

# Twenty Years of Efforts towards Ecosystem Planning in the Bruce Peninsula National Park, Ontario Canada: 1987 to 2006

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Since the establishment of the Bruce Peninsula National Park in Ontario, Canada various ecosystem planning initiatives have been developed. This paper reviews the twenty year history of these planning efforts within the context of the preparation of an ecosystem conservation plan. This includes research completed by the Heritage Resources Centre at the University of Waterloo which reviewed scientific, policy and other types of studies and conducted meetings and interviews with concerned persons on existing information and knowledge required to develop an ecosystem conservation plan for the national park. To organize and better understand the issues for planning purposes six main categories were developed to summarize the individual issues and the connections that exist between them: communication; recreational technology and activities; transport and communication infrastructure; resource uses; environmental conditions; and land use planning and management. These six categories of issues were in turn organized in terms of stresses, effects and responses. Significant natural features were identified and the relationship between resource and land uses and significant natural features was highlighted by the identification of several areas of concern. A range of management, planning and decision-making arrangements and their environmental effects has been identified and analyzed in a general way as a basis for ecosystem conservation planning in Bruce Peninsula National Park.

*Key Words: National Parks, Conservation, Ecosystem, Planning*

## Introduction

After amendments to the National Parks Act in 1988, national parks in Canada were mandated to ensure the maintenance of ecological integrity by reducing the undesirable effects of human activities in the region around national parks and primarily within the parks themselves. The Panel on Ecological Integrity of National Parks (2000) proposed that "An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species

and biological communities, rates of change and supporting processes."

National Parks are to complete Ecosystem Conservation Plans (ECPs) to identify problems, issues and concerns that need to be addressed in order to maintain ecological integrity. Ecosystem Conservation Plans (ECPs) are intended to maintain the ecological integrity of national parks through the conservation of plants, animals and other natural resources - or essential elements and processes - in

the environment or ecosystem. The natural environment of which a national park is part does not stop at the park boundary. It is therefore, necessary to prepare a plan that considers not only the national park but the surrounding lands and waters or Greater Park Ecosystem (GPE). In this context, according to Parks Canada, ECPs are to provide a “reasoned course of action” for a national park’s ecosystem management program (Zorn et al., 1997). The national park and its neighbors must deal together with a number of transboundary concerns such as wildlife movements, waterflow and drainage, hiking and recreational uses and the effects of land and resource uses inside and outside of the park boundaries on the ecosystem.

Parks Canada defines an ecosystem conservation plan as a dynamic document which develops and proposes specific goals for the maintenance of park ecological integrity and management of the park ecosystem (Parks Canada, 1992). The goals of the ECP are to be based on objectives as identified in the Park Management Plan or Interim Management Guidelines, or Resource Conservation Interim Management Guidelines. The ECP is to provide a documented, integrated and prioritized program for the management of a national park’s natural resources and the natural evolution of the park’s ecosystems (Parks Canada, 1992). Several Ecosystem Conservation Plans have been completed for national parks in southern Ontario, including St. Lawrence Islands National Park, Georgian Bay Islands National Park, and Point Pelee National Park. The preparation of these plans largely followed the policies and guidelines outlined in the 1992 revised Parks Canada Natural Resource Management Process Manual. Nelson et al. (2000) provides an overview and assessment of the development of ecosystem conservation plans by Parks Canada.

The aim of this paper is to review and assess various efforts taken in regards to the development of ecosystem based planning for the Bruce Peninsula National Park, Ontario, Canada<sup>1</sup>. Since the establishment of the National Park in 1987, several steps have been taken towards a more comprehensive planning approach for a fuller range of

natural and human elements and issues associated with management concerns. The major planning activities to be examined in this paper include the park management plan (1988 interim draft and 1996 final approved version), efforts by a study team from the Heritage Resources Center at the University of Waterloo to prepare for an ecosystem conservation approach, the completion of ECP by Parks Canada in 2001, and recent related implementation activities. A detailed discussion of the HRC study provides a context for the evolution of ecosystem planning in the National Park during the twenty years from 1987 to 2006 that led to the completion of the ecosystem conservation plan by Parks Canada.

## Bruce Peninsula National Park

Discussion about the establishment of a national park in the northern Bruce Peninsula had been ongoing since the 1960s, but it was not until the completion of a federal study in 1981 that serious consideration was undertaken by governments and local citizens. Public consultation during 1982 revealed concern about a number of issues including land ownership and rights to conduct traditional land uses such as hunting, fishing, lumbering, and recreation within the proposed national park. A number of individuals and citizen groups voiced strong opposition to the establishment of a national park. Following local municipal elections and a public referendum, one of the two affected local municipalities, Lindsay Township, decided not to support the creation of a national park. As a result of these and other concerns a federal-provincial agreement was developed leading to the establishment of Bruce Peninsula National Park in St. Edmunds Township in 1987 (Figure 1).

Bruce Peninsula National Park (BPNP) was initially formed from the transfer of public land holdings by the Ontario government to the Canadian government. After over two decades of studies and consultation, the creation of a national park was based on acknowledgment of the outstanding significance of the natural features and resources in the northern Bruce Peninsula area and the need to conserve and maintain these values for future generations. Proposed boundaries were agreed upon with the intent that the area within them would be acquired by Parks Canada and added to the national park in ensuing years. The national park contained private and provincial lands and economic and other activities at that time and still does to varying degrees today.

<sup>1</sup> Within the northern Bruce Peninsula, the Fathom Five National Marine Park (FFNMP) was also established in 1987 along within the Bruce Peninsula National Park (BPNP). Although these are two separate parks they share many common park management and planning activities, related programs, and Parks Canada staff. For the purposes of this paper the focus will be on the Bruce Peninsula National Park, but the reader should also be aware that ecosystem conservation planning as undertaken for BPNP also often included FFNMP.

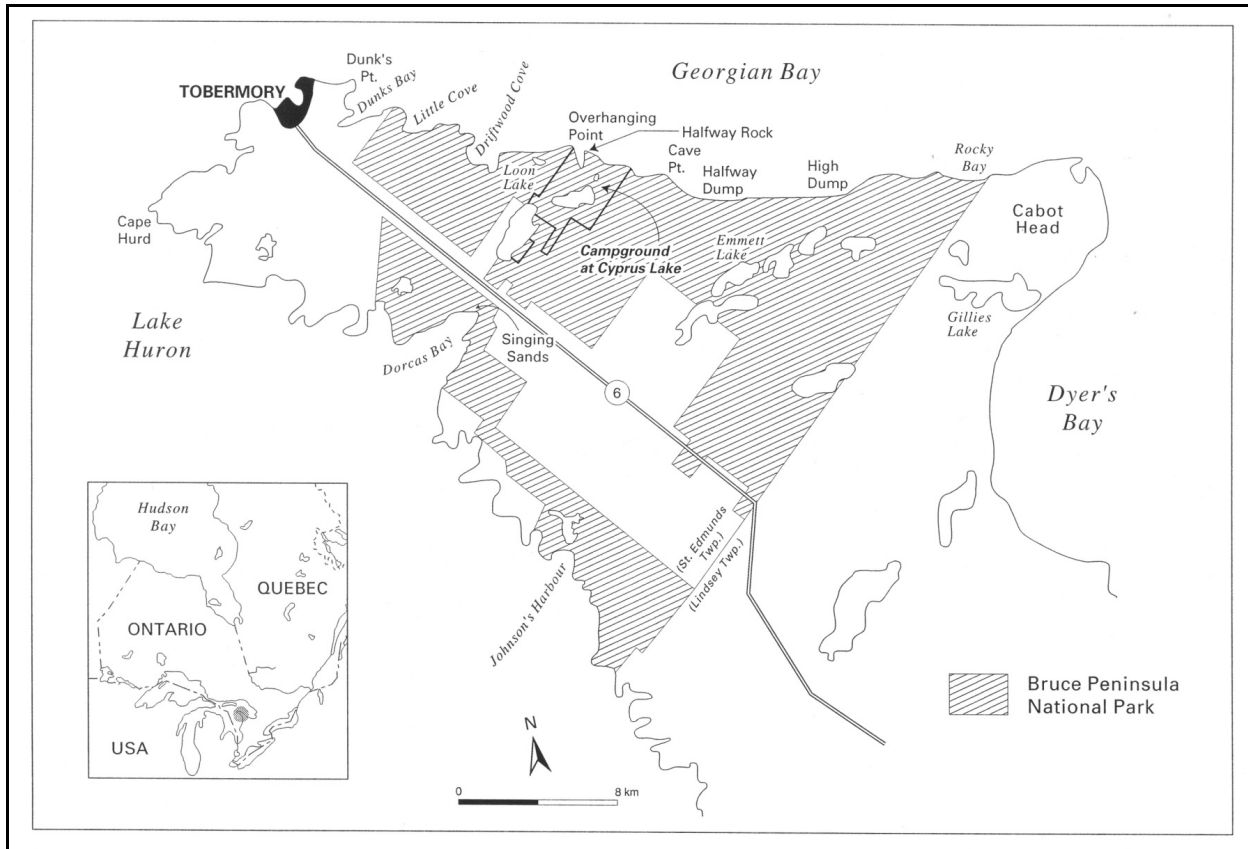


Figure 1. Bruce Peninsula National Park

The federal/provincial agreement includes provisions stipulated by the Township of St. Edmunds including the definition of strict boundaries for the national park (Government of Canada/Government of Ontario, 1987). The park area of BPNP (140 km<sup>2</sup>) includes the former Cyprus Lake Provincial Park, provincial Crown Land holdings, and private lands within St. Edmunds Township. Several large sections of adjacent land were left out of the park area due to conditions in the federal-provincial agreement. These excluded lands include a development/commercial corridor along Highway # 6; a 4,000 ha area to be maintained as a deer hunting area by the Ontario Ministry of Natural Resources; and a 1,600 ha Native Hunting Reserve of the Chippewas of Nawash and Saugeen First Nations (Figure 1).

The present land tenure or ownership within the national park area is a mix of federal, provincial and private

lands (Figure 2). Currently approximately 22% of the lands within the designed park area are still under private ownership (CPAWS Wildlands League, 2005). The remaining lands are either under direct ownership of the federal government or are managed by Parks Canada under agreement with the Province of Ontario, including existing Ontario Ministry of Natural Resources Crown Land holdings. Parks Canada currently has a land acquisition program to buy the remaining private land with the park boundaries on a buyer-willing and seller-willing basis. However, the amount of funding available for land purchase has been limited by budget reductions. For example, in the period from 1992 to 1996 a total of \$1.65 million was spent by Parks Canada to acquire 31 properties totaling 1500 ha within the park area for BPNP. Land acquisition efforts by Parks Canada to secure additional properties within the designated national park boundary are ongoing.

## Park Management Plan (1987 to 1996)

Upon the establishment of the Bruce Peninsula National Park (BPNP) an interim park management plan was prepared. Further review of the plan, implementation of planning and related park activities during the early years of the park, the emergence of several new park management issues, advancements in science and basic resource inventories, all resulted in the need to revise and complete a final park management plan. The approved park management plan was finally completed in 1996. The plan

provides the general framework for management of the natural resources and human activities associated with the national park. The preparation of the plan included consultations with the local community, members of the park advisory committee, and the local First Nations. The plan is intended as a “strategic framework within which management decisions, more detailed planning, and subsequent implementation will take place” (Parks Canada, 1996, p.1).

The purpose of the park management plan is to “provide long term guidance for the protection, operation,

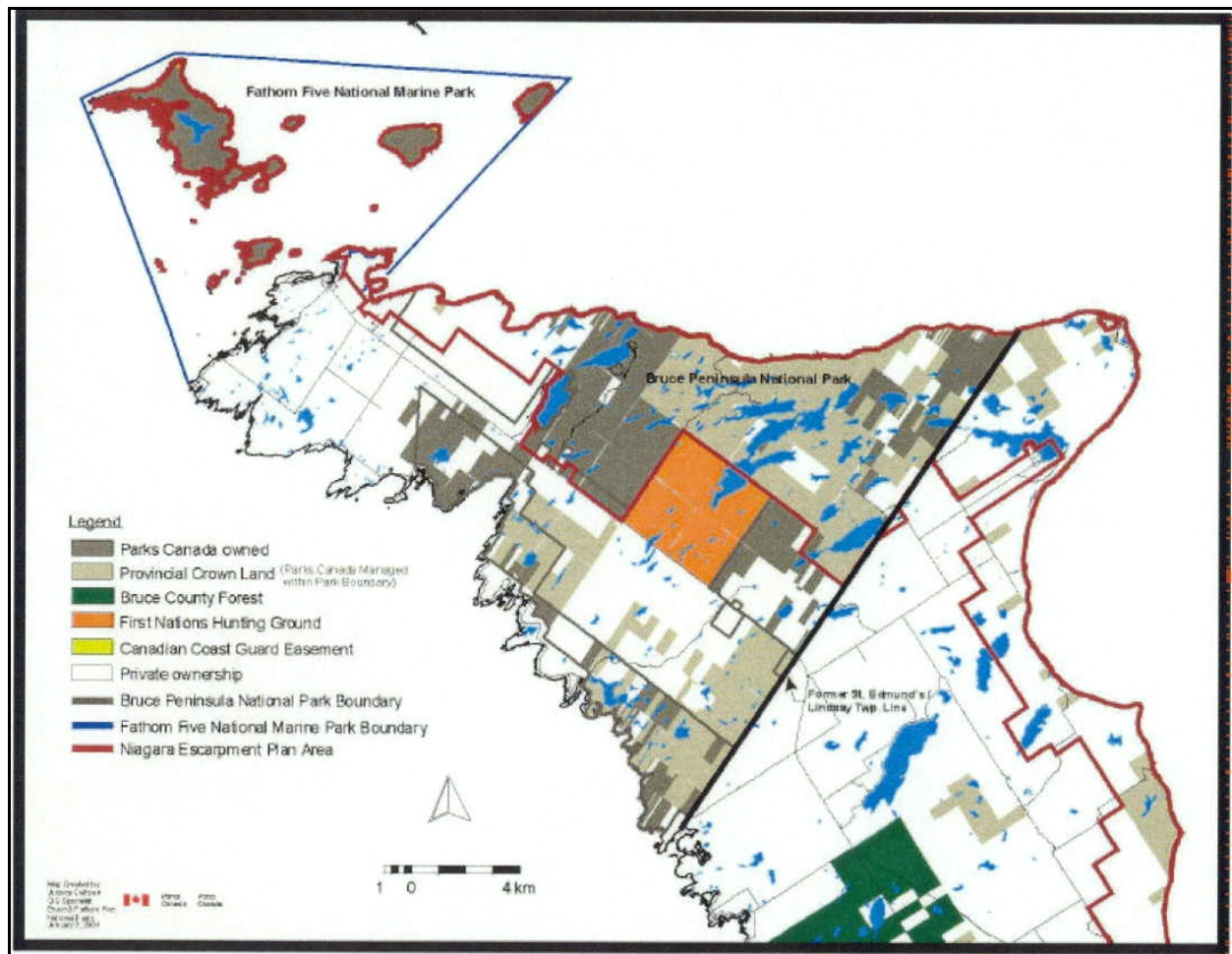


Figure 2. Land Tenure within the Bruce Peninsula National Park

public experience of the park” (Parks Canada, 1988, p.1). The plan makes reference to the need to consider an ecosystem approach to the national park by regional conservation efforts to complement other planning undertaken by other various land management agencies and organizations including the Federation of Ontario Naturalists, Ontario Ministry of Natural Resources, several local municipal efforts, and the First Nations. The designation of the Niagara Escarpment (which passes through the national park) as a special planning area under the 1973 Niagara Escarpment Planning and Development Act (amended 1990, 2005) and as a World Biosphere Reserve by the UNESCO Man and Biosphere Program in 1990 are seen as important manifestations of the need to undertake a coordinated approach to natural area management within the national park and surrounding region. The national park is also part of the Niagara Escarpment Parks and Open Space System, a series of over 100 parks and protected areas, and the route of the 780 kilometer long Bruce Trail runs through the national park.

The park management plan describes the mission of the national park as “to protect the natural and cultural heritage within the Park and to work with allies outside the Park to conserve the Upper Bruce Peninsula Ecosystem” (Parks Canada, 1996, p. 8). This concept of the Upper Bruce Peninsula Ecosystem eventually evolved into consideration for the Greater Park Ecosystem in subsequent park conservation planning activities. The management plan also provides a vision for the future of the park and includes protecting important biological systems, supporting the viability of sustainable living, providing opportunities for research and monitoring, and cooperative management to protect natural and cultural resources and the environment.

One important management aim is to maintain or enhance the extent of unfragmented forest cover at a level no less than that of 1994. Thus the northeastern portion of the national park from Halfway Dump to Rocky Bay (see Figure 1) is to be managed to enhance forest cover and provide the highest quality wilderness experience for visitors in the national park (Parks Canada, 1998). Monitoring programs and visitor management will be developed so as to address the potential impacts from providing for public enjoyment and experiences within the national park.

Of particular note within the park management plan is the issue of park zoning. For most national park management planning efforts, zoning of management intents, including levels of conservation and public use, is a

common plan element. However, in the case of the Bruce Peninsula National park the management plan does not include the standard park zoning system with its five zones for permitted activities. The decision not to complete a park zoning system was based on the fact that land acquisition within the park area was not complete and would not be for many years (Parks Canada, 1996). The park management plan does include the identification, classification and mapping of “resource values” within the national park. The resource values rank the significance of key natural features and processes, such as tree cover, rare species, wetlands, old growth cedar forests, landforms and escarpment features.

The management plan also provides for a series of six strategies intended to direct future park management activities. The first strategy focuses on maintaining and protecting the natural and cultural resources of the national park with an aim towards addressing ecological integrity, conducting rehabilitation of previously disturbed sites, undertaking environmental impacts assessments for any new developments, and monitoring land use impacts. The next strategy addresses management of the cultural and historical resources including the need to develop a comprehensive cultural resource management program. The third strategy is intended to consider the various aspects of public use and enjoyment of the park by examining user needs, interests, activities and their potential impacts on the natural systems of the national park.

Strategy four examines the issues associated with provisions for additional public services needed within the national park such as public safety concerns, planning for the Bruce Trail, and access for disabled persons. Public education is the fifth management plan strategy which takes into consideration the communication and interpretation themes and messages that are to be the basis for visitor education programs to be developed within the national park. The six and final strategy expresses the idea that working with partners in the both the public and private sectors will be necessary to achieve management objectives for the national park.

Overall the 1996 park management plan does provide general direction for the major activities and programs to be conducted by Parks Canada for the national park. The plan also provides for several fundamental planning concepts including the need for an ecosystem focus, the regional scale for planning, and a cooperative approach. The main area of interest within the park management plan is addressing the



conservation and human impacts of visitors on lands owned by Parks Canada and under active management control. Although the park management plan provides general direction or guidance in terms of ecosystem planning it lacks specific goals, actions and activities towards that aim. The park management plan offers little specific guidance on planning and management of land uses and human activities that occur around the national park area, which have various impacts on its natural system.

## Preparing for Ecosystem Conservation Planning (1996 to 1998)

As a result of park management challenges and changes to the National Parks Act in 1988, which focused on maintenance and enhancement of ecological integrity, a study team from the Heritage Resources Centre (HRC) at the University of Waterloo was initially contracted to prepare an Ecosystem Conservation Plan (ECP) for the Bruce Peninsula National Park (BPNP). The HRC study team conducted research and completed a series of reports, relating to the development of the ECP by Parks Canada. The aim was to contribute a review and assessment of issues of importance to the ECP and provide direction towards the protection and enhancement the ecological integrity of the national parks and surrounding area.

The objectives of the study conducted by the HRC were to: 1). complete a background study for the preparation of the ECP for BPNP; 2). foster effective institutional arrangements for undertaking ecosystem based management in the national park and surrounding lands and waters or Greater Park Ecosystem (GPE) and; 3). develop a Communication Strategy (CS) to assist in the consultation and education required for the preparation of the ECP. A discussion of the methods, results, and subsequent planning implications from that study is presented in order to provide a context for the development of ecosystem planning subsequent to the park management plan.

The ABC Resource Survey Method was utilized to assist in the organization and evaluation of information as the basis for preparation of the ECP. A comprehensive, dynamic, and interactive approach to land use mapping and research is ultimately desirable and useful for learning and general understanding, as well as for planning, management, and decision-making. the land use, resource and environmental survey and assessment system known as the ABC resource survey method has been developed with

these desired characteristics of comprehensiveness, dynamism, and interaction in mind (Nelson et al., 1988). The method is basically one of applied human ecology. The ultimate goal is to map, analyze, and assess human relations with the environment. Working toward this goal requires studies not only of geologic and biological aspects of the environment, but also the values, ideas, technology, policies, and land use activities which humans use to adapt to and change the world around them. The ABC method is comprehensive in that it covers: abiotic (including geologic, landform, and hydrologic information); biotic (including plant, animal, and soils information) and cultural (including land use, economic, human heritage, land management, institutional, and other human information).

The method is dynamic in that it can be used to prepare historic maps and analyses and to link abiotic, biotic, and cultural (or human) patterns, processes, and changes. It is also dynamic in that it provides for both historic and current mapping and analyses (Nelson et al., 1988).

## ECP Study Approach

The first step was the preparation of a Background Information Study (BIS). The BIS was intended to provide information for the ECP by compiling a summary of general information on the study area needed by agencies, groups and individuals to participate in the development of the ECP. The BIS was also intended to highlight information bearing on problems, issues and concerns (PICs) related to the ECP BPNP. A Synopsis of the BIS was subsequently prepared to highlight key information, interpretations, and results from the BIS report (Lawrence et al., 1998).

A large amount of geologic, biologic, land use, historical, economic, and other information has been produced on the Bruce Peninsula in the last century and particularly the last two decades. To be useful in preparing the ECP for BPNP this information has to be screened and organized to address the problems, issues and concerns (PICs) for national park planning as identified by Parks Canada and other affected parties. Several different methods were used for collecting existing information and organizing it to address PICs. These methods included:

1. examining previous studies conducted by Parks Canada for BPNP;

2. reviewing the Parks Canada Geographic Information System (GIS) database for BPNP;
3. assessing relevant information on the area around the national park as provided by various planning agencies, local groups and others;
4. reviewing the ECPs prepared for other national parks in Ontario; and
5. interviews and consultations undertaken in preparing a Communication Strategy (CS) for the ECP

During this work on the BIS and the ECP in general the study team frequently consulted with a Project Review Group and the Park Advisory Committee for BPNP. The Project Review Group consisted of the HRC study team, Parks Canada staff, and some members of the Park Advisory Committee. The Park Advisory Committee includes about fifteen individuals representing the major government agencies and private groups concerned about the management of BPNP.

From January 1997 to December 1998, the study team collected and evaluated existing and ongoing research studies and available information on BPNP. An extensive review was conducted of existing reference materials available from Parks Canada, the University of Waterloo, Bruce County Planning and Development Office, Niagara Escarpment Commission, Ontario Ministry of Natural Resources, Bruce Trail Association, and other government and non-government agencies. Parks Canada has undertaken a large number of scientific studies relating to the national park. Resource Conservation staff with Parks Canada have also developed an extensive computer database for the collection, organization and synthesis of information relating to the national park. It is important to recognize that this information bears mainly on the land and waters within the national park and not on the surrounding areas. This limited the extent to which ecosystem conservation planning could be undertaken in the Greater Park Ecosystem around the national park.

In preparing the Communication Strategy for the ECP, the study team has consulted with stakeholders affected by the preparation of the ECP. From March to June 1997, 35 interviews, meetings and workshops were conducted with groups and individuals involved in land use,

resource and environmental affairs in the BPNP area (Black and Nelson, 1997). The study team attempted to identify as many concerned agencies and individuals as possible in order to locate important information or to assist in the identification of problems, issues and concern to be addressed in the ECP.

## ECP Study Results

The first task was to identify the problems, issues and concerns (PICs) to be addressed in the plan (Parks Canada, 1992). This began with consultations with Parks Canada staff, local residents and visitors who were knowledgeable about the parks and surrounding area. The PICs were organized according to the ABC Resource Survey Method into categories of: Abiotic (geology, hydrology, landforms), Biotic (plants and animals), and Cultural (land use, social, economic and political) (Nelson et al., 1988). The challenge in terms of ECP planning is that many diverse PICs were identified by Parks Canada. These PICs differed in terms of complexity, ranging from large to small scale. Under these circumstances it was difficult to come to an understanding of what the fundamental concerns were and how to deal with them in an organized and systematic way.

The array of PICs as presented by Parks Canada and by concerned groups and citizens during consultation and meetings was examined. The next step was to identify some general or basic PICs with the idea that proper planning for these would be the first or basic step in planning for the related more detailed ones. With this in mind the PICs were organized and thought about in terms of the general groups or categories outlined below:

**Communication:** Discussion with stakeholders, including local citizens, developed slowly for the national park. People agreed that communication was a major challenge for Parks Canada as well as other agencies and parties concerned about the national park.

**Recreation and Tourism:** It was thought necessary to understand the distribution and potential effects of current land uses and human activities on valued natural and cultural resources and the natural environment. Recreation and tourism seemed to be especially significant in these respects.

**Transport and Infrastructure:** Roadways, boating routes, trails, buildings, and other structures are distributed

throughout the study area and have significant environmental effects, notably fragmentation of habitats.

**Resource Uses:** Various resource uses have affected the natural environment of the national park. Examples include forestry, fishing, and agriculture.

**Environmental Conditions:** Understanding the character of abiotic (geology, soils and landforms) and biotic resources (vegetation, wildlife) was required to know how they are changing and how they could be affected by cultural activities such as resource and land uses.

**Land Use Planning and Management:** In order to decide how to respond to land and resource activities and their effects, existing land use planning and management arrangements in the study area had to be examined. This included land tenure and ownership, land use zoning, identification of environmental sensitive areas, and municipal planning arrangements.

After being organized into these general groups or categories, the PICs were then sorted according to whether they were considered to be Stresses, Effects or Responses. The Stresses include resource uses, recreation and tourism, transport and infrastructure, and socio-economic activities. The Effects include water pollution, loss of wetlands, habitat fragmentation or other impacts on the natural environment. The Responses are mainly land use planning, management and decision-making approaches although communication is of underlying and basic importance to all of these.

## Land and Resource Use Stresses

Understanding the types and locations of historic and current resource and land uses is important in addressing potential stresses and effects in the study area and especially in identifying Areas of Concern for planning and management responses. The main types of resource and land uses were considered to be: forestry; commercial fishing; sand and gravel extraction; tourism and recreation; and residential development.

With early settlement came extensive commercial logging within the northern Bruce Peninsula. Cutting, processing (mills) and transport (mainly by water routes) were the main economic activities in the northern Bruce Peninsula from the mid 1800's into the early 1900's. By this

time extensive clearing and a series of large forest fires had removed the primary forest cover and logging underwent a major decline. Currently, selective and small scale lumber operations still occur on private lands, although data on the level of this activity are not readily available. The Ontario Ministry of Natural Resources in an arrangement with the County of Bruce also practices forest management on three County Agreement Forests in St. Edmunds Township and Lindsay Township (County of Bruce, 1995).

Commercial fisheries were another important early resource use. By the late 1800's and early 1900's fishing involved over 20 boats operating out of Tobermory. The number of boats operating on Georgian Bay peaked by the early 1930's and fell thereafter as the fish catch declined substantially (County of Bruce, 1995). By the late 1990s only four commercial fishing boats operated out of Tobermory and data from the 1991 Census indicate that only ten individuals were employed in this industry in St. Edmunds Township. The main market for the current commercial fishing industry was local sales of Whitefish to residents and tourists from a few retail outlets.

Due to the great distance from major population centres and markets for stone and aggregates (sand and gravel), surface quarries are not yet a major resource use. Presently nine main sand and gravel pit operations with a total licensed area of 105 ha are located outside the national park in St. Edmunds Township. Future expansion of this industry is possible, with increased demand in southern Ontario for these construction materials and the gradual decline in alternative supplies within the Province. Quality supplies of sand and gravel are limited and the Niagara Escarpment Planning and Development Act will restrict future expansion of this industry in the Niagara Escarpment Plan Area.

Based on employment and economic factors, the single largest current land use activity in the study area is tourism and recreation. Beginning with improvements in transportation (roads and ferries) in the 1940's, the area around BPNP has been a focus for cottages and seasonal vacations. The current recreational features and activities include trails (hiking and snowmobiling), tour boats, dive sites (snorkeling and scuba), camp ground sites (national parks and private sites), a golf course, parking lots, and picnic areas. The Georgian Bay shoreline from Cabot Head to Little Cove, the community of Tobermory and waters adjacent to the main islands in Fathom Five National Marine Park, are main areas for tourism and recreation



activities. More research is needed on the character, the growth, and the effects of these activities as well as the adequacy of planning and management responses.

Highway # 6 passes through BPNP and will continue to serve as a development corridor because the Federal/Provincial Agreement leaves it out of the national park area. A number of other township roads lead from Highway # 6 and fragment the national park. More information is needed to understand the evolving patterns and effects of transport and communication systems and the adequacy of related planning and management responses.

Residential development in the Tobermory area consists of waterfront cottages (over 60% of total residential buildings) with all types of seasonal cottages accounting for almost 80% of the total. Trends for the period 1978 to 1993

indicate peak periods for development applications occurred in 1978, 1987 and 1989. New developments requiring planning approval (official plan amendments, zoning changes, severances or minor variances) were less than 4 per year since 1989. Building permits - indicating levels of construction activities of new buildings or renovations/demolition of existing structures - peaked in 1989 (52) and have ranged from 12 to 28 since 1990 (County of Bruce, 1995).

One way of generally estimating and understanding the cumulative or overall pattern of land use and resource stresses is to map concentrations of roads, trails, cottages, marinas, and other facilities in the form of nodes and corridors of human activity. The resulting patterns can be used to estimate potential effects on natural processes and features essential for ecological integrity or health. Figure

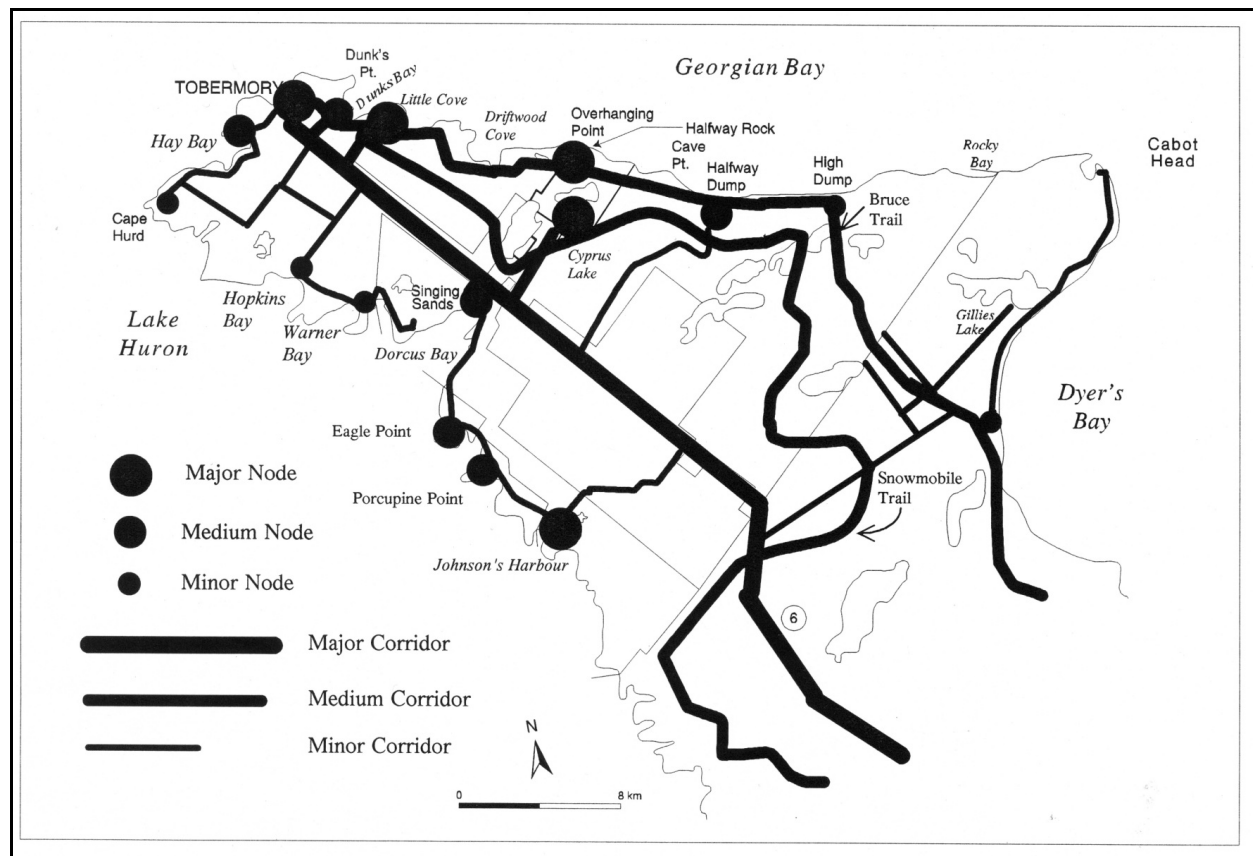


Figure 3: Nodes and Corridors

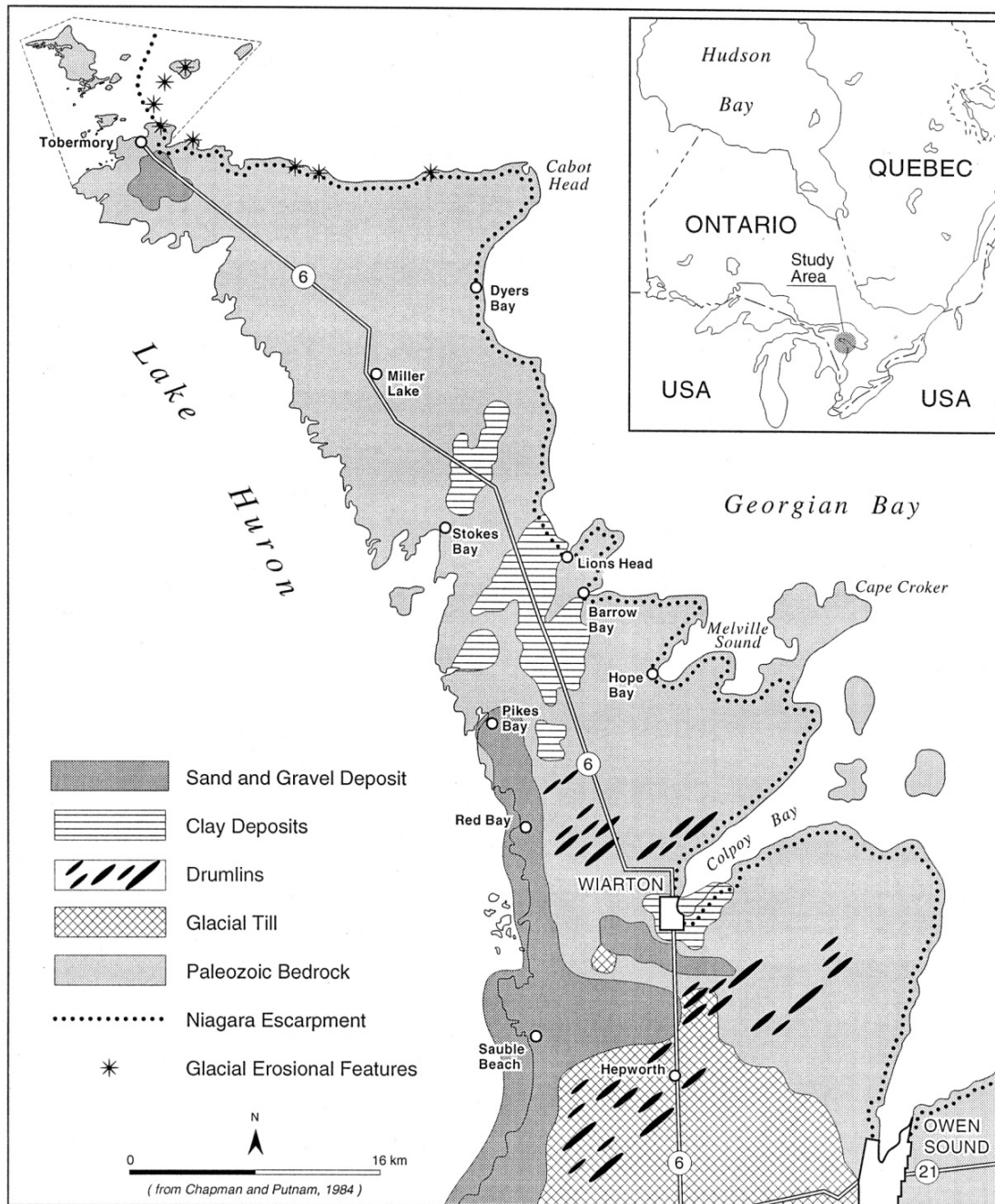


Figure 4. Surface Geology and Landforms

3 is an initial attempt to outline the various resource and land uses in this manner for the study area. Three very general rankings or levels of the nodes and corridors were identified to reflect the different scales of activities that occur. Where three or more uses occur at a node a major ranking is given. Nodes consisting of one or two uses, or which cover a large area, were given a medium ranking. Nodes with one main resource or land use were given a low rank. The corridors were ranked in a similar manner according to the estimated level of use.

## Environmental Effects

Resource and land uses can have various effects on the natural environment. One way of describing or understanding these current or potential effects is to map the natural processes and features deemed essential to the maintenance of ecological integrity in the national park and surrounding lands and waters. This study identified and mapped the location and distribution of significant abiotic and biotic features and processes.

Studies have identified a number of abiotic (geological, hydrological and landforms) features in the study area that are considered to be significant primarily because of their limited occurrence or distribution in Ontario (Geomatics, 1994; Kor, 1994). The surface geology and landforms of the Bruce Peninsula range from extensive surface exposures of Paleozoic bedrock to remnant glacial features including drumlins and till (Figure 4). Prominent among these significant features are: beaches and dunes, alvars; caves; and cliff/talus (Figure 5). These features are of interest in their own right. They also provide for interpreting and understanding the range of geologic, hydrologic and other historic and current earth science processes that have shaped and are shaping the lands and waters of the study area.

Significant abiotic features were identified at Dunks Point and Dunks Bay (glacial ridges and scours); Georgian Bay shoreline and islands (caves and cliffs), Dorcas Bay (dunes, alvars), Cameron Lake (dunes), and Flowerpot Island ("flowerpot" rock formations). Large areas of alvars are scattered through the study area. They are considered to be potentially significant wherever



Figure 5. Cliffs and slopes of the Niagara Escarpment along the Georgian Bay shoreline within the Bruce Peninsula National Park

they occur but have not been mapped in terms of specific sites.

The region is one of high biological significance. The national park is located within a large woodland area encompassing 50,000 ha from Whippoorwill Bay to Tobermory on the Bruce Peninsula (Figure 6). In the northern Bruce Peninsula region 75% of the land cover consists of forests (CPAWS Wildlands League, 2005). Within the national park area four main plant or biological



Figure 6. Forested landscape of the Bruce Peninsula

habitat types were identified on the basis of dominant vegetation, including upland coniferous (coniferous canopy greater than 75%); upland mixed (coniferous or deciduous canopy greater than 25%); uplands deciduous (deciduous canopy greater than 75%); and wetlands (tall shrub thicket swamps, marshes and fens). In addition to these main habitat types, numerous other smaller or more specialized habitat areas were mapped such as escarpment cliffs and talus slopes, cleared lands, alvars, sand dunes and cobble and sand beach communities.

The range of habitats supports a rich and diverse community of life. Thus far, 872 taxa of plants, 36 species of mammals, 26 species of herpetofauna, almost 300 species of birds (including migrants) and over 40 species of fish have been recorded within the study area (Lawrence and Nelson, 1998). The distribution of plant and animal species

has been found to be closely associated with available habitats. Biotic features and functions that have been identified as significant include: areas with seasonal concentrations of animals; areas with rare or specialized habitats and communities; areas with rare species; areas identified in accordance with provincial criteria as significant wetlands or fish habitat; and provincial Areas of Natural and Scientific Interest (ANSIs) (Figure 7).

## Management and Planning Responses

The history of management, planning, and decision-making is important in understanding how to deal with resource and land uses in the study area. It has only been within the last 20 years that local land use planning and management have

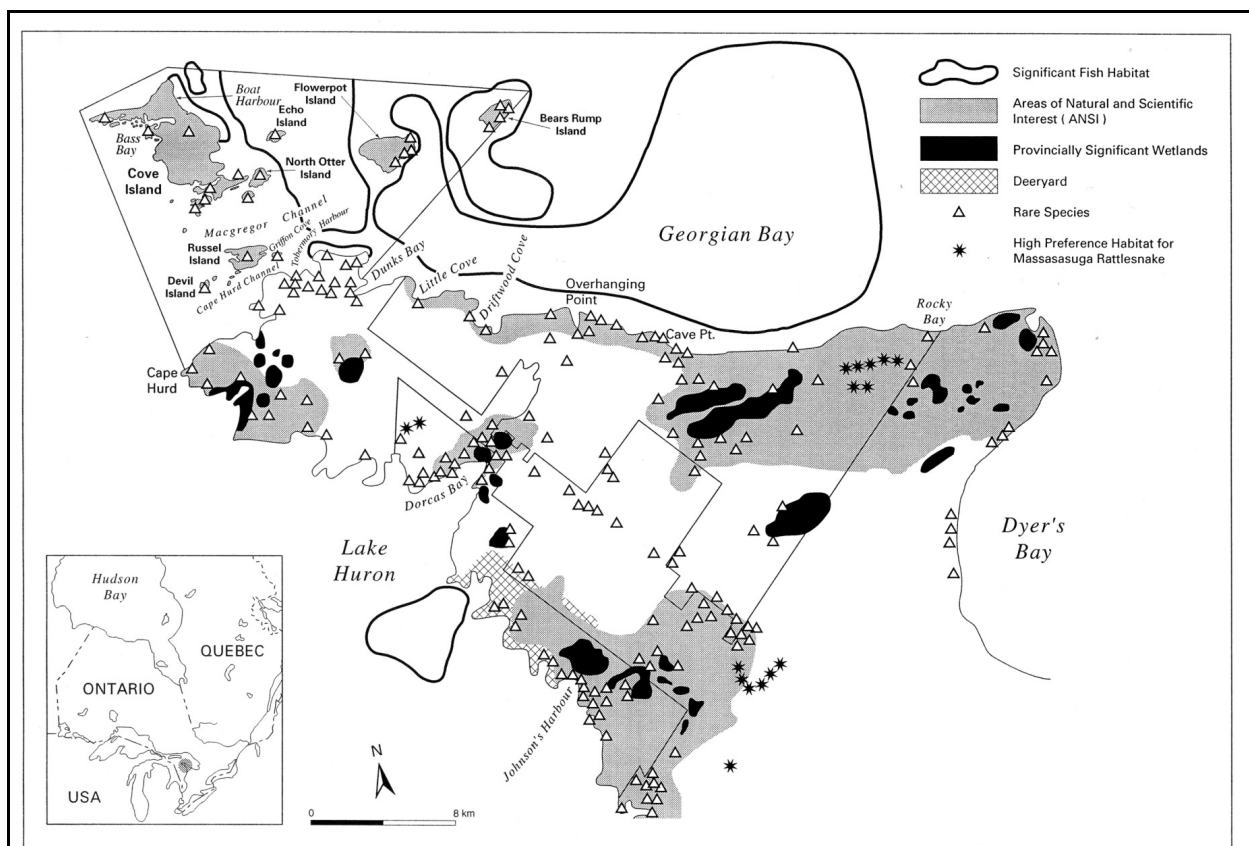


Figure 7. Areas of Biotic Significance

developed in Bruce County and Township of St. Edmunds. During this time the study area has also been affected by major provincial land use policies such as the establishment of the Niagara Escarpment Plan, a series of major changes to the Ontario Planning Act, and the creation of the national park. In addition, the park management plan for BPNP was approved (Parks Canada, 1996). The fact that the Niagara Escarpment has received international designation as a World Biosphere Reserve also highlights the natural and ecological significance of the region. It is important that the Niagara Escarpment Plan and World Biosphere designation receive careful attention in future planning and management for ecological integrity or health by Parks Canada.

Within the study area, the Bruce County Official Plan (County of Bruce, 1996) establishes land use policies to direct the future types and locations of new development. The land currently within the national park is designated as major open space with the majority of the surrounding area designated as rural lands. The Official Plan also identifies natural environment areas outside BPNP that are intended to include: environmental hazard lands (flood and erosion susceptibility, steep slopes and other conditions); encourage the protection of all regionally significant wetlands; identify and preserve areas of environmental or ecological significance; and promote the preservation of locally significant environmentally significant areas. Opportunities exist for linking and cooperatively planning for these natural

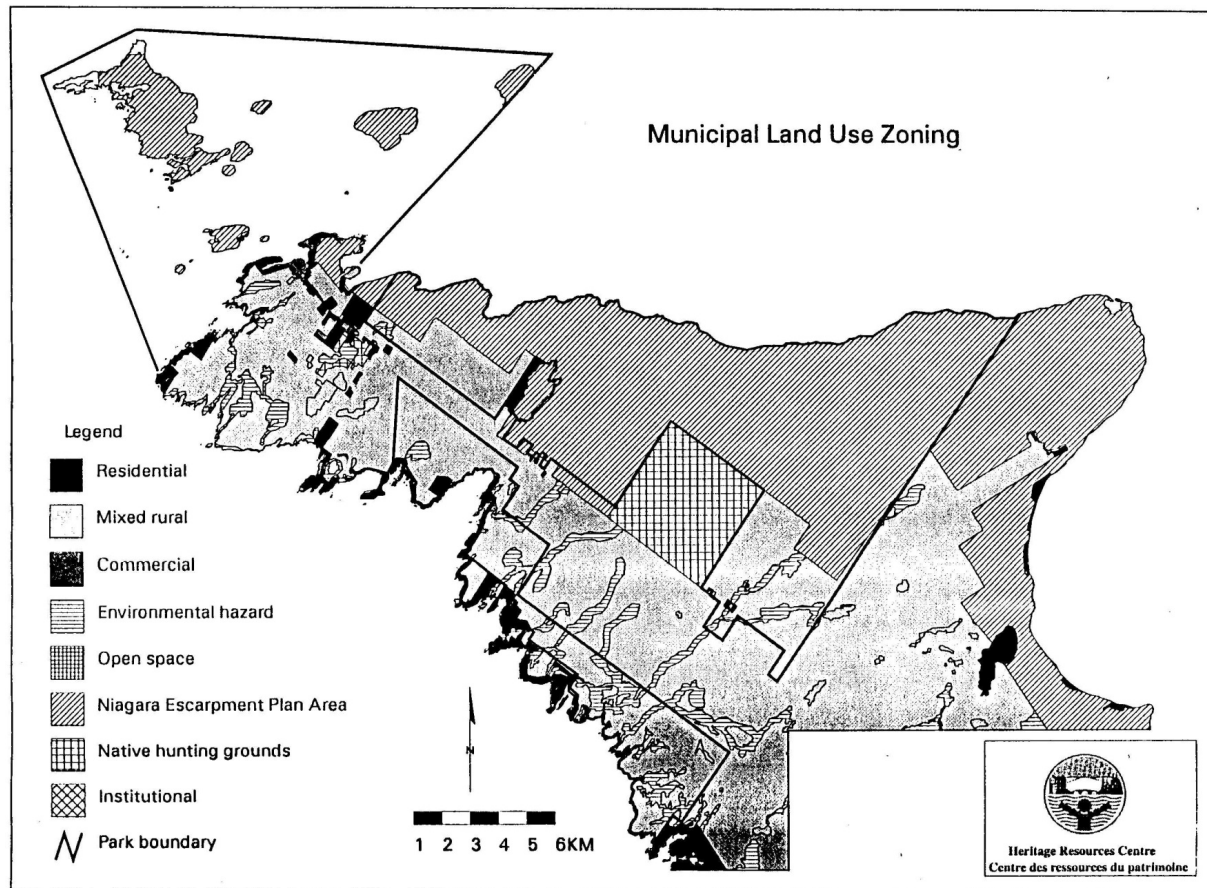


Figure 8 Municipal Land Use Planning



environment areas with the lands and waters of BPNP.

The Tobermory and Area Community Land Use Plan is intended to manage future growth and development within and adjacent to the community of Tobermory. The plan is associated with the broader goals and objectives of the Strategic Plan for the Township of St. Edmunds. A series of eleven land use designations have been established and mapped for the area: rural; residential; downtown/harbour commercial; highway commercial; space extensive commercial and light industrial; recreational commercial; extractive industrial; Niagara Escarpment Plan Area; community facilities; recreation and open space; and natural area.

The Township of St. Edmunds controls the permitting and regulation of development through the use of a Zoning

Bylaw. The By-Law provides specific provisions for the types of land uses that are permitted on private lands within the study area. At the time of the study the municipal zoning consisted of eight main types: Residential; Rural; Commercial; Environmental Hazard; Open Space; Niagara Escarpment Plan Area; and Institutional (Figure 8). The effect of changes to the Planning Act in Ontario and the amalgamation municipalities in Bruce County is unknown and will require future study.

BPNP is also partially located within the Niagara Escarpment Plan Area. Plan policies contain seven land use designations that indicate acceptable types of development and where they can be located: Escarpment Natural Area; Escarpment Protection Area; Escarpment Rural Area; Minor Urban Centre; Urban Area; Escarpment Recreation

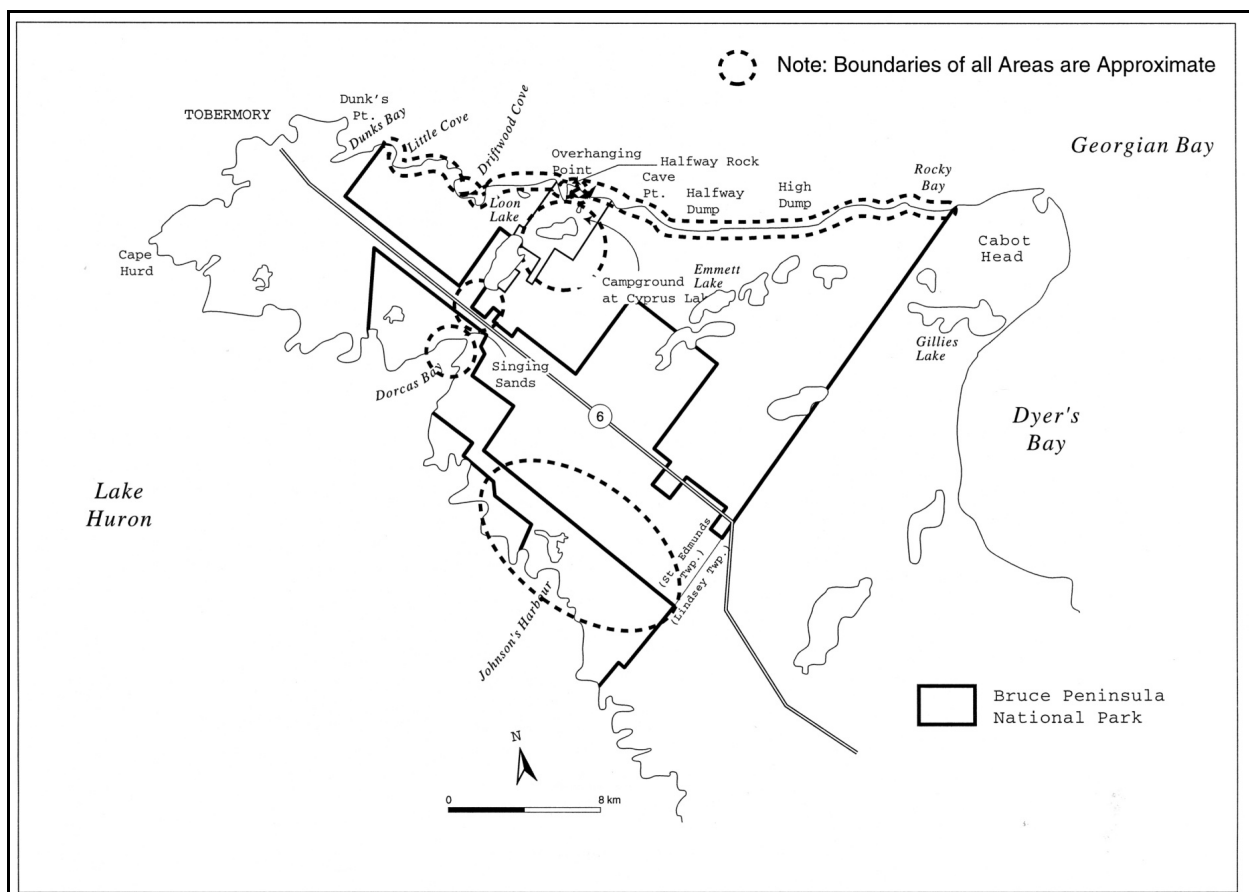


Figure 9. Areas of Concern

Area; and Mineral Extraction Area. These areas have been mapped along the length of the Escarpment and are used by the Niagara Escarpment Commission (NEC) in conjunction with local municipalities to review and approve land use changes within the Escarpment Plan Area.

In addition to the aforementioned land use planning arrangements, several important special environmental policies apply to the study area and the Bruce Peninsula more generally. These include Environmentally Significant Areas (ESAs), Areas of Scientific and Natural Significance and Interest (ANSIs), and Provincially Significant Wetlands. Other policies and related arrangements include the designation of the Niagara Escarpment Plan Area as a World Biosphere Reserve by the UNESCO and new stewardship opportunities made available to private landowners by the Ontario government. These policies provide relatively new means of conserving and sustainably using lands and waters around the national park. These new arrangements were seen as potentially making substantial contributions to conservation and sustainable development in the study area as well as to the ecological integrity of the lands and waters within BPNP.

## Areas of Concern

In order to facilitate planning, areas were identified where the interaction of stresses, effects and responses seemed to require early attention in order to maintain the ecological health or integrity of the study area. The areas that were identified as being of particular concern were those where stresses were affecting abiotic and biotic resources considered to be of special significance in the study area. Significant areas where stresses seem to be having undesirable affects have been termed Areas of Concern and require prompt attention in order to develop more effective planning responses.

The identification of Areas of Concern was intended to represent priorities for future management, planning and decision-making by Parks Canada and other stakeholders in the study area. Areas of Concern could be monitored, assessed, and dropped from this status as effective planning and management responses were developed to deal with them. For planning and management purposes six Areas of Concern were identified (Figure 9). These areas were considered high priority for further studies and assessments by Parks Canada and other concerned agencies, groups and individuals. These studies and assessments could build on

existing management plans or lead to new management or action plans.

It is important to recognize that other sites within the national park area could be under stress now or in future as recreation and other uses increase and as knowledge of significant natural areas grows. The list of Areas of Concern could change for such reasons and also because management or action plans may be prepared that effectively address problems, issues and concerns at sites now on the list. To the extent that they do so these sites can be removed from the list.

## Parks Canada Ecosystem Conservation Plan and Implementation Activities (1998 to 2006)

Since the completion and submission of a report by Nelson (1998) on the preparation of an ecosystem conservation plan (ECP) for the Bruce Peninsula National Park, discussions and further work was done on the development of an ECP by Parks Canada staff. Parks Canada also made a decision to move away from the identification of problems, issues and concerns (PICs) as a focus in preparing ECPs and instead pursue a more strategic approach. For a more through discussion of the development of ecosystem conservation plans for Canadian National Parks, including the Bruce Peninsula National Park, the reader is referred to Nelson et al. (2000).

After reviewing the Nelson 1998 report, Parks Canada staff in the national park decided that they would complete the final ECP. The ECP would be built around the development and implementation of goals, objectives, indicators and targets for ecological integrity with the establishment of monitoring indicators and measures (BPNP, 2001). The intent is to move the ECP beyond the park management plan to a broader ecosystem context for planning and to focus on monitoring and maintaining ecosystem integrity within the national park and also within the Greater Park Ecosystem that Parks Canada has defined as the natural area of the northern Bruce Peninsula.

The ECP is intended to “provide a decision-making support system to assist park and natural resource

management in ensuring the long-term viability of our ecosystem” (BPNP, 2001). Within the ECP six ecosystem integrity goals were developed with indicators, objectives and targets established for each: maintain viable populations, represent all community types, maintain evolutionary and ecological processes, work with others to protect the ecosystem, maintain functional ecological connections, and protection of cultural resources. The implementation of the ECP outlines an ecosystem management program and assessment process, which includes specific planning and technical components for each ecosystem integrity goal, and provides detailed descriptions of priorities, budget information, and scheduling of tasks. The ECP can very much be seen as a framework or work plan for conducting monitoring within the national park geared to examining ecological integrity.

Also starting in 2000 Parks Canada staff in the National Park began development of a State of the Park report, which was developed from measures and reporting of sixteen ecological integrity indicators and protocols first selected in 1996 within a monitoring program that was established within the National Park. Eight measures were fully implemented and considered operational. A comprehensive computer data management and decision support system was developed to interpret the data and report on the indicators. Ongoing assessment of the monitoring efforts and results continues.

The 2004 State of the Park Report provides a summary of the current status of ecological integrity based upon the eight measures for which monitoring has been conducted (Parks Canada, 2004). Of the eight measures, one (stewardship) is assessed as having a positive contribution to the ecological integrity of the national park. The measure of species diversity has been assigned a moderate assessment due to the presence of alien invasive species. Land cover change impacts have resulted in a moderate assessment of the terrestrial ecosystem function measure. Continued human activities leading to natural area fragmentation has also resulted in the moderate assessment of the habitat change stressor indicator. The ongoing impacts associated with disturbed areas associated with back country campsites and the increased park visitor attendance have lead to deteriorating ecological integrity in areas within the national park where those activities are present (Parks Canada, 2004). It should also be noted that due to the insufficient information, and lack of monitoring, three of the eight measures have not been developed.

Budget and policy changes over the last few years within Parks Canada have also provided opportunities to begin implementing some aspects of ecosystem conservation planning at the Bruce Peninsula National Park. Budget 2005 provided Parks Canada with \$60 million nation-wide in new ecological integrity funding over five years, followed by \$15 million in new annual ongoing funding. Parks Canada will use the funds to broaden its ecological monitoring and reporting work, augment its current ecological expertise, and undertake new initiatives to ensure the long-term ecological health of Canada's national parks. It will also proceed with significant projects to engage Canadians in protecting the ecological integrity of Canada's national parks, restore key ecosystems, involve Aboriginal communities in the management of northern national parks, and educate the public about ecological integrity. The new ecological integrity funding Parks Canada received in Budget 2005 builds on the \$75 million in new ecological integrity funding over five years, followed by \$25 million in ongoing annual funding, that the Agency received in Budget 2003.

Efforts are underway in the Bruce Peninsula National Park to secure access to some of these funds to support ongoing ecosystem research and environmental monitoring programs, including studies of black bears, the eastern massasauga rattlesnakes, lake water quality, and forest management. Also in July 2006, after over a decade of planning, a \$7 million visitor center for the Bruce Peninsula National Park was opened in Tobermory providing an excellent forum and venue for ecosystem based interpretation, public awareness, education and community outreach activities.

In a separate, but related effort, the Canadian Parks and Wilderness Society – Wildlands League Chapter - has recently completed a community ecosystem atlas for the northern Bruce Peninsula (CPAWS, 2005). The atlas provides a general overview of the natural ecosystem, information on land use and development, and related conservation efforts – including the Bruce Peninsula National Park. A series of detailed color mapping (by use of Geographic Information Science technologies) provides an excellent visual and descriptive presentation of key ecosystem elements and human activities.

## Conclusions

A major challenge in undertaking ecosystem planning is the need to provide information as a basis for management and decision-making. Often the wealth of scientific data and research can make it very difficult to make important decisions regarding environmental management issues. Information to assist in ecosystem planning can come from a variety of sources including professional consultation, public participation, and the scientific community. A challenge facing decision-making is how to more efficiently and effectively collect, evaluate and present this information.

Planning for the maintenance of the ecological integrity of Bruce Peninsula National Park requires understanding of a range of complex and often interrelated management issues. The Nelson (1998) study examined a vast range of research studies, published reports, databases and engaged in public consultation with stakeholders in and around the national park in an attempt to identify, assess and prioritize those issues requiring attention within an Ecosystem Conservation Plan for BPNP. This work has focused on moving beyond an initial list of problems, issues and concerns (PICs) to the development of a Stress, Effects, Response planning framework and the identification of Areas of Concern in order to assist Parks Canada and other concerned parties in addressing ecosystem conservation issues within the national park and surrounding lands and waters.

The twenty year history of ecosystem planning efforts reflects a range of policy changes within Parks Canada, including changes and revisions to the National Park Act, but also administrative and procedure changes within the agency. In addition, during that period there has been the emergence of new scientific information, technologies, and a growing awareness of - and appreciation for - the local community and contributions of humans within and around the Bruce Peninsula National Park. Progress has been made in improving the understanding of the natural ecosystem and the full range of human activities and associated impacts. A broader context for planning based on ecological integrity and heightened awareness of the greater park ecosystem has emerged.

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