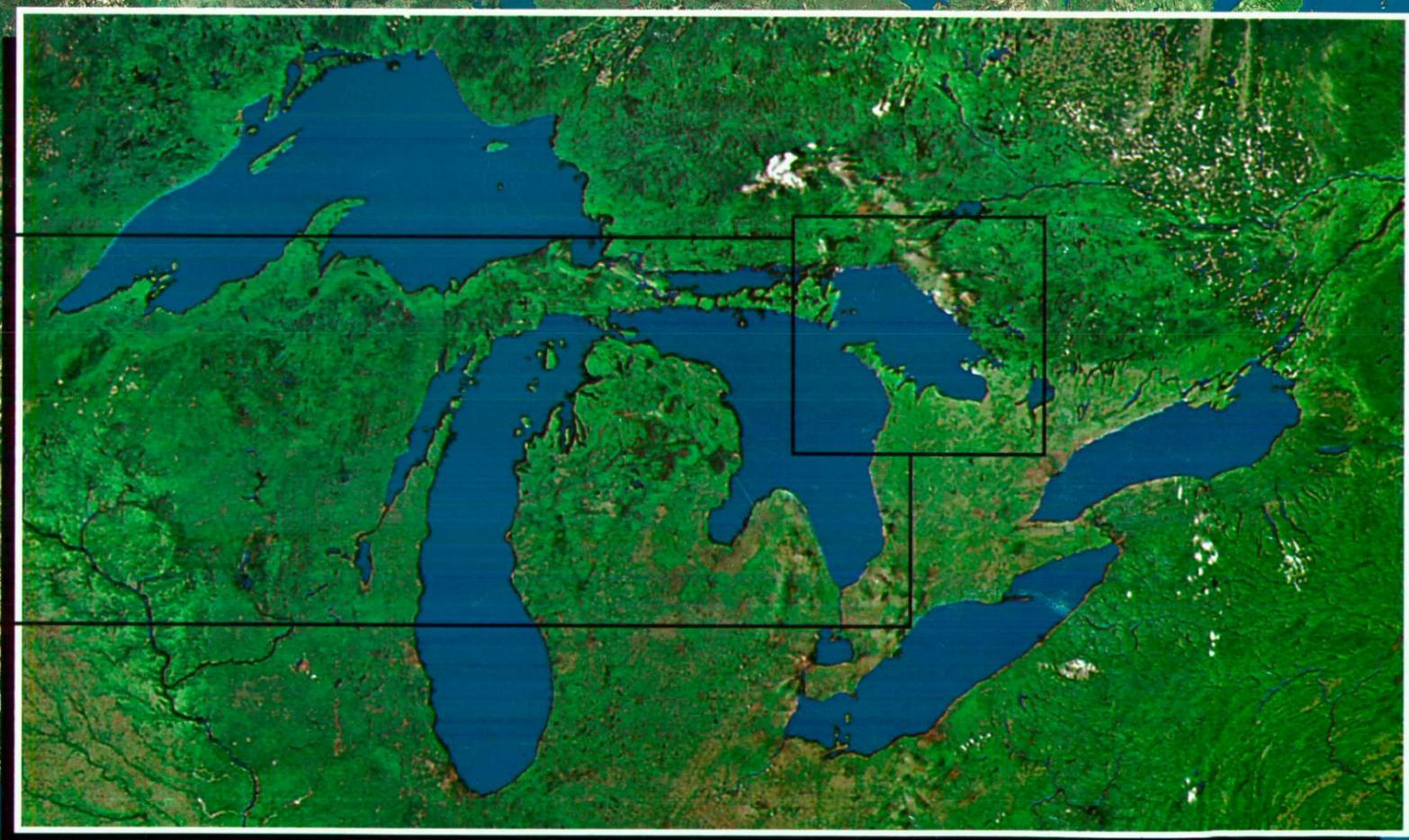


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**Environmental  
Sensitivity Atlas for  
Lake Huron's  
Canadian Shoreline  
(including Georgian Bay)**



Environnement  
Canada

Environnement  
Canada

Environmental  
Protection Branch  
Ontario Region

Direction générale  
de la protection de  
l'environnement  
Région de l'Ontario

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# Legend

- ESI\* Ranking**
- Shoreline Habitats**
- Bedrock or Impermeable Shores**
- 1a Exposed Bedrock Bluff less than 1 metre elevation
  - 1b Exposed Bedrock Bluff 1-5 metre elevation
  - 1c Exposed Bedrock Bluff greater than 5 metre elevation
  - 2 Retaining Wall/Harbour Structure/ Breakwaters
  - 3 Shelving Bedrock
- Unconsolidated Sediment Shores**
- 4 Exposed Sediment Bluff
  - 5a Sand Beach: Depositional
  - 5b Sand Beach: Erosional or Transitory
  - 6 Sand Barrier With Lagoon
  - 7a Pebble Beach
  - 7b Pebble/Cobble Beach
  - 7c Cobble Beach
  - 8 Rip Rap
  - 9 Boulder Beach
  - 10 Mixed Beach (% by sediment in DOE Database)
- Vegetated Shores**
- 11 Low Vegetated Bank (Grass or Trees)
  - 12 Delta Mud Flat
  - 13a Fringing Wetland
  - 13b Broad Wetland
- \* ESI - Environmental Sensitivity Index  
Higher numbers indicate greater sensitivity
- Biological Resources**
- Fish**
- Area of Seasonal Fish Spawning
  - Location of Seasonal Fish Migration
- Birds**
- Migratory Waterfowl
  - Colonial Nesting Birds (total nests - all species)
  - Wading Birds (total nests - all species)
  - Shore Birds
  - Raptors
- Shore Associated Mammals**
- Furbearers (such as Muskrat, Mink, and Beaver)
- Human-Use Resources**
- High Recreational Usage**
- Marinas and Small Craft Harbours
  - Anchorage Sites
  - Residential, Recreational or Cottage Use
  - High-Use Recreational Beach
  - Recreation Dive Site
- Resource Extraction**
- Water Intakes - Industrial
  - Water Intakes - Municipal
  - Outfall
  - Commercial Fisheries Activity
- Special Status Areas**
- Highly Sensitive Classified Feature (within 2km)
  - First Nation
  - National Park
  - Provincial Park, Nature Reserve or Wilderness Area
  - Conservation Area or Municipal Park
  - Environmentally Sensitive Area\*
  - Areas of Natural and Scientific Interest\*
  - Area of Ecological Significance (e.g. Wetland)
  - Dune Formations
- \* As identified by Ontario Ministry of Natural Resources or Conservation Authorities
- Countermeasures**
- Access Site (for land vehicles)
  - Approach Concerns: Foreshore Flats/Rocky Reef
  - Exposed Rock
  - Coast Guard Light Station
  - Boat Launch: Excellent
  - Boat Launch: Good
  - Boat Launch: Poor
  - Helicopter Landing Site
  - Staging Area: Excellent
  - Staging Area: Good
  - Staging Area: Poor
  - Automated Weather Stations

## Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline (including Georgian Bay)

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CANADA'S GREEN PLAN



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**Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline  
(including Georgian Bay)**

**Prepared by:**

Environment Canada  
Environmental Protection Branch  
Ontario Region  
1994

**These maps are not to be used for navigational purposes.**

While every effort has been made to ensure the accuracy, quality and completeness of the data contained in the Environmental Sensitivity Atlas (and Supplement) for Lake Huron's Canadian Shoreline, no responsibility will be accepted by Environment Canada for any consequential loss or damage arising from its use.

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## Atlas and Supplement Project Team

The following people were key members of the project team:

Project Manager - Brad Cumming (Environment Canada)

Atlas Editors - Brad Cumming, Philip Baker and Sheelagh Hysenaj (Environment Canada)

Data Collection and Processing Team - Nancy Hubbs, Angela Lee, Sheelagh Hysenaj, Steve Clement, Sue Lyn Chen, Laura Hammersley, Sandra Di Giantomasso, Rob Steeves, Christine Rowe (Environment Canada)  
George Ball, Larry Fletcher (Canadian Coast Guard)

Countermeasures Consultant - Janet M. Huehn

Geomorphology Consultant - Jeff Ollerhead

Digitizing and System Design Consultants - Christine Rowe (Environment Canada consultant),  
Michael Quinn and Bruce Mooney (DigiMap Data Services Inc.)

Layout and Printing Consultant - Frank Provenzano (Rawling Communications)

National Sensitivity Mapping Manager - Roger Percy (Environment Canada)

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## 1.0 Introduction

The "Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline" is a publication designed for use in response to spills of oil and other hazardous materials. This Atlas will allow responders to work from a common basis to rapidly identify the resources at risk during a spill. Information in the Atlas will assist decision makers to quickly assign priorities for protection measures.

This project is a collaboration of Environment Canada's Ontario Region office of the Environmental Protection Branch (EPB-OR) and Transport Canada's Canadian Coast Guard (CCG) Central Region office.

Two versions of this information have been produced; a softbound Atlas, and a hardbound Supplement to the Great Lakes Annex of the Canada-United States Joint Marine Pollution Contingency Plan. A limited number of copies of the hardbound, laminated Supplement have been produced. This version is designed for the day to day operational use by several agencies and organizations which have major spill related jurisdictional responsibilities, or deal with environmental emergencies on the Great Lakes on numerous occasions.

The Supplement is designed to complement the Joint Marine Pollution Contingency Plan, which contains additional spill response information such as spill response personnel and procedures. The Supplement differs from the Atlas only in its requirement for field durability, and the addition of several types of spill response countermeasures information that is critical to spill response decision makers.

A softbound version of the Lake Huron Atlas has been prepared for broad distribution to assist agencies and companies in spill preparedness and response. While it will be useful for resource management in general, the Atlas has been designed primarily to assist spill responders.

Numerous references are made in this publication to the Atlas, and to the Supplement. These references indicate the two versions described above. Both versions have been generated from Environment Canada's master database, which is the major product of the project. All data which have been collected and represented on the paper maps reside digitally in an electronic desktop environmental sensitivity mapping system, similar to a Geographic Information System (GIS). This system will readily allow additions or changes to the database so that updated versions of the Atlas could be released periodically. More importantly, the system will allow for enhanced spill response management at the time of a spill.

The electronic desktop environmental sensitivity mapping system is a continually evolving system. The Environmental Protection Branch (EPB-OR) would welcome additional information and updates that could enhance the master database. For questions, suggestions or concerns about this publication or the master database, please contact:

Regional Environmental Emergencies Coordinator (REEC)  
Environmental Emergencies Section  
Environmental Protection Branch, Ontario Region  
Environment Canada  
4905 Dufferin St., Downsview, Ontario  
CANADA, M3H 5T4  
(416) 739-5908

## 2.0 Project Background

In June, 1993, Environment Canada asked many agencies to assist in the development of the Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline. EPB-OR received an excellent response, with many agencies expressing interest or cooperating to provide data and expertise.

The Lake Huron project consisted of six major phases; digital base map preparation, data collection, data digitizing, legend definition, data overlay layer creation, and finally, Atlas layout design.

During the data collection phase in 1993-94, videotaped helicopter shoreline surveys were made of the lake, which facilitated the completion of shoreline classification, and identification of many countermeasure features. Biological and human-use resources data were assembled from reviews of existing information from partner agencies.

Environment Canada was given access to various agencies' resource information. Appendix A has a list of these agencies and the data they contributed. This resource information was subsequently transcribed and digitized to suit the electronic requirements of the production process.

A great deal of care was directed to the selection of legend features and symbols which would serve the immediate needs of spill responders on the Great Lakes. Specific electronic layers were created to present geomorphological, cultural, biological and human-use information.

With input from many response experts, the project team has designed the Atlas to convey critical information to a spill responder in a concise, straightforward manner, with a minimum of extraneous detail. Before final publication, these map pages for Lake Huron and the Georgian Bay were extensively reviewed by the key resource agencies instrumental in its development and future use.

### 2.1 Regional Approach within a National and International Framework

Every effort has been made to ensure that the Ontario Region master database will be compatible with the recommendations of Environment Canada's National Sensitivity Mapping Program, which is currently being developed. Consultations with the United States National Oceanic and Atmospheric Administration (N.O.A.A.) have ensured that data and sensitivity representations are similar to Atlas production underway for the United States shorelines of the Great Lakes. Close cooperation with Canadian Coast Guard operational officers dictated many of the design layout features of the Atlas and Supplement.

## 3.0 Environment Canada's Desktop Environmental Sensitivity Mapping System

The maps in this publication have been generated from Environment Canada's electronic desktop environmental sensitivity mapping system. The system currently employs MapInfo® software and MapBasic® programming language to overlay sensitivity and countermeasure data on electronic base maps.

To show all data at once on paper maps would impact on the clarity and utility of the publication. The specific resource agency information supplied to Environment Canada in the data collection phase of this project has been entered into a comprehensive master database. Information in this database will be readily available to responders in contact with Environment Canada during a spill. This database will also form an appendix to the Supplement version.

For base maps, National Topographic System (NTS) digital map sheets at 1:250,000 have been used as this was the only scale available for Lake Huron and Georgian Bay. On each map page of the publication, reference is made to the relevant NTS map sheet(s) covering that portion of shoreline displayed. Once data overlays (or 'layers') are added to the base maps, the assembled Atlas information is printed at a scale of 1:50,000, covering the entire 4,810 kilometers of Lake Huron and Georgian Bay shoreline in 136 map pages.

The system displays a latitude/longitude graticule superimposed over each map, with hatch marks for each minute of latitude or longitude, and darker hatch marks representing five minute intervals. A full degree is denoted by the thickest mark. Arrows in the corners of each map page point to the exact location of the displayed coordinates. This system has created maps employing an unprojected latitude and longitude coordinate system.

## 4.0 Nature of Data

### 4.1 Data Collection and Levels of Confidence

EPB-OR staff contacted or visited all contributing partner agencies between June 1993 and January 1994. Existing data were confirmed and new data sets were gathered or surveyed for the project. For collection of existing data, relevant maps, publications and databases were reviewed, with pertinent information transcribed and then digitized by Environment Canada. A new shoreline classification scheme, developed for spill response on the Great Lakes, defines 19 different shoreline habitats. This was the major component of new information specifically surveyed for this project.

Data in digital form existed for only a few legend features for Lake Huron. To some degree, data availability on the Great Lakes has dictated definition of Legend features and the manner they are displayed on the maps. To use a cross-hatched or coloured polygon to represent an area implies a level of certainty regarding the boundaries of that area. Such detailed boundary accuracy was not always available at the time of the data collection phase of the project.

For example, since fish spawning activity information was often supplied for general areas rather than for specific areas or points, a decision was made to use a point symbol, but one defined to represent a broad area, hence the Legend feature 'Area of Seasonal Fish Spawning'. This works well considering that the source information does not allow for the rigorous definition of exact boundaries of all fish activity; it more customarily identifies general areas of observed activity, or of suitable habitat. For spill response, it can be assumed that activity occurs in the general vicinity of each fish spawning symbol, with more specific information often being found in the 'Notes' column where available.

Fish spawning and migration data for the lake were often based more on suitable habitat identification than recent specific activity observations. Consultations with local resource experts can assist in defining boundaries more accurately at the time of a spill.

The majority of the Bird information is based on recent, thorough surveys conducted by the Canadian Wildlife Service and the Ontario Ministry of Natural Resources. 'Shore Associated Mammals' information is based on observations by local authorities, or identification of suitable habitats. 'High Recreational Usage', and 'Resource Extraction' features are based on documented surveys. Prior to publication, these locations were thoroughly reviewed and modified by local individuals familiar with the lake's different regions.

For 'Special Status Areas', polygon boundaries have been digitized as provided by various agencies and are considered accurate and up-to-date. 'Countermeasures' symbols were placed following EPB-OR video review sessions and helicopter and ground surveys between July and October 1993. These symbols were then reviewed for accuracy and modified where necessary by local experts familiar with the areas involved.

The geomorphology of approximately 98 percent of the Canadian shoreline of Lake Huron and the shoreline of Georgian Bay was newly classified by the project geomorphologist during the 1993 helicopter survey which was undertaken specifically for this project. Videotapes were filmed during these surveys then reviewed to confirm the shore classifications that comprise the 'Shoreline Habitat' layer of information. The confidence level for these data is excellent.

These 'Shoreline Habitat' classifications are an excellent guide for responders at the time of a spill. On-site examination (or 'ground truthing') will ensure that any minor discrepancies are identified during spill response.

## 5.0 Atlas Design and Function

### 5.1 Symbology and Use of Colour

Each Legend 'feature' represents a different 'layer' of information. These features have been defined by three types of symbols: point symbols, line symbols, and areas, or polygons. A Municipal Water Intake is an example of a point symbol, a Shoreline Habitat classification is a line symbol, and a National Park is an example of an area or polygon, with defined boundaries.

Colour has been used to provide a richness in display and to denote differences among similar symbols, such as an excellent and a poor boat launch. It also distinguishes different shoreline classifications. To assist users in discerning one shoreline colour from another, a removable Legend guide has been included with the Atlas in a pocket attached to the back cover. If required, users may line up this card over the shoreline habitat in question to determine the exact colour code for any given habitat.

During spill response, photocopying and facsimile transmission form a large part of information transfer. Each of the symbols chosen are unique (with only a few exceptions) so that black and white reproductions of the Atlas pages will result in minimal information loss.

For Shoreline Habitats, colour coding is the best manner to convey this key information without obscuring other valuable data on the maps. In situations where colour cannot be conveyed, the electronic system can produce maps showing Shoreline Habitats by Environmental Sensitivity Index (ESI) number, rather than colour, to meet these needs.

### 5.2 Sensitivity Ranking

Much international work has gone into determining environmental sensitivity ranking schemes. It is a very complex undertaking. Shoreline habitats, biological, cultural and human-use resources all form an intricate relationship with many different potential impacts at the time of an oil spill. Some ranking schemes endeavour to weigh many factors and values to come up with a single numerical ranking indicating relative sensitivities of all resources in question. From this ranking, protection and clean up priorities are assigned when deploying limited response equipment and available resources. Alternatively, some atlases limit information to identifying the location of resources at risk without ranking them.

Some sensitivities are readily identified and ranked, such as shoreline habitats. Other resources' relative sensitivities can be completely dependent on circumstances surrounding the spill itself. During any significant spill, a consultation among spill response experts will consider those spill-specific circumstances before coming up with the set of protection and clean up priorities appropriate for that particular incident.

Taking this into consideration, the Environmental Sensitivity Atlas (and Supplement) for Lake Huron's Canadian Shoreline (including the Georgian Bay shoreline) ranks 'Shoreline Habitats' in order of increasing sensitivity based on factors such as oil residence time, cleaning potential and exposure. Features such as 'Biological Resources' and 'Human-Use Resources' are identified on the maps, but are not specifically ranked in relation to one another. Broad terms such as low, moderate or high priority are used in the 'Notes' column on many map pages to give an indication of relative sensitivity. Relative sensitivities are broadly discussed in the text of Section 7.0, but the final prioritizing decisions will be made by qualified response experts at the time of the spill.

## 6.0 Description of Atlas Legend Features

A colour example of the Environmental Sensitivity Atlas legend is shown in Figure 1. Figure 2 identifies standard features on the base maps in the Atlas and Supplement. A definition of each Environmental Sensitivity Atlas legend feature follows in Sections 6.1 through 6.4. Section 9.0 defines the Shoreline Habitats found in the Atlas.

The size of the symbols in the legend do not represent the exact size shown on the individual maps, due to space constraints.

Figure 1: Environmental Sensitivity Atlas Legend

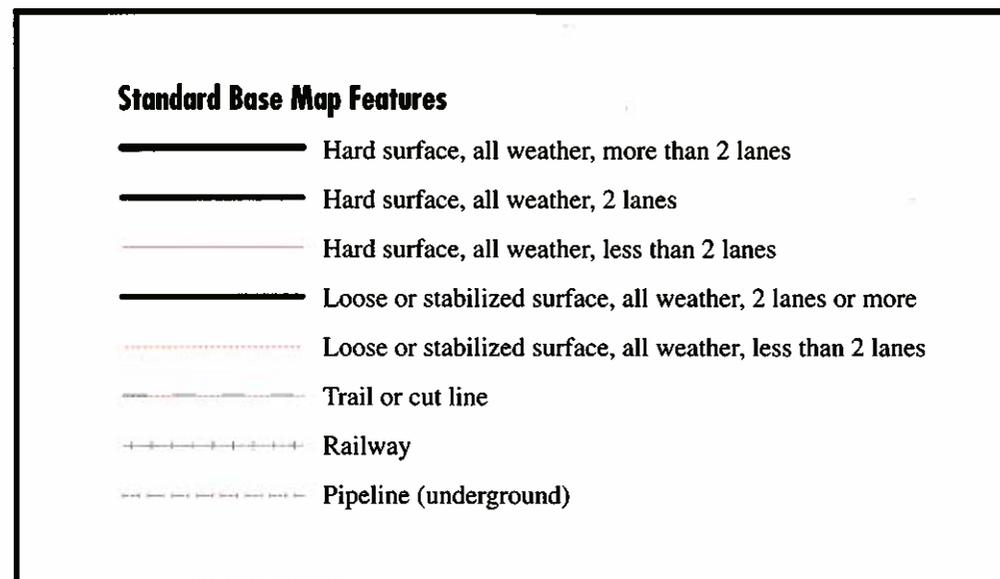


Figure 2: Standard Cartographic Legend for Base Maps



## 6.1 'Notes'

One current constraint of the electronic desktop mapping system is that it does not allow the use of symbology to identify both species and their seasonality in a clear, easily understood manner. The central objective of the Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline is to present mapped sensitivity information that may be readily understood at a glance by spill responders.

To achieve this objective, the 'Notes' column on the side of each map page displays species and seasonality information, where available. The symbol on the maps for 'Notes' is a red exclamation point with a white number inside it. Each numbered 'Note' symbol on a map corresponds to the same number in the 'Notes' column for that page. These 'Notes' also highlight important site-specific facts or concerns for the responder. The 'Notes' are anecdotal but can be expanded in future Atlas updates as more sensitivity information becomes available.

## 6.2 Biological Resources

Biological Resources include broad groupings entitled Fish, Birds, and Shore Associated Mammals. While specific species information is valuable to the responder, the 'top layer' of an Atlas should provide a straightforward initial indication of the general biological activity in an area. The responder can quickly get a sense of local sensitivities without deciphering complex symbology, or cross-referenced tables of data. This latter detail will be required, but it can reside in the 'hidden layers' of the master database, for use by responders in consultation with local resource experts at the time of a spill.

A limited amount of data was available for rare plant species along the Lake Huron and Georgian Bay shoreline. Rare plants are highly sensitive to human activity, and to some degree, to oiling. Reported species and locations have been described in the 'Notes' column. In general, they are sporadically located along the Lake Huron and Georgian Bay shoreline, from Square Bay to Michael's Bay, on Flowerpot Island, Bedford Island, Misery Point, in Matchedash Bay, Howdenvale Wetland, and in the Wasaga Backlands.

### 6.2.1 Fish

#### 'Area of Seasonal Fish Spawning' and 'Location of Seasonal Fish Migration'

In the Lake Huron Atlas, the available data collected focused mainly on known areas of spawning and migration activity for fish species having commercial or recreational value. Site-specific information on non-commercial or non-sport fish species was not readily available during data collection for Lake Huron and Georgian Bay. The primary forage fish on Lake Huron and Georgian Bay include herring and smelt and appropriate references have been made throughout the Atlas and Supplement. As more information becomes available, it will be incorporated into Environment Canada's master database, and Atlas updates.

As explained in Section 4.1, to use a polygon to represent an area implies a level of certainty regarding the boundaries of that area. Since fish spawning activity information was supplied for general areas, a point symbol defined as an area is used. The symbol for 'Area of Seasonal Fish Spawning' is used to denote habitats such as fish spawning streams, reefs and beaches, and also locations where sensitive life stages (egg, larvae and juvenile) are concentrated. For 'Location of Seasonal Fish Migration', the symbol is typically placed at the mouth of a river or stream known to be used for migration.

For spill response, it can be assumed that activity occurs in the general vicinity of each fish symbol, with more specific information often being found in the 'Notes' column when available. Consultations with local resource experts can assist in defining boundaries more specifically at the time of a spill. In times of emergency, the Atlas symbols will provide critical initial information regarding fish spawning and fish migration. The following species and seasonality information for Lake Huron and Georgian Bay was supplied by the various District offices of the Ontario Ministry of Natural Resources (OMNR). This general information will complement details found on the individual maps.

Commercial fish species in Lake Huron and Georgian Bay include lake herring, lake trout, whitefish and smelt. Sport fishing species include lake trout, rainbow trout, coho, chinook and pink salmon, yellow perch, white sucker, northern pike, smallmouth bass, black crappie, and walleye. These species occur along the Lake Huron and Georgian Bay shoreline, in some bays and in most tributaries.

Lake trout spawn between late September and early November on gravelly beaches and rocky shoals in shallow water.

Whitefish are especially abundant along the shorelines of Lake Huron in the fall. Adults congregate in shallow water (usually at depths of less than 8 metres) in November and December to spawn. Young whitefish are found in the shallow inshore waters until the early summer when they move into deeper water.

Lake herring generally occupy the open lake in water 15 to 50 metres deep. They spawn in late fall to early winter.

Rainbow trout enter most tributaries to spawn during April and May after the peak smelt runs and smaller runs occur in the fall months.

Brown trout enter tributaries to spawn in late fall.

Smelt are present in most streams in spring.

Coho and chinook salmon are fall spawners occurring in many Lake Huron tributaries. Pink salmon are also present in the lake.

Smallmouth bass spawn in June and are present in clear, rocky waters with very little vegetation.

Yellow perch spawn in April and May and are present in clear waters with some vegetation.

Northern pike spawn in early spring and enjoy quiet, vegetated waters.

### 6.2.2 Birds

Areas requiring protection in the case of an oil spill include staging areas for migrating birds, breeding colony sites, important feeding areas of wetlands along the shore, and endangered species habitats. Through a combination of Notes and symbols, these areas have been identified, or the information is available in the master database wherever such data were supplied for the lake.

#### 'Migratory Waterfowl'

This category is comprised of both migrants and breeders which are present on the lake for at least part of the year. Species such as Canada geese and various dabbling ducks (including the mallard, black duck, American wigeon and teal), are found on shoreline wetlands and in sheltered bays. Species preferring an open water habitat include loons, grebes and the diving ducks (including common goldeneye, canvasback, scaup, redhead, scoters and mergansers). The 'Notes' column will often identify critical staging areas and wetlands for these migratory waterfowl.

#### 'Colonial Nesting Birds (total nests - all species)', and 'Wading Birds (total nests - all species)'

Regarding colonial waterbirds, the information presented in this Atlas was obtained as part of a program to census all gulls, terns, cormorants, herons and egrets nesting on the Great Lakes during 1989 to 1991. This program was carried out simultaneously in Canada and the U.S. In Canada, the program was coordinated and supervised by the Canadian Wildlife Service (CWS).

CWS is preparing a number of Technical Reports, which together will constitute the Atlas of Colonial Waterbirds Nesting on the Canadian Great Lakes. The CWS Technical Reports will provide detailed information, compare present (1989-91) breeding distribution and abundance data with data for earlier years, and discuss the census findings in a biological context.

The Technical Reports will also deal with the relative scarcity of different species and habitats, and their needs for conservation. For more information on the Atlas of Colonial Waterbirds Nesting on the Great Lakes, please contact Dr. Hans Blokpoel or Mr. Gaston Tessier, Canadian Wildlife Service (see Appendix A under 'Bird Information').

There are numerous species of colonial waterbirds that nest regularly on the Canadian Great Lakes and associated wetlands, with several of these species nesting in the Canadian portion of Lake Huron and on Georgian Bay: Herring Gulls, Double-crested Cormorants, Great Blue Herons, Black-crowned Night Herons, Ring-billed Gulls, and Caspian and Common Terns.

Cormorants are large, dark-plumaged birds with long necks and long bills with a sharp hook at the tip. Terns are small to medium, light coloured birds with forked tails and long narrow wings. Gulls are medium sized birds with long wings and rounded tails. Wading birds such as the Great Blue Heron are easily recognized by their distinctive long legs, neck, and bill.

All nesting locations were provided by CWS from their 1989 to 1991 census. In the Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline, two symbols are used to indicate nesting colonies of waterbirds. One symbol, a gull in flight ('Colonial Nesting Birds'), represents nesting locations for gulls, terns and cormorants. The other symbol, a standing heron ('Wading Birds'), represents nesting or breeding by herons.

Where they occur on the individual map pages, these two symbols are followed by a number representing the total number of nests for all species at that location. Note that the species-specific nest numbers are available in the master database. The total nests number was used for a quick reference to give responders an order of magnitude idea of site-specific occurrence of the category; for instance, less than 10 nests is a lower priority; 10 to 100 is of higher priority; and over 100 nests is a high priority concentration.

Of course, number of nests is not the only consideration in setting spill response priorities, but this information will assist responders in initial assessments. The numbers are provided only as a guideline for deploying limited resources; in the event of a spill, the Canadian Wildlife Service will be consulted for specific species information that may change priorities. When a 'Wading Bird' or 'Colonial Nesting Bird' symbol occurs without a number in brackets, it represents a foraging location and is typically mentioned in the 'Notes' column.

#### **'Shore Birds'**

This category includes species such as sandpipers and plovers which are small, active birds with short to medium length legs and bills. They can be found nesting and feeding on sand or gravel beaches along Lake Huron and Georgian Bay during the ice-free season.

#### **'Raptors'**

The three most important raptor species found along the shores of Lake Huron are osprey, peregrine falcons, and bald eagles. Both the bald eagle and peregrine falcon are endangered species (CWS). Exact nesting locations of these raptors remain classified in the master database for use by responders during an environmental emergency.

### **6.2.3 Shore Associated Mammals**

#### **'Furbearers (such as Muskrat, Mink and Beaver)'**

This biological grouping includes mammals such as otters, muskrats, minks, or beavers, that are known to occur along the shorelines of the Great Lakes and its tributary rivers. Wetlands are the most important habitat for these species. Several species, such as muskrat, beaver and mink have economic importance.

The 'Notes' column will also periodically make reference to shore associated mammals, such as deer. Larger mammals, such as moose and bear, also occasionally come to the shore, but their locations cannot be pinpointed on the maps. Rather, a general comment can be made to alert responders to be prepared for possible encounters with these mammals during shore clean up activities. Oiled carcasses should be removed from shores whenever practical to prevent their ingestion by mammals or raptors.

Note that no symbol was used to denote reptiles. Relatively few species of reptiles are associated with the shorelines of the Great Lakes. The Port Severn-Sturgeon Bay area of Georgian Bay is a significant turtle habitat.

There was essentially no information available for amphibian distribution. Amphibians are at risk during an oil spill, but mapping their distribution would not be practical. Amphibians are dependent on water, especially wetlands. (Owens et al., 1992). The Atlas identifies wetland habitats. By protecting these areas against oiling,

reptile and amphibian populations will be taken into account, along with birds, fish, and mammals. In the few exceptions where specific information exists, the 'Notes' column includes a reference.

## **6.3 Human-Use Resources**

Human-Use Resources are features that have a heightened sensitivity or value because of their use or importance to humans. Locations with these symbols will typically have higher protection and clean up priorities associated with them. These features include areas of high recreational usage, economic benefit or special status (cultural, scientific or ecological importance).

### **6.3.1 High Recreational Usage**

#### **'Marinas and Small Craft Harbours'**

In order for a facility to be designated with the 'marina' symbol, it must have fuel, docking, parking and telephone facilities. Small Craft Harbours, under the jurisdiction of the Department of Fisheries and Oceans, are also included.

#### **'Anchorage Sites'**

These sites offer suitable and secure anchorage for small craft. They are often located in sheltered bays or inlets.

#### **'Residential, Recreational or Cottage Use'**

This symbol includes cottages, seasonal and permanent dwellings, resorts, campgrounds, picnic areas, and trailer parks. Residential 'clusters' were often grouped together and denoted by a single symbol.

#### **'High-Use Recreational Beach'**

These areas have a heightened sensitivity during the summer months.

#### **'Recreational Dive Site'**

These locations have been identified by the Ontario Underwater Council and the Ontario Ministry of Culture, Tourism and Recreation.

### **6.3.2 Resource Extraction**

#### **'Water Intakes - Industrial'**

This symbol denotes locations where water is extracted from Lake Huron and Georgian Bay for industrial, non-food related uses.

#### **'Water Intakes - Municipal'**

This symbol denotes locations where water is extracted from Lake Huron and Georgian Bay for community use for drinking water or food processing.

#### **'Water Outfalls'**

This symbol denotes locations where water is discharged to Lake Huron and Georgian Bay. Though outfalls are not water resource extraction elements, they are associated with water-use operations.

#### **'Commercial Fisheries Activity'**

The 'Commercial Fisheries Activity' symbol was used where such activity was specifically identified in source data either for shore activity such as a primary fish processing facility, or areas along the shores where commercial fishing activity takes place, including harvesting and stocking. Individual map pages identify specific commercial and recreational fishing areas. Generally though, this activity can occur anywhere on Lake Huron and Georgian Bay unless otherwise noted (for instance, restricted areas). Commercial fish farming locations identified on Lake Huron and Georgian Bay include Depot Harbour, Bedford Harbour and La Cloche Channel. Licensed trap lines exist near the Lake Huron shoreline, from south of Kettle Point to near Sarnia. More specific Commercial Fisheries Activity data may be added to the database as they become available.

### 6.3.3 Special Status Areas

These are areas where implementation of protection measures and/or assessment of the effects of oil spills are considered a high priority.

#### 'Highly Sensitive Classified Feature (within 2 km)'

Certain information sets were of a restricted nature due to the high biological, cultural or physical sensitivity of the features described. Endangered species information and archaeological sites are two examples. Exact locations and details are maintained in Environment Canada's master database, but agencies providing the source data did so only with the understanding that this information would not be made readily available, except to responders.

In the event of a spill, responders will report all occurrences of this symbol in an effected area. By reporting the number inside the symbol, they will immediately receive the appropriate information and response advice from Environment Canada (416-346-1971) and the agency that provided the source data, so that they can effectively implement protection and clean up measures.

#### 'First Nation'

There are 21 First Nations identified along the shoreline of Lake Huron and Georgian Bay. A reference to the local First Nation Chief in each case is made in the 'Notes' column so that responders may contact them when responding to a spill in their local area, or when a spill threatens to impact their property.

#### 'National Park'

National Parks managed by the Canadian Parks Service are identified by a polygon symbol on the map pages. These can include underwater parks, such as the Fathom Five National Marine Park located at the northern tip of the Bruce Peninsula.

#### 'Provincial Park, Nature Reserve or Wilderness Area'

Provincial Parks, Nature Reserves or Wilderness Areas are areas representing different classes of provincial parks under the jurisdiction of the Ontario Ministry of Natural Resources. Where possible, the 'Notes' column addresses sensitive features specific to the identified area.

#### 'Conservation Area or Municipal Park'

These are areas along the lakeshore managed either by Conservation Authorities or municipalities, and may include urban recreation areas.

#### 'Environmentally Sensitive Area'

These are areas designated by Conservation Authorities, or sensitive areas identified by the Ontario Ministry of Natural Resources in their Sensitive Area Reports (SAR). They have especially sensitive features which are identified in the 'Notes' column.

#### 'Area of Natural and Scientific Interest'

An Area of Natural and Scientific Interest (ANSI) is designated by the Ontario Ministry of Natural Resources and is an "area of land and water containing natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study or education.

"Where ANSIs occur on public lands managed by the Ministry, it will ensure that the land uses and activities which occur, provide for the protection of the identified values.

"On private lands, the Ministry will, through cooperation with others, attempt to ensure that landowners are aware of significant features on their properties and seek the owner's cooperation in protecting such features." (OMNR, 1983)

Site-specific information for ANSIs is detailed in the 'Notes' column.

#### 'Area of Ecological Significance (e.g. Wetland)'

Significant wetland areas along the shores of Lake Huron and Georgian Bay have been identified by several agencies providing source data. Their particular sensitivities are represented by a combination of Biological Resources symbols and entries in the 'Notes' column. These areas defined by polygons are in addition to the broad and fringing wetland habitats that have been identified along the shore as part of the shoreline geomorphological classification (Shoreline Habitats). The polygons are used to show the extent of the most significant wetland areas.

"Wetlands support many species of water-associated terrestrial animals. Waterfowl (ducks, geese and swans) and herons are dependent on wetlands, primarily during migration and nesting periods. Many species of amphibians are especially dependent on wetlands throughout their annual cycles. Several species of mammals use wetlands during parts of their annual cycles, but a few, such as muskrats, beaver and mink, are essentially year-round inhabitants. Lakeshore and connecting channel marshes in particular, provide critical feeding, nesting, rearing and moulting habitats for a wide variety of waterbirds and waterfowl." (Owens et al., 1992).

For a discussion of the different types of wetlands present on the Great Lakes, see Environment Canada's "Oil Spill Shoreline Clean Up Assessment Team (SCAT) Manual for the Ontario Great Lakes and St. Lawrence River Shorelines" (Owens, 1992), or consult the Ontario Ministry of Natural Resources.

Areas with unique and regionally or seasonally significant habitats (e.g. migratory stopovers) are also considered to be Areas of Ecological Significance.

#### 'Dune Formations'

This line symbol denotes areas along the shore where vegetated or unvegetated sand dunes exist. Their sensitivity is outlined in the 'Notes' column for responders. Damage to vegetation on dunes can lead to further dune erosion.

## 6.4 Countermeasures

#### 'Access Site (for land vehicles)'

This symbol identifies locations where a good road is close enough to the shore, and an existing trail is adequate to walk to the water and drag boom and light equipment for response purposes. Note that any access over private property will require permission from the landowner before response activities commence at that location. The same applies to the use of private boat launches.

#### 'Approach Concerns: Foreshore Flats/Rocky Reef'

These markings denote some of the features that will be of concern to responders when approaching a shore from the water. These markings are meant to reinforce existing navigational aids and charts, not replace them.

#### 'Exposed Rock'

This marking denotes a feature that will be of concern to responders during response activity. These markings are meant to reinforce existing navigational aids and charts, not replace them.

#### 'Coast Guard Light Station'

This symbol shows the approximate location of manned or unmanned Canadian Coast Guard light station installations. Equipment and facility details vary by location; full information is maintained in the master database. Often, facilities such as helicopter pads, docking facilities and buildings will also be identified by their own corresponding symbol.

#### 'Boat Launch: Excellent'

A boat launch is rated "excellent" if it has a large, firm surface ramp into deep water, is protected from waves, has good road access, and has sufficient space for manoeuvring large trailers. Docks to accommodate large boats must also be present.

### **'Boat Launch: Good'**

A "good" boat launch has a solid ramp for small vessels leading into deep water.

### **'Boat Launch: Poor'**

A "poor" boat launch symbol marks a site where a ramp of gravel exists, or merely a trail over the beach. Such sites may need additional work before being useable for response efforts. Certain additional locations have been described in the 'Notes' column as suitable sites for dragging small craft over the sand or cobble beach, but these have not received boat launch symbols.

### **'Helicopter Landing Site'**

Only designated sites with proper pads able to accommodate large helicopters such as the Coast Guard's '212' (or equivalent) are noted. Pilots will advise on other acceptable landing sites, as required, during response to a spill.

### **'Staging Area: Excellent'**

Staging areas are locations for setting up and deploying response equipment and for establishing command centres or outposts. Before a staging area is rated "excellent", it must have large parking and storage space, a building suitable for operational headquarters, adequate power and telephone, road and water access, and sufficient docking facilities.

### **'Staging Area: Good'**

A "good" staging area has road and water access, telephone, power, parking space, and facilities adequate enough to establish a small or secondary command post/headquarters.

### **'Staging Area: Poor'**

A "poor" staging area is in a more remote location, and is probably the only site available. It will have road and water access, as well as space for a command post trailer.

### **'Automated Weather Stations'**

These locations have been identified by Environment Canada's Atmospheric Environment Service to give an indication of the nearest station to a given spill. Portable emergency equipment is available for site specific weather reporting in case of an environmental emergency.

## **Additional Countermeasures Note:**

The Supplement version of this Atlas includes additional layers of information for use by spill response experts, as outlined below:

### **'Equipment Depot' and**

### **'Boom Storage Site (Marine Emergency Response Trailer)'**

Canadian Coast Guard and Canadian Petroleum Products Institute response equipment depots and boom storage sites (Marine Emergency Response Trailers) are identified on appropriate map pages, as symbols, in the Supplement.

### **'Location of Collection and Recovery Site'**

These locations mark areas where oil will likely collect naturally, and where clean up activities could be carried out, for instance on sand beaches or platform rock. In some cases, booms could be used to direct oil to these locations to facilitate clean up and protect more sensitive adjacent shores.

### **'Suggested Boom Deployment'**

These markings show only suggested positioning of boom. They do not give boom length requirements. The master database will describe the use for the boom i.e. whether deflection, exclusion or containment booming should be used, or suggest the sealing of a culvert in a causeway.

These boom deployments are only suggestions for protection measures. The actual deployment of boom during an environmental emergency will be guided by spill response experts, after a prompt review of the circumstances related to the actual spill.

## 7.0 Sensitivities of Biological Resources; Vulnerability to Spilled Oil on the Great Lakes

This section includes direct quotes or summaries of information from the Canadian Wildlife Service and the Natural Resource Response Guide Series produced by the U.S. National Oceanic and Atmospheric Administration (N.O.A.A.). Such guides, along with local resource experts, may be consulted to obtain specific information regarding life history, habitat preferences, behaviour, and other ecological factors that influence sensitivity to spilled pollutants.

A short description of the sensitivity to spilled oil or hazardous materials will follow for the biological groupings of fish, birds and shore associated mammals. Prior to discussing individual biological groupings, a few definitions will assist responders in determining the expected impact of spills.

**Aromatic hydrocarbons** are a major group of cyclic petroleum hydrocarbons such as benzene and toluene that are moderately soluble in water and are generally highly toxic to aquatic organisms. **Refined oil** is the product of distillation of crude oil into light or heavy components. Light refined oils include gasoline, kerosene, diesel oil, and individual components such as benzene or toluene. Heavy refined oils include fuel oil Numbers 4 (Heating Oil), 5, and 6 (Bunker C). **The water-soluble fraction (WSF)** is that portion of an oil that is soluble in water under equilibrium conditions. The water-soluble fraction of petroleum hydrocarbons is composed mostly of aromatic hydrocarbons, such as benzene or toluene (N.O.A.A., 1987).

### 7.1 Fish

Regarding fish, the adverse impacts associated with spills of crude and refined oils are primarily caused by the chemical toxicity of the water-soluble fraction.

"The WSF is the portion of oil that marine fish are most likely to be exposed to during an oil spill. Oils that are relatively soluble in water will be more likely to cause toxic effects to fish. For this reason, refined petroleum products (especially gasoline) present a much more severe threat to open water marine fish than do crude oils.

"A review of experimental and accidental oil spills shows that...the average concentrations of oil likely to be encountered by open-water fish are about 100 to 10,000 times lower than the acute toxicity values of most petroleum hydrocarbons. Therefore, an oil slick floating on the water surface is unlikely to affect adult fish, but there is some potential for toxic effects to...eggs and larvae" (N.O.A.A., 1987).

Toxic effects may also occur as a result of direct contamination of the shallow habitats used by fish and it is therefore important to identify critical fish habitats.

"Such contamination may result in acute short term toxic effects from the oil or long term effects from residual hydrocarbons that are persistent in sediments. Heavy refined oils (including Heating Oil and Bunker C) contain a high proportion of these hydrocarbons known to cause chronic contamination of shorelines. This type of contamination can cause toxic effects to fish species that spawn in shallow areas, and these effects may occur long after the spawning sites were initially exposed to oil" (N.O.A.A., 1987).

According to the Ontario Ministry of Natural Resources, all wetlands on the shore of Lake Huron and Georgian Bay are considered critical fish habitat which should be given high priority for protection (pers. comm., OMNR, 1992). Other areas of critical fish habitat such as spawning beds and migration routes are identified throughout Lake Huron and Georgian Bay on the individual maps.

Much of the data represented in the Atlas refers to anadromous fish. These are fish species that live in brackish (slightly salty) or salt water as adults and ascend freshwater coastal rivers to spawning and nursery grounds. Many freshwater fish such as walleye, trout and salmon are considered to be anadromous fish in the Great Lakes because they ascend tributary rivers during spawning.

"All anadromous species are considered to be at moderate to high risk from oil and hazardous materials spills occurring in navigable waters due to their dependence on certain nearshore and shallow water habitats for critical stages of their life cycle" (N.O.A.A., 1987).

Adult fish are at moderate risk during spawning runs since they must pass through nearshore areas where spills are likely to pose a significant threat of toxic exposure.

"Eggs and larvae are at a high risk of exposure at spawning areas. These life stages are unable to avoid waterborne pollutants due to poor swimming ability or dependence on certain habitats such as gravel streambeds. Spills that result in contamination of bottom sediments pose the most serious threat to anadromous fish populations because eggs of many species adhere to or are buried in sediments. Salmonids are probably the most sensitive to contamination of spawning areas because their eggs are spawned in shallow waters, and they remain in the sediments for many months prior to hatching and downstream migration" (N.O.A.A., 1987).

Juvenile fish are dependent on shallow, nearshore nursery areas. This places them at a moderate to high risk of exposure to toxic concentration of pollutants during spills.

### 7.2 Birds

"Most of the negative effects of oil spills on marine birds are the result of the birds coming into direct contact with floating oil. Exposure of birds to oil has the primary effect of fouling the plumage. Oil causes disruption of the fine structure of the small strands that form the feathers, causing loss of their water-repellent characteristics. The plumage of oiled birds also becomes matted, allowing water to penetrate to the body surface, which results in chilling and hypothermia as well as a loss of buoyancy" (N.O.A.A., 1988).

Some bird species are more vulnerable to oil spills than others. "Presumably, those species that are able to leave the water and thereby reduce or avoid hypothermia (such as gulls, wading birds, and some waterfowl) are more tolerant to oil" (N.O.A.A., 1988).

"Oiled birds can also readily ingest oil during preening. The effects of ingested oil include anemia, pneumonia, intestinal irritation, kidney damage, altered blood chemistry, decreased growth, and decreased production and viability of eggs" (N.O.A.A., 1988). Direct exposure of eggs to oil has the greatest potential for reproductive damage. Exposure to very small quantities of oil during the early stages of incubation are most toxic. Oiled adult birds can easily transfer toxic doses to eggs.

Certain behavioural characteristics of birds can increase their vulnerability to impacts of oil spills. "Feeding, flocking and roosting behaviours of many species result in repeated or prolonged diving into or sitting on the water surface where contact with floating oil is possible" (N.O.A.A., 1988).

There have been various indices developed to determine relative sensitivities of birds to oil. These typically consider factors such as range, population, habits, mortality, and annual exposure in a given region (N.O.A.A., 1988). As discussed in Section 5.2, such factors will be taken into account by local resource experts at the time of spill. For the purposes of this Atlas, some considerations have been listed to give a general idea of relative sensitivities.

The following paragraphs summarize the vulnerability of the various bird categories symbolized in the Atlas legend. Again, the Canadian Wildlife Service and N.O.A.A.'s Natural Resource Response Guide for Marine Birds are the main sources for this information.

#### 7.2.1 Migratory Waterfowl

The vulnerability of waterfowl to spilled oil is highly variable, depending primarily on habitat preference. Geese and many diving ducks are highly vulnerable because they concentrate, often in large flocks, on relatively exposed offshore and nearshore waters during migration. Dabbling ducks are less vulnerable due to their preference for more protected coastal wetlands. Loons and grebes are highly adapted to an aquatic existence and rarely leave the open water where they are present during much of the year. This increases their vulnerability to an oil spill, but they do not form large flocks. They tend to occur in small groups or as scattered individual birds.

## 7.2.2 Colonial Nesting Birds

"The most significant offshore terrestrial animal resources at risk from an oil spill are nesting colonies of gulls, terns, and cormorants. Although colonies on the Great Lakes are widely scattered, an oil spill could have a significant effect if large colonies are within the spill zone" (Owens et al., 1992).

For the Lake Huron Atlas, as noted in Section 6.2.2, the Colonial Nesting Birds category includes gulls, terns and cormorants. Only one species of cormorant nests on the Great Lakes. Terns and cormorants are highly vulnerable in that they feed on fish and are therefore forced to use waterbodies for foraging. Cormorants are true divers (i.e. they dive from the surface of the water and swim underwater pursuing their prey), whereas terns plunge-dive from the air. The feeding behaviour of diving birds, such as cormorants, results in regular entry into the water, increasing their vulnerability to spilled oil. On the other hand, terns and cormorants tend to roost on islands, structures, etc., rather than on the water itself. "These birds do not form large flocks or roost on the water, so mass mortalities are not likely" (N.O.A.A., 1988).

Gulls (ring-bills and herring) often feed on sources such as dumps or farm fields, but they also forage along the shores of the Great Lakes, catching fish by plunge-diving, as terns do. Surface feeding birds such as gulls...

"...often form large flocks that regularly roost on the open water. This behaviour can result in large kills from spilled oil, but based on numerous case histories, impacts to these birds are usually not severe. This is due in large part to their highly adaptable nature. Gulls are well known for their ability to exploit a wide range of habitats and food sources and they also are relatively prolific breeders. They are readily able to avoid oil spills, and their populations can recover from mortalities if they occur" (N.O.A.A., 1988).

The breeding season varies for colonial waterbird species. Gulls usually return to the colonies before snow and ice has melted, but terns normally return several weeks later (feeding exclusively on fish, they need to be assured of open water). In Lake Huron and Georgian Bay, most activities at the nesting colonies will take place during May through August.

## 7.2.3 Wading Birds

Hérons and cranes have much lower vulnerability to floating oil because they are rarely immersed in the water and do not flock or roost on the water. For this reason they are identified separately on the maps, even though herons are also considered to be colonial waterbirds. Herons stalk shallow pools, immersing only their heads to catch prey. These birds tend to avoid oiled areas, but responders must be aware of the possibility of contamination of their food sources in the water column of shallow, sheltered waters. (N.O.A.A., 1988). In Lake Huron and Georgian Bay, most activities at the nesting colonies will take place during May through August.

## 7.2.4 Shore Birds

Most shorebirds have low to moderate vulnerability to spilled oil. They are rarely immersed in water and are unlikely to encounter spilled oil. They do not form large staging flocks along the Lake Huron and Georgian Bay shore. At certain times in other areas (for instance, on Lake Ontario), their habit of flocking by the thousands to a limited number of specific locations (very shallow, productive waters) increases their vulnerability, due to the impact that oil spills could have on their highly localized food source (on which they are heavily reliant). "Large flocks of shorebirds are generally attracted to areas with mud flats" (pers. comm., CWS, 1994).

## 7.2.5 Raptors

Bald eagles are considered to be highly vulnerable in the event of an oil spill. Although they rarely enter the water and are unlikely to be oiled, they have a small population and a very long recovery rate. "Osprey are much more marine oriented and will capture fish directly from the water. They are ranked as moderately vulnerable (lower than bald eagles) because they are more common and more widely distributed than bald eagles" (N.O.A.A., 1988). For both of these species, and for peregrine falcons, consumption of oiled prey is a concern.

## 7.2.6 Bird Seasonality

When such information is available, the 'Notes' column on individual map pages gives site specific descriptions of seasonality. In the following table, a general description is provided for species occurring on Lake Huron.

**Table 1A: Lake Huron Bird Seasonality: Colonial Waterbirds**

Species	Period present on Lake Huron	Breeding Season*	Nest Location	Category			Abundance		
				Migrant	Summer Resident	Winter Visitor	Common	Uncommon	Rare
Double-crested Cormorant	April to October	May to August	On ground (islands)	✓	✓		✓		
Herring Gull	March to November	May to August	On ground (islands and peninsulas)	✓	✓		✓		
Ring-billed Gull	April to October	May to August	On ground (islands and peninsulas)	✓	✓		✓		
Great Blue Heron	April to October	May to August	In trees (islands and coastline)	✓	✓			✓	
Black-crowned Night heron	May to September	May to August	In trees (islands and coastline)	✓	✓				✓
Common Tern	May to September	May to August	On ground (islands and peninsulas)	✓	✓			✓	
Caspian Tern	May to September	May to August	On ground (islands and peninsulas)	✓	✓				✓

\*From establishing nesting territories through fledgling chicks.

(CWS, 1994)

**Table 1B: Lake Huron Bird Seasonality: Waterfowl, Shorebirds, Raptors**

Species	Status	Period Present on Lake Huron
Common Loon	Common migrant and summer visitor; occasional breeder	During ice free period, particularly April and May, August to December
Grebe species	Common migrants	During ice free period, particularly April and May, August to December.
Canada Goose	Very common migrant; local breeders	Year round when water open, highest numbers during migration April and May, August to November
Dabbling Ducks (including mallard, black duck, northern pintail, American wigeon, teal)	Very common migrants and common summer visitors; local breeders	Year round when water open, highest numbers during migration April and May, August to December, Moderate numbers during summer.
Diving Ducks (including scaups, redhead, canvasback, common goldeneye, bufflehead, scoters, mergansers)	Common to very common migrants; common summer visitors; uncommon and local breeders	Year round when water open, highest numbers during migration April and May, August to December.
Shorebirds (including sandpipers and plovers)	Locally common migrants; uncommon breeders	Mostly during migration (May, August to September)
Bald Eagles	Rare migrant, very rare breeder	March to December
Osprey	Uncommon migrant and breeder	April to November
Peregrine Falcon	Very rare migrant	April to November

(CWS, 1994)

## 7.3 Shore Associated Mammals

A shore associated mammal's exposure to spilled oil can result in a significant reduction in the insulative property of its fur. Once exposed to oil, a mammal's grooming activity may lead to ingestion of oil. (N.O.A.A., 1989).

## 8.0 Sensitivities of Human-Use Resources; Vulnerability to Spilled Oil on the Great Lakes

Factors to consider when establishing sensitivities of Human-Use Resources include economic value, resource 'replaceability', risk to public health, and cultural/archaeological value.

No rigorous ranking scheme has been employed for these features, as discussed in Section 5.2. Broad terms such as "highly valued" have been used in the 'Notes' column to give an indication of the level of priority likely to be assigned to a Human-Use Resource during spill response.

## 9.0 Shoreline Habitats and Associated Countermeasures

### 9.1 Lake Huron Shoreline Habitat Classification Scheme

The Canadian shoreline of Lake Huron and Georgian Bay has been classified as shown below. The Environmental Sensitivity Index (ESI) number for each shore type indicates the sensitivity ranking of that type. Higher numbers indicate greater relative sensitivity to the impacts of an oil spill. Colours range from "coldest" for 'Exposed Bedrock' to "hottest" for 'Broad Wetland.'

#### ESI Ranking

#### Bedrock or Impermeable Shores

- 1a. Exposed Bedrock Bluff less than 1 metre elevation
- 1b. Exposed Bedrock Bluff 1-5 metre elevation
- 1c. Exposed Bedrock Bluff greater than 5 metre elevation
2. Retaining Wall/Harbour Structure/Breakwaters  
(Anthropogenically modified shore)
3. Shelving Bedrock

#### Unconsolidated Sediment Shores

4. Exposed Sediment Bluff
- 5a. Sand Beach: Depositional
- 5b. Sand Beach: Erosional or Transitory
6. Sand Barrier with Lagoon
- 7a. Pebble Beach
- 7b. Pebble/Cobble Beach
- 7c. Cobble Beach
8. Rip Rap (Anthropogenically modified shore)
9. Boulder Beach
10. Mixed Beach (% by sediment in DOE Database)

#### Vegetated Shores

11. Low Vegetated Bank (Grass or Trees)
12. Delta Mud Flat
- 13a. Fringing Wetland
- 13b. Broad Wetland

## 9.2 Shoreline Habitat Characteristics and Appropriate Countermeasures

In this section, the major physical characteristics of each Shoreline Habitat will be discussed. A photograph is provided for each shoreline type, depicting a typical example on Lake Huron and Georgian Bay. Expected oil behaviour and residence time for each Shoreline Habitat will be described. Suggestions for appropriate clean up methods for each shore type will be made.

The following shoreline characteristics will be addressed:

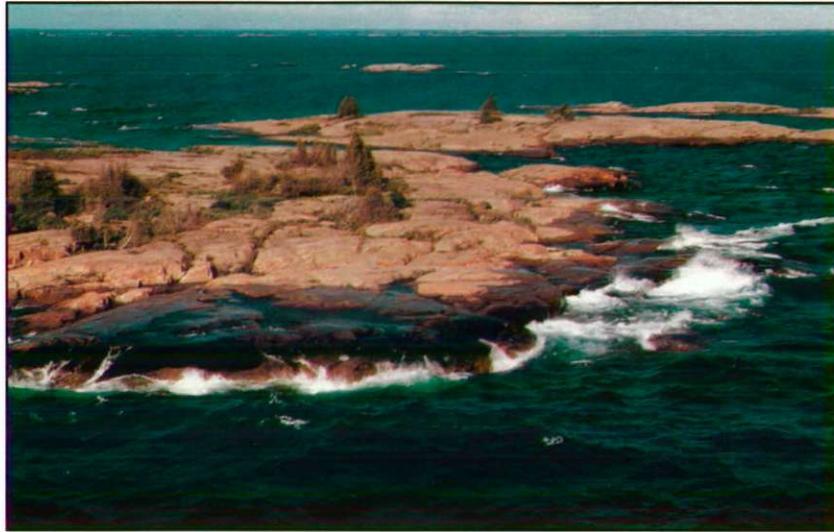
- i) **Shoreline Morphology**- includes a description of shoreline width, slope and characteristic topography, component sediment type(s), and the wave/littoral drift environment. Littoral drift is sedimentary material that is transported in the littoral (coastal) zone under the influence of waves and currents.
- ii) **Shoreline Sensitivity**- includes oil residence time, natural oil removal processes/rate, and the impact to immediate flora and terrestrial fauna.
- iii) **Clean Up Operations**- involves identifying effective clean up methods for each shoreline type, as well as indicating potential environmental hazards that the clean up operation may pose.

In general, in the Great Lakes the water volume and distances between shores are insufficient to "absorb" large quantities of oil. Oil moved off one shoreline will likely reappear on an adjacent shore. Environment Canada recommends cleaning any oil deposits which can be removed safely and without causing further habitat damage.

All of the clean up methods outlined are suggestions only. Each has certain implications or drawbacks that must be weighed on a site-by-site basis by spill response experts in the event of a spill. **All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.**

Additional information on shoreline protection and clean up on the Great Lakes is addressed in the Environment Canada video "Great Lakes Shoreline Protection and Clean Up." Contact Chromavision International Inc. (613-748-5335) for ordering details.

## 9.2.1 Bedrock or Impermeable Shores



**1a. Exposed Bedrock Bluff  
less than 1 metre elevation**

### **ESI 1a, 1b, and 1c. Exposed Bedrock Bluff**

The combination of resistant bedrock surfaces, little sediment, steep slopes, and a constant, high wave energy environment make exposed bedrock bluffs the least sensitive shoreline to oiling.

If the stranded oil is below the normal limit of wave action, it would persist for only a few days to weeks. If shoreline oiling occurred during a storm event then the material would be stranded and unaffected by normal wave action, until the recurrence of a subsequent storm event of similar magnitude. Lower bluffs (< 1 m elevation) are generally more sensitive since they usually have rough surfaces, containing many fractures and pockets. Oil may collect within these surfaces and persist for up to several seasons.

Bedrock bluff shorelines are not especially biologically sensitive due to scant flora and terrestrial fauna. Bedrock bluff shorelines with a

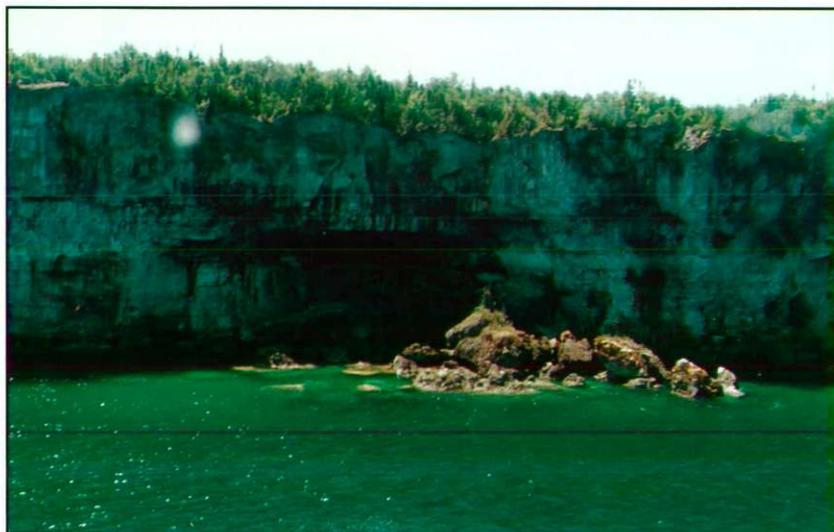
heightened Human-Use value or bluffs which were oiled during storm events, will likely require remedial clean up measures. Low-pressure hosing and manual oil scraping are the preferred clean up methods. Steam cleaning and/or high-pressure hosing may be considered for the most resistant rock surfaces.

Access to these shores is often poor by land and often hazardous by water. Bedrock bluff shorelines in locations without heightened Human-Use value may be permitted to self-clean through natural wave abrasion, if manual removal is unsafe or logistically impossible.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



**1b. Exposed Bedrock Bluff  
1-5 metre elevation**



**1c. Exposed Bedrock Bluff  
greater than 5 metre elevation**

## ESI 2. Retaining Wall/Harbour Structure/Breakwaters

When artificial shorelines are created through construction, the shoreline is designated as Retaining Wall/Harbour Structure/Breakwaters. Retaining walls are usually small isolated features used to protect private property from bank erosion. They are composed of wood pilings, structural steel, asphalt, or concrete. When concentrated in near-continuous stretches (such as along large ports) they are termed harbour structures. Rip rap material within wire netting can be used to front shorelines, resulting in a vertical shore classified as harbour structure.

Retaining wall/harbour structure shores are not particularly sensitive to oil, or clean up operations. This shoreline type commonly supports very little plant or animal life, except for some birds along the structure's upper portions. There is minimal oil persistence along sections exposed to waves, but long term oil persistence is possible along sheltered sections.

Hard, durable harbour structure surfaces permit the use of high-pressure hosing or steam cleaning for clean up. Recently spilled oil can be effectively cleaned by means of low-pressure hosing. Ships docked along harbour facilities will similarly require all traces of oil residue removed from their hulls before leaving the port.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



## ESI 3. Shelving Bedrock

Shelving bedrock shores are wide, flat expanses of bedrock, at or immediately below normal water levels.

Generally, shelving bedrock shores are lower energy wave environments than bedrock bluff shores. Waves could carry oil across the full width of the shelf.

Continued wave exposure would likely readily cleanse oil from the lower reaches of the shelf. Oil deposited during a storm would be stranded above normal water levels and would be cleansed only during storms of similar magnitude.

Inaccessible shelving bedrock shores may naturally self-clean (perhaps within two seasons). Other shores, including those with high aesthetic or recreational value will likely require remedial clean up measures.

Oil which collects within depressed regions of the shelf may be cleaned manually or by sump/pump removal. Stranded deposits could be removed by low or high-pressure hosing or steam cleaning for the most resistant rock surfaces. Shelving bedrock shores which support high populations of birds, especially nesting sites, should be cleaned manually to minimize disturbance.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

## 9.2.2 Unconsolidated Sediment Shores

Unconsolidated sediment shores differ from bedrock shores in that the material is loose and non-cemented.

### ESI 4. Exposed Sediment Bluff

These bluffs are predominantly erosional forms, carved by wind, wave and surface water erosion. They form where accumulations of glacial material border the shoreline and are exposed to direct wave action. Lake Huron and Georgian Bay contain very few sections of exposed sediment bluff shoreline. There is little biological activity along these bluffs.

Shoreline sections are commonly steep and relatively narrow (< 4 metres). Several very high, steep segments of unconsolidated material occur, such as found near the government dock at Blind River.

Spilled oil would be deposited along the lowest portion of the bluff, where wave energy is high, and the oil would be self-cleaned within days or weeks through wave abrasion. Oil deposited during storms may be stranded above this level and may persist until manually removed or subsequent storm surges self-clean the area.

The clean up of stranded oil along unconsolidated sediment bluffs is made

difficult by the lack of a shore zone beach, steep bluff slopes, and the ease of bluff erosion. Heavy machinery would be unable to access high or extensive sediment bluff sections. The removal of material at the base of the bluff could promote slumping or landsliding; a serious hazard to clean up crews, and land owners residing on the crest of the bluff. Similarly the use of low/high-pressure hosing or steam cleaning could remove sufficient sediment to induce slope failure.

In the case of small sediment bluffs where shore zone access is available, manual clean up is recommended. Very steep or high sediment bluff sections are generally not accessible; in these instances it is recommended that the oil deposit naturally self-clean.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.





### ESI 5a. Sand Beach: Depositional

Depositional sand beaches occur where wave and littoral drift deposited sand has accumulated along a cove or other sheltered environment. Offshore regions tend to be shallow and uniformly sloping.

Small coves and bays tend to produce a thinner beach face, which rarely terminates with elevated sand dunes. Thin beach faces along Lake Huron occur at Evansville and near Deerbrook.

The beaches at Grand Bend, Ipperwash and at Grand Duck Island are examples where large coves often produce very wide sand beaches, often with a series of backshore dunes. Vegetation growing on the dunes enhances their stability. Destruction of this vegetation by clean up crews will lead to wind erosion of the dunes.

Biological activity typically includes the presence of shorebirds, and sand beaches are often of high recreational value.

Spilled oil would be deposited along the upper limit of wave action. Heavy or viscous oil rarely penetrates more than 2 centimetres, though with higher temperatures or lighter oil, penetration depth will likely increase.

If water levels were normal the stranded oil deposit may be buried by subsequent storm beach deposits. It is important to locate and remove oil

before subsequent burial, where possible. When buried, stranded oil can persist for decades, requiring regular clean up for several years, as the deposits resurface.

In times of elevated water levels, oil may be stranded above the normal swash zone, where it could weather to form an "asphalt pavement". Eroded asphalt pavement material is often deposited over a wide area as small "tar balls".

Sand beaches, due to their shallow slopes, load bearing capacity, lack of vegetation, and many access roads often permit the use of heavy machinery such as graders/scrapers. Note that sediment removal must be minimized; if too much sand is removed, the beach may be destabilized, causing accelerated beach erosion.

Beach cleaning machines may be used to remove stray tar ball deposits from affected beaches. On very narrow beaches, or those without road access, manual raking is a slow but effective method.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

### ESI 5b. Sand Beach: Erosional or Transitory

Few erosional or transitory sand beaches were observed along Lake Huron and Georgian Bay shoreline. Transitory beaches form down drift from eroding unconsolidated sediment bluffs. During times of normal water levels, eroded sediment may collect within small coves or wave-cut notches to form a poorly defined beach. Such deposits are transient and are regularly removed by intensified littoral drift during storms.

Transitory sand beaches are extremely narrow and often quite steep. Offshore regions are often very deep, permitting waves to break very close to the shoreline.

Oil deposited on a transitory sand beach during times of normal water level is apt to be quickly eroded during the next major storm surge, and transported down drift (likely within 1 season) to strand elsewhere, likely as sediment laden "tar balls".

Clean up operations along transitory sand beaches are complicated by the lack of access roads, and the mobility of the beach material. Where clean up can be very quickly undertaken, manual raking of the beach is recommended.

Clean up should not be attempted along transitory beaches which occupy wave-cut notches in unconsolidated sediment bluffs. The danger of bluff slumping to clean up crews, as well as the risk to property owners at the crest of the bluff, is too great. In this environment natural self-cleaning should be allowed, though down drift locations are likely to be affected by tar balls which wash ashore.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



### ESI 6. Sand Barrier with Lagoon

This shore type occurs where littoral drift causes a smooth barrier of sand to form and effectively seal a cove. Coves containing a stream typically have a very small opening (the "outlet") in the sand barrier. The backwater cove which forms is termed a lagoon.

The thin, low sand barrier now protects the lagoon from wave action, and a wetland often develops behind the barrier. Such wetlands are especially sensitive to disturbances of the protective sand barrier.

The impact of an oil spill on the sand barrier would be similar to that for a depositional sand beach. It is unlikely that oil could cross the barrier through wave splash or beach erosion. Oil could, however, enter the lagoon if waves cross the outlet. This is likely in storm events.

In the event of a spill, a boom should be deployed to seal the barrier outlet, and diversion booms used to deflect oil from the sand barrier. Heavy machinery must not be employed for clean up. The removal of sand during clean up, compaction of sand by machinery, plus the potential of vegetation disturbance along the barrier crest could result in extensive barrier erosion and the inundation of the lagoon environment. In this instance manual raking of effected shorelines is the only acceptable clean up method.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

### ESI 7a. Pebble Beach

Pebble beaches are shore accumulations of coarse sediment (0.2-4 cm diameter) that form in a higher energy wave environment compared to sand beaches. Pebble beaches are characteristically narrower and steeper than sand beaches; widths of 2-5 metres are common along Lake Huron.

Oil will penetrate a pebble beach to occupy the spaces between pebbles; common penetration depths are 0.5 metres. Very light oil, though able to penetrate the sediment, would be washed through the beach sediment and into the lake by wave action. Heavy oil may remain on the surface and, after weathering, cement pebble grains to form asphalt pavement.

On a pebble beach, where the sediment moves more readily with wave action, subsequent storms tend to bury stranded oil. Oil buried at a depth of 0.5 metres or more could persist for years before natural abrasion by wave action removed the deposit.

Sensitive flora and fauna may be adversely affected by oil on shore and in the water column.

Most pebble beaches are thin, relatively steep, and lack easy road access, so use of heavy machinery is restricted. The load bearing capacity of pebble beaches can often support light equipment such as bobcats. Aeration using long tynes dragged through the pebble can be effective in bringing oil nearer to the surface for self-cleaning and weathering.

Low-pressure flushing may assist in moving light oil through the sediment into the lake for collection. The use of steam cleaning, and low or high-pressure hosing should be avoided on pebble beaches, since they temporarily reduce the viscosity of the oil and could drive oil deeper through the pebble material, making removal more difficult. Pebble and cobble beaches must be water flushed quickly, while the spilled oil is still fresh. Otherwise, the oil will be present in the substrate for a much longer time.

Manual cleaning can be an effective clean up option. Responders must be careful to minimize sediment removal.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



### ESI 7b. Pebble/Cobble Beach

Pebble/cobble beaches are quite common along the Lake Huron and Georgian Bay shoreline, especially near East Bruce Peninsula and East Manitoulin Island. They consist of a mixture of pebbles (0.2-4 cm diameter) and larger cobble material (4.5-25 cm). Generally pebble/cobble beaches are narrower and steeper than pebble beaches; widths of 2-3 metres are common.

Oil may rapidly seep into the spaces between pebble/cobble sediment. Even heavy oil may penetrate to a depth of 1 m or more, where it can persist for years before natural abrasion by wave action would remove the deposit.

Very light oil, though able to penetrate the sediment, would be washed through the beach sediment and into the lake by wave action. Heavy or viscous oil may remain on the surface and, after weathering, cement pebble/cobble material to form an asphalt pavement.

Sensitive flora and fauna may be adversely affected by oil on shore and in the water column.

Most pebble/cobble beaches are very thin, relatively steep, and do not have easy road access, so use of heavy machinery is restricted. The load bearing capacity of pebble/cobble beaches may support light equipment such as bobcats. If the cobbles are not too large, aeration using long tynes dragged through the sediment can be effective in bringing oil nearer to the surface for self-cleaning and weathering.

Low-pressure flushing may assist in moving light oil through the sediment into the lake for collection. The use of steam cleaning, and low or high-pressure hosing should be avoided on pebble/cobble beaches, since they temporarily reduce the viscosity of the oil and could drive oil deeper through the shore material, making removal more difficult. Pebble and cobble beaches must be water flushed quickly, while the spilled oil is still fresh. Otherwise, the oil will be present in the substrate for a much longer time. Manual cleaning can be an effective clean up option. Responders must be careful to minimize sediment removal.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

### ESI 7c. Cobble Beach

Cobble beaches are less common along the Lake Huron and Georgian Bay shoreline than pebble/cobble beaches. Cobble beaches contain well sorted sediment clasts, 4.5-25 cm in diameter. The cobble clasts on some Lake Huron beaches resemble shingles.

Cobble beaches are generally narrower and steeper than pebble/cobble beaches; widths of 2 metres or less are common. Cobble-sized material cannot pack tightly, permitting oil to rapidly infiltrate cobble sediment.

Heavy oil is likely to penetrate to a depth of 1 metre or more, where it can persist for years before natural abrasion by wave action would remove the deposit. Very light oil, though able to penetrate the sediment, would be washed through the beach sediment and into the lake by wave action. Heavy or very viscous oil may remain on the surface, and, after weathering, cement cobble clasts to form an asphalt pavement.

Sensitive flora and fauna may be adversely affected by oil on shore and in the water column.

Most cobble beaches are extremely thin, steep, and rarely have easy road access, so use of heavy machinery is very restricted. The load bearing capacity of cobble beaches may support light equipment such as bobcats. If the cobbles are not too large, aeration using long tynes dragged through the sediment can be effective in bringing oil nearer to the surface for self-cleaning and weathering.

Low-pressure flushing may assist in moving light oil through the sediment into the lake for collection. The use of steam cleaning, and low or high-pressure hosing should be avoided on cobble beaches, since they temporarily reduce the viscosity of the oil and could drive oil deeper through the shore material, making removal more difficult. Pebble and cobble beaches must be water flushed quickly, while the spilled oil is still fresh. Otherwise, the oil will be present in the substrate for a much longer time.

Manual cleaning can be an effective clean up option. Responders must be careful to minimize sediment removal.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.





### ESI 8. Rip Rap (Anthropogenically Modified Shore)

When natural shorelines are mantled with debris to protect the shore from wave-induced bank erosion, the resulting shoreline is termed rip rap. Rip rap usually takes the form of large, coarse material which is inexpensive and locally available. On Lake Huron and Georgian Bay most rip rap shores are composed of roughly quarried granite blocks. Other locally available material used includes scrap wood, damaged concrete castings, or clay pipe refuse.

Most rip rap shores are narrow and fairly steep. Wave energy within these locales tends to be high (hence the need for rip rap).

Rip rap can be an important substrate for some bird and fish activity.

The large blocks often used in rip rap behave as a boulder beach, having large interstitial pockets between blocks that can retain oil if not

thoroughly cleaned. For these reasons, certain rip rap shores may be a priority for protection measures.

In most cases, good road access permits the use of several forms of heavy equipment. In some cases, the large, blocky nature of rip rap permits the use of high-pressure hosing or steam cleaning without significantly endangering (through erosion) the underlying protected shoreline.

Recently spilled oil can often be effectively cleaned by low-pressure hosing. Small spills can be cleaned by employing manual labour and scraping the rip rap, or through the use of sorbent material to remove pooled oil.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

### ESI 9. Boulder Beach

Boulder beaches are not common along Lake Huron and Georgian Bay shores. Boulder beaches are accumulations of large boulders (25+ centimetres diameter), the smaller sediments having been washed away by wave action in the high energy environment.

Boulder beaches are extremely narrow and often quite steep; beach widths of 2 metres or less are common.

Boulder beach sediment, due to its large size, cannot pack densely. Light oil, when washed onshore, will rapidly penetrate boulder sediment and be washed through the beach sediment and returned to the lake by wave action. Abrasion by breaking waves and a very permeable sediment combine to remove trapped light oil relatively quickly.

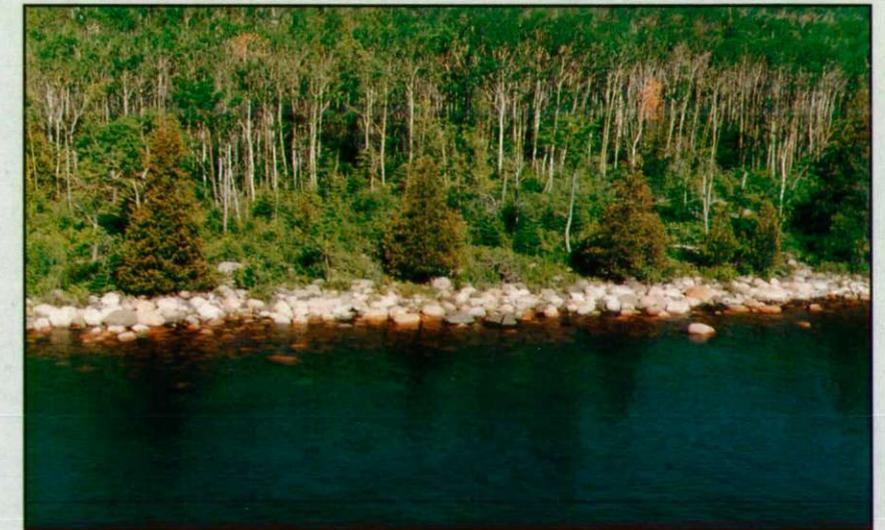
Heavy oil is likely to penetrate to a depth of 1 metre or more, and oil could remain trapped between boulders from where it will seep out over time if not cleaned. Very viscous oil may remain on the surface, and adhere to boulders where it will eventually weather and form an asphalt pavement.

Sensitive flora and fauna may be adversely affected by oil on shore and in the water column.

Since boulder beaches are extremely thin, steep, and rarely have easy road access, the use of heavy machinery for clean up operations is severely limited. Where possible, steam cleaning or low/high-pressure hosing may be effective in speeding the removal of recently stranded oil. Due to the permeable nature of boulder beaches, oil buried to a great depth (+0.5 metres) can be effectively removed by these methods.

If these methods are not feasible, isolated boulder beaches may be considered for self-cleaning through wave abrasion, as long as adjacent sensitive shores are protected. Boulder beaches with sensitive features or high Human-Use value may be cleaned manually, using aids such as sorbent pads and scrapers.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



### ESI 10. Mixed Beach (% by sediment in DOE Database)

Mixed beaches are not common along the Lake Huron and Georgian Bay shoreline. They are accumulations of very poorly sorted sediment including large amounts of coarse sediment (boulders and cobbles), and some finer materials (e.g. sand). The percentage of component sediment types in each shore's case is expressed in descending order (e.g. boulders-70%; cobbles-30%) in Environment Canada's master database.

Mixed beaches are typically shallow sloped, very small (less than 100 metres in length), fairly wide, and restricted to pockets/coves between headlands, in well-sheltered, low energy wave environments. The sheltered wave environment permits the finer sediment to remain and fill the spaces between larger cobble/boulder sized material.

Oil washed ashore along mixed beaches with finer sediment is unlikely to penetrate much; this sediment limits the downward movement of oil. Only very light oils could penetrate this material. Since the sheltered wave environment limits the oil's removal by wave abrasion, deposits of oil are likely to persist for

a long time on the surface of mixed beaches. Heavier oils could slowly weather to form asphalt pavements.

Sensitive flora and fauna may be adversely affected by oil on shore and in the water column.

Where road access exists, heavier clean up equipment can be considered. Heavy machinery can be quite destructive to the beach surface; the sheltered wave environment ensures beach damage will not quickly be repaired by natural deposition and reworking of shoreline sediments.

On newly deposited oil, low-pressure hosing and flushing, and manual clean up with shovels, pitchforks, and sorbent pads can be effective. Sump/pump operations can be effective on thick accumulations of oil on the beach surface.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



### 9.2.3 Vegetated Shores

Shorelines dominated by vegetation are common features in sheltered environments along Lake Huron and Georgian Bay. Coves protected by peninsulas, or the leeward edges of major Lake Huron and Georgian Bay islands often are dominated by vegetated shores.

#### ESI 11. Low Vegetated Bank (Grass or Trees)

Low vegetated banks are sheltered environments nearly covered in vegetation, with no erosive bluffs or exposed sediment immediately above the waterline; vegetation covers all land surfaces along the shore. Low vegetated bank shorelines are distinguished from broad and fringing wetland shores by the absence of aquatic vegetation.

Most low vegetated shorelines exist in low wave energy environments. Generally gentle in slope, these shores include environments such as forests, meadows, fields and lawns.

Due to the very low energy environment, stranded oil is unlikely to be removed naturally. The impact of spilled oil can be effectively reduced if there is time to manually spread sorbent material along the shore prior to oiling.

Great care must be taken not to harm the vegetation during clean up, since it serves to stabilize the banks. Low-pressure flushing and hosing

may be used to remove recently stranded oil as long as smaller vegetation species are not apt to be damaged, and if topsoil will not be removed by the process. Runoff water must be collected and removed. This method may drive residual oil into soil, complicating clean up operations.

An on-site expert is recommended for supervision during clean up.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

#### ESI 12. Delta Mud Flat

There are no deltaic mud flat shorelines present along the Lake Huron or Georgian Bay shorelines.



ESI 11



#### ESI 13a. Fringing Wetland

Fringing wetlands are a type of vegetated shoreline containing an abundance of aquatic vegetation. They are usually much smaller than broad wetlands. Along Lake Huron and Georgian Bay, marsh communities are the most common form of fringing wetland. Characteristically, they are restricted to shallow water coves protected from wind or waves. They closely border the shore to form a narrow belt of aquatic vegetation offshore. The shores near Kettle Point contain excellent examples.

Oil spills pose a serious threat to fringing wetlands, which are highly valued for their importance as significant faunal habitats (nesting and spawning sites of various, often endangered species), or for the sensitive flora they contain.

Oil spilled in fringing wetlands could persist for years since wave abrasion processes are absent. The use of floating barrier booms at the mouth of coves, or deflection booms updrift of fringing wetlands could reduce oil damage to these sensitive environments.

All wetland environments are extremely sensitive to destructive clean up practices, especially when vegetation or sediment is removed, since wetland regeneration happens very slowly. The use of heavy equipment is

potentially more hazardous to the wetland community than the spill itself due to the risk of vegetation destruction, compaction of organic matter, grinding of oil into marsh soil, and the spreading of oil adhered to equipment surfaces to uncontaminated wetland regions.

Low-pressure flushing and hosing, and manual use of sorbents are the safest clean up methods. Usually road access does not exist; clean up crews would likely have to be transported to and from the site by small flat-bottomed boats. The use of low-pressure hosing to direct thin sheens of oil away from vegetation and towards deeper water (where it may be collected by skimming), is one method that has been effective.

Cutting oiled vegetation should only be considered as a last resort, but great care must be taken not to damage or trample roots.

An on-site expert is recommended for supervision during clean up.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.

#### ESI 13b. Broad Wetland

Broad wetlands are vegetated shorelines which contain an unusual abundance of diverse aquatic vegetation. Along Lake Huron and Georgian Bay shores, marsh communities are the most common form of broad wetland.

Broad wetlands are usually quite large (1 to 2 km long), and occupy shallow water coves (often containing creek outlets) protected from wind or wave action in very low energy environments. They may extend into bay waters for hundreds of metres.

Oil spills pose a serious threat to broad wetlands, which are highly valued for their importance as significant faunal habitats (nesting and spawning sites of various, often endangered species), or for the sensitive flora they contain.

Oil spilled in broad wetlands could persist for years since wave abrasion processes are absent. The use of floating barrier booms at the mouth of coves, or deflection booms updrift of broad wetlands could reduce oil damage to these sensitive environments. In very dense wetlands, oil is unlikely to penetrate past the outer edge of the vegetation.

All wetland environments are extremely sensitive to destructive clean up

practices, especially when vegetation or sediment is removed, since wetland regeneration happens very slowly. The use of heavy equipment is potentially more hazardous to the wetland community than the spill itself due to the risk of vegetation destruction, compaction of organic matter, grinding of oil into marsh soil, and the spreading of oil adhered to equipment surfaces to uncontaminated wetland regions.

Low-pressure flushing and hosing, and manual use of sorbents are the safest clean up methods. Usually road access does not exist; clean up crews would likely have to be transported to and from the site by small flat-bottomed boats. The use of low-pressure hosing to direct thin sheens of oil away from vegetation and towards deeper water (where it may be collected by skimming), is one method that has been effective.

Cutting oiled vegetation should only be considered as a last resort, but great care must be taken not to damage or trample roots.

An on-site expert is recommended for supervision during clean up.

All clean up methods employed require measures to ensure the collection and proper disposal of oil as it is liberated from the shore.



## 10.0 Lake Huron: Physical Overview

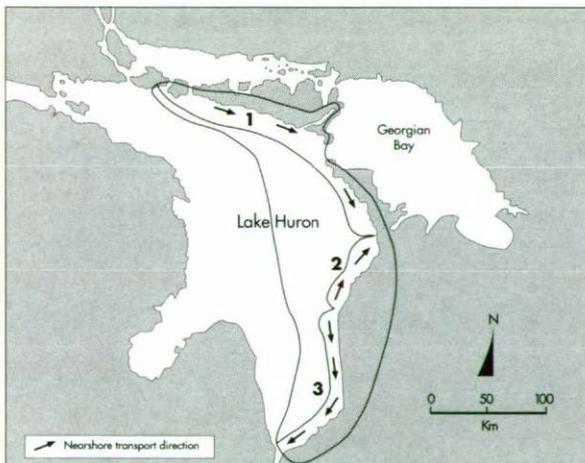
Lake Huron is one of the largest of the Great Lakes in surface area and volume, and is one of the largest freshwater lakes in the world. Including islands, the Canadian shoreline of Lake Huron and Georgian Bay is 4,810 kilometers in length. Portions of the lakeshore are sparsely populated, and some of the islands and peninsulas are remote. Although an intricate highway system and railroads provide access to the east and north shores of the lake and shores of Georgian Bay, much of the irregular shoreline is fairly inaccessible. Since much of the shoreline is less populated or developed, Lake Huron and Georgian Bay have not been subject to the degree of study applied to the southern Great Lakes. The popular Georgian Bay area experiences an increase in population during the summer months.

The North Channel-Georgian Bay shoreline is generally dominated by bedrock outcrops; maximum fetch distances (the area of open water over which waves are generated by wind) in Georgian Bay are approximately 200 kilometers, but the coasts are very sheltered due to the numerous islands, headlands and embayments that provide a high degree of shelter to the mainland coast. The central Lake Huron coasts are predominantly bedrock in the north and beaches or narrow beaches with retreating cliffs in the south (Owens, 1979). All coasts are exposed with maximum fetch distances up to 300 kilometers. The irregular coast in the northern areas produces considerable local sheltering and low energy bay environments (Owens, 1992).

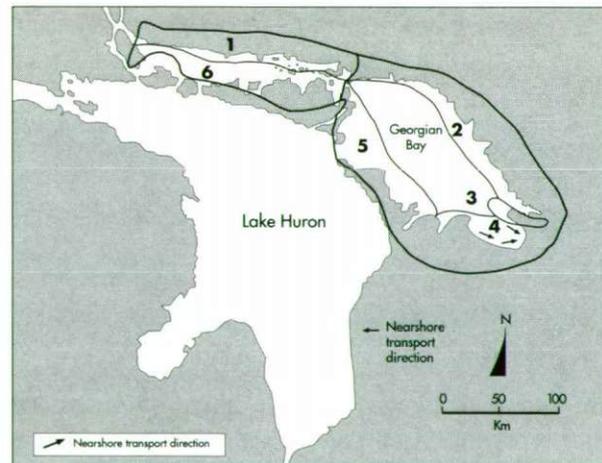
## 10.1 Water Circulation and Shoreline Transport

In the event of a spill, wind and wave conditions must be monitored to assist in predicting the trajectory of a contaminant. When the trajectory and destination of a spill have been defined, the target shoreline should be assessed for shoreline transport. While overviews of circulation are not necessarily reliable measures of transport, the following information will assist response decision makers in assessing spill impact.

Longshore sediment transport is the mechanism by which sediment material is moved parallel to the coast (by wave-induced processes). Figures 3a and 3b show the coastal environments and primary shore-zone transport directions for the Lake Huron region. Tables 2a and 2b summarize the main features for corresponding subdivisions in Figures 3a and 3b.



**Figure 3a: Coastal environments and shore-zone transport directions - Central Lake Huron region (Owens, 1979)**



**Figure 3b: Coastal environments and shore-zone transport directions - North Channel - Georgian Bay region (Owens, 1979)**

**Table 2a: Coastal Environments of Lake Huron**

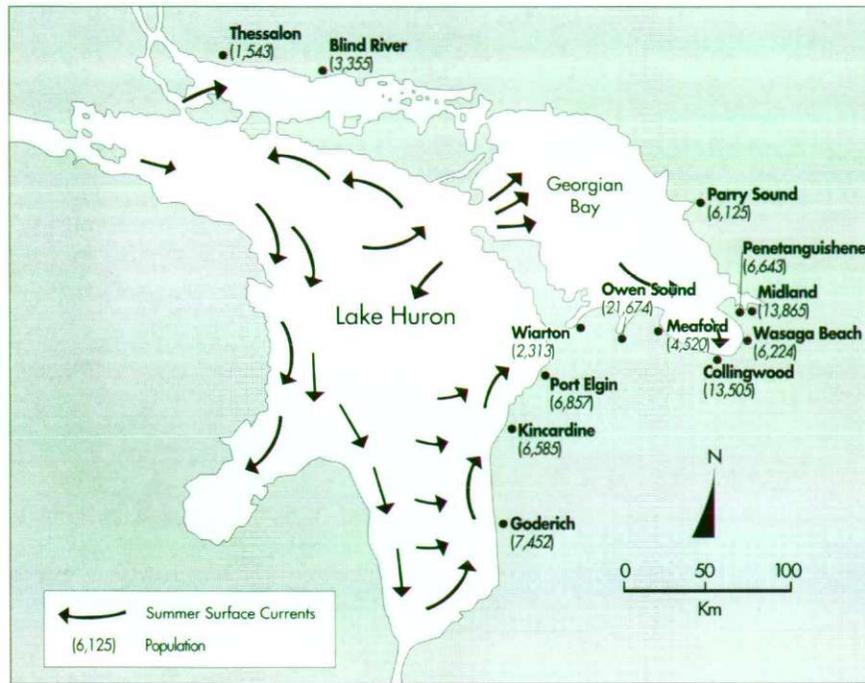
Subdivision	Relief and Geology	Coastal Zone		Fetch, Wave Exposure and Ice	Sediment Availability and Transport
		Shore-Zone Character	Beach Character		
1. Northeast Coast	Resistant sedimentary rocks outcrop in shore zone and dip gently to the centre of lake basin: very low relief	Irregular shoreline with wide, shallow, boulder-strewn, rock platforms, many small islands and reefs: marshes in embayments and sheltered areas	Few beaches, where present usually coarse sediments and boulders	Fetch distances up to 300 km: exposed coast with many sheltered bays: shore-zone ice up to 4 months/year	Sediments very scarce: local transport systems with prevailing transport direction to the south-east
2. Central East Coast	Resistant sedimentary rocks dip gently to west: very low relief with a few sections of low (3 m) cliffs cut into backshore unconsolidated sediments	Two sections of extensive beach systems separated by sections of wide, boulder-strewn, rock platforms with an irregular shoreline	Beach sections have sand with pebble sediments and low dunes: elsewhere predominantly coarse sediments with marshes in sheltered bays	Exposed coast with fetch distances up to 300 km: some sheltered bays: shore-zone ice up to 4 months/year	Sediments generally scarce but more abundant in southwest and northeast sections: transport to the northeast
3. Southeast Coast	Steep coast of unconsolidated sediments, cliffs up to 20 m: a few bedrock outcrops in shore zone in southern section	Straight coast of unconsolidated cliffs in north with two extensive beach-dune systems in the south: cliffed sections undergoing erosion and artificially protected in the south	Adjacent to cliffs beaches are narrow and predominantly sand and coarse sediments: beach sections have wide, sand, shore-zone backed by high (10m) dunes	Exposed, high-energy coast: fetch distances up to 300 km: shore-zone ice up to 4 months/year	Sediments available from cliff erosion transported to the south and into St. Clair River: removal of material in erosion zones causes local scarcity with accumulation characteristic in most of the beach-dune systems

(Owens, 1979)

**Table 2b: Coastal Environments of Georgian Bay**

Subdivision	Relief and Geology	Coastal Zone		Fetch, Wave Exposure and Ice	Sediment Availability and Transport
		Shore-Zone Character	Beach Character		
1. North Coast North Channel	Resistant Shield rocks outcrop in shore zone: low relief	Complex shoreline of bedrock outcrops, islands and bays: some beaches and marshes in bays	Absent or narrow pocket beaches of poorly-sorted sand and coarse sediments	Very sheltered coast, maximum fetch 100 km: very low wave-energy levels: shore-zone ice up to 5 months/year	Sediments generally very scarce, restricted to river mouths and low-lying embayments: local transport systems
2. North and East Georgian Bay	Resistant Shield rocks outcrop in shore zone: low relief	Extremely complex shoreline of bedrock outcrops, islands and bays: few beaches	Absent or narrow pocket beaches of sand and coarse sediments	Fetch distances up to 200 km: outer coasts exposed but considerable local sheltering: shore-zone ice up to 5 months/year	Sediments very scarce, restricted to river mouths and low-lying embayments: local transport systems
3. East Christian Island Peninsula	Relatively resistant sedimentary rocks outcrop in shore zone: low relief	Irregular shoreline with boulders on shallow, nearshore bedrock platforms	Predominantly cobble-boulder beaches: some pocket sand beaches	Fetch distances <50 km: most of the coast very sheltered, low wave-energy environments: shore-zone ice up to 5 months/year	Sediments scarce, where available predominantly boulders with some sand: local transport systems
4. Nottawasaga Bay	Embayment formed by erosion of less resistant sedimentary rocks that outcrop in a northwest-southeast trend: low relief, maximum cliffs heights are 10m: extensive barrier beach in the southeast	Large beach-dune system with nearshore bars adjacent to the beach at head of bay: bedrock exposed as headlands in north east and as straight coast with boulder-strewn, shallow, nearshore platform in the west	Predominantly wide, sand beach, with some pebble sediments in southeast: elsewhere narrow beaches of poorly-sorted sand, pebbles, cobbles and boulders	Maximum fetch of 200 km to northwest: exposed coast: shore-zone ice up to 4 months/year	Abundant sand-sized sediments in southeast from erosion of former beach and lake deposits: elsewhere locally abundant but not sediment rich coasts: transport to south on east and west coasts, to east along south coast
5. East Bruce Peninsula and East Manitoulin Island	Niagara Escarpment of resistant sedimentary rocks: high backshore relief with cliffs up to 100 m in north: high backshore but low shore zone relief in south and on Manitoulin	Upland coast with bedrock cliffs in north and Manitoulin, unconsolidated cliffs in south: irregular coast except in most northerly sections: usually steep nearshore slopes	Sand and pebble-cobble beaches in south adjacent to sediment sources: few, small coarse-sediment beaches in the north: on Manitoulin coarse-sediment beaches narrow or absent except in Smith and James Bays	Fetch distances up to 200 km to north and east, but not high wave-energy levels as winds are predominantly offshore and many sections of the coast are sheltered: shore-zone ice up to 4 months/year	Some material available in the south: very scarce in north and on Manitoulin, except in Smith and James Bays: local transport systems
6. South Coast North Channel	Niagara Escarpment of resistant sedimentary rocks: backshore relief up to 150 m, in east, decrease to low relief in the west	Indented coast of predominantly bedrock outcrops with few beaches and cliffs: marshes in bays	Few beaches except on St. Joseph and Cockburn Islands: usually poorly-sorted coarse sediments	Maximum fetch of 100 km: very sheltered coast, very low wave-energy levels: shore-zone ice up to 5 months/year	Very scarce in west: more abundant on St. Joseph and Cockburn Islands: local transport systems

(Owens, 1979)



**Figure 4: Lake Huron Overview, and Summer Surface Currents**  
 (Surface Current source: Environment Canada, Atmospheric Environment Service, 1992)  
 (Population Data Source: Statistics Canada Census, 1991)

Wind driven currents are the dominant surface circulation on the Great Lakes. Surface currents on Lake Huron and Georgian Bay travel counterclockwise (see Figure 4), but the patterns are sensitive to wind direction. Water surface temperatures on Lake Huron and Georgian Bay typically reach between 18- 20° C in summer. Figure 4 also gives general information such as communities and their populations.

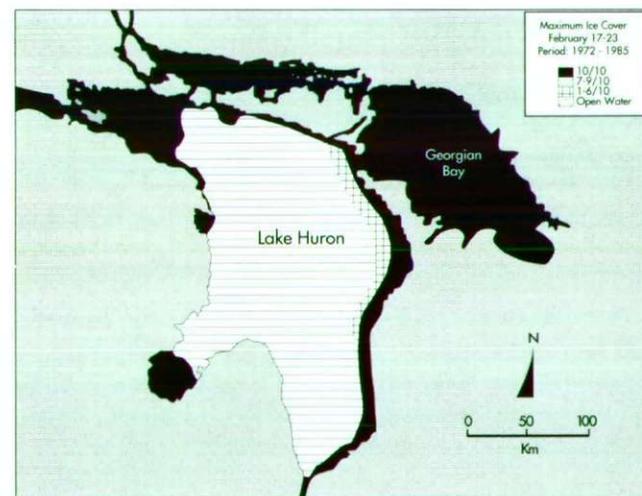
## 10.2 Ice Cover

“Initial ice formation begins in the North Channel, along the east coast of Georgian Bay and in Saginaw Bay during the second half of December. As the winter season progresses, the ice expands along the coastal areas and then extends out into Lake Huron. Maximum ice cover occurs around the middle of February with about 68% coverage in Lake Huron and 90% coverage in Georgian Bay.”  
 (Saulesleja, 1986).

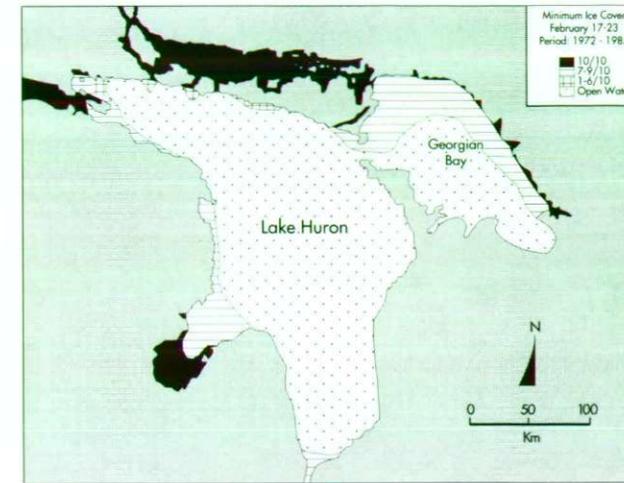
Maximum ice coverage can be as low as 25% in a mild winter, while during a severe winter, ice coverage on Lake Huron and Georgian Bay can increase to 95% and 100% respectively. “Ice has formed as early as the second week of November and persisted as late as the second week of May.”(Saulesleja, 1986). During normal winter conditions, ice may grow to a thickness of 45 to 75 centimetres, in sheltered harbours and bays.

Ice on Lake Huron normally begins to break-up during March and the entire lake clears by the second week of April, except the North Channel, where ice remains until the end of the month. (Saulesleja, 1986).

The average maximum and minimum ice coverage on Lake Huron, at the normal time of greatest ice coverage is shown in Figures 5a and 5b, for the period 1972 to 1985.



**Figure 5a: Lake Superior Maximum Ice Cover**  
 (Saulesleja, 1986)

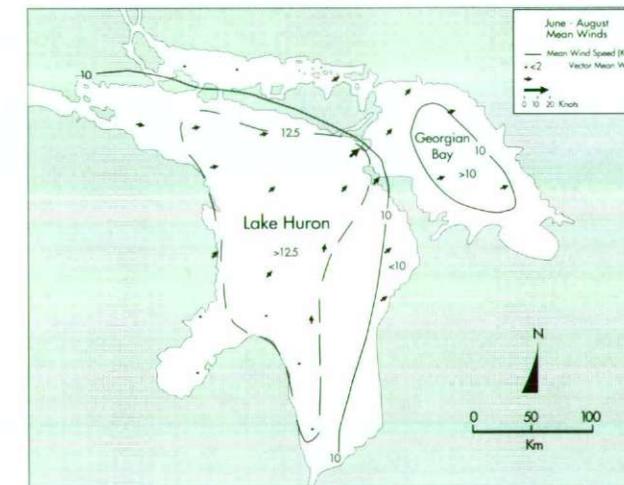


(Saulesleja, 1986)

**Figure 5b: Lake Huron Minimum Ice Cover**

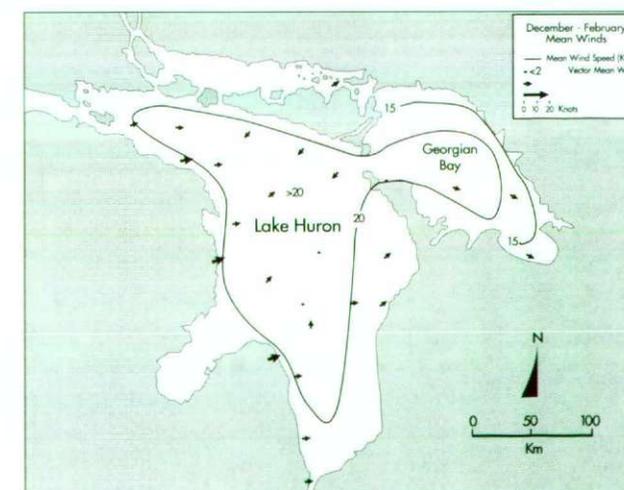
## 10.3 Wind and Waves

Figures 6a and 6b show the mean wind speed and direction information for Lake Huron and Georgian Bay in summer and winter, respectively. Winter wave heights on Lake Huron exceed 1 metre 75% of the time (Owens, 1979), with rare maximums of 5 to 9 metres possible (Saulesleja, 1986). Summer wave heights exceed 1 metre only 30% of the time (Owens, 1979), with rare maximums of 2 to 5 metres possible (Saulesleja, 1986). The prevailing winds for Lake Huron are out of the west. The North Channel is a very sheltered environment, as indicated by the wind speeds in Figures 6a and 6b.



(Saulesleja, 1986)

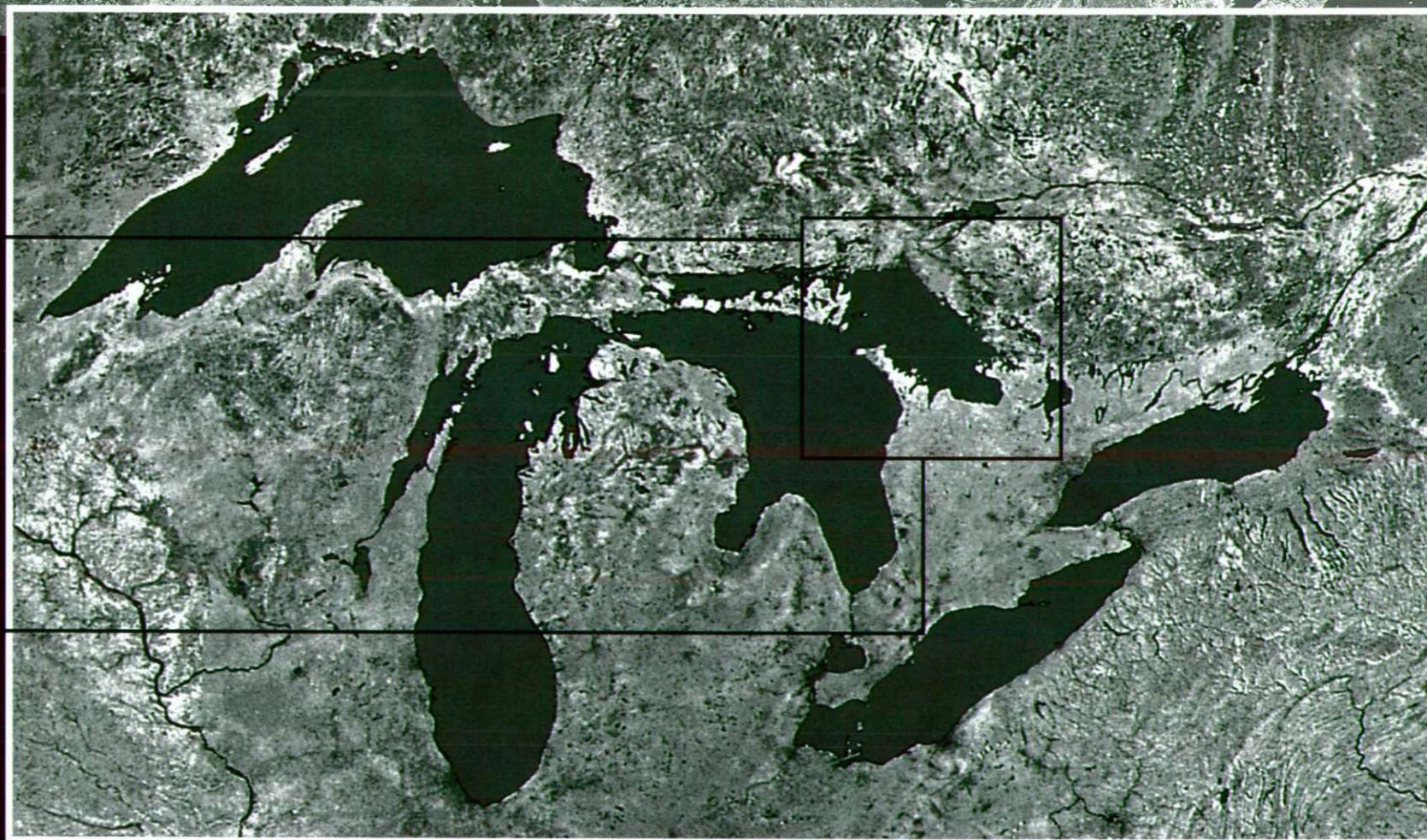
**Figure 6a: Lake Huron and Georgian Bay Summer Wind Information**



(Saulesleja, 1986)

**Figure 6b: Lake Huron and Georgian Bay Winter Wind Information**

**Environmental  
Sensitivity Maps for  
Lake Huron's  
Canadian Shoreline  
(including Georgian Bay)**

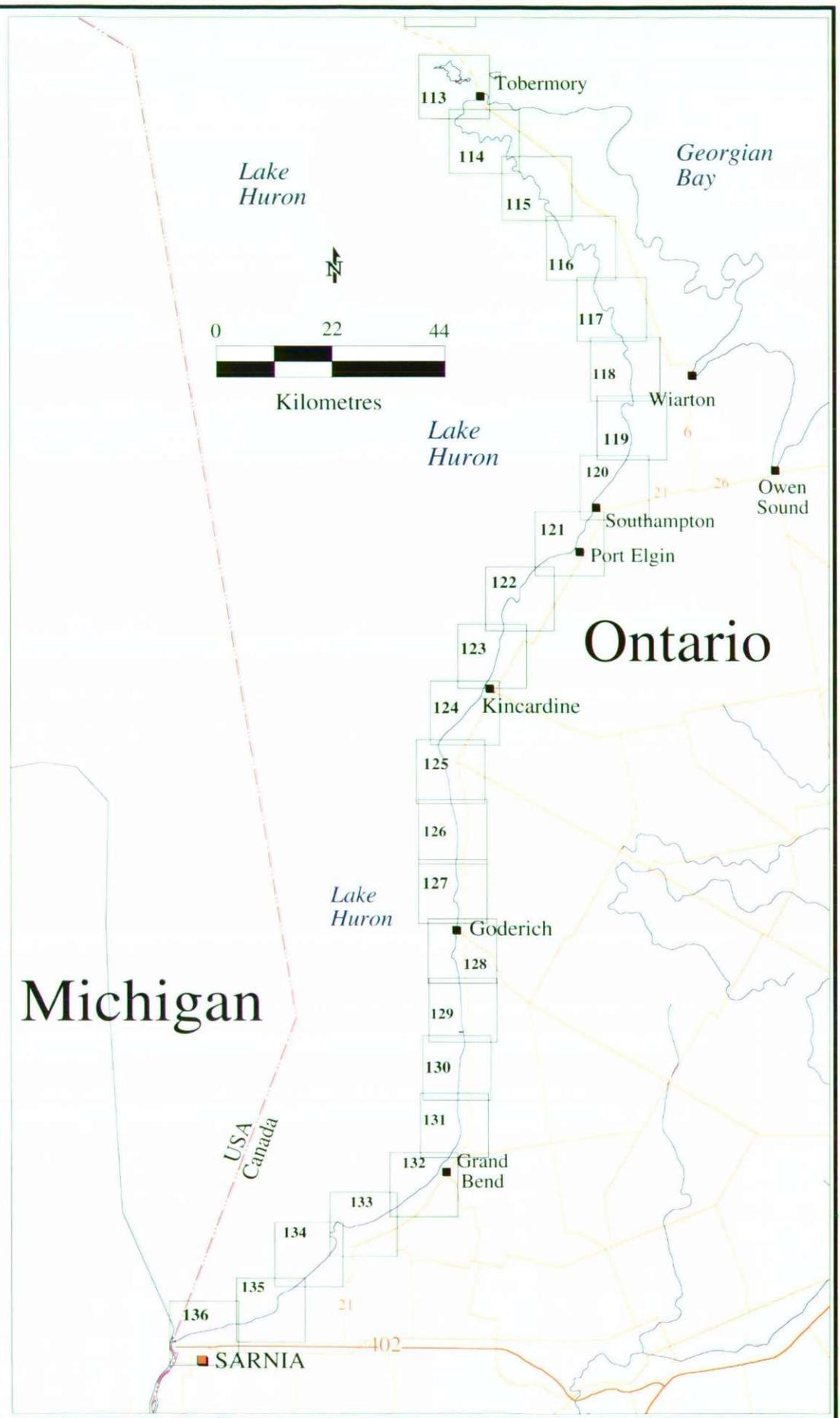
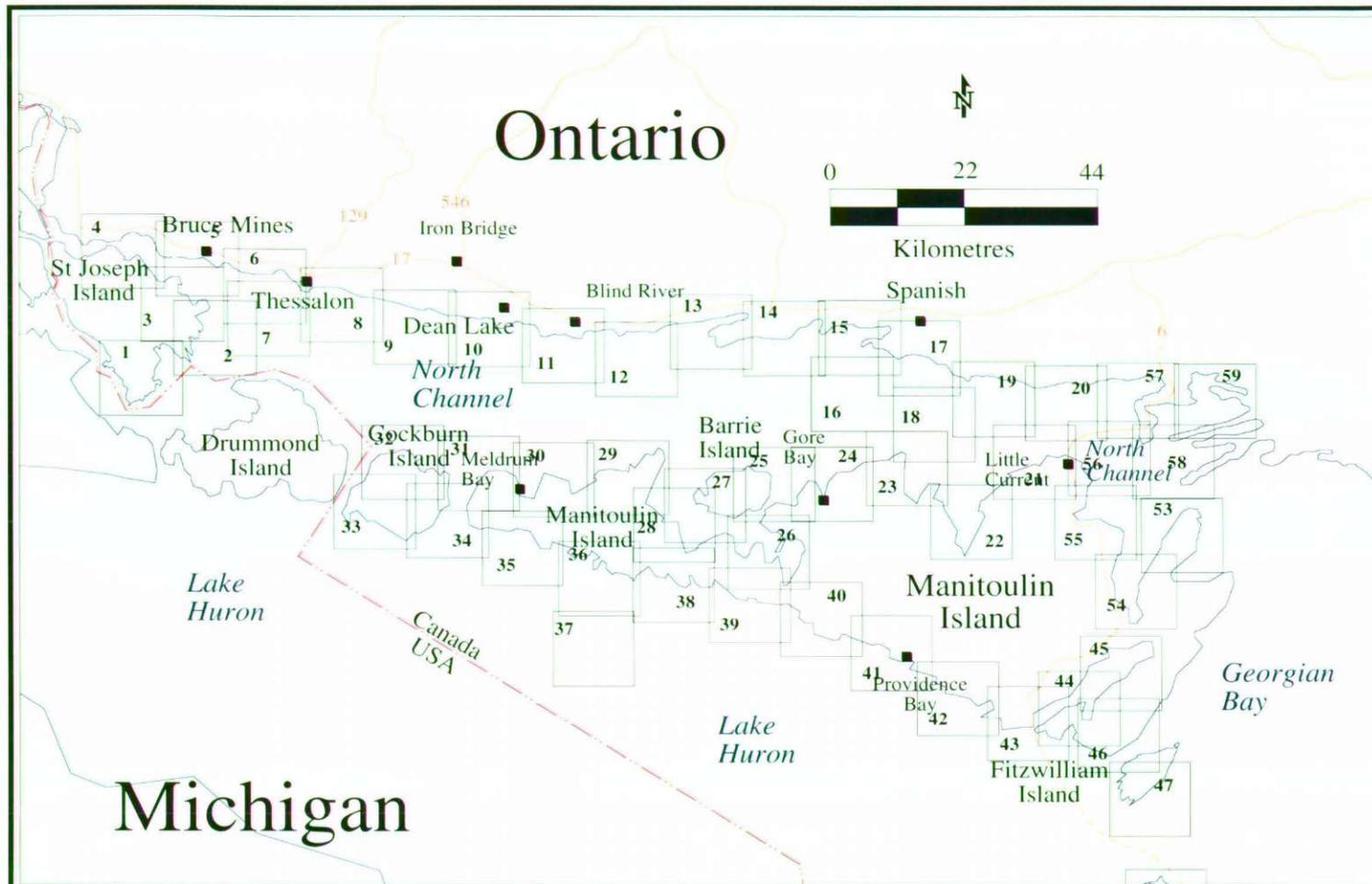


Environnement  
Canada

Environmental  
Protection Branch  
Ontario Region

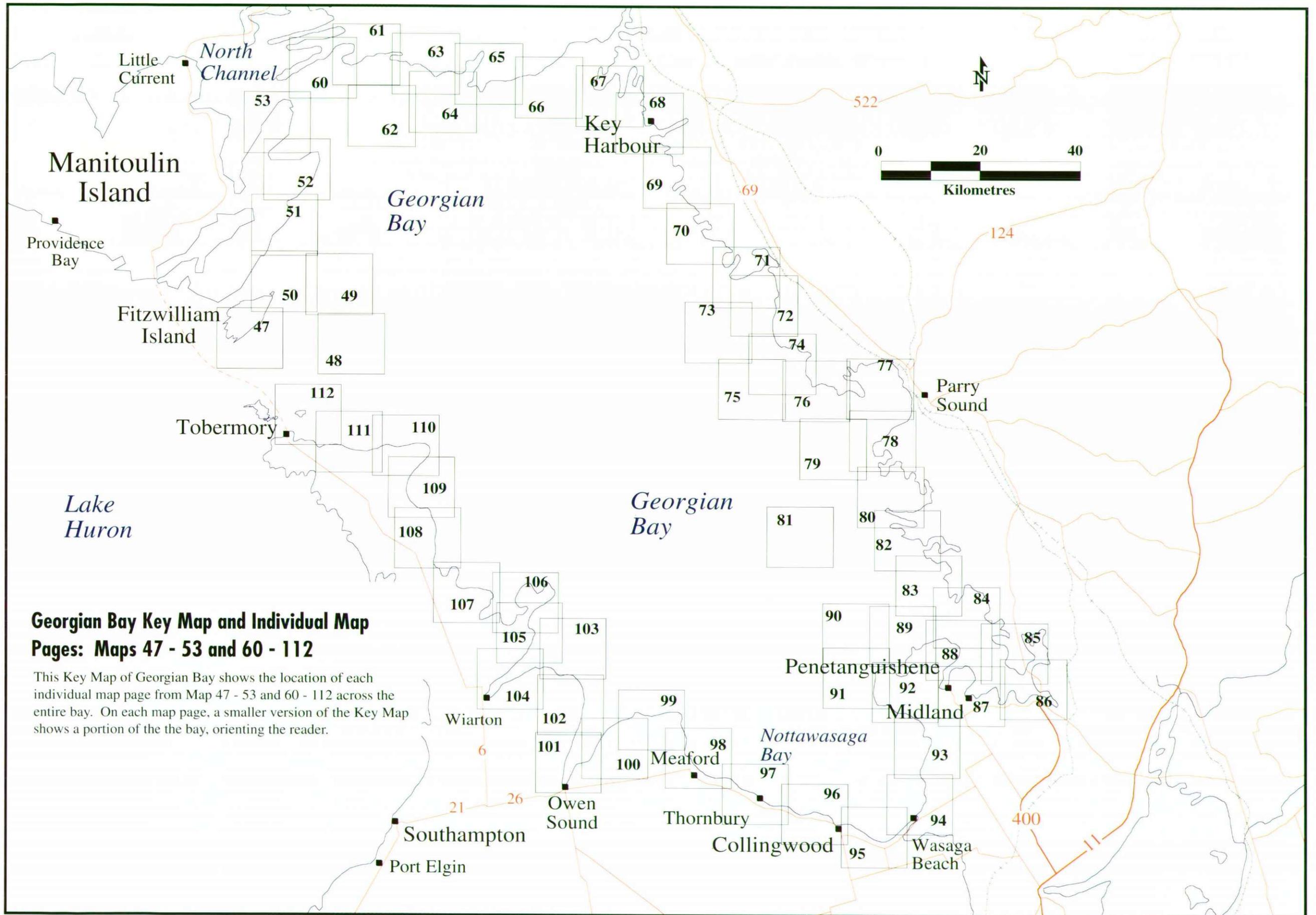
Environnement  
Canada

Direction générale  
de la protection de  
l'environnement  
Région de l'Ontario



**Lake Huron Key Map and Individual Map Pages:  
Maps 1 to 47, 53-59, 113-136.**

This Key Map of Lake Huron shows the location of each individual map page from Map 1-47, 53-59 and 113-136 across the Canadian shoreline of the lake. On each map page, a smaller version of the Key Map shows a portion of the lake, orienting the reader.



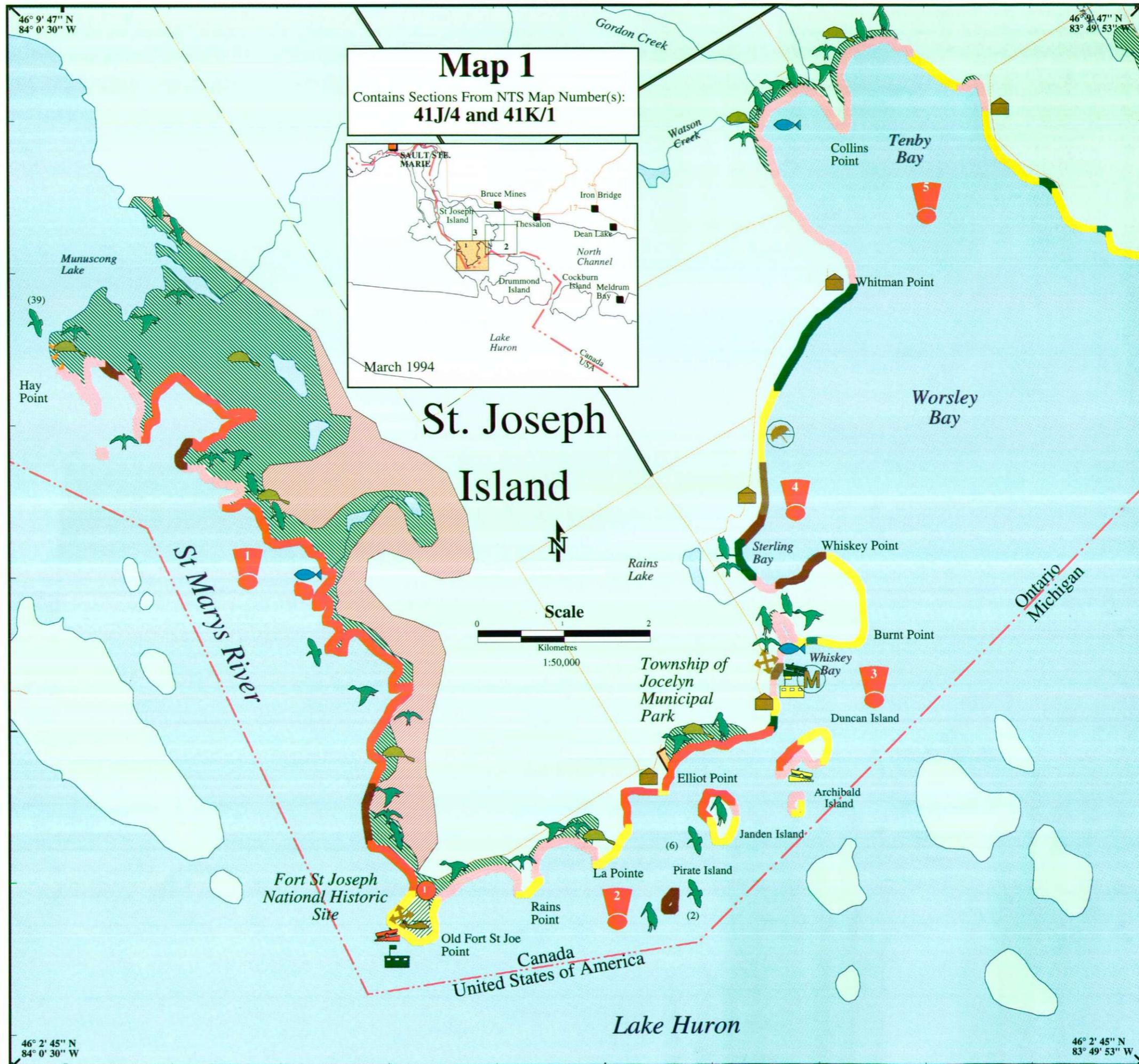
**Georgian Bay Key Map and Individual Map  
Pages: Maps 47 - 53 and 60 - 112**

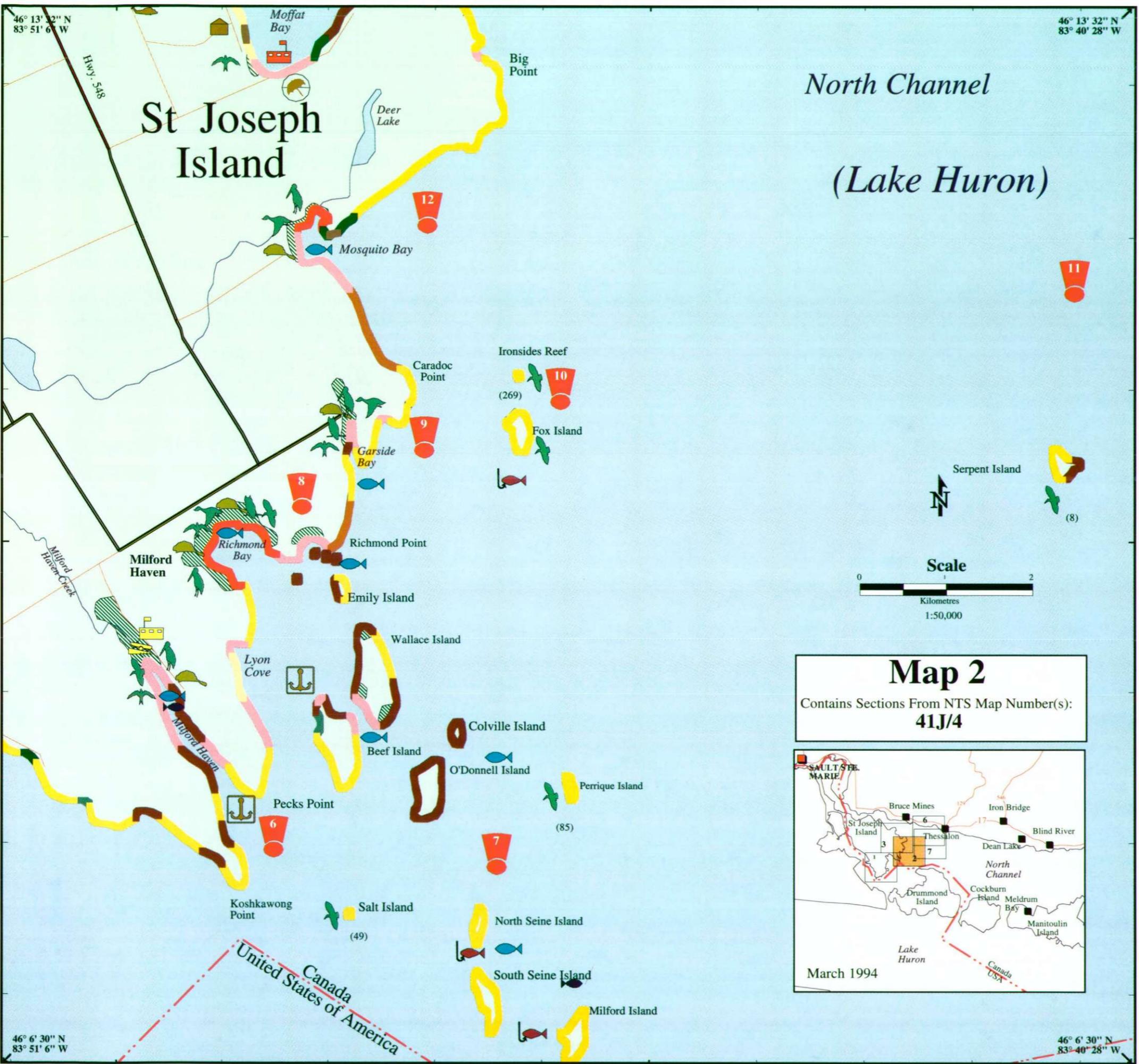
This Key Map of Georgian Bay shows the location of each individual map page from Map 47 - 53 and 60 - 112 across the entire bay. On each map page, a smaller version of the Key Map shows a portion of the the bay, orienting the reader.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 1 The Hay Marsh is a provincially significant wetland which is classified as an Environmentally Sensitive Area. It supports colonial waterbirds, wading birds, shorebirds and raptors. It is a significant bird sanctuary supporting migratory waterfowl. This wetland provides a habitat for fish spawning and fur bearing mammals.
- 2 The St. Joseph Island shoreline from Old Fort St. Joe Point to Burnt Point contains numerous small wetlands which support colonial waterbirds, waterfowl, shorebirds, wading birds, raptors and fur bearing mammals.
- 3 The Whiskey Bay shoreline is an area of recreational cottage use and is a significant deer migration region.
- 4 Sterling Bay provides a habitat for shorebirds and raptors. There is a recreational beach and several cottages nearby.
- 5 Small wetlands in Tenby Bay support migratory waterfowl, wading birds, shorebirds, raptors and fur bearing mammals. Gordon Creek is an important fish spawning watercourse: Rainbow Smelt in Spring.



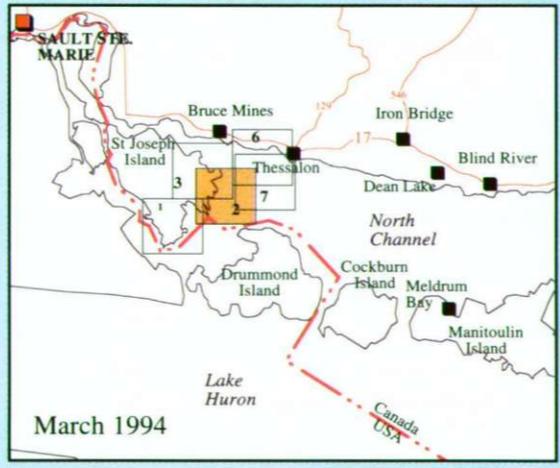


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 6 Milford Haven Wetland provides a habitat for colonial waterbirds, wading birds, shorebirds and fur bearing mammals. Milford Haven Creek is an important fish spawning and fish migration watercourse. An old sawmill exists in Milford Haven. Responders must take care not to cause damage in this area. A boat launch exists along the access road.
- 7 Nesting colonial waterbirds occur on Salt Island and Perriquet Island. Seasonal commercial fishing and fish spawning activities occur in Lake Huron near O'Donnell Island and the Seine Islands: Lake Whitefish in late Fall.
- 8 Important wetlands at Richmond Bay and Richmond Point provide a habitat for rare colonial waterbirds, wading birds, shorebirds, migratory waterfowl, raptors and fur bearing mammals.
- 9 Small wetlands at Garside Bay support migratory waterfowl, wading birds and raptors. It provides a habitat for fur bearing mammals and fish spawning activities.
- 10 Nesting colonial waterbirds occur on Ironsides Reef. Seasonal fish spawning and commercial fishing activities occur in this area of Lake Huron: Lake Whitefish in late Fall.
- 11 Nesting colonial waterbirds occur on Serpent Island and Kangaroo Rock.
- 12 Mosquito Bay Wetland supports wading birds and migratory waterfowl. It provides a habitat for fur bearing mammals and fish spawning activities.

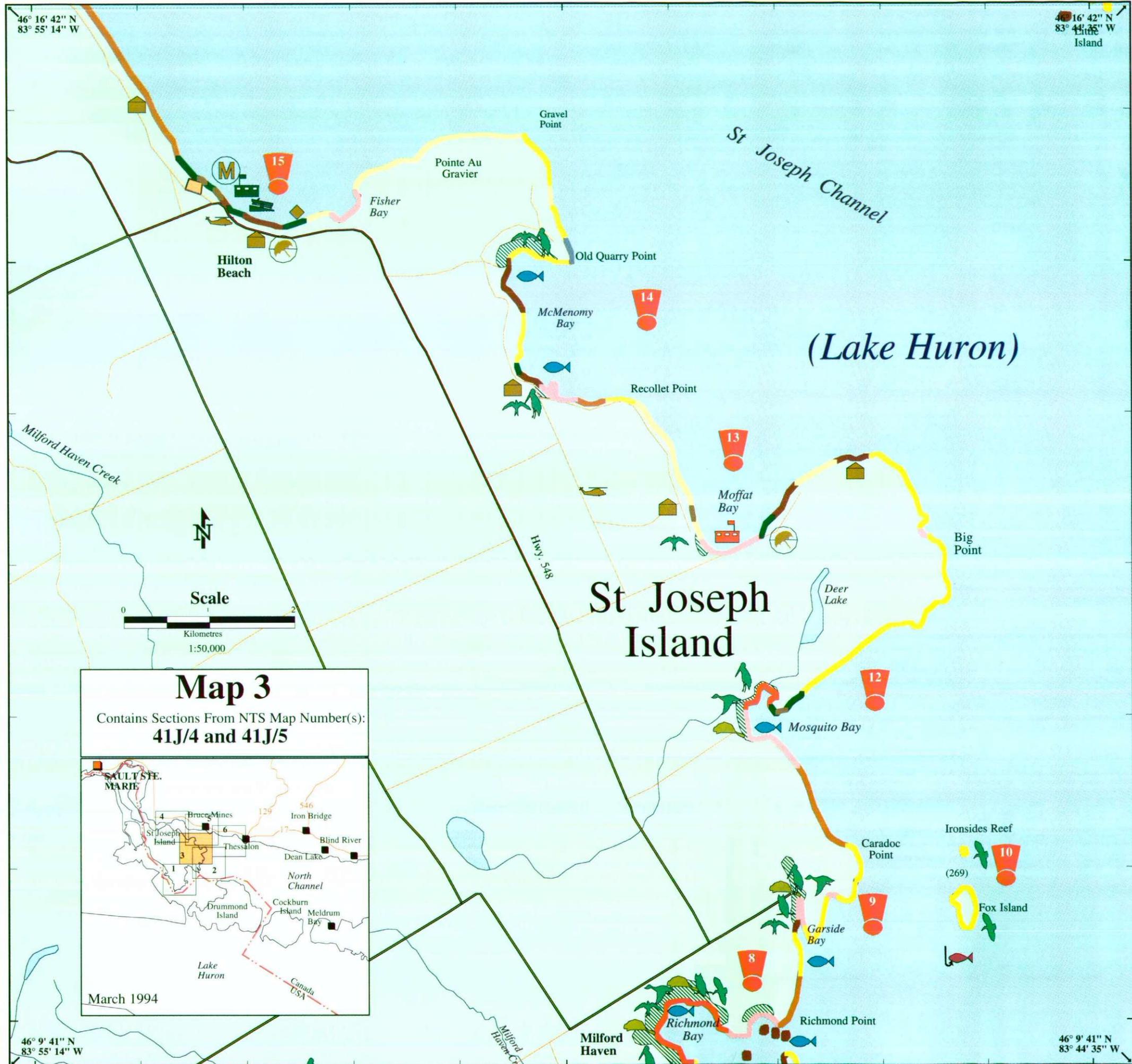
**Map 2**  
Contains Sections From NTS Map Number(s):  
**41J/4**



## NOTES

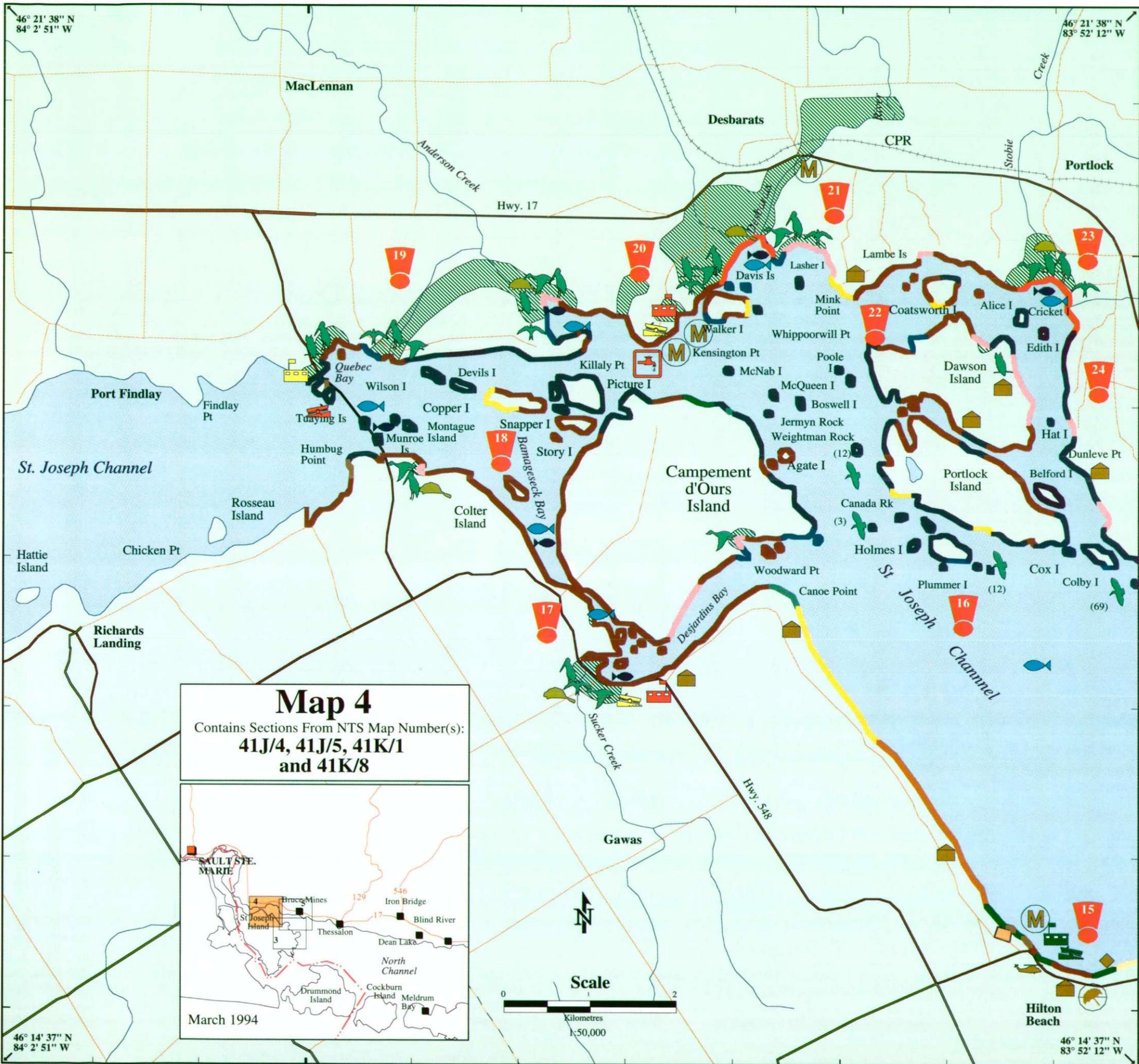
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 8** Important wetlands at Richmond Bay and Richmond Point provide a habitat for rare colonial waterbirds, wading birds, shorebirds, migratory waterfowl, raptors and fur bearing mammals.
- 9** Small wetlands at Garside Bay support migratory waterfowl, wading birds and raptors. It provides a habitat for fur bearing mammals and fish spawning activities.
- 10** Nesting colonial waterbirds occur on Ironsides Reef. Seasonal fish spawning and commercial fishing activities occur in this area of Lake Huron: Lake Whitefish in late Fall.
- 12** Mosquito Bay Wetland supports wading birds and migratory waterfowl. It provides a habitat for fur bearing mammals and fish spawning activities.
- 13** Recreational cottages occur along the shoreline of Lake Huron from Big Point to McMenemy Bay. A municipal recreational beach occurs in Moffat Bay.
- 14** Small wetlands occur in McMenemy Bay which support shorebirds and wading birds.
- 15** Hilton Beach is an important recreational area with a marina, a beach and numerous cottages. A sewage outfall will be installed in 1994. The town water is supplied by a well.



**Map 3**  
 Contains Sections From NTS Map Number(s):  
**41J/4 and 41J/5**

SAULT STE. MARIE  
 Bruce Mines  
 129  
 Iron Bridge  
 546  
 Blind River  
 Dean Lake  
 North Channel  
 Cockburn Island  
 Meldrum Bay  
 Drummond Island  
 Lake Huron  
 Canada USA  
 March 1994

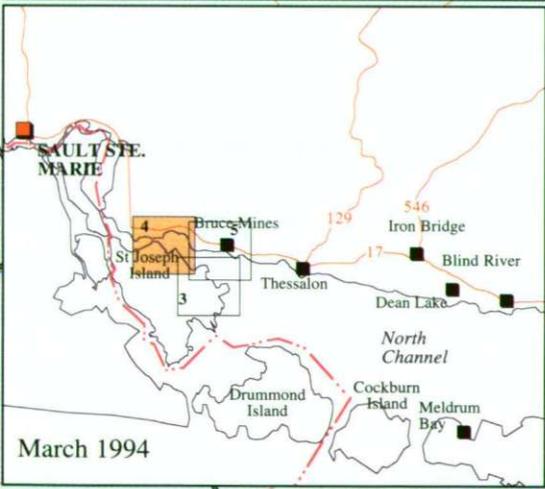


### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 15** Hilton Beach is an important recreational area with a marina, a beach and numerous cottages. A sewage outfall will be installed in 1994. The town water is supplied by a well.
- 16** Nesting colonial waterbirds occur near Plummer Island. Seasonal fish spawning occurs in the St. Joseph Channel: Northern Pike and Walleye in Spring.
- 17** The Sucker Creek wetland supports wading birds, shorebirds and migratory waterfowl. It provides a habitat for migrating fish and fur bearing mammals.
- 18** Seasonal fish spawning and migration occurs in Bamageseck Bay: Northern Pike, Smallmouth Bass and Walleye in Spring.
- 19** The Anderson Creek Wetland supports wading birds, waterfowl, shorebirds, nesting raptors and fur bearing mammals. The creek is an important fish spawning and migration watercourse.
- 20** Desbarats municipal water intake: Call - (705) 782-6601. Seasonal fish spawning occurs in the St. Joseph Channel: Northern Pike and Walleye in Spring.
- 21** The Desbarats Wetland is a provincially significant wetland which is classified as an Environmentally Sensitive Area. It supports wading birds, shorebirds, migratory waterfowl, raptors and fur bearing mammals. The Desbarats River is an important fish spawning and migration watercourse.
- 22** Dawson Island supports nesting raptors.
- 23** The Stobie Creek Wetland is a provincially significant wetland that is classified as an Environmentally Sensitive Area. It supports wading birds, shorebirds, migratory waterfowl, raptors and fur bearing mammals. Stobie Creek is an important fish spawning and migration watercourse.
- 24** Numerous recreational cottages occur along the St. Joseph Channel shoreline from Mink Point to Dunleve Point.

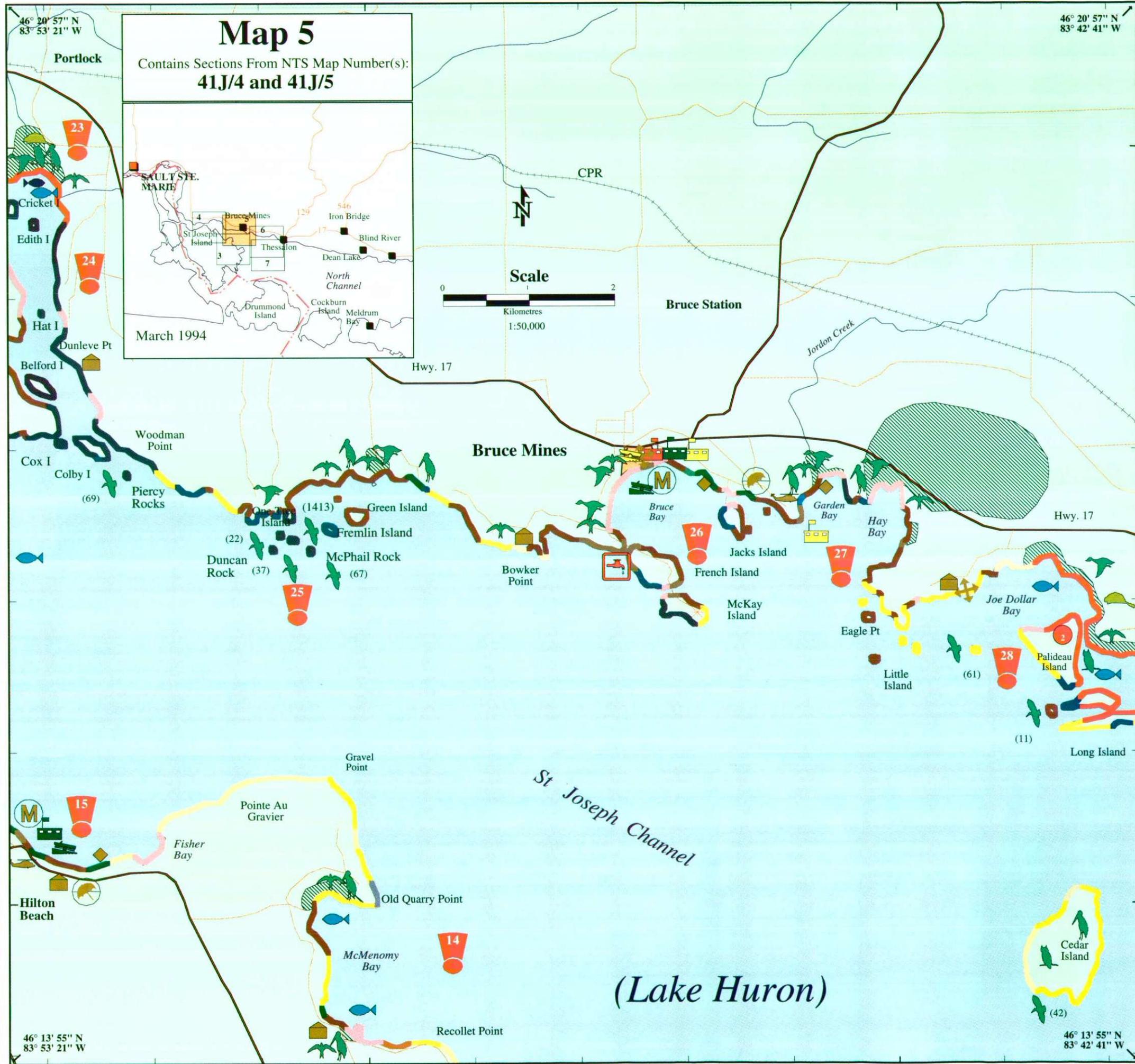
**Map 4**  
Contains Sections From NTS Map Number(s):  
**41J/4, 41J/5, 41K/1**  
and **41K/8**

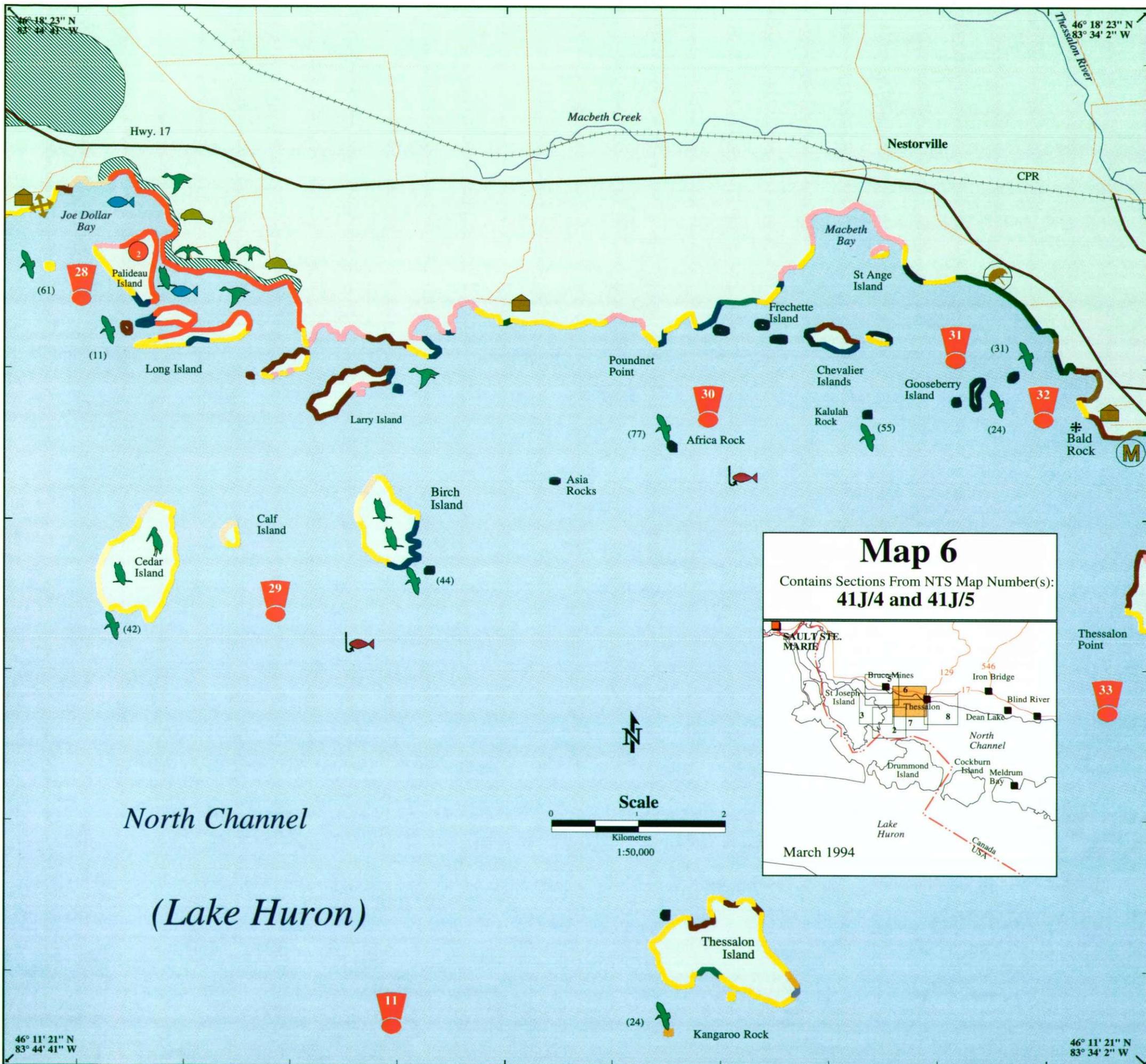


# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 14** Small wetlands occur in McMenomy Bay which support shorebirds and wading birds.
- 15** Hilton Beach is an important recreational area with a marina, a beach and numerous cottages. A sewage outfall will be installed in 1994.  
The town water is supplied by a well.
- 23** The Stobie Creek Wetland is a provincially significant wetland that is classified as an Environmentally Sensitive Area. It supports waterfowl, shorebirds, migratory waterfowl, raptors and fur bearing mammals. Stobie Creek is an important fish spawning and migration watercourse.
- 24** Numerous recreational cottages occur along the St. Joseph Channel shoreline from Mink Point to Dunleve Point.
- 25** Nesting colonial waterbirds occur on One Tree Island, Duncan Rock and McPhail Rock.
- 26** Bruce Mines Water Treatment Plant water intake and Sewage Treatment Plant water outfall: Call - (705) 785-3445. Small wetlands at Bruce Mines support migratory waterfowl and shorebirds.
- 27** The Peat Wetland and Hay Bay provide a habitat for wading birds, shorebirds and migratory waterfowl.
- 28** The wetland on Palideau Island supports migratory waterfowl, shorebirds and raptors. It provides a habitat for fur bearing mammals and supports fish spawning activities. A barrier beach and island occurs between Palideau Island and Long Island. Responders must take care not to damage these formations.





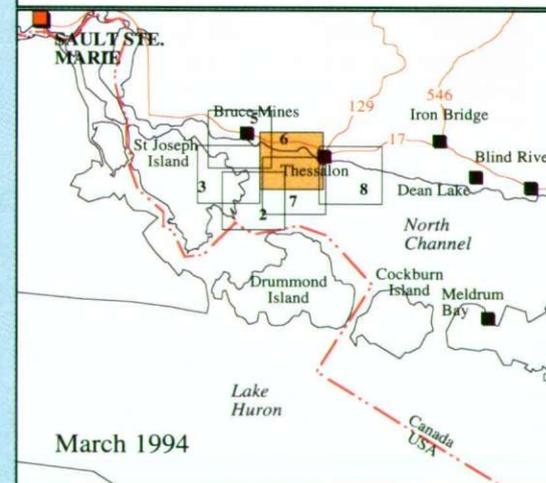
### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Nesting colonial waterbirds occur on Serpent Island and Kangaroo Rock.
-  The wetland on Palideau Island supports migratory waterfowl, shorebirds and raptors. It provides a habitat for fur bearing mammals and supports fish spawning activities. A barrier beach and island occurs between Palideau Island and Long Island. Responders must take care not to damage these formations.
-  Nesting colonial waterbirds and raptors occur on Cedar Island and Birch Island.
-  Commercial fisheries activities occur in Lake Huron near Africa Rock: Lake Whitefish and Lake Trout in the Fall. Nesting colonial waterbirds occur on Africa Rock.
-  Nesting colonial waterbirds occur on numerous rocks near Gooseberry Island.
-  Recreational beaches and cottages occur along the Lake Huron shoreline from St. Ange Island to Bald Rock.
-  Thessalon Point is an important cultural heritage region. Seasonal fish spawning occurs in Lake Huron at Thessalon Point: Lake Whitefish in late Fall. A small wetland exists on the west side of the peninsula providing habitat to wading birds, shorebirds and migratory waterfowl.

## Map 6

Contains Sections From NTS Map Number(s):  
**41J/4 and 41J/5**



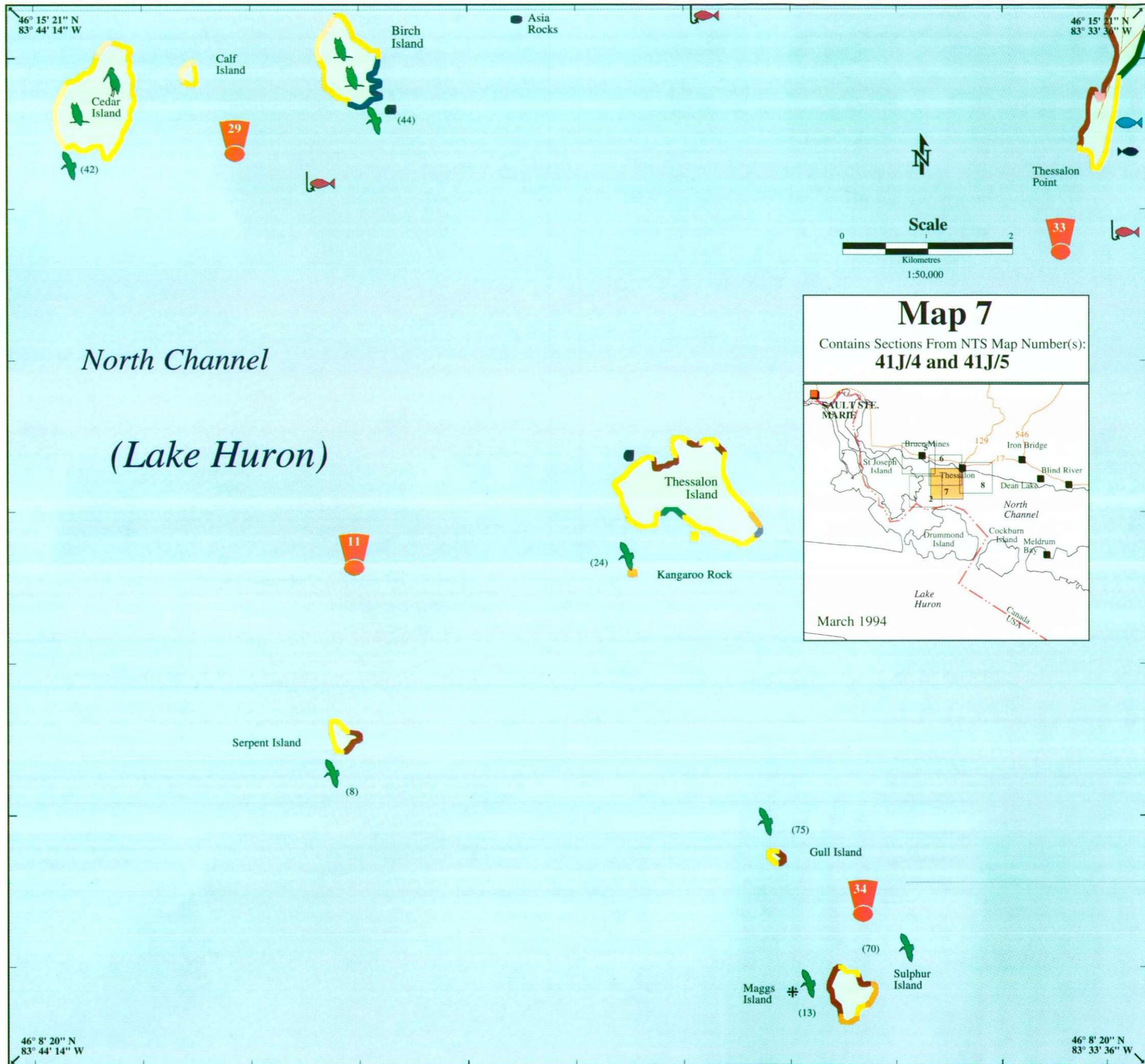
North Channel

(Lake Huron)

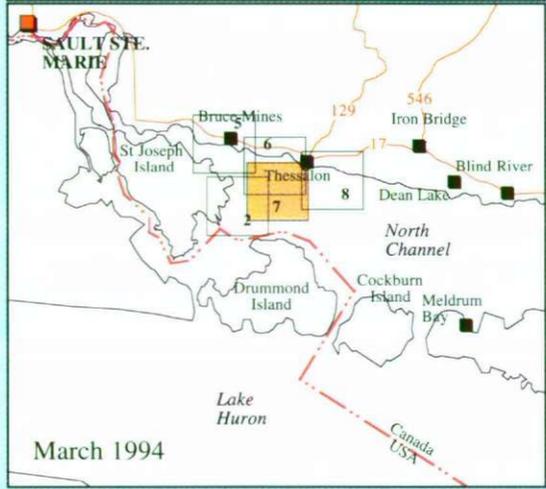
## NOTES !

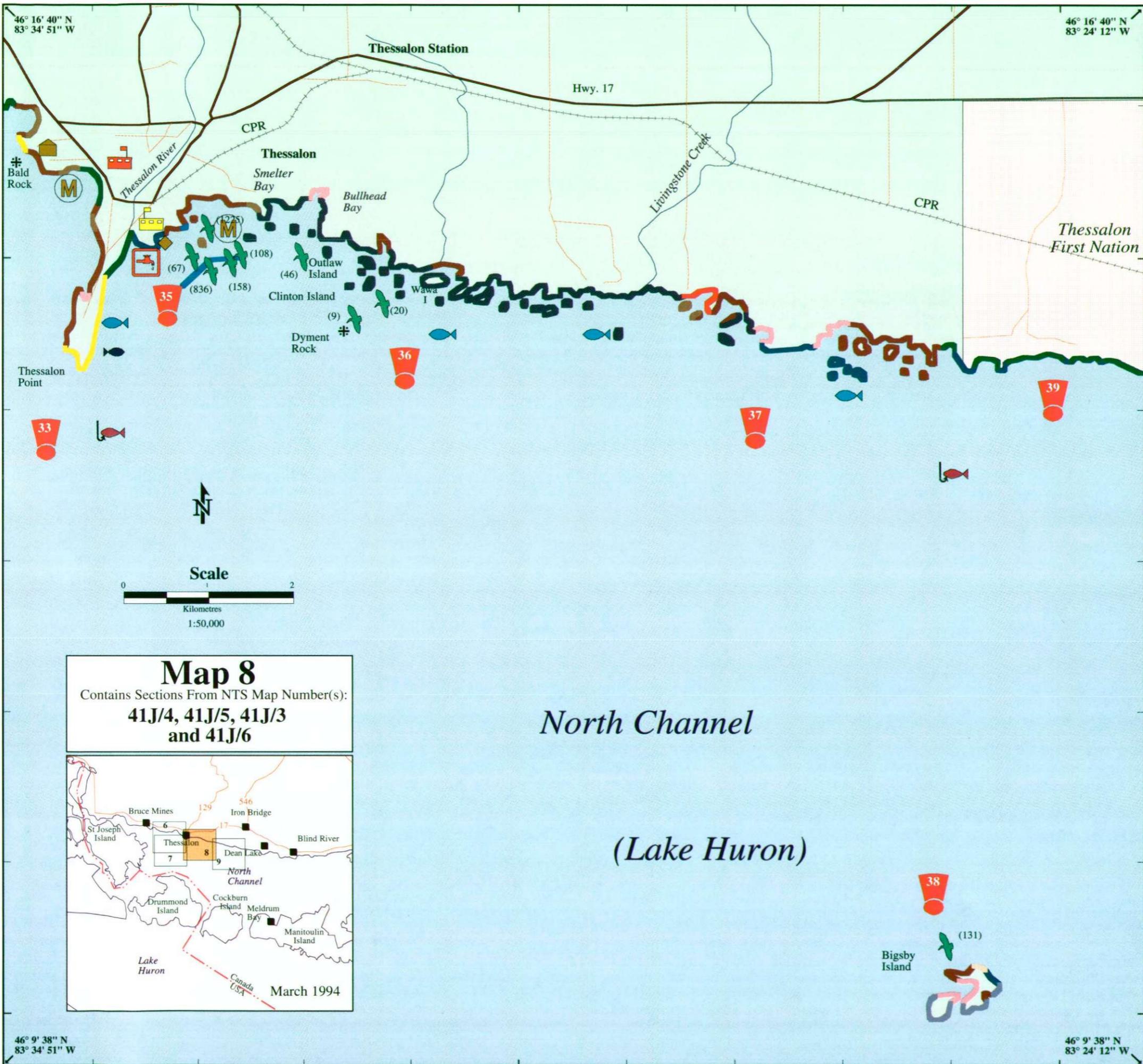
A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Nesting colonial waterbirds occur on Serpent Island and Kangaroo Rock.
-  Nesting colonial waterbirds and raptors occur on Cedar Island and Birch Island.
-  Thessalon Point is an important cultural heritage region. Seasonal fish spawning occurs in Lake Huron at Thessalon Point: Lake Whitefish in late Fall. A small wetland exists on the west side of the peninsula providing habitat to wading birds, shorebirds and migratory waterfowl.
-  Nesting colonial waterbirds occur on Sulphur Island, Maggs Island and Gull Island.



**Map 7**  
Contains Sections From NTS Map Number(s):  
**41J/4 and 41J/5**





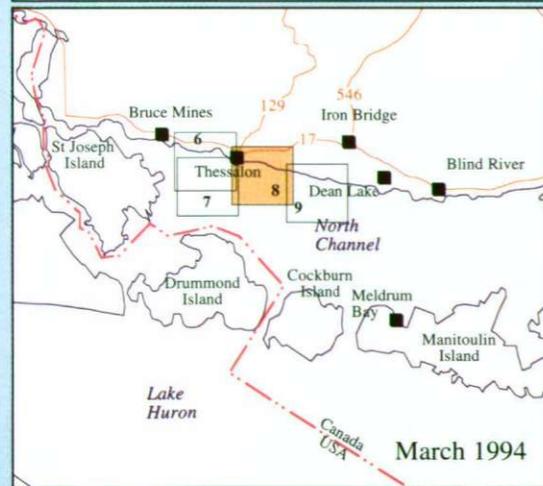
### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 33** Thessalon Point is an important cultural heritage region. Seasonal fish spawning occurs in Lake Huron at Thessalon Point: Lake Whitefish in late Fall. A small wetland exists on the west side of the peninsula providing habitat to wading birds, shorebirds and migratory waterfowl.
- 35** Thessalon Sewage Treatment Plant water outfall and Water Treatment Plant water intake: Call - (705) 842-2217. Nesting colonial waterbirds occur on the breakwater at Thessalon.
- 36** Seasonal fish spawning occurs in Lake Huron, near Wawa Island: Lake Whitefish in the Fall. Nesting colonial waterbirds occur on Clinton Island and Dymont Rock.
- 37** Seasonal fish spawning occurs in Lake Huron from Livingstone Creek to Bright Point: Lake Whitefish in the Fall.
- 38** Nesting colonial waterbirds occur on Bigsby Island.
- 39** Thessalon First Nation. Responders should contact the Chief of the Thessalon First Nation before commencing response activities.

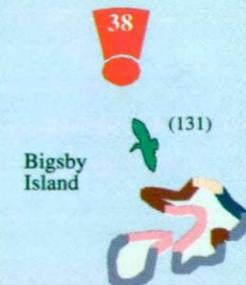
## Map 8

Contains Sections From NTS Map Number(s):  
**41J/4, 41J/5, 41J/3  
 and 41J/6**



*North Channel*

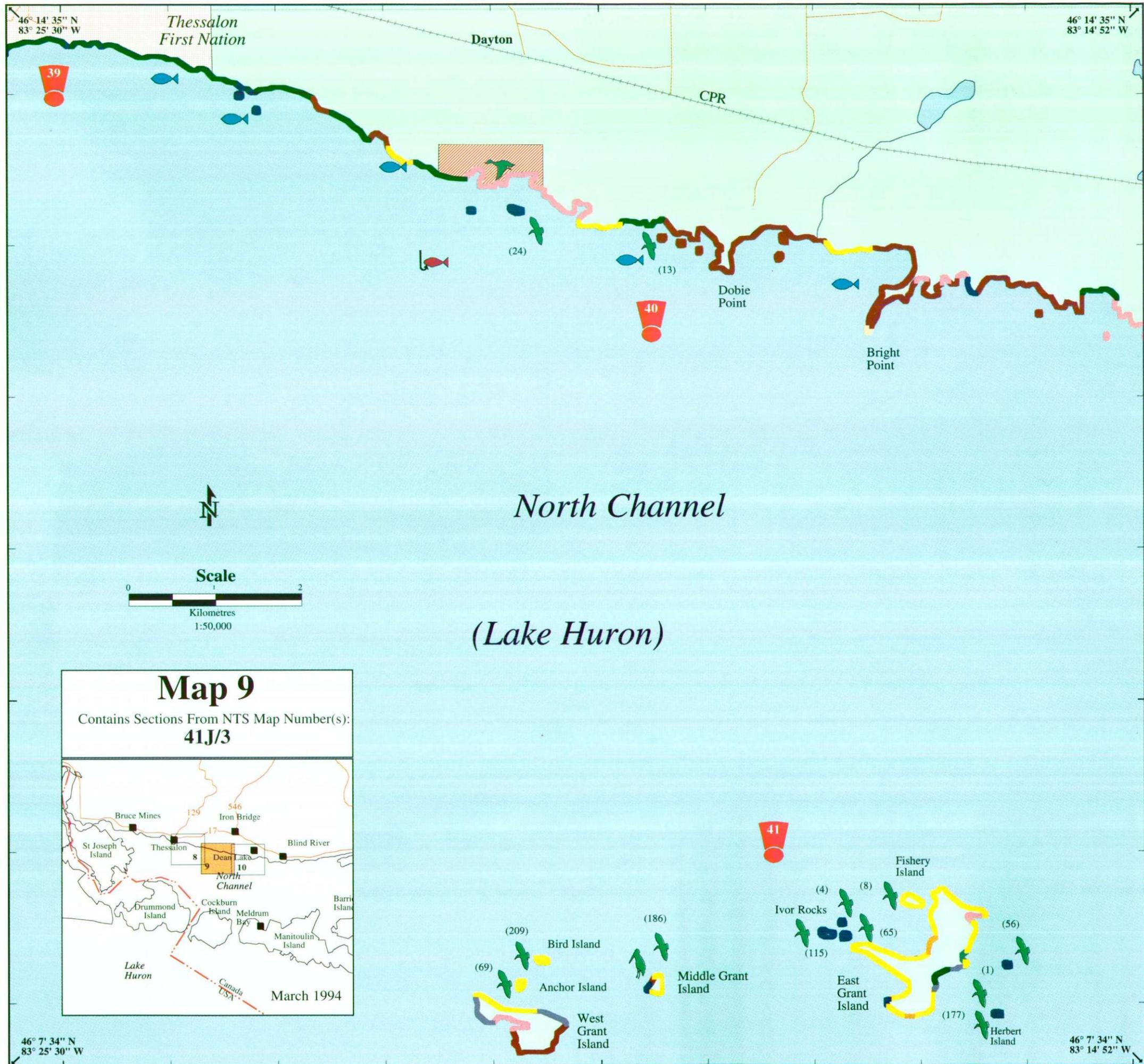
*(Lake Huron)*

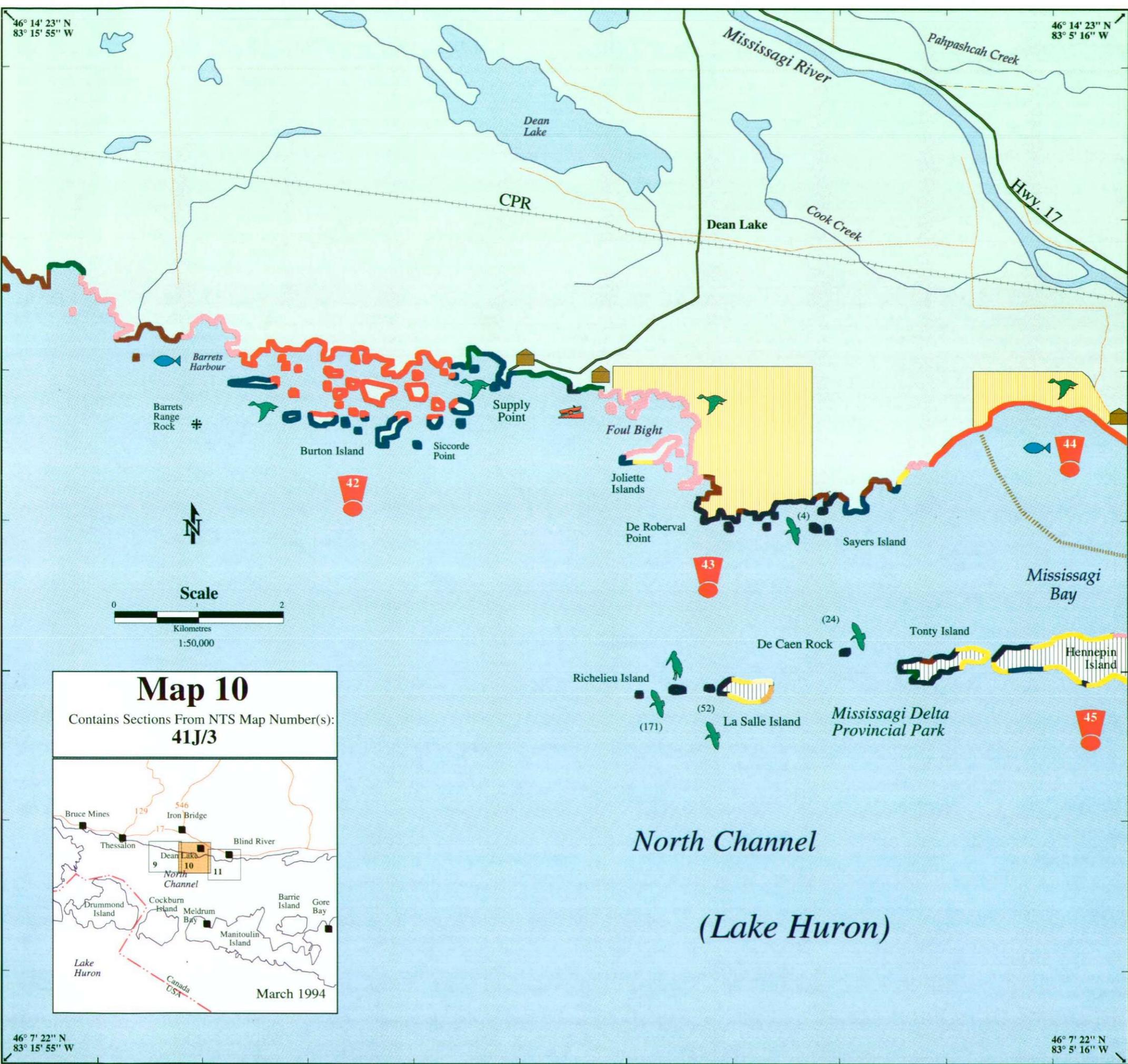


**NOTES** !

A red exclamation point symbol is used on the maps to catch the responder's attention.

- ! 39 Thessalon First Nation. Responders should contact the Chief of the Thessalon First Nation before commencing response activities.
- ! 40 Seasonal fish spawning occurs in Lake Huron from Livingstone Creek to Bright Point. Lake Whitefish in the Fall. This area includes an Environmentally Sensitive Area, which provides a habitat for migratory waterfowl.
- ! 41 Nesting colonial waterbirds occur on the numerous rocks and islands associated with the Grant Islands.





**NOTES**

- A red exclamation point symbol is used on the maps to catch the responder's attention.
- 42** The Burton Island Area is a significant waterfowl migratory area.
- 43** Foul Bight is a significant waterfowl migratory area and is a candidate Area of Natural and Scientific Interest.
- 44** Mississagi Bay is classified as an Environmentally Sensitive Area. This is a highly significant fish spawning area. Approach concerns exist in Mississagi Bay. Responders should exercise caution when approaching the shoreline. This area is also a candidate Area of Natural and Scientific Interest.
- 45** The Mississagi Delta Provincial Park is an important recreational and educational area. It is a significant migratory waterfowl region and seasonal fish spawning and migration occur in the Mississagi River.

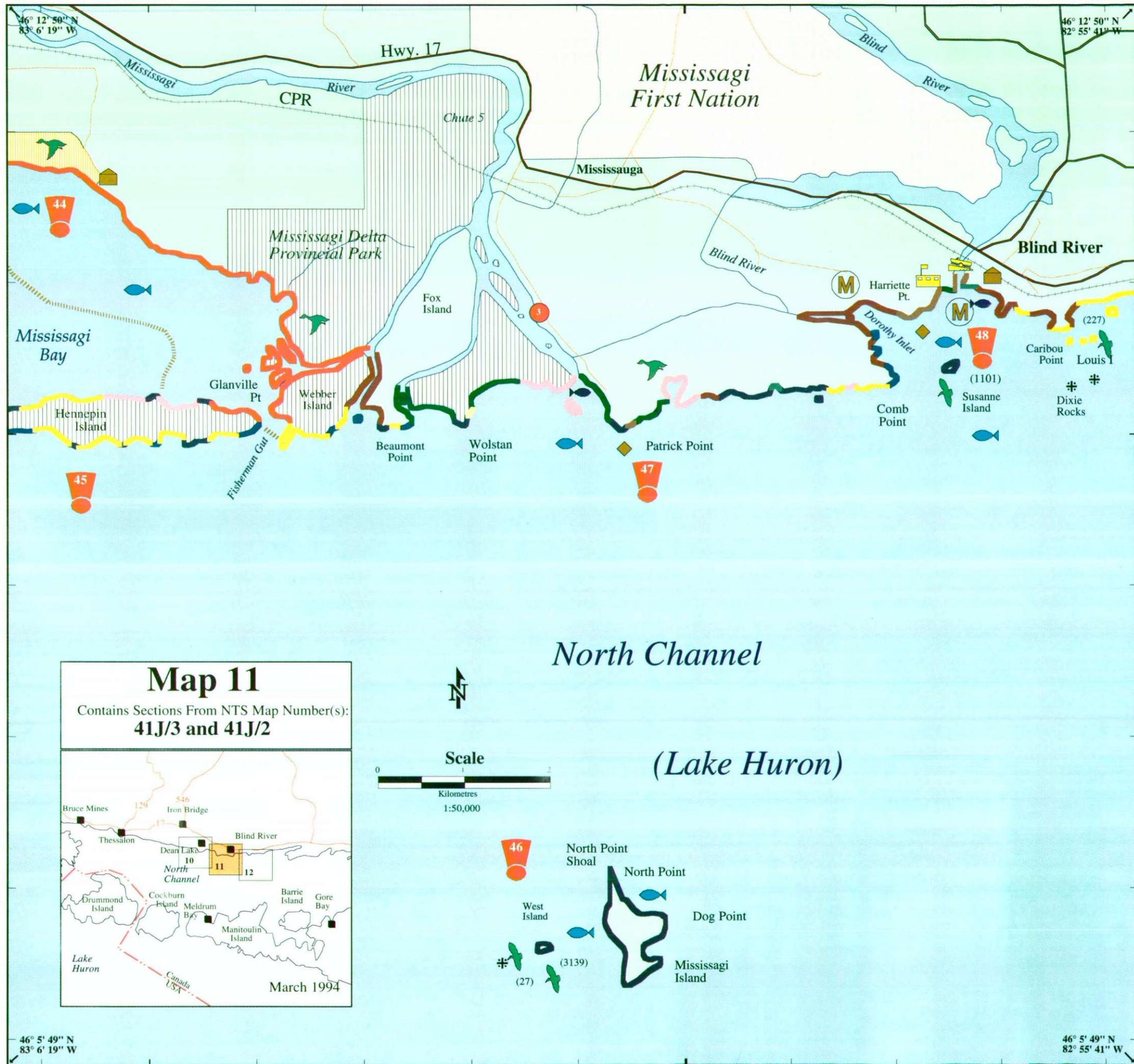
**Map 10**  
 Contains Sections From NTS Map Number(s):  
**41J/3**

March 1994

# NOTES

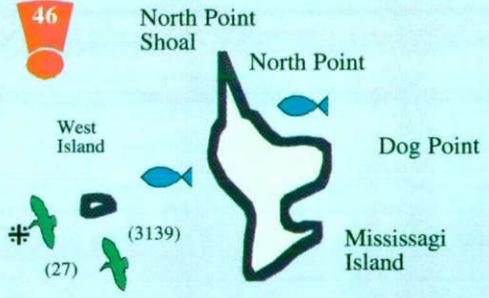
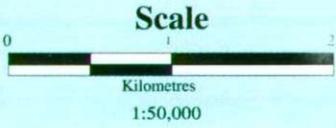
A red exclamation point symbol is used on the maps to catch the responder's attention.

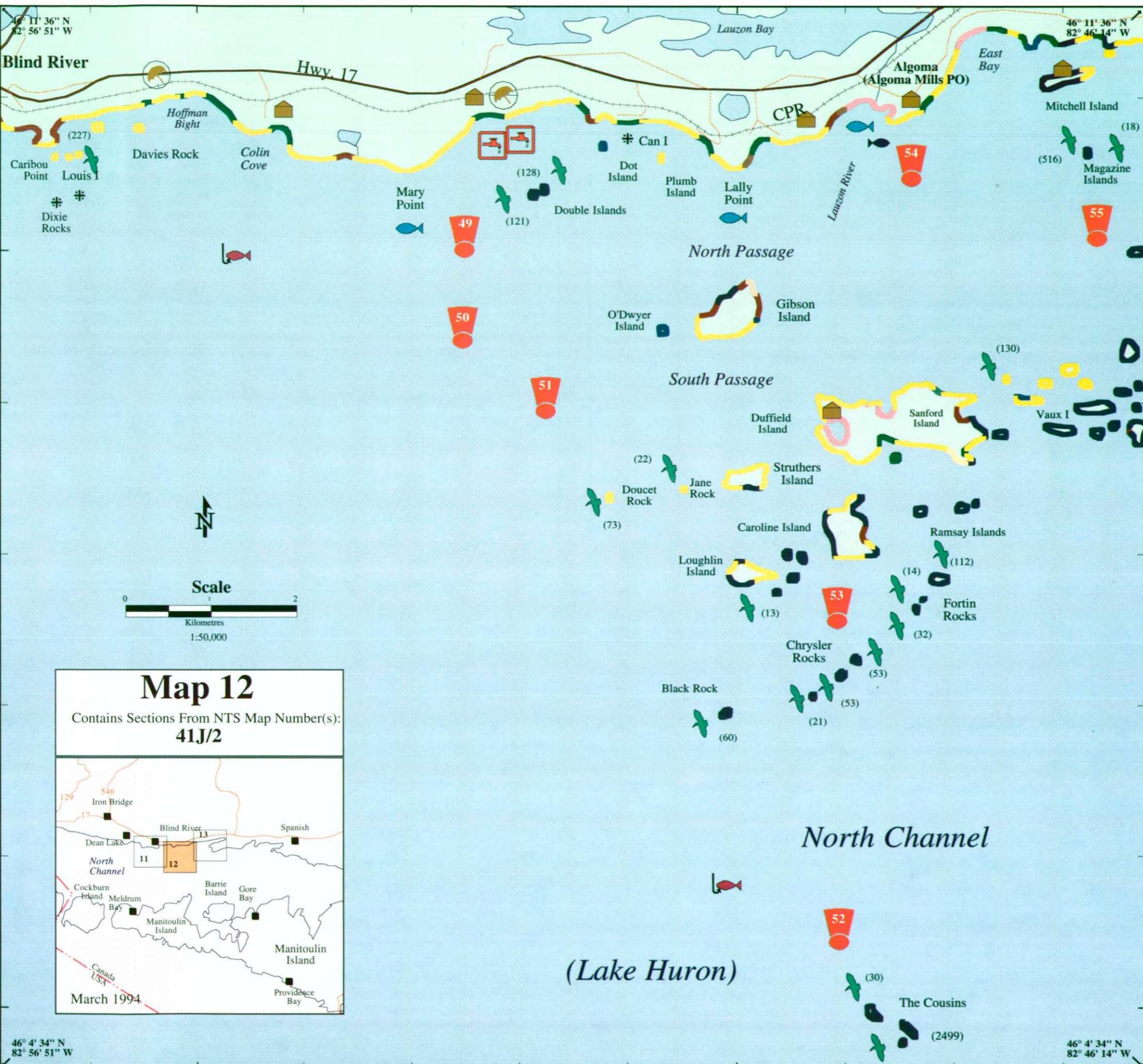
-  Mississagi Bay is classified as an Environmentally Sensitive Area. This is a highly significant fish spawning area. Approach concerns exist in Mississagi Bay. Responders should exercise caution when approaching the shoreline. This area is also a candidate Area of Natural and Scientific Interest.
-  The Mississagi Delta Provincial Park is an important recreational and educational area. It is a significant migratory waterfowl region and seasonal fish spawning and migration occur in the Mississagi River.
-  Nesting colonial waterbirds occur on West Island. Seasonal fish spawning occurs in Lake Huron, near West Island and Mississagi Island: Lake Whitefish in the Fall.
-  Cameco Limited water outfall: Call - (705) 356-1496.
-  Blind River Sewage Treatment Plant water outfall: Call - (705) 356-2251. The Blind River supports seasonal fish spawning and migration activities: Rainbow Smelt in Spring.



**Map 11**  
Contains Sections From NTS Map Number(s):  
**41J/3 and 41J/2**

March 1994



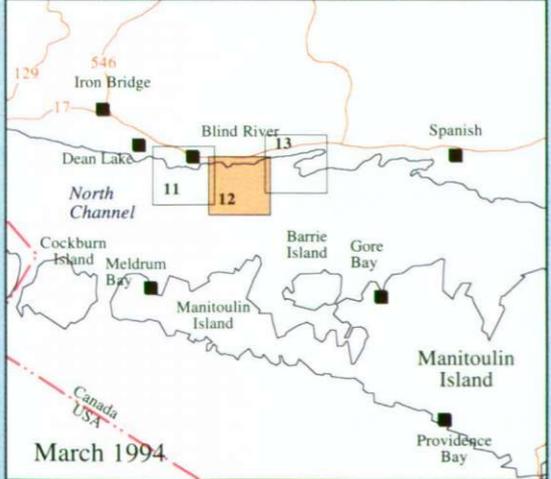


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 49** Township of the North Shore water intakes: Call - (705) 849-2213. Recreational cottages, homes and beaches occur along the Lake Huron shoreline, from Hoffman Bight to Algoma Mills.
- 50** Seasonal fish spawning occurs in Lake Huron from Blind River to Lally Point: Lake Trout and Whitefish in the Fall.
- 51** Nesting colonial waterbirds occur on the Double Islands, Doucet Rock and Jane Rock.
- 52** Nesting colonial waterbirds occur on the Cousins in the North Channel.
- 53** Nesting colonial waterbirds occur on the Chrysler Rocks and Fortin Rocks.
- 54** The Lauzon River is a significant fish spawning watercourse: Rainbow Smelt in Spring.
- 55** Nesting colonial waterbirds occur on the Magazine Islands in the North Channel.

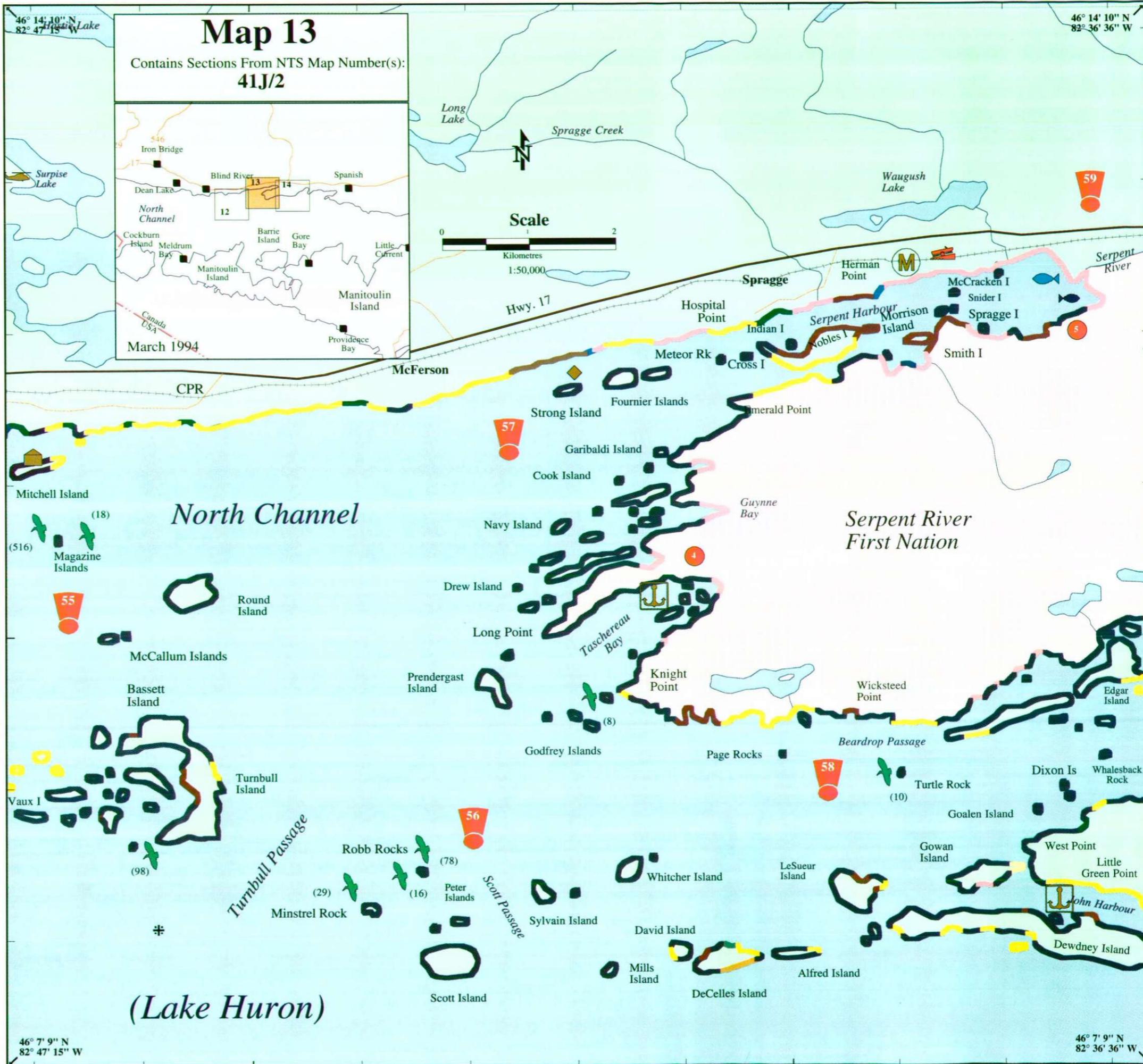
**Map 12**  
Contains Sections From NTS Map Number(s):  
**41J/2**



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 55 Nesting colonial waterbirds occur on the Magazine Islands in the North Channel.
- 56 Nesting colonial waterbirds occur on numerous rocks and islands in the Scott Passage.
- 57 Rio Algom Limited water outfall: Call - (705) 461-1830.
- 58 Serpent River First Nation. Responders should contact the Chief of the Serpent River First Nation before commencing response activities.
- 59 The Serpent River is a seasonal fish spawning and migration watercourse: Walleye, Northern Pike, White Sucker and Yellow Perch in Spring.

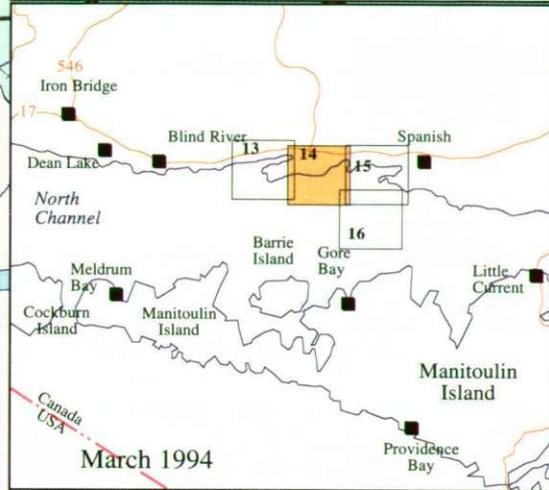


46° 13' 33" N  
82° 37' 49" W

46° 13' 33" N  
82° 27' 11" W

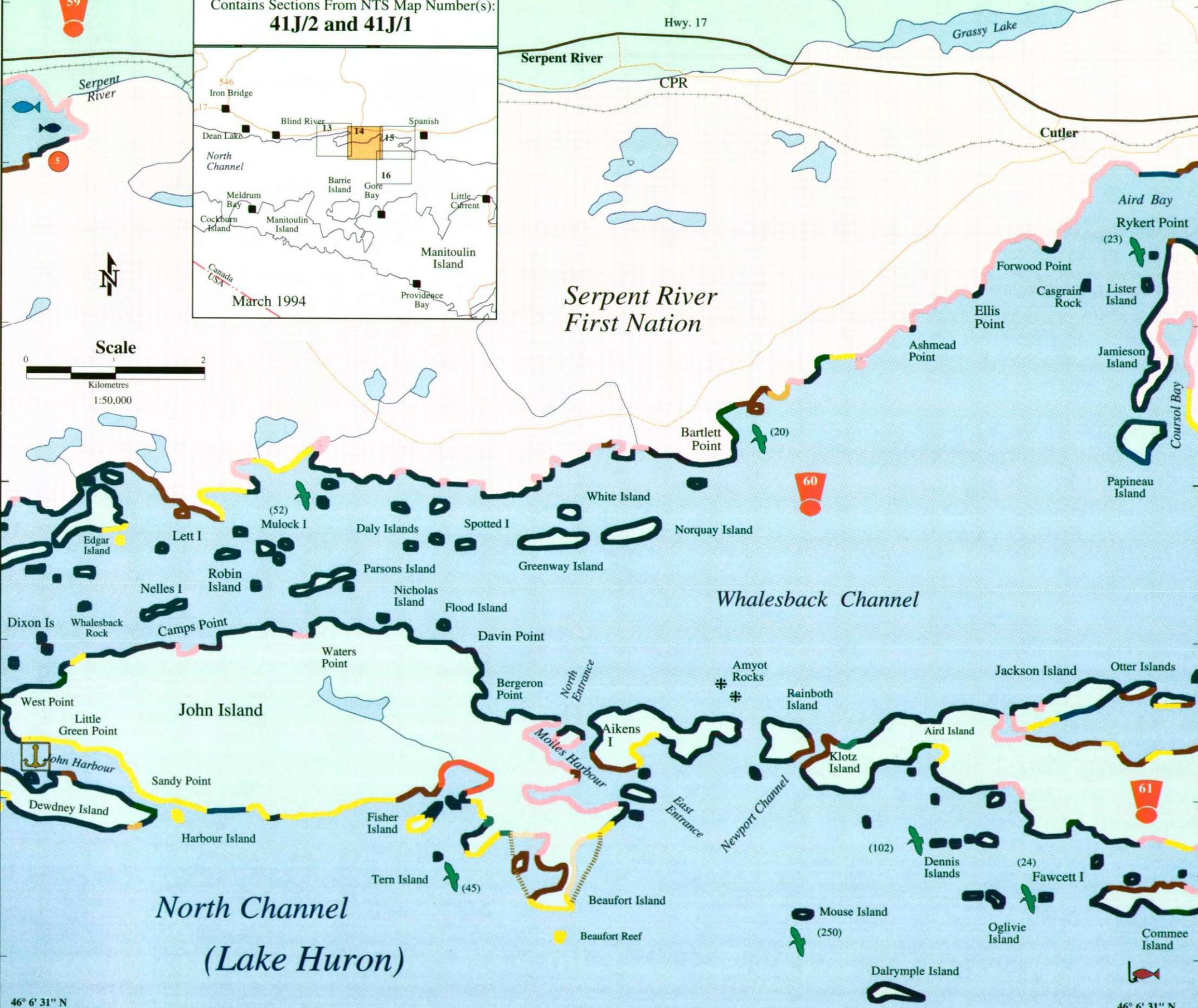
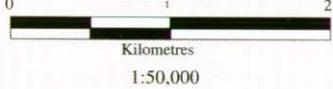
# Map 14

Contains Sections From NTS Map Number(s):  
**41J/2 and 41J/1**



March 1994

Scale



46° 6' 31" N  
82° 37' 49" W

46° 6' 31" N  
82° 27' 11" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**59** The Serpent River is a seasonal fish spawning and migration watercourse: Walleye, Northern Pike, White Sucker and Yellow Perch in Spring.

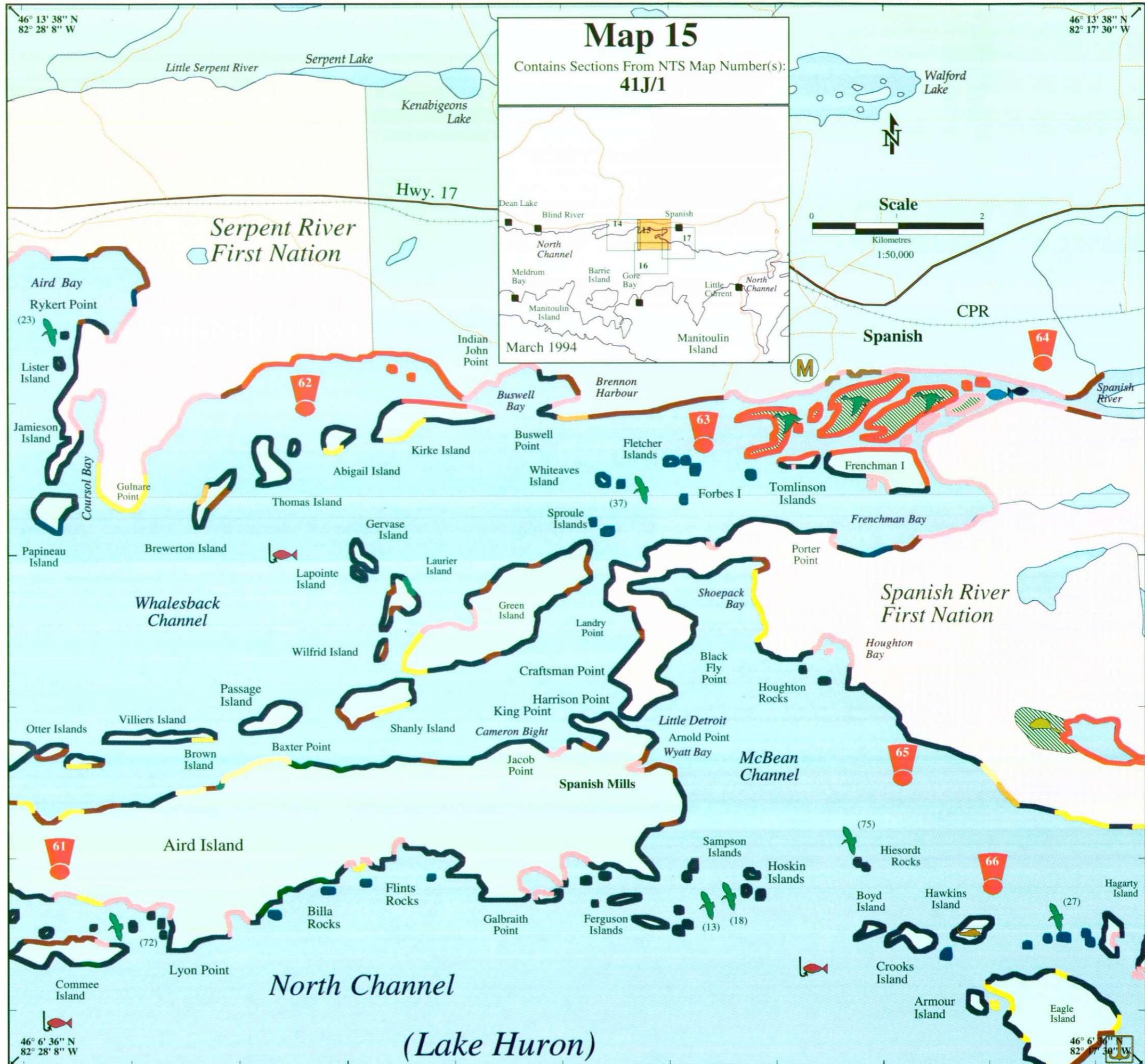
**60** Serpent River First Nation. Responders should contact the Chief of the Serpent River First Nation before commencing response activities.

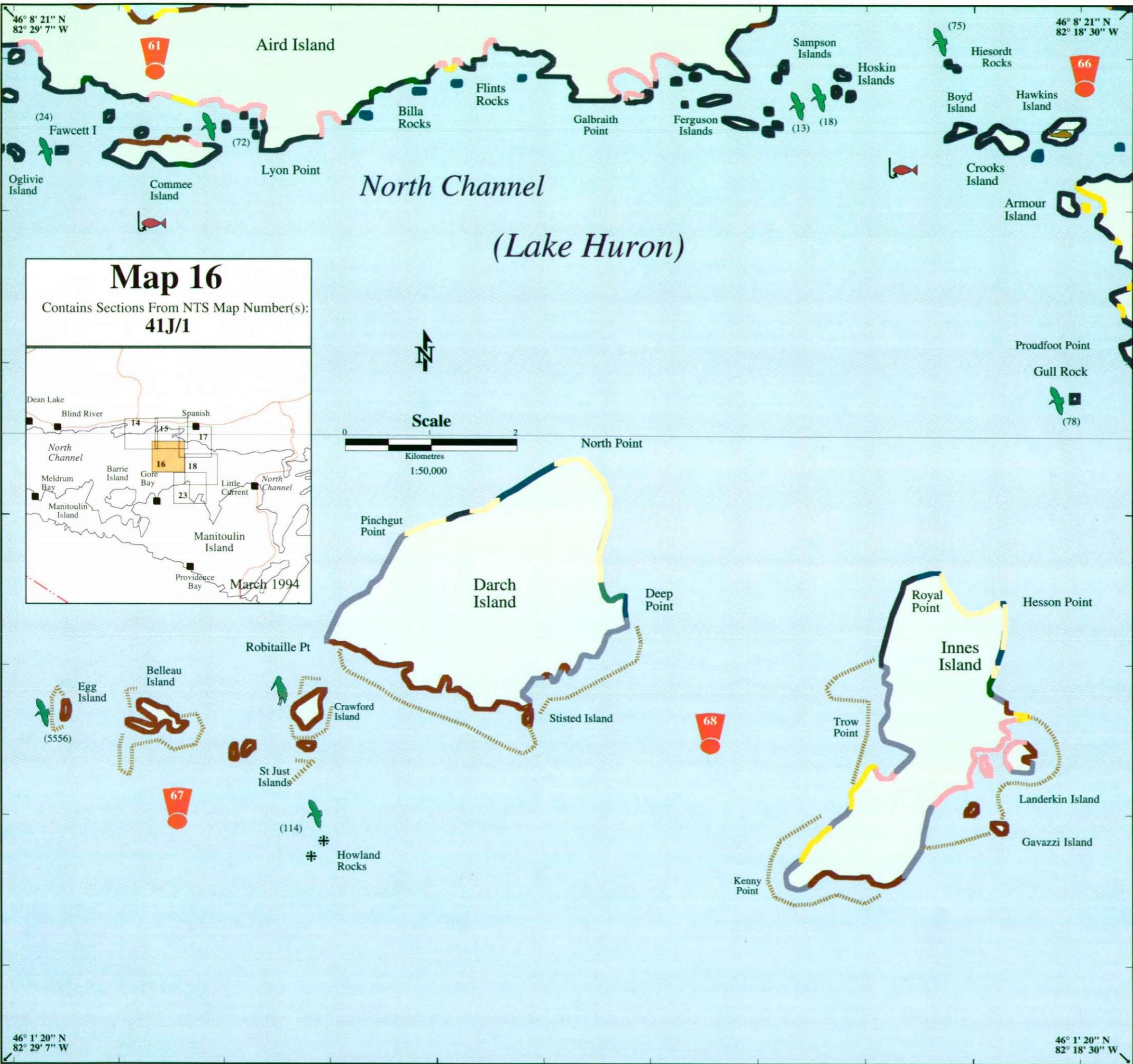
**61** Nesting colonial waterbirds occur on numerous rocks and islands in Georgian Bay, near Aird Island.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 61** Nesting colonial waterbirds occur on numerous rocks and islands in Georgian Bay, near Aird Island.
- 62** Serpent River First Nation. Responders should contact the Chief of the Serpent River First Nation before commencing response activities.
- 63** Nesting colonial waterbirds occur on Whiteaves Island. The wetland at the mouth of the Spanish River is a significant stopover for migratory waterfowl.
- 64** Seasonal fish spawning and migration occurs in the Spanish River: Northern Pike, Walleye, White Sucker and Yellow Perch in Spring.
- 65** Spanish River First Nation. Responders should contact the Chief of the Spanish River First Nation before commencing response activities.
- 66** Nesting colonial waterbirds occur on numerous rocks and islands in the McBean Channel.





**Map 16**  
 Contains Sections From NTS Map Number(s):  
**41J/1**

March 1994

- NOTES** !
- ! A red exclamation point symbol is used on the maps to catch the responder's attention.
  - ! 61 Nesting colonial waterbirds occur on numerous rocks and islands in Georgian Bay, near Aird Island.
  - ! 66 Nesting colonial waterbirds occur on numerous rocks and islands in the McBean Channel.
  - ! 67 Nesting colonial waterbirds occur on Egg Island and Howland Rocks. Nesting wading birds occur on Crawford Island.
  - ! 68 Shoals situated at Darch Island, Innes Island and surrounding islands are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.





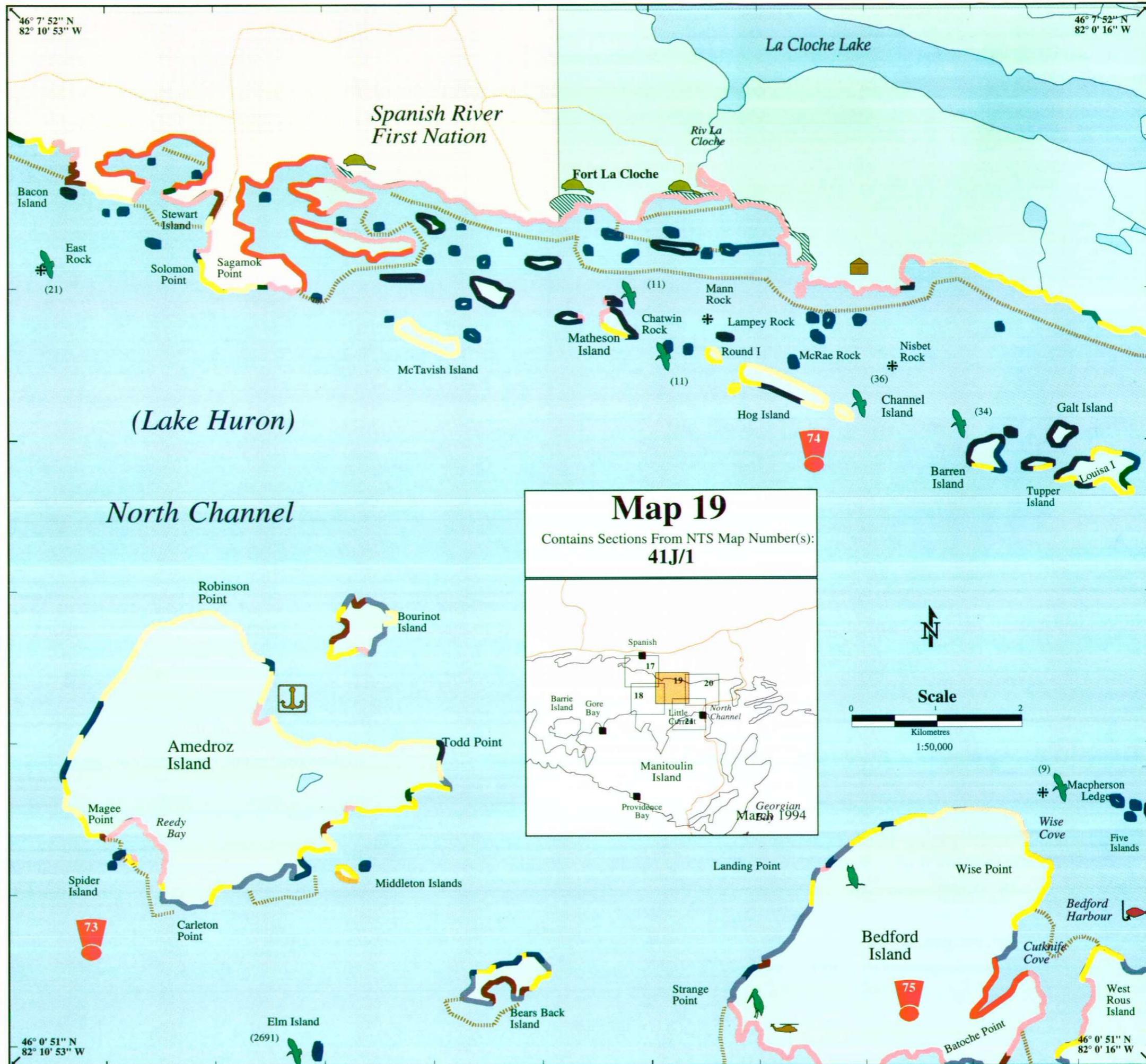
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

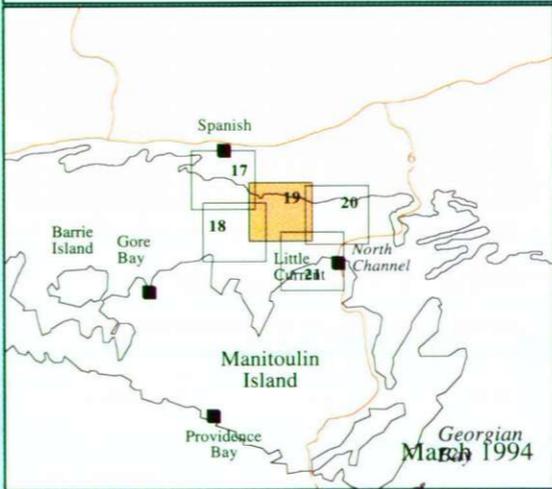
**73** Shoals situated at Logan Island, Logan Bay and Reedy Bay are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.

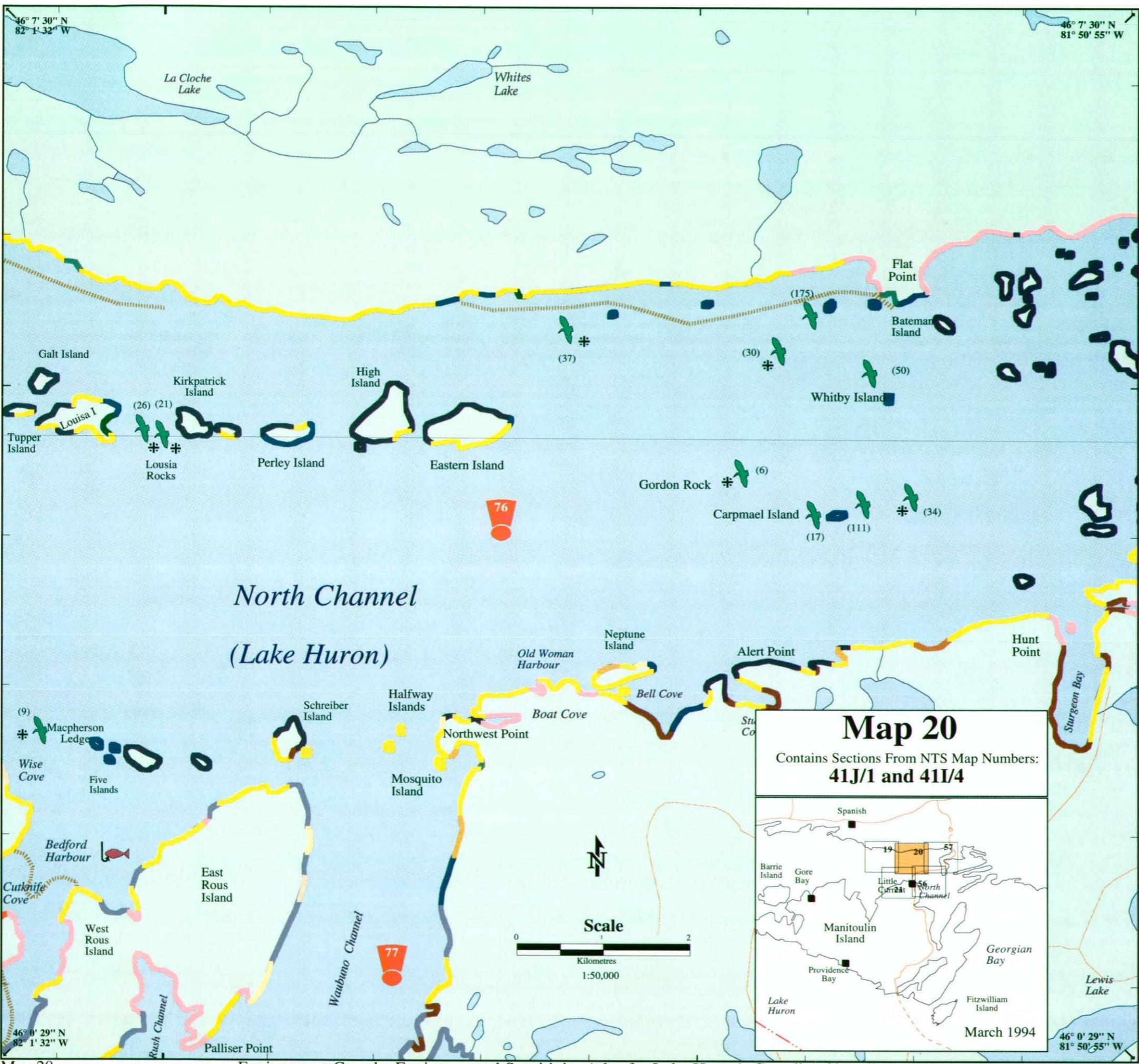
**74** Nesting colonial waterbirds occur on numerous rocks and islands in the North Channel, near Hog Island.

**75** Bedford Island and the associated marsh land support nesting raptors and wading birds and provides a habitat for a variety of rare flora. A commercial aquaculture facility occurs in Bedford Harbour. Shoals situated at Strange Bay, Batoche Point and on Bears Back Island are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.



**Map 19**  
Contains Sections From NTS Map Number(s):  
**41J/1**





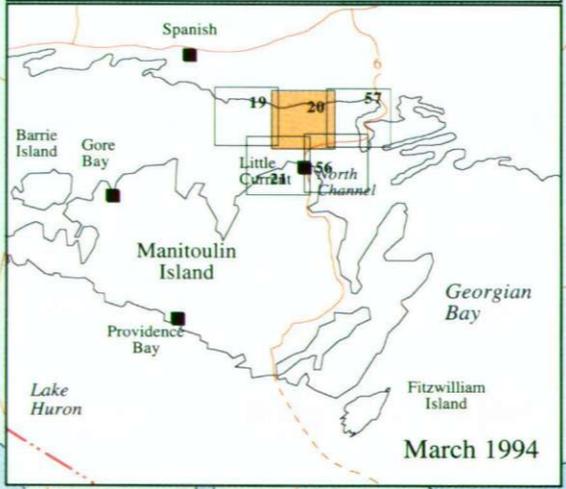
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Nesting colonial waterbirds occur on numerous rocks and islands in the North Channel.
-  Seasonal fish spawning occurs in Waubuno Channel: Yellow Perch in Spring and Lake Trout in Fall.

**Map 20**

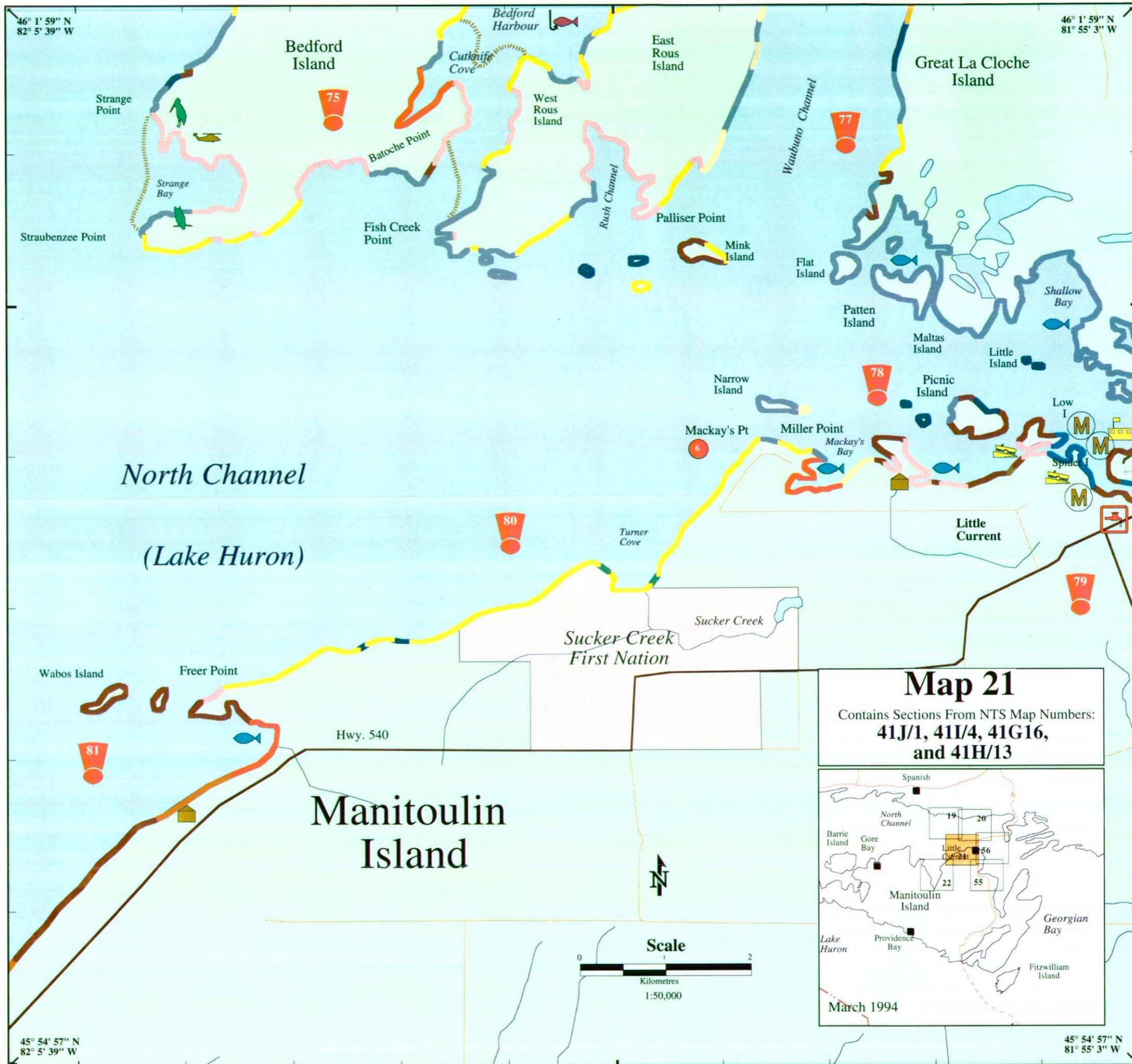
Contains Sections From NTS Map Numbers:  
**41J/1 and 41I/4**



## NOTES

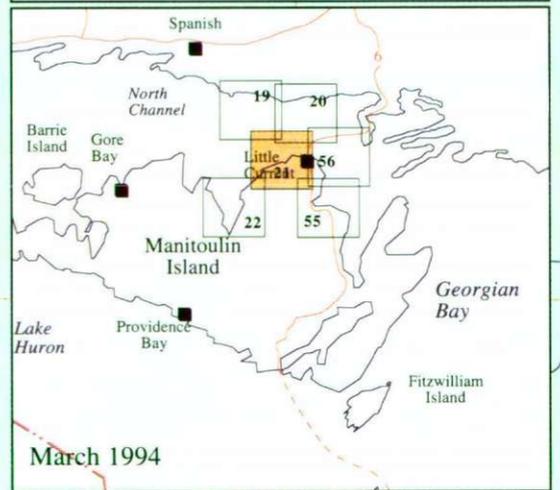
A red exclamation point symbol is used on the maps to catch the responder's attention.

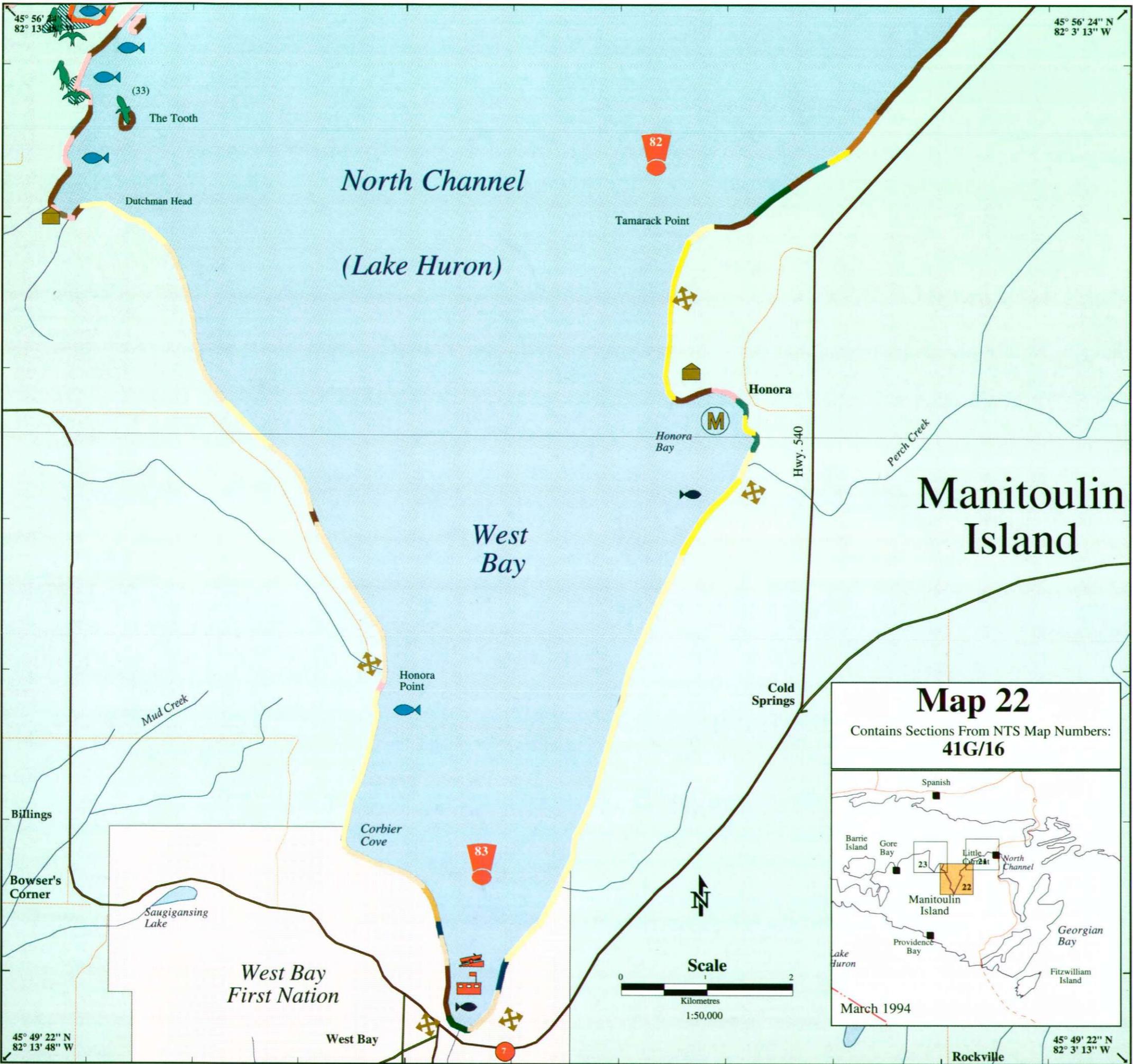
- 75** Bedford Island and the associated marsh land support nesting raptors and wading birds and provides a habitat for a variety of rare flora. A commercial aquaculture facility occurs in Bedford Harbour. Shoals situated at Strange Bay, Batoche Point and on Bears Back Island are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.
- 77** Seasonal fish spawning occurs in Waubuno Channel: Yellow Perch in Spring and Lake Trout in Fall.
- 78** Numerous recreational cottages and permanent homes are on the North Channel shoreline. Seasonal fish spawning occurs in numerous bays of the North Channel: Northern Pike and Carp in Spring.
- 79** Little Current Water Treatment Plant water intake: Call - (705) 368-2277.
- 80** Sucker Creek First Nation. Responders should contact the Chief of the Sucker Creek First Nation before commencing response activities.
- 81** Numerous recreational cottages occur along Manitoulin Island from Freer Point to Honora Bay.



## Map 21

Contains Sections From NTS Map Numbers:  
**41J/1, 41I/4, 41G16,  
 and 41H/13**





**NOTES**

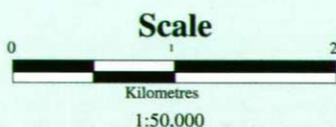
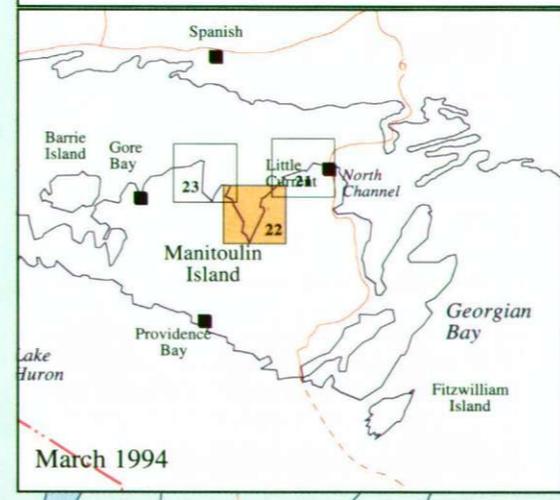
A red exclamation point symbol is used on the maps to catch the responder's attention.

**82** Numerous recreational cottages occur along Manitoulin Island from Freer Point to Honora Bay.

**83** West Bay First Nation. Responders should contact the Chief of the West Bay First Nation before commencing response activities. The creek draining into West Bay is an important Rainbow Trout and Chinook Salmon migration watercourse. Rainbow Smelt spawns in the creek in the spring.

**Map 22**

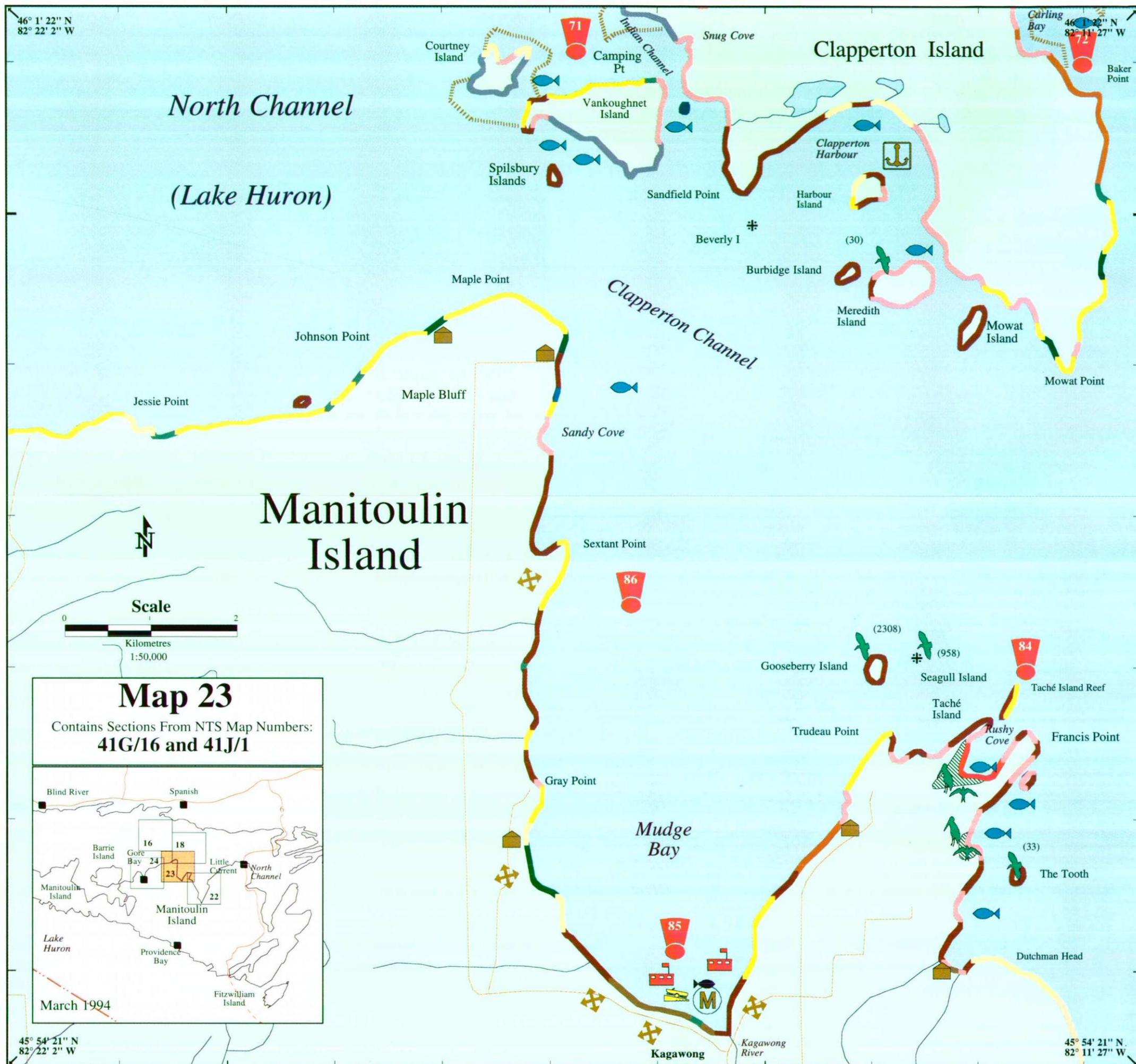
Contains Sections From NTS Map Numbers:  
**41G/16**

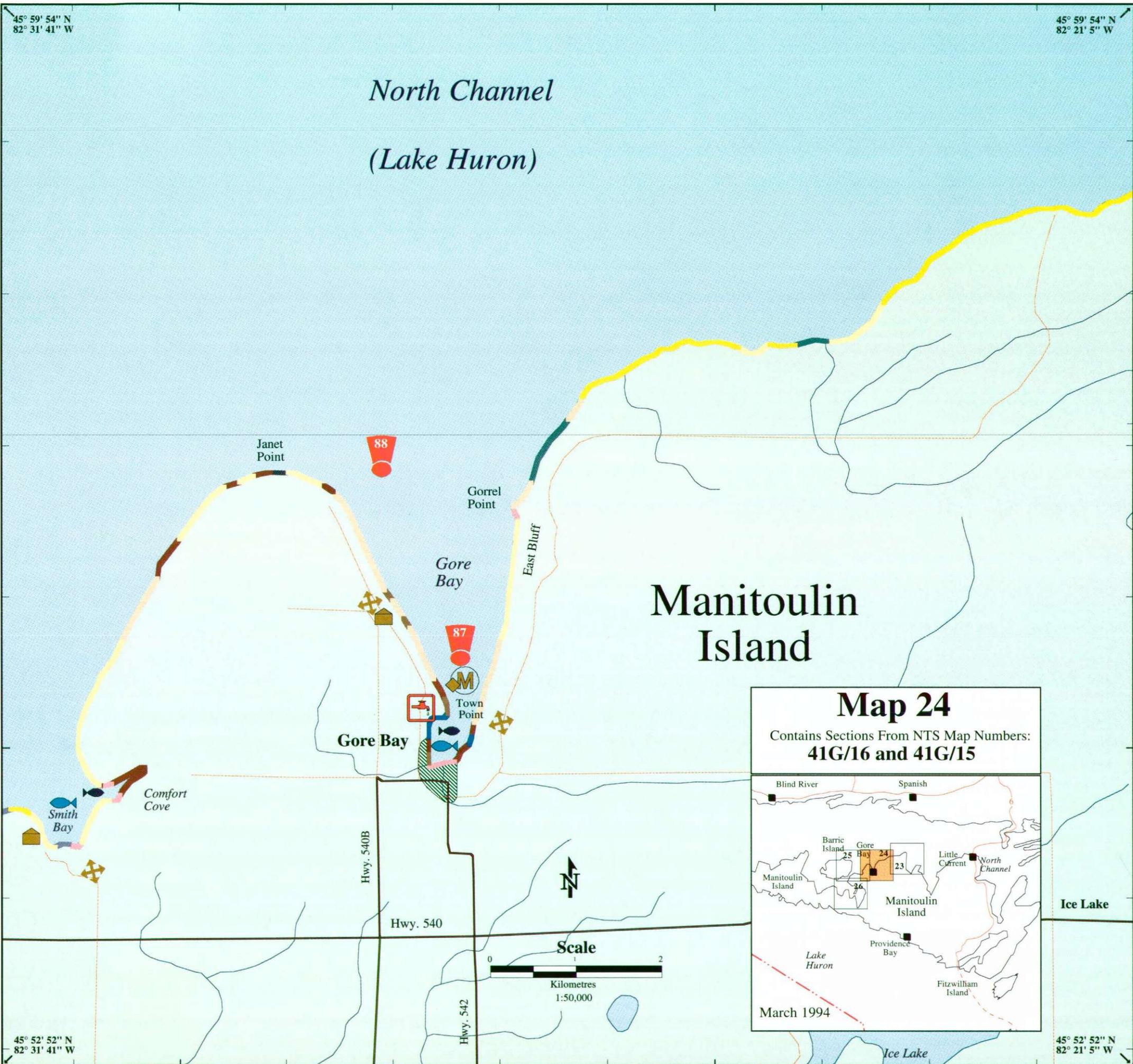


## NOTES !

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 71** Seasonal fish spawning occurs in Lake Huron along the Vankoughnet Island shoreline: Walleye and Northern Pike in Spring. There are numerous shoals situated in this area that are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.
- 72** Numerous sheltered bays and harbours of Clapperton Island provide a significant fish spawning environment: Walleye and Northern Pike in Spring.
- 84** Nesting colonial waterbirds occur on Seagull Island, Gooseberry Island and The Tooth. Numerous recreational cottages occur along the Mudge Bay shoreline at Trudeau Point. Seasonal fish spawning occurs in Lake Huron from Dutchman Head to Rushy Cove: Walleye and Northern Pike in Spring.
- 85** The Kagawong River is an important Rainbow Trout and Chinook Salmon migration watercourse. Rainbow Smelt spawn in the creek in spring. The mouth of Kagawong River to Bridal Falls is classified as a fish sanctuary from September 25 to October 31.
- 86** Numerous recreational cottages occur along the Mudge Bay shoreline from Gray Point to Maple Point.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- ! **87** Gore Bay Water Treatment Plant water intake and Water Pollution Control Plant water outfall: Call - (705) 282-2420.
- ! **88** Numerous recreational cottages occur along the Gore Bay shoreline from Town Point to Janet Head. The creek which drains into Gore Bay is an important Rainbow Trout and Chinook Salmon spawning and migration watercourse. Rainbow Smelt spawn in the creek in Spring.

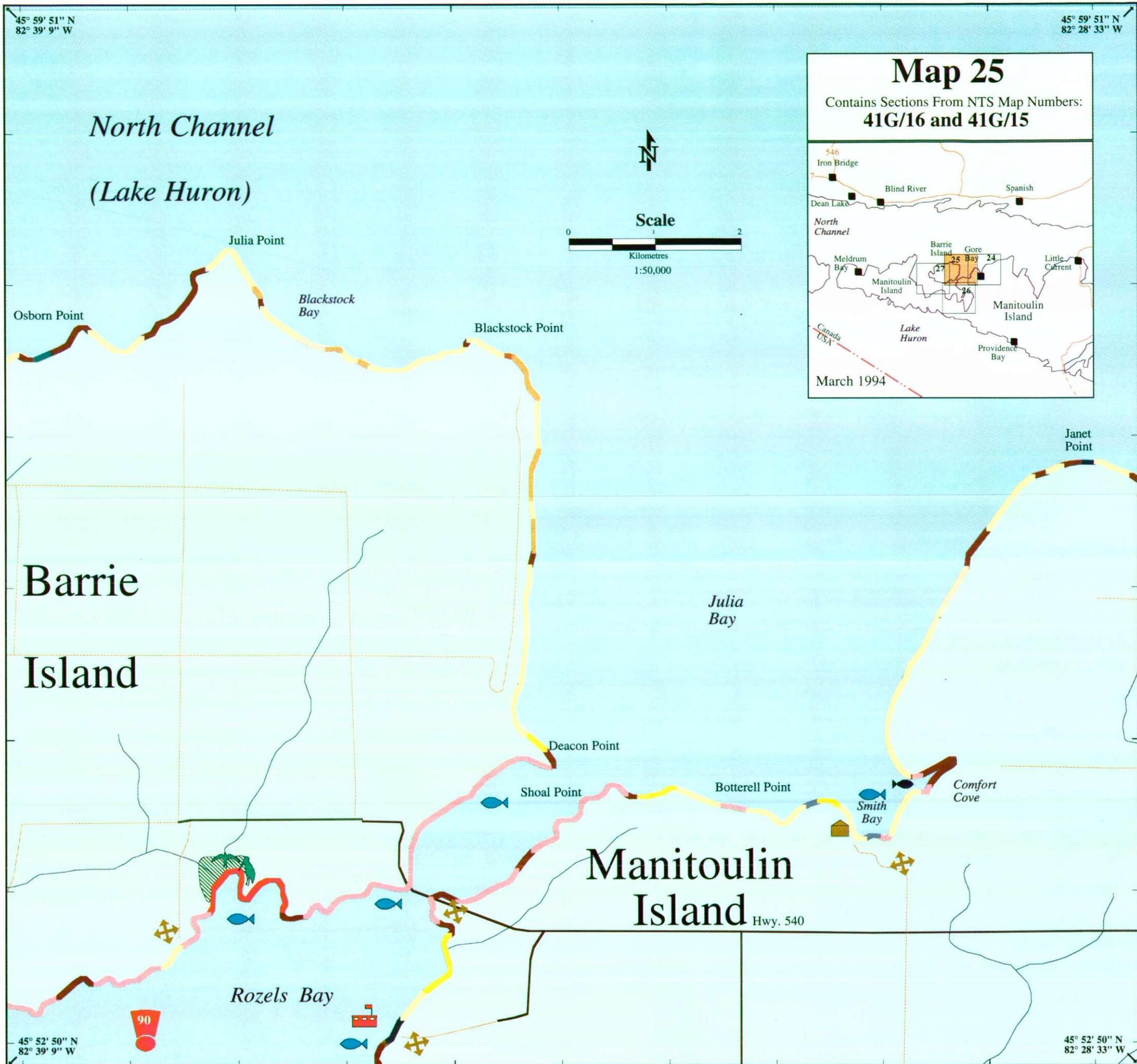
**Map 24**  
 Contains Sections From NTS Map Numbers:  
**41G/16 and 41G/15**

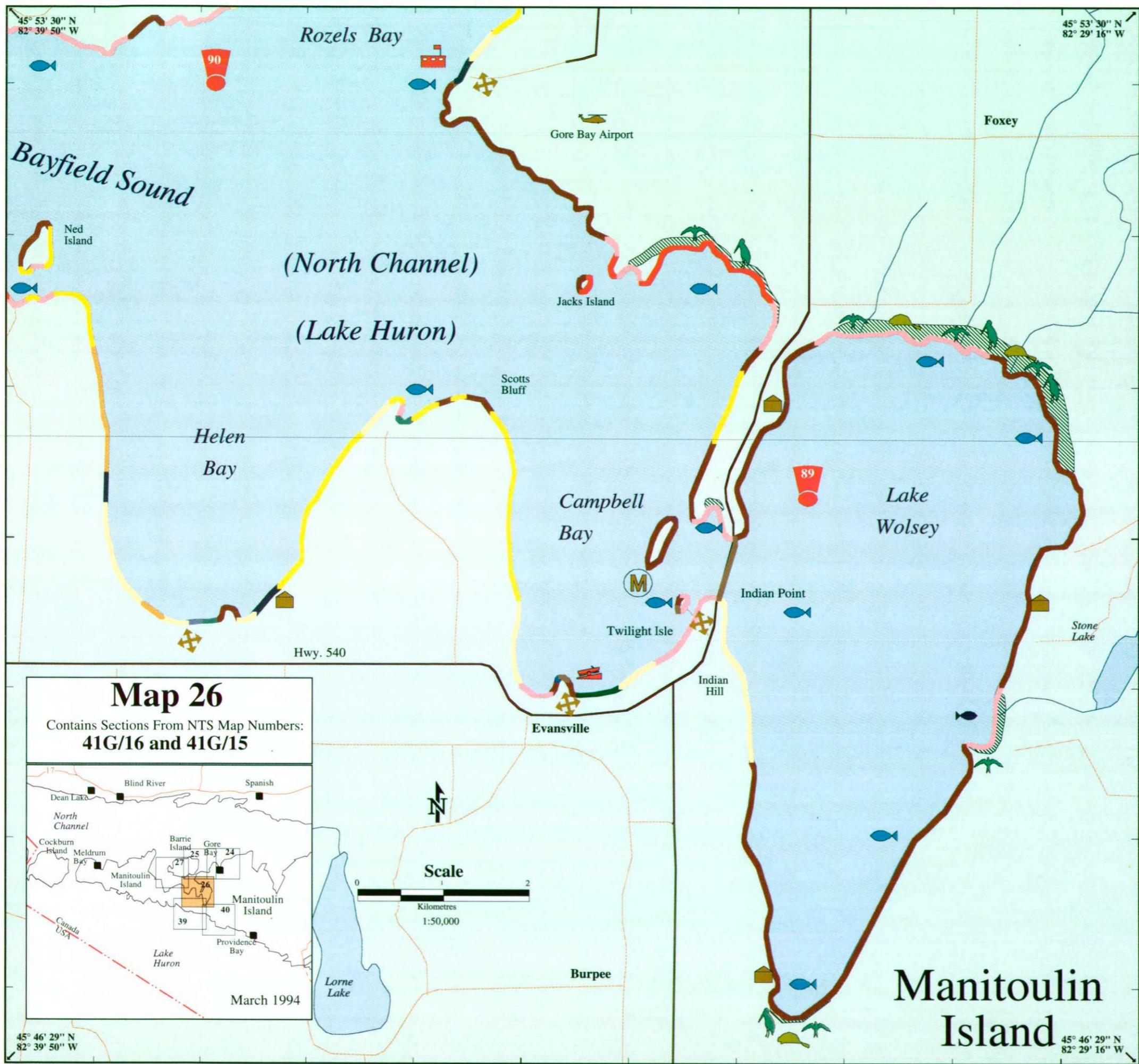
March 1994

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

 Residential cottages occur along the shoreline of Smith Bay, Campbell Bay, Helen Bay, and Elizabeth Bay. Seasonal fish spawning occurs in these same waters: Northern Pike in the Spring.





**NOTES**

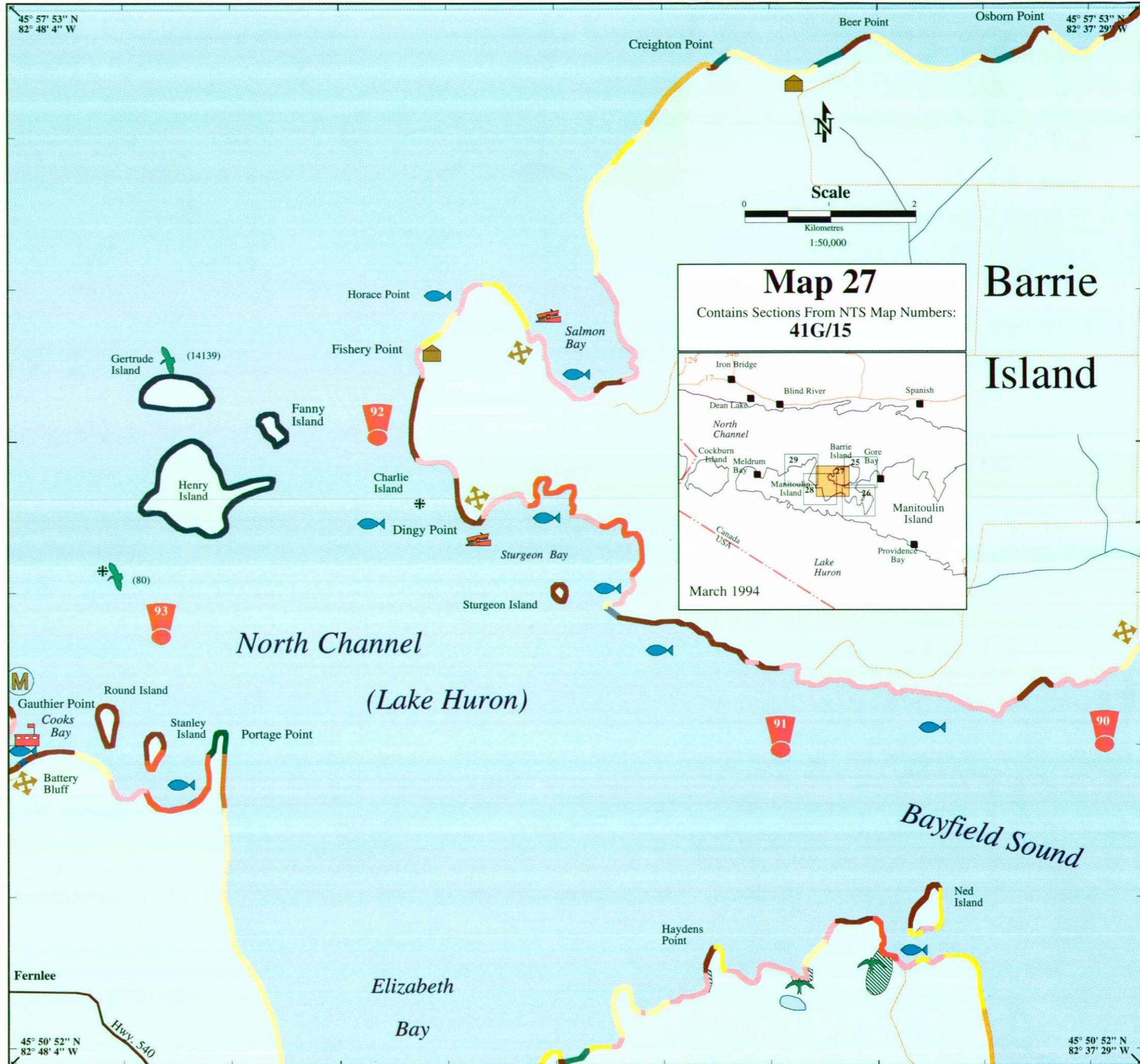
A red exclamation point symbol is used on the maps to catch the responder's attention.

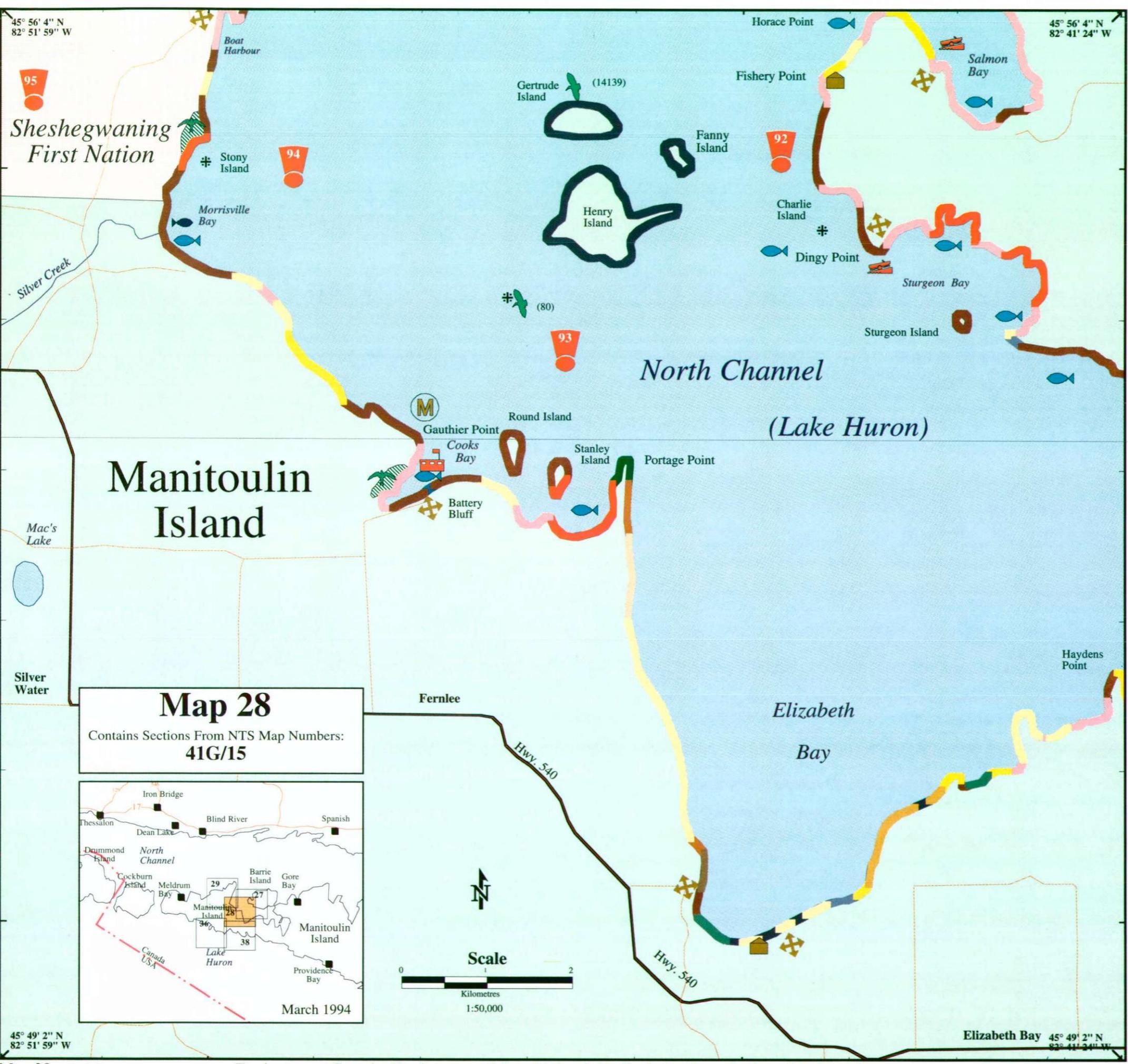
- 89** Lake Wolsey is a Northern Pike spawning area. Recreational cottages occur on the shoreline and fringing wetlands provide a habitat for shorebirds, wading birds and fur bearing mammals.
- 90** Residential cottages occur along the shoreline of Smith Bay, Campbell Bay, Helen Bay, and Elizabeth Bay. Seasonal fish spawning occurs in these same waters: Northern Pike in the Spring.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Residential cottages occur along the shoreline of Smith Bay, Campbell Bay, Helen Bay, and Elizabeth Bay. Seasonal fish spawning occurs in these same waters: Northern Pike in the Spring.
-  Seasonal fish spawning occurs in Bayfield Sound, south of Barrie Island: Lake Whitefish in Fall.
-  Numerous recreational cottages occur along the North Channel shoreline of Barrie Island from Beer Point to Dingy Point.
-  Nesting colonial waterbirds occur on Gertrude Island. Seasonal fish spawning occurs in Cooks Bay: Northern Pike in Spring.



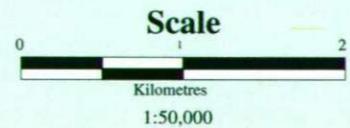
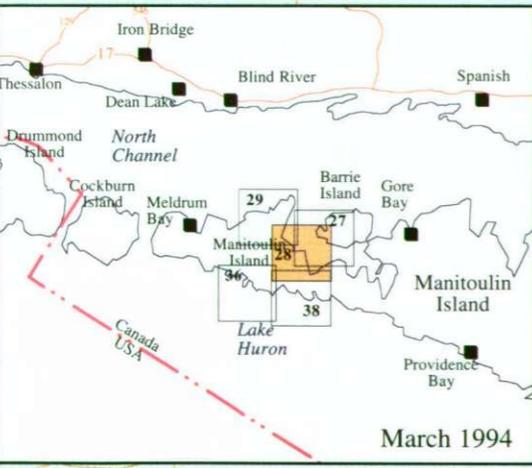


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 92 Numerous recreational cottages occur along the North Channel shoreline of Barrie Island from Beer Point to Dingy Point.
- 93 Nesting colonial waterbirds occur on Gertrude Island. Seasonal fish spawning occurs in Cooks Bay: Northern Pike in Spring.
- 94 Silver Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.
- 95 Sheshegwaning First Nation. Responders should contact the Chief of the Sheshegwaning First Nation before commencing response activities.  
Cockburn Island First Nation. Responders should contact the Chief of the Cockburn Island First Nation before commencing response activities.

**Map 28**  
Contains Sections From NTS Map Numbers:  
**41G/15**



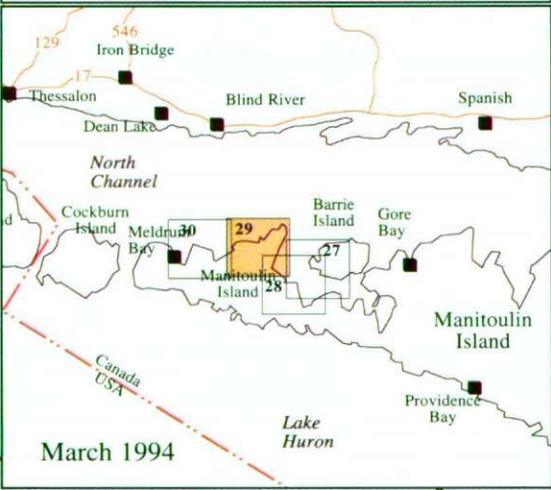
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 94** Silver Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.
- 95** Sheshegwaning First Nation. Responders should contact the Chief of the Sheshegwaning First Nation before commencing response activities.  
Cockburn Island First Nation. Responders should contact the Chief of the Cockburn Island First Nation before commencing response activities.
- 96** Vidal Bay - Creasor Bight is a varied habitat of deciduous and coniferous forests. This area contains some of the last mature cedar on Manitoulin Island. Vidal Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.



**Map 29**  
Contains Sections From NTS Map Numbers:  
**41G/15 and 41J/2**



46° 0' 17" N  
83° 7' 36" W

46° 0' 17" N  
82° 57' 0" W

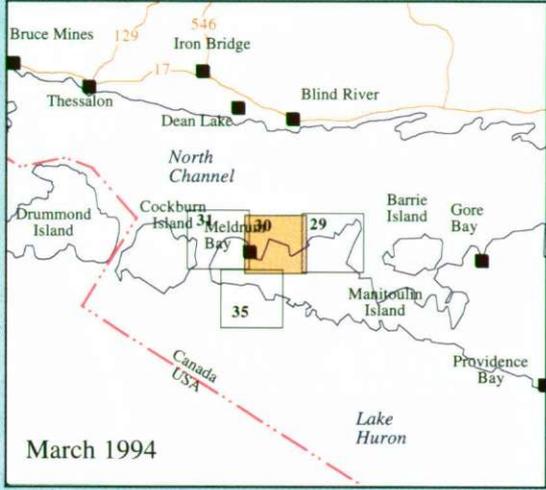
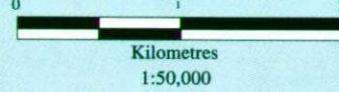
# Map 30

Contains Sections From NTS Map Numbers:  
**41G/15, 41G/14, 41J/2  
and 41J/1**



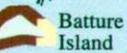
## North Channel (Lake Huron)

Scale

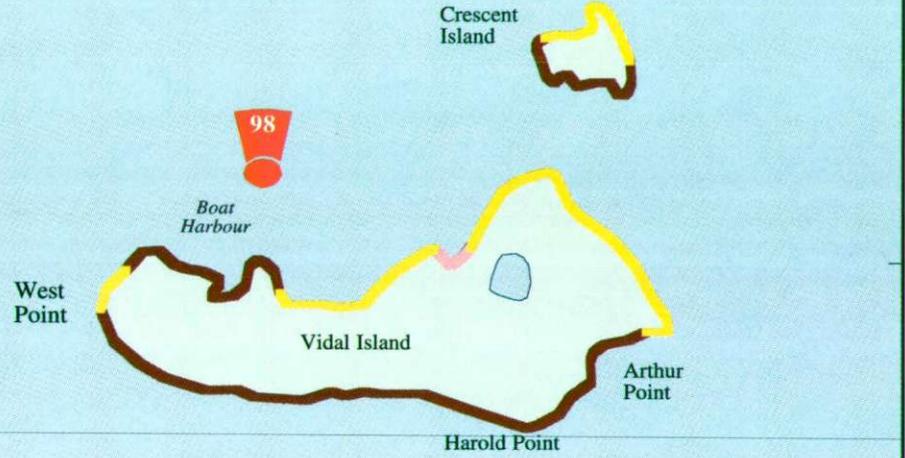


March 1994

(4261)



Chamberlain Point



West Point

Vidal Island

Crescent Island

Boat Harbour

Harold Point

Arthur Point

Suicide Point



Meldrum Bay

Meldrum Bay

# Manitoulin Island

Vidal Bay



Bonnie Doon

Macrae Cove

Muriel Point

Whitly Point

Newberry Cove

Welsh I

Pothole Lake

Burnett Lake

Linda Lake

Kerr Lake

Falls Lake

Lily Lake

Loon Lake

Hog Lake

Maple Lake

Maple Creek

Beaver Meadow Lakes

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**96** Vidal Bay - Creasor Bight is a varied habitat of deciduous and coniferous forests. This area contains some of the last mature cedar on Manitoulin Island. Vidal Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.

**97** Seasonal fish spawning occurs in Vidal Bay: Lake Whitefish in late Fall. Maple Creek is an important Rainbow Trout and Chinook Salmon migration and spawning watercourse.

**98** Vidal Island is a limestone island with scattered beach deposits. Responders should take care not to damage these formations.

**99** Nesting colonial waterbirds occur on Batture Island.

**100** Recreational cottages occur along the shoreline of Meldrum Bay. Bonnie Doon is an important Rainbow Trout migration watercourse.

# NOTES

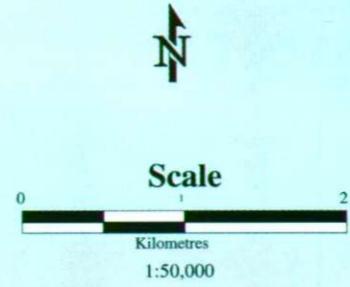
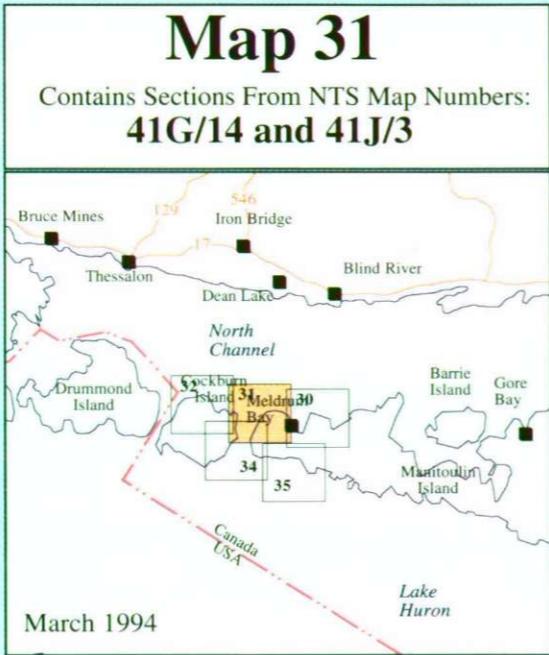
A red exclamation point symbol is used on the maps to catch the responder's attention.

**101** Standard Aggregates Incorporated water intake and outfall: Call - (705) 283-3011.

**102** Cinder Point is a limestone pavement with raised sand beaches. Responders must take care not to damage these formations.

46° 0' 52" N  
83° 17' 19" W

46° 0' 52" N  
83° 6' 43" W



*North Channel*  
*(Lake Huron)*



45° 53' 50" N  
83° 17' 19" W

45° 53' 50" N  
83° 6' 43" W



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**104** Cockburn Island First Nation. Responders should contact the Chief of the Cockburn Island First Nation before commencing response activities.

**105** Wagosh Bay is a sensitive area due to the presence of varied undisturbed wetlands, fens, bogs and marshes surrounded by upland forests. Lake Whitefish spawn in Wagosh Bay in late Fall.

**106** Nesting colonial waterbirds occur at Boom Point, on Cockburn Island. Lake Whitefish spawn in Lake Huron, from Boom Point to Cinder Point, in late Fall. A heronry is located at Smith Point.

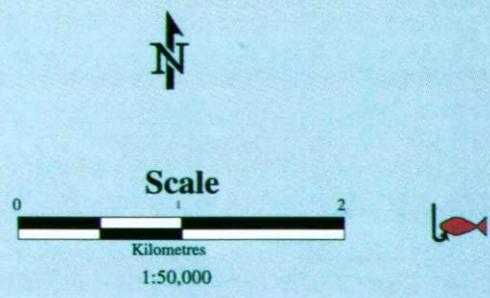
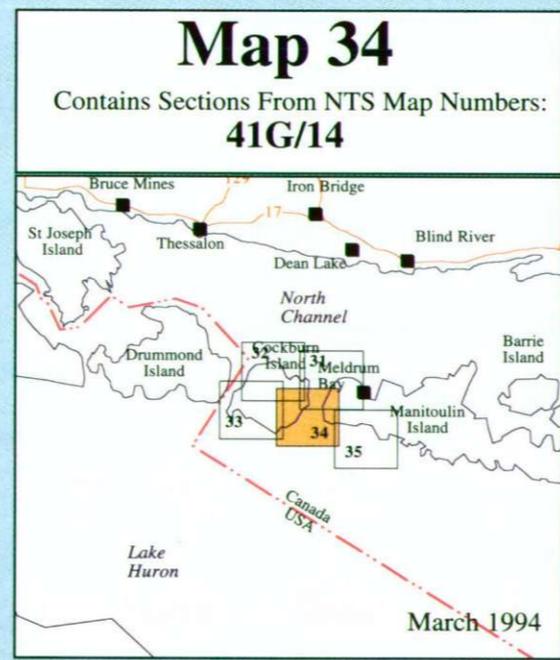




**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 101** Standard Aggregates Incorporated water intake and outfall: Call - (705) 283-3011.
- 102** Cinder Point is a limestone pavement with raised sand beaches. Responders must take care not to damage these formations.
- 106** Nesting colonial waterbirds occur at Boom Point, on Cockburn Island. Lake Whitefish spawn in Lake Huron, from Boom Point to Cinder Point, in late Fall. A heronry is located at Smith Point.



**NOTES** !

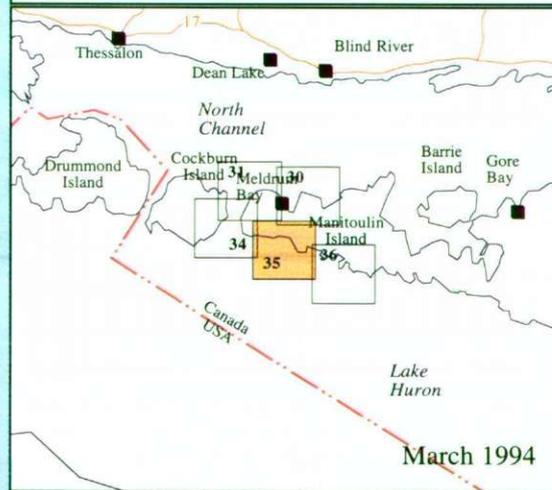
A red exclamation point symbol is used on the maps to catch the responder's attention.

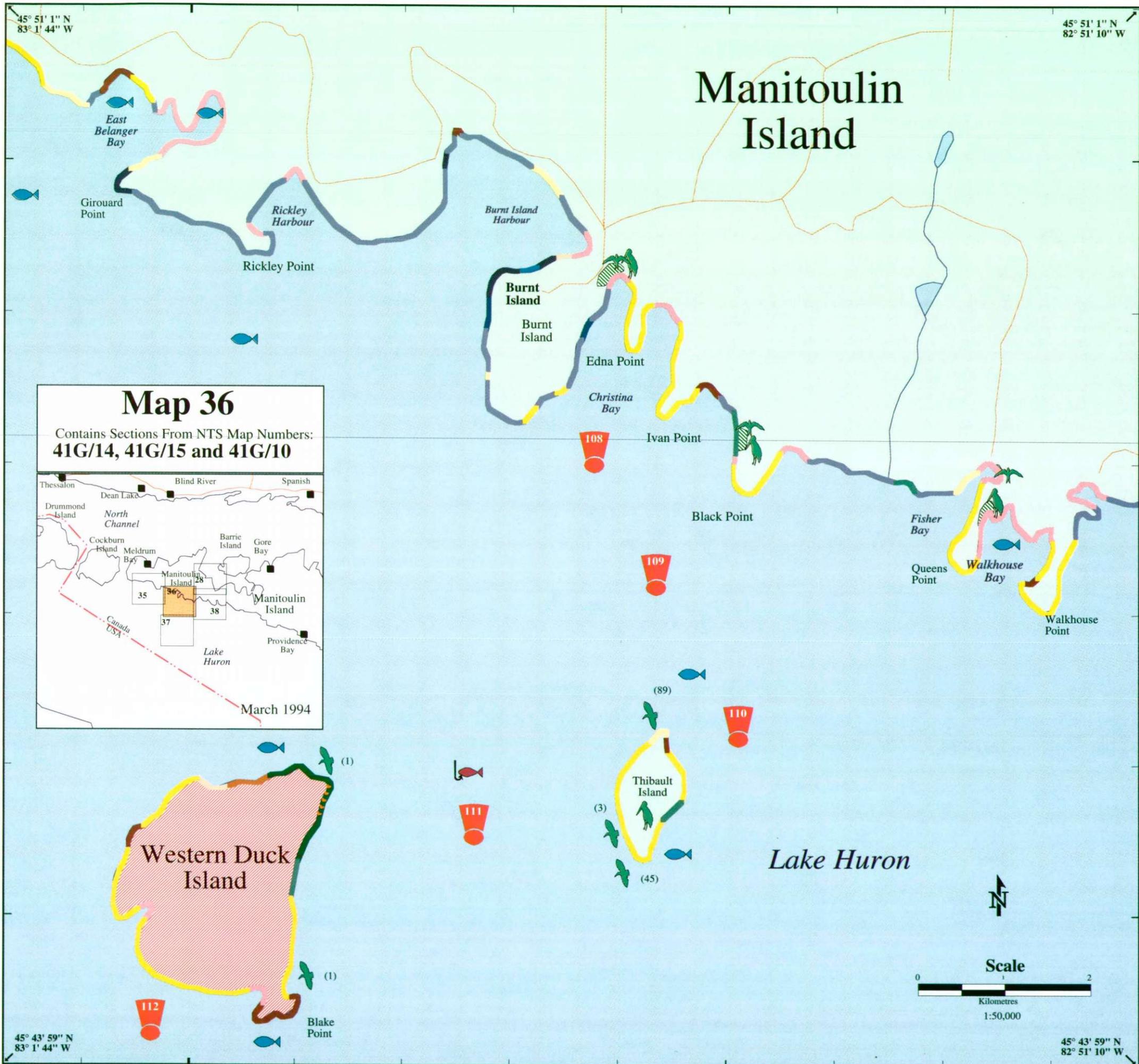
107 Seasonal fish spawning occurs in Lake Huron, along the south shoreline of Manitoulin Island: Lake Whitefish in late Fall. Nesting colonial waterbirds occur on Greene Island and on the rocks near Quarry Bay.



**Map 35**

Contains Sections From NTS Map Numbers:  
**41G/14**





**Map 36**  
 Contains Sections From NTS Map Numbers:  
**41G/14, 41G/15 and 41G/10**

March 1994

**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 108** Christina Bay exhibits a limestone plain with fen areas supporting rare plant species.
- 109** Seasonal fish spawning occurs in Lake Huron along the south shoreline of Manitoulin Island from Rickley Point to Walkhouse Point: Lake Whitefish in Fall.
- 110** Thibault Island exhibits an unusually long subaqueous sand ridge which extends close to Black Point.
- 111** Seasonal fish spawning occurs in Lake Huron near Western Duck Island and Thibault Island: Lake Whitefish in Fall. Commercial fishing activities are seasonally significant in Lake Huron.
- 112** Western Duck Island is an Environmentally Sensitive Area and provincially significant due to the presence of glacial and contemporary landforms. Structures include truncated beach profiles, offshore ridge extensions and back beach sand dunes. Responders must take care not to damage these formations.

## NOTES

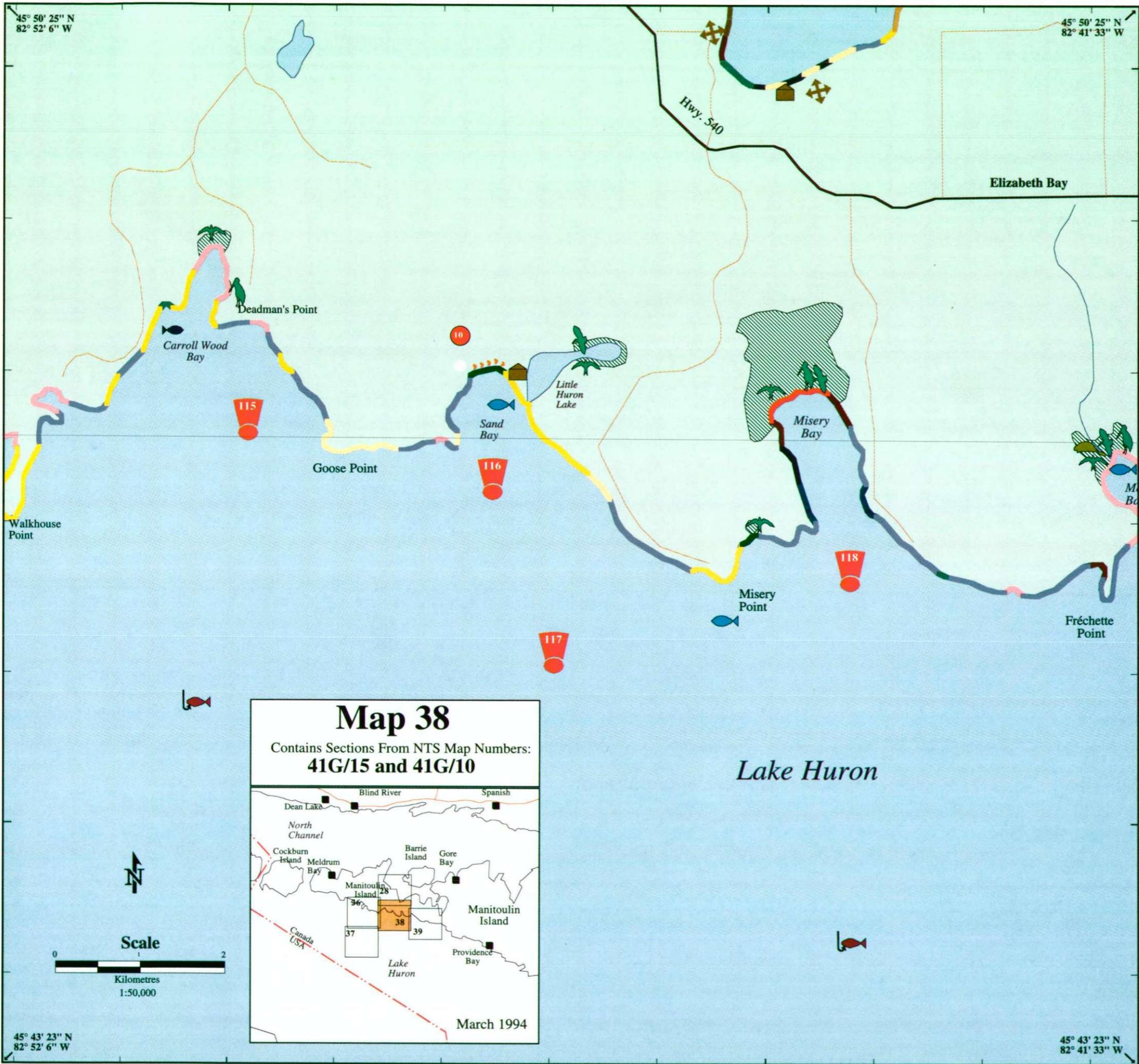
A red exclamation point symbol is used on the maps to catch the responder's attention.

**112** Western Duck Island is an Environmentally Sensitive Area and provincially significant due to the presence of glacial and contemporary landforms. Structures include truncated beach profiles, offshore ridge extensions and back beach sand dunes. Responders must take care not to damage these formations.

**113** Seasonal fish spawning occurs in Lake Huron, near Great Duck Island, Western Duck Island and Middle Duck Island: Lake Whitefish in late Fall. Commercial fishing activities are seasonally significant in Lake Huron.

**114** Great Duck Island is an Environmentally Sensitive Area and provincially significant due to the presence of very sensitive coastal sand dunes at Horseshoe Bay and Desert Point. These dunes represent one of the few remaining, undisturbed coastal dune systems left in Ontario. Responders must take care not to damage these formations.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 115** Carroll Wood Bay is the site of a raised beach and swale pattern. Responders must take care not to damage these formations.
- 116** Sand Bay provides a habitat for several varieties of rare vascular flora. Responders must take care not to cause damage in this area.
- 117** Seasonal fish spawning occurs in Lake Huron from Walkhouse Point to Misery Point: Lake Whitefish in Fall. The small wetland near Misery Point provides a habitat for several varieties of rare vascular flora.
- 118** Misery Bay has a fringing wetland which supports shore birds, wading birds, colonial waterbirds and fur bearing mammals.

**Map 38**  
 Contains Sections From NTS Map Numbers:  
**41G/15 and 41G/10**

March 1994

## NOTES

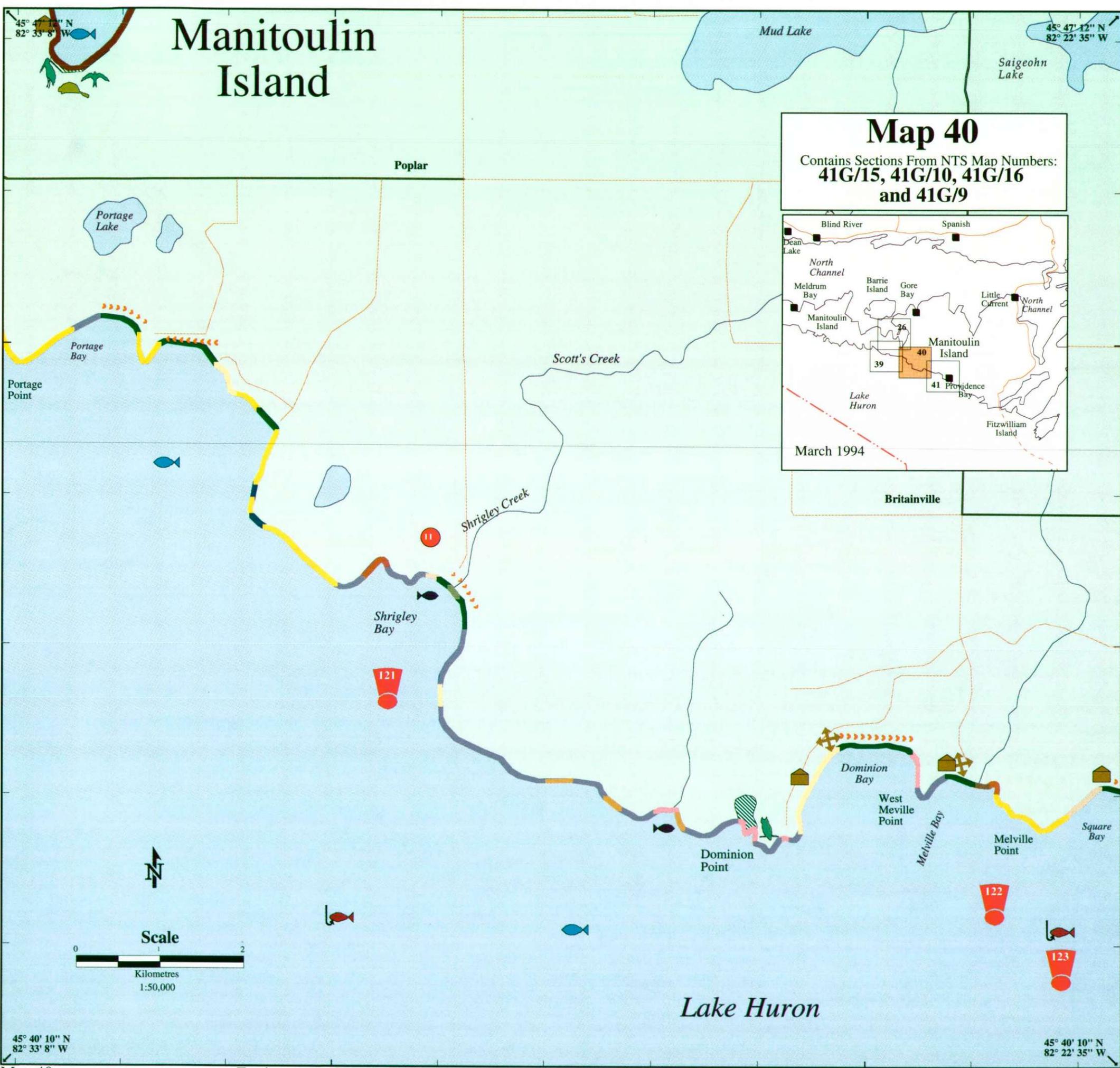
A red exclamation point symbol is used on the maps to catch the responder's attention.

**119** Mac's Bay has a fringing wetland which supports shore birds, wading birds, colonial waterbirds and fur bearing mammals. Murphy Point provides a habitat for several varieties of rare flora. This is not the best spot for access unless a clear open area is available. Responders must take care not to cause damage in this area.

**120** Seasonal fish spawning occurs in Lake Huron, along the south shoreline of Manitoulin Island: Lake Whitefish in late Fall. Commercial fishing activities are seasonally significant in Lake Huron.



# Manitoulin Island



## NOTES

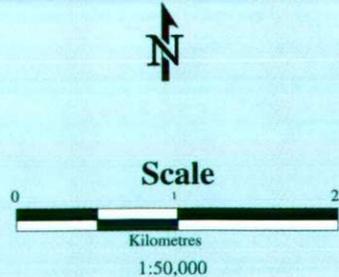
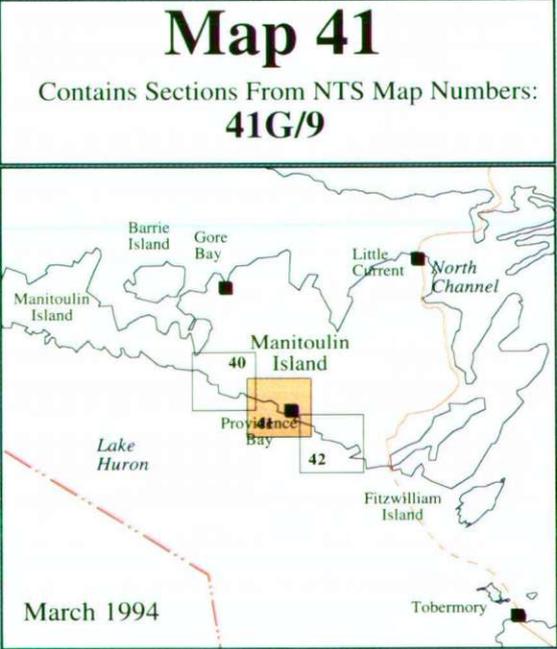
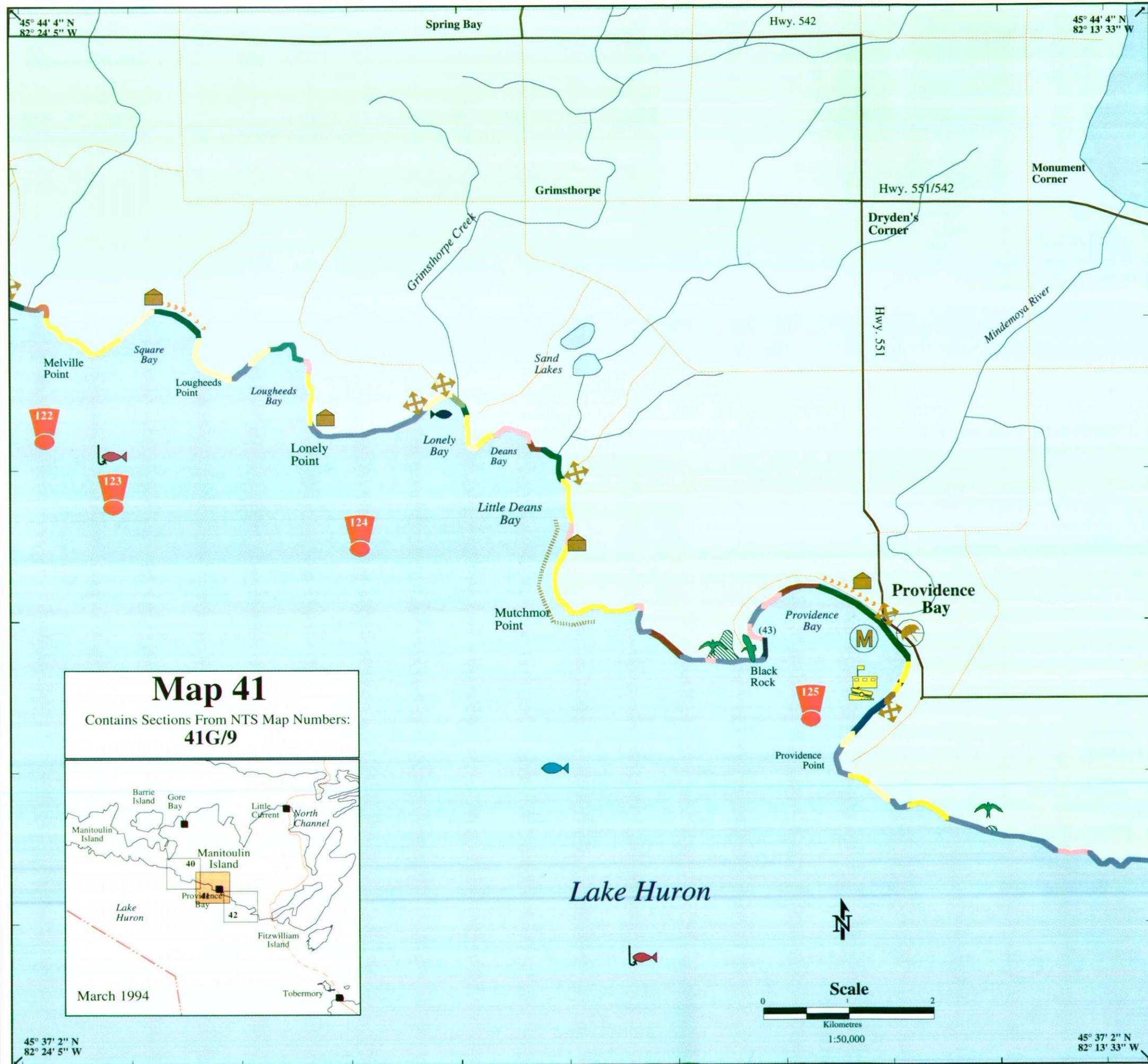
A red exclamation point symbol is used on the maps to catch the responder's attention.

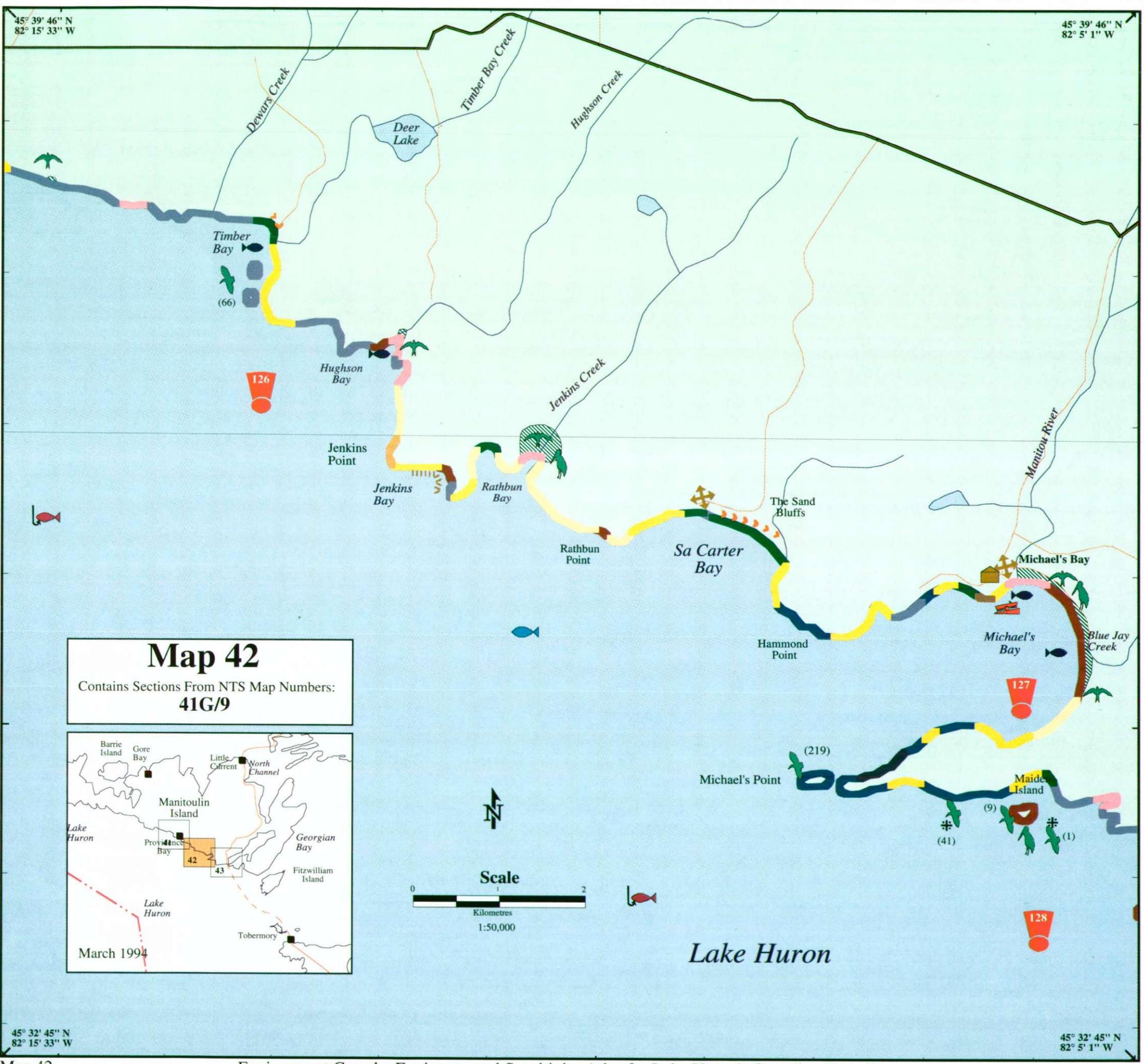
- 121** Rare vascular flora occur at Shrigley Bay. The Shrigley Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.
- 122** Recreational cottages occur along the Lake Huron shoreline from Dominion Point to Lougheeds Point.
- 123** Seasonal fish spawning occurs in Lake Huron, along the south shore of Manitoulin Island: Lake Whitefish in late Fall. Commercial fishing activities are seasonally significant in Lake Huron.

## NOTES

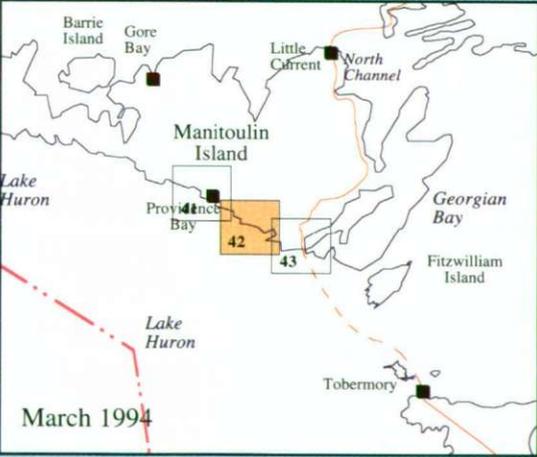
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 122** Recreational cottages occur along the Lake Huron shoreline from Dominion Point to Loughdeeds Point.
- 123** Seasonal fish spawning occurs in Lake Huron, along the south shore of Manitoulin Island: Lake Whitefish in late Fall. Commercial fishing activities are seasonally significant in Lake Huron.
- 124** Recreational cottages occur along the Lake Huron shoreline from Loughdeeds Point to Mutchmor Point. Rare vascular flora occur at Square Bay and Deans Bay. Grimsthorpe Creek is an important migration and spawning watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall. Approach concerns exist at Mutchmor Point. Responders should exercise caution when approaching this shoreline.
- 125** A recreational beach, a marina and numerous cottages occur along the shoreline of Providence Bay. Nesting colonial waterbirds occur on Black Rock. Rare vascular flora occur in the fringing wetland at Providence Bay. Mindemoya River is an important fish migration watercourse and is a classified fish sanctuary from September 25 - October 31 each year.





**Map 42**  
 Contains Sections From NTS Map Numbers:  
**41G/9**



**NOTES** !

A red exclamation point symbol is used on the maps to catch the responder's attention.

**126** ! Timber Bay Creek and Hughson Creek are significant migration and spawning watercourses: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.

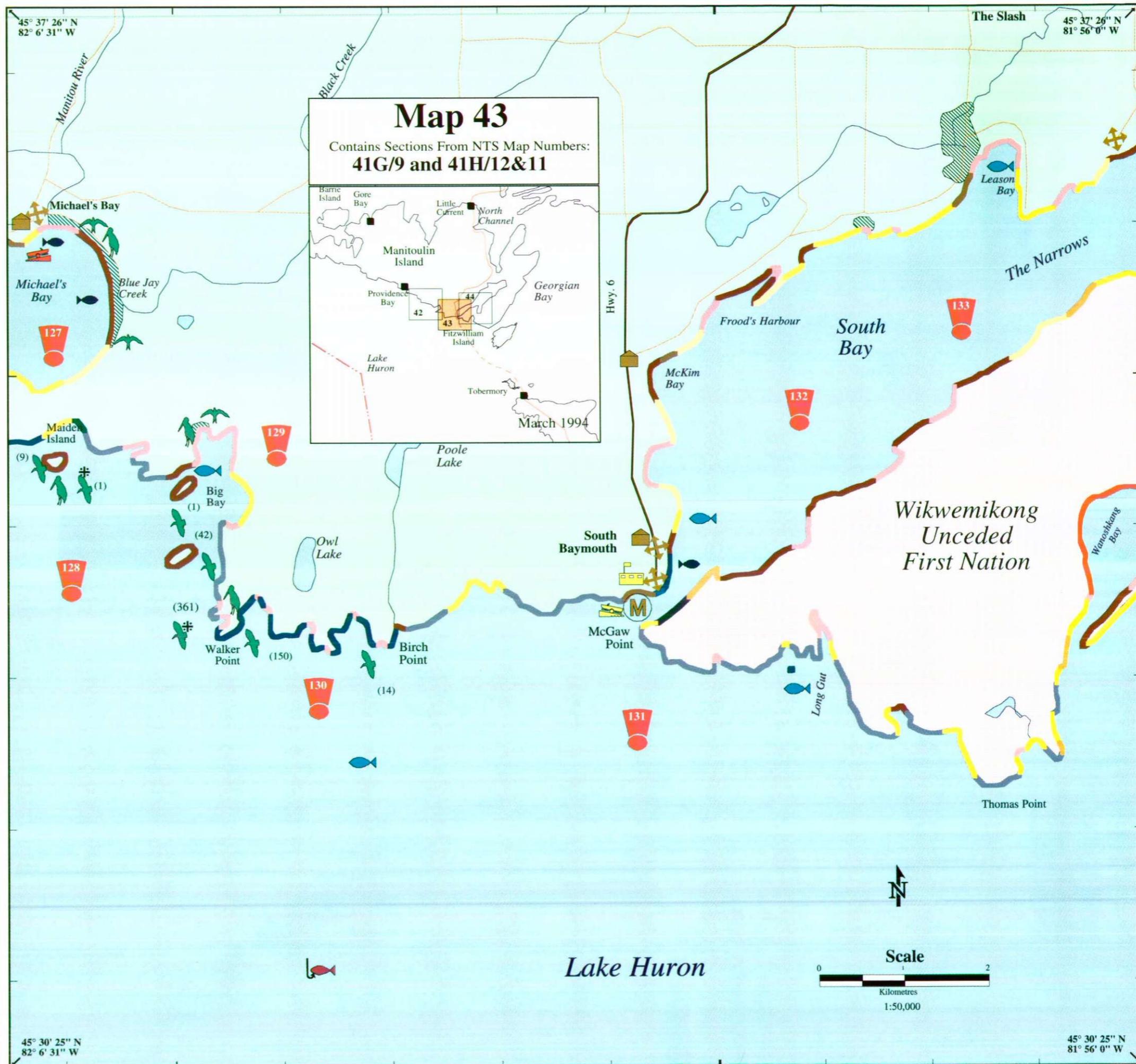
**127** ! Michael's Bay fringing wetland supports rare vascular flora and provides a habitat for shorebirds and wading birds. Blue Jay Creek and Manitou River are significant migration and spawning watercourses: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.

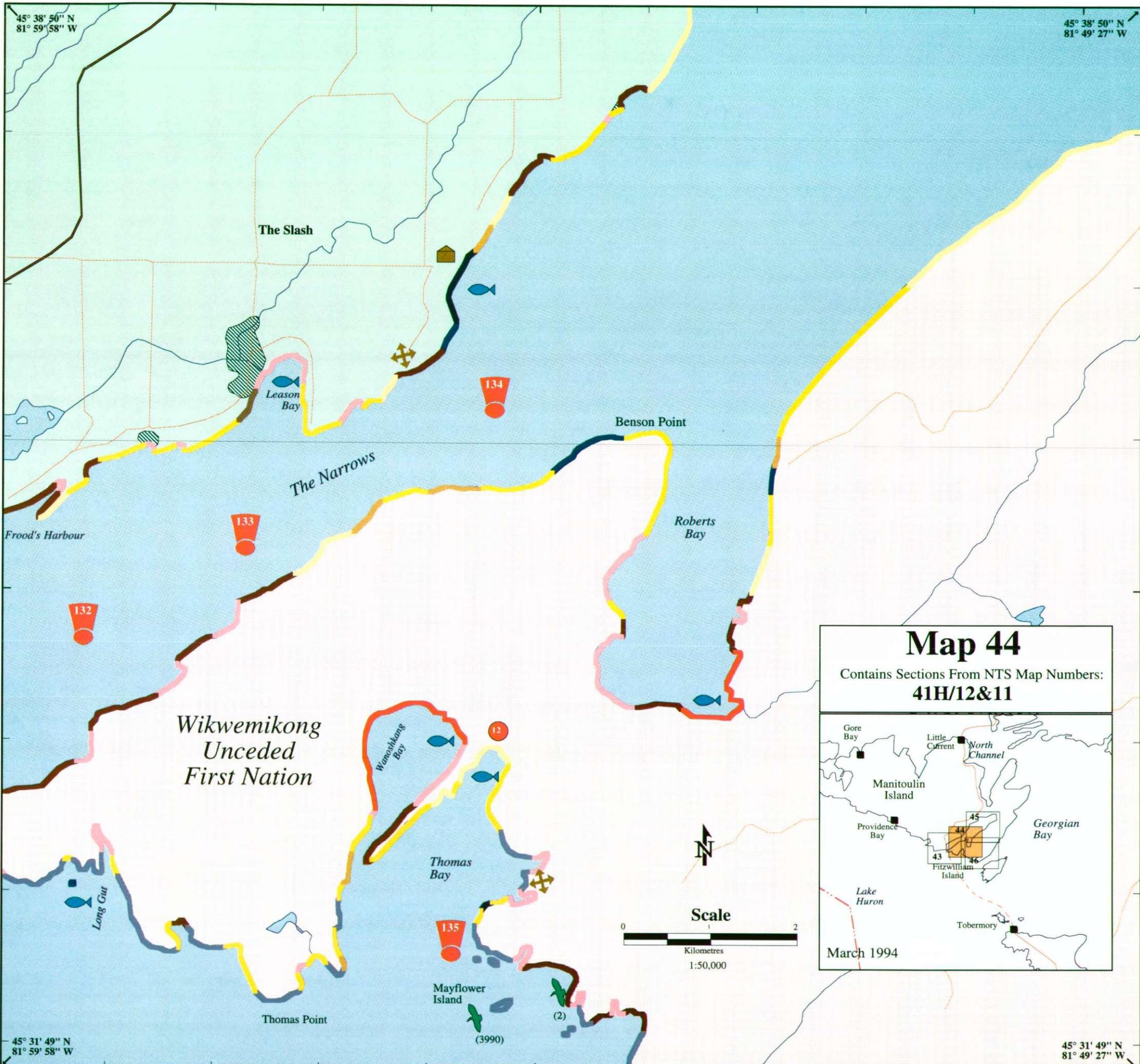
**128** ! Nesting colonial waterbirds occur on Michael's Point and Maiden Island.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 127** Michael's Bay fringing wetland supports rare vascular flora and provides a habitat for shorebirds and wading birds. Blue Jay Creek and Manitou River are significant migration and spawning watercourses: Rainbow Trout spawn in the Spring and Chinook Salmon in the Fall.
- 128** Nesting colonial waterbirds occur on Michael's Point and Maiden Island.
- 129** Big Bay is a Yellow Perch spawning habitat in the Spring. Its fringing wetlands support shorebirds and wading birds.
- 130** Nesting colonial waterbirds occur on rocks and islands near Walker Point and Birch Point. Seasonal fish spawning occurs in Lake Huron, along the south shore of Manitoulin Island: Lake Whitefish in late Fall.
- 131** A ferry service occurs between South Baymouth and Tobermory.
- 132** Recreational cottages occur along the north shoreline of South Bay. Seasonal fish spawning and sport fishing occurs in South Bay: Yellow Perch spawn in Spring and Lake Whitefish and Lake Trout spawn in late Fall. Rare vascular flora occur at South Baymouth.
- 133** Wikwemikong Unceded First Nation. Responders should contact the Chief of the Wikwemikong Unceded First Nation before commencing response activities.



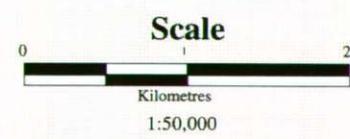
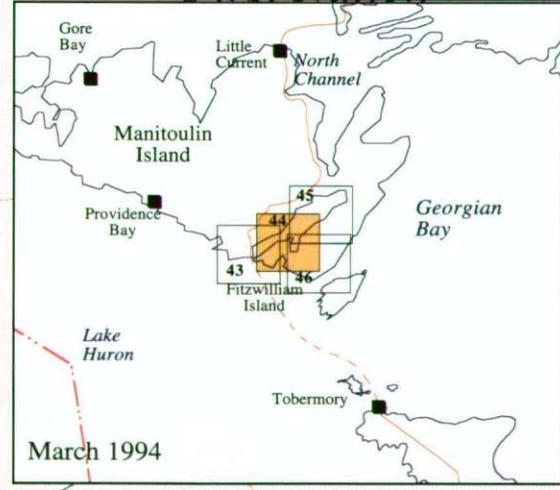


### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 132** Recreational cottages occur along the north shoreline of South Bay. Seasonal fish spawning and sport fishing occurs in South Bay: Yellow Perch spawn in Spring and Lake Whitefish and Lake Trout spawn in late Fall. Rare vascular flora occur at South Baymouth.
- 133** Wikwemikong Unceded First Nation. Responders should contact the Chief of the Wikwemikong Unceded First Nation before commencing response activities.
- 134** Seasonal fish spawning occurs in the Narrows of South Bay, Leason Bay and Roberts Bay: Lake Trout in October and Whitefish in November and December.
- 135** Seasonal fish spawning occurs in Thomas Bay: Lake Trout in October, Lake Herring in November and December. Nesting colonial waterbirds occur on Mayflower Island.

**Map 44**  
 Contains Sections From NTS Map Numbers:  
**41H/12&11**

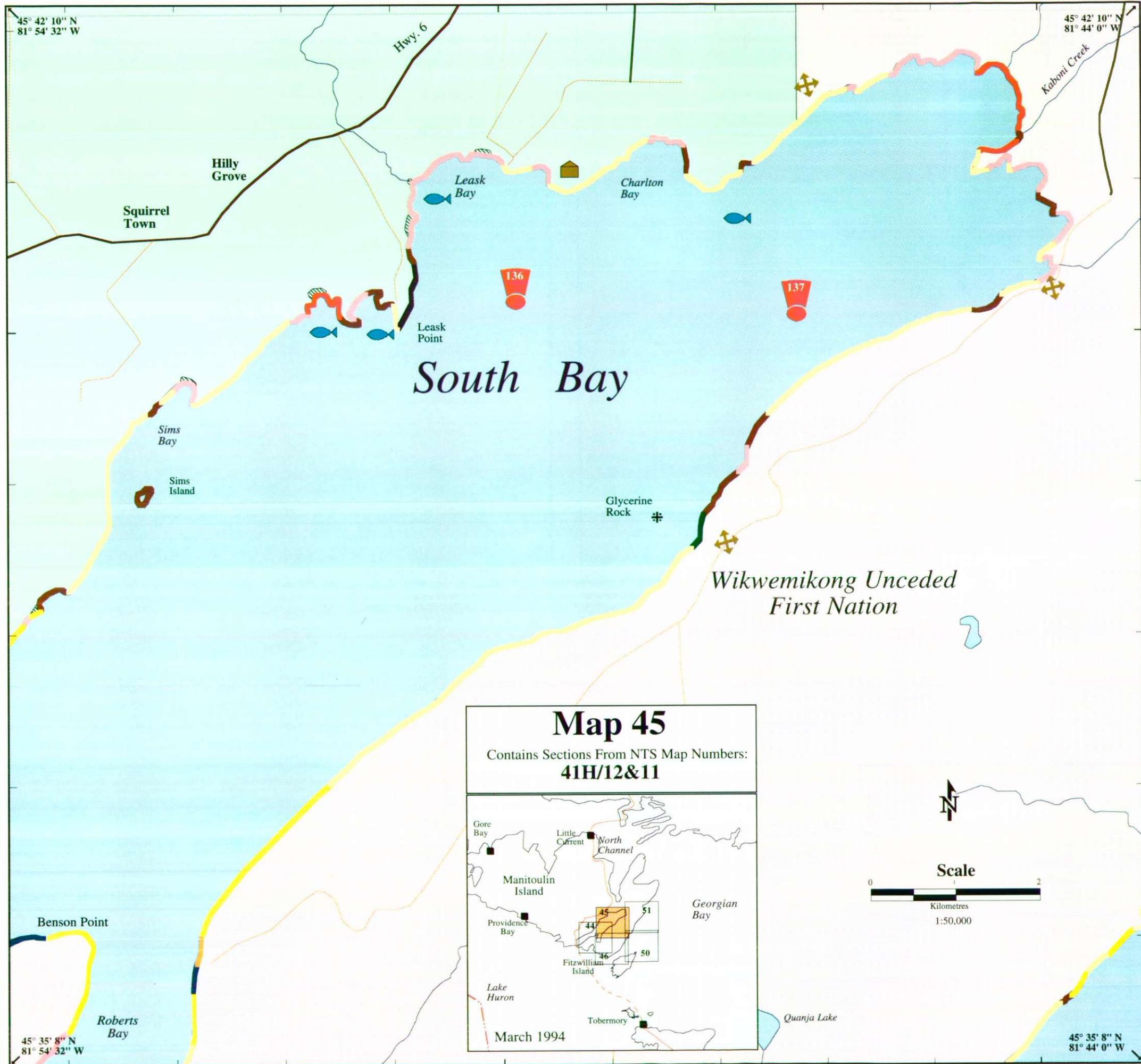


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

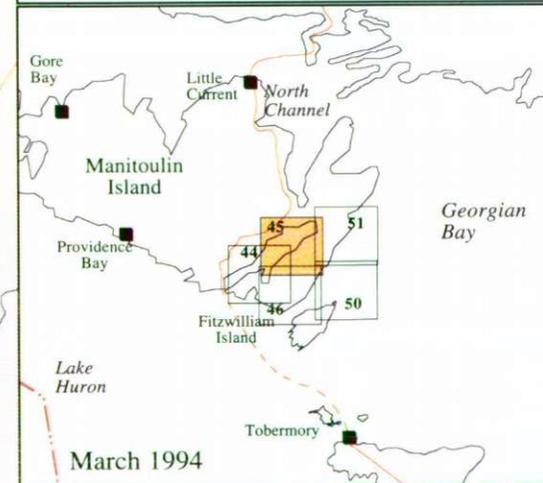
**136** Seasonal fish spawning occurs in South Bay and Leask Bay. Lake Trout in October and Whitefish in November and December. High use recreational cottage dwellings occur along the shoreline of South Bay.

**137** Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities.

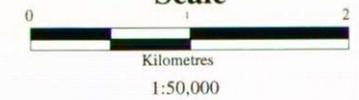


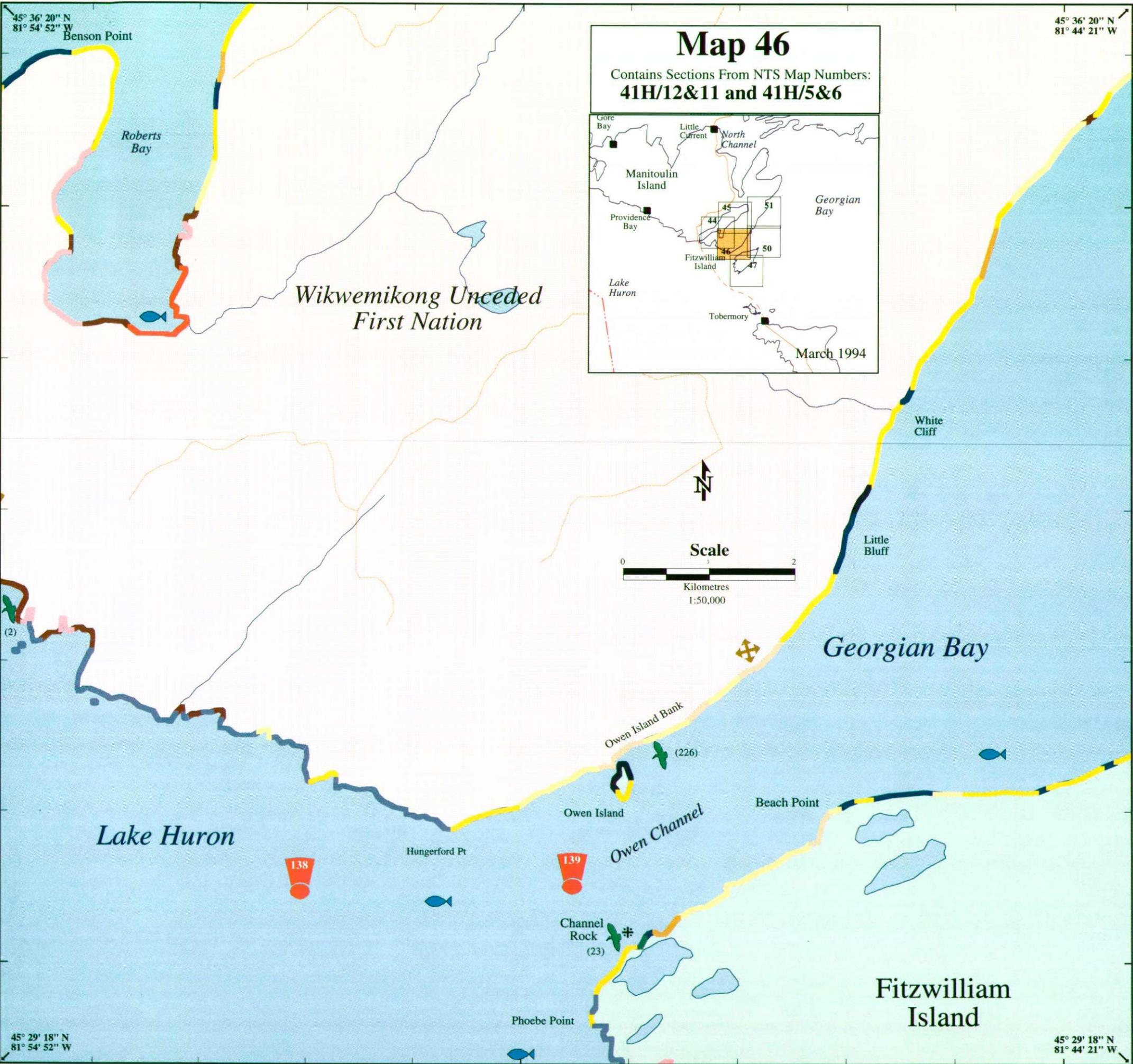
**Map 45**

Contains Sections From NTS Map Numbers:  
**41H/12&11**



**Scale**





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**138** Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities.

**139** Nesting colonial waterbirds occur on Owen Island Bank and Channel Rock and seasonal fish spawning occurs in Owen Channel: Whitefish in November and December.

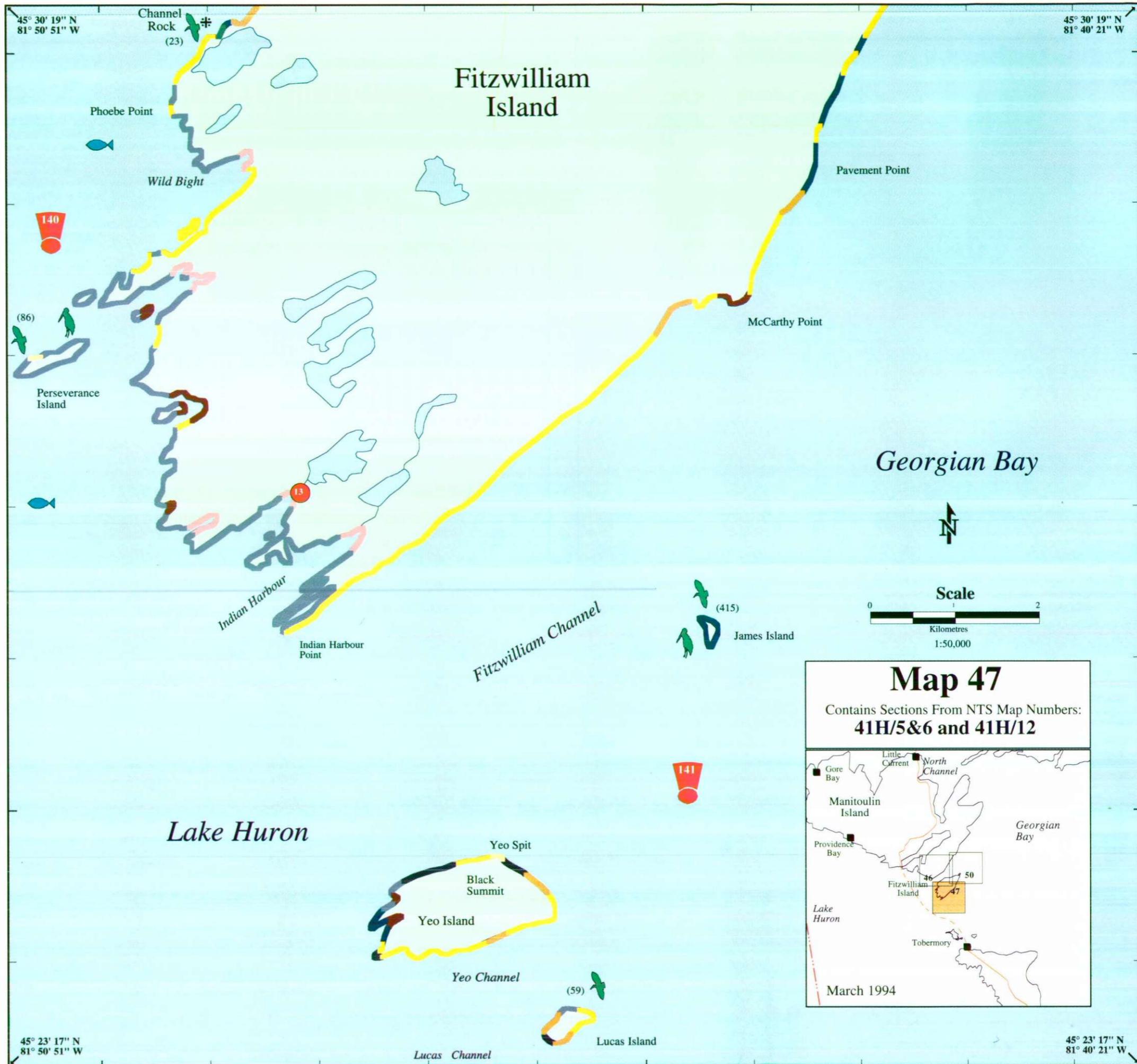


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**140** Seasonal fish spawning occurs west of Fitzwilliam Island, Ling in October, Whitefish in November and December. Nesting colonial waterbirds occur on Perseverance Island.

**141** Nesting colonial waterbirds occur on Lucas Island and James Island.



**Map 47**  
 Contains Sections From NTS Map Numbers:  
**41H/5&6 and 41H/12**

March 1994

45° 29' 43" N  
81° 34' 49" W

45° 29' 43" N  
81° 24' 20" W

(Lake Huron)

Georgian Bay

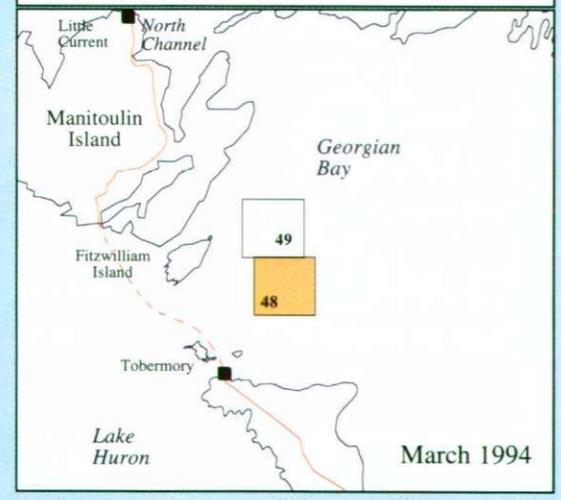


Halfmoon Island

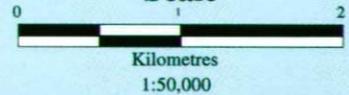
(4853)

# Map 48

Contains Sections From NTS Map Numbers:  
**41H/5&6**



Scale



45° 22' 41" N  
81° 34' 49" W

45° 22' 41" N  
81° 24' 20" W

## NOTES

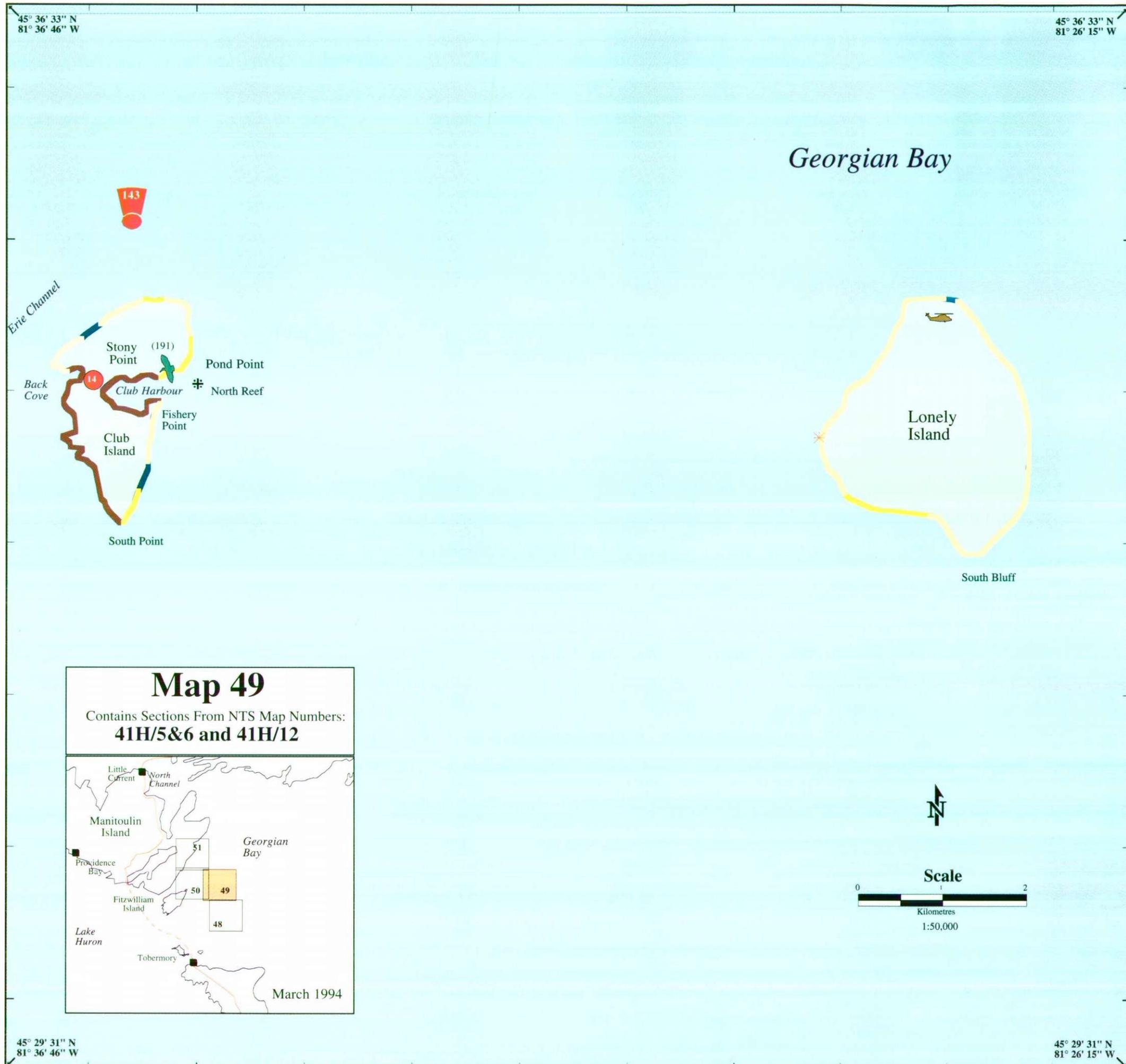
A red exclamation point symbol is used on the maps to catch the responder's attention.

Nesting colonial waterbirds occur on Halfmoon Island in Georgian Bay.

**NOTES** !

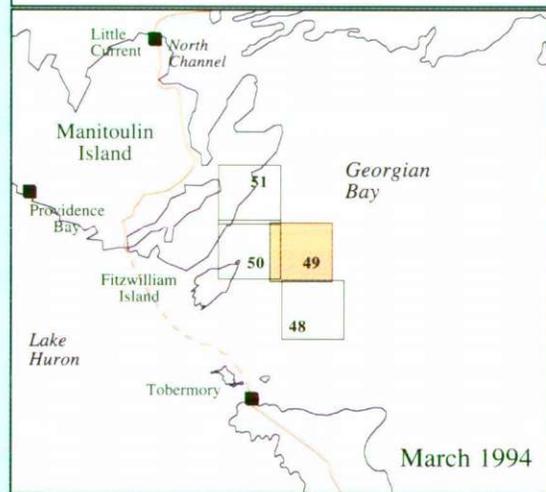
A red exclamation point symbol is used on the maps to catch the responder's attention.

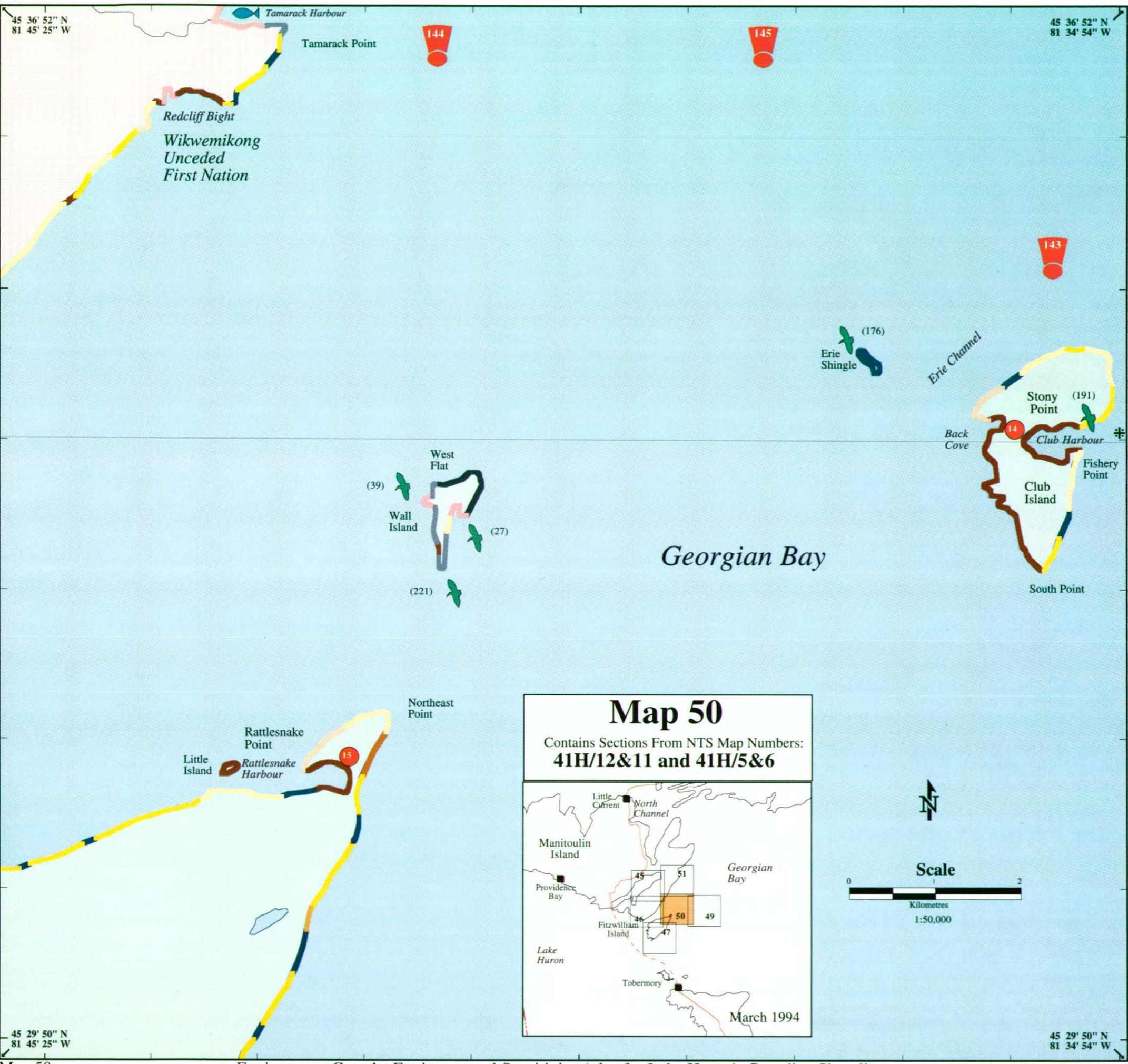
! Nesting colonial waterbirds occur on Club Island near Pond Point.  
143



**Map 49**

Contains Sections From NTS Map Numbers:  
**41H/5&6 and 41H/12**





**NOTES**

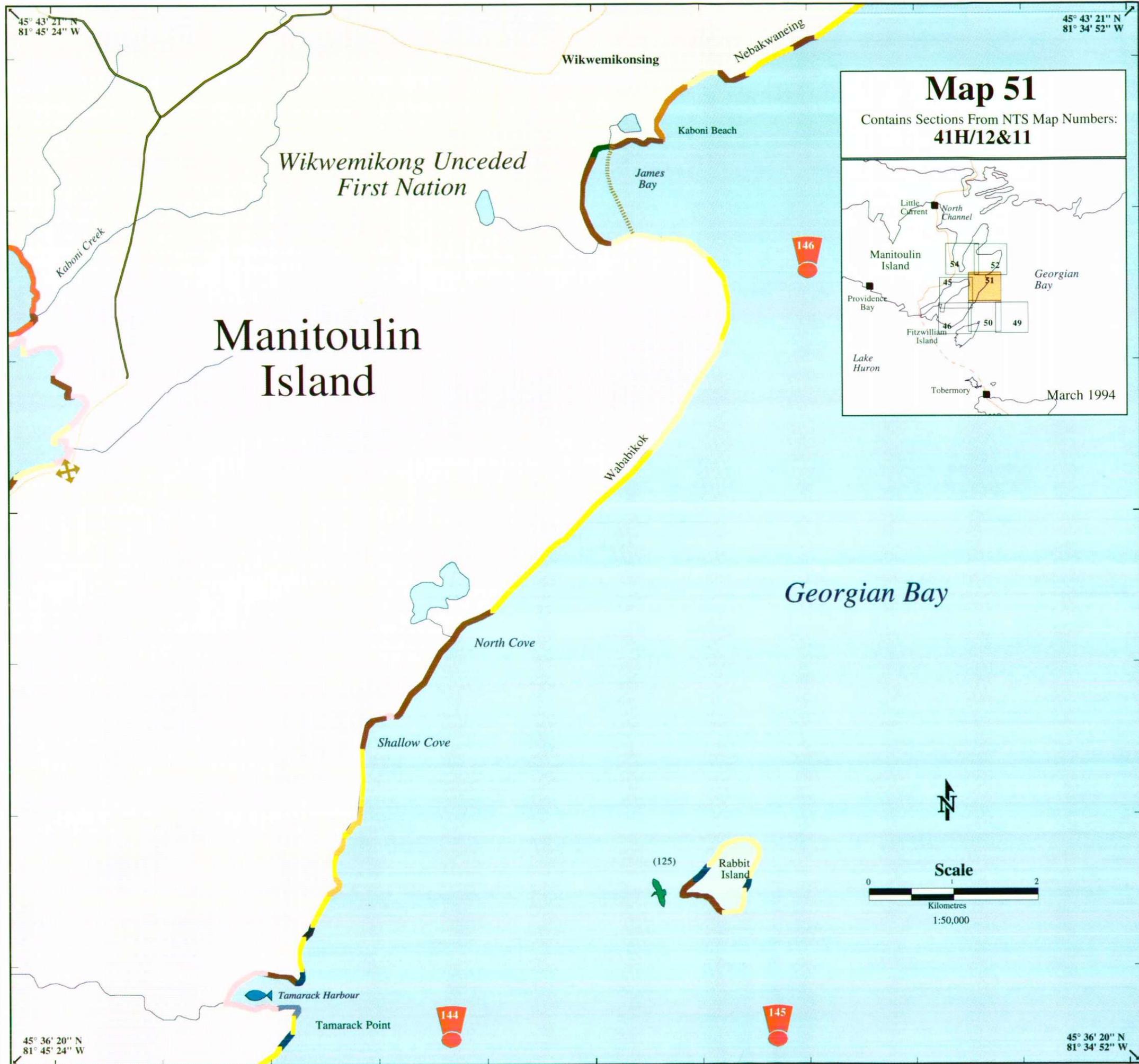
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 143 Nesting colonial waterbirds occur on Club Island near Pond Point.
- 144 Seasonal fish spawning occurs in streams connecting to Georgian Bay: White Sucker in Spring.
- 145 Nesting colonial waterbirds occur on Erie Shingle, Wall Island and Rabbit Island.

**NOTES**

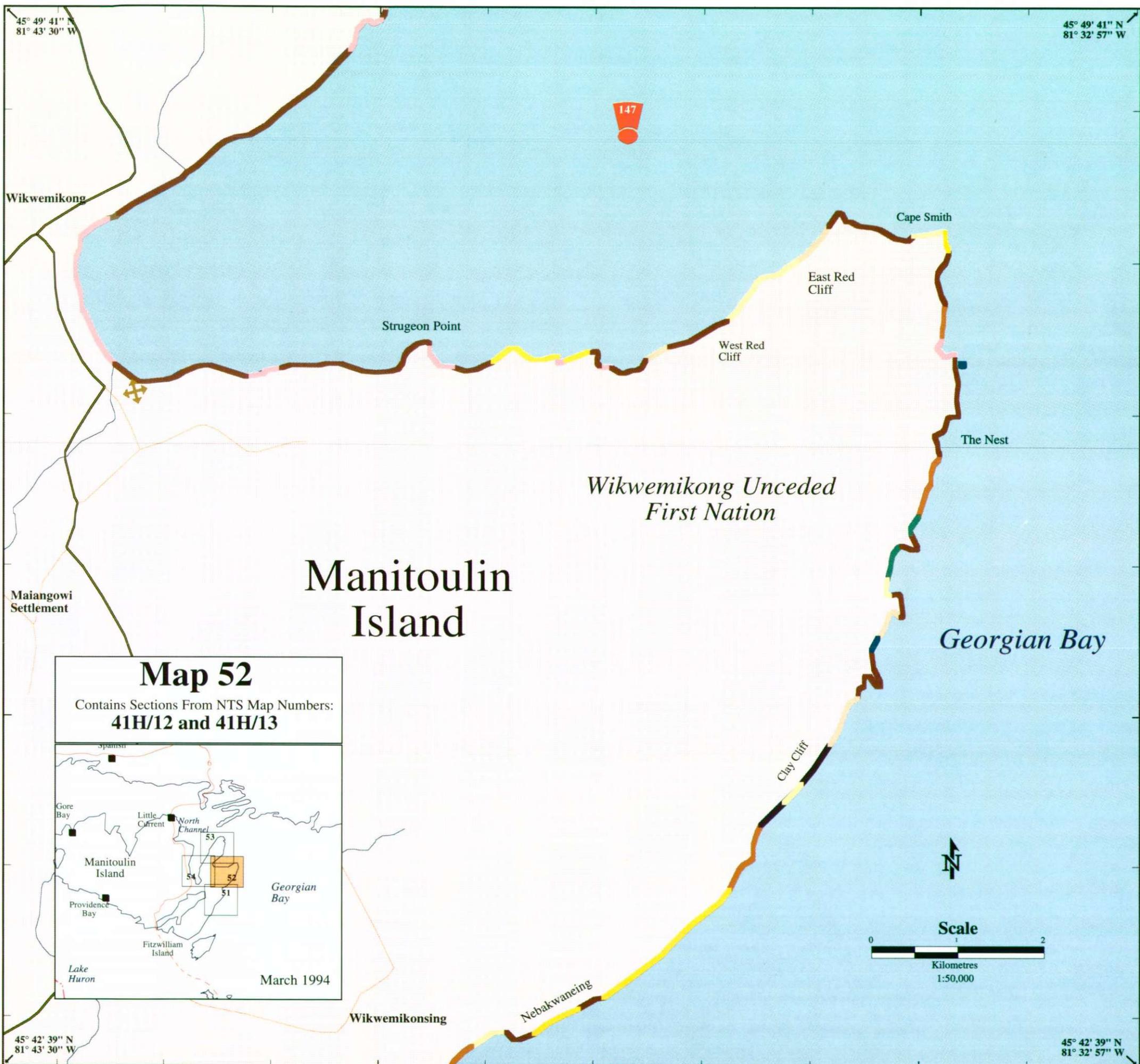
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 144 Seasonal fish spawning occurs in streams connecting to Georgian Bay: White Sucker in Spring.
- 145 Nesting colonial waterbirds occur on Erie Shingle, Wall Island and Rabbit Island.
- 146 Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities. Approach concerns exist in James Bay that are hazardous to boating activities. Responders should exercise caution when approaching the shoreline.



**Map 51**  
 Contains Sections From NTS Map Numbers:  
**41H/12&11**

March 1994



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

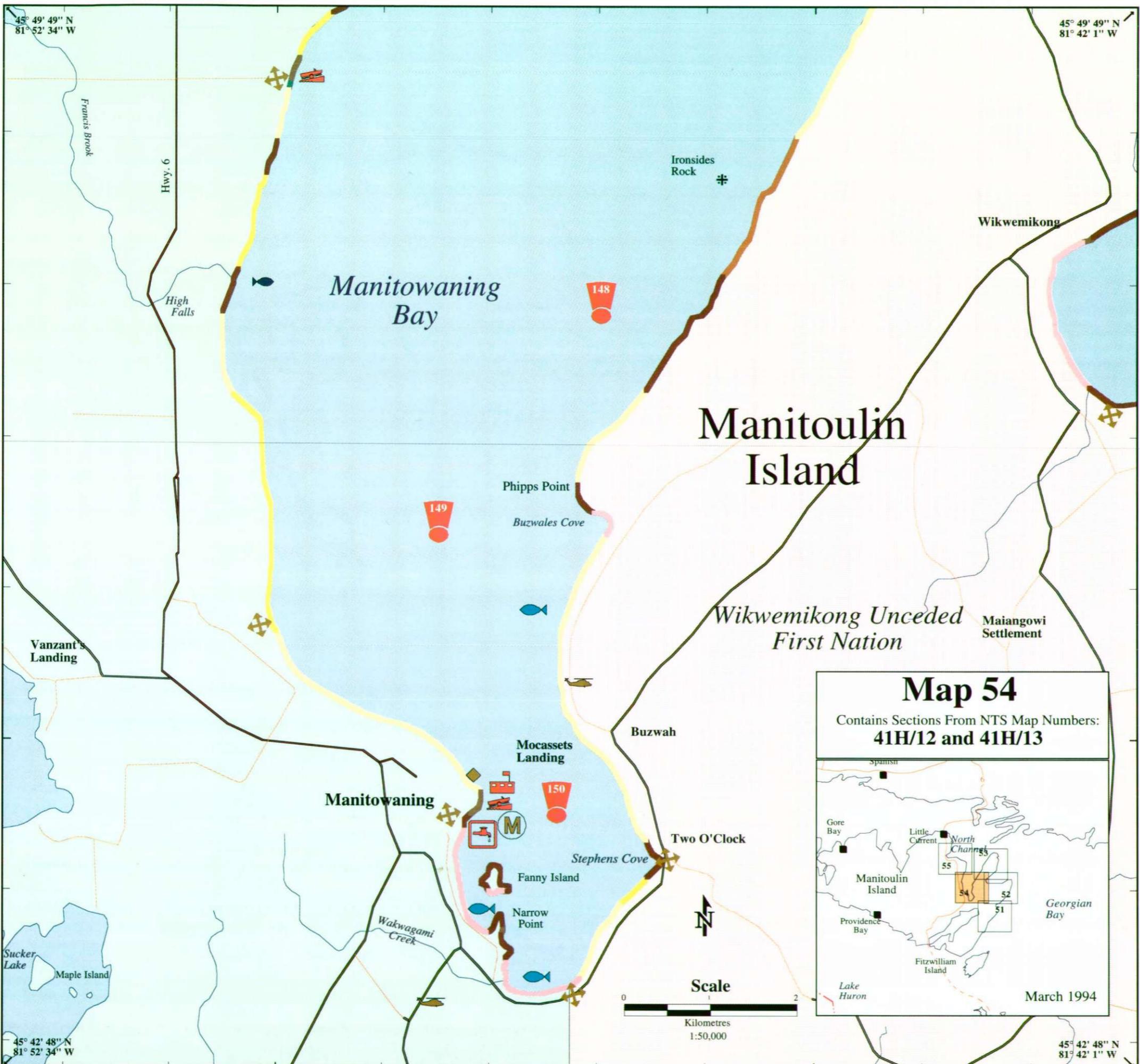
**147** Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

147 Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities.





### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Wikwemikong Unceded First Nation. Responders should contact the Chief of Wikwemikong Unceded First Nation before commencing response activities.
-  Seasonal fish spawning and sport fishing activities occur in Manitowaning Bay.
-  Assignack Water Treatment Plant water intake and Water Pollution Control Plant: Call - (705) 859-3302.

### Map 54

Contains Sections From NTS Map Numbers:  
**41H/12 and 41H/13**

March 1994

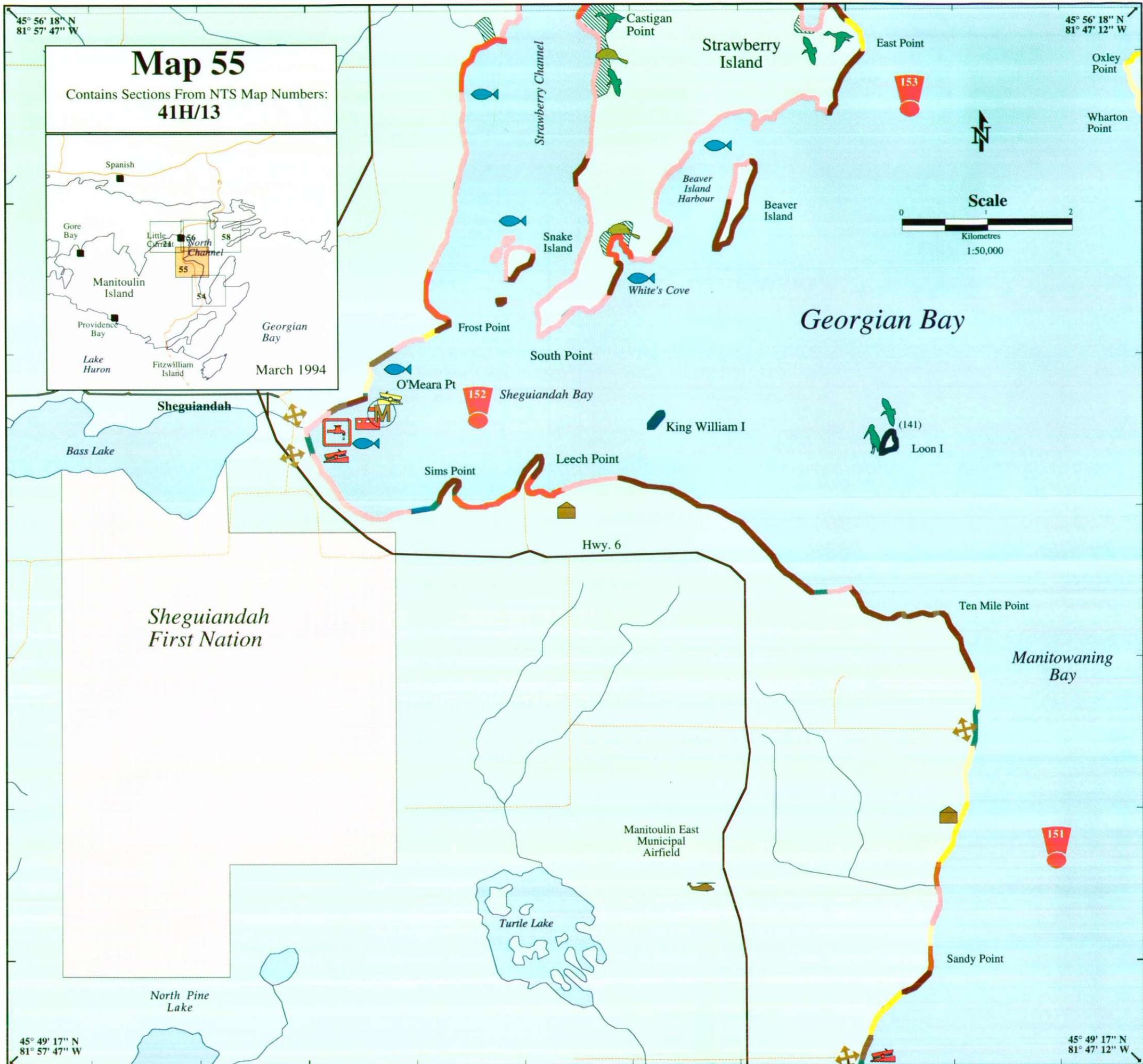
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**151** Numerous recreational cottages occur along the shoreline of Manitowaning Bay and Sheguiandah Bay.

**152** Sheguiandah First Nation. Responders should contact the Chief of the Sheguiandah First Nation before commencing response activities.  
Municipal Water Treatment Plant Water Intake. Call - (705) 368-2009.

**153** Seasonal fish spawning occurs in Sheguiandah Bay, Strawberry Channel and around Strawberry Island: Northern Pike and Carp in Spring. Numerous small wetlands occur on Strawberry Island, providing a habitat for colonial waterbirds, waterfowl, shorebirds and fur bearing mammals.

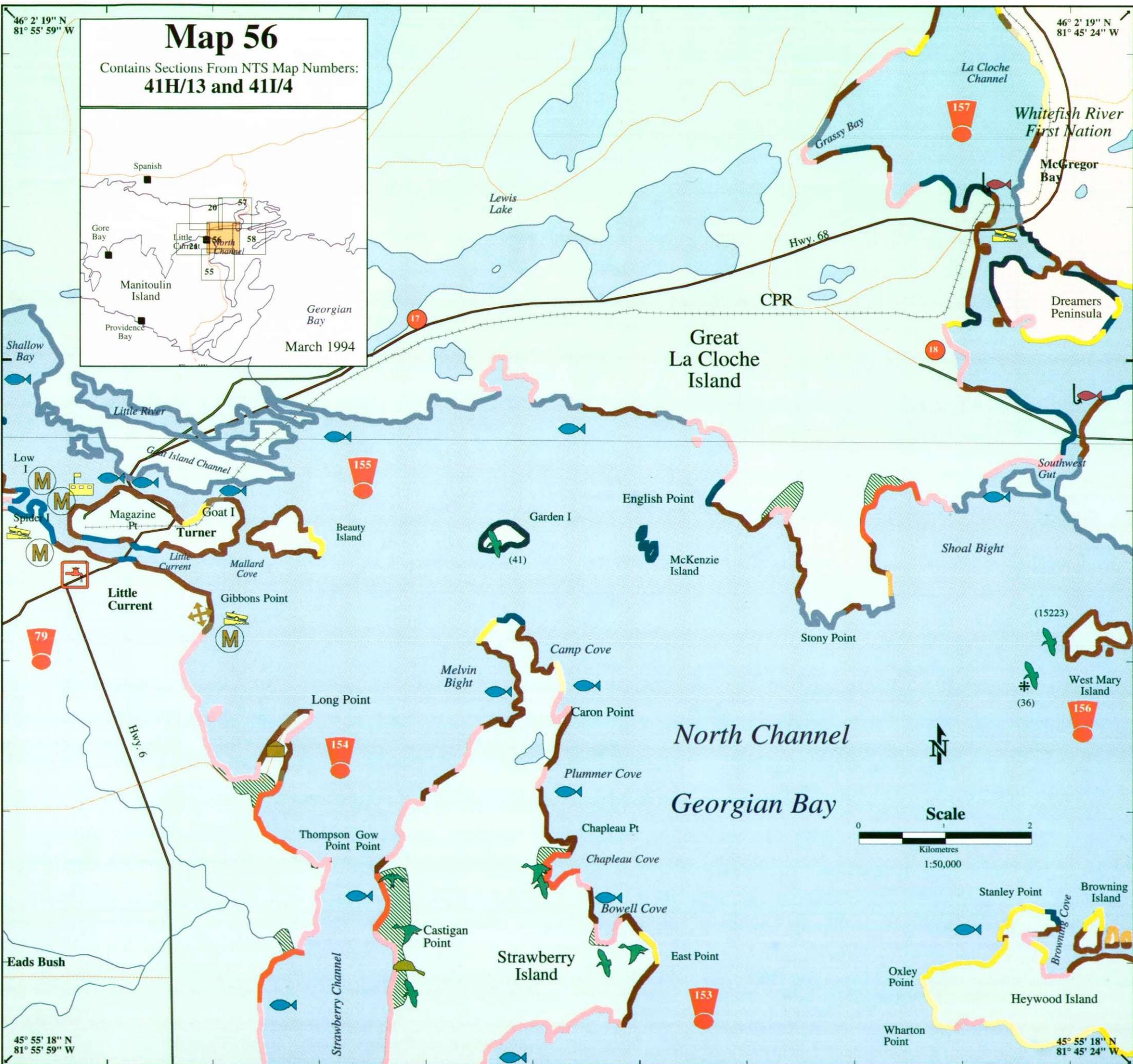
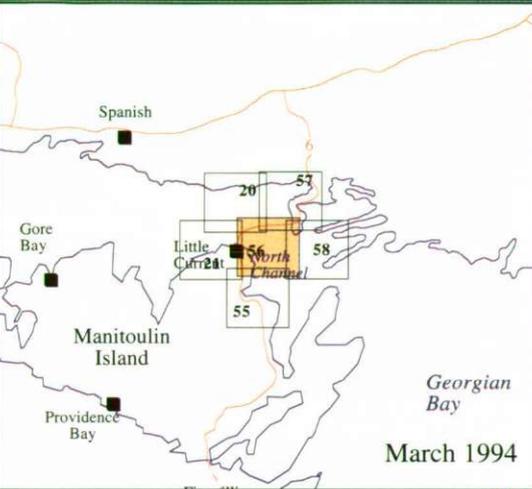


46° 2' 19" N  
81° 55' 59" W

# Map 56

Contains Sections From NTS Map Numbers:  
**41H/13 and 41I/4**

46° 2' 19" N  
81° 45' 24" W



## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 79** Little Current Water Treatment Plant water intake: Call - (705) 368-2277.
- 153** Seasonal fish spawning occurs in Sheguiandah Bay, Strawberry Channel and around Strawberry Island: Northern Pike and Carp in Spring. Numerous small wetlands occur on Strawberry Island, providing a habitat for colonial waterbirds, waterfowl, shorebirds and fur bearing mammals.
- 154** Numerous recreational cottages and permanent homes occur on the Manitoulin Island shoreline at Long Point.
- 155** Seasonal fish spawning occurs in Goat Island Channel and in the North Channel near Great La Cloche Island: Yellow Perch in Spring and Lake Trout in Fall.
- 156** Nesting colonial waterbirds occur on West Mary Island, East Mary Island and Heywood Rock.
- 157** Whitefish River First Nation. Responders should contact the Chief of the Whitefish River First Nation before commencing response activities. Commerical fish aquaculture activities occur in La Cloche Channel.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**157** Whitefish River First Nation. Responders should contact the Chief of the Whitefish River First Nation before commencing response activities. Commercial fish aquaculture activities occur in La Cloche Channel.

**158** The Numerous small islands in the Bay of Islands are hazardous to boating activities. Responders should exercise caution when approaching shorelines.





**NOTES**

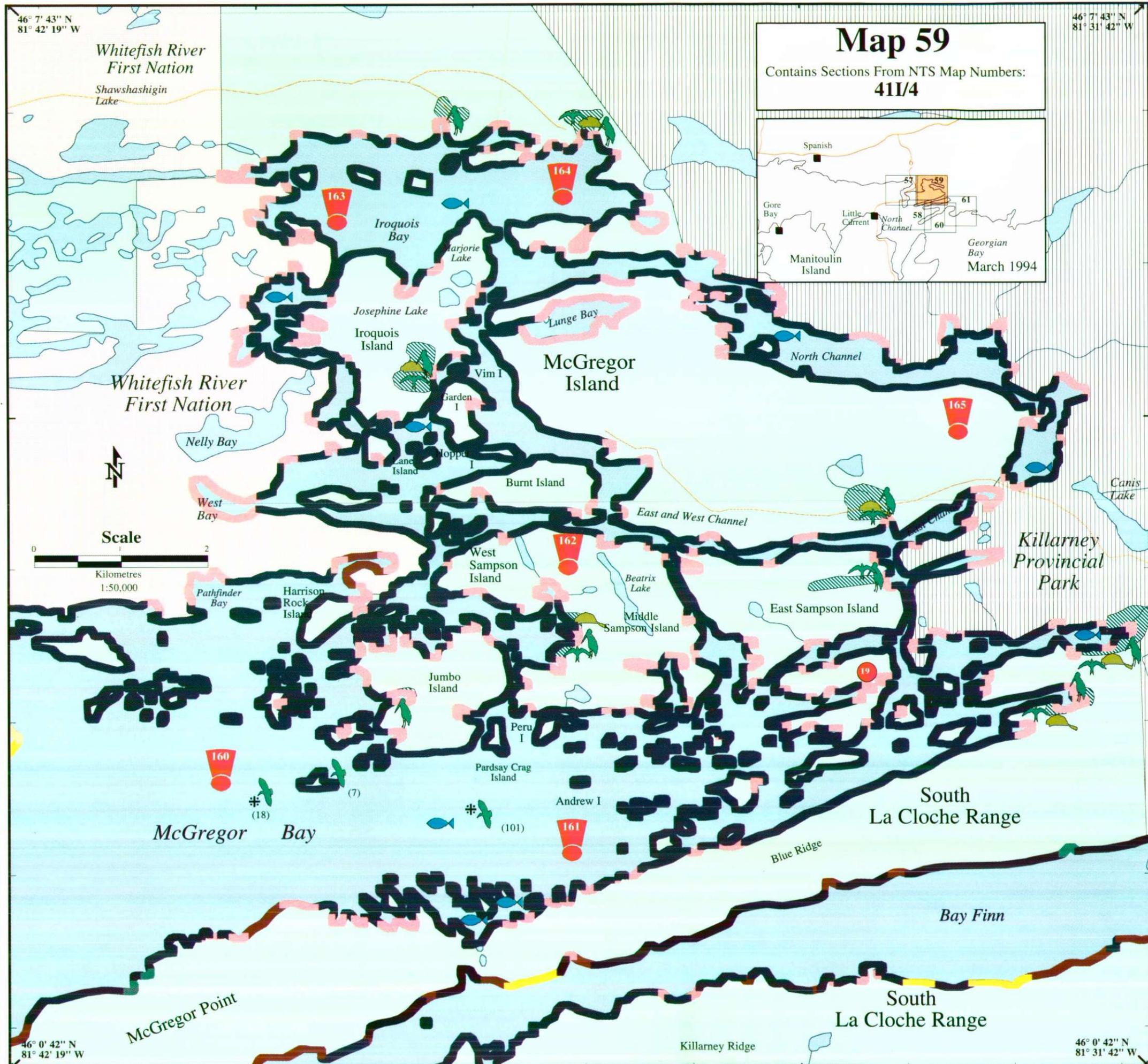
A red exclamation point symbol is used on the maps to catch the responder's attention.

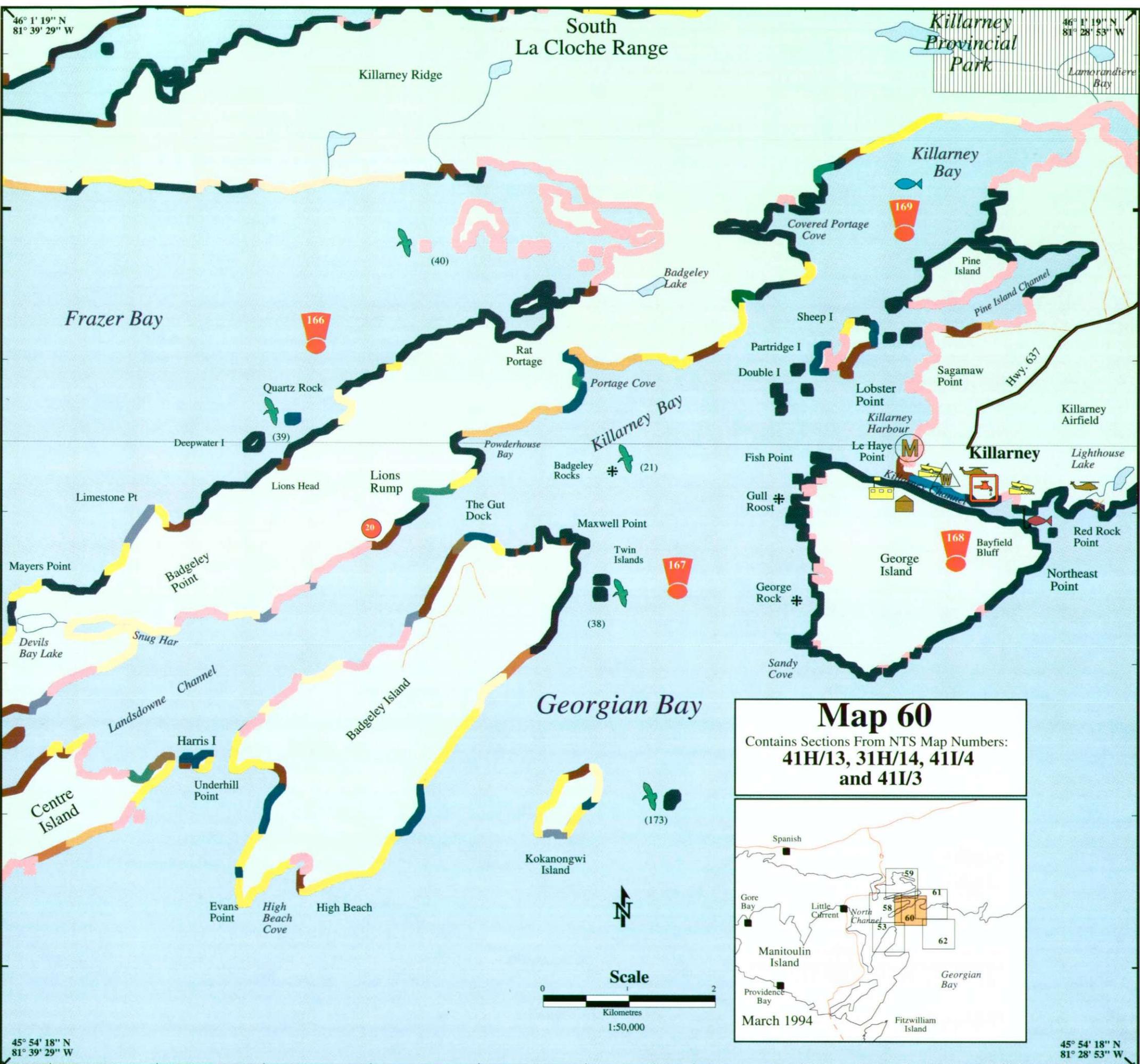
- 156** Nesting colonial waterbirds occur on West Mary Island, East Mary Island and Heywood Rock.
- 157** Whitefish River First Nation. Responders should contact the Chief of the Whitefish River First Nation before commencing response activities. Commercial fish aquaculture activities occur in La Cloche Channel.
- 159** Nesting colonial waterbirds occur on numerous rocks and islands, near McGregor Point, in Frazer Bay.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 160** Nesting colonial waterbirds occur on numerous rocks and islands in McGregor Bay. Seasonal fish spawning occurs in McGregor Bay: Yellow Perch in Spring and Splake in Fall.
- 161** The numerous small islands in McGregor Bay are hazardous to boating activities. Responders should exercise caution when approaching shorelines.
- 162** Fringing wetlands on Middle Sampson Island support shorebirds, wading birds and fur bearing mammals.
- 163** Whitefish River First Nation. Responders should contact the Chief of the Whitefish River First Nation before commencing response activities.
- 164** Fringing wetlands in Iroquois Bay support shorebirds, wading birds and fur bearing mammals.
- 165** Killarney Provincial Park is an important recreational and educational area. Fringing wetlands at Killarney Provincial Park support shorebirds, wading birds and fur bearing mammals.



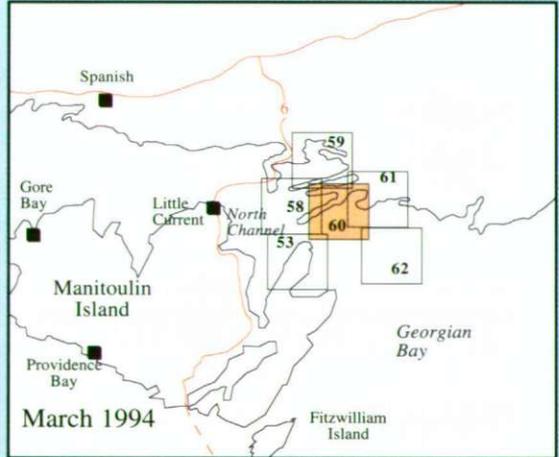


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 166** Nesting colonial waterbirds occur on Quartz Rock in Frazer Bay.
- 167** Nesting colonial waterbirds occur on the Twin Islands and the Badgeley Rocks, near Kokanongwi Island.
- 168** Town of Killarney municipal water intake: Call - (705) 287-2424.
- 169** Killarney Provincial Park is an important recreational and educational area.

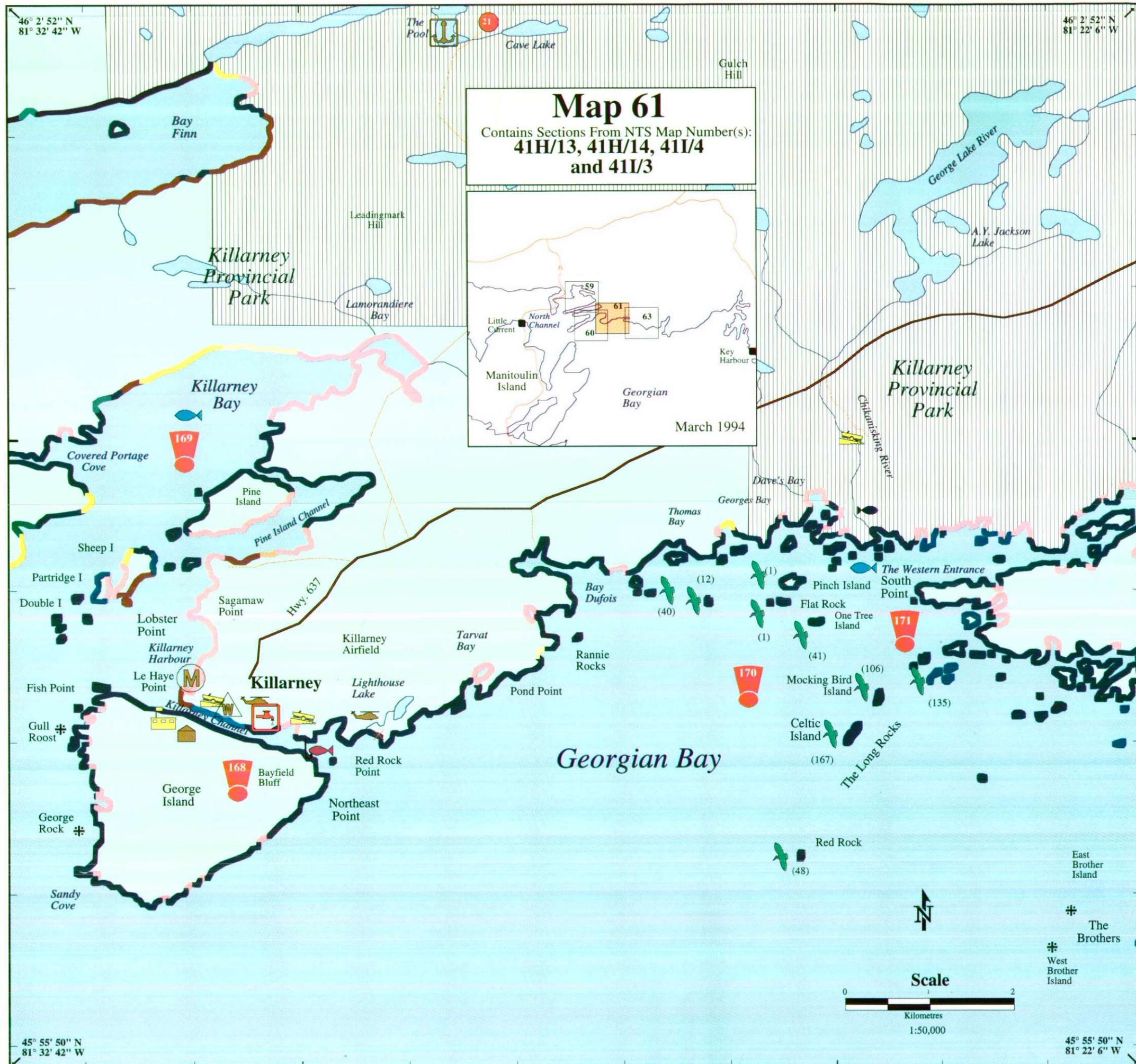
**Map 60**  
 Contains Sections From NTS Map Numbers:  
**41H/13, 31H/14, 41I/4**  
**and 41I/3**



# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Town of Killarney municipal water intake: Call - (705) 287-2424.
-  Killarney Provincial Park is an important recreational and educational area.
-  Nesting colonial waterbirds occur on and near The Long Rocks, Flat Rock and Pinch Island.
-  Chikanisking River is an important fish spawning and migration watercourse.

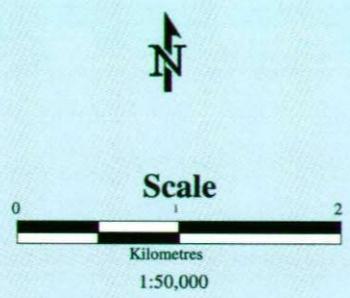
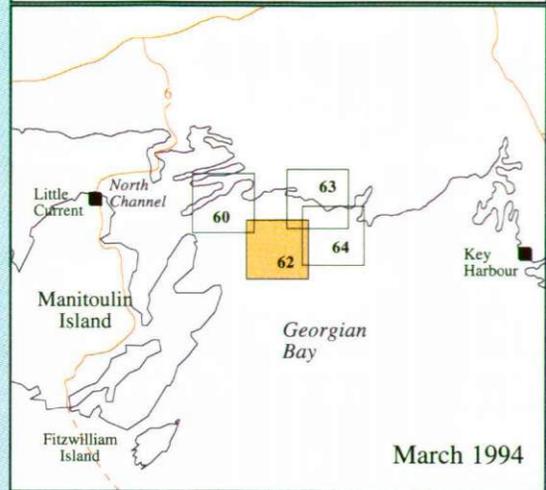


45° 55' 50" N  
81° 30' 15" W

45° 55' 50" N  
81° 19' 40" W

# Map 62

Contains Sections From NTS Map Number(s):  
**41H/13 and 41H/14**



✦ The Triangle

Southwest Hawk Island (592)

174

(253)  
Scarecrow Island

✦ Single Rock

Papoose Island (3904)

173

45° 48' 48" N  
81° 30' 15" W

45° 48' 48" N  
81° 19' 40" W

172  
Annie Rock

(234)  
Young Squaw Island

North Point

(265)  
West Rock

Ragged Rock

South Point

Squaw Island

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

172 Nesting colonial waterbirds occur on Young Squaw Island and West Rock.

173 Nesting colonial waterbirds occur on Papoose Island and Gull Island.

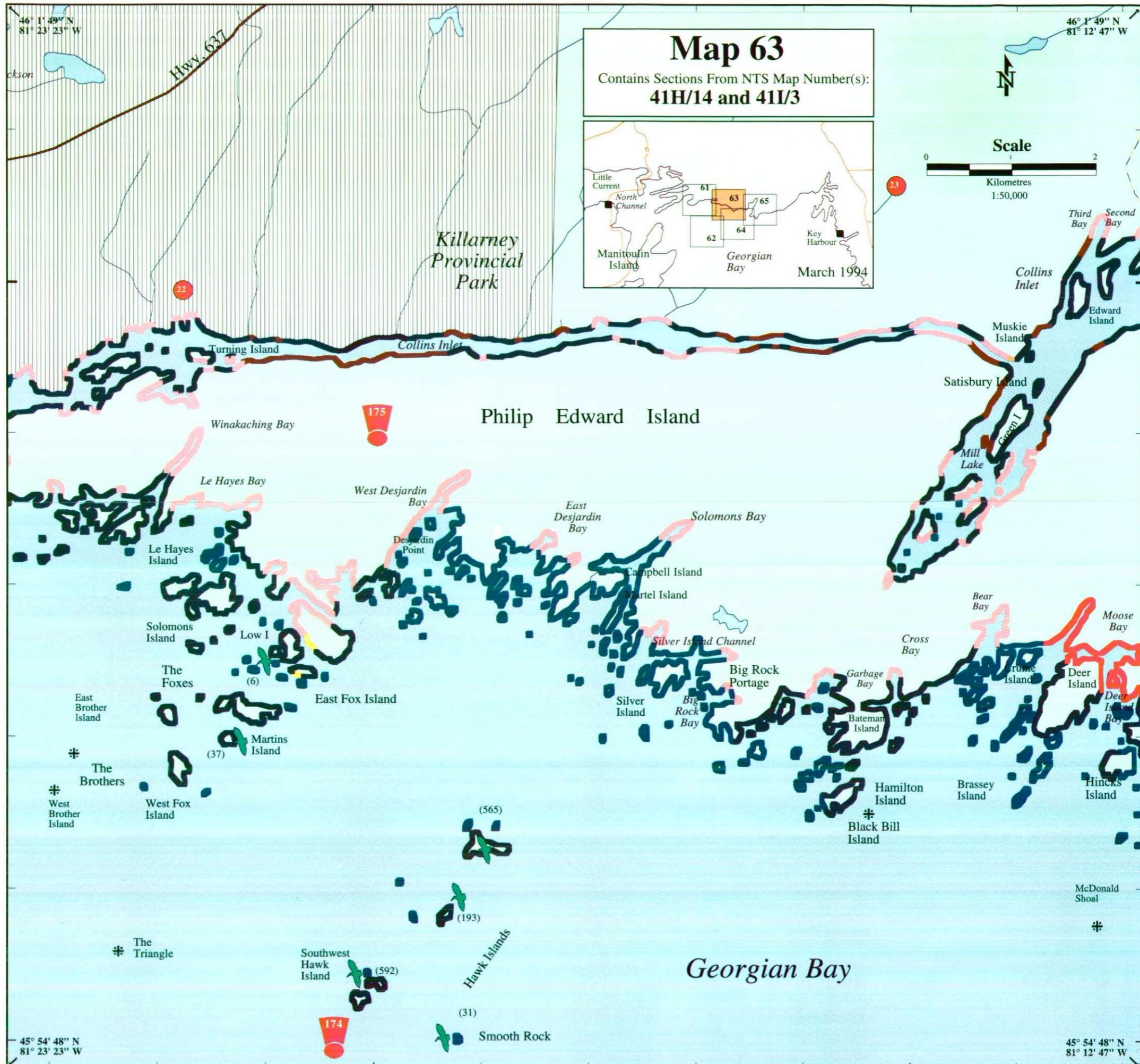
174 Nesting colonial waterbirds occur on the Hawk Islands, Green Island, Scarecrow Island and Smooth Rock.

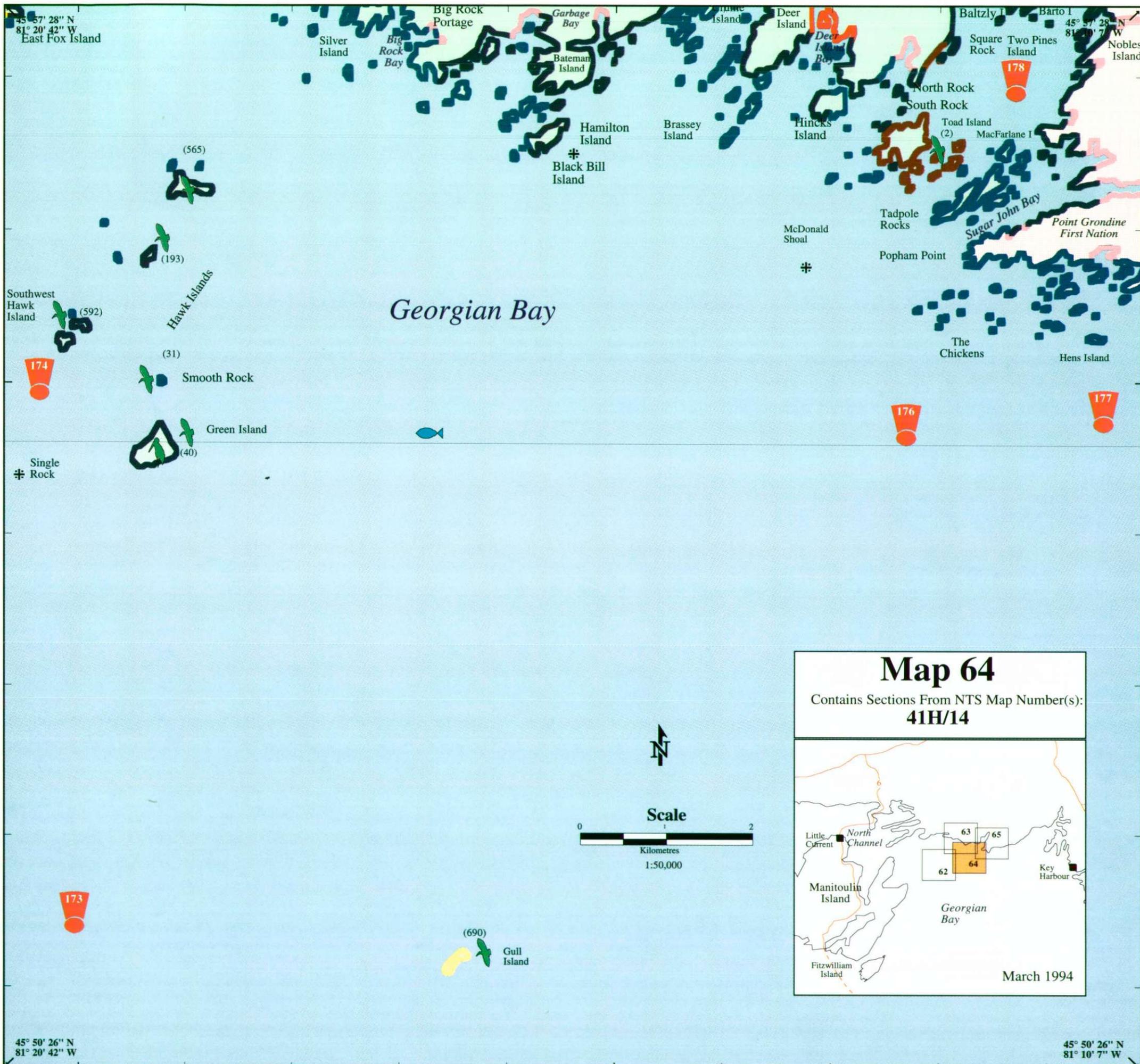
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**174** Nesting colonial waterbirds occur on the Hawk Islands, Green Island, Scarecrow Island and Smooth Rock.

**175** Killarney Provincial Park is an important recreational and educational area.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 173 Nesting colonial waterbirds occur on Papoose Island and Gull Island.
- 174 Nesting colonial waterbirds occur on the Hawk Islands, Green Island, Scarecrow Island and Smooth Rock.
- 176 Seasonal fish spawning occurs in Georgian Bay: Lake Whitefish in late Fall.
- 177 Point Grondine First Nation. Responders should contact the Chief of the Point Grondine First Nation before commencing response activities.
- 178 Nesting colonial waterbirds occur on Fleming Island and near MacFarlane Island. The numerous small islands near Toad Island are hazardous to boating activities. Responders should exercise caution when approaching shorelines.

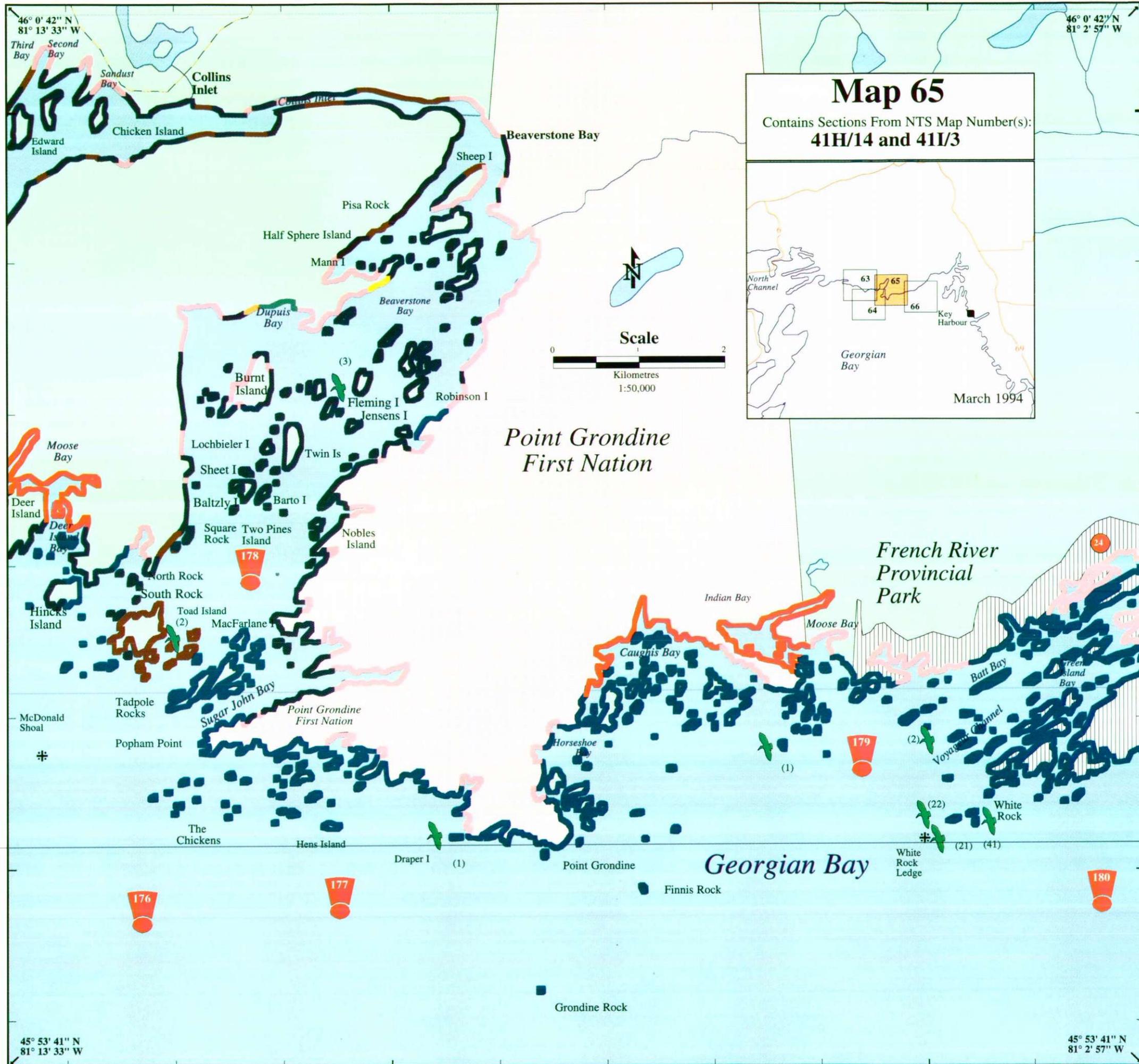
**Map 64**  
 Contains Sections From NTS Map Number(s):  
**41H/14**

March 1994

**NOTES**

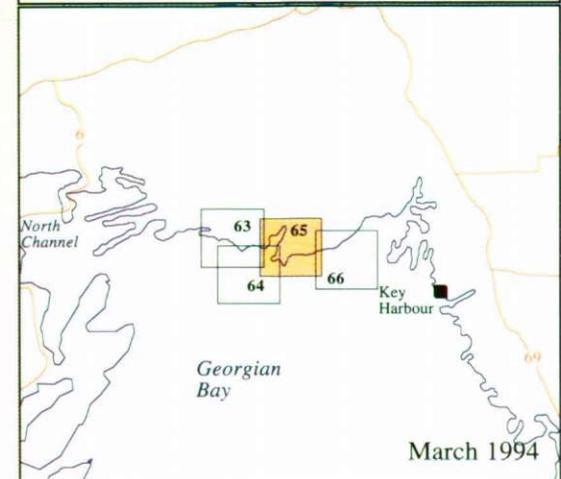
A red exclamation point symbol is used on the maps to catch the responder's attention.

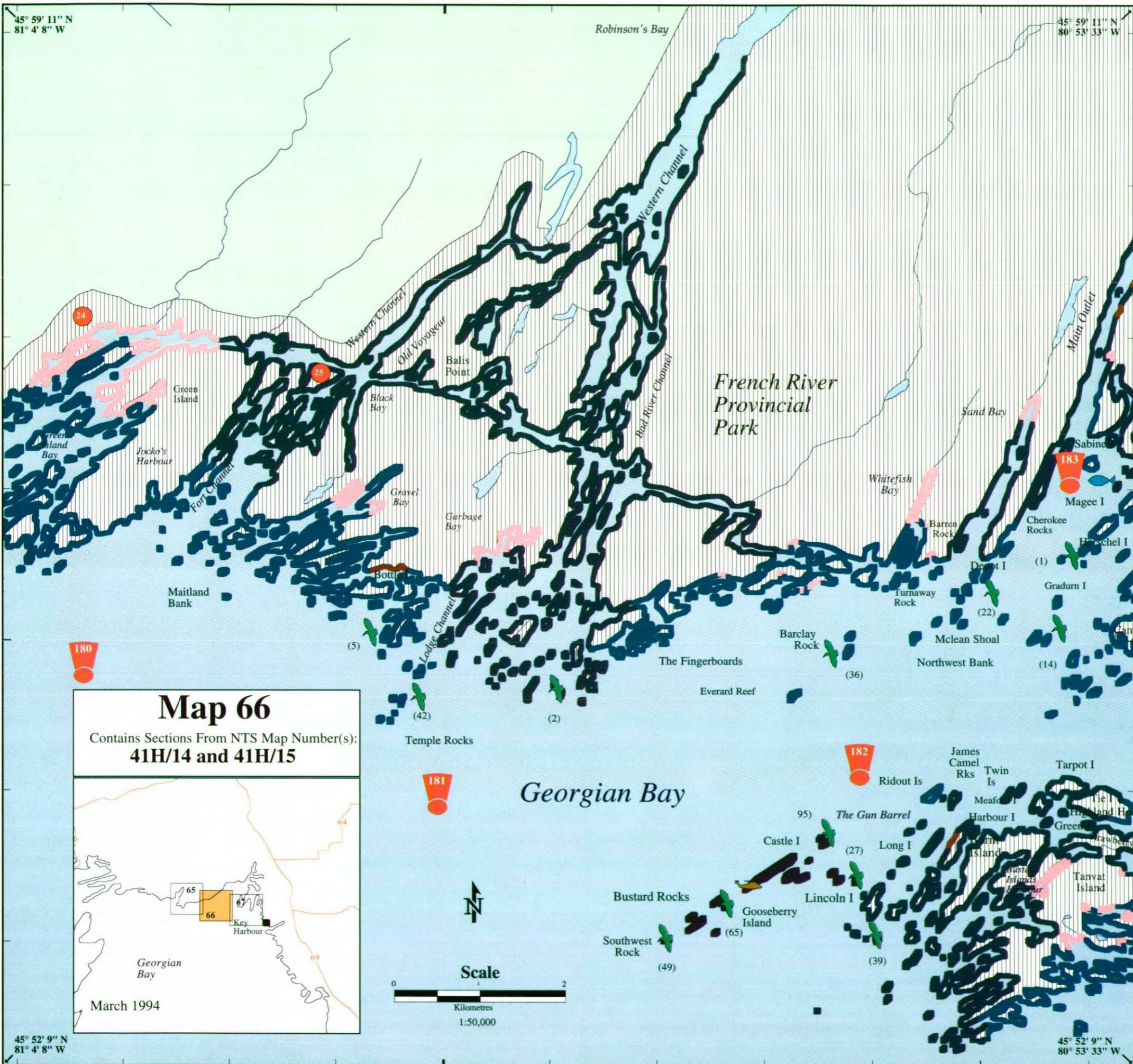
- 176 Seasonal fish spawning occurs in Georgian Bay: Lake Whitefish in late Fall.
- 177 Point Grondine First Nation. Responders should contact the Chief of the Point Grondine First Nation before commencing response activities.
- 178 Nesting colonial waterbirds occur on Fleming Island and near MacFarlane Island. The numerous small islands near Toad Island are hazardous to boating activities. Responders should exercise caution when approaching shorelines.
- 179 French River Provincial Park is an important recreational and educational area.
- 180 Numerous nesting colonial waterbirds occur on White Rock, White Rock Ledge and Temple Rocks.



**Map 65**

Contains Sections From NTS Map Number(s):  
**41H/14 and 41I/3**





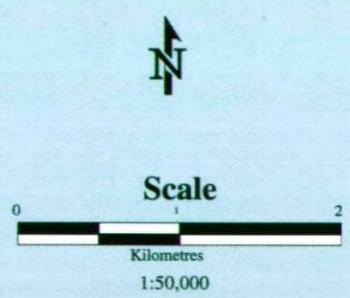
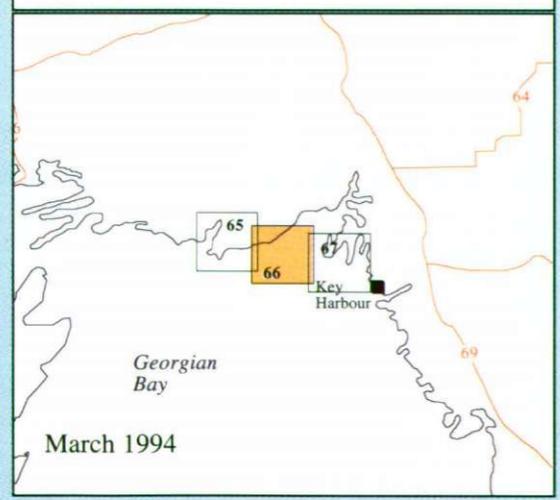
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 
 Numerous nesting colonial waterbirds occur on White Rock, White Rock Ledge and Temple Rocks.
   
**180**
- 
 French River Provincial Park is an important recreational and educational area.
   
**181**
- 
 Nesting colonial waterbirds occur on numerous islands in the Northeast Passage of Georgian Bay, west of Burnt Island, at the Bustard Rocks.
   
**182**
- 
 Seasonal fish spawning occurs at the mouth of the French River: Walleye in Spring.
   
**183**

**Map 66**

Contains Sections From NTS Map Number(s):  
**41H/14 and 41H/15**



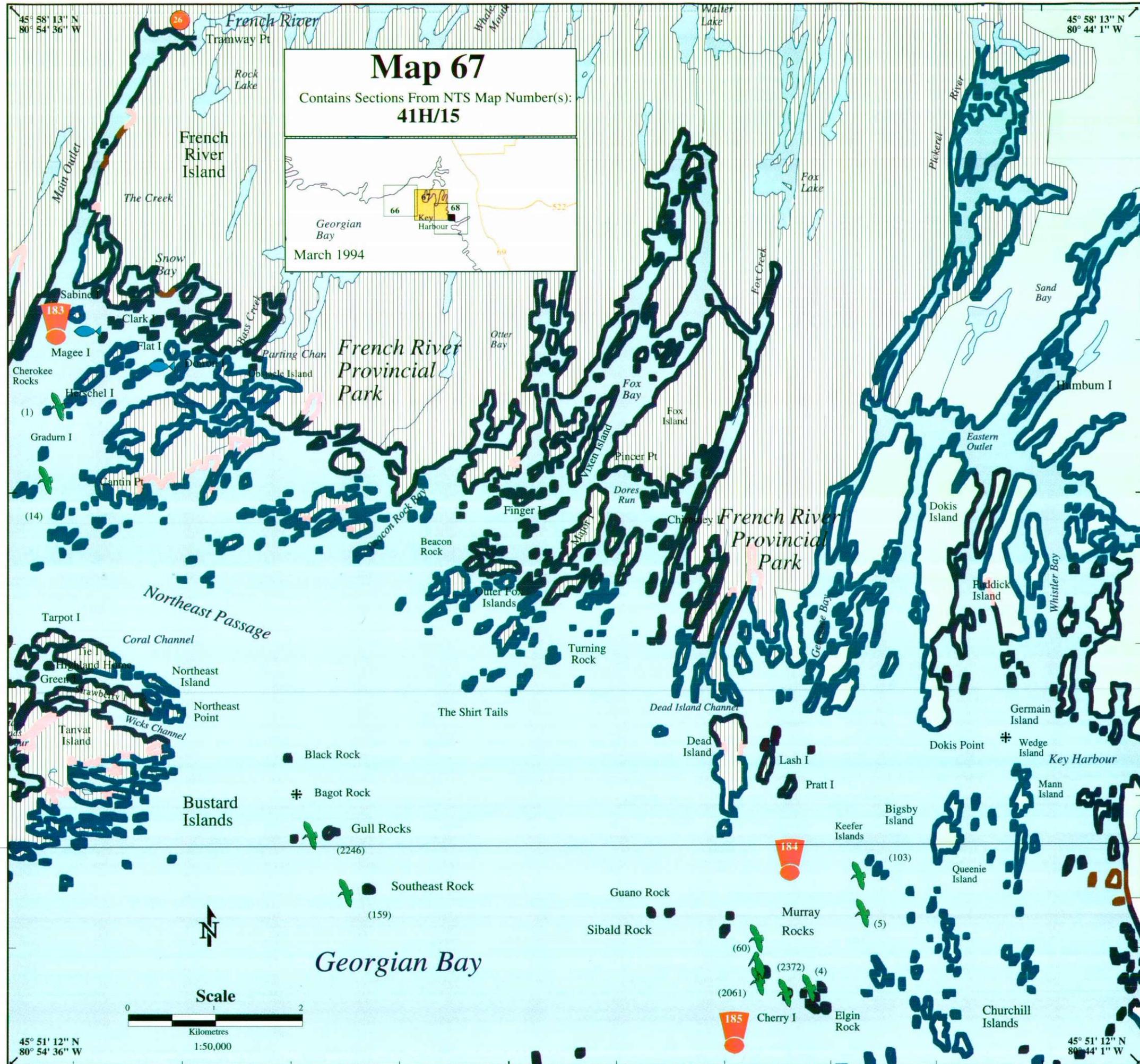
**NOTES**

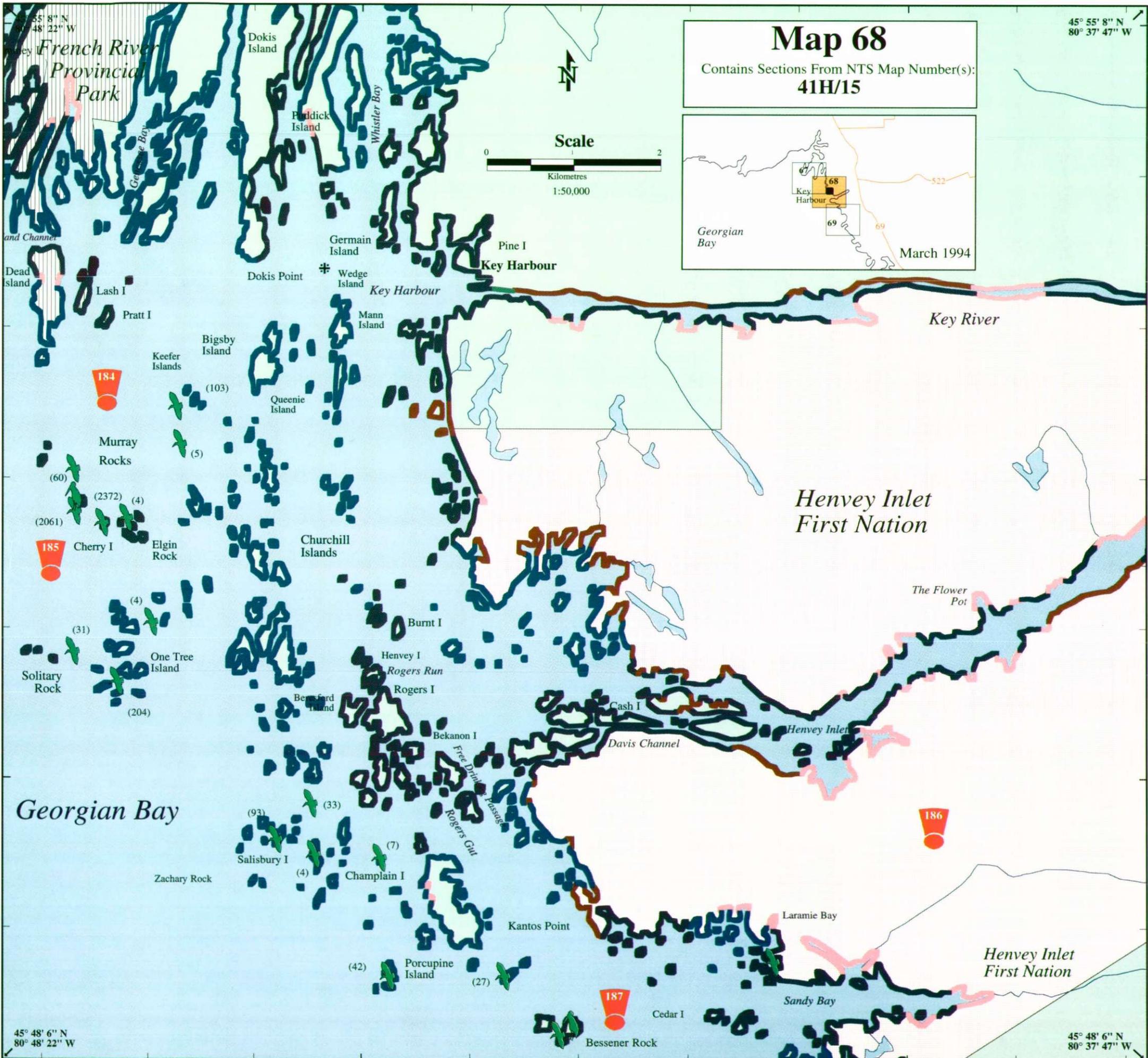
A red exclamation point symbol is used on the maps to catch the responder's attention.

**183** Seasonal fish spawning occurs at the mouth of the French River: Walleye in Spring.

**184** French River Provincial Park is an important recreational and educational area.

**185** Nesting colonial waterbirds occur on numerous islands and rocks in Georgian Bay, near the Gull Rocks, Southeast Rock, the Murray Rocks, the Churchill Islands, and the Churchill Islands.





**Map 68**  
 Contains Sections From NTS Map Number(s):  
**41H/15**



**NOTES**

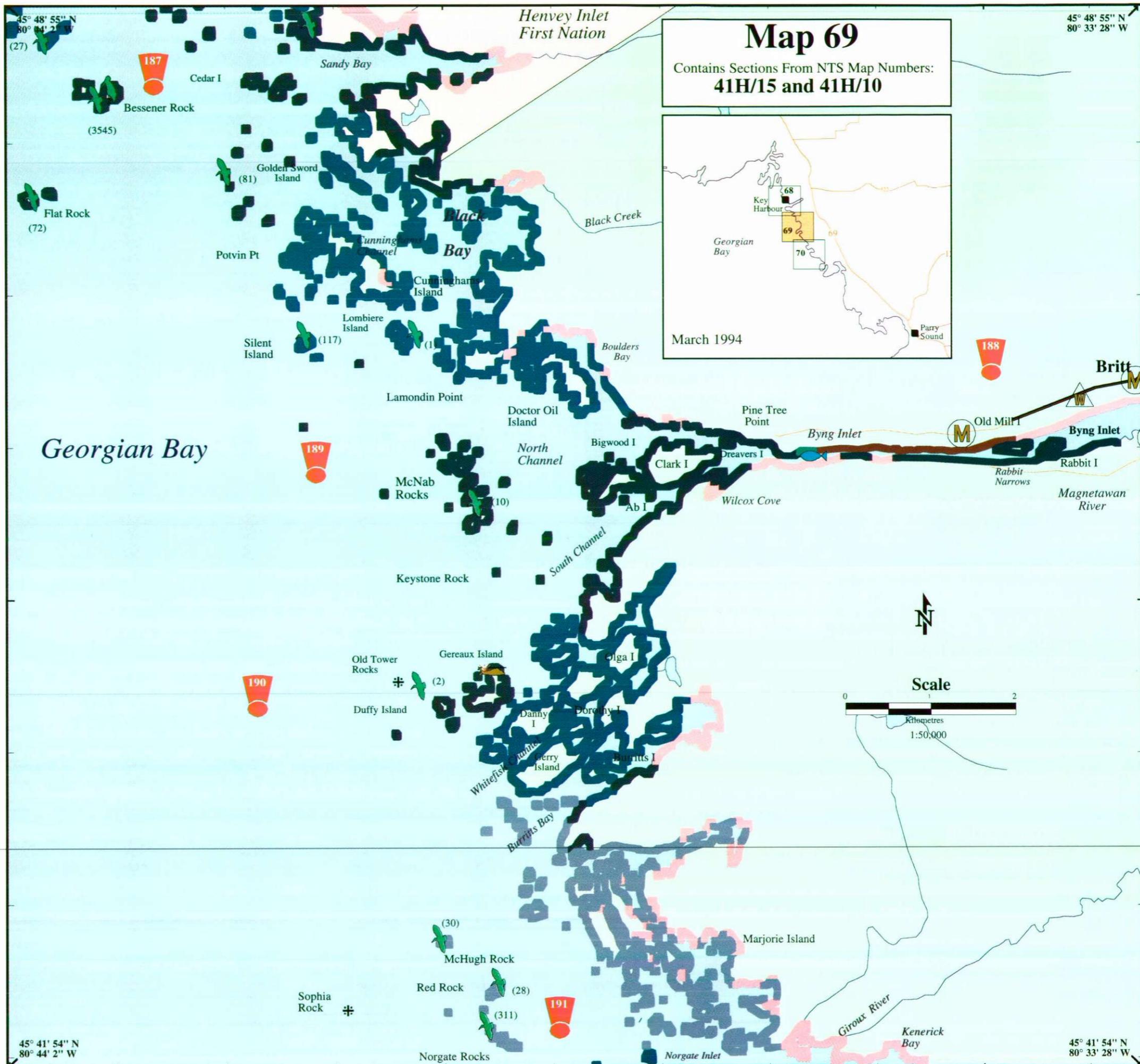
A red exclamation point symbol is used on the maps to catch the responder's attention.

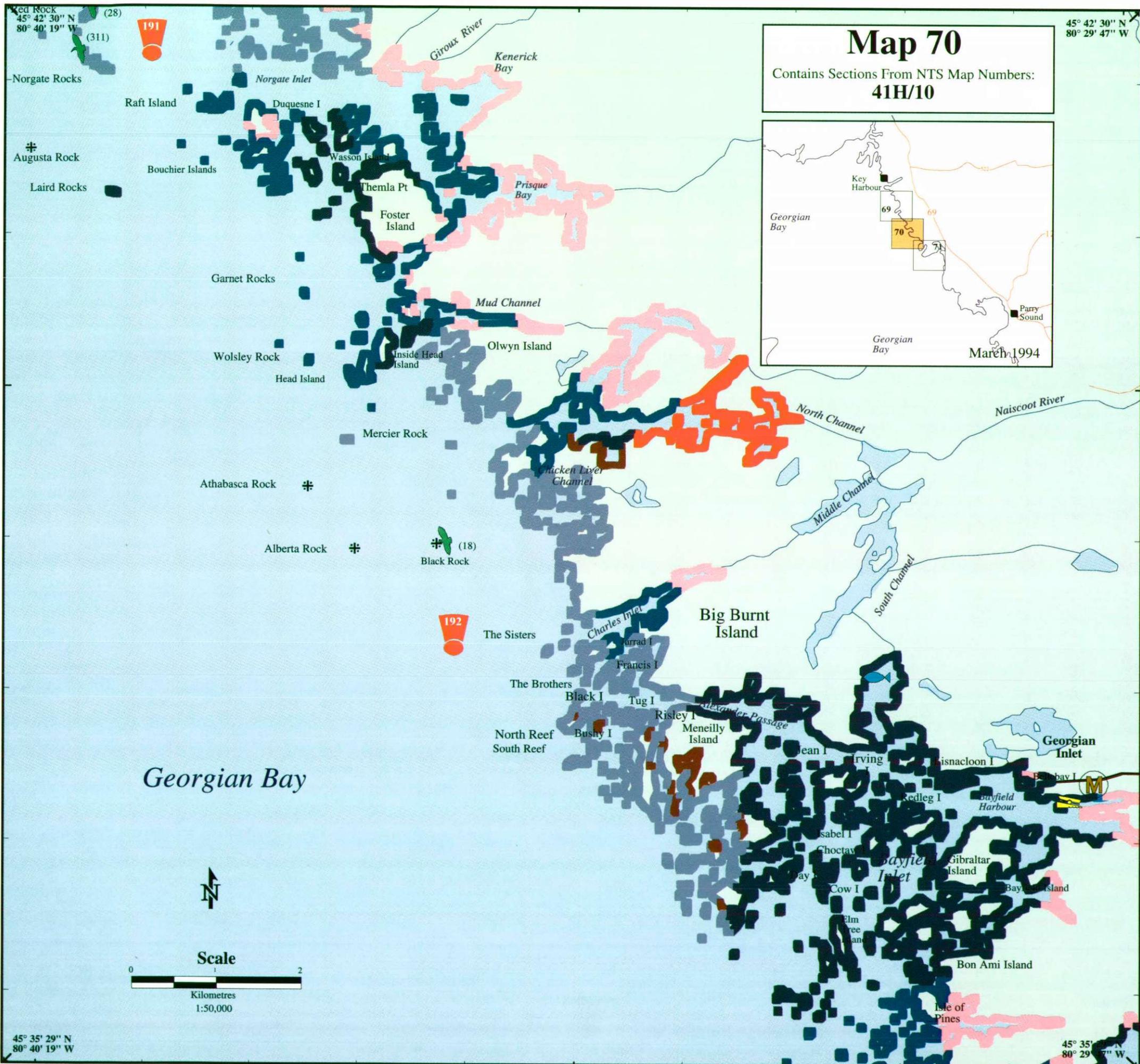
- 184** French River Provincial Park is an important recreational and educational area.
- 185** Nesting colonial waterbirds occur on numerous islands and rocks in Georgian Bay, near the Gull Rocks, Southeast Rock, the Murray Rocks, and the Churchill Islands.
- 186** Henvey Inlet First Nation. Responders should contact the Chief of the Henvey Inlet First Nation before commencing response activities.
- 187** Nesting colonial waterbirds occur on numerous islands and rocks in Georgian bay, near Champlain Island.

**NOTES**

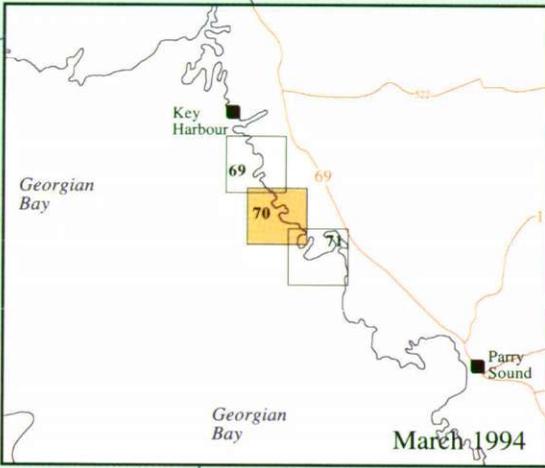
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 187 Nesting colonial waterbirds occur on numerous islands and rocks in Georgian bay, near Champlain Island.
- 188 Byng Inlet is a seasonally significant recreational area. Seasonal fish spawning occurs in Magnetawan River, east of Byng Inlet: Northern Pike and Walleye in Spring and Smallmouth Bass in late Spring to Summer.
- 189 Nesting colonial waterbirds occur on the McNab Rocks, Lombiere Island and Silent Island.
- 190 Nesting colonial waterbirds on the Old Tower Rocks.
- 191 Nesting colonial waterbirds occur on Red Rock, McHugh Rock and the Norgate Rocks.





**Map 70**  
 Contains Sections From NTS Map Numbers:  
**41H/10**



**NOTES**

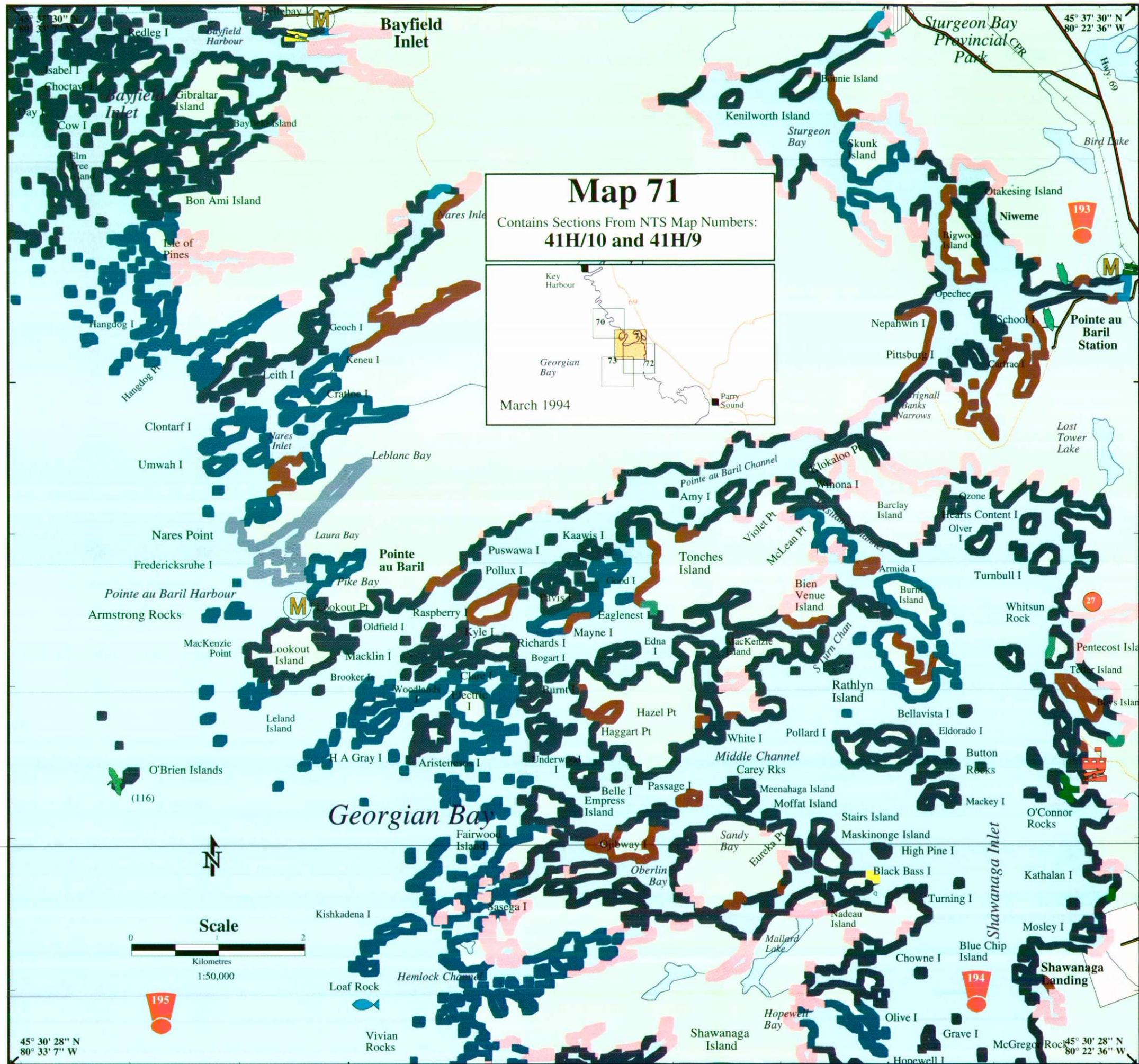
A red exclamation point symbol is used on the maps to catch the responder's attention.

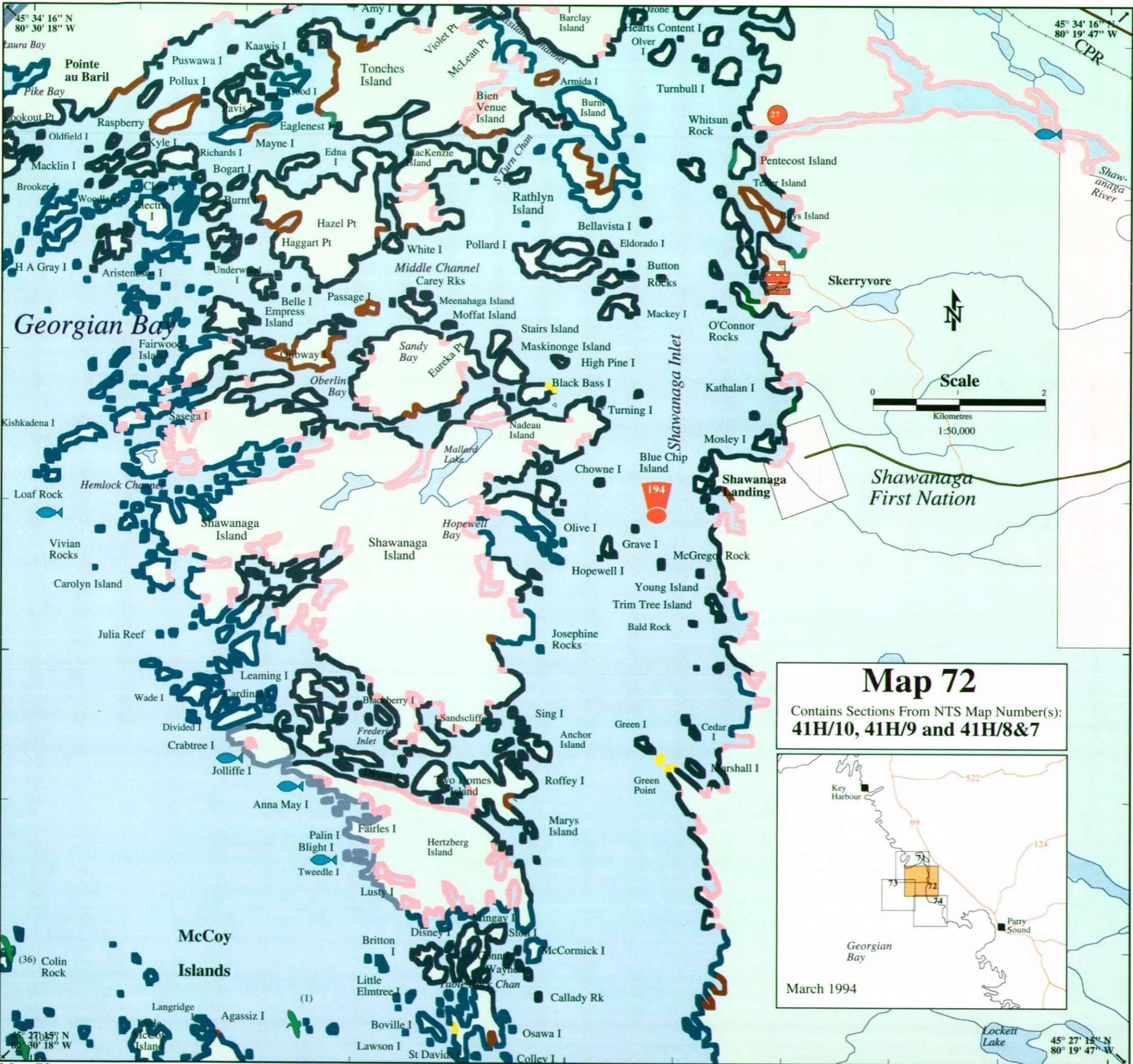
- 191 Nesting colonial waterbirds occur on Red Rock, McHugh Rock and the Norgate Rocks.
- 192 Nesting colonial waterbirds occur on Black Rock.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Nesting raptor sites occur in Baril Channel near Pointe au Baril Station.
-  Shawanaga First Nation. Responders should contact the Chief of the Shawanaga First Nation before commencing response activities.
-  Nesting colonial waterbirds occur on the O'Brien Islands and the Black Bill Islands.



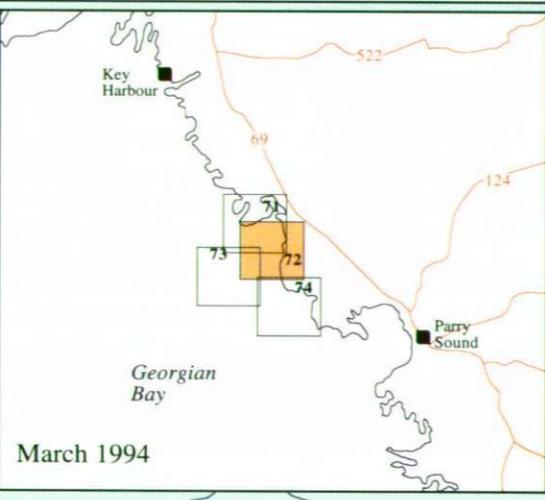


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**194** Shewanaga First Nation. Responders should contact the Chief of the Shewanaga First Nation before commencing response activities.

**Map 72**  
 Contains Sections From NTS Map Number(s):  
**41H/10, 41H/9 and 41H/8&7**



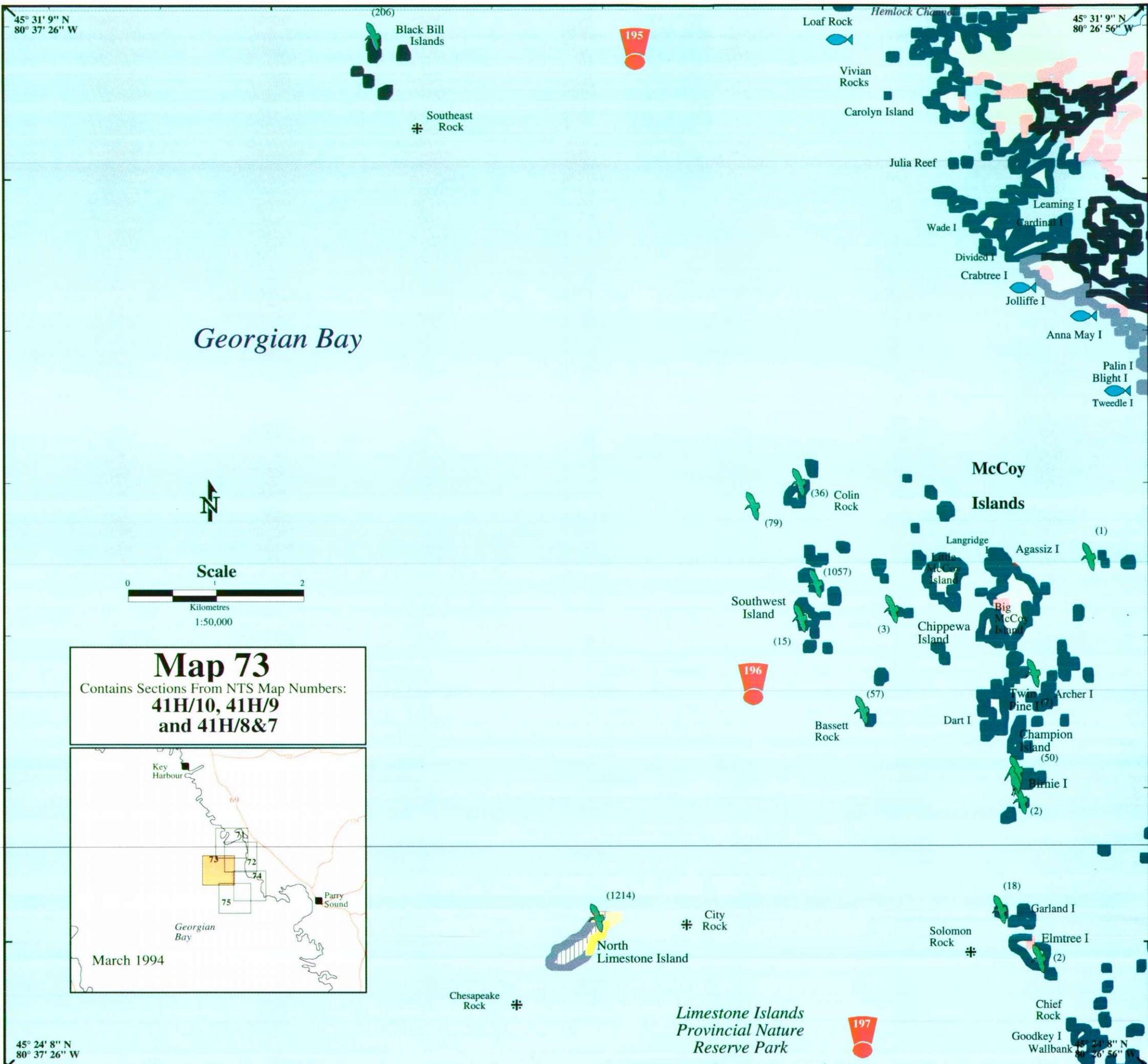
**NOTES** !

A red exclamation point symbol is used on the maps to catch the responder's attention.

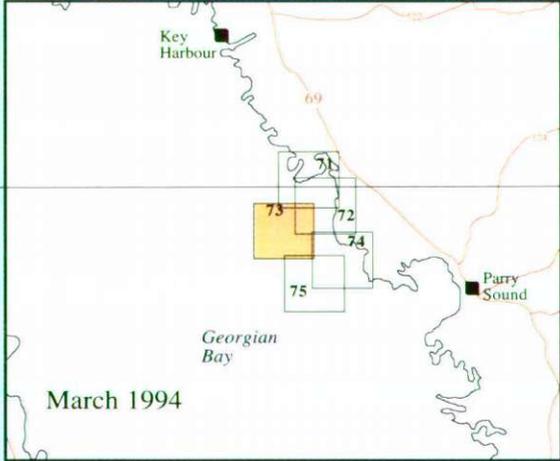
! 195 Nesting colonial waterbirds occur on the O'Brien Islands and the Black Bill Islands.

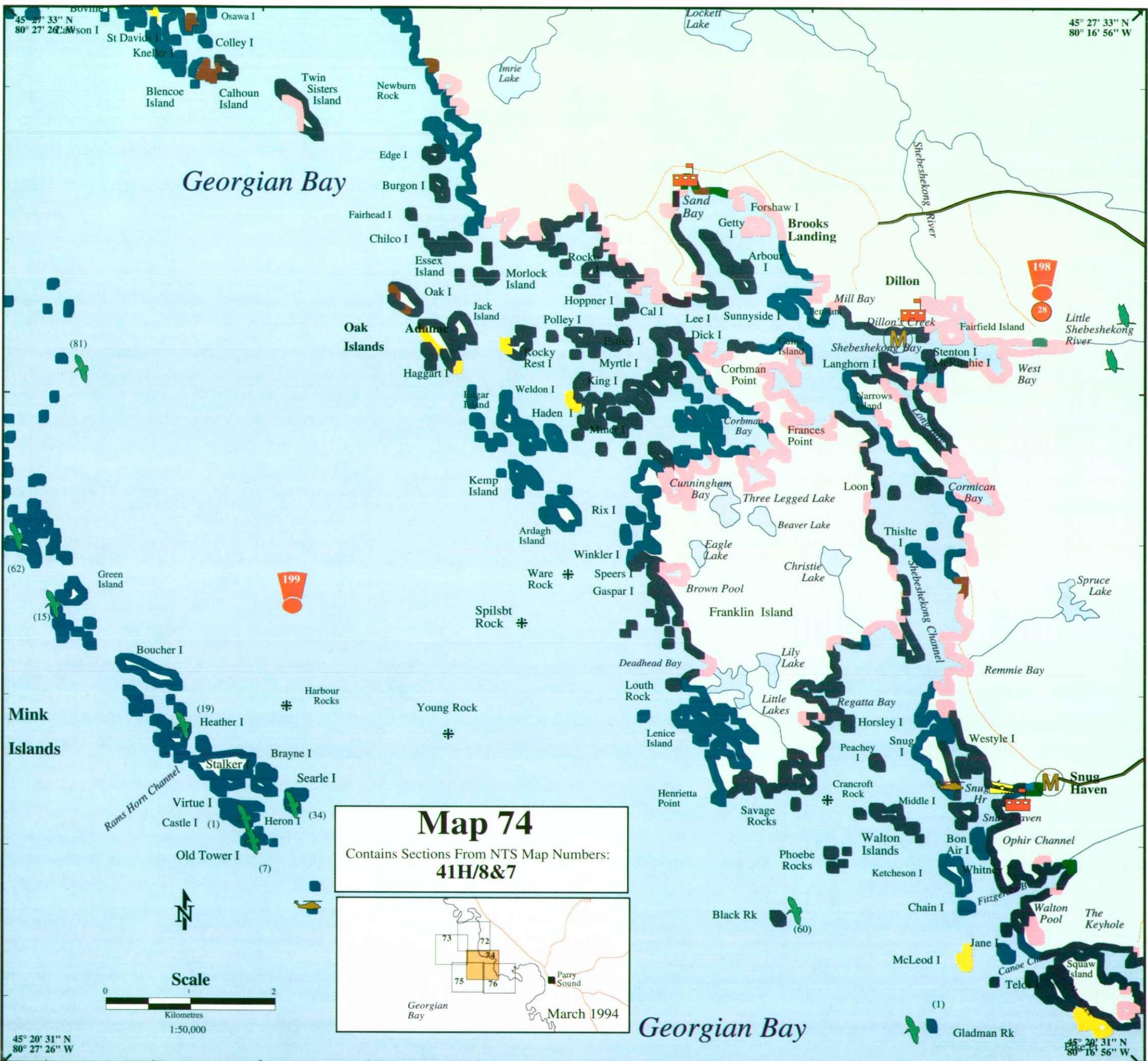
! 196 Nesting colonial waterbirds occur on numerous rocks and islands associated with the McCoy Islands. Seasonal fish spawning occurs in Georgian Bay near Anna May Island, Jolliffe Island and Blight Island: Walleye in the Spring.

! 197 Limestone Islands Provincial Nature Reserve support nesting colonial waterbirds.



**Map 73**  
Contains Sections From NTS Map Numbers:  
**41H/10, 41H/9**  
**and 41H/8&7**





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

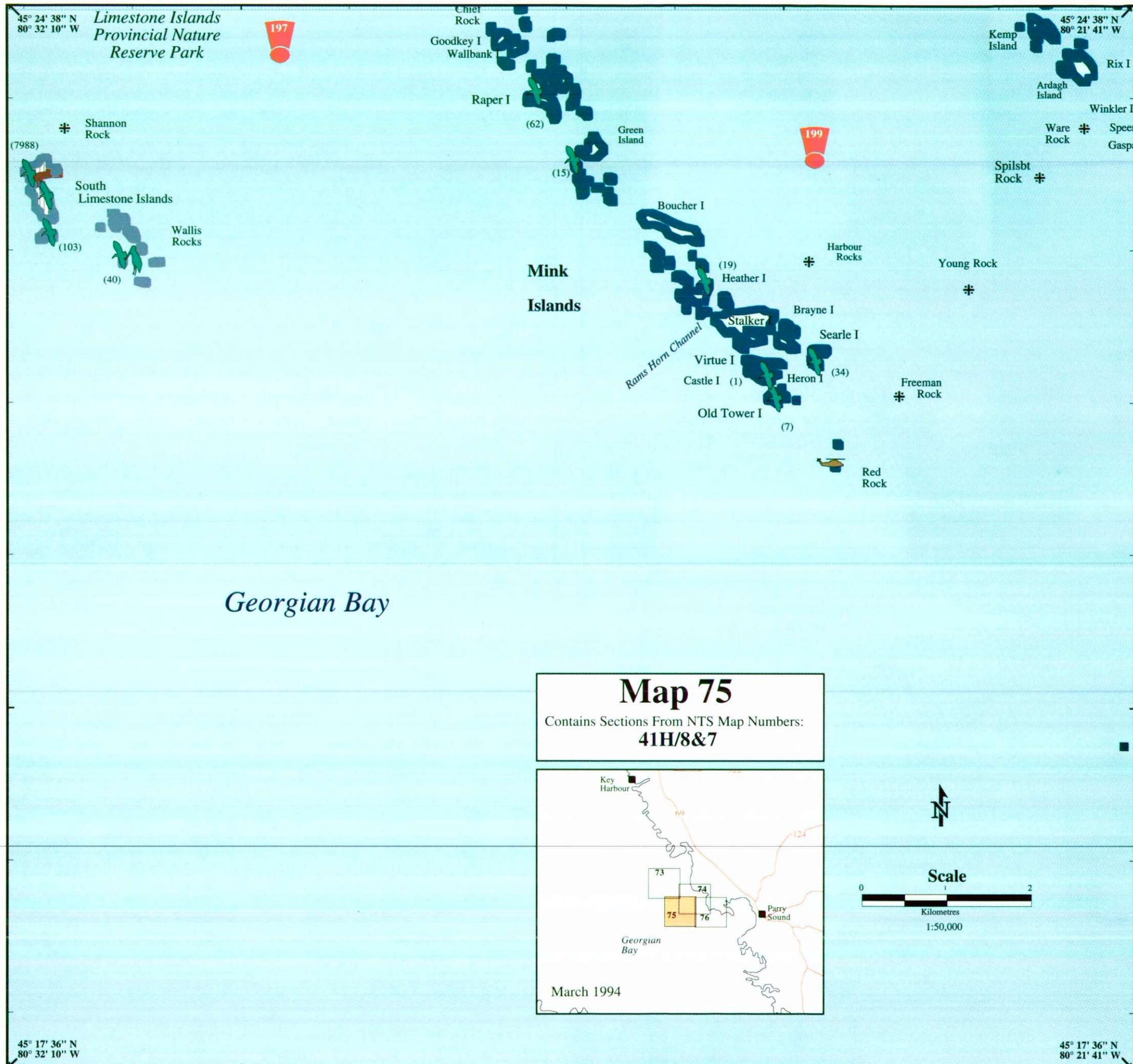
- 198** Nesting raptor sites occur near the mouth of the Little Shebeshekong River.
- 199** Nesting colonial waterbirds occur on numerous rocks and islands associated with the Mink Islands in Georgian Bay.

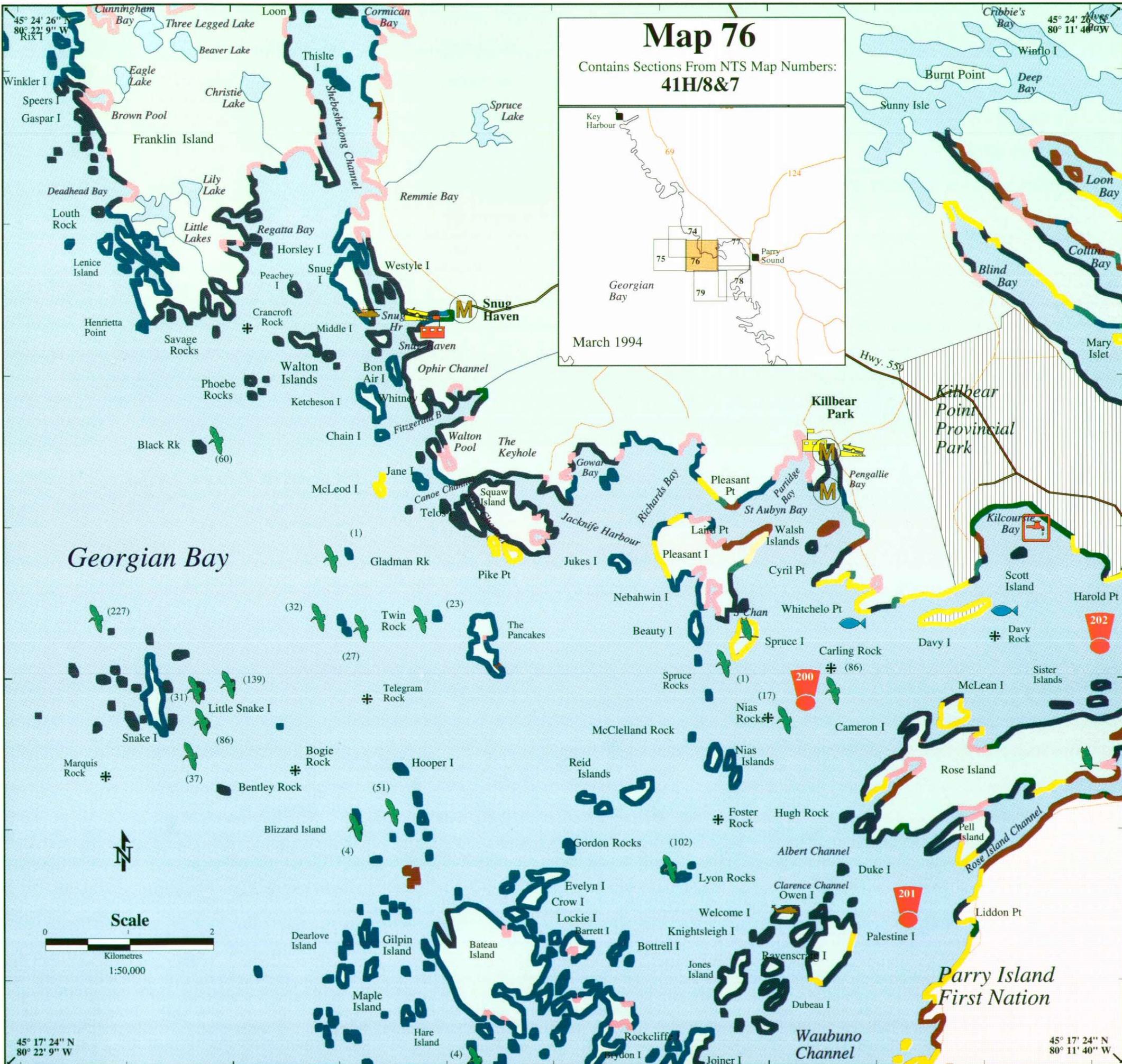
**NOTES** !

A red exclamation point symbol is used on the maps to catch the responder's attention.

! 197 Limestone Islands Provincial Nature Reserve support nesting colonial waterbirds.

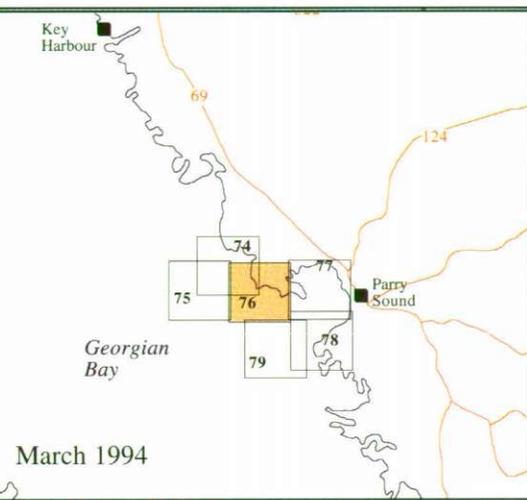
! 199 Nesting colonial waterbirds occur on numerous rocks and islands associated with the Mink Islands in Georgian Bay.





# Map 76

Contains Sections From NTS Map Numbers:  
**41H/8&7**



March 1994

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 200** Nesting colonial waterbirds occur on the Spruce Rocks, the Nias Rocks, and the Lyon Rocks.
- 201** Parry Island First Nation. Responders should contact the Chief of the Parry Island First Nation before commencing response activities.
- 202** Killbear Point Provincial Park Water Treatment Plant water intakes: Call - (705) 342-5492.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

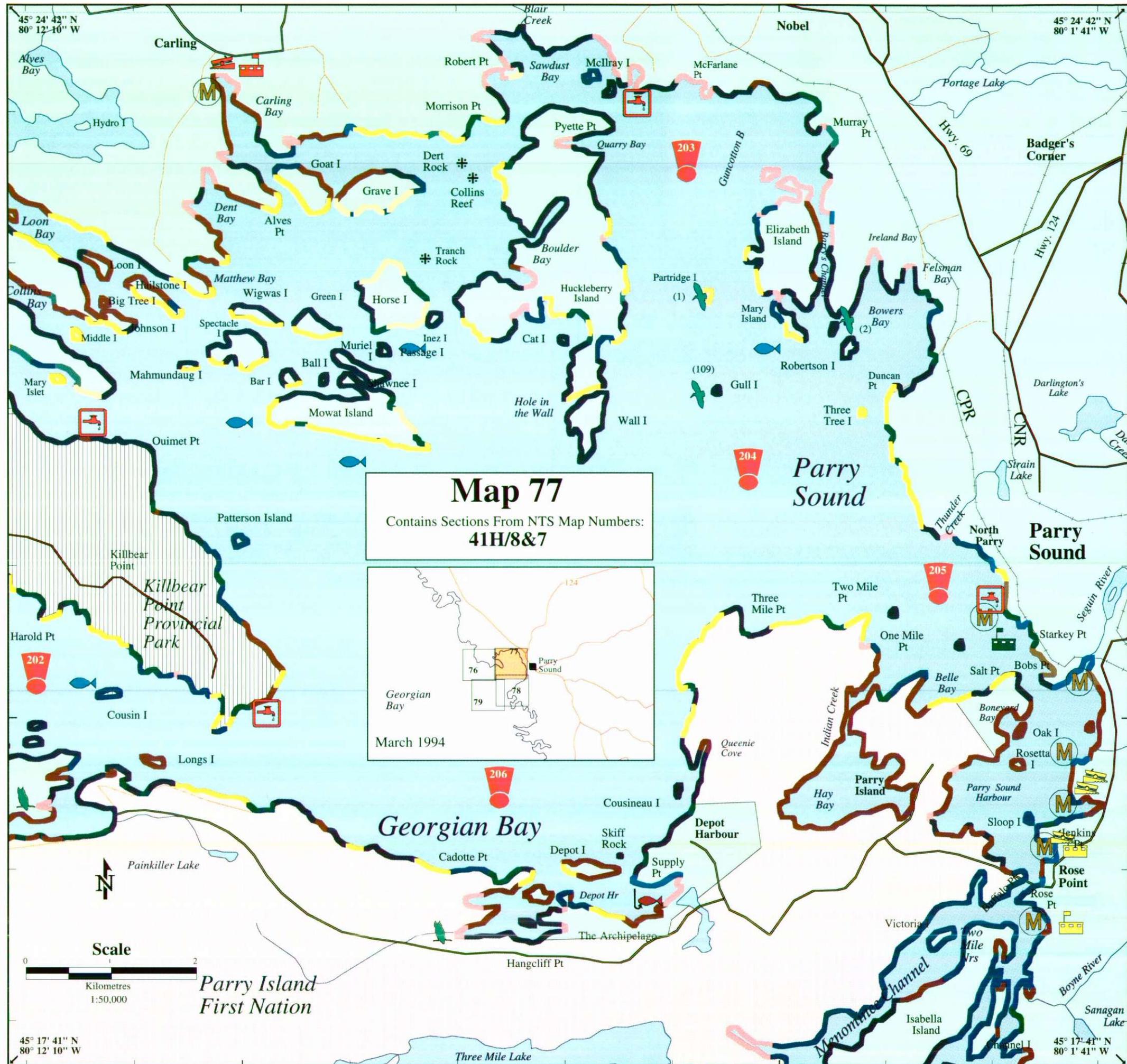
**202** Killbear Point Provincial Park Water Treatment Plant water intakes: Call - (705) 342-5492.

**203** McDougall Township Water Treatment Plant water intake: Call - (705) 342-5252.

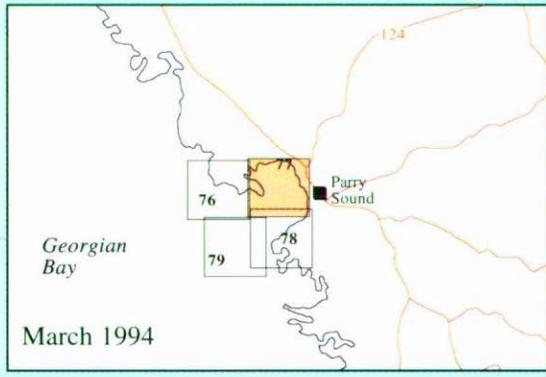
**204** Nesting colonial waterbirds occur on Robertson Island, Gull Island and at the tip of Bowers Bay. Seasonal fish spawning occurs in Georgian Bay near Mowat Island, Cousin Island, Robertson Island, Horse Island and Alves Point: Lake Trout in the Fall.

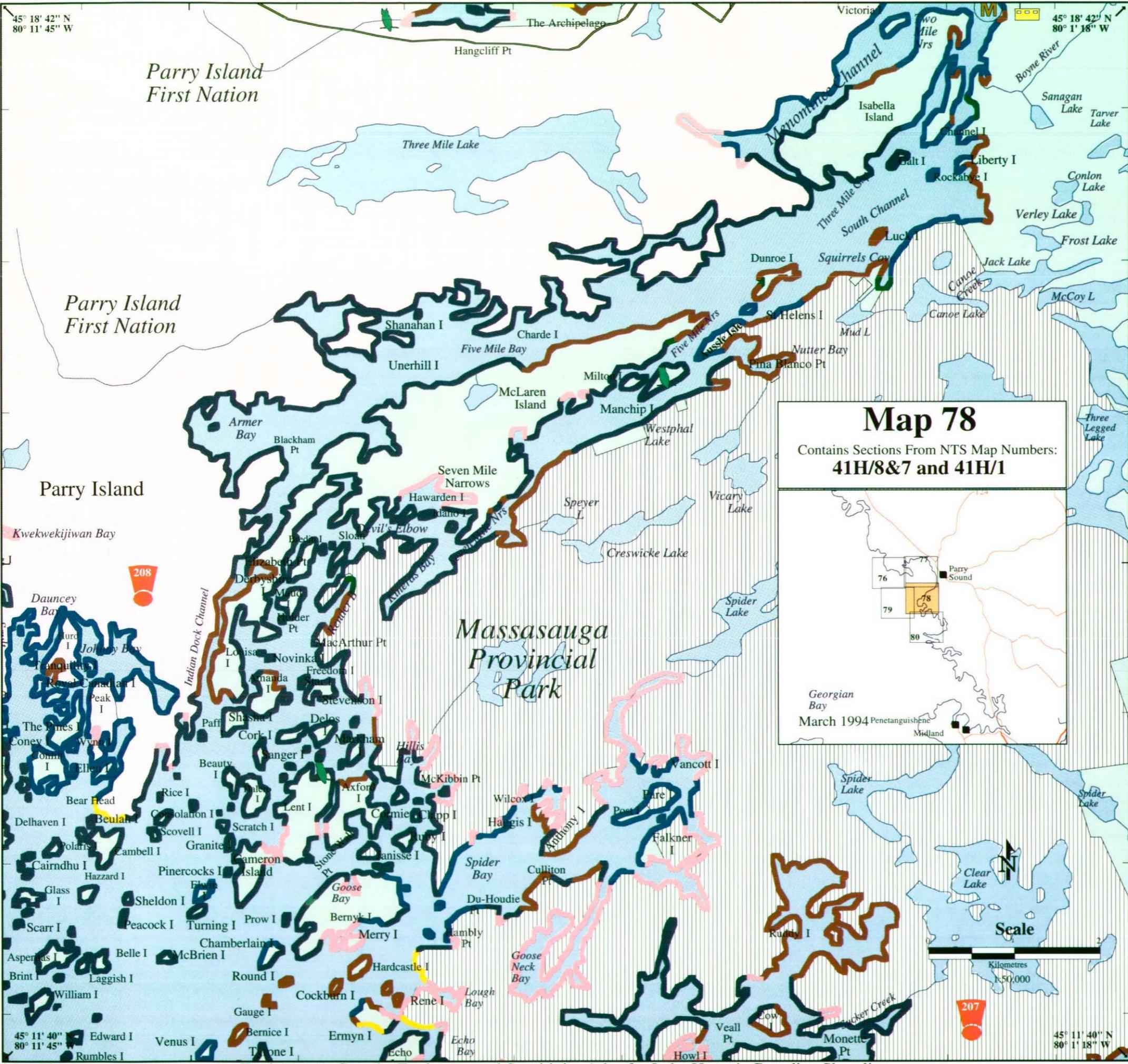
**205** Parry Sound Water Treatment Plant water intake: Call - (705) 746-5866. Numerous marinas occur in Parry Sound Harbour.

**206** Parry Island First Nation. Responders should contact the Chief of the Parry Island First Nation before commencing response activities. Commercial aquaculture activities occur in Depot Harbour.



**Map 77**  
Contains Sections From NTS Map Numbers:  
**41H/8&7**



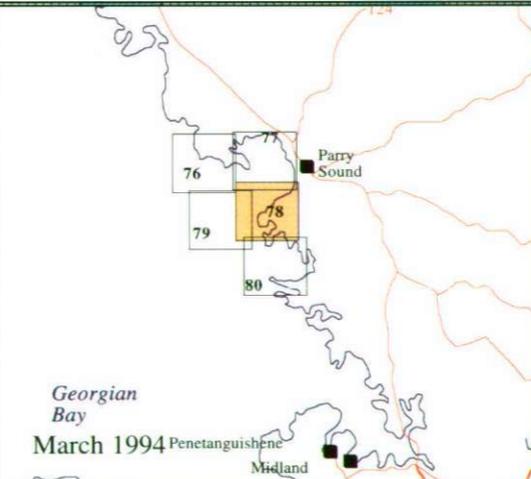


**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Massasauga Provincial Park supports numerous recreational activities.
-  Parry Island First Nation: Responders should contact the Chief of Parry Island First Nation before commencing response activities.

**Map 78**  
 Contains Sections From NTS Map Numbers:  
**41H/8&7 and 41H/1**



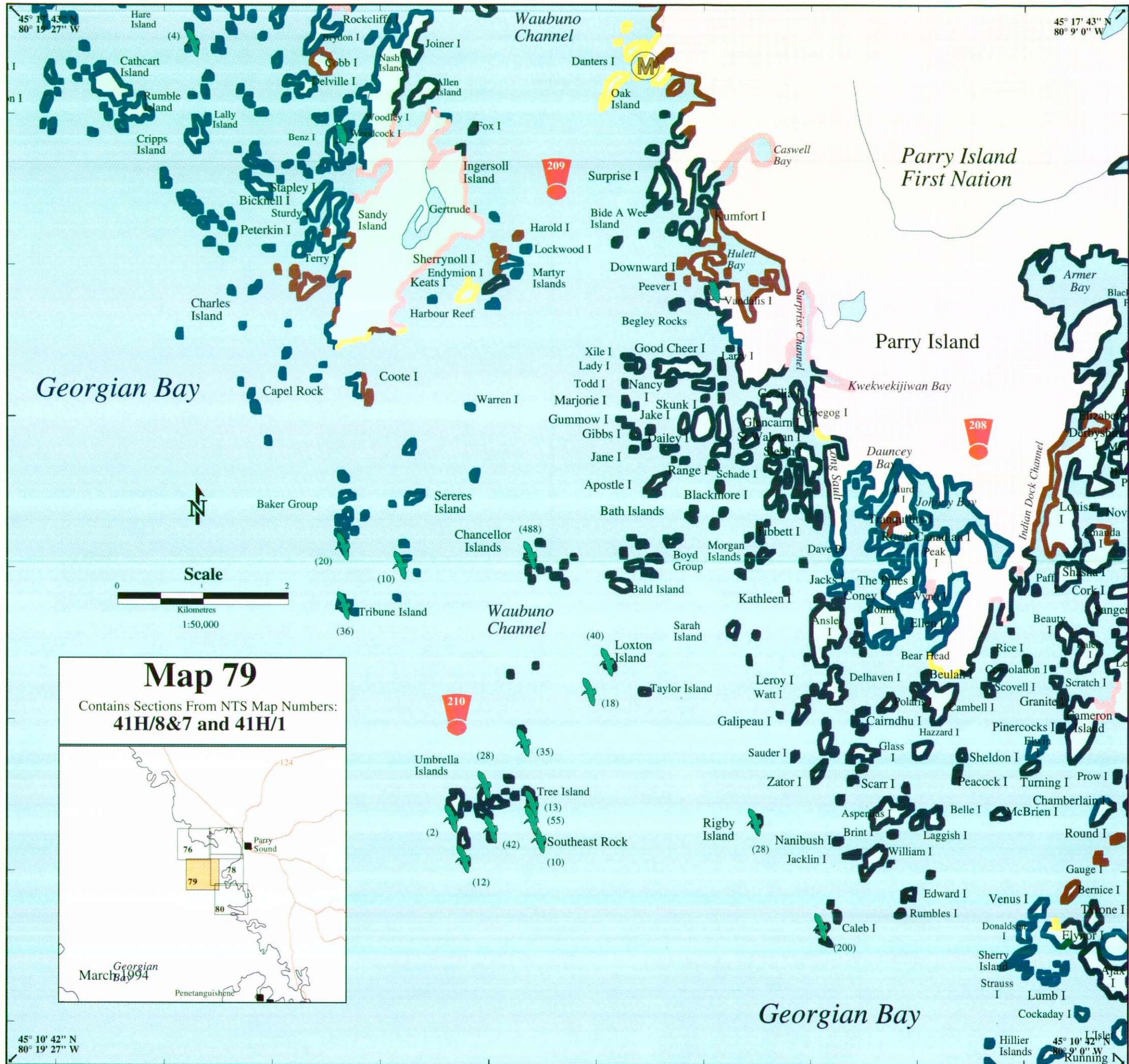
Georgian Bay  
 March 1994 Penetanguishene  
 Midland

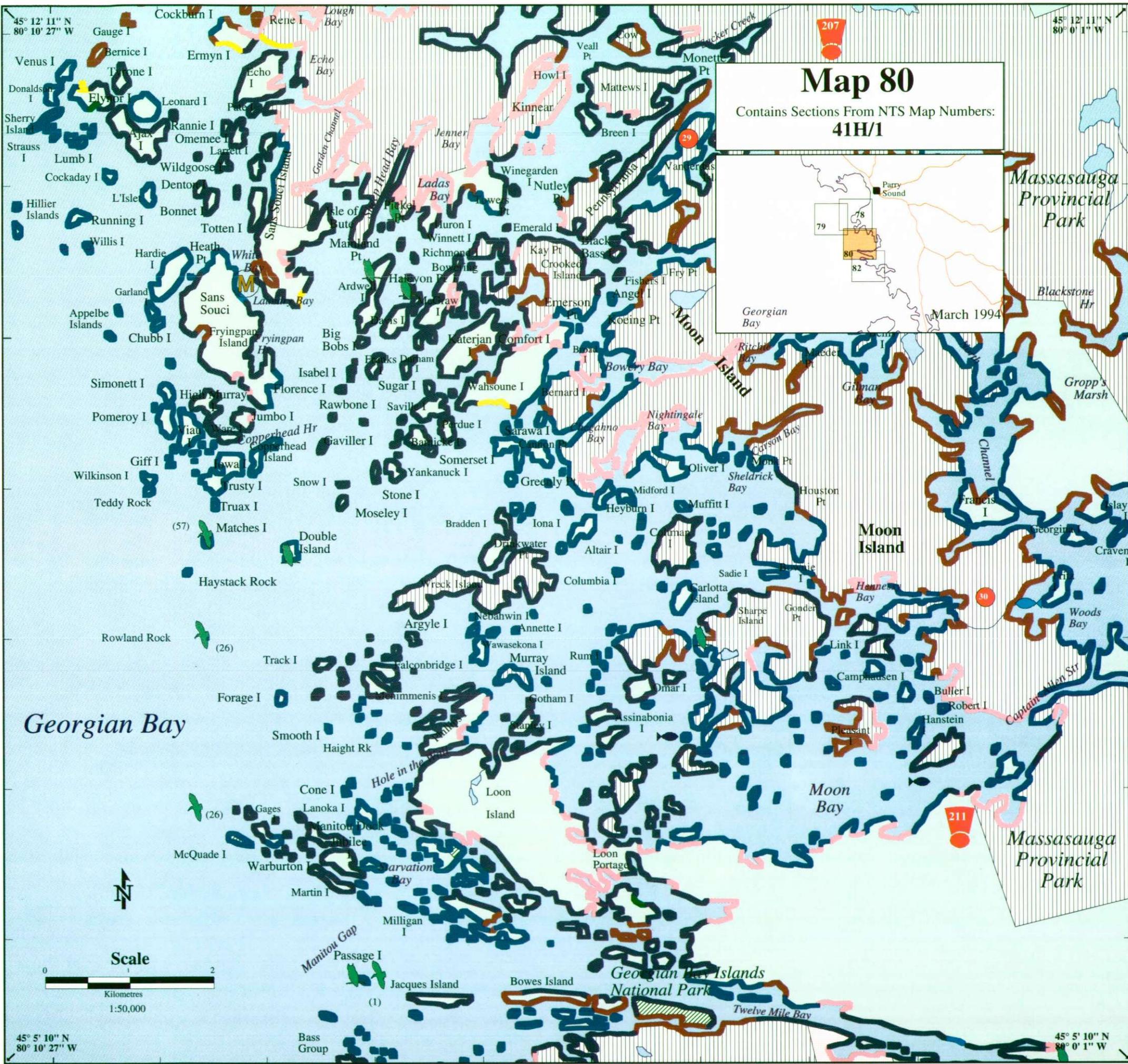


**NOTES**

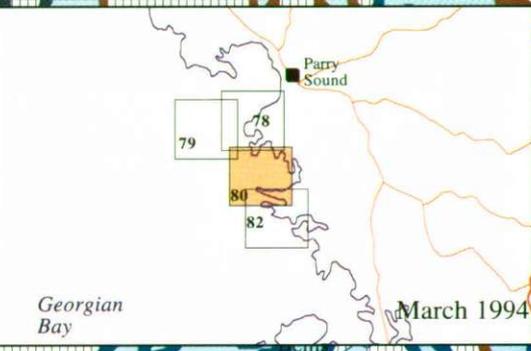
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 208** Parry Island First Nation: Responders should contact the Chief of Parry Island First Nation before commencing response activities.
- 209** Raptor nesting sites occur at Vandalis Island and Woodcock Island.
- 210** The Umbrella Islands in Waubuno Channel support nesting colonial waterbirds.





**Map 80**  
 Contains Sections From NTS Map Numbers:  
**41H/1**



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

-  Massasauga Provincial Park supports numerous recreational activities.
-  Massasauga Provincial Park, Georgian Bay Islands National Park and O'Donnell Point Provincial Nature Reserve Park support numerous recreational activities.

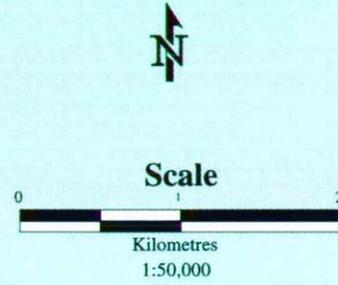
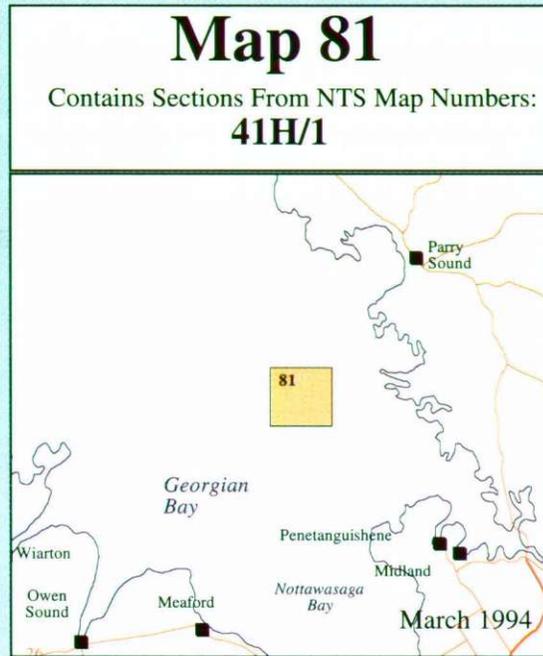
# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

212 The Western Islands support nesting colonial waterbirds.

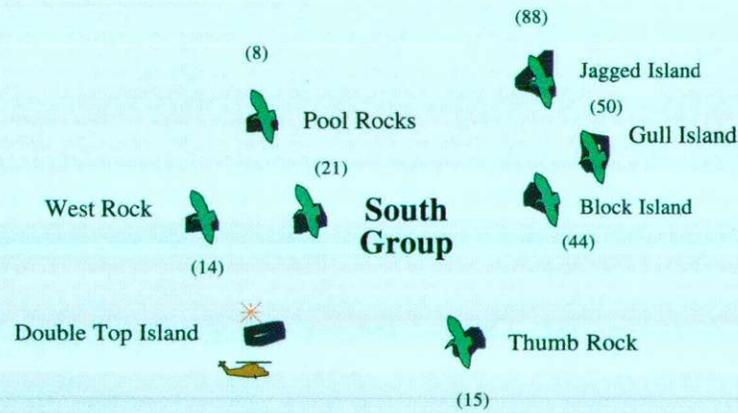
45° 7' 33" N  
80° 24' 33" W

45° 7' 33" N  
80° 14' 8" W



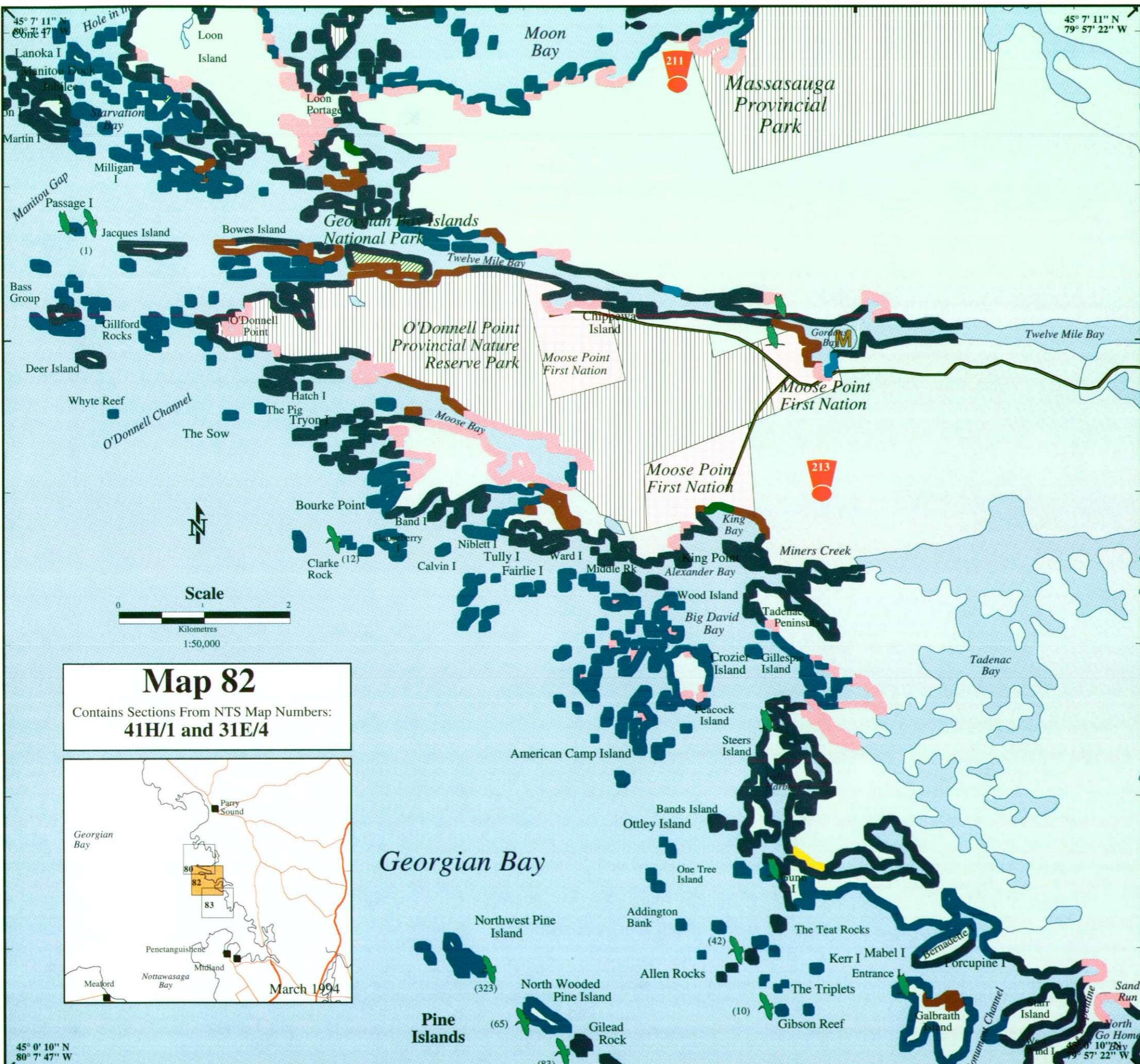
## Western Islands

## Georgian Bay



45° 0' 31" N  
80° 24' 33" W

45° 0' 31" N  
80° 14' 8" W



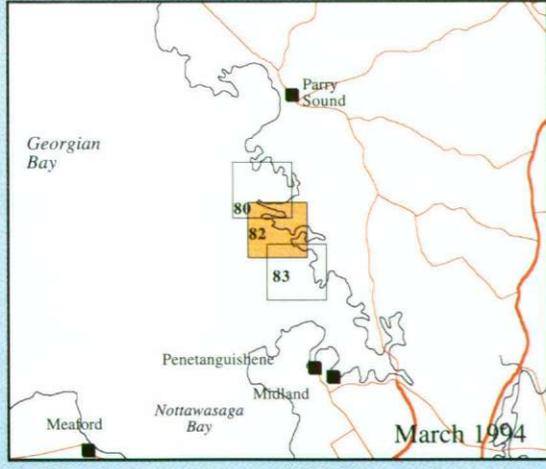
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**211** Massasauga Provincial Park, Georgian Bay Islands National Park and O'Donnell Point Provincial Nature Reserve Park support numerous recreational activities.

**213** Moose Point First Nation. Responders should contact the Chief of the Moose Point First Nation before commencing response activities. Raptor nesting sites occur near Gordons Bay, Steers Island, Gunn Island and on Galbraith Island.

**Map 82**  
 Contains Sections From NTS Map Numbers:  
**41H/1 and 31E/4**



## NOTES

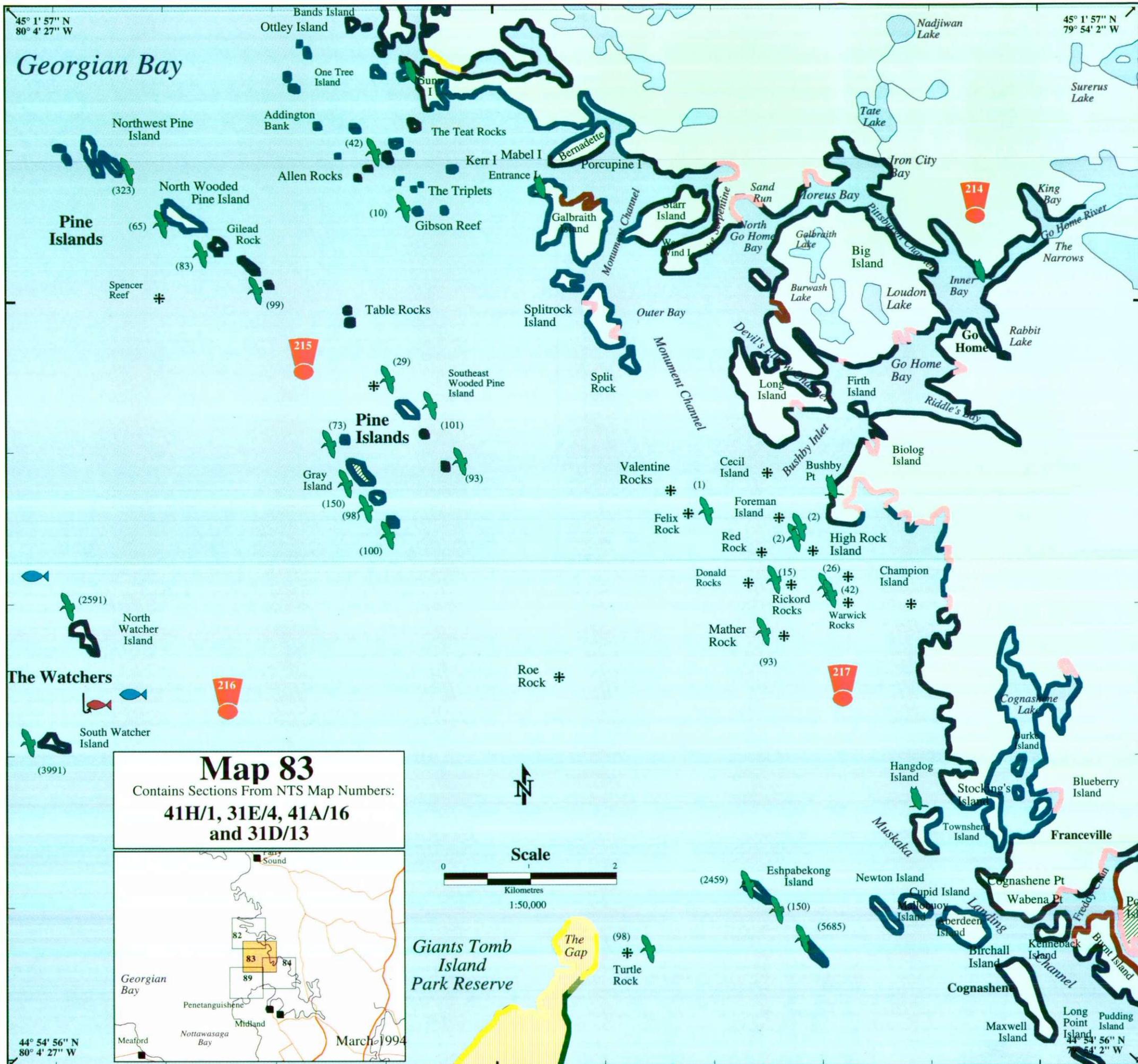
A red exclamation point symbol is used on the maps to catch the responder's attention.

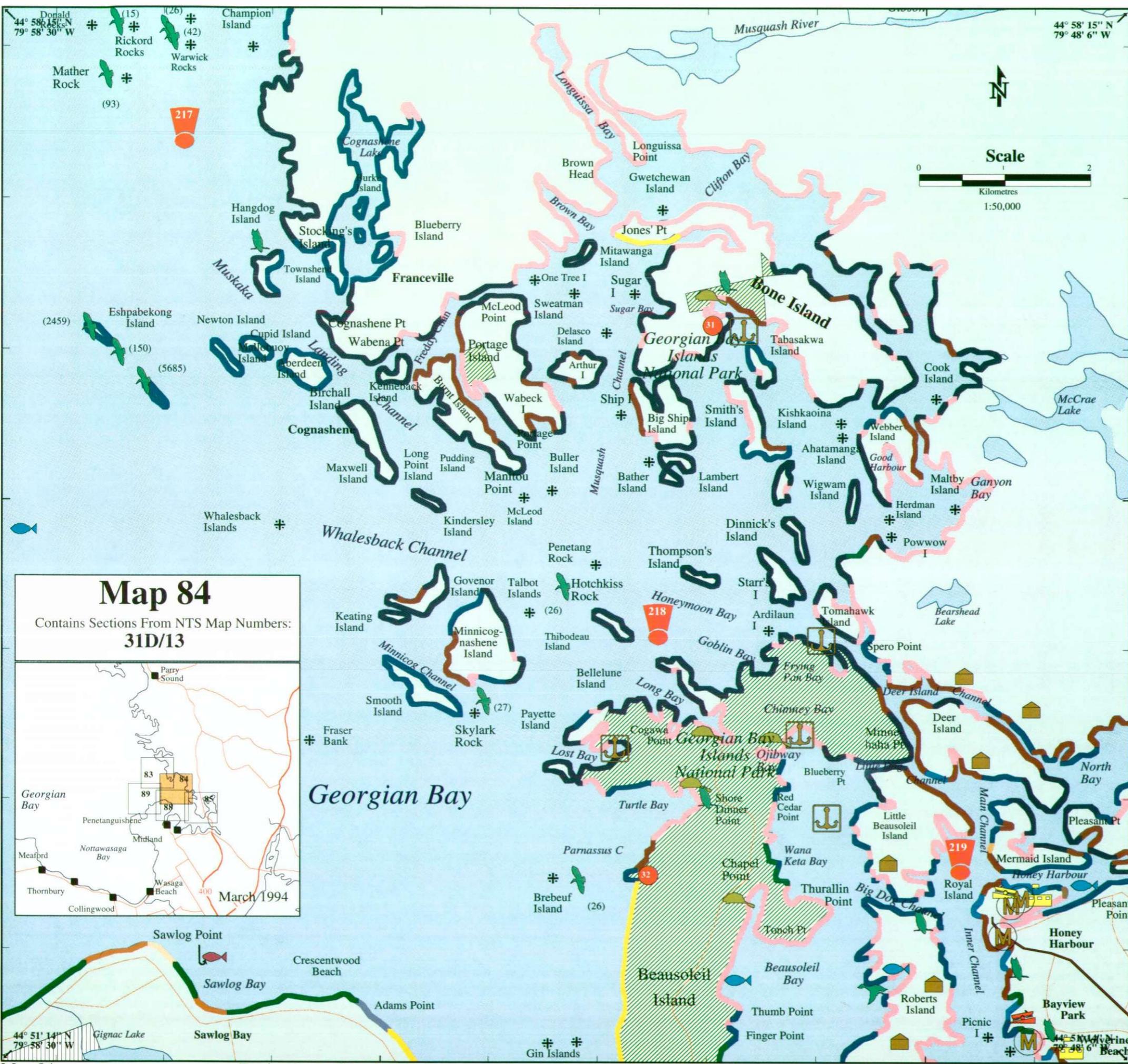
**214** Raptor nesting sites occur in Georgian Bay on Galbraith Island and at the Inner Bay mouth of Go Home River.

**215** The Pine Islands support nesting colonial waterbirds.

**216** Nesting colonial waterbirds occur on the Watchers Islands. Seasonal fish spawning occurs in Georgian Bay near the Watchers Islands: Lake Whitefish in November and December.

**217** Numerous small rocks and islands in eastern Georgian Bay, south of Monument Channel and north of Turtle Rock, support nesting colonial waterbirds. These rocks and islands are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**217** Numerous small rocks and islands in eastern Georgian Bay, south of Monument Channel and north of Turtle Rock, support nesting colonial waterbirds. These rocks and islands are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.

**218** Small islands east and north of Beausoleil Island support nesting colonial waterbirds and raptors. Beausoleil Island is part of the Georgian Bay Islands National Park.

**219** Numerous marinas and recreational cottages occur in the channels located between Honey Harbour and Beausoleil Island. This area also supports waterfowl and raptor populations.

**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**219** Numerous marinas and recreational cottages occur in the channels located between Honey Harbour and Beausoleil Island. This area also supports waterfowl and raptor populations.

**220** Severn Sound is an important waterfowl migratory and fish spawning area: Muskellunge in Spring.

**221** Waterfowl staging areas occur along the Lake Huron shoreline from Maceys Bay to Long Point.

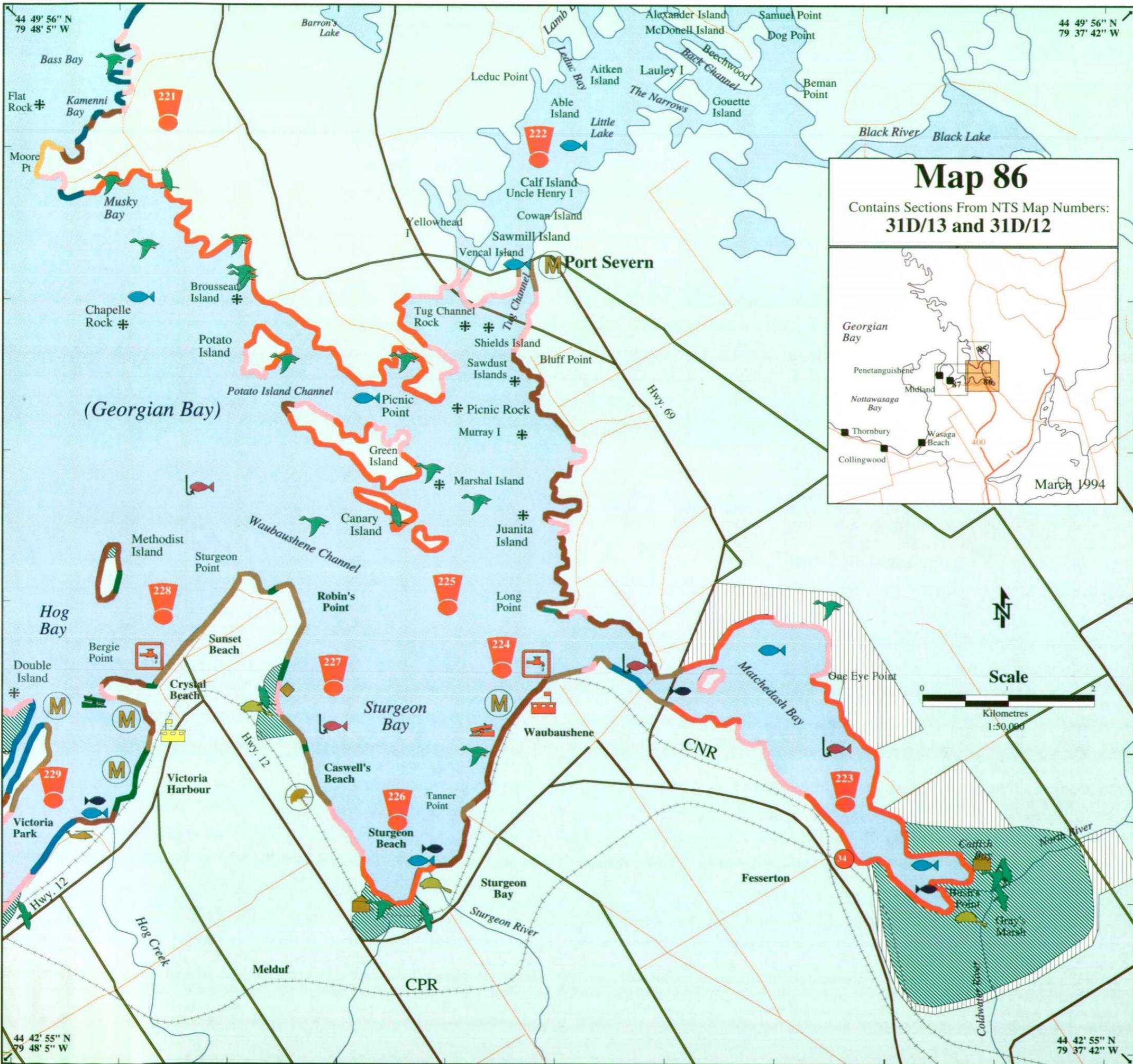
**222** Port Severn is designated as the major Walleye spawning site for all of Severn Sound.



**Map 85**  
 Contains Sections From NTS Map Numbers:  
**31D/13**

Geographic locations shown in inset: Parry Sound, Georgian Bay, Penetanguishene, Midland, Nottawasaga Bay, Wasaga Beach, Thornbury, Collingwood, Buena Vista Point, Deer Island, Deer Island Run, Gloucester Pool, Burrows Island, Richardson Point, Samuel Point, Dog Point, Beman Point, Beechwood I, Gouette Island, The Narrows, Lauley I, Aitken Island, Able Island, Little Lake, Calf Island, Uncle Henry I, Cowan Island, Sawmill Island, Vencal Island, Yellowhead I, Tug Channel, Tug Rock, Shields Island, Sawdust Islands, Bluff Point, Murray I, Picnic Point, Potato Island, Brousseau Island, Chapelle Rock, Moore Pt, Flat Rock, Kamenni Bay, Musky Bay, Bass Bay, Maceys Bay, Vennings Bay, Maceys Bay, Georgian Bay Islands National Park, Quarry Island, Wildgoose Island, Brandy's I, Tobies Bay, Wolverine Beach, Bayview Park, Picnic I, Roberts Island, Honey Harbour, Pleasant Point, Lownie Island, Jacks Rock, Cow Island, Pleasant Pt, North Bay, South Bay, South Bay, Honey Harbour, Mermaid Island, Royal Island, Little Beausoleil Island, Deer Island, Deer Island Channel, Minnehaba Pt, Spero Point I, Wood Landing, Baxter Lake, Pickerel Point, Little Go Home Bay, Georgian Bay, Penetanguishene, Midland, Nottawasaga Bay, Wasaga Beach, Thornbury, Collingwood, Buena Vista Point, Deer Island, Deer Island Run, Gloucester Pool, Burrows Island, Richardson Point, Samuel Point, Dog Point, Beman Point, Beechwood I, Gouette Island, The Narrows, Lauley I, Aitken Island, Able Island, Little Lake, Calf Island, Uncle Henry I, Cowan Island, Sawmill Island, Vencal Island, Yellowhead I, Tug Channel, Tug Rock, Shields Island, Sawdust Islands, Bluff Point, Murray I, Picnic Point, Potato Island, Brousseau Island, Chapelle Rock, Moore Pt, Flat Rock, Kamenni Bay, Musky Bay, Bass Bay, Maceys Bay, Vennings Bay, Maceys Bay, Georgian Bay Islands National Park, Quarry Island, Wildgoose Island, Brandy's I, Tobies Bay, Wolverine Beach, Bayview Park, Picnic I, Roberts Island, Honey Harbour, Pleasant Point, Lownie Island, Jacks Rock, Cow Island, Pleasant Pt, North Bay, South Bay, South Bay, Honey Harbour, Mermaid Island, Royal Island, Little Beausoleil Island, Deer Island, Deer Island Channel, Minnehaba Pt, Spero Point I, Wood Landing, Baxter Lake, Pickerel Point, Little Go Home Bay.

March 1994



### Map 86

Contains Sections From NTS Map Numbers:  
**31D/13 and 31D/12**

March 1994

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 221 Waterfowl staging areas occur along the Lake Huron shoreline from Macey's Bay to Long Point.
- 222 Port Severn is designated as the major Walleye spawning site for all of Severn Sound.
- 223 Matchedash Bay Marsh is a nesting area for waterbirds, a significant plant species habitat and a waterfowl staging area. It supports fur bearing mammals and is important for commercial fish harvesting and recreational activities. There is winter cover for mammals. This wetland resides within a designated wildlife area. Walleye spawn in Matchedash Bay in Spring. Commercial and sport fishing activities have significance in Matchedash Bay.
- 224 Waubaushene Water Treatment Plant water intake: Call - (705) 538-1170.
- 225 Map turtle populations occur in the Port Severn - Sturgeon Bay area. Commercial and sport fishing activities have seasonal significance in Waubaushene Channel.
- 226 The Sturgeon Bay Wetland is a feeding area for waterbirds and supports fish spawning and staging waterfowl. It is a habitat for fur bearing mammals, snapping turtles and has winter cover for deer. Fishing and recreational activities occur in Sturgeon Bay. The Sturgeon River is an important fish spawning and migration watercourse.
- 227 Victoria Harbour Water Pollution Control Plant water outfall: Call - (705) 534-3866. Victoria Harbour Wetland is a feeding area for waterbirds and is a habitat for raptors and furbearing mammals. Fish harvesting has seasonal significance.
- 228 Victoria Harbour Water Treatment Plant water intake: Call - (705) 534-3866.
- 229 Hog Bay Wetland is a feeding area for waterbirds, it provides a habitat for fur bearing mammals and winter cover for hares. Hog Creek is an important Rainbow Trout and Salmon migratory and spawning watercourse.

## NOTES

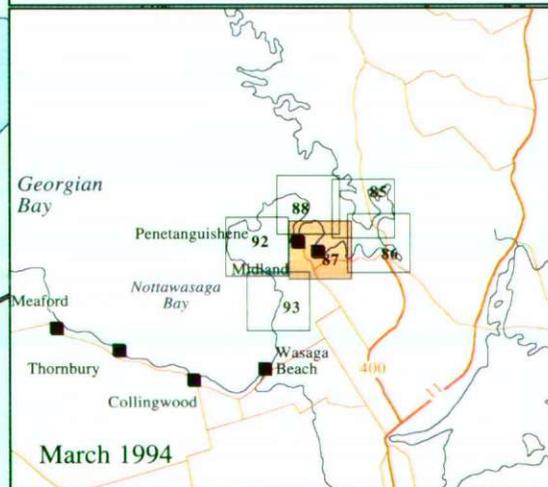
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 220** Severn Sound is an important waterfowl migratory and fish spawning area: Muskellunge in Spring.
- 229** Hog Bay Wetland is a feeding area for waterbirds, it provides a habitat for fur bearing mammals and winter cover for hares. Hog Creek is an important Rainbow Trout and Salmon migratory and spawning watercourse.
- 230** Port McNicoll Sewage Treatment Plant water outfall: Call - (705) 534-7281. Port McNicoll Marsh is a feeding area for waterbirds and is a habitat for furbearing mammals and snapping turtles. Fish harvesting, recreational fishing and canoeing are seasonal activities.
- 231** Port McNicoll Water Treatment Plant water intake: Call - (705) 534-7281.
- 232** Fish migration occurs in the mouth of Tiffin Basin: Salmon in Spring and Fall. Wye Marsh Wetland Complex is south of Tiffin Basin and encompasses Mud Lake. It is a highly significant migratory stop-over area and supports regionally significant waterfowl feeding and breeding activities.
- 233** Midland Water Pollution Control Plant water outfalls: Call - (705) 526-9361. Midland Swamp is a small wetland which supports colonial waterbirds and provides a habitat for several furbearing mammals.
- 234** The South Basin area of Penetang Harbour provides a habitat for spring spawning Black Cruppie. Sport fishing activities have seasonal significance in Penetang Harbour. Numerous marinas occur in Penetang Harbour.
- 235** Penetanguishene Water Pollution Control Plant water outfalls: Call - (705) 549-8081.
- 236** Sucker Creek Wetland is an active feeding area for colonial waterbirds, raptors and has regional and local significance for waterfowl staging and production. Several species of fur bearing mammals reside here.



### Map 87

Contains Sections From NTS Map Numbers:  
**31D/13 and 31D/12**





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 218** Small islands east and north of Beausoleil Island support nesting colonial waterbirds and raptors. Beausoleil Island is part of the Georgian Bay Islands National Park.
- 219** Numerous marinas and recreational cottages occur in the channels located between Honey Harbour and Beausoleil Island. This area also supports waterfowl and raptor populations.
- 220** Severn Sound is an important waterfowl migratory and fish spawning area: Muskellunge in Spring.
- 235** Penetanguishene Water Pollution Control Plant water outfalls: Call - (705) 549-8081.
- 236** Sucker Creek Wetland is an active feeding area for colonial waterbirds, raptors and has regional and local significance for waterfowl staging and production. Several species of fur bearing mammals reside here.
- 237** Diving waterfowl are a seasonally significant species which inhabit this shoreline from Peekaboo Point to Pinery Point.
- 238** The Methodist Point Provincial Park has been designated as an Area of Natural and Scientific Interest. Proposed nature reserve zones illustrate undisturbed upland forests separated by a bluff, a lowland area with shallow marsh vegetation, a shoreline fen, and the Farlain Lake Bog. The lowland areas provide a habitat for several fur bearing mammals.
- 239** Commercial fishing activities are seasonally significant in Georgian Bay, near Giant's Tomb Island.

## NOTES !

A red exclamation point symbol is used on the maps to catch the responder's attention.

**238** ! The Methodist Point Provincial Park has been designated as an Area of Natural and Scientific Interest. Proposed nature reserve zones illustrate undisturbed upland forests separated by a bluff, a lowland area with shallow marsh vegetation, a shoreline fen, and the Farlain Lake Bog. The lowland areas provide a habitat for several fur bearing mammals.

**239** ! Commercial fishing activities are seasonally significant in Georgian Bay, near Giant's Tomb Island.

**240** ! The Giants Tomb Island Park Reserve is designated as an Area of Natural and Scientific Interest. This is a sand plain island with a till dome supporting forests, beaches sand dunes and several provincially rare plant species. The dome is ringed by 80 metre high post glacial shore cliffs. This area is a proposed nature reserve site. Responders must take care not to damage these formations.

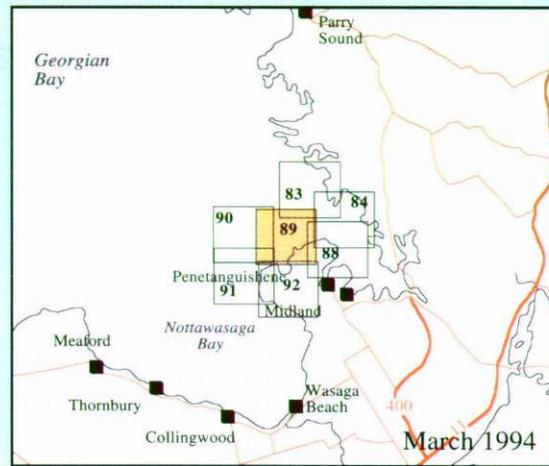
**241** ! Commercial fishing has seasonal significance in Georgian Bay near Christian Island, Hope Island and Beckwith Island.

**242** ! Christian Island, Hope Island and Beckwith Island are under the jurisdiction of the Christian Island First Nation. Responders must contact the Chief of the Christian Island First Nation before commencing response activities.

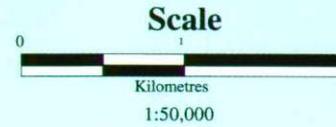
44° 56' 5" N  
80° 8' 29" W

## Map 89

Contains Sections From NTS Map Numbers:  
**31D/13 and 41A/16**

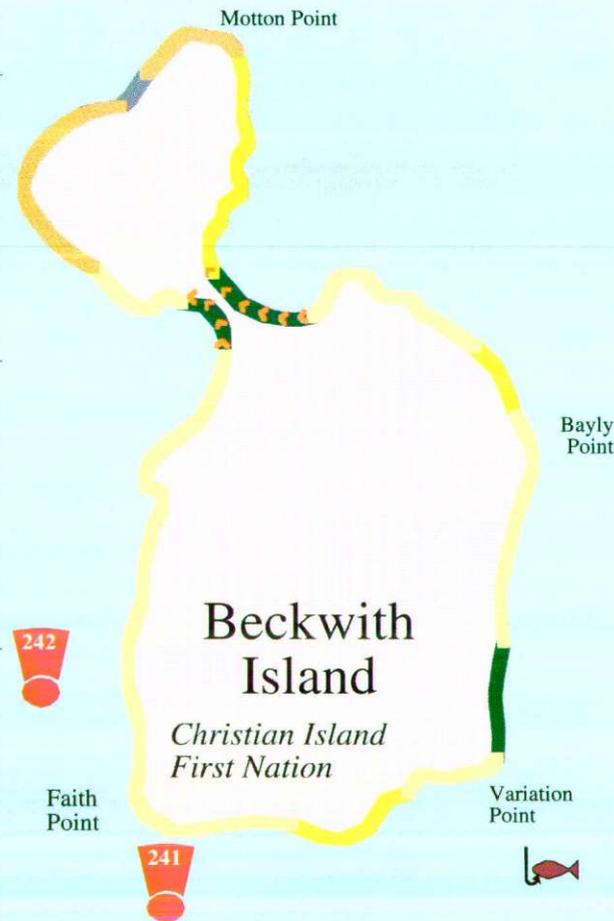
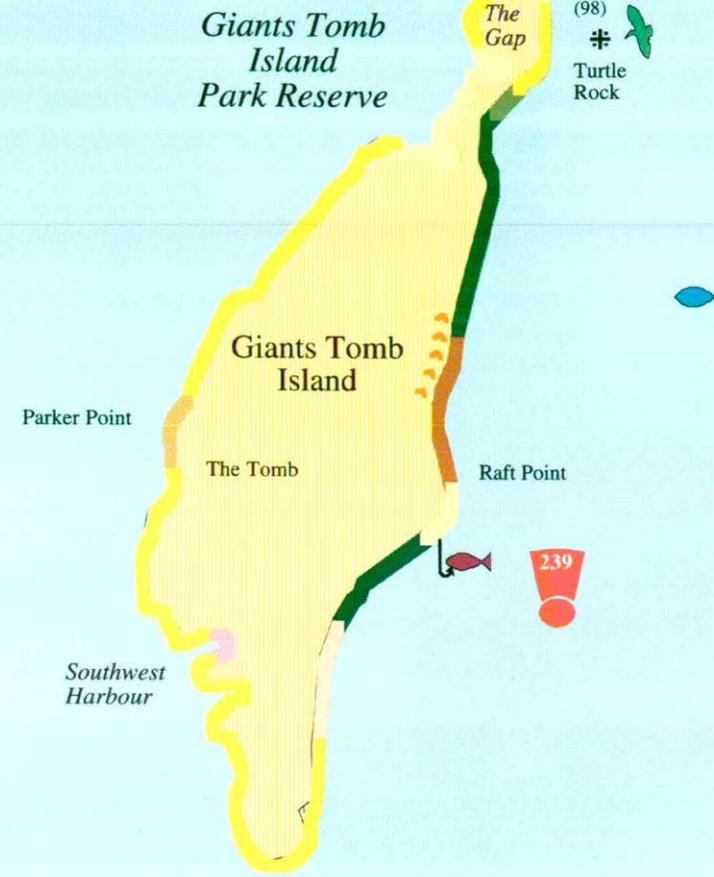


44° 56' 5" N  
79° 58' 5" W

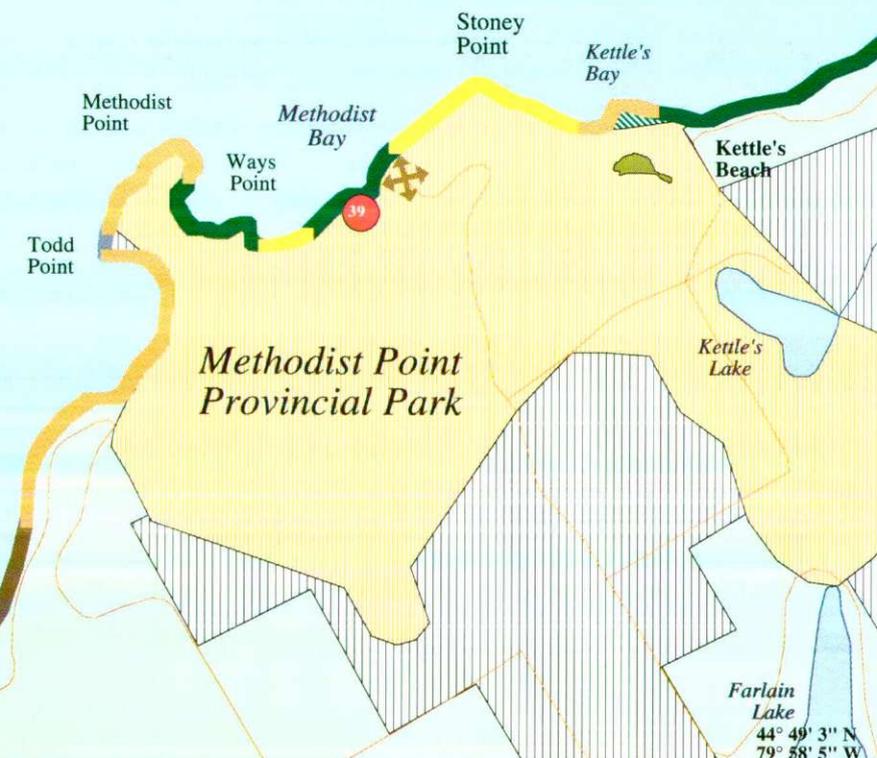


Georgian Bay

Giants Tomb Island  
Park Reserve



44° 49' 3" N  
80° 8' 29" W



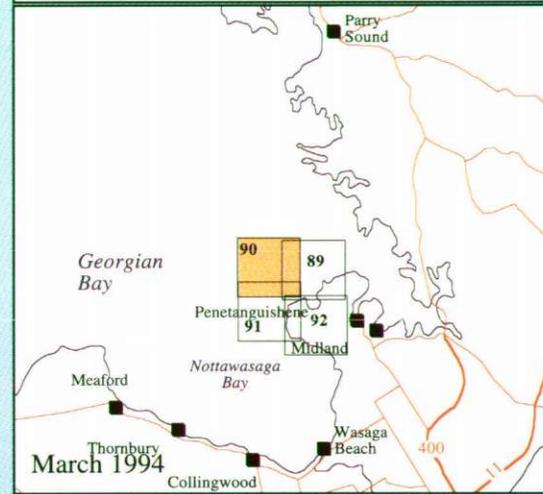
44° 49' 3" N  
79° 58' 5" W

44° 56' 21" N  
80° 15' 48" W

44° 56' 21" N  
80° 5' 24" W

# Map 90

Contains Sections From NTS Map Numbers:  
**41A/16**



## Georgian Bay

Hardhead Point

Hoar Point

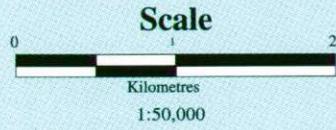
### Hope Island

*Christian Island First Nation*

Sandy Bay

South Point

Shoal Point



Daly Point

Salt Harbour



Charity Point  
Whitefish Bay

Big Sand Bay

Little Sand Bay

Mayne Point

Motton Point

Bayly Point

### Beckwith Island

*Christian Island First Nation*



Faith Point

Variation Point



Hayter Point

### Christian Island

*Christian Island First Nation*

Christian Island

Menague Point

44° 49' 20" N  
80° 15' 48" W

44° 49' 20" N  
80° 5' 24" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

Commercial fishing has seasonal significance in Georgian Bay near Christian Island, Hope Island and Beckwith Island.

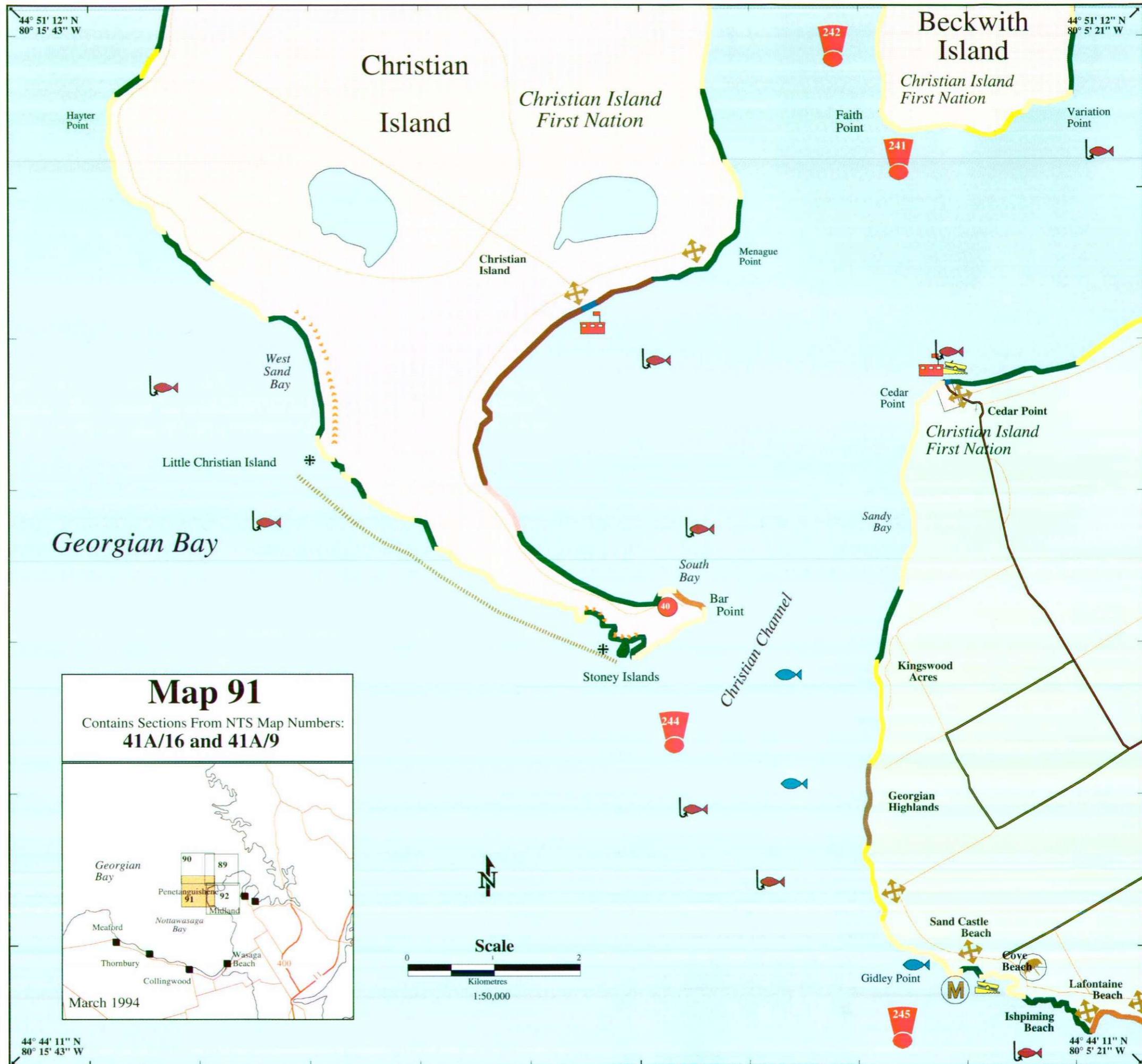
Christian Island, Hope Island and Beckwith Island are under the jurisdiction of the Christian Island First Nation. Responders must contact the Chief of the Christian Island First Nation before commencing response activities.

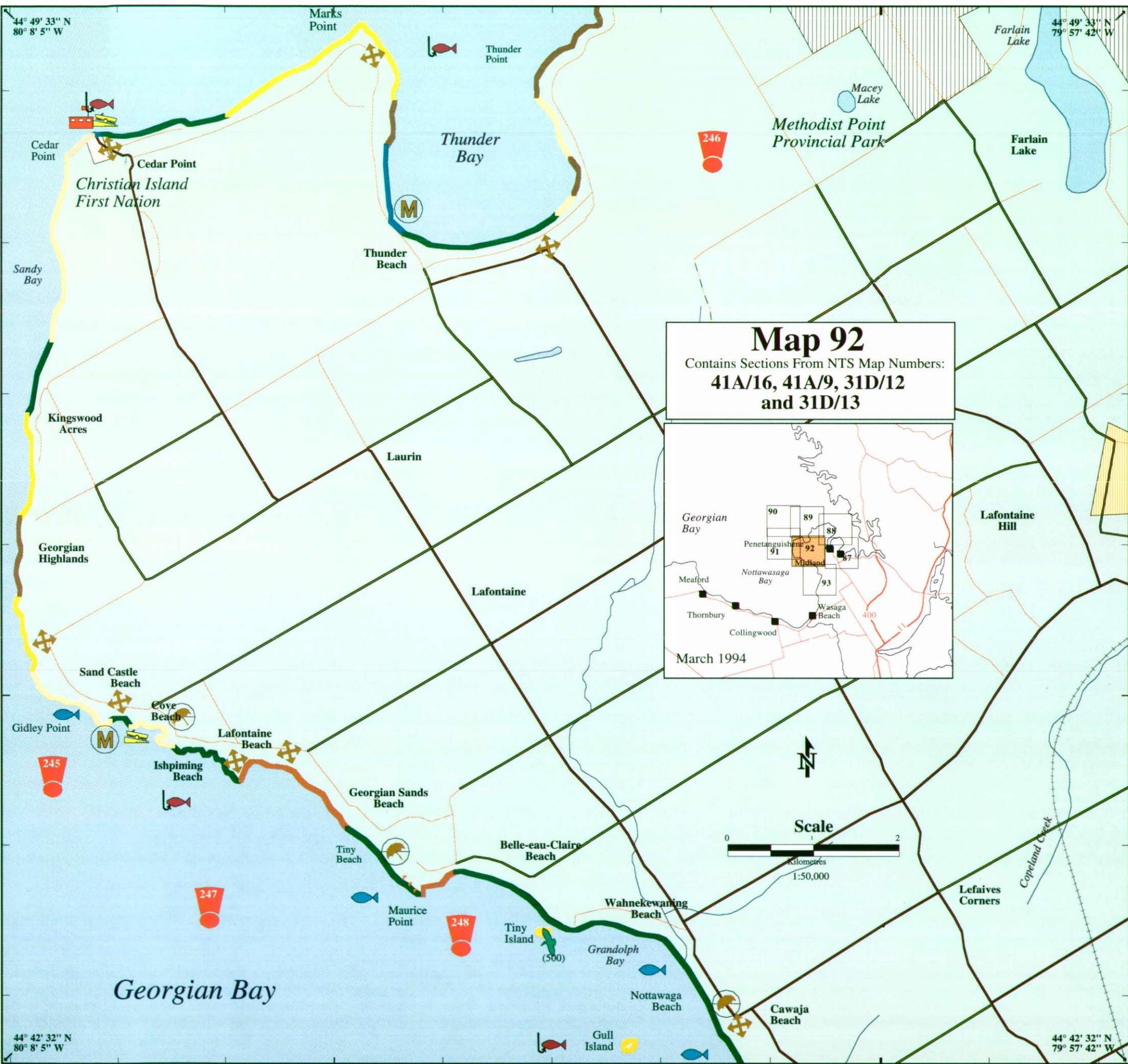
Seasonal fish spawning occurs in Big Sand Bay: Lake Whitefish in November and December.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 241** Commercial fishing has seasonal significance in Georgian Bay near Christian Island, Hope Island and Beckwith Island.
- 242** Christian Island, Hope Island and Beckwith Island are under the jurisdiction of the Christian Island First Nation. Responders must contact the Chief of the Christian Island First Nation before commencing response activities.
- 244** Commercial fishing and seasonal fish spawning activities occur in Christian Channel. Approach concerns, which are hazardous to boating activities, exist on the Christian Island shoreline between Little Christian Island and the Stoney Islands. Responders should exercise caution when approaching this shoreline. Ferry service exists between Christian Island and Cedar Point.
- 245** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from Sand Castle Beach to Nottawaga Beach.





**Map 92**  
 Contains Sections From NTS Map Numbers:  
**41A/16, 41A/9, 31D/12**  
**and 31D/13**

Geographic Bay  
 Penetanguishene  
 Nottawasaga Bay  
 Meaford  
 Thornbury  
 Collingwood  
 Wasaga Beach  
 400

March 1994

**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 245** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from Sand Castle Beach to Nottawaga Beach.
- 246** The Methodist Point Provincial Park has been designated as an Area of Natural and Scientific Interest. Proposed nature reserve zones illustrate undisturbed upland forests separated by a bluff, a lowland area with shallow marsh vegetation, a shoreline fen, and the Farlain Lake Bog. The lowland areas provide a habitat for several fur bearing mammals.
- 247** Commercial and sport fishing activities have seasonal significance in Nottawasaga Bay. Lake Whitefish spawn in Nottawasaga Bay in late Fall, from November to December.
- 248** The Belle-eau-Claire Beach/Tiny Island region has been designated as a Significant Biological Area. This area supports nesting colonial waterbirds. Responders should take care not to cause damage in this area.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**249** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from Nottawaga Beach to Balm Beach.

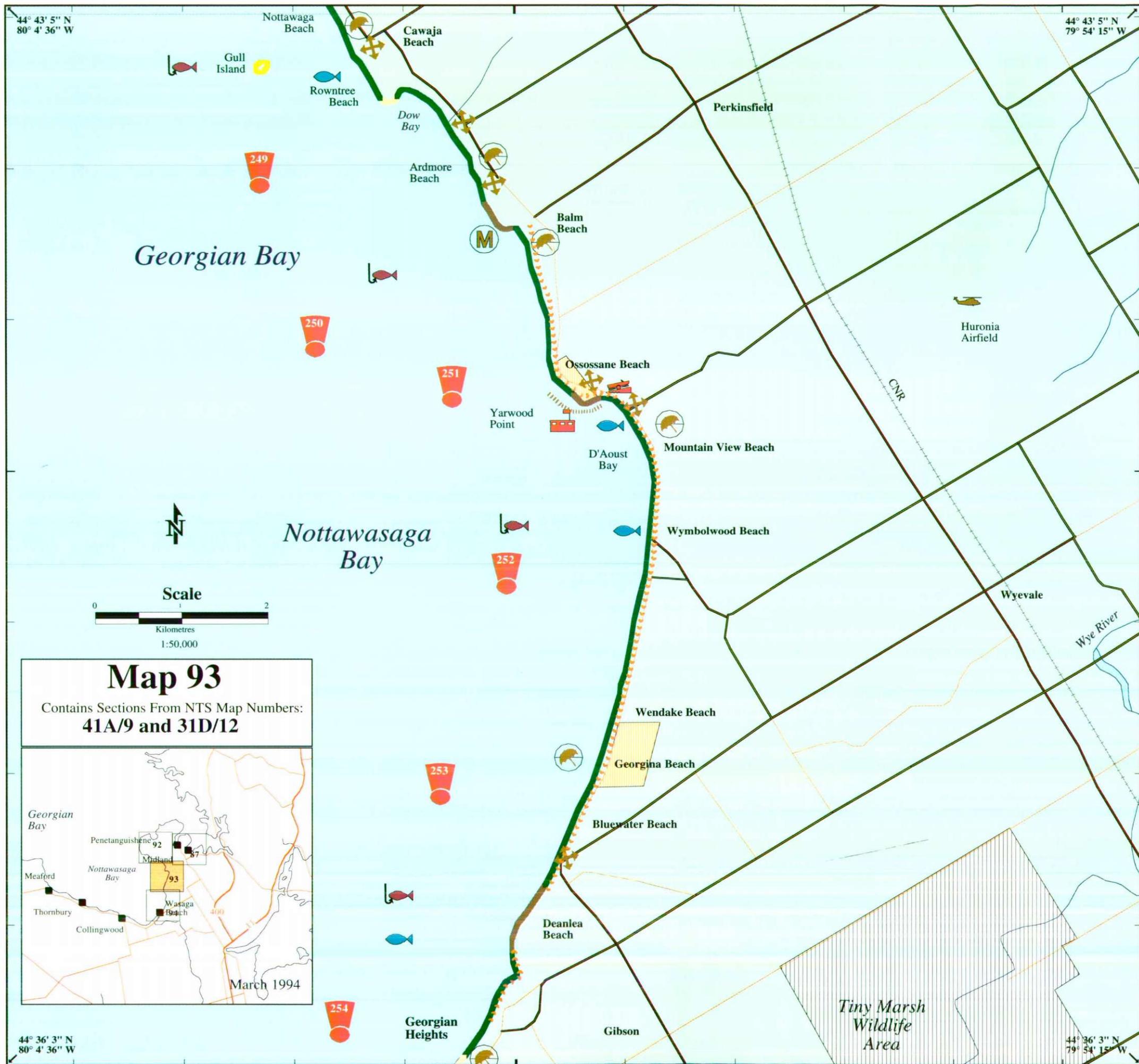
**250** Commercial and sport fishing activities have seasonal significance in Nottawasaga Bay. Lake Whitefish spawn in Nottawasaga Bay in late Fall, from November to December.

**251** Ossossane Beach is classified as an Area of Natural and Scientific Interest. It is characterized by beach ridges and dunes dominated with intermittent forest growth. Responders must take care not to damage these formations.

**252** Recreational beaches occur along the shoreline of Nottawasaga Bay from Balm Beach to Deanlea Beach.

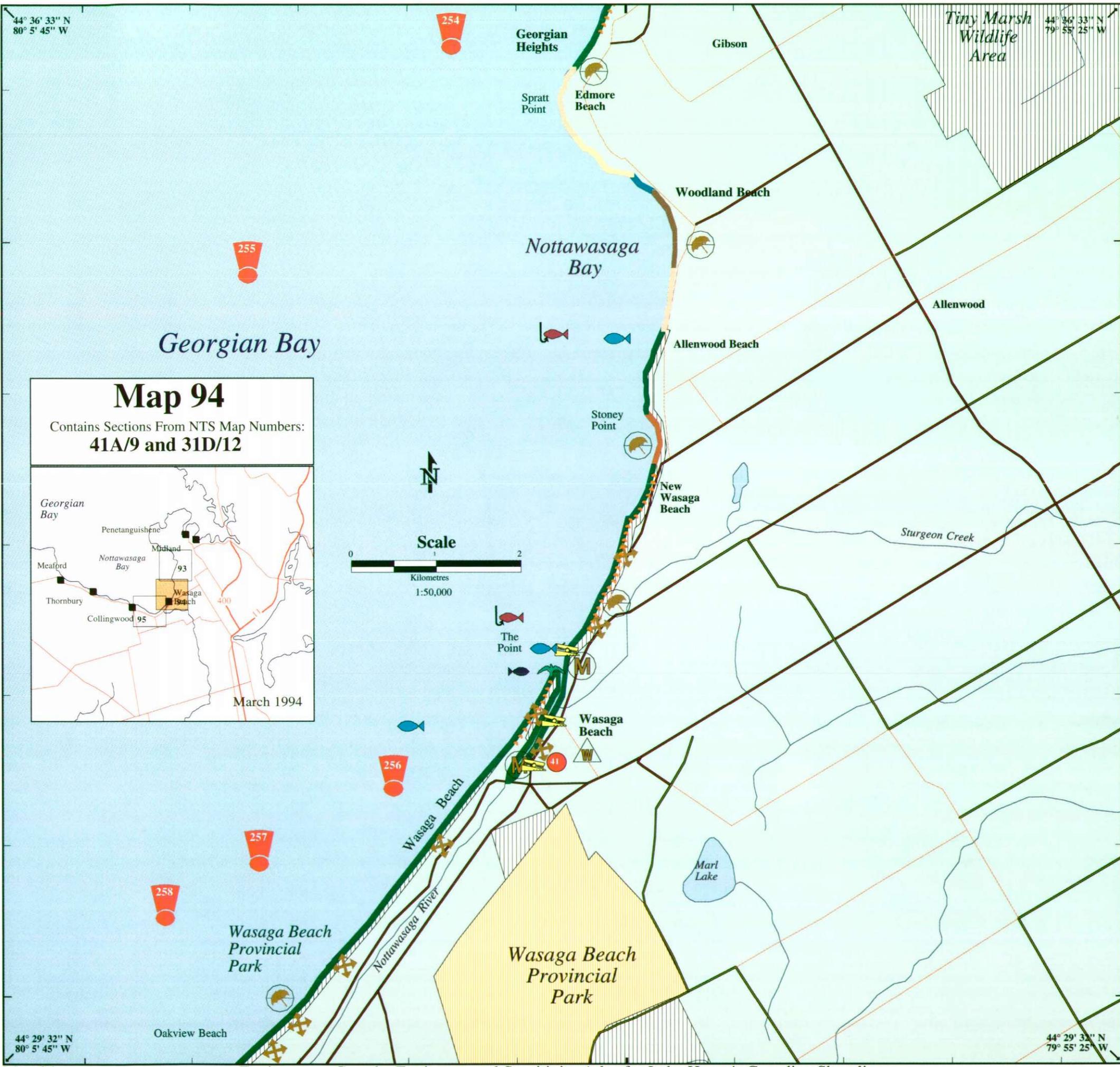
**253** Georgina Beach is classified as an Area of Natural and Scientific Interest. There are beach ridges and dunes with an open mixture of forests. Responders must take care not to damage these formations.

**254** Recreational beaches occur along the shoreline of Nottawasaga Bay from Deanlea Beach to New Wasaga Beach.



**Map 93**  
 Contains Sections From NTS Map Numbers:  
**41A/9 and 31D/12**

*Georgian Bay*  
 Penetanguishene 92  
 Meaford  
 Thornbury  
 Collingwood  
 Nottawasaga Bay  
 Wasaga Beach 93  
 Wasaga Point  
 400  
 March 1994



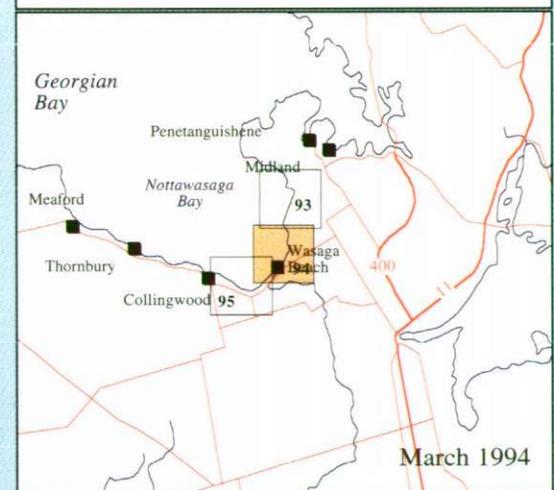
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 254** Recreational beaches occur along the shoreline of Nottawasaga Bay from Deanlea Beach to New Wasaga Beach.
- 255** Commercial and sport fishing activities have seasonal significance in Nottawasaga Bay. Lake Whitefish spawn in Nottawasaga Bay in late Fall, from November to December.
- 256** A portion of Wasaga Backlands Park Reserve is classified as an Area of Natural and Scientific Interest and is a proposed Nature Reserve. This area supports provincially significant combinations of raised beaches, dunes, prairie plant species and forests. Responders must take care not to damage these formations. Wasaga Beach Snowmobile Trail dissects the area.
- 257** The Nottawasaga River is a significant watercourse supporting seasonal fish spawning and migration activities: Walleye, Rainbow Trout and Lake Sturgeon spawn in Spring, Chinook Salmon spawn in the Fall. Lake Whitefish spawn in Nottawasaga Bay in Fall from November to December.
- 258** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from New Wasaga Beach to Oakview Beach.

**Map 94**

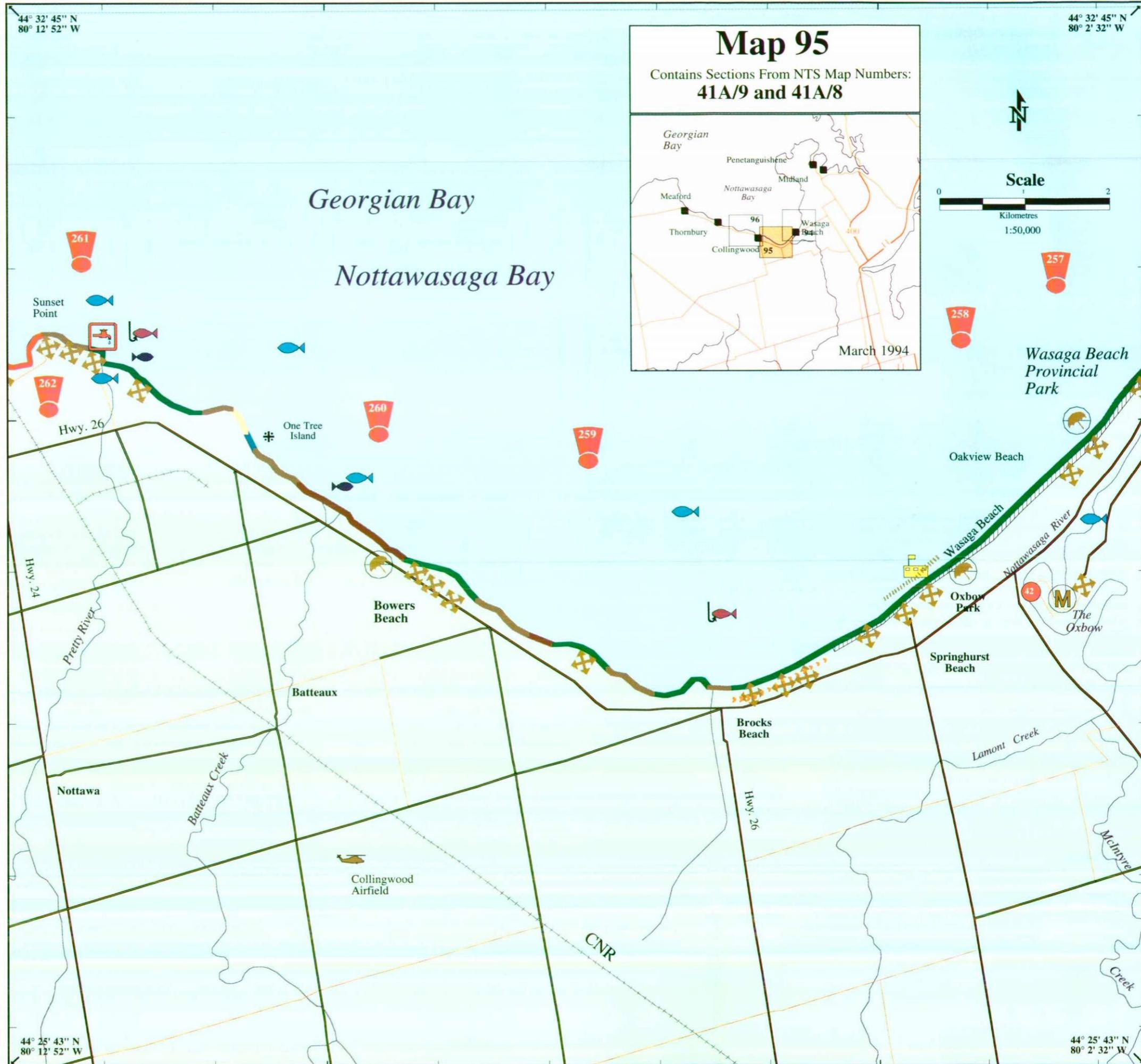
Contains Sections From NTS Map Numbers:  
**41A/9 and 31D/12**



## NOTES

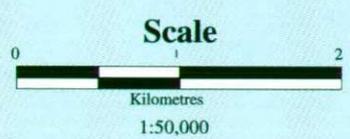
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 257** The Nottawasaga River is a significant watercourse supporting seasonal fish spawning and migration activities: Walleye, Rainbow Trout and Lake Sturgeon spawn in Spring, Chinook Salmon spawn in the Fall. Lake Whitefish spawn in Nottawasaga Bay in Fall from November to December.
- 258** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from New Wasaga Beach to Oakview Beach.
- 259** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay.
- 260** Seasonal fish spawning occurs in Nottawasaga Bay: Lake Whitefish in Fall from November to December. Batteaux Creek is a significant watercourse supporting Rainbow Trout migration and spawning activities. Commercial and sport fishing activities have seasonal significance along the shoreline of Nottawasaga Bay.
- 261** Collingwood Water Treatment Plant water intake: Call - (705) 445-1800. Seasonal fish spawning occurs in Nottawasaga Bay near Collingwood Harbour: Lake Whitefish in late Fall.
- 262** Pretty River is a significant watercourse supporting fish spawning and migration activities: Rainbow Trout spawn in the Spring, Brown Trout and Chinook Salmon spawn in the Fall.



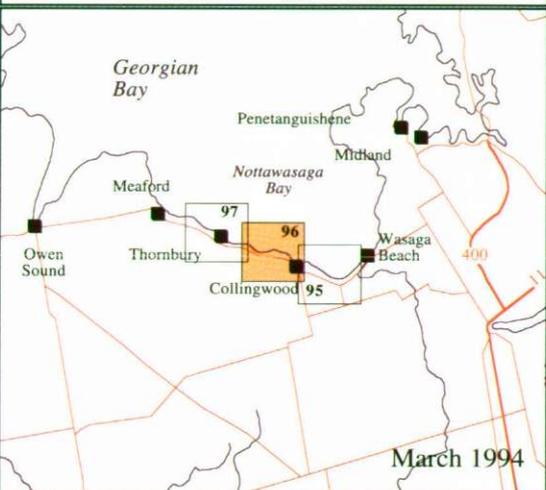
44° 35' 24" N  
80° 22' 8" W

44° 35' 24" N  
80° 11' 48" W



# Map 96

Contains Sections From NTS Map Numbers:  
**41A/9 and 41A/8**



Georgian Bay

Nottawasaga Bay

Craigeith Provincial Park

Craigeith

Long Point

Dominion Island

West Black Bass Bay

East Black Bass Bay

Pigeon Point

Beacon Glow Point

Whites Bay

Hen and Chicken Island

Collingwood Harbour

Sunset Point

Banks

Mair Mills

Collingwood

Silver Creek

Black Ash Creek

Hwy. 24

44° 28' 22" N  
80° 22' 8" W

44° 28' 22" N  
80° 11' 48" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 261** Collingwood Water Treatment Plant water intake: Call - (705) 445-1800. Seasonal fish spawning occurs in Nottawasaga Bay near Collingwood Harbour: Lake Whitefish in late Fall.
- 262** Pretty River is a significant watercourse supporting fish spawning and migration activities: Rainbow Trout spawn in the Spring, Brown Trout and Chinook Salmon spawn in the Fall.
- 263** Collingwood Harbour Marsh supports colonial waterbirds, waterfowl, shorebirds and several species of fur bearing mammals. It is a significant migratory passerine area. Collingwood Water Treatment Plant water outfall at Black Ash Creek: Call - (705) 445-1800. Seasonal fish spawning occurs in Black Ash Creek: Rainbow Trout in Spring and Brown Trout in Fall.
- 264** Goodyear Canada Incorporated Water Treatment Plant water outfall: Call - (705) 445-3410. Commercial and sport fishing activities have seasonal significance in Collingwood Harbour: Walleye and White Sucker in Spring, Yellow Perch and Smallmouth Bass in late Spring.
- 265** Commercial and sport fishing activities have seasonal significance along the shoreline of Nottawasaga Bay near Collingwood Harbour: Smallmouth Bass in Spring, Lake Trout in October and Lake Whitefish in late Fall.
- 266** Cranberry Lake Marsh and the Collingwood Shores Wetland Complex support colonial waterbirds, fur bearing mammals, and several species of vegetation.
- 267** Nottawasaga Island, which is part of the Collingwood Shores Wetland Complex, is classified as a Nature Reserve as it is a bird sanctuary supporting nesting colonial waterbirds.
- 268** Silver Creek supports Rainbow Trout spawning activities in the Spring. Collingwood Sewage Treatment Plant water outfall: Call - (705) 445-1800.
- 269** Craigeith Provincial Park is an important recreational and scientific area. It exhibits the fossiliferous Whitby Formation. Responders should take care not to damage this area.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**269** Craigeith Provincial Park is an important recreational and scientific area. It exhibits the fossiliferous Whitby Formation. Responders should take care not to damage this area.

**270** Delphi Point is classified as an Area of Natural and Scientific Interest. It is an example of the Whitby Formations and contains numerous fossils. This area is important for scientific and educational purposes.

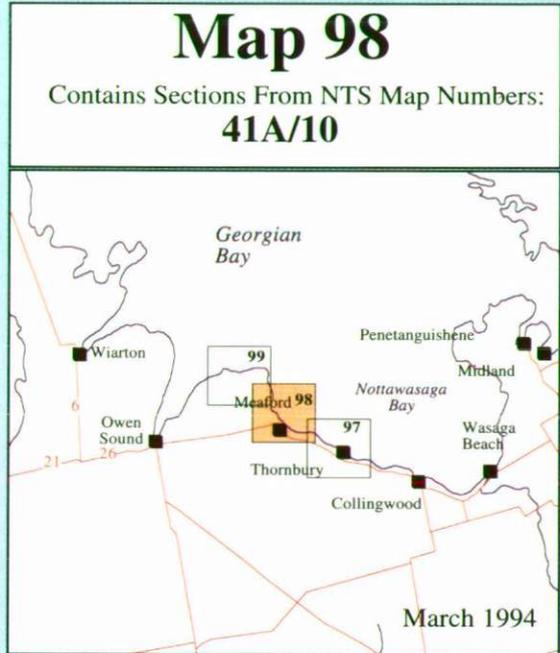
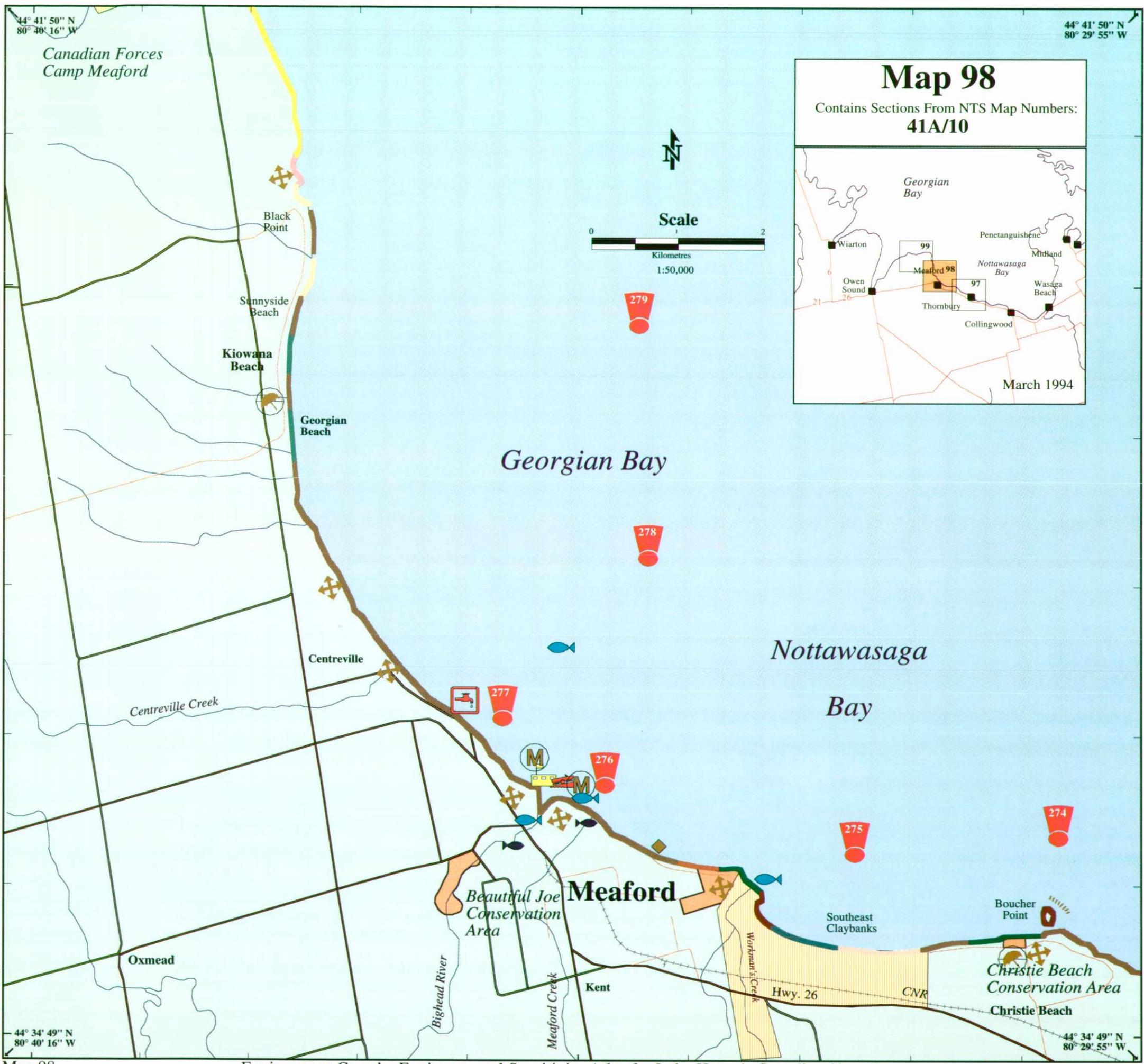
**271** Peasmarsh Nature Reserve is an important recreational and educational area with numerous trails giving access to forests, fauna and plants. Several species of fur bearing mammals seek refuge here. Indian Brook flows northeast through the property into Nottawasaga Bay and provides a spawning and migration route for Rainbow Trout, Carp and White Sucker. The brook is a sand and gravel bar bottom and separates the bay shoreline into a boulder beach and sand beach. Responders should take care not to damage these features.

**272** Beaver River is a significant fish spawning and migration watercourse: Rainbow Trout spawn in the Spring and Chinook Salmon spawn in the Fall.

**273** Thornbury Water Treatment Plant water intake and Water Pollution Control Plant water outfall: Call - (519) 538-3311.

**274** Christie Beach Conservation Area is an important recreational and educational area with a large parkland.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

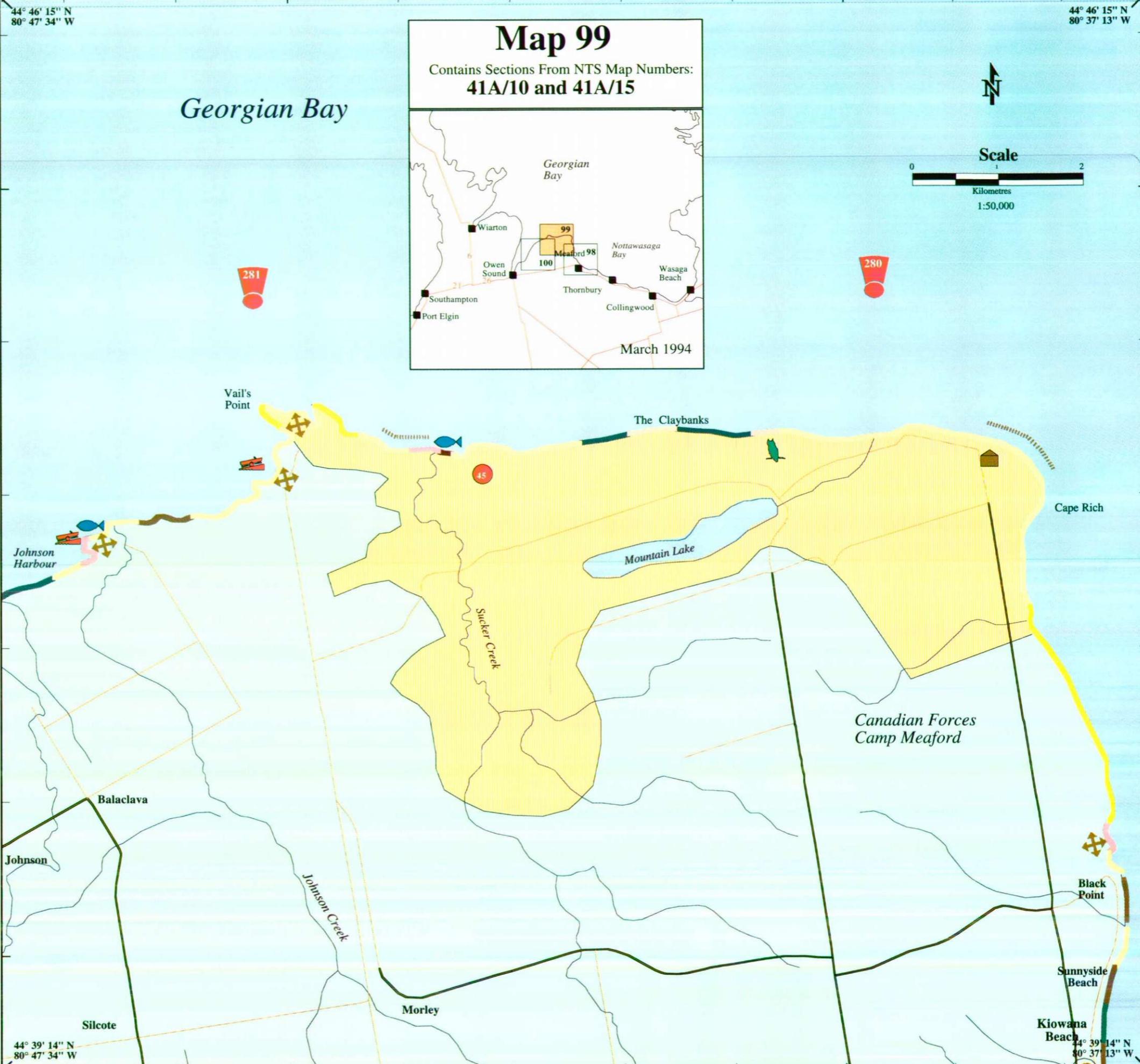
- 274** Christie Beach Conservation Area is an important recreational and educational area with a large parkland.
- 275** East Meaford Creek is designated as an Area of Natural and Scientific Interest. This area is an excellent geological record of the Georgian Formation and the Whitby Formation. It is a frequently visited site for scientific and educational purposes. Responders should take care not to damage these formations. This creek section is a nature reserve candidate.
- 276** Meaford Creek and Bighead River are fish spawning and migration watercourses: Rainbow Trout in the Spring and Brook Trout and Brown Trout in the Fall.
- 277** Meaford Water Treatment Plant water intake and Pollution Control water outfall: Call - (519) 538-2662.
- 278** Numerous recreational beaches occur along the shoreline of Nottawasaga Bay from Christie Beach to Sunnyside Beach.
- 279** Fish spawning has seasonal significance in Nottawasaga Bay: Lake Whitefish in late November to December.

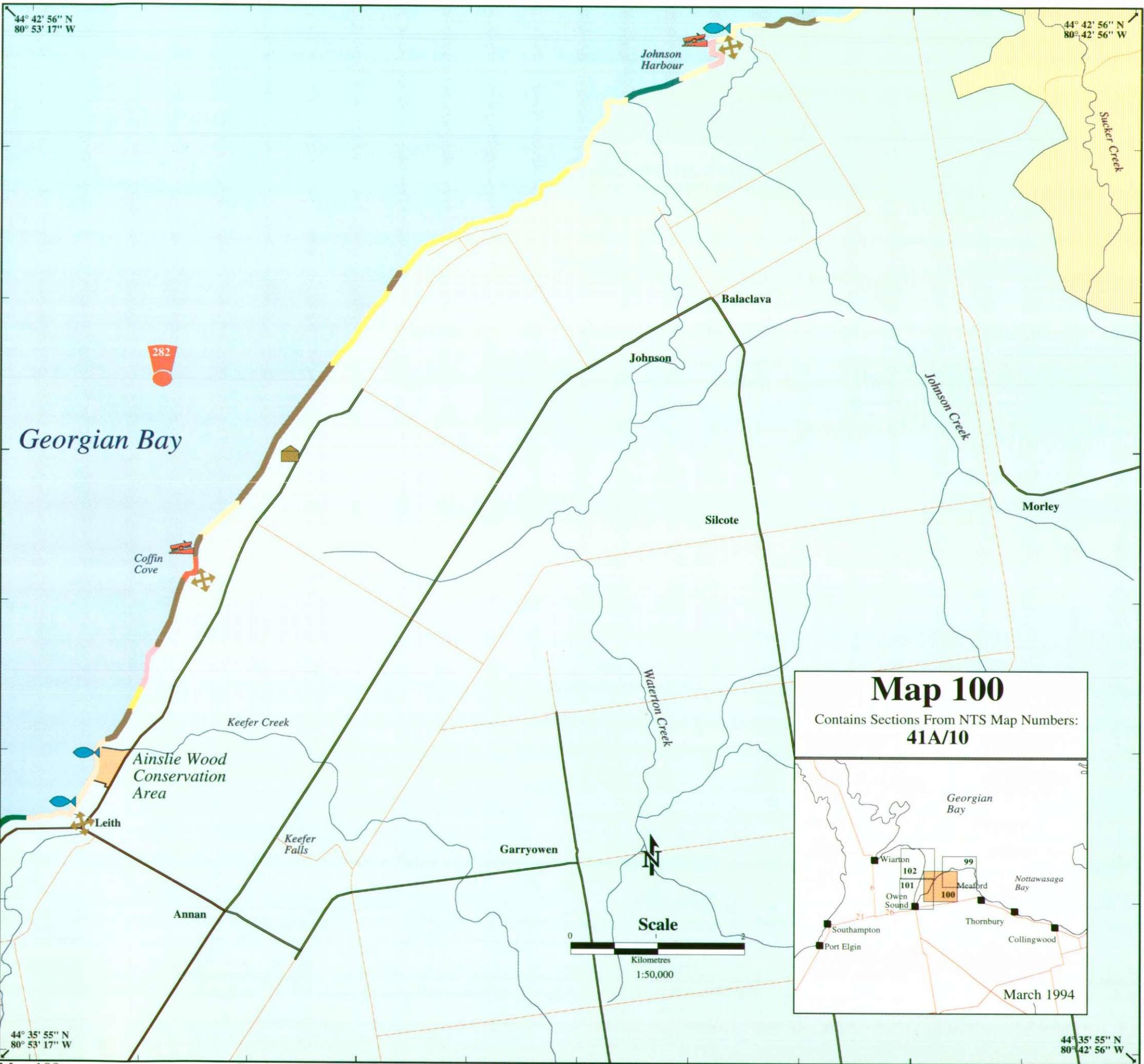
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**280** Sucker Creek Valley - Cape Rich is designated as an Area of Natural and Scientific Interest. This area is an excellent geological record of the Georgian Bay Formation and the Queenston Formation. It is a frequently visited site for scientific and educational purposes. Responders should take care not to damage these formations. This creek section is a nature reserve candidate. Canadian Forces Camp Meaford. Responders should receive permission from the base commander before commencing response activities: Call - (519) 538-1371.

**281** Recreational fishing has seasonal significance in Georgian Bay from Cape Rich to Owen Sound.





**Map 100**  
 Contains Sections From NTS Map Numbers:  
**41A/10**

Georgian Bay  
 Warton 102  
 99  
 101  
 Owen Sound  
 Southampton  
 Port Elgin  
 Meatbrd  
 Thornbury  
 Collingwood  
 Nottawasaga Bay  
 March 1994

**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**282** Recreational fishing has seasonal significance in Georgian Bay from Cape Rich to Owen Sound. Keefer Creek is an important fish spawning watercourse: Rainbow Trout in the Spring and Brown Trout in the Fall.

# NOTES

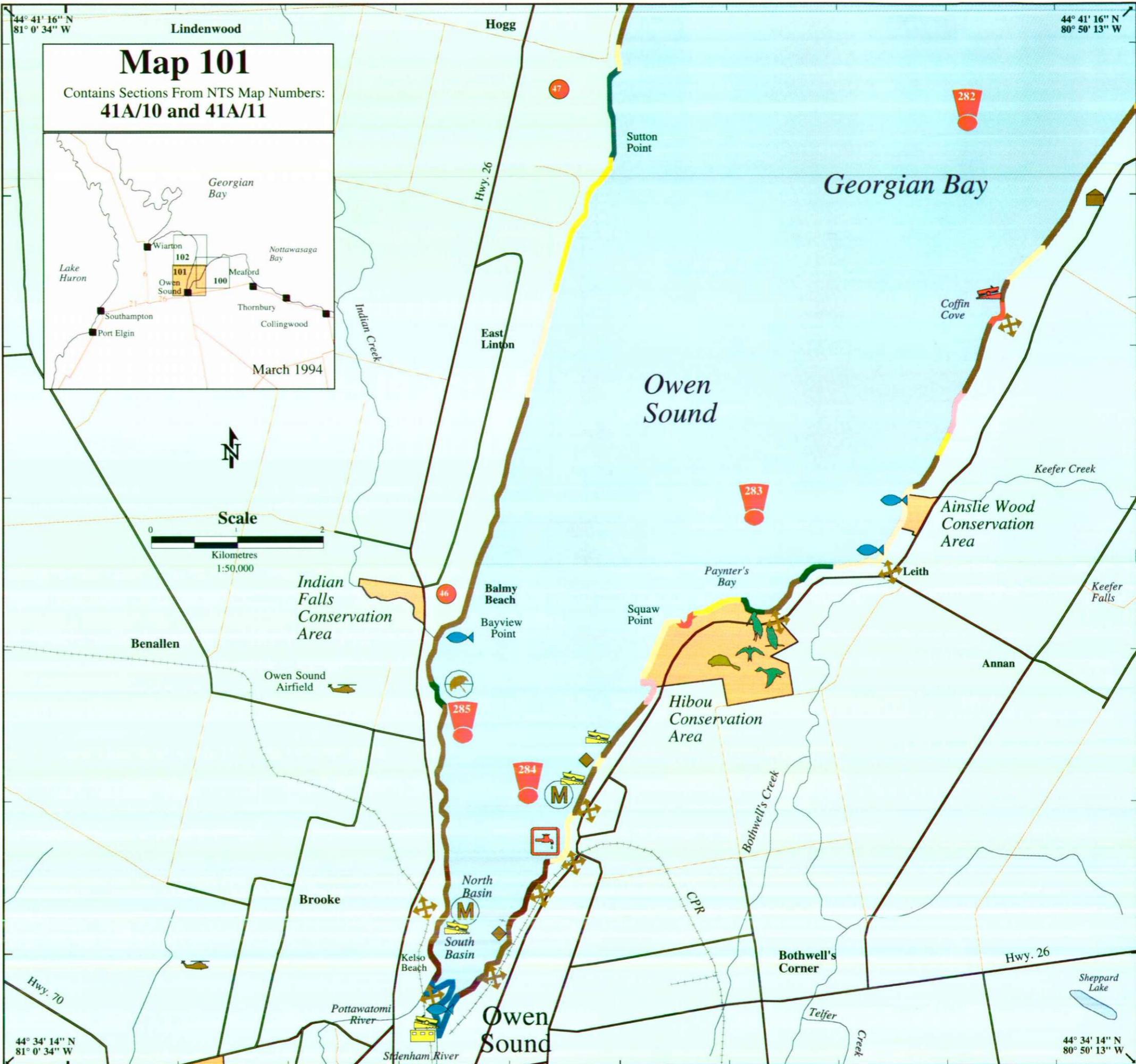
A red exclamation point symbol is used on the maps to catch the responder's attention.

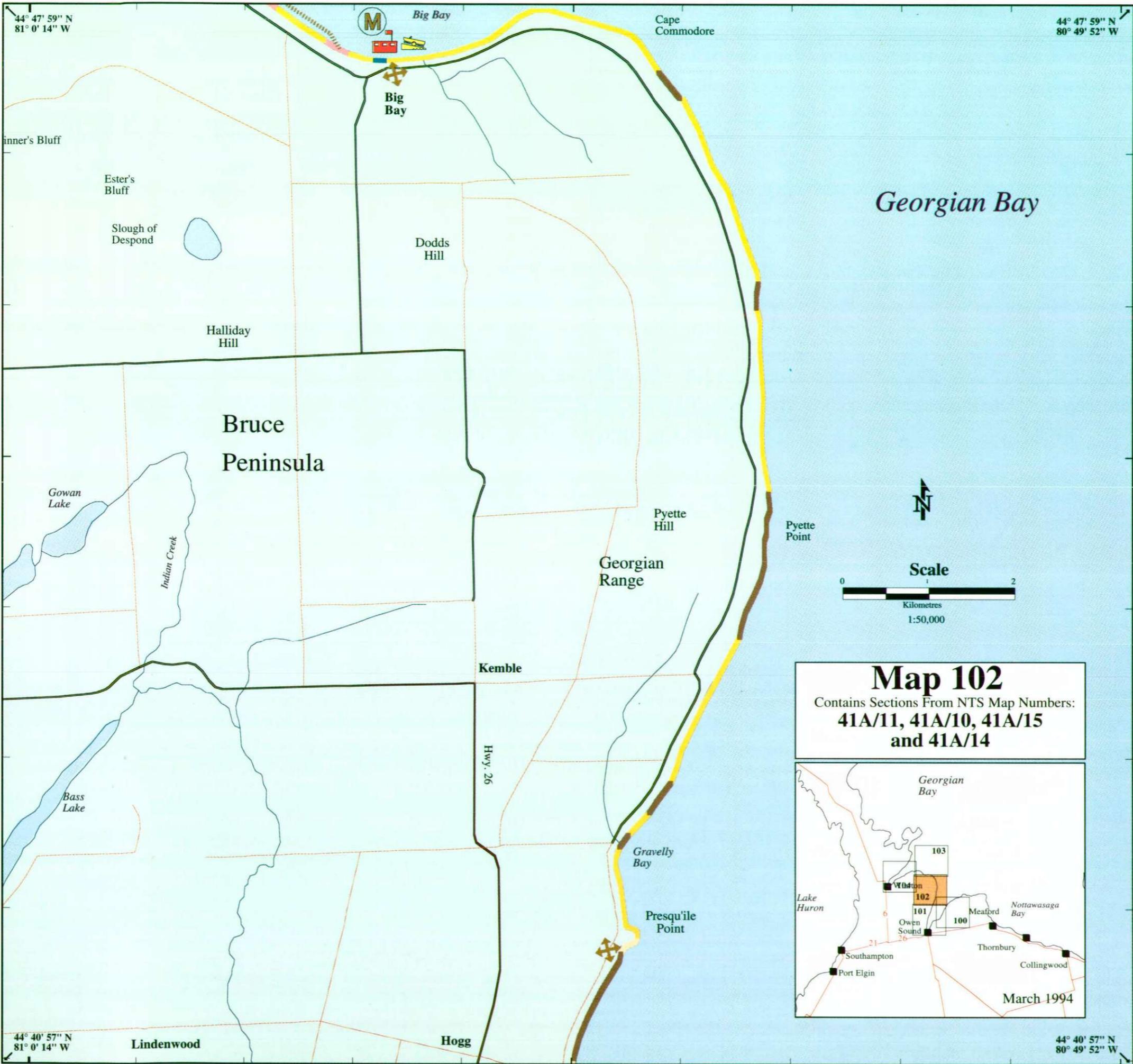
**282** Recreational fishing has seasonal significance in Georgian Bay from Cape Rich to Owen Sound. Keefer Creek is an important fish spawning watercourse: Rainbow Trout in the Spring and Brown Trout in the Fall.

**283** The Hibou Conservation Area provides a habitat for shorebirds, wading birds, staging waterfowl, raptors and several fur bearing mammals. It is the last remnant shoreline in the natural state in Owen Sound. Bothwell's Creek, the Sydenham River and the Pottawatami River are important fish spawning watercourses: Rainbow Trout in the Spring and Brown Trout in the Fall.

**284** Goodyear Canada Inc. water outfall: Call - (519) 376-9730. Owen Sound Water Treatment Plant water intake and Owen Sound Water Pollution Control Plant water outfall: Call - (519) 376-4530.

**285** Indian Creek is an important fish spawning watercourse: Rainbow Trout in the Spring.

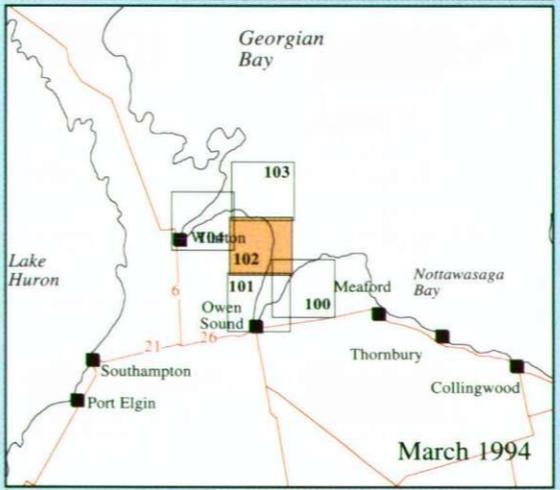




**NOTES**

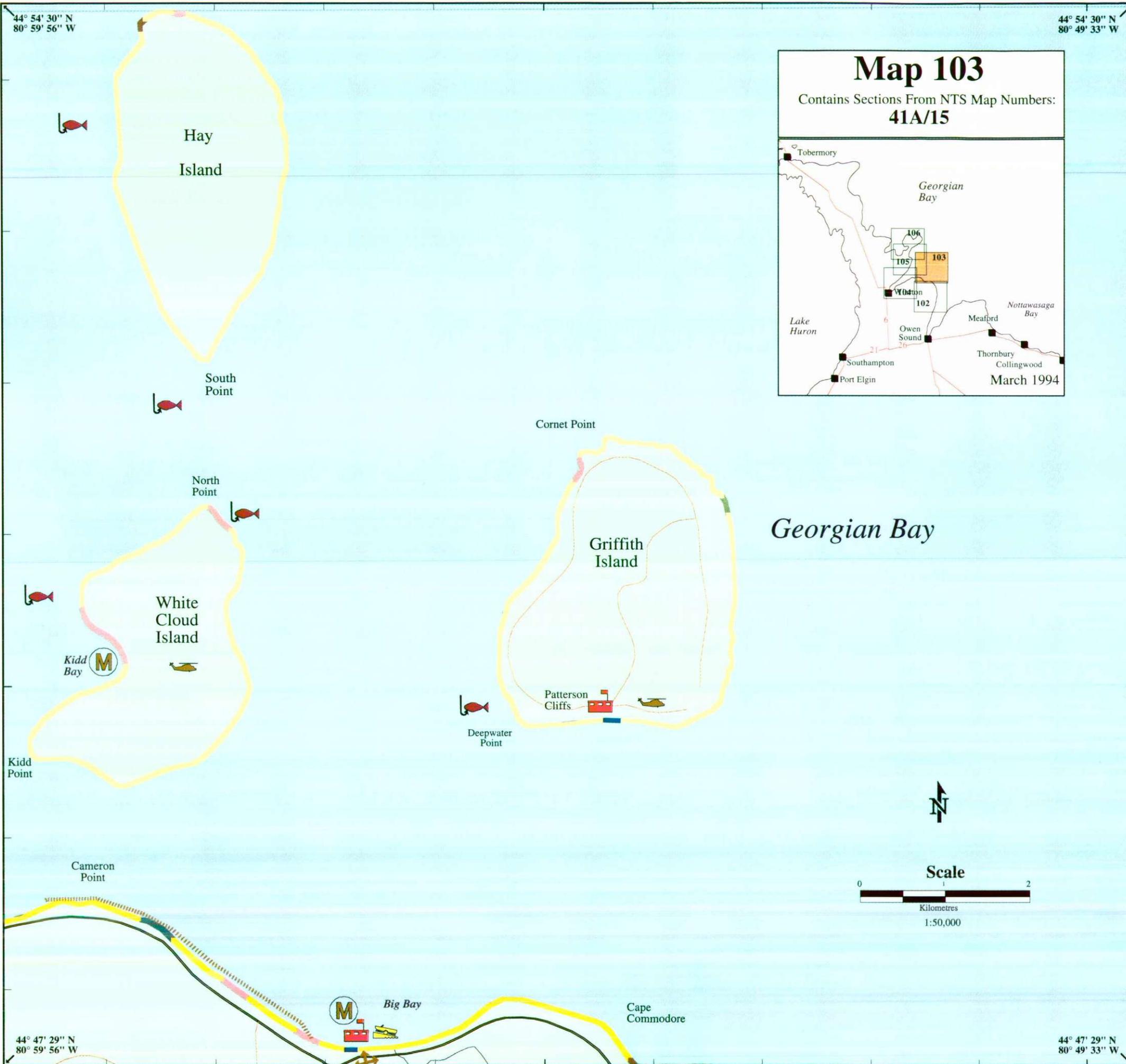
A red exclamation point symbol is used on the maps to catch the responder's attention.

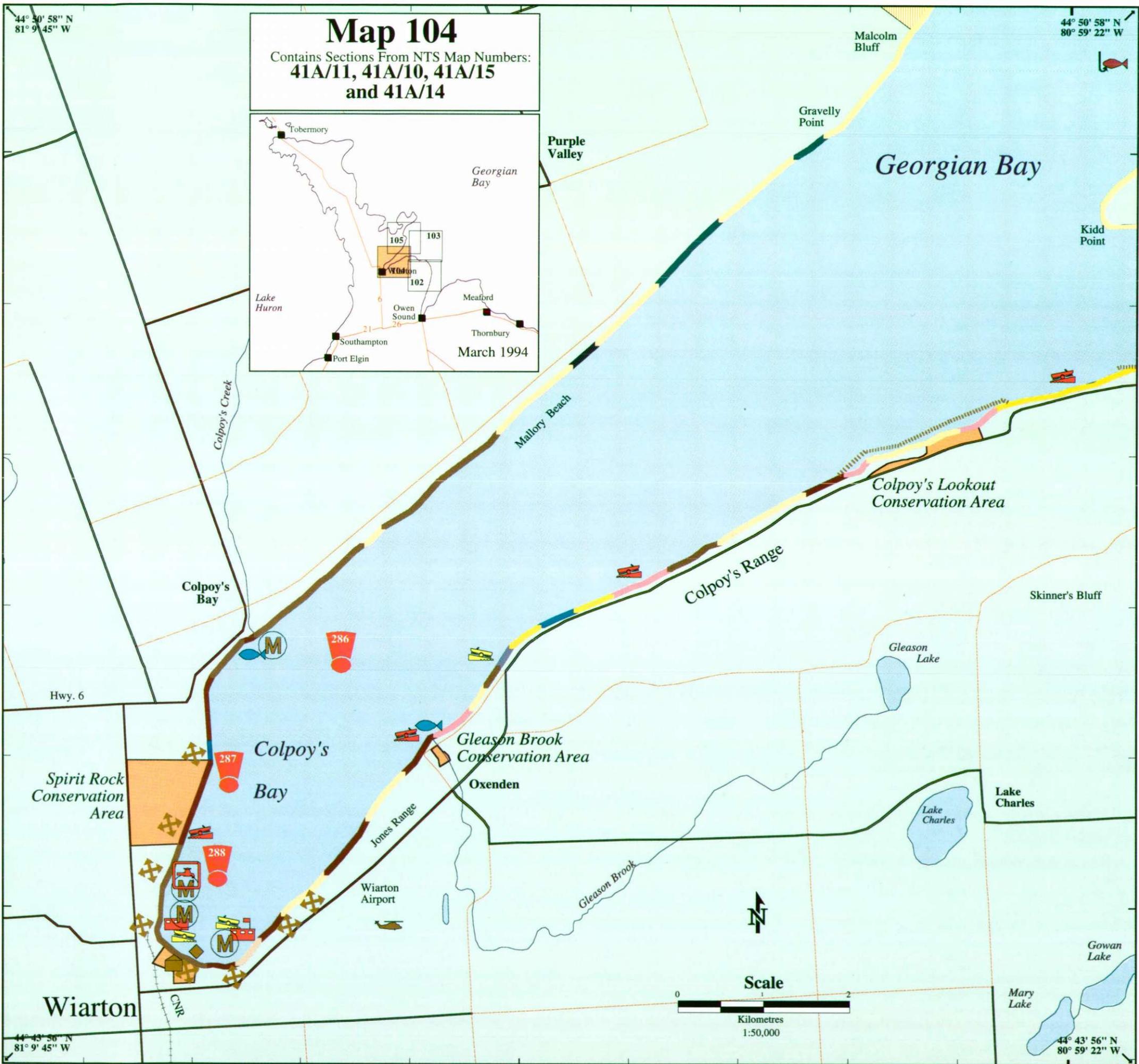
**Map 102**  
 Contains Sections From NTS Map Numbers:  
**41A/11, 41A/10, 41A/15**  
**and 41A/14**



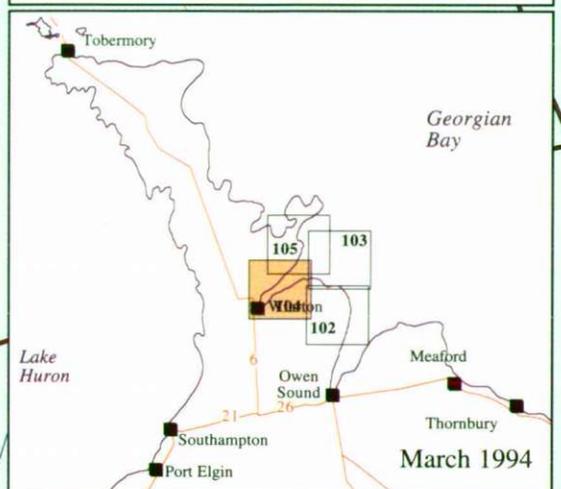
# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.





**Map 104**  
 Contains Sections From NTS Map Numbers:  
**41A/11, 41A/10, 41A/15**  
**and 41A/14**



**NOTES**

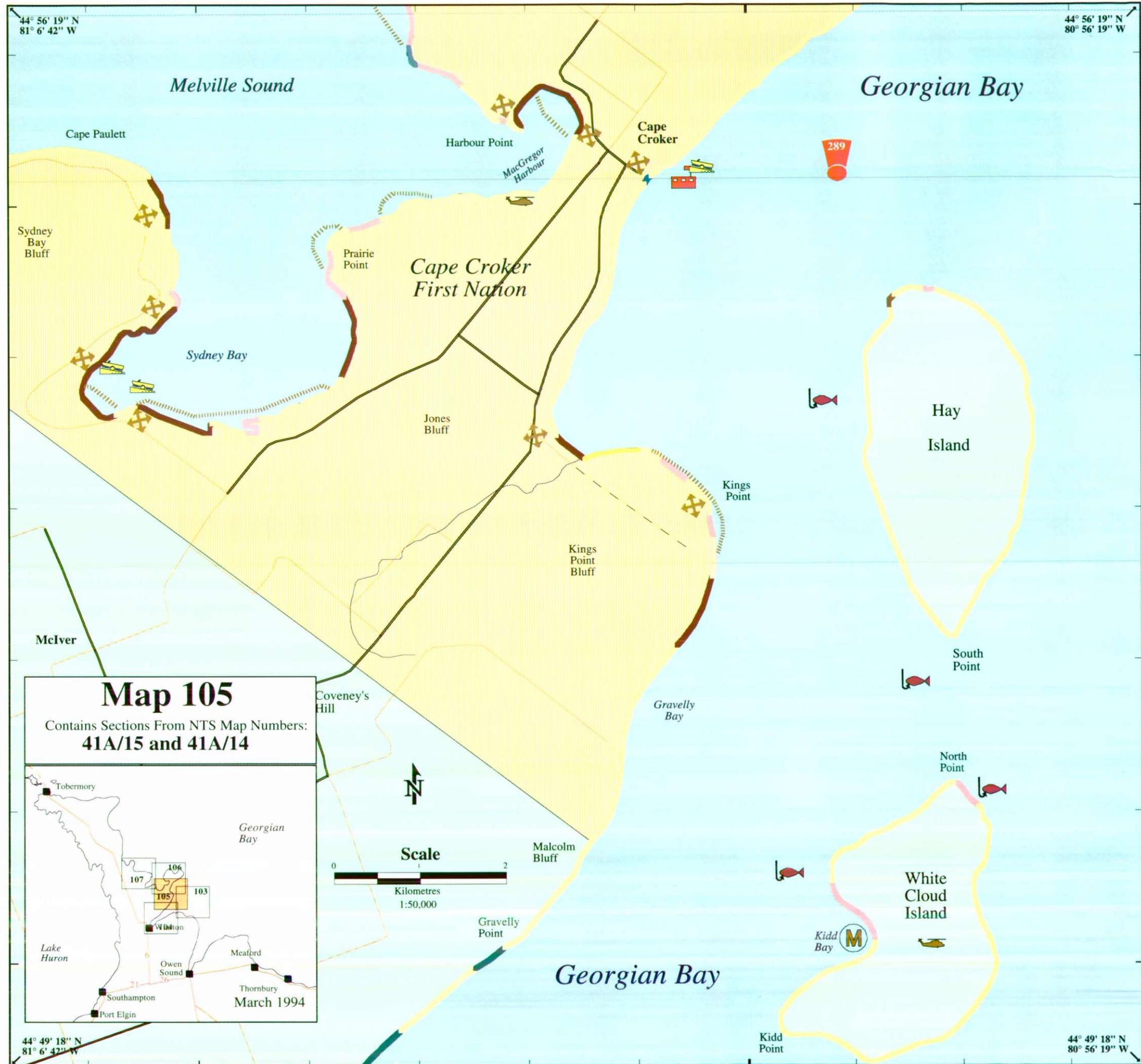
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 286** Gleason Brook is an important fish spawning watercourse: Rainbow Trout in Spring. Colpoy's Bay at Warton is a significant recreational area supporting marinas, motels and parks. Recreational fishing has seasonal significance: Pink Salmon in summer.
- 287** The Spirit Rock Conservation Area is important for recreational and educational activities.
- 288** Warton Water Treatment Plant water intake and Water Pollution Control Plant water outfall: Call - (519) 534-0260.

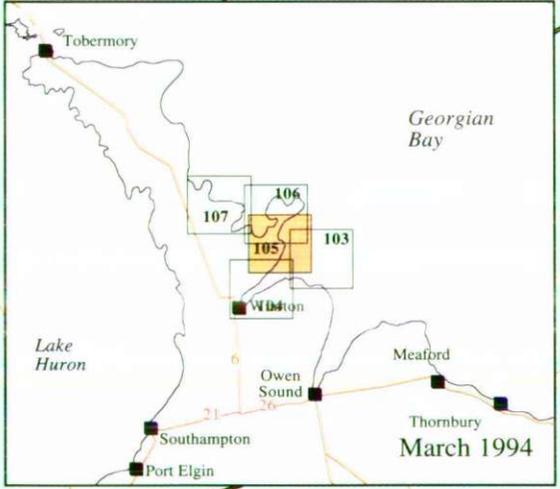
# NOTES

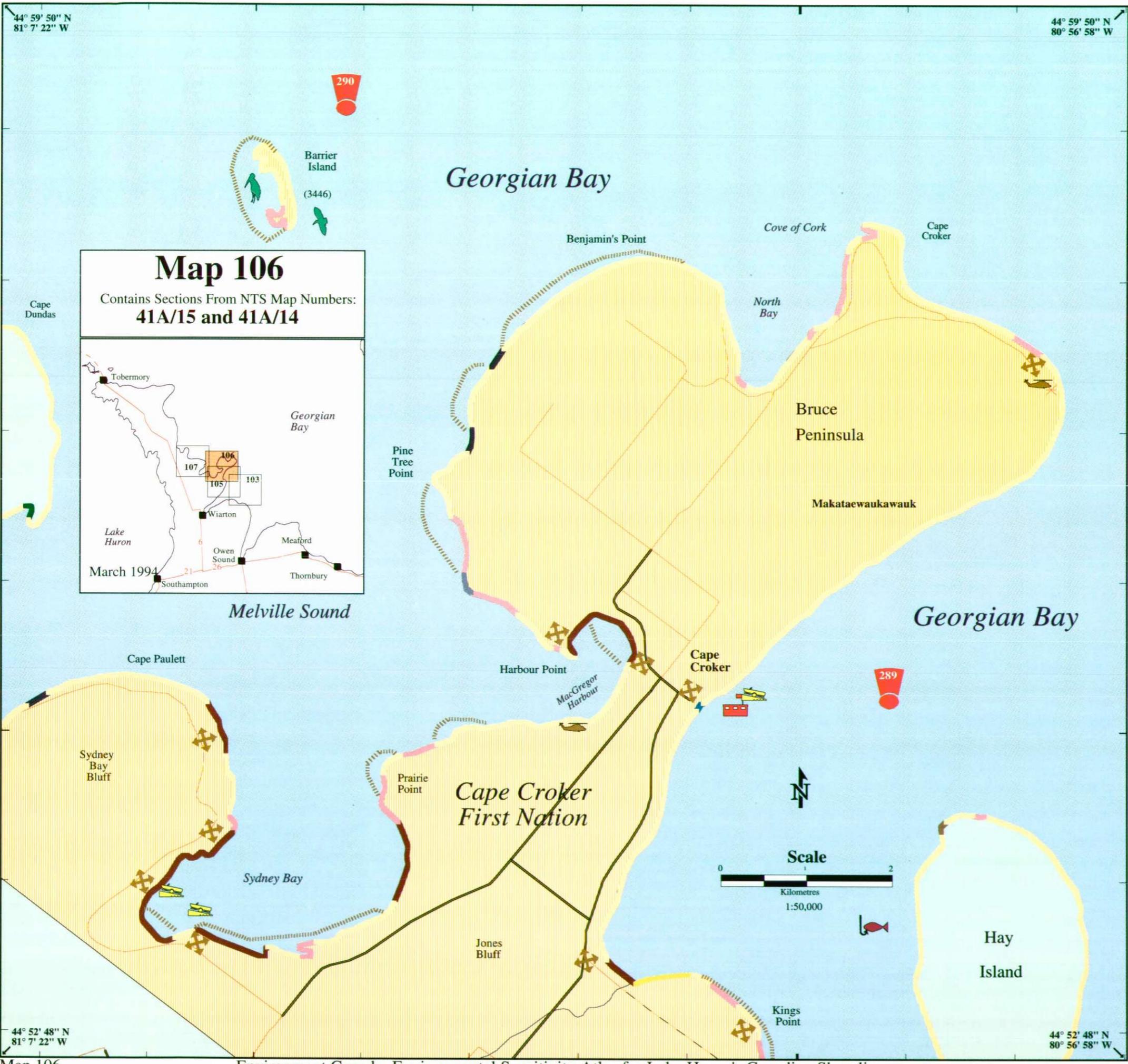
A red exclamation point symbol is used on the maps to catch the responder's attention.

**289** The Cape Croker area is classified as an Area of Natural and Scientific Interest. It is important for recreational and educational activities. Evidence of past glacial episodes as well as high bluffs bounded by sand beaches are dominant in this area. Responders should take care not to damage these formations. This area resides within the Cape Croker First Nation. Responders should contact the Chief of the Cape Croker First Nation before commencing response activity in the Area. Approach concerns exist in Sydney Bay and Melville Sound which are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.



**Map 105**  
Contains Sections From NTS Map Numbers:  
**41A/15 and 41A/14**





**NOTES**

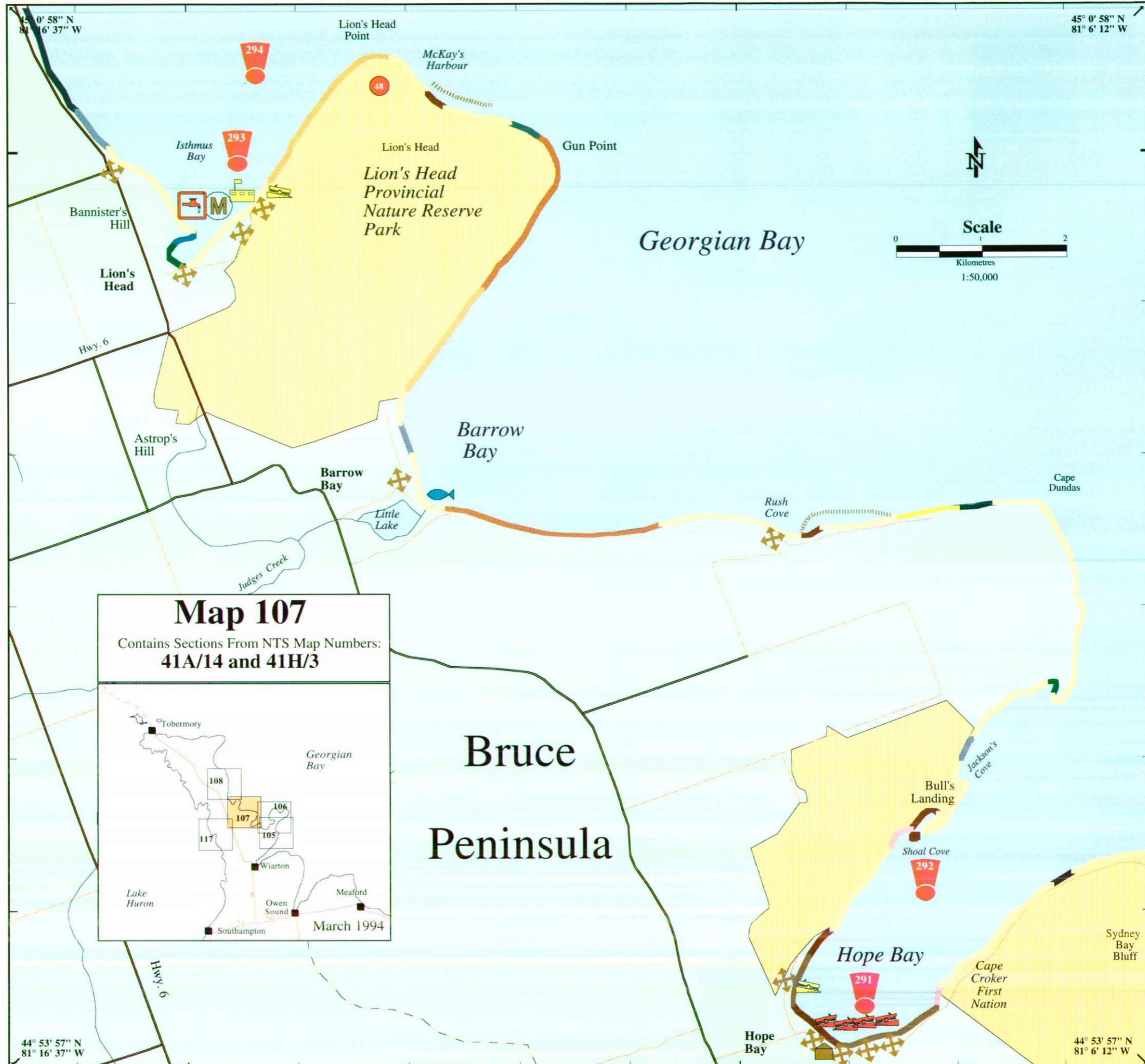
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 289** The Cape Croker area is classified as an Area of Natural and Scientific Interest. It is important for recreational and educational activities. Evidence of past glacial episodes as well as high bluffs bounded by sand beaches are dominant in this area. Responders should take care not to damage these formations. This area resides within the Cape Croker First Nation. Responders should contact the Chief of the Cape Croker First Nation before commencing response activity in the Area. Approach concerns exist in Sydney Bay and Melville Sound which are hazardous to boating activities. Responders should exercise caution when approaching these shorelines.
- 290** Barrier Island is classified as an Area of Natural and Scientific Interest. This island provides a habitat for nesting colonial waterbirds. Cobble beaches dominate three sides of the island and a marshy bay occurs on the south side. Approach concerns at Barrier Island are hazardous to boating activities. Responders should exercise caution when approaching the shoreline.

**NOTES**

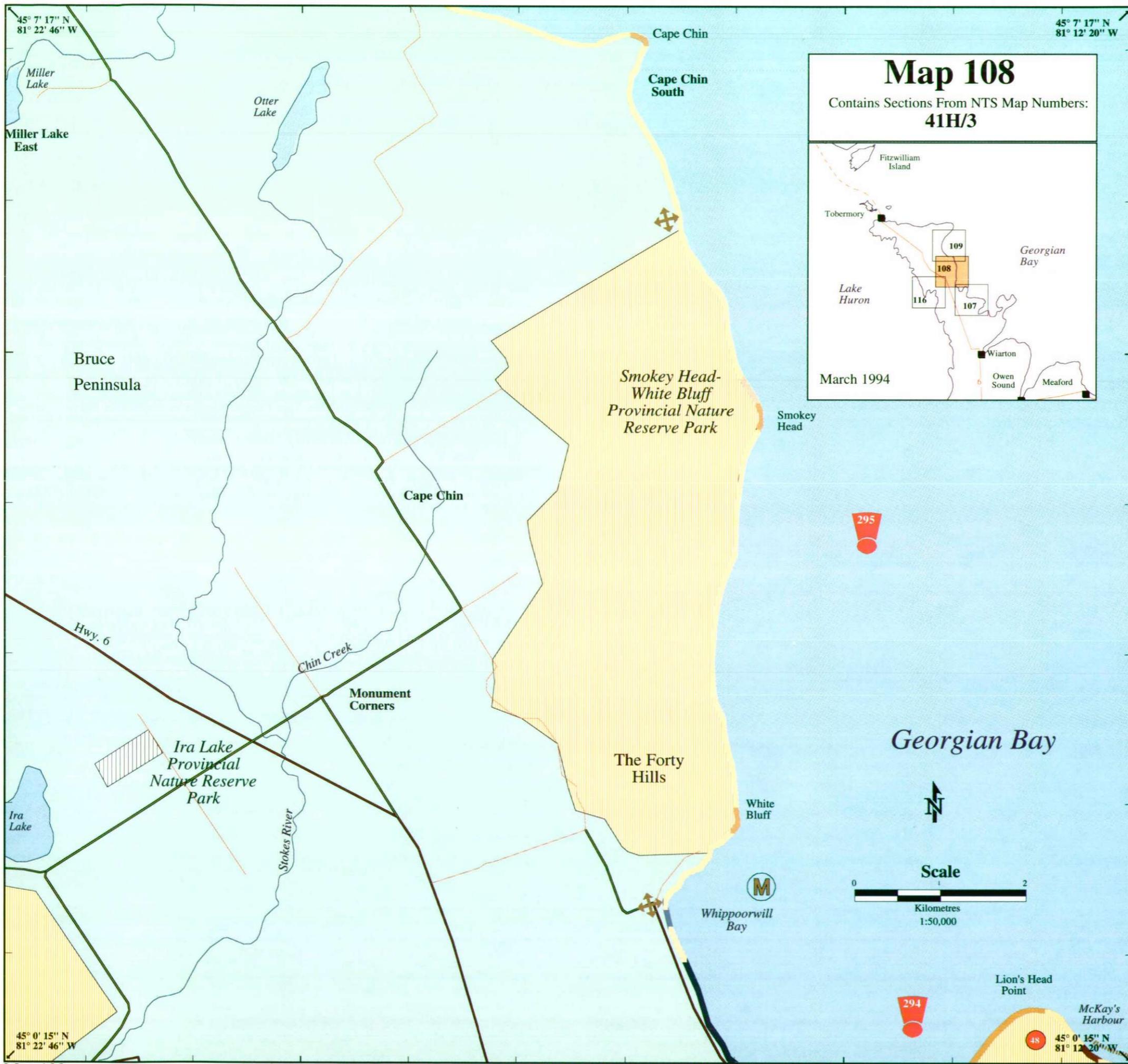
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 
 Hope Bay is a high use recreational and cottage area.
- 
 Hope Bay Forest is classified as an Area of Natural and Scientific Interest. This escarpment is an excellent geological record of past glacial episodes and depicts upland forests and glacial lake features. It is a frequently visited site for scientific and educational purposes. Responders should take care not to damage these formations.
- 
 Lion's Head Water Treatment Plant water intake: Call - (519) 793-3731.
- 
 Lion's Head Promontory is classified as an Area of Natural and Scientific Interest. Significant aspects include bedrock outcropping and glacial lake features depicting previous glacial episodes.

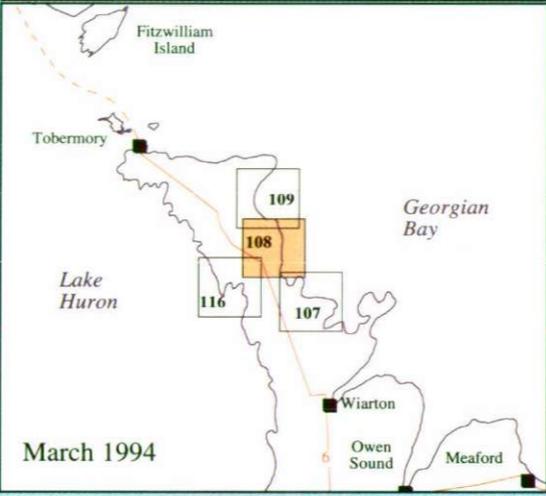


**Map 107**  
 Contains Sections From NTS Map Numbers:  
**41A/14 and 41H/3**

The inset map shows the location of Map 107 (highlighted in yellow) within the Georgian Bay region. It includes map numbers 105, 106, 107, 108, and 117. Key locations marked include Tobermory, Wiarton, Owen Sound, Meaford, and Southampton. The map is dated March 1994.



**Map 108**  
 Contains Sections From NTS Map Numbers:  
**41H/3**



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

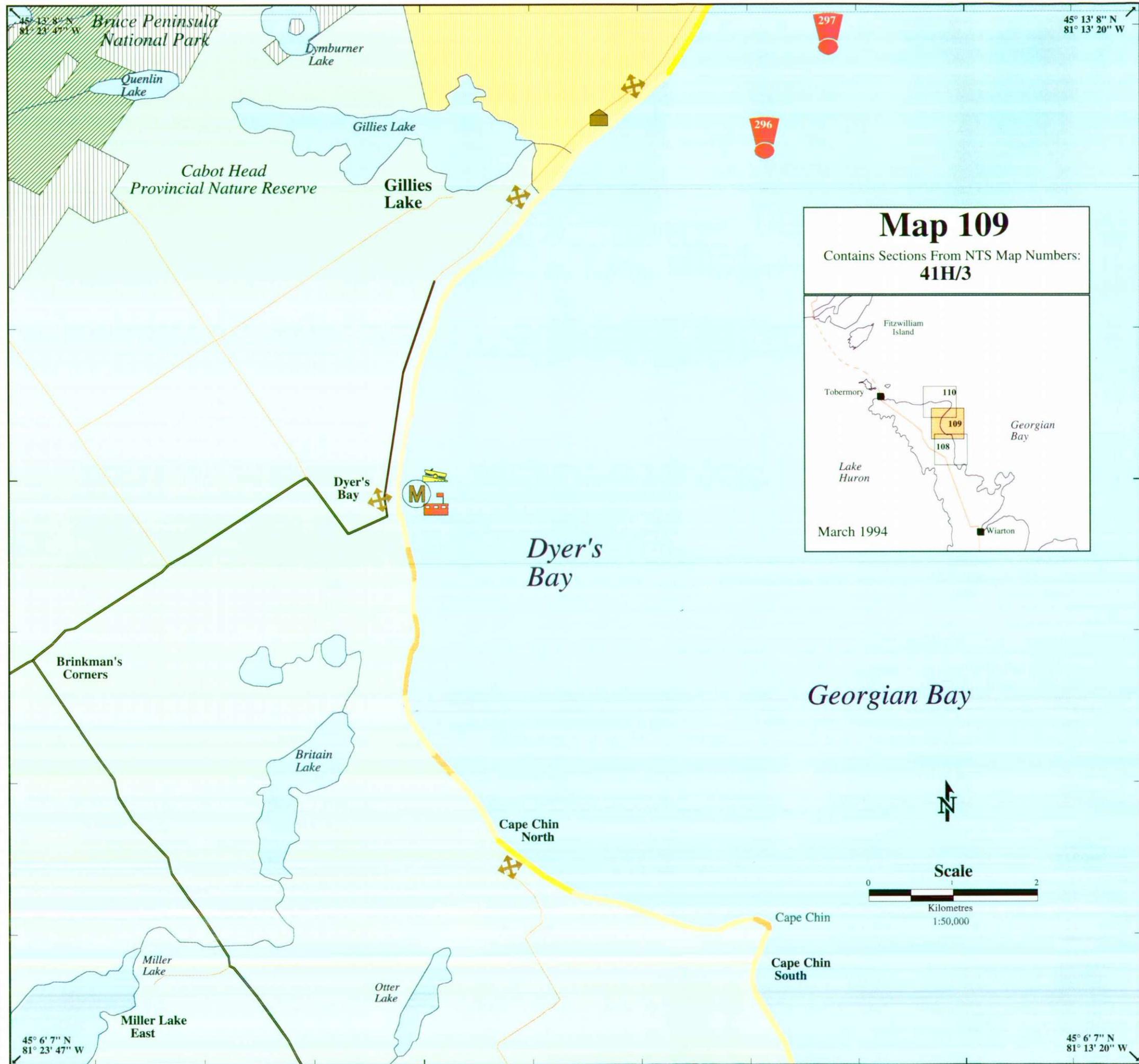
- 294** Lion's Head Promontory is classified as an Area of Natural and Scientific Interest. Significant aspects include bedrock outcropping and glacial lake features depicting previous glacial episodes.
- 295** Smokey Head - White Bluff is classified as an Area of Natural and Scientific Interest. It exhibits a variety of Georgian Bay shoreline habitats.

# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**296** Cabot Head is classified as an Area of Natural and Scientific Interest. It is an extensive escarpment with fossiliferous bedrock depicting geological records. A variety of forests and plants occur here. This area is important for scientific and educational purposes. Responders must take care not to damage these formations.

**297** Bruce Peninsula National Park is comprised of numerous lakes and marshes, a variety of forests and plant species and is bordered by an escarpment along the Georgian Bay shoreline. This is an important recreational area.

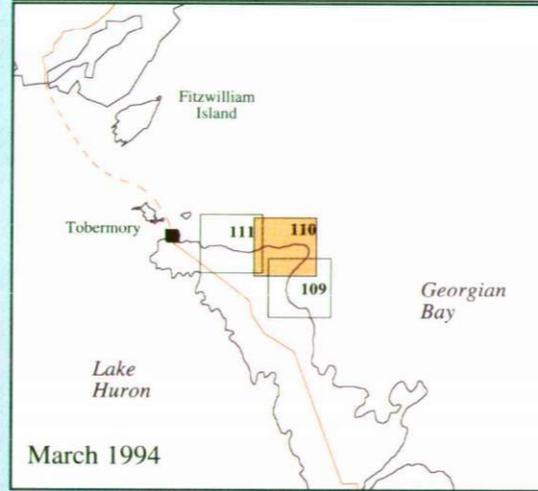


45° 17' 58" N  
81° 26' 15" W

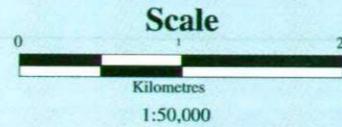
45° 17' 58" N  
81° 15' 48" W

# Map 110

Contains Sections From NTS Map Numbers:  
**41H/3 and 41H/5&6**



## Georgian Bay



- ### NOTES
- A red exclamation point symbol is used on the maps to catch the responder's attention.
  - 296** Cabot Head is classified as an Area of Natural and Scientific Interest. It is an extensive escarpment with fossiliferous bedrock depicting geological records. A variety of forests and plants occur here. This area is important for scientific and educational purposes. Responders must take care not to damage these formations.
  - 297** Bruce Peninsula National Park is comprised of numerous lakes and marshes, a variety of forests and plant species and is bordered by an escarpment along the Georgian Bay shoreline. This is an important recreational area.
  - 298** The Wingfield Basin Wetland is a feeding habitat for colonial waterbirds and waterfowls. It supports fur bearing mammals and is a sheltered anchorage heavily used by recreational boaters.



45° 10' 57" N  
81° 26' 15" W

45° 10' 57" N  
81° 15' 48" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

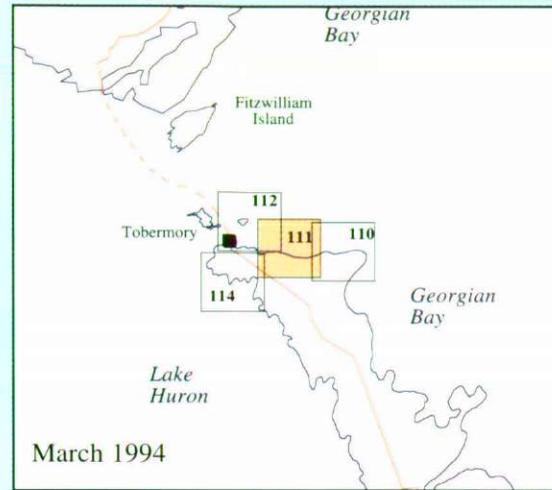
**299** Bruce Peninsula National Park is comprised of numerous lakes and marshes, a variety of forests and plant species and is bordered by an escarpment along the Georgian Bay shoreline. This is an important recreational area.

**300** Little Cove-Cave Point resides within Bruce Peninsula National Park. It is illustrative of typical Georgian Bay shoreline and escarpment bedrock. There are vertical shore cliffs, sea caves, lagoons landlocked by boulder barrier bars, boulder beaches, numerous raised beaches and karst formations. Little Cove is a popular viewing area and access point to the Bruce Trail. This area is important for recreational and educational purposes. Responders must take care not to damage these formations. This region is a candidate nature reserve.

45° 18' 21" N  
81° 35' 8" W

## Map 111

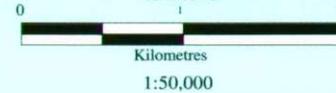
Contains Sections From NTS Map Numbers:  
**41H/3, 41H/4 and 41H/5&6**



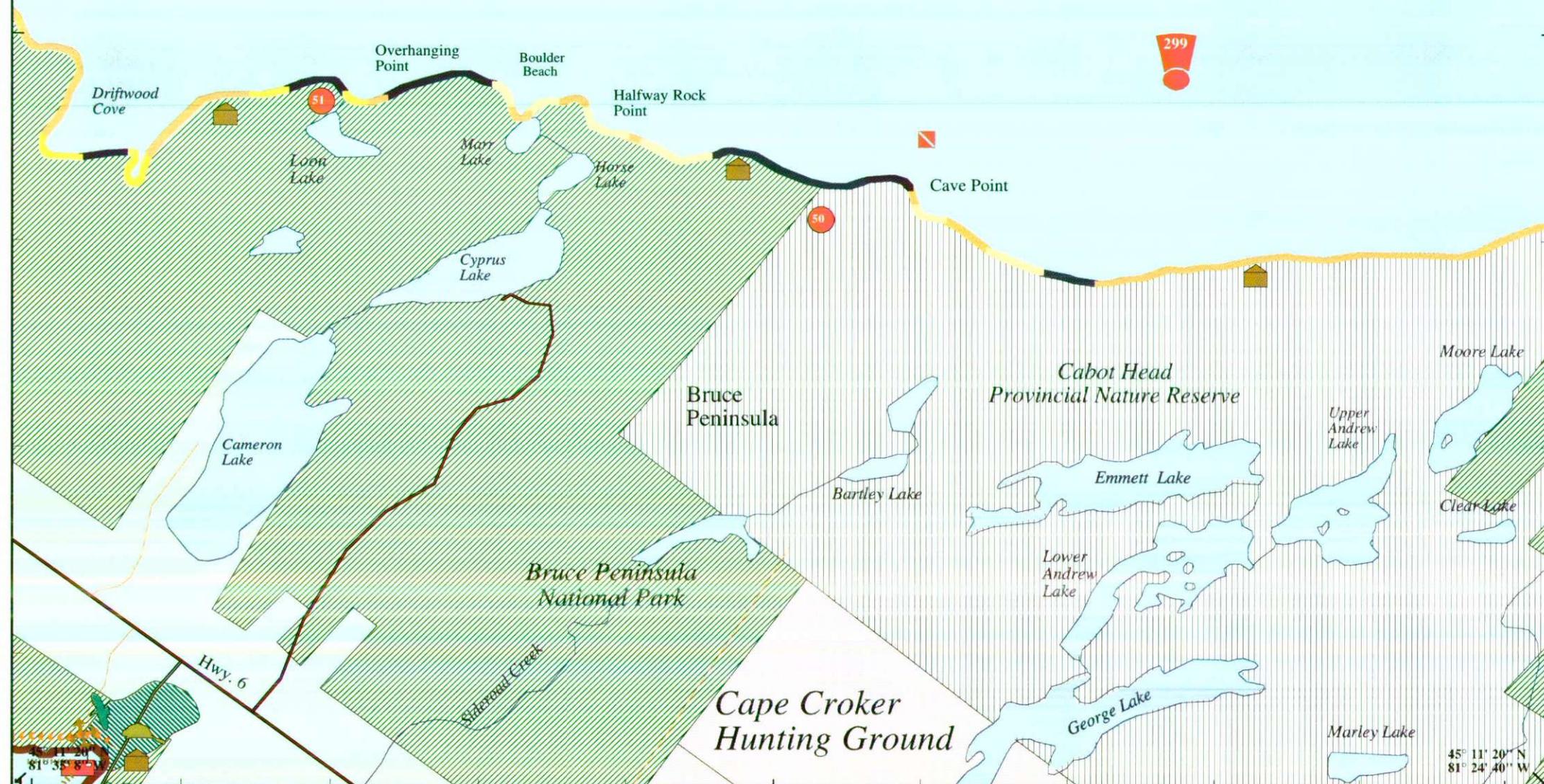
March 1994

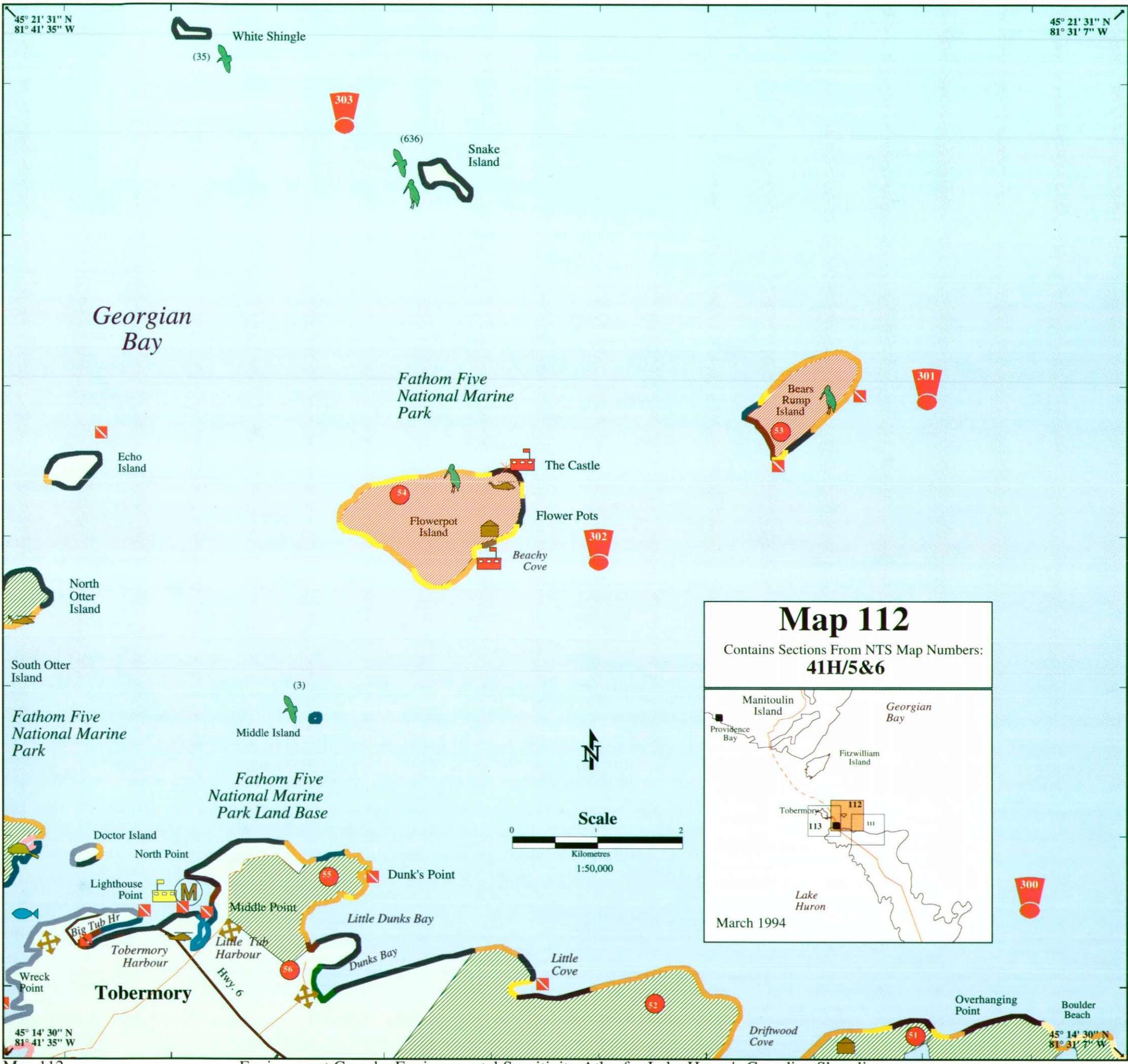


Scale



Georgian Bay





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 300** Little Cove-Cave Point resides within Bruce Peninsula National Park. It is illustrative of typical Georgian Bay shoreline and escarpment bedrock. There are vertical shore cliffs, sea caves, lagoons landlocked by boulder barrier bars, boulder beaches, numerous raised beaches and karst formations. Little Cove is a popular viewing area and access point to the Bruce Trail. This area is important for recreational and educational purposes. Responders must take care not to damage these formations. This region is a candidate nature reserve.
- 301** Bears Rump Island resides within Fathom Five National Marine Park. The island is representative of typical Georgian Bay shoreline with wave cut cliffs, low shelving and forested sloping shores. The wave cut features are the most significant aspect of this area.
- 302** Flowerpot Island resides within Fathom Five National Marine Park. The island is representative of typical Georgian Bay shoreline with wave cut cliffs, low shelving and forested sloping shores. Several rare plant species thrive here. The wave cut features are the most significant aspect of this area. This is an important recreational area and is classified as an Environmentally Sensitive Area.
- 303** Nesting colonial waterbirds occur on Snake Island and White Shingle Island.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**304** Cove Island resides within Fathom Five National Marine Park. It is an excellent representation of Lake Huron shoreline habitat. A low dolomite island containing a mixture of open storm beaches and dense coniferous thickets characterize this island.

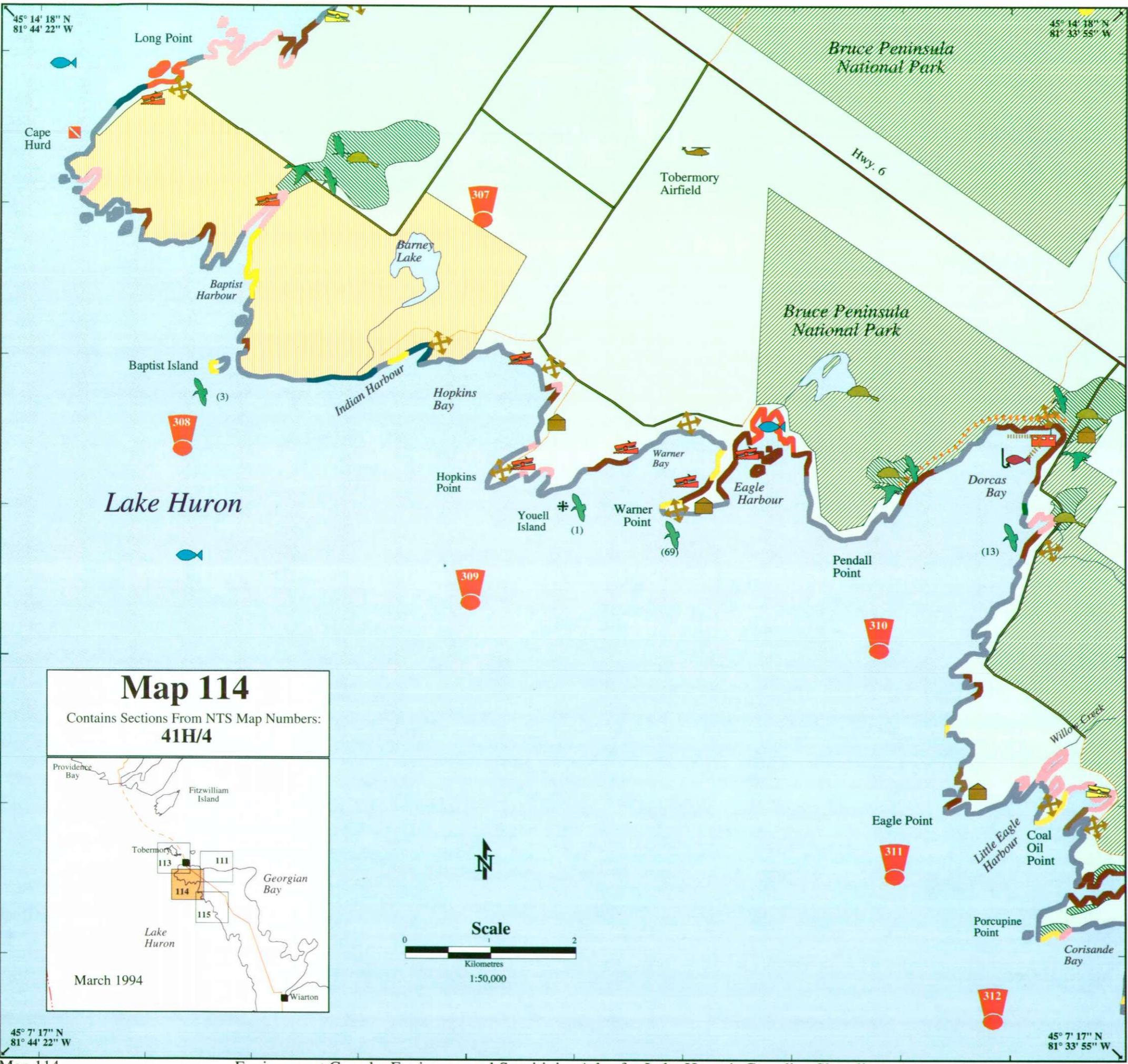
**305** Seasonal fish spawning occurs west of Cove Island in Lake Huron: Lake Trout in October.

**306** Nesting colonial waterbirds occur on islands in MacGregor and Cape Hurd Channels. Seasonal fish spawning occurs in Lake Huron and Cape Hurd Channel: Lake Trout in October and Whitefish in November and December.

45° 20' 15" N  
81° 48' 49" W

45° 20' 15" N  
81° 38' 21" W





### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 307** Barney Lake Wetland is an active feeding area for colonial waterbirds, and provides a habitat for regionally significant raptors and waterfowl production. It supports several fur bearing mammals and provides winter cover for small mammals and birds.
- 308** Cape Hurd - Baptist Island area is classified as an Area of Natural and Scientific Interest. It illustrates habitats typical of Lake Huron rocky shoreline with a high diversity of forest and plant species. It is a candidate nature reserve.
- 309** Nesting colonial waterbirds occur on islands near the Lake Huron shoreline, from Baptist Island to Dorcas Bay. High use recreational cottage dwellings occur along the shoreline of Lake Huron. Seasonal fish spawning occurs in Lake Huron: Lake Whitefish in November and December.
- 310** The Dorcas Bay Wetland is an active feeding area for colonial waterbirds, a production area for waterfowl and is an important migratory passerine location. It supports fur bearing mammals and is provincially significant as a winter cover area for deer. There is a significant dune complex on the Lake Huron shoreline at Dorcas Bay. Commercial fish harvesting and nature appreciation activities are seasonally significant.
- 311** High use recreational cottage dwellings occur along the Lake Huron shoreline from Dorcas Bay to Johnston's Harbour.
- 312** The Corisande Bay Wetland is an active feeding area for colonial waterbirds and staging waterfowls. It supports fur bearing mammals and is provincially significant as a winter cover area for deer. Commercial fish harvesting and recreational hunting are seasonally significant activities. This area is part of the Corisande Bay Area of Natural and Scientific Interest. It has this designation due to a well-developed wetland and forest complex.

## Map 114

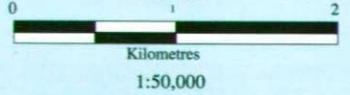
Contains Sections From NTS Map Numbers:  
**41H/4**



March 1994



### Scale



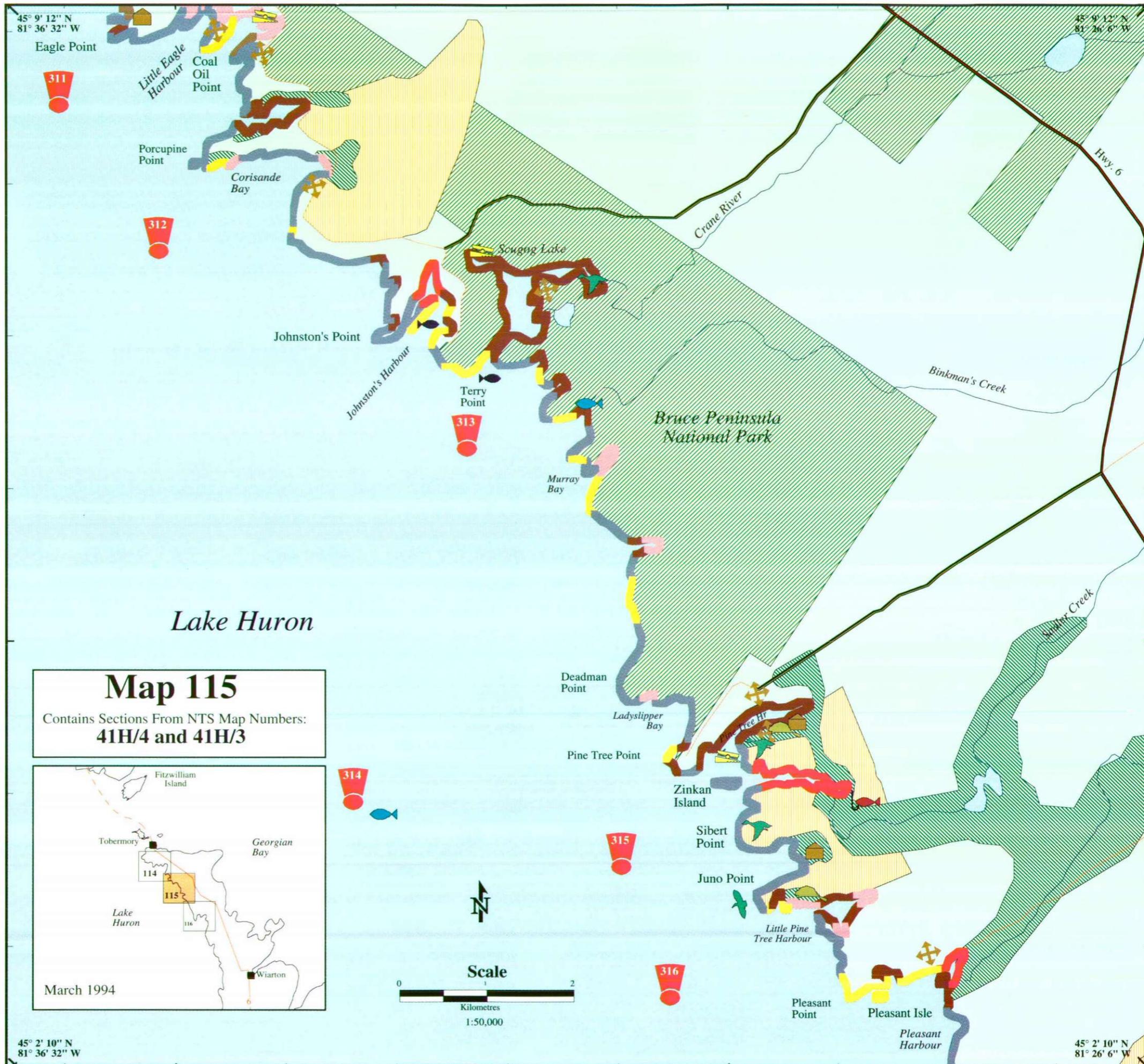
45° 7' 17" N  
81° 44' 22" W

45° 7' 17" N  
81° 33' 55" W

## NOTES

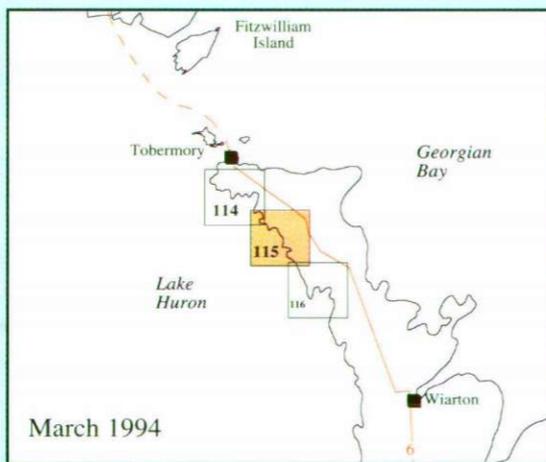
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 311** High use recreational cottage dwellings occur along the Lake Huron shoreline from Dorcas Bay to Johnston's Harbour.
- 312** The Corisande Bay Wetland is an active feeding area for colonial waterbirds and staging waterfowls. It supports fur bearing mammals and is provincially significant as a winter cover area for deer. Commercial fish harvesting and recreational hunting are seasonally significant activities. This area is part of the Corisande Bay Area of Natural and Scientific Interest. It has this designation due to a well-developed wetland and forest complex.
- 313** Scugog Lake is an important waterfowl staging and production area.
- 314** Seasonal fish spawning occurs in Lake Huron: Lake Whitefish in November and December.
- 315** Zinkan Island Cove is classified as an Area of Natural and Scientific Interest. This undeveloped land is a complex of flat bedrock and mixed forests and other plants.
- 316** Sadler Creek Wetland is an active feeding area for colonial waterbirds and it supports waterfowl staging and production. It supports several species of fur bearers and provides a habitat for deer. Commercial fish harvesting, high use hunting and nature appreciation activities are seasonally significant.



## Map 115

Contains Sections From NTS Map Numbers:  
**41H/4 and 41H/3**





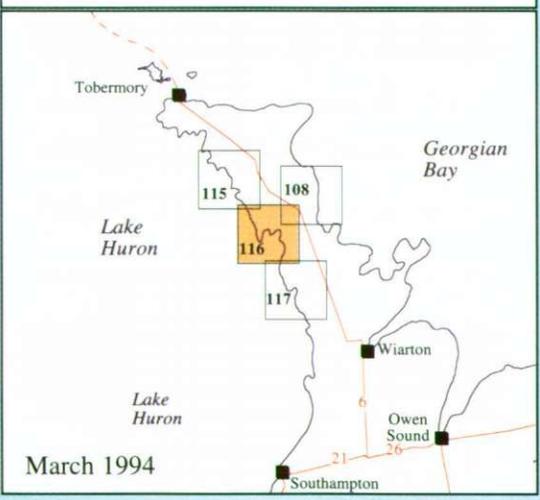
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

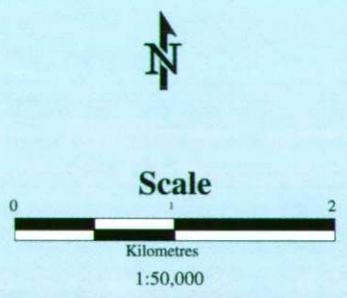
- 317** The Bruce County Forest and Miller Lake / Spring Creek Tract is classified as an Area of Natural and Scientific Interest. There is a mixed forest area with several lakes and marshes.
- 318** Stokes Bay Wetland provides a feeding habitat for colonial waterbirds and supports provincially significant plant species. This wetland is significant as a migratory passerine area and it is a habitat for several fur bearing mammals. Commercial fish harvesting, high use recreational fishing, canoeing, hunting and nature appreciation activities have seasonal significance. Seasonal fish spawning occurs in the Stokes River: Carp in late spring and summer.
- 319** The Greenough Harbour Wetland provides a feeding habitat for wading birds and waterfowls. High use recreational hunting and fishing activities have seasonal importance.
- 320** The Knife Islands, Dane Island and Mad Reef support nesting colonial waterbirds. Approach concerns, which are hazardous to boating activities, exist along the Lake Huron shoreline from Scotch Thistle Point to Stokes Bay and at Lyal Island. Responders should exercise caution when approaching these shorelines.
- 321** The Black Creek Swamp is classified as a Nature Reserve and an Area of Natural and Scientific Interest. It supports several fur bearing mammals, and provides a habitat for colonial waterbirds and waterfowls. High use recreational activities have seasonal significance.
- 322** Numerous residential/cottage dwellings occur along the Lake Huron shoreline from Stokes Bay to Pike Bay.

**Map 116**

Contains Sections From NTS Map Numbers:  
**41H/3 and 41A/14**



March 1994



## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

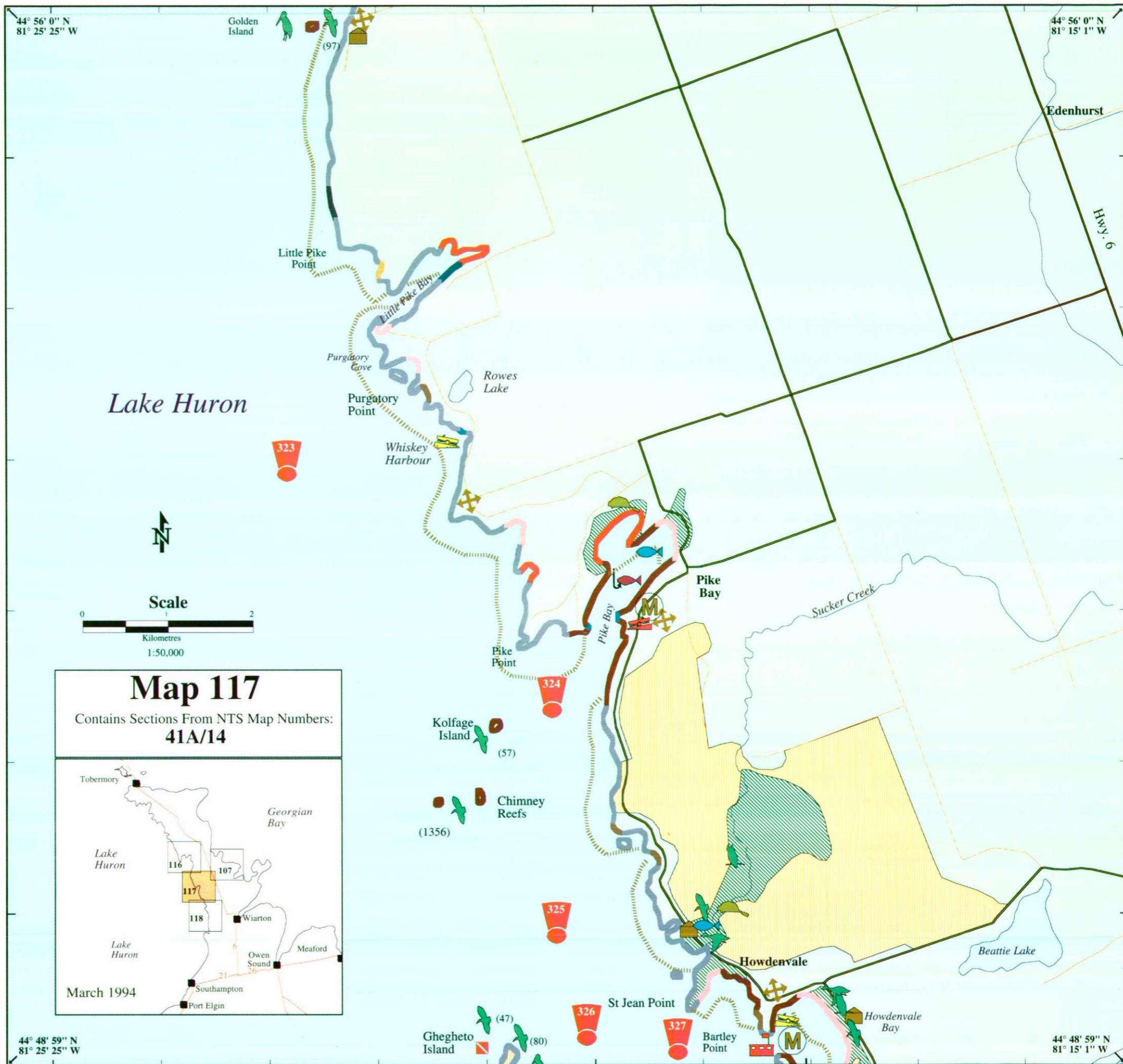
**323** Numerous residential/cottage dwellings occur along the Lake Huron shoreline from Stokes Bay to Pike Bay. Approach concerns along the Lake Huron shoreline are hazardous to boating activities. Responders should exercise caution when approaching the shoreline.

**324** The Pike Bay Wetland supports commercial fish harvesting activities, fur bearing mammals and provides winter cover for deer. It is an important high use recreational fishing area. Pike Bay is a habitat for Smallmouth Bass. Kolfage Island and the Chimney Reefs support nesting colonial waterbirds.

**325** The Sucker Creek Wetland provides a feeding habitat for colonial waterbirds, raptors and waterfowl. It supports several provincially and regionally significant plant species, fur bearing mammals, and migratory passerine activities. This wetland is an important high use recreational hunting area. Sucker Creek Wetland is located within the Sucker Creek Area of Natural and Scientific Interest. This region is an excellent example of a slope and valley bottom forest. The St. Jean's Point Nature Reserve resides in the Sucker Creek Wetland at St. Jean's Point. Sucker Creek is an important fish spawning watercourse: Smallmouth Bass in late Spring.

**326** Numerous residential/cottage dwellings occur along the Lake Huron shoreline from Pike Bay to Stony Point. Responders should be aware of approach concerns near the Lake Huron shoreline.

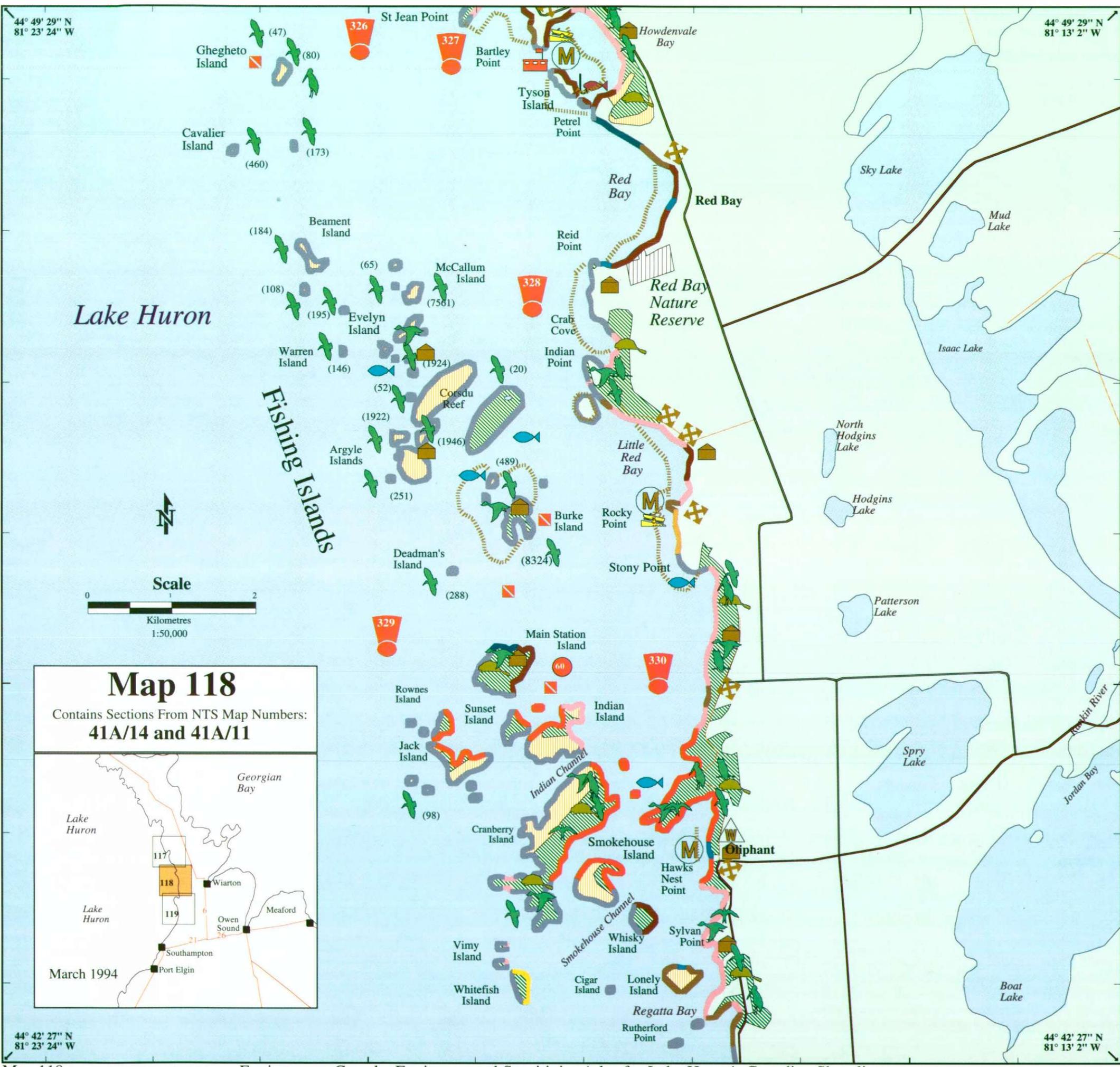
**327** The Howdenvale Wetland supports feeding colonial waterbirds, waterfowl and raptors and provincially significant plant species. It is an important migratory passerine area and provides a habitat for fur bearing mammals. Commercial fish harvesting and high use recreational and educational activities are important. The Howdenvale Wetland is classified as an Area of Natural and Scientific Interest. It is a wet sand plain with representative non-bedrock fens mixed with provincially significant rare plants.



## Map 117

Contains Sections From NTS Map Numbers:  
**41A/14**





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 326** Numerous residential/cottage dwellings occur along the Lake Huron shoreline from Pike Bay to Stony Point. Responders should be aware of approach concerns near the Lake Huron shoreline.
- 327** The Howdenvale Wetland supports feeding colonial waterbirds, waterfowl and raptors and provincially significant plant species. It is an important migratory passerine area and provides a habitat for fur bearing mammals. Commercial fish harvesting and high use recreational and educational activities are important. The Howdenvale Wetland is classified as an Area of Natural and Scientific Interest. It is a wet sand plain with representative non-bedrock fens mixed with provincially significant rare plants.
- 328** The Red Bay Wetland Complex supports feeding colonial waterbirds, raptors and breeding waterfowls. It supports fur bearing mammals and is an important migratory passerine area. Recreational cottage development occurs along the shoreline.
- 329** The Fishing Islands Wetland complex provides a nesting habitat for colonial waterbirds and staging waterfowl. It supports provincially significant plant species and several fur bearing mammals. High use recreational hunting, nature appreciation, fishing and canoeing activities are seasonally important. This is an important Lake Whitefish spawning area. This wetland complex has been designated as an Area of Natural and Scientific Interest due to numerous bedrock exposures and mixed forest vegetation.
- 330** The Oliphant Wetland is classified as a provincially significant wetland. It provides a feeding habitat for provincially significant colonial waterbirds, wading birds, raptors and otters. Both waterfowl staging and production occur here. This wetland is a highly significant migratory shorebird stopover area. It provides a habitat for several fur bearing mammals and is important for recreational fishing, educational and nature appreciation activities. Extensive cottage development occurs along the shoreline.

## NOTES !

A red exclamation point symbol is used on the maps to catch the responder's attention.

**331** ! The Chief's Point Wetland is an active feeding area for colonial waterbirds, staging waterfowl, shorebirds and raptors. It is a refuge for fur bearing mammals and supports provincially significant plant species. This wetland is a significant migratory passerine area and important for high use recreational/cottage activities. The Chief's Point First Nation is located within this wetland. Responders should contact the Chief of the Chief's Point First Nation before commencing response activity in the Area.

**332** ! Sauble Falls is classified as an Area of Natural and Scientific Interest. Significant features include a beach ridge and swale vegetation complex. This area also provides a habitat for raptors.

**333** ! Seasonal fish spawning occurs at the mouth of the Sauble River: Northern Pike in early Spring and Smallmouth Bass in Summer.

**334** ! A large recreational beach area occurs along the Lake Huron shoreline at Sauble Beach.

**335** ! The Lake Huron shoreline of the Saugeen First Nation is a high use recreational area containing beaches and numerous private dwellings. Responders should contact the Chief of the Saugeen First Nation before commencing response activity in the area.

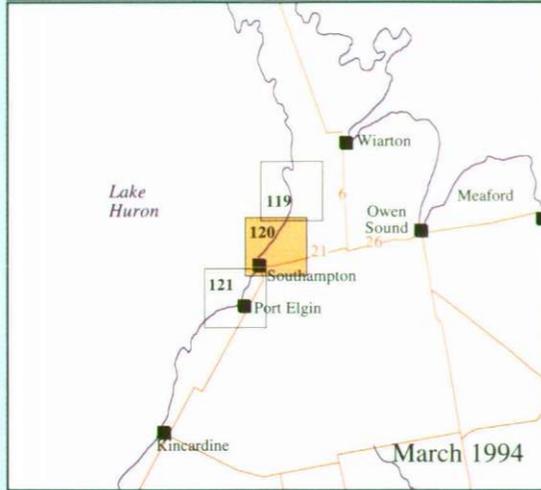


44° 36' 33" N  
81° 24' 59" W

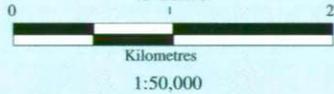
44° 36' 33" N  
81° 14' 39" W

# Map 120

Contains Sections From NTS Map Numbers:  
**41A/11 and 41A/6**



Scale



Lake Huron

Saugeen First Nation

Stoney Creek

Scotch Settlement

Elsinore

Chippawa Hill

Hwy. 21

Saugeen River

Southampton

Chantry Island (6583)

44° 29' 32" N  
81° 24' 59" W

44° 29' 32" N  
81° 14' 39" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**336** The Lake Huron shoreline of the Saugeen First Nation is a high use recreational area containing beaches and numerous private dwellings. Responders should contact the Chief of the Saugeen First Nation before commencing response activity in the area.

**337** Southampton Water Pollution Control Plant water outfall: Call - (519) 797-2238. The Saugeen River is an important fish spawning and migration watercourse: Rainbow Trout and White Sucker spawn in the Spring, Smallmouth Bass spawns in late Spring, Carp in the Summer and Chinook Salmon in the Fall.

**338** Chantry Island is classified as an Environmentally Sensitive Area. This is a significant migratory bird sanctuary. Numerous recreational dive sites occur near Chantry Island. Responders should take care not to cause damage in this area.

## NOTES

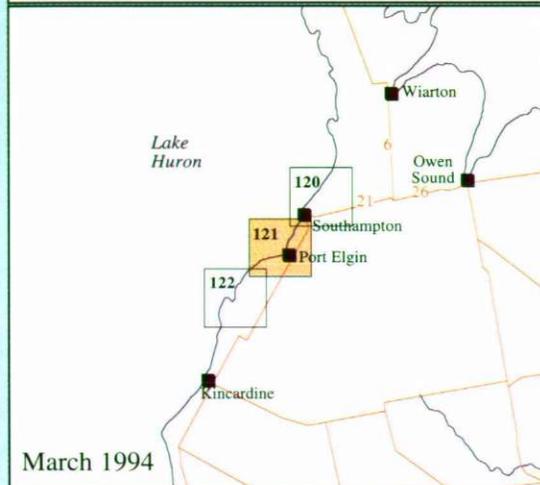
A red exclamation point symbol is used on the maps to catch the responder's attention.

-  **338** Chantry Island is classified as an Environmentally Sensitive Area. This is a significant migratory bird sanctuary. Numerous recreational dive sites occur near Chantry Island. Responders should take care not to cause damage in this area.
-  **339** Southampton Water Treatment Plant water intake: Call - (519) 797-2238.
-  **340** Numerous recreational beaches, private dwellings and cottages occur along the Lake Huron shoreline from Queen's Bush Beach to Saugeen Beach.
-  **341** Seasonal fish spawning occurs in Lake Huron: Walleye and Northern Pike in the Spring. Commercial and sport fishing activities have seasonal significance.
-  **342** MacGregor Point Provincial Park water intake: Call - (519) 389-9056.
-  **343** The MacGregor Point Wetland provides a feeding habitat for colonial waterbirds and raptors, supports staging and production activities for waterfowl and is a significant migratory passerine area. This wetland is provincially significant. It offers deer winter cover and numerous rare plants. High use recreational hunting, nature appreciation and educational visits are important activities. It supports several fur bearing mammals. The MacGregor Point Wetland is part of the MacGregor Point Environmentally Sensitive Area and Provincial Park. This is a significant Raptor migratory and feeding area. Numerous sand dunes occur along the Lake Huron shoreline. Responders must take care not to damage these formations.
-  **344** Numerous beaches, private dwellings and recreational cottages occur along the Lake Huron shoreline from MacGregor Point to Scott Point. Brucedale Conservation Area is an important high use recreational campsite area.

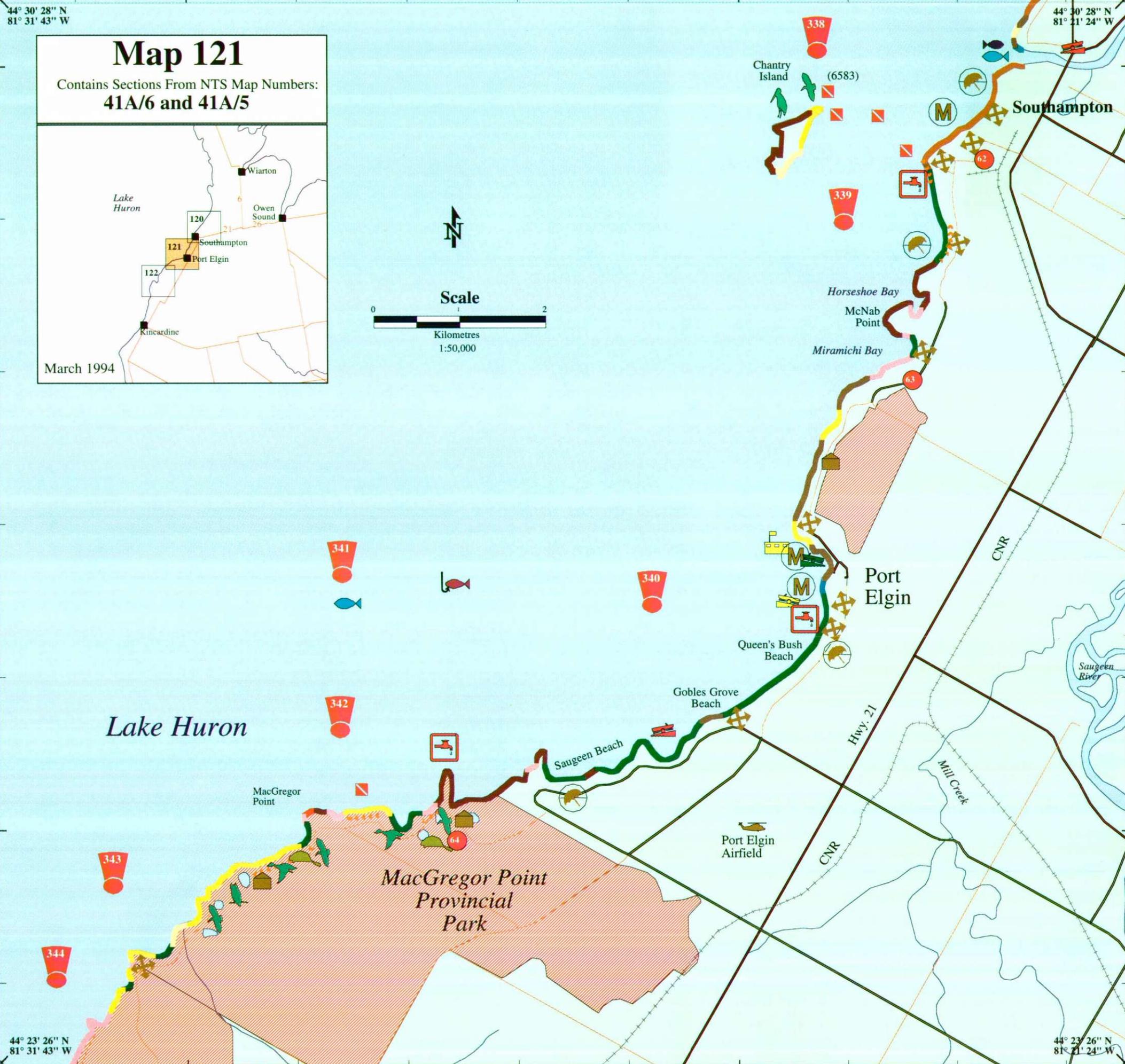
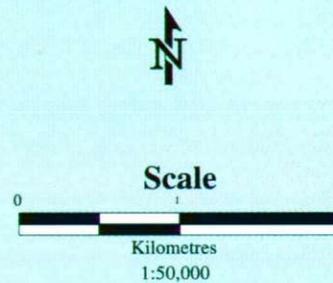
44° 30' 28" N  
81° 31' 43" W

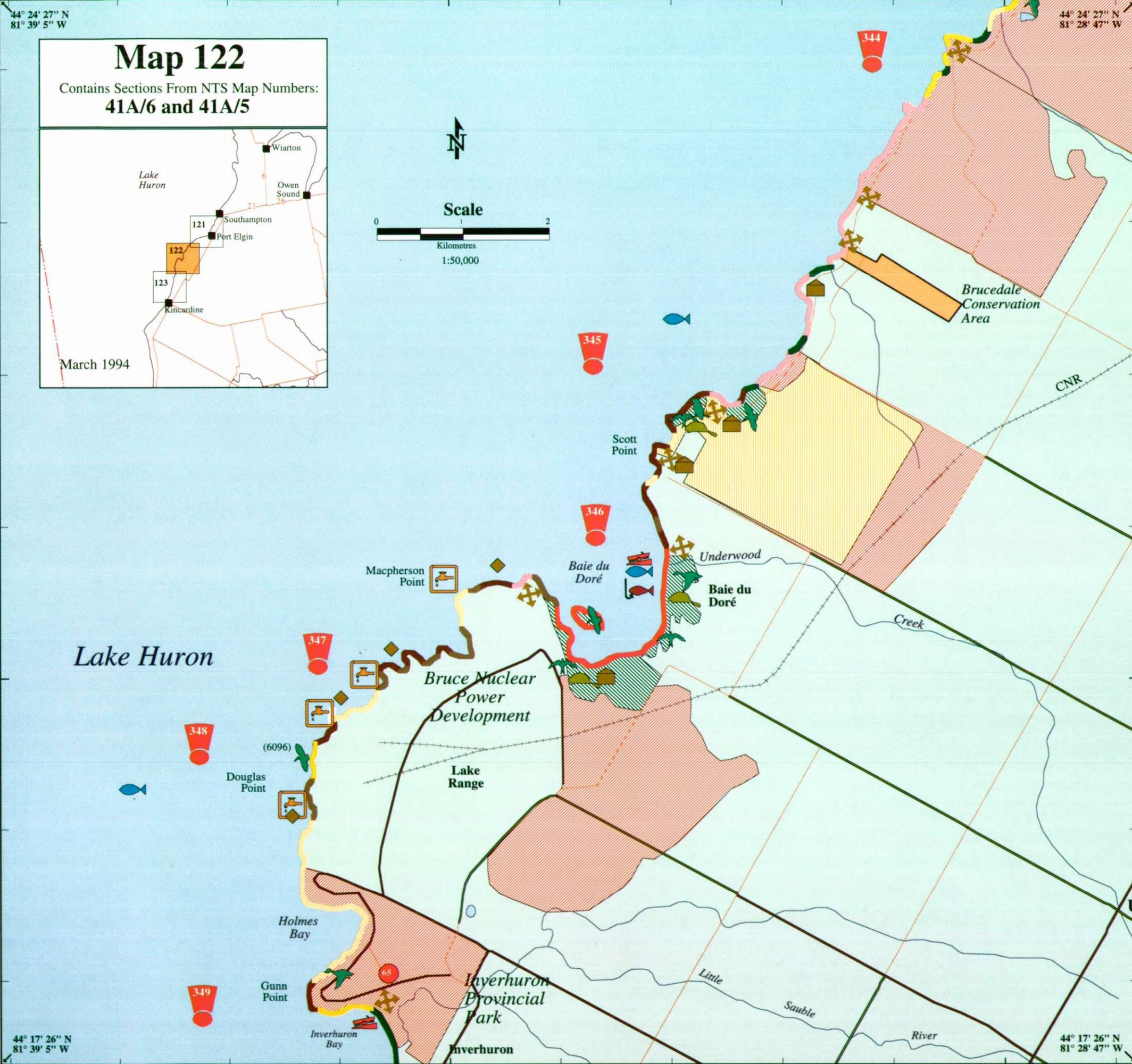
## Map 121

Contains Sections From NTS Map Numbers:  
**41A/6 and 41A/5**



March 1994





### NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 344** Numerous beaches, private dwellings and recreational cottages occur along the Lake Huron shoreline from MacGregor Point to Scott Point. Bruce Conservation Area is an important high use recreational campsite area.
- 345** Scott Point Wetland complex supports waterbirds, waterfowl and raptors. It provides a variety of plant species, supports a habitat for fur bearing mammals, it is a significant shorebird migratory passerine area and is a significant deer winter cover region. Recreational hunting is seasonally significant. Scott Point is classified as a Area of Natural and Scientific Interest and an Environmentally Sensitive Area. It is one of the largest relatively undisturbed shoreline and backshore areas on Lake Huron and contains a variety of vegetation types, cobble shores and sand dunes. Responders should take care not to damage these formations. It is a candidate nature reserve.
- 346** Baie du Dore Wetland is a habitat for waterbirds, waterfowl and shorebirds. It is a migratory passerine area, provides a habitat for fur bearing mammals and is important for commercial fish harvesting and recreational activities. Seasonal fish spawning occurs in Underwood Creek: Rainbow Trout and White Sucker in the Spring, Carp in the Summer and Chinook Salmon in the Fall.
- 347** Ontario Hydro's Bruce Nuclear and Douglas Point Nuclear Station water intakes and outfalls: Call - (519) 361-2673.
- 348** Seasonal fish spawning occurs in Lake Huron: Walleye and Northern Pike in the Spring. Commercial and sport fishing activities have seasonal significance.
- 349** Inverhuron Provincial Park is classified as an Environmentally Sensitive Area. It supports waterfowl and numerous rare flora.

## NOTES !

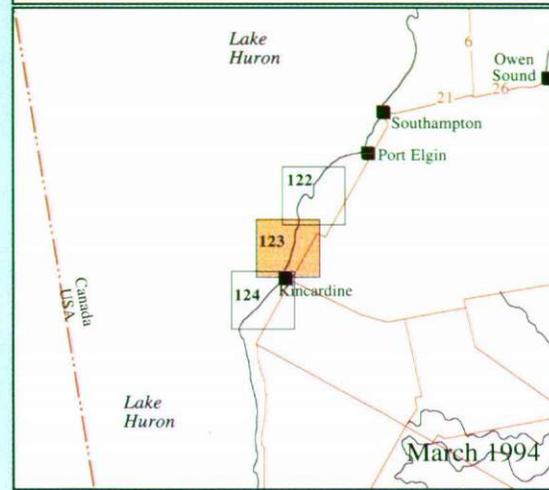
A red exclamation point symbol is used on the maps to catch the responder's attention.

- 349** ! Inverhuron Provincial Park is classified as an Environmentally Sensitive Area. It supports waterfowl and numerous rare flora.
- 350** ! Numerous beaches, private dwellings and recreational cottages occur along the shoreline from Gunn Point to south of McRae Point.
- 351** ! Seasonal fish spawning occurs in Lake Huron: Walleye and Northern Pike in the Spring. Commercial and sport fishing activities have seasonal significance.
- 352** ! Lorne Beach is classified as an Environmentally Sensitive Area. It is a conservation area containing some wetlands.
- 353** ! Private dwellings, recreational cottages and beaches occur along the Lake Huron shoreline from Lorne Beach to Kincardine Harbour.

44° 18' 11" N  
81° 43' 12" W

# Map 123

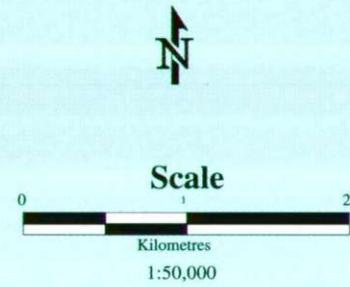
Contains Sections From NTS Map Numbers:  
**41A/5 and 41A/4**



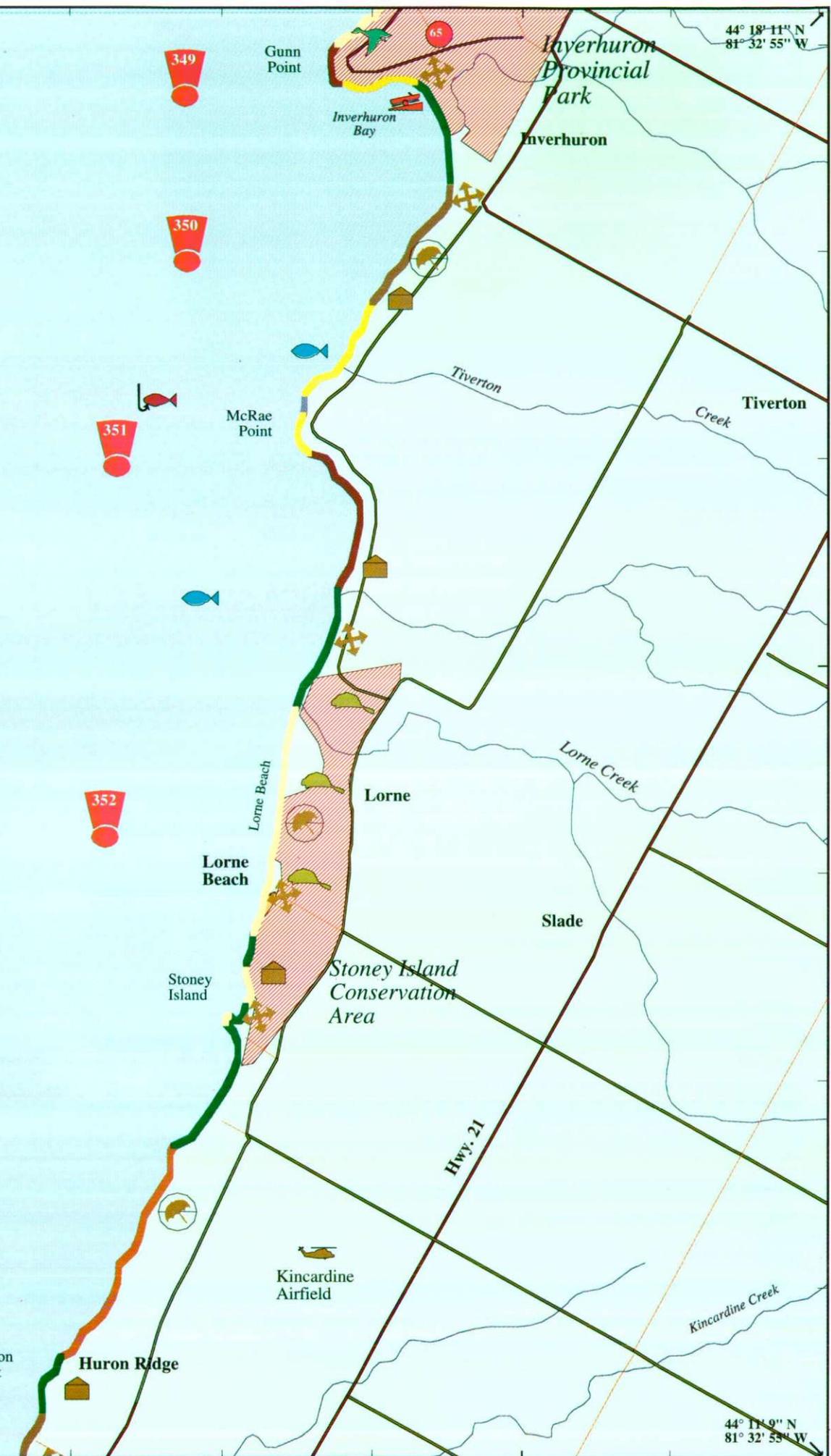
44° 11' 9" N  
81° 43' 12" W

44° 18' 11" N  
81° 32' 55" W

44° 11' 9" N  
81° 32' 55" W



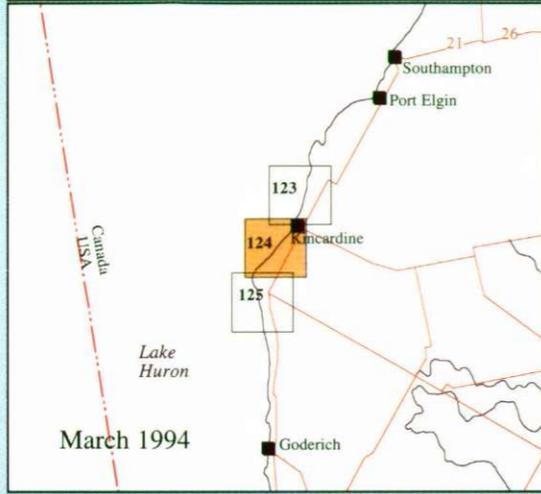
Lake Huron



44° 11' 59" N  
81° 47' 14" W

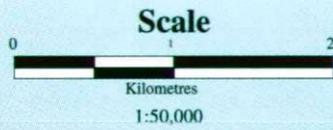
# Map 124

Contains Sections From NTS Map Numbers:  
41A/4



44° 11' 59" N  
81° 36' 59" W

## Lake Huron



44° 4' 58" N  
81° 47' 14" W

44° 4' 58" N  
81° 36' 59" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**353** Private dwellings, recreational cottages and beaches occur along the Lake Huron shoreline from Lorne Beach to Kincardine Harbour.

**354** Kincardine Water Treatment Plant water intakes: Call - (519) 396-3471. Numerous recreational dive sites occur at Kincardine Harbour. Responders must take care not to cause damage in this area.

**355** Kincardine Water Pollution Control Plant water outfall: Call - (519) 396-3471. Numerous recreational dive sites occur near the Lake Huron shoreline opposite Boiler Beach.

**356** Seasonal fish spawning occurs in streams connecting to Lake Huron: White Sucker in Spring. Commercial and sport fishing activities are seasonally significant in Lake Huron.

**357** Recreational cottages, homes and beaches occur along the Lake Huron shoreline from Kincardine Harbour to Bruce Beach.

**358** Recreational cottages, homes and beaches occur along the Lake Huron shoreline from Bruce Beach to Amberley Beach.

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**358** Recreational cottages, homes and beaches occur along the Lake Huron shoreline from Bruce Beach to Amberley Beach.

**359** Seasonal fish spawning occurs in streams connecting to Lake Huron: White Sucker in Spring. Point Clark is a high use recreational park situated on Federal Government land.

**360** The Eighteen Mile South Shorecliff is an Area of Natural and Scientific Interest. This area represents the only substantially continuous and undisturbed length of Lake Huron shorecliff in this region. Features include a steep clay bluff under a tree canopy dominated by Eastern White Cedar.

**361** High use recreational beaches occur along the Lake Huron shoreline from Amberley Beach to Kintail Beach.

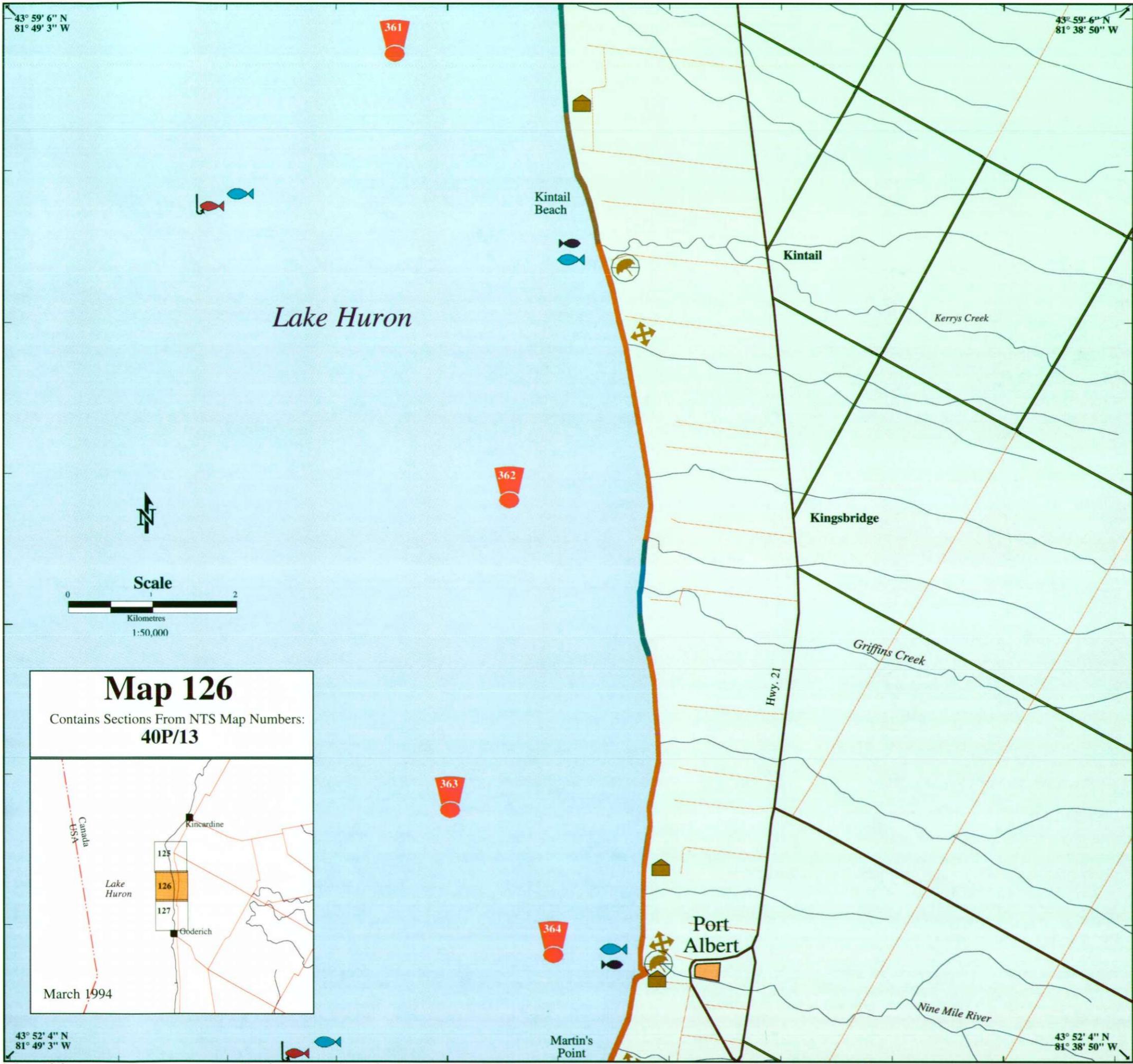


**Map 125**  
 Contains Sections From NTS Map Numbers:  
**41A/4 and 40P/13**

Southampton  
 Port Elgin  
 Kincardine  
 Goderich

Canada  
 USA  
 Lake Huron

March 1994



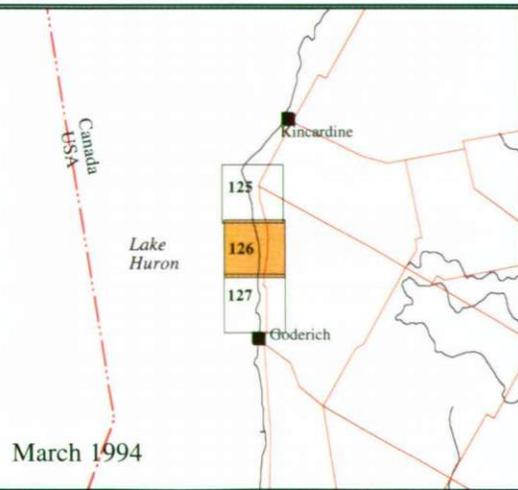
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 361** High use recreational beaches occur along the Lake Huron shoreline from Amberley Beach to Kintail Beach.
- 362** Recreational cottages and homes occur along the Lake Huron shoreline from Kintail Beach to Martin's Point.
- 363** Seasonal fish spawning occurs in streams connecting to Lake Huron: Walleye, White Sucker and Yellow Perch in Spring, Smallmouth Bass in Summer and Chinook Salmon in the Fall.
- 364** Port Albert is an important area supporting recreational beach and fishing activities. A Ministry of Natural Resources fish ladder also occurs here.

**Map 126**

Contains Sections From NTS Map Numbers:  
**40P/13**



# NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

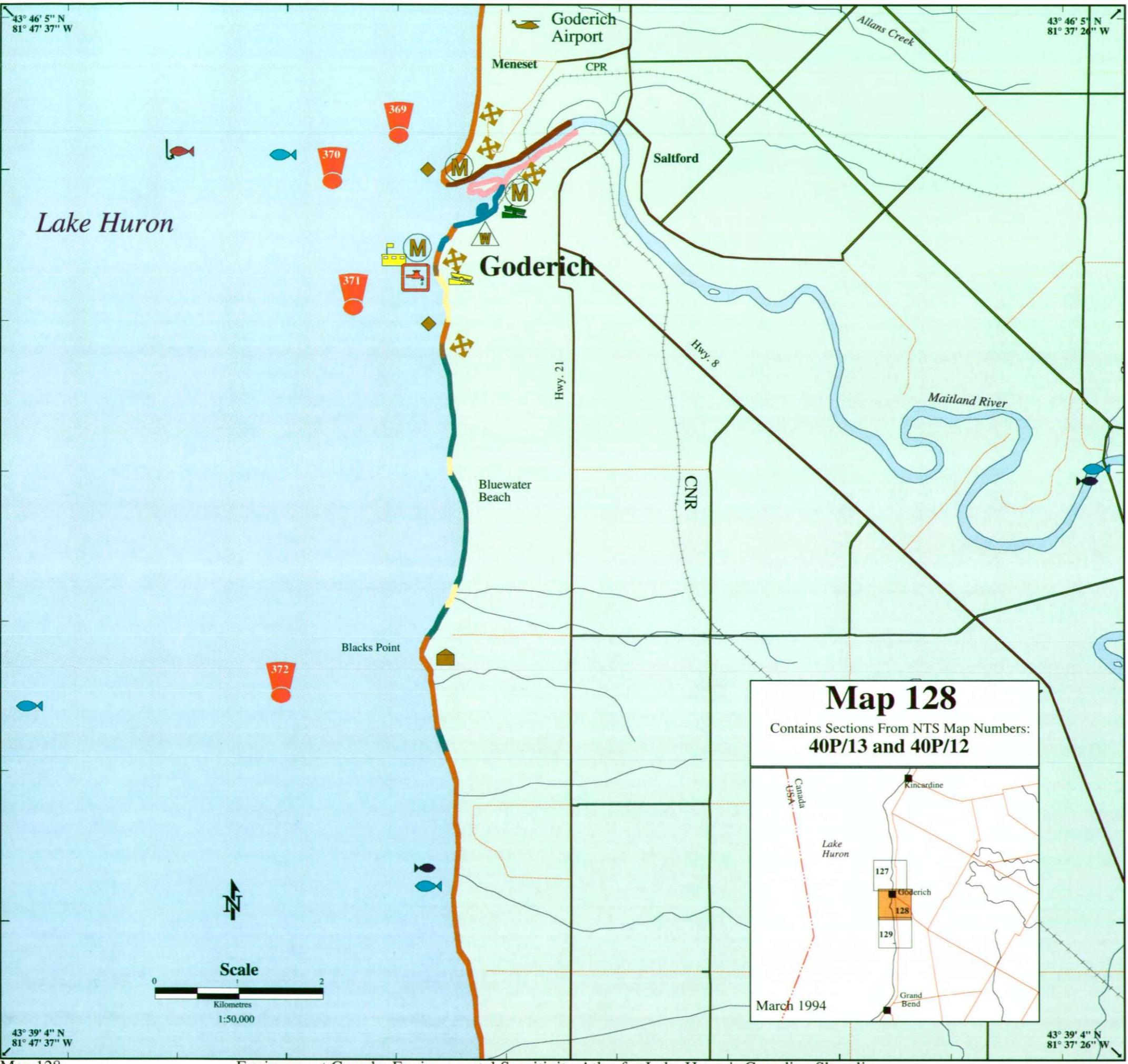
**365** Recreational cottages and homes occur along the Lake Huron shoreline from Martin's Point to Bogies Beach.

**366** Point Farms Provincial Park is an important recreational and educational area.

**367** Seasonal fish spawning occurs in streams connecting to Lake Huron: Walleye, White Sucker and Yellow Perch in Spring, Smallmouth Bass in Summer and Chinook Salmon in the Fall.

**368** Recreational cottages and beaches occur along the Lake Huron shoreline at Bogies Beach and Sunset Beach.





**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 369** Seasonal fish spawning occurs in Lake Huron, near Goderich: Longnose Sucker in Spring. The Maitland River and associated creeks are important Rainbow Trout, Brown Trout and Smallmouth Bass spawning and migration watercourses: Rainbow Trout spawns in the Spring, Smallmouth Bass spawns in late Spring and Brown Trout spawns in the Fall.
- 370** Domtar Incorporated/Sifto Salt Industrial water outfall: Call - (800) 387-8580 or (519) 524-8351.
- 371** Goderich Water Treatment Plant water intake and Water Pollution Control Plant water outfall: Call - (519) 524-6583.
- 372** Recreational cottages and homes occur along the Lake Huron shoreline from Bayfield to Goderich. Seasonal fish spawning occurs in Lake Huron between Goderich and Bayfield: Walleye and Yellow Perch in Spring and Lake Whitefish in late Fall.

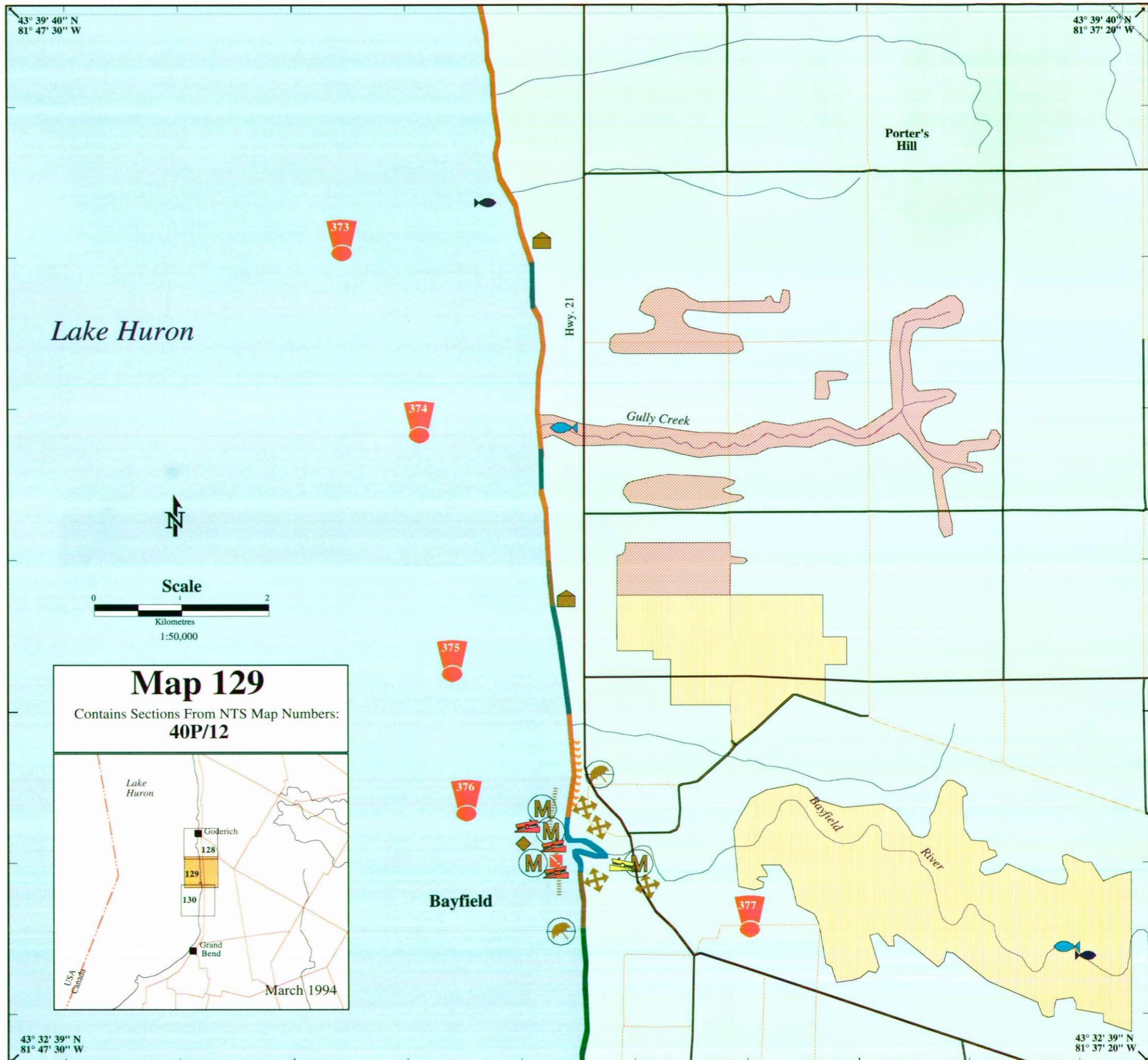
**Map 128**  
 Contains Sections From NTS Map Numbers:  
**40P/13 and 40P/12**

March 1994

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

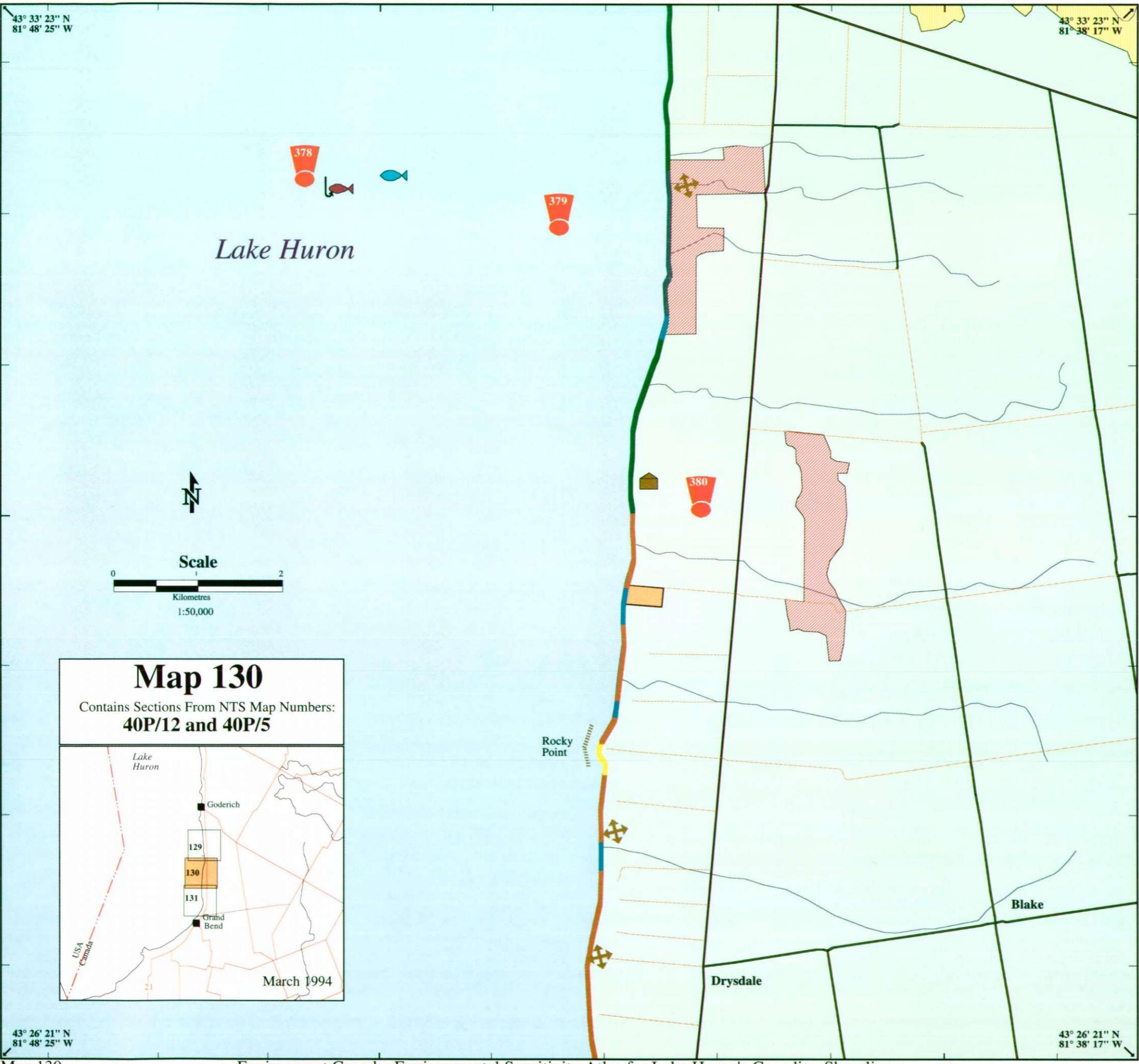
- 373** Recreational cottages and homes occur along the Lake Huron shoreline from Goderich to Bayfield. Seasonal fish spawning occurs in Lake Huron between Goderich and Bayfield: Walleye and Yellow Perch in Spring and Lake Whitefish in late Fall.
- 374** Gully Creek watershed is classified as an Environmentally Sensitive Area. The Creek is an important salmonoid watercourse. This area contains a great diversity of ecological communities including a wetland supporting dense cattail and sedge growth. Numerous small Environmentally Sensitive Areas occur near Gully Creek. A large variety of vegetative species thrive here, many of which are representative of Central Huron County.
- 375** The Bayfield North Life Science area is an Area of Natural and Scientific Interest. Bayfield North represents the best example of a relatively undisturbed upland woodlot in this region and also provides a habitat for several species of rare flora.
- 376** Bayfield is an important recreational and commercial area. Recreational cottages, beaches and marinas occur near the mouth of the Bayfield River. The Bayfield River and associated creeks is an important Rainbow Trout and Smallmouth Bass spawning and migration watercourse.
- 377** The Bayfield River Life Science Area is an Area of Natural and Scientific Interest. Bayfield River is a good example of a valley system illustrating a good diversity of valley rims, slopes, open and forested flood plains, and river bank vegetation.



**Map 129**  
 Contains Sections From NTS Map Numbers:  
**40P/12**

USA Canada

March 1994



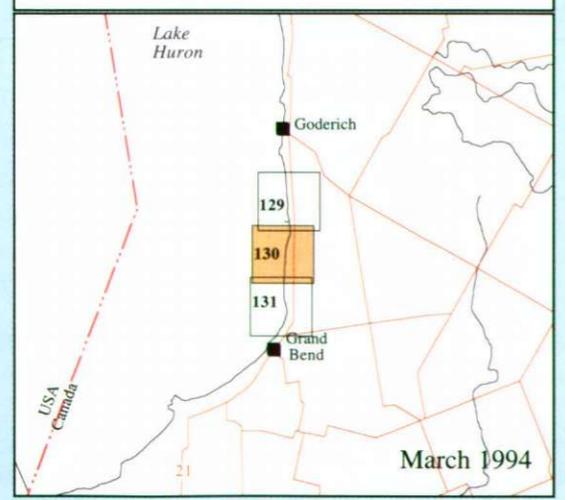
**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 378** Seasonal fish spawning occurs in Lake Huron, south of Bayfield: Walleye and Yellow Perch in Spring and Lake Whitefish in late Fall.
- 379** A large wooded area occurs along the Lake Huron shoreline. It is important due to a large expanse of woodland surface water storage capabilities and contains some wetlands. It is classified as an Environmentally Sensitive Area.
- 380** This large wooded area is classified as an Environmentally Sensitive Area because it supports a wide variety of tree species.

**Map 130**

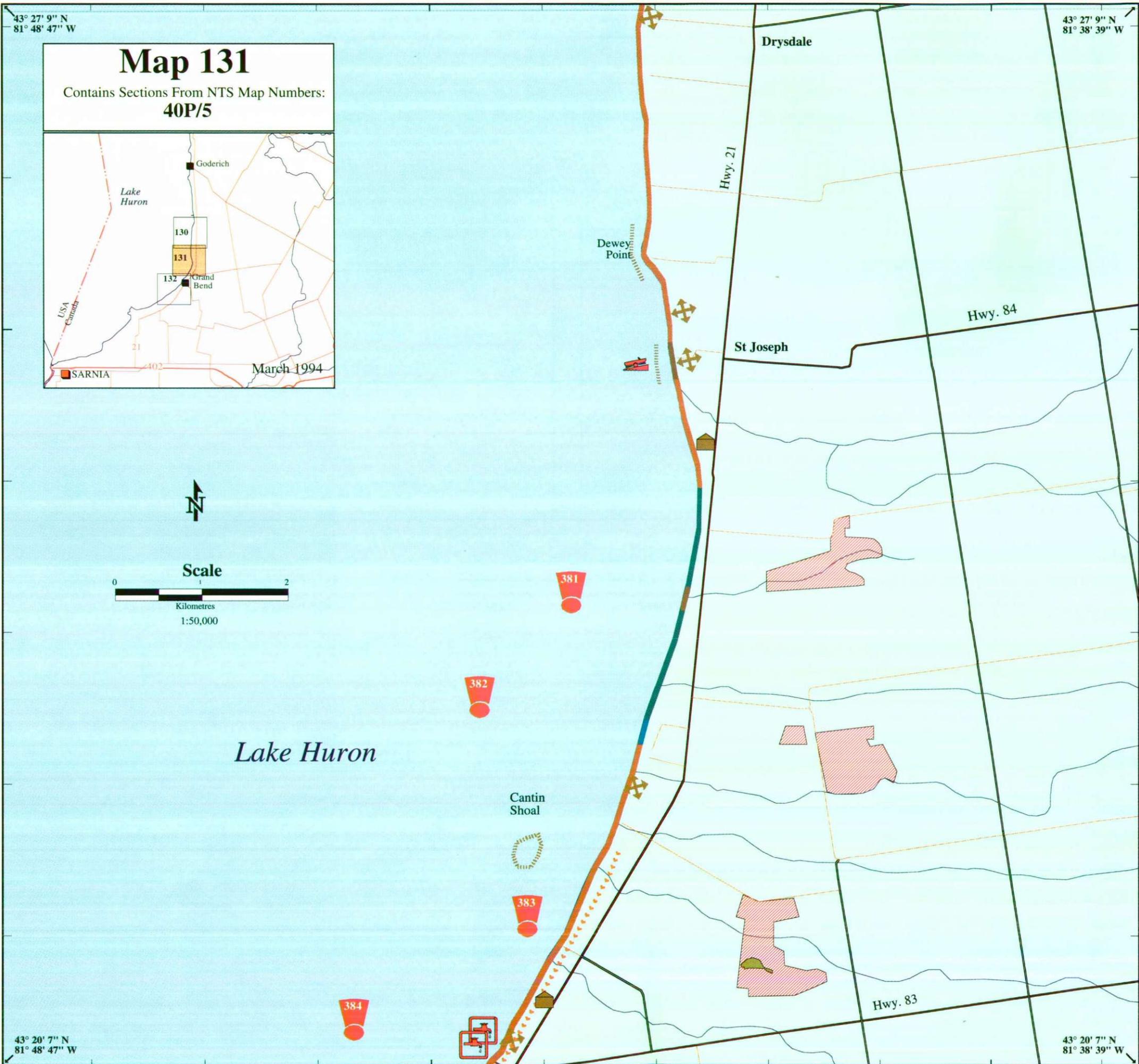
Contains Sections From NTS Map Numbers:  
**40P/12 and 40P/5**



**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

- 381** Several Environmentally Sensitive Areas occur adjacent to the Lake Huron shoreline. Several species of trees thrive here, including those which are consistent with wetland habitats.
- 382** Numerous houses and recreational cottages occur along the Lake Huron shoreline from Dewey Point to the Port Blake Conservation Area.
- 383** This Environmentally Sensitive Area supports numerous species of trees, including numerous wetland varieties. This region is an important red fox habitat.
- 384** Lake Huron Water Service System water intakes: Call - (519) 238-8466.

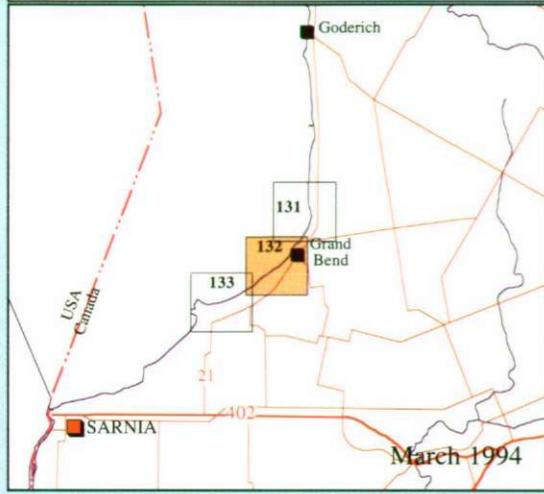


43° 20' 42" N  
81° 53' 17" W

43° 20' 42" N  
81° 43' 11" W

# Map 132

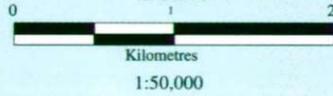
Contains Sections From NTS Map Numbers:  
**40P/5 and 40P/4**



## Lake Huron



Scale



The Pinery  
Provincial  
Park

The Pinery  
Provincial  
Park

The Pinery  
Provincial  
Park

Walker Woods

Grand  
Bend

Southcott  
Pines

Beach  
O'Pines

The Pinery  
Provincial  
Park

Old Ausable Channel

Ausable River

Port Blake  
Conservation  
Area

43° 13' 41" N  
81° 43' 11" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**384** Lake Huron Water Service System water intakes: Call - (519) 238-8466.

**385** Numerous houses and recreational cottages occur along the Lake Huron shoreline from Dewey Point to the Port Blake Conservation Area.

**386** Seasonal fish spawning occurs in Lake Huron near Grand Bend: Walleye and Yellow Perch in Spring and Lake Whitefish in late Fall. High use recreational beaches occur along the Lake Huron shoreline from the Port Blake Conservation Area to Pinery Provincial Park.

**387** An Environmentally Sensitive Area adjacent to the Lake Huron shoreline supports numerous species of trees, including numerous wetland varieties near the Old Ausable Channel. The Environmentally Sensitive Area contributes to water storage and the existing vegetation stabilizes the banks of the old river bed.

**388** The Pinery Provincial Park is an important recreational and educational area. There are several areas of cultural significance that must not be disturbed. An extensive dune formation creates parallel ridges throughout the entire park. Responders must take care not to cause damage in this area.

**NOTES**

A red exclamation point symbol is used on the maps to catch the responder's attention.

**389** Numerous private dwellings, commercial buildings and recreational cottages occur along the Lake Huron shoreline at Port Franks. Seasonal fish spawning occurs in Lake Huron near Port Franks: Walleye and Yellow Perch in Spring and Lake Whitefish in late Fall.

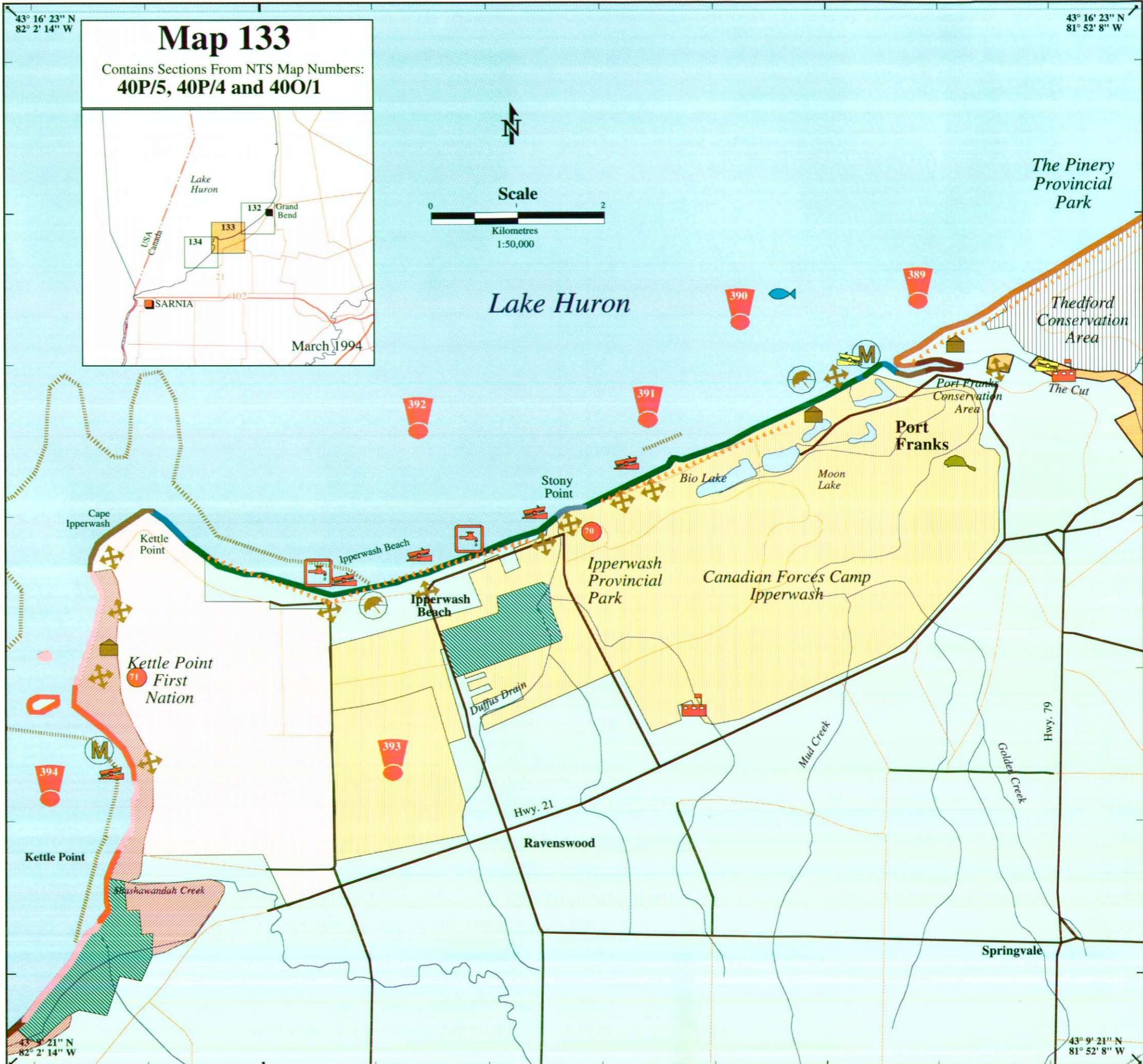
**390** Port Franks Wetlands and Forested Dunes are classified as an Area of Natural and Scientific Interest. It is a diverse coastal dune sequence featuring well developed wetland communities and a series of wooded dunes. This area supports provincially significant plants and rare butterfly populations and is a candidate nature reserve.

**391** Canadian Forces Camp Ipperwash. Responders should receive permission from the base commander before commencing response activities: Call - (519) 786-2375.

**392** Ipperwash Beach is a high use recreational beach. A water intake occurs at Stony Point servicing Camp Ipperwash and Ipperwash Provincial Park: Call - (519) 786-2375.

**393** Ipperwash Inner-Dunal Wetland complex is comprised of semi-open and forested sand ridges and a variety of interridge wetlands. Responders must take care not to cause damage in this area. Ravenswood Earth Science Area is an Area of Natural and Scientific Interest due to alternating ridges of dunes parallel to the shoreline and the wetlands.

**394** Kettle Point First Nation. Responders should contact the Chief of the Kettle Point First Nation before commencing response activities. Approach concerns exist near Kettle Point which are hazardous to boating activities. Responders should exercise caution when approaching the shoreline. The Kettle Point Wetland provides a habitat for fur bearing mammals and supports numerous species of trees. The Shashawandah Creek Woodlots and Lakeshore Marsh are classified as Environmentally Sensitive Areas. Both the Kettle Point Wetland and the Shashawandah Creek Woodlot area have several species of trees thriving here, including those which are consistent with wetland habitats.





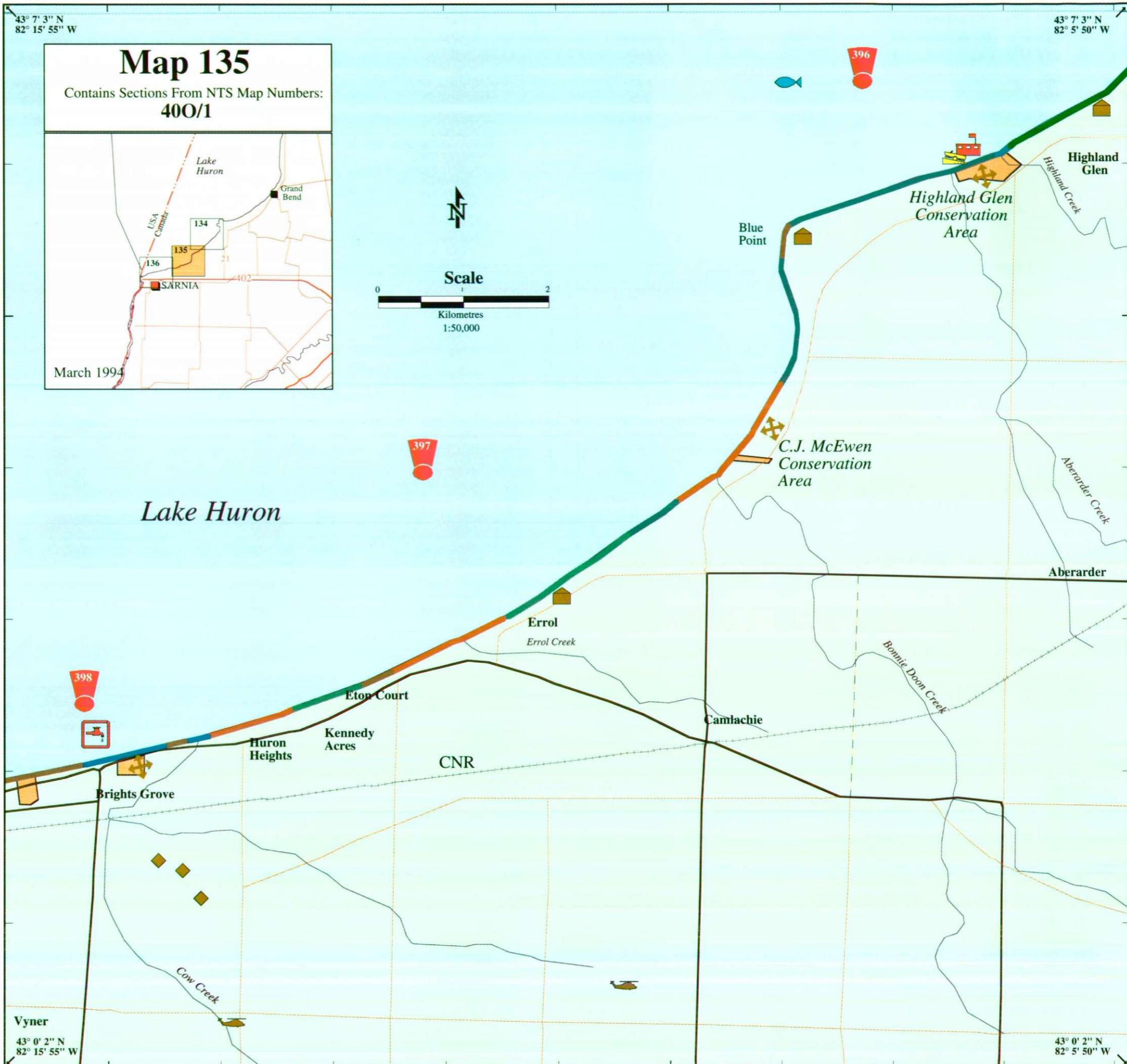
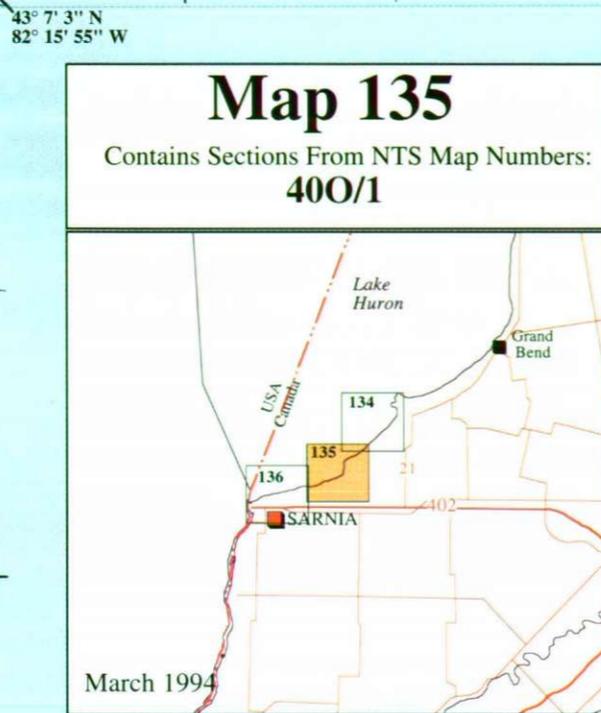
## NOTES !

A red exclamation point symbol is used on the maps to catch the responder's attention.

**396** Seasonal fish spawning occurs in Lake Huron: Walleye and Yellow Perch in the Spring and Lake Whitefish in the fall. Licensed commercial trapnet fishing activities occur near the Lake Huron shoreline from south of Kettle Point to near Sarnia.

**397** Numerous houses and recreational cottages occur along the Lake Huron shoreline from Blue Point to Huron Heights.

**398** Petrolia Water Treatment Plant water intake: Call - (519) 882-0340. Numerous houses and recreational cottages occur along the Lake Huron shoreline from Brighton to Point Edward.

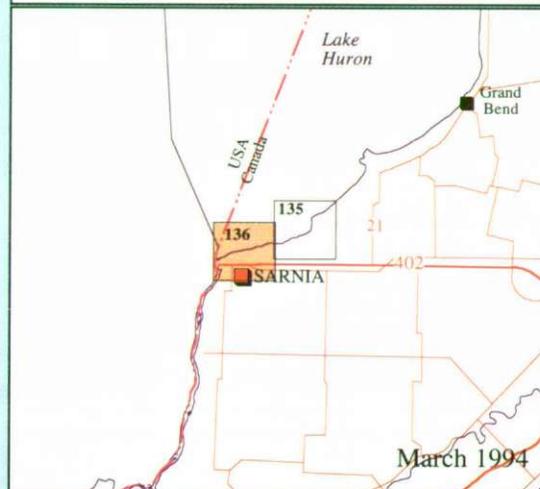


43° 4' 31" N  
82° 25' 38" W

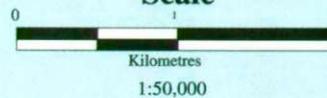
43° 4' 31" N  
82° 15' 34" W

# Map 136

Contains Sections From NTS Map Numbers:  
**40O/1 and 40J/16**

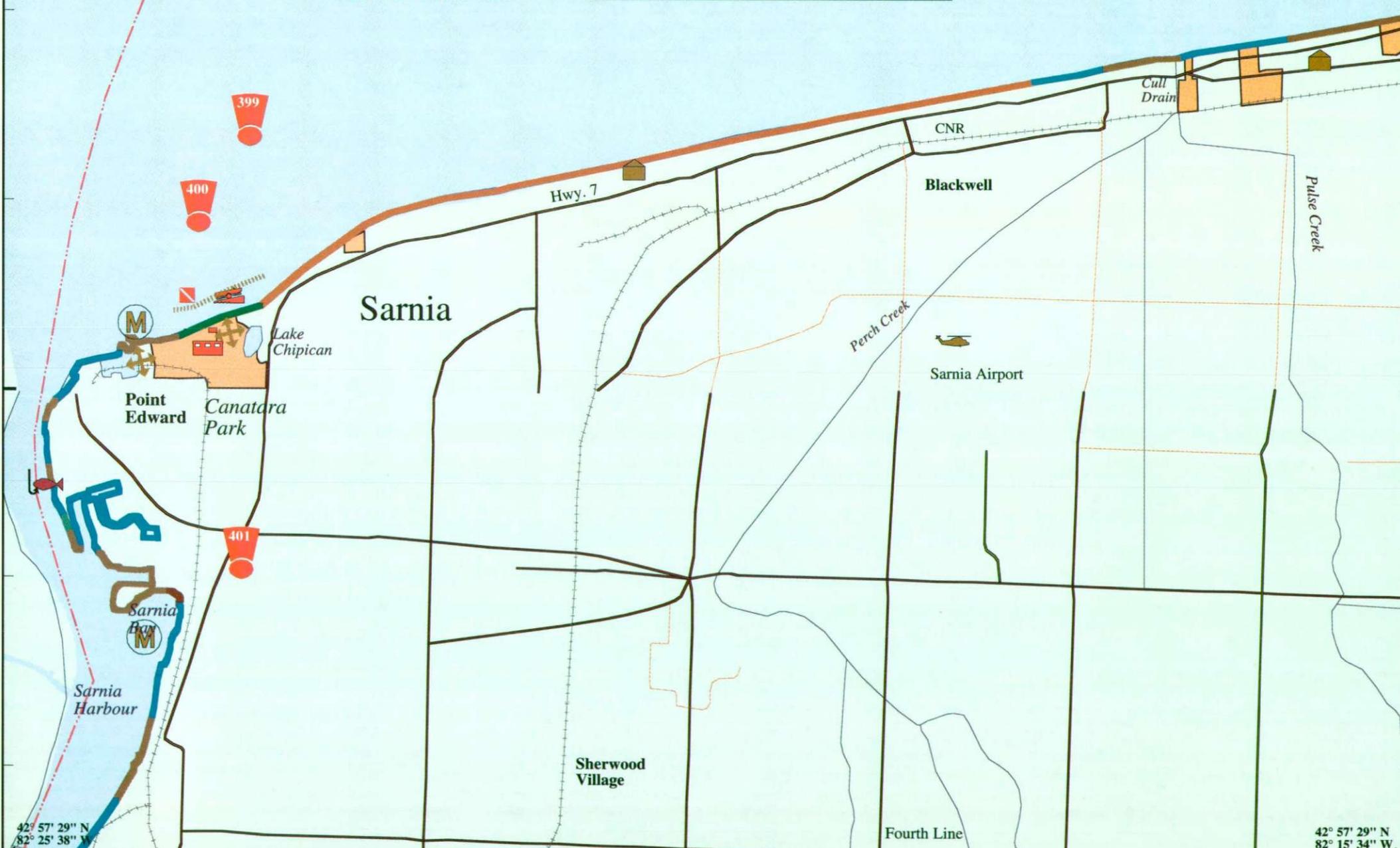


Scale



Outside study area: For Environmental Sensitivity Information for the St. Clair River, contact Environment Canada.

## Lake Huron



42° 57' 29" N  
82° 25' 38" W

42° 57' 29" N  
82° 15' 34" W

## NOTES

A red exclamation point symbol is used on the maps to catch the responder's attention.

**399** A recreational dive site exists in Lake Huron adjacent to Canatara Park. Responders must take care not to cause damage in this area.

**400** Lambton County Sarnia City Water Service System water intake: Call - (519) 344-7429. Licensed commercial trap net fishing activities occur near the Lake Huron shoreline from Kettle Point to near Sarnia.

**401** Commercial fishing activities have seasonal significance in Lake Huron near Point Edward.

## Appendix A

### Data Sources

Source agencies for data used in the creation of the Environmental Sensitivity Atlas for Lake Huron's Canadian Shoreline are listed below.

### A.1 Biological Resources

#### A.1.1 Bird Information

Colonial Waterbird Nesting Sites

Contact - Dr. Hans Blokpoel

Contact - Gaston Tessier

Canadian Wildlife Service

49 Camelot Drive

Nepean, ON K1A 0H3

(613) 952-2410

Waterfowl, Raptor, and Shorebird Data

Contact - Joe Carreiro

Canadian Wildlife Service

49 Camelot Drive

Nepean, ON K1A 0H3

(613) 952-0931

Waterfowl Specialist

Contact - Ken Ross

Canadian Wildlife Service

49 Camelot Drive

Nepean, ON K1A 0H3

(613) 952-2299

Waterfowl Specialist

Contact - Norm North

Canadian Wildlife Service

152 Newbold Court

London, Ontario N6E 1Z7

(519) 681-0980

Ducks Unlimited 1-800-665-DUCK

Long Point Bird Observatory

Contacts - Ron Ridout

Raptor Information

John McCracken

Bird Migration Specialist

Dr. Richard Knapton

Waterfowl Specialist

P. O. Box 106

Port Rowan, Ontario N0E 1M0

(519) 586-3531

Ministry of Natural Resources - Midhurst

Contact - Robin Craig

Area Biologist Huronia District

Midhurst, Ontario L0L1X0

(705) 728-2900

Ministry of Natural Resources - Espanola

Contact - Ruth Steedman

Wildlife Biologist

148 Fleming Street

Espanola, Ontario P0P 1C0

(705) 869-1330

Ministry of Natural Resources - Blind River

Christilaw Area Technician

62 Queen Street

Blind River, Ontario P0R 1B0

(705) 356-2234

Ministry of Natural Resources - Sault Ste. Marie

Contact - Peter Burch

Shoreline Technician

875 Queen Street East

Sault Ste. Marie, Ontario P6A 5L5

(705) 949-1231

Ministry of Natural Resources - Parry Sound

Contact - Lloyd Thurston

Area Biologist

7 Bay Street

Parry Sound, Ontario P2A 1S4

(705) 746-4201

Ministry of Natural Resources - Owen Sound

Contact - Al Murray

Area Biologist

611 - 9th Avenue East

Owen Sound, Ontario N4K 3E4

(519) 376-3860

Ministry of Natural Resources - Wingham

Contact - Ray Barnard or Steve Bowers

Area Technicians

RR5 Wingham, Ontario N0G 2W0

(519) 357-3131

Ministry of Natural Resources - Aylmer

Contact - Doug Baird

Area Technician

353 Talbot Street West

Aylmer, Ontario N5H 2S8

(519) 773-9241

Ministry of Natural Resources - Chatham

Contact - Don Hector

Area Technician

1023 Richmond Street West

Chatham, Ontario N7M 5J5

(519) 354-7340

National Museum of Canada/Royal Ontario Museum

Flora and Fauna (including rare) information, historic data

(geological, meteorological)

Royal Ontario Museum

Contact - Ross James

Curator of Ornithology

University of Waterloo

Mike Cadman

Migratory Waterfowl

(519) 885-1211 ext. 3237

#### A.1.2 Fish Information

Canada Centre for Inland Waters

Fish and Ocean Charts

Burlington, Ontario

(416) 366-4549

Ministry of Natural Resources - Midhurst, Espanola, Blind

River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,

Aylmer and Chatham Regions

#### A.1.3 Shore Associated Mammals

Ministry of Natural Resources - Midhurst, Espanola, Blind

River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,

Aylmer and Chatham Regions

### A.2 Countermeasures

Canadian Coast Guard (CCG)

Contact - Dan Badger

CCG Parry Sound District

Parry Sound, Ontario

(705) 746-2196

Canadian Coast Guard (CCG)

Contact - D. Clow

CCG Flight Supervisor

Parry Sound, Ontario

(705) 746-2196

Canadian Coast Guard (CCG)

Contact - Bob Carter and George Ball

CCG Pilots

Parry Sound, Ontario

(705) 746-2196 ext. 249

Canadian Petroleum Products Institute

Contact - Chuck Bailey

Toronto, Ontario

(416) 492-5713

Ontario Ministry of the Environment and Energy - Sault Ste.

Marie, Parry Sound, London, Owen Sound, Sarnia

Regional Environmental Emergencies Coordinator

Environmental Protection - Ontario Region

Environment Canada

(416) 973-1059

Janet Huehn (Contractor) in consultation with Environment

Canada and Canadian Coast Guard

Contact - Environment Canada

### Weather Information

Atmospheric Issues Division

Contact - Brian Smith

Meteorological Station Sites, Meteorological Data (wind,

temperature, precipitation etc.)

4905 Dufferin Street

Downsview, Ontario

M3H 5T4

### A.3 Human-Use Resources

#### A.3.1 High Recreational Usage

Ontario Ministry of the Environment and Energy - Sault Ste. Marie, Parry Sound, London, Owen Sound, Sarnia

Ministry of Natural Resources - Midhurst, Espanola, Blind River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham, Aylmer and Chatham Regions

Various Conservation Authorities

#### Anchorage Sites

Richardson's Chartbook and Cruising Guide: Lake Huron Edition

Ministry of Natural Resources - Midhurst, Espanola, Blind River, Sault Ste. Marie and Parry Sound Regions

#### Small Craft Harbours

Department of Fisheries and Oceans (DFO)

Contact - Serge Metikosh

Small Craft Harbours

(416) 336-4637

#### Recreational Dive Sites

Ontario Underwater Council

1220 Sheppard Avenue East

Willowdale, Ontario M2K 2X1

(416) 495-4245

Parks Canada - Bruce District

P.O. Box 189

Tobermory, Ontario N0H 2R0

(519) 596-2233

Marine Heritage Conservation Program

1 Nicholas Street, Suite 1105

Ottawa, Ontario K1N 7B7

(613) 566-3731

#### A.3.2 Resource Extraction

##### Water Intakes

Canadian Great Lakes Basin Intake and Outfall Atlas, Ontario Ministry of the Environment

Commercial Fisheries Activity

Department of Fisheries and Oceans (DFO)

(416) 336-4637

Ministry of Natural Resources - Midhurst, Espanola, Blind

River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,

Aylmer and Chatham Regions

#### A.3.3 Special Status Areas

##### Archaeological Site Information

The Ontario Ministry of Culture, Tourism and Recreation includes the following statement as a matter of standard policy with data distribution: "While the Ministry of Culture, Tourism and Recreation attempts to maintain a current and reliable database covering all known archaeological occurrences in the province, the Ministry waives responsibility for the quality, accuracy and completeness of this information and any damages which may be incurred through its use."

Heritage Policy Branch

Ontario Ministry of Culture, Tourism and Recreation

Contact - Bernice Field

Archaeological Site Database

77 Bloor St. West

Toronto, Ontario

(416) 314-7161

(416) 314-7790 (Fax)

##### Area of Ecological Significance

Canadian Wildlife Service

Nepean, ON

(613) 952-0931

Ministry of Natural Resources - Midhurst, Espanola, Blind

River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,

Aylmer and Chatham Regions

##### Areas of Natural and Scientific Interest (ANSI)

Ministry of Natural Resources - Midhurst

Contact - Lands Division

Areas of Natural and Scientific Interest

Midhurst, Ontario L0L 1X0

(705) 728-2900

Ministry of Natural Resources - Espanola

Contact - Lands Division

Areas of Natural and Scientific Interest

148 Fleming Street

Espanola, Ontario P0P 1C0

(705) 869-1330

Ministry of Natural Resources - Blind River

Contact - Lands Division

Areas of Natural and Scientific Interest

62 Queen Street

Blind River, Ontario P0R 1B0

(705) 356-2234

Ministry of Natural Resources - Sault Ste. Marie

Contact - Lands Division

Areas of Natural and Scientific Interest

875 Queen Street East

Sault Ste. Marie, Ontario P6A 5L5

(705) 949-1231

Ministry of Natural Resources - Parry Sound

Contact - Lands Division

Areas of Natural and Scientific Interest

7 Bay Street

Parry Sound, Ontario P2A 1S4

(705) 746-4201

Ministry of Natural Resources - Owen Sound

Contact - Lands Division

Areas of Natural and Scientific Interest

611 - 9th Avenue East

Owen Sound, Ontario N4K 3E4

(519) 376-3860

Ministry of Natural Resources - Wingham

Contact - Lands Division

Areas of Natural and Scientific Interest

RR5 Wingham, Ontario N0G 2W0

(519) 357-3131

Ministry of Natural Resources - Aylmer

Contact - Lands Division

Areas of Natural and Scientific Interest

353 Talbot Street West

Aylmer, Ontario N5H 2S8

(519) 773-9241

Ministry of Natural Resources - Chatham

Contact - Lands Division

Areas of Natural and Scientific Interest

1023 Richmond Street West

Chatham, Ontario N7M 5J5

(519) 354-7340

#### Conservation Area Information

Association of Conservation Authorities of Ontario

Contact - Jan Street

Suite 127, Times Square

380 Armour Road

Peterborough, Ontario K9H 7L7

(705) 749-9131

Ministry of Natural Resources Conservation Authority

Information

Contact - Phyllis Miller

Toronto, Ontario

(416) 314-1978

Ausable Bayfield Conservation Authority

Contact - Patrick Donnelly

Planning Supervisor

(519) 235-2610

Maitland Valley Conservation Authority

Contact - Geoff Peach

Shoreline Management Coordinator

(519) 335-3557

Nottawasaga Valley Conservation Authority

Contact - Wayne Wilson

Chief Administrative Officer

(705) 424-1479

St. Clair Region Conservation Authority

Contact - David Sawyer

Resources Planner

(519) 245-3710

Saugeen Valley Conservation Authority

Contact - Geoff Peach

Shoreline Management Coordinator

(519) 364-1255

Grey Sauble Conservation Authority  
Contact - Andrew Sorenson  
Planning Technician  
(519) 376-3076

#### Dune Formation Information

Natural Resources Canada, Geological Survey of Canada,  
Ottawa, Ontario  
(613) 995-4342

Ministry of Natural Resources Crown Lands  
77 Wellesley St.,  
MacDonald Block  
Toronto, Ontario M7A 2C1  
(416) 314-2001

Ministry of Natural Resources Surveys, Mapping and Remote  
Sensing Branch  
Geographic Information Services  
Topographic Data Base  
90 Sheppard Ave., East, 4th Floor  
North York, Ontario M2N 3A1  
(416) 392-2510

Ministry of Northern Development and Mines  
900 Bay St.  
Toronto, Ontario  
(416) 314-3790

Ontario Geological Survey Mines and Minerals Information  
Centre Library  
c/o Janet Heitsch  
Rm. M2-17900 Bay Street, MacDonald Block  
Toronto, Ontario M7A 1C3  
(416) 314-3803

#### Environmentally Sensitive Areas

Association of Conservation Authorities of Ontario  
Contact - Jan Street  
Suite 127, Times Square  
380 Armour Road  
Peterborough, Ontario K9H 7L7  
(705) 749-9131

Ministry of Natural Resources  
Conservation Authority Information  
Contact - Phyllis Miller  
Toronto, Ontario  
(416) 314-1978

Ministry of Natural Resources - Midhurst, Espanola, Blind  
River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,  
Aylmer and Chatham Regions

Ausable Bayfield Conservation Authority  
Contact - Patrick Donnelly Planning Supervisor  
(519) 235-2610

Maitland Valley Conservation Authority  
Contact - Geoff Peach  
Shoreline Management Coordinator  
(519) 335-3557

Nottawasaga Valley Conservation Authority  
Contact - Wayne Wilson  
Chief Administrative Officer  
(705) 424-1479

St. Clair Region Conservation Authority  
Contact - David Sawyer  
Resources Planner  
(519) 245-3710

Saugeen Valley Conservation Authority  
Contact - Geoff Peach  
Shoreline Management Coordinator  
(519) 364-1255

Grey Sauble Conservation Authority  
Contact - Andrew Sorenson  
Planning Technician  
(519) 376-3076

#### First Nation Information

Indian and Northern Affairs Canada  
Toronto, Ontario  
(416) 973-6234

Ministry of Natural Resources  
Native Register Population (maps of settlements - numbers,  
locations, resources used)

#### National Parks

Canadian Parks Service  
Georgian Bay Islands National Park  
(705) 756-2415

Canadian Parks Service  
Bruce Peninsula National Park  
(519) 596-2233

Canadian Parks Service  
Fathom Five National Marine Park  
(519) 596-2233

#### Provincial Parks, Nature Reserves or Wilderness Areas

Ministry of Natural Resources - Midhurst, Espanola, Blind  
River, Sault Ste. Marie, Parry Sound, Owen Sound, Wingham,  
Aylmer and Chatham Regions

#### A.4 Shoreline Habitats Shoreline Classifications

Regional Environmental Emergencies Coordinator  
Environment Protection Branch- Ontario Region  
Environment Canada  
(416) 973-1059

Jeff Ollerhead (Contractor)  
Geomorphologist  
Contact - Environment Canada

#### Aerial Photos

Natural Resources Canada  
Air Photo Sales  
Ottawa, Ontario  
(613) 995-4560

Ministry of Natural Resources  
Aerial Mapping Service  
First floor, Room # M173900 Bay  
(Corner of Bay and Wellesley)  
Toronto, Ontario  
(416) 314-2001

Ministry of Natural Resources  
Air Photos (road, forestry and ground)  
77 Wellesley St., MacDonald Block  
Toronto, Ontario  
M7A 2C1  
(416) 314-2001

Ministry of Natural Resources  
Surveys, Mapping and Remote Sensing Branch  
Geographic Information Services/Topographic Data Base  
90 Sheppard Ave., East, 4th Floor  
North York, Ontario M2N 3A1  
(416) 392-2510

University of Toronto Mapping Library  
Toronto, Ontario

University of Waterloo Map and Design Library  
Environmental Studies Building #1  
University of Waterloo  
Waterloo, Ontario  
(519) 885-1211

#### A.5 Base Maps and Mapping System Digital Layer Creation

Natural Resources Canada, Geological Survey of Canada,  
Ottawa, Ontario (613) 995-4342

Environment Canada and Digimap Data Services Inc.  
(Contractor)  
Contacts - Bruce Mooney & Michael Quinn  
Digimap Data Services Inc.  
37 Kodiak Crescent, Unit 3 North York, Ontario  
(416) 633-2213

#### Municipal Maps

Ontario Base Maps (OBM) 1:2 000  
Ministry of Natural Resources Topographic Mapping Section  
90 Sheppard Ave., East, 4th Floor  
North York, Ontario M2N 3A1  
(416) 733-5090

#### Topographical Maps

Natural Resources Canada  
615 Booth Street  
Ottawa, Ontario K1A 0E9  
(613) 995-4321

Ministry of Natural Resources  
Crown Lands (land titles, patents and leases)  
77 Wellesley St., MacDonald Block  
Toronto, Ontario M7A 2C1  
(416) 314-2001

Ministry of Natural Resources  
Topographical Maps  
77 Wellesley St.,  
MacDonald Block  
Toronto, Ontario M7A 2C1  
(416) 314-1666

## Appendix B

### Listing of National Topographic System (NTS) Map Sheets

The following NTS map sheets (1:50,000 scale) cover the  
Canadian portion of the Lake Huron and Georgian Bay  
shoreline. Elements of base topographic maps showing on each  
atlas page have been reproduced with Natural Resources  
Canada's permission.

Map Sheet	Year	Map Sheet	Year
31 D/12	1980	41 H/1	1990
31 D/13	1980	41 H/3	1990
31 E/4	1986	41 H/4	1993
40 O/1	1985	41 H/5 & H/6	1990
40 P/4	1985	41 H/8 & H/7	1990
40 P/5	1985	41 H/9	1990
40 P/12	1985	41 H/10	1990
40 P/13	1985	41 H/12 & H/11	1990
41 A/4	1978	41 H/13	1990
41 A/5	1978	41 H/14	1990
41 A/6	1978	41 H/15	1990
41 A/8	1979	41 I/3	1975
41 A/9	1993	41 I/4	1975
41 A/10	1979	41 J/1	1975
41 A/11	1979	41 J/2	1975
41 A/14	1979	41 J/3	1975
41 A/15	1993	41 J/4	1975
41 A/16	1979	41 J/5	1975
41 G/9	1976	41 K/1	1983
41 G/10	1976	41 K/8 & K/7	1983
41 G/14	1976		
41 G/15	1976		
41 G/16	1976		

## Appendix C

### References and Suggestions for Further Reading

Canadian Wildlife Service 1974: "Waterfowl Studies in  
Eastern Canada 1969 - 1973", Edited by Hugh Boyd. Report  
Series 29.

Canadian Wildlife Service, 1984: "Waterfowl Studies in  
Ontario 1973-81", Edited by S. G. Curtis, D. G. Denis and H.  
Boyd, Occasional paper 54.

The Environmental Applications Group Ltd., 1987: "Lake Erie  
Atlas: Sensitivity of Coastal Environments and Wildlife to  
Spilled Oil: Supplement to the Joint Canada - United States  
Marine Pollution Contingency Plan for Spills of Oil and Other  
Noxious Substances", prepared for Environmental Protection -  
Ontario Region, Environment Canada, Toronto.

Goodyear, C. D., T. A. Edsall, D. M. Ormsby Dempsey, G. D.  
Moss and P. E. Polansky, 1982: "Atlas of the Spawning and  
Nursery Areas of Great Lakes Fishes", Volumes 1 to 14.  
Prepared for the offices of Biological Services, Fish and  
Wildlife Service, U. S. Department of the Interior, Washington,  
D. C. 20240.

"Guide to Eating Ontario Sport Fish", Ministry of the  
Environment and Energy, 1992.

Gundlach, E. R., Baca, B. J., Coastal Science and Engineering  
Inc., 1986: "St. Clair River, Lake St. Clair, and Detroit River: A  
Coastal Resource Atlas: Sensitivity of Coastal Environments  
and Wildlife to Spilled Oil: Supplement to the Joint Canada -  
United States Marine Pollution Contingency Plan for Spills of  
Oil and Other Noxious Substances", prepared for  
Environmental Protection - Ontario Region, Environment  
Canada, Toronto.

Kleinfeldt Consultants Ltd., 1990: "Canadian Great Lakes Basin  
Intake/Outfall Atlas", Volume 1 (Lake Huron) prepared for the  
Ontario Ministry of the Environment.

"Migratory Fish Location and Species", 1969; map produced by  
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To assist users in discerning one shoreline colour from another, a removable Legend insert has been included with the atlas. If required, users may line up this card over the shoreline habitat in question, to determine the exact colour of a given habitat.

## Legend

**ESI\* Ranking**

- 1a Exposed Bedrock Bluff less than 1 metre elevation
- 1b Exposed Bedrock Bluff 1-5 metre elevation
- 1c Exposed Bedrock Bluff greater than 5 metre elevation
- 2 Retaining Wall/Harbour Structure/ Breakwaters
- 3 Shelving Bedrock
- 4 Exposed Sediment Bluff
- 5a Sand Beach: Depositional
- 5b Sand Beach: Erosional or Transitory
- 6 Sand Barrier With Lagoon
- 7a Pebble Beach
- 7b Pebble/Cobble Beach
- 7c Cobble Beach
- 8 Rip Rap
- 9 Boulder Beach
- 10 Mixed Beach (% by sediment in DOE Database)
- 11 Low Vegetated Bank (Grass or Trees)
- 12 Delta Mud Flat
- 13a Fringing Wetland
- 13b Broad Wetland

\* ESI - Environmental Sensitivity Index  
Higher numbers indicate greater sensitivity

**Shoreline Habitats**

**Bedrock or Impermeable Shores**

**Unconsolidated Sediment Shores**

**Vegetated Shores**

**Biological Resources**

**Fish**

- Area of Seasonal Fish Spawning
- Location of Seasonal Fish Migration

**Birds**

- Migratory Waterfowl
- Colonial Nesting Birds (total nests - all species)
- Wading Birds (total nests - all species)
- Shore Birds
- Raptors

**Shore Associated Mammals**

- Furbearers (such as Muskrat, Mink, and Beaver)

**Human-Use Resources**

**High Recreational Usage**

- Marinas and Small Craft Harbours
- Anchorage Sites
- Residential, Recreational or Cottage Use
- High-Use Recreational Beach
- Recreation Dive Site

**Resource Extraction**

- Water Intakes - Industrial
- Water Intakes - Municipal
- Outfall
- Commercial Fisheries Activity

**Special Status Areas**

- Highly Sensitive Classified Feature (within 2km)
- First Nation
- National Park
- Provincial Park, Nature Reserve or Wilderness Area
- Conservation Area or Municipal Park
- Environmentally Sensitive Area\*
- Areas of Natural and Scientific Interest\*
- Area of Ecological Significance (e.g. Wetland)
- Dune Formations

\* As identified by Ontario Ministry of Natural Resources or Conservation Authorities

**Countermeasures**

- Access Site (for land vehicles)
- Approach Concerns: Foreshore Flats/Rocky Reef
- Exposed Rock
- Coast Guard Light Station
- Boat Launch: Excellent
- Boat Launch: Good
- Boat Launch: Poor
- Helicopter Landing Site
- Staging Area: Excellent
- Staging Area: Good
- Staging Area: Poor
- Automated Weather Stations

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