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PUKASKWA NATIONAL PARK



PROVISIONAL MASTER PLAN

PUKASKWA NATIONAL PARK
PROVISIONAL MASTER PLAN

Prepared by Planning
and Development Division
Ontario Region, Parks Canada

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This provisional master plan is presented in two parts, to enable the reader to grasp easily what is actually being proposed and to provide background material to further enlighten the reader.

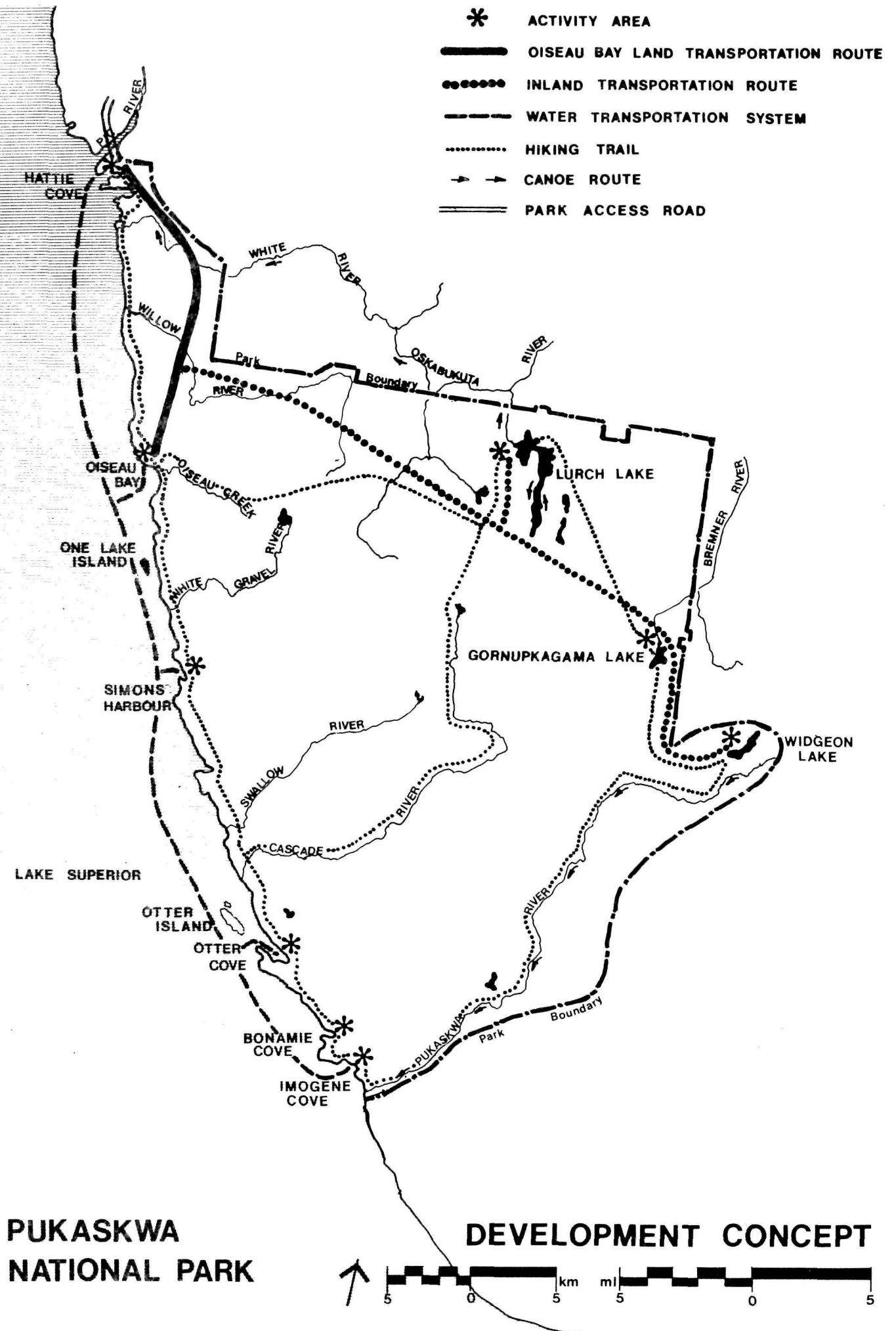
Part one provides a summary of the proposals followed by objective statements for the park as a whole as its individual components. This in turn is followed by a development proposal that reflects the objective statements. Concluding part one is a statement on basic factors that have influenced the development proposal.

The second part provides background information that will enable the reader to further understand the proposed plan as well as what is intended for the future.

1. Summary of Proposals

This provisional master plan contains the following major proposals:

- The park is zoned according to the national park zoning system which is common to all National Parks. All five zones common to the system have been applied to Pukaskwa.
- The park will contain a reception area at Hattie Cove. A series of interior and coastal development sites will be interconnected by public land and water transportation systems.
- Hattie Cove will be accessible from the Trans-Canada Highway and will serve as the introduction to the park and jump-off point for virtually all park visitors. A variety of park and commercial services will be available at Hattie Cove.
- Sites on the coast will be developed at Oiseau Bay, Simons Harbour, Otter Cove and Bonamie Cove. Oiseau Bay will serve as a day-use and tenting area and will be accessible by the Oiseau Bay land transportation and water transportation systems. The water transportation system will also provide access to the other sites which will serve as destination and jump-off points for hikers and campers.
- Inland sites will be developed at Lurch-Birch-Louie Lakes, Gornupkagama Lake and Widgeon Lake. Like the coastal sites, these will function as destination and jump-off points for hikers, campers and canoeists. Access to these sites will be provided by the inland transportation system.



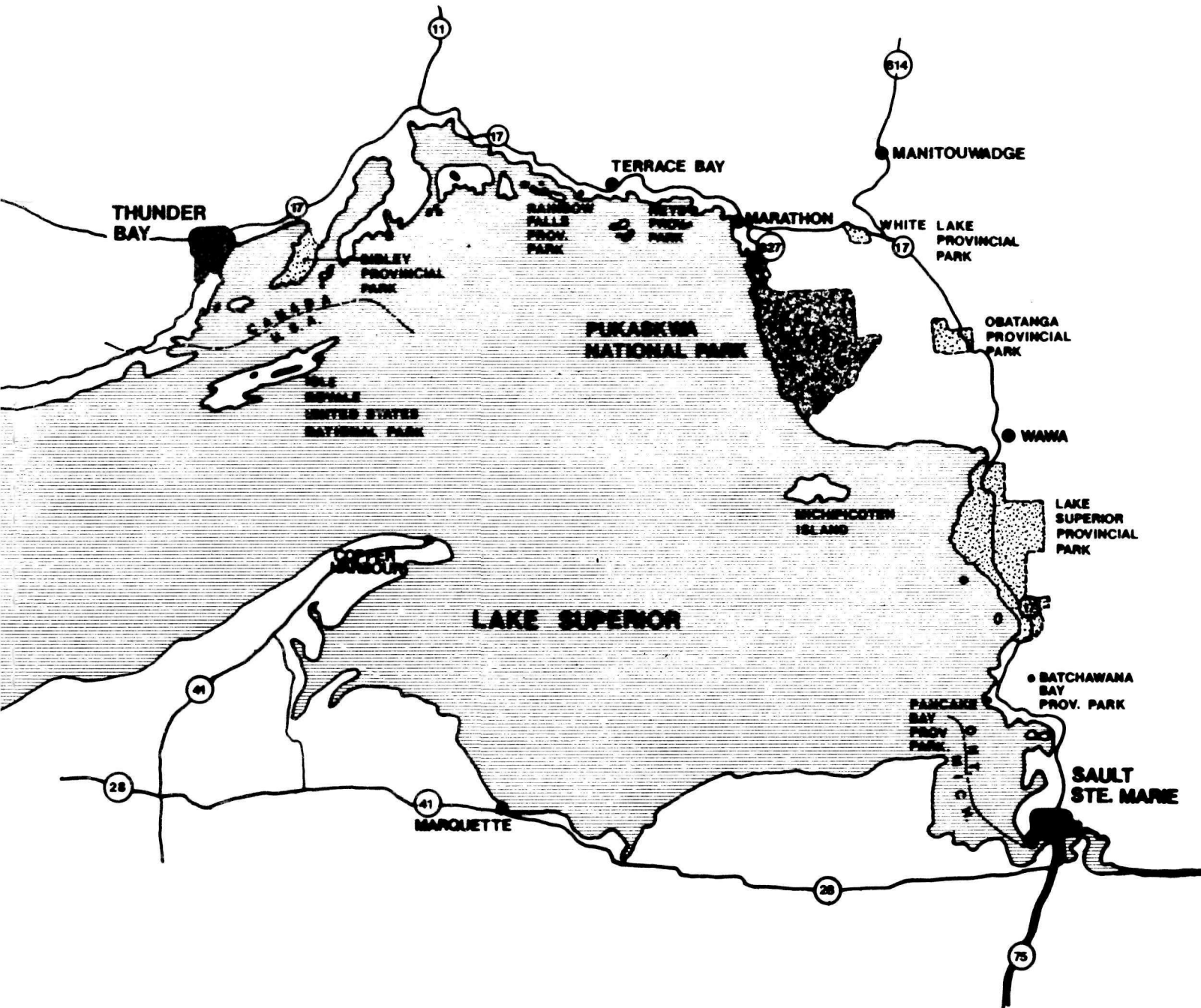
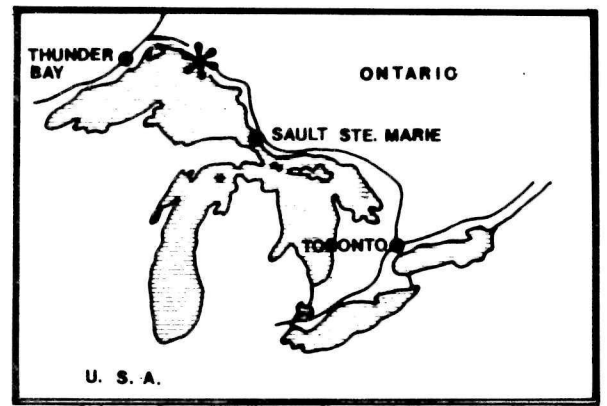
- Canoe routes, trails, primitive campsites and other secondary developments will be provided for the use and enjoyment of the park visitor.
- Further natural and cultural resource research is required prior to the actual implementation of the proposed developments to provide the base data so that environmental impacts can be minimized.
- A public involvement program to solicit public comment on this provisional master plan will be undertaken prior to the development of a master plan.

2. Park Role & Objectives

2.1 Introduction

The park has an area of approximately 1,878 km² (725 square miles) and is situated along the northeast shore of Lake Superior. Its history is intimately linked to Lake Superior and to the resources of its shoreline. It was a rugged habitat for early Native inhabitants and lay along the historic trade routes to the rich furbearing areas of the northwest. As a result of the large storehouse of timber resources of the region, logging that once took place in the park continues to thrive along the Pic River north of the park.

In addition to being one of twenty-eight national parks in Canada, it is one of twenty-five parks within a radius of 320 kilometres (200 miles). There are twenty-four provincial parks in this area of which two are wild river parks, two are natural environment parks and twelve are recreation parks. Private campgrounds and facilities also serve the region and use of Crown land for outdoor recreation purposes is extensive and popular. Pukaskwa, with its emphasis on preservation of the natural environment, will add a different dimension for participants in outdoor recreation by increasing opportunities for the more primitive types of day and overnight use along Lake Superior.



PUKASKWA NATIONAL PARK

REGIONAL SETTING



The closest centre of any size to Pukaskwa is Marathon, Ontario. Marathon should play an important role in supplying the needs of park users for such things as medical, automotive and other specialized services. There will be however a need to provide more services of a park specific nature closer to the visitor concentration since Marathon is 32 kilometres (20 miles) away.

2.2 Provisional Master Plan

The broad guidelines of the National Parks Act, the fundamental basis of this provisional master plan, were supplemented in 1964 by the National Parks Policy. The policy affirms the general objectives of the Act, provides guiding principles for planning, development and operation, and ensures continuity in the administration of the national parks. Thus this provisional master plan is intended to provide direction in order to preserve the natural environment of the park for the benefit of future generations; to propose development which allows for the recognition and appreciation of the park's typical and outstanding areas and features without unnecessary impairment of the resources; and to provide facilities necessary for the park visitor to experience the park. Assistance in the preparation of the planning concepts within Parks Canada's existing policy framework for this provisional master plan was provided by an advisory committee that was formed in 1971. The advisory committee was

composed of federal, provincial and Robinson-Superior Band representatives.

In order for the master planning programme to be completed, this provisional plan must undergo public scrutiny and comment by the people of Canada and in particular those people within the immediate region of the park.

2.3 Park Purpose

The purpose of Pukaskwa National Park is to further fulfil the aim of Parks Canada which is to foster protection of those places which are significant examples of Canada's natural and cultural heritage and to encourage public understanding and enjoyment of those representative heritage areas now and in the future.

Parks Canada, through the Parliament of Canada, has the responsibility of providing the highest degree of protection possible for these special places. As a result, they can be passed on unimpaired so that future generations of Canadians may understand, enjoy and appreciate the significance and value of their natural heritage.

It is the intent of the national parks system to include representative areas from each of the natural regions of Canada. Parks Canada recognizes 48 major natural regions and

Pukaskwa has been established to represent Natural Region 18, the Central Boreal Uplands.

2.4 Park Role

The roles established for Pukaskwa are as follows:

- to represent the following natural history themes, which in part characterize natural region 18: the Port Arthur Hills Division of the James Bay Physiographic Region, the Precambrian Era of geologic history and the Superior Section of the Boreal Forest Region;
- to complement the Ontario Provincial Parks System by adding another outdoor recreational dimension to the existing system along the Lake Superior shoreline;
- to preserve and protect outstanding and/or representative landscapes, ecosystems and features;
- to provide a variety of facilities and services that will permit the visitor to enjoy the park while ensuring a minimum of impairment to the park's resource;
- to increase public understanding and appreciation of the Pukaskwa National Park area and the national parks system;
- to encourage and develop cooperative programs with neighbouring land management agencies to ensure a complementary approach to management and protection of resources within and adjacent to the boundaries of the park;

- to provide for the operation and maintenance of the park in such a manner so as to minimize public inconvenience and establish an acceptable environmental quality; and
- to encourage residents in the area to participate in employment and development opportunities offered by the park.

2.5 Park Functions

Reporting to the park superintendent there will be five functional groups responsible for the operation and maintenance of the park: Administration, General Works, Interpretation, Visitor Services and Resource Conservation.

2.5.1 Administration Function

The Administration function will coordinate, plan and manage the park's financial, manpower and material resources, the administration buildings and staff housing.

The park's headquarters will be situated at Marathon, Ontario, as will permanent staff housing. Necessary administrative facilities and seasonal staff accommodations will be located in Hattie Cove.

2.5.2 General Works Function

The general works function will be responsible for all maintenance to, and construction of manmade facilities within the park. Maintenance and construction standards must ensure an acceptable level of visitor satisfaction and yet minimize damage to the environment.

2.5.3 Interpretation Function

The primary objective of Interpretation is to increase public awareness and appreciation of Canada's natural and cultural heritage by communicating to the park user the values of Pukaskwa National Park as a member of a total system of national parks in Canada, and its significant and distinguishing natural and cultural resources.

In order to meet this objective Interpretation must:

- i) develop an interpretive communications system designed to reach all visitors to the park.
- ii) provide a progressive range of interpretive programs and experiences geared to visitor capabilities, inclinations and experience. This should facilitate the visitor achieving some awareness and appreciation of the park's values through better understanding of:
 - the forces that have shaped and sustained Pukaskwa's rugged hills, valleys and coasts;
 - Pukaskwa as a representative area of up-land Canadian Shield on the northeast shore of the largest freshwater lake in the world;
 - Pukaskwa's representation of part of natural region 18 in which environmental components have complex ecological relationships, and within which are located some plants and animals which are rare and unique; and

- the influence of man on the landscape
and the influence of the land on man.

Interpretive units and themes which provide the framework for development of storylines, programs and facilities have been developed.

The overall park theme is Wild Shore of an Inland Sea. The six interpretive units which closely follow geomorphological boundaries and their respective themes are as follows:

- i) The Coast - Wild Shore of an Inland Sea;
- ii) White River Plains - Lake of the Sea;
- iii) Pukaskwa Plains - From Ice to Sea;
- iv) Cascade Mountains - Island on a Mountain Top;
- v) Lurch Mountains - Ancient Shoals; and,
- vi) The Plateau - Sea Floors.

2.5.4 Visitor Services Function







The primary objective of Visitor Services is to provide a variety of facilities and services that will permit the visitor to use the park while being compatible with and ensuring minimum impairment of the park's resources.

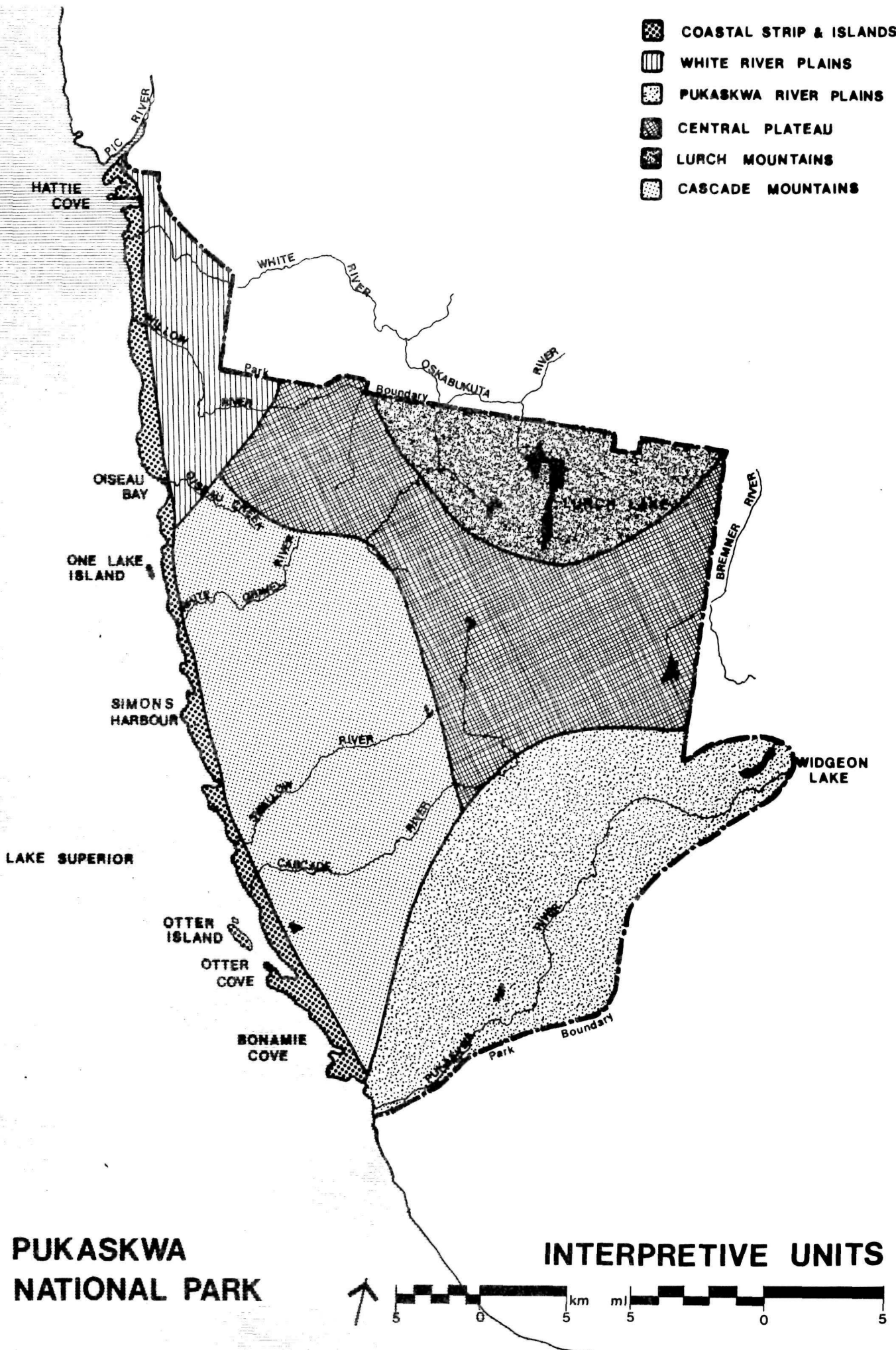
In order to meet this objective, Visitor Services:

- i) ensures that facilities, activities and services meet the needs of the park user:
 - by identifying and measuring the various visitor needs;

PUKASKWA NATIONAL PARK

INTERPRETIVE UNITS

-  COASTAL STRIP & ISLANDS
-  WHITE RIVER PLAINS
-  PUKASKWA RIVER PLAINS
-  CENTRAL PLATEAU
-  LURCH MOUNTAINS
-  CASCADE MOUNTAINS



- by ensuring that existing facilities and activities provide the park user with a quality service;
 - by providing appropriate day-use services in areas such as Hattie Cove and Oiseau Bay;
 - by providing appropriate accommodation facilities and services in areas such as Hattie Cove, Oiseau Bay and selected coastal and inland locations;
 - by providing reasonable access to the park; and
 - by monitoring changes in needs and adjusting the visitor services program to accommodate those needs and changes.
- ii) encourages the visitor to experience and explore the park:
- by using centres of high visitor contact, such as the visitor reception centre at Hattie Cove, to inform the park visitor of the recreational opportunities within the park;
 - by identifying the most appropriate means of access based on the type of facility or service being provided (for example: trail access to Tip Top Mountain, land transportation system to the park interior; the water transportation system to coastal sites, or canoe access along the Pukaskwa River).

2.5.5 Resource Conservation

The primary role of Resource Conservation is to ensure the protection and preservation of the park's natural and cultural resources. In order to accomplish this, it is necessary to reconcile to the extent possible recreational and visitor use activities with this preservation role.

This role is achieved by:

- 1) developing an approach to, and implementing a continuing natural resources studies management and protection program and preparing interrelated plans directed toward the natural evolution, maintenance, and/or modification of the resources of an area;
- 2) co-ordinating and carrying out a public safety program;
- 3) preparing and establishing a law enforcement program directed toward the prevention of visitor/resource and inter-visitor conflicts and maintaining respect for the National Parks Act, policy and regulations; and
- 4) participating in public relations activities to enhance the image and understanding of Parks Canada and also to increase the knowledge and understanding of the role of Resource Conservation in preserving and managing the park's natural environment.

In order to meet the primary role, the following resource conservation objectives have been established for Pukaskwa National Park;

1. Natural Resource Management

With respect to the entire park, the primary resource management objective is to ensure that the natural character of Pukaskwa National Park is maintained and that natural processes are allowed to evolve with a minimum of interference from man by:

- a) ensuring the preservation and perpetuation of the natural vegetation mosaic and successional trends by allowing them to evolve naturally, while recognizing the specific habitat requirements of wildlife populations;
- b) developing, implementing and monitoring a wildlife management program; and carrying out Parks Canada's protection and preservation role while accepting the rights of the Robinson-Superior Treaty Indian Group and other users;
- c) ensuring the protection and perpetuation of representative, unique, rare/endangered, fragile natural and cultural resources and processes through the selective use of resource management techniques;
- d) minimizing the detrimental effects of park development, visitor activities and operations upon park resources and processes while recognizing the need for compatible recreational activities; and

- e) cooperating with adjacent private or provincial land use agencies.

2. Public Safety

The public safety objective is to assist park users in maximizing their park experience in a safe manner by:

- a) developing and co-ordinating a program of emergency public assistance; and
- b) continuing to identify and treat appropriately features or conditions hazardous to the public.

3. Law Enforcement

The law enforcement objective is to ensure that the role and objectives of Pukaskwa National Park with respect to preservation and use are achieved and maintained through the judicious application of the National Parks Act, and the unbiased enforcement of the National Park's Regulations by:

- a) developing a co-operative enforcement program with other appropriate federal and provincial regulatory agencies; and
- b) developing and maintaining a public awareness program in conjunction with other agencies to maximize achievement of the objective of preservation and use while minimizing legal confrontation.

4. Public Relations

The public relations objective is to participate with park staff in the development of a program to promote an understanding

of Parks Canada, the role and objectives of Resource Conservation and respect for the National Parks Act, Policies and Regulations.

3. Activity Areas

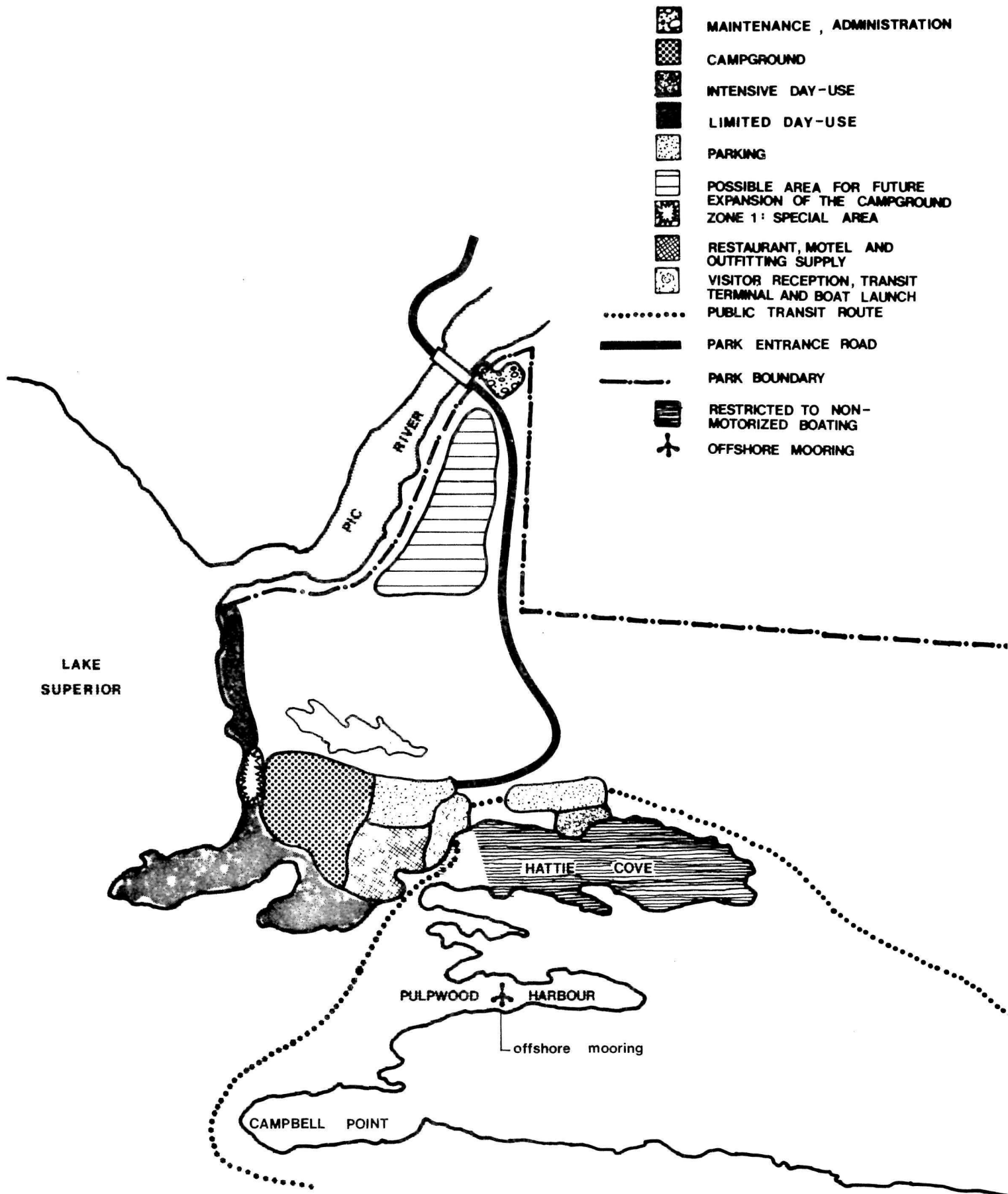
3.1 Hattie Cove

Hattie Cove will be the major visitor service centre for Pukaskwa National Park. It will:

- i) serve as the introduction to the park;
- ii) provide a variety of accommodation and day-use facilities and services for the convenience of the visitor;
- iii) provide opportunities for an intensive interpretation program on the natural and cultural history of the park;
- iv) be the area in which the park maintenance and service compound will be located; and
- v) serve as the primary terminal for the land and water transportation systems.

The facilities that will be located in Hattie Cove include the following:

- a visitor reception centre;
- campgrounds;
- concessions;
- a terminal for the land and water transportation systems;
- an intensive day-use area;
- informal day-use areas;
- a small boat launch;
- visitor parking facilities; and
- a park maintenance and service area.



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**HATTIE COVE
DEVELOPMENT CONCEPT**



The visitor reception centre should be a major focus and attraction for all park visitors and will be the place where park visitors can become oriented to the park, acquire information, and participate in interpretation programs.

A central, semi-serviced campground will be provided as will a camping facility for organized groups. An area has also been identified for future consideration as a campground if expansion of the proposed campground facility is deemed necessary. For those visitors who are not prepared to camp overnight, motel accommodation will be provided. A restaurant and outfitting supply store will also be developed for the convenience of all park users.

A common terminal for the land and water transportation systems will be in Hattie Cove and will ensure convenient access to the visitor parking area and visitor reception centre.

An organized day-use area will be established for Hattie Cove users within the protected confines of Hattie Cove. Informal day-use areas will make use of headlands and beaches along Lake Superior. Picnic facilities and casual walking trails will be provided.

A small boat launch ramp will be constructed for visitors wishing to visit the Pukaskwa shoreline with their own boat. Within Hattie Cove the water will be zoned for use by motorized and non-motorized craft, with the majority of the waterbody in Hattie Cove being allocated to non-motorized use. Off-shore moorage for large cruisers will be provided outside of Hattie Cove in the Pulpwood Harbour area if required.

There are areas in Hattie Cove that warrant protection. Specifically, these areas include the habitats of the Franklin's Lady-slipper (Cypripedium passerinum) and the Northern Twayblade (Listera borealis), two plants of arctic alpine affinity whose known range has been extended with their identification in the park.

Winter recreational activities such as camping, snowshoeing, cross country skiing and nature study are compatible with the philosophy of the park. Consideration will be given to accommodating these activities initially in the Hattie Cove area. Winter use of the Oiseau Bay land transit route will be restricted because of the potential negative affect upon the wintering caribou herd.

3.2 Oiseau Bay

Oiseau Bay will serve as a focal point for park visitors wishing to gain a coastal experience.

-  DAY USE AREA
-  HIKING TRAILS
-  ZONE 1 - SPECIAL AREA
-  TRANSIT TERMINAL
-  CAMPGROUND
-  OISEAU BAY LAND TRANSPORTATION ROUTE
-  WATER TRANSPORTATION SYSTEM

LAKE SUPERIOR

OISEAU BAY

OISEAU CREEK

OISEAU POINT

PUKASKWA
NATIONAL PARK

OISEAU BAY DEVELOPMENT CONCEPT



The facilities that will be located in Oiseau Bay include the following:

- a campground;
- a terminal for land and water transportation systems;
- day-use areas; and
- hiking/walking trails.

A semi-serviced campground will be provided for "walk-in" tent campers. It will be reached by utilizing either the land or water transportation systems. A common terminal will link the land and water transportation systems and will be situated in proximity to the campground and day use area.

A day use area with picnic facilities will be situated on Lake Superior adjacent to the transportation terminal. Hiking trails will be developed for extended and short term walks. Trails that are intended for heavy use will have this reflected in their design and location.

There are areas in Oiseau Bay that warrant protection. Specifically, these are a great Blue Heron rookery on one of the off-shore islands, two sites that harbour the Pitcher's Thistle (Circium pitcheri) and a wintering ground for the Woodland Caribou north of Oiseau Bay. Until further investigations are conducted, a portion of the ecosystem in which a jack pine stand is located will also be protected.

3.3 Simons Harbour, Otter Cove, Bonamie Cove and Imogene Cove

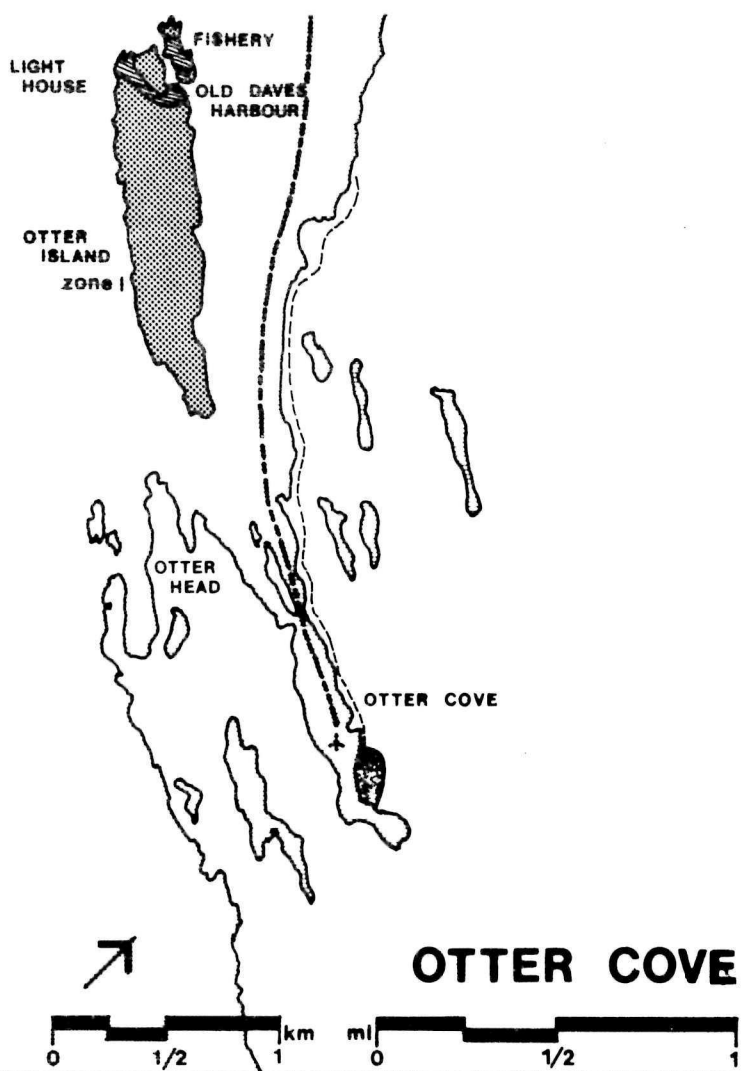
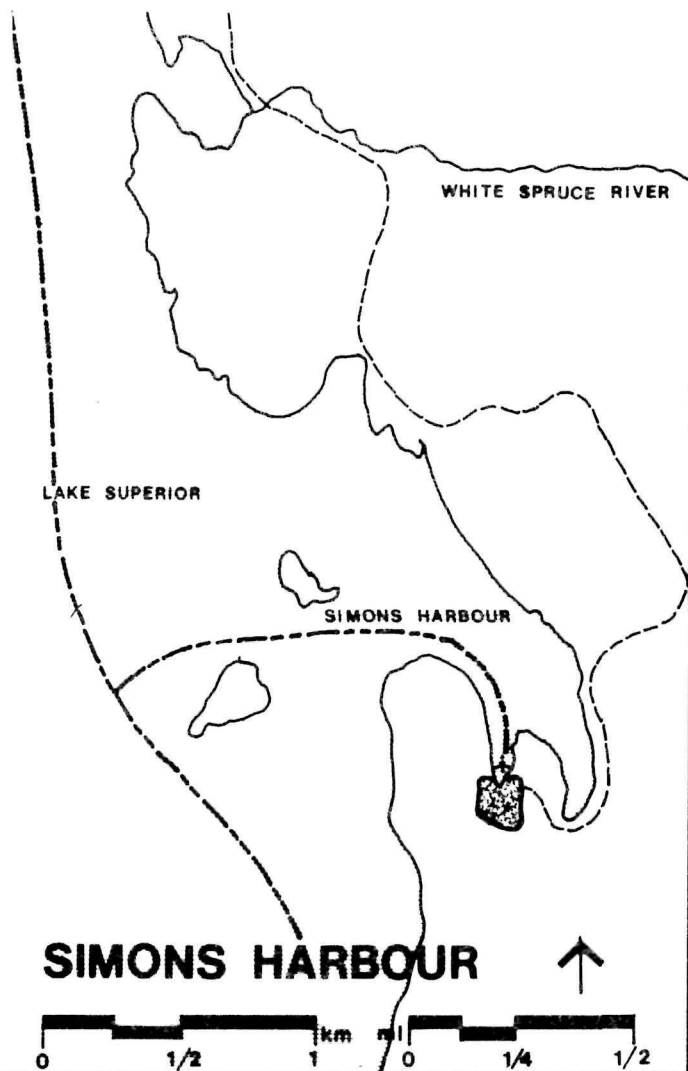
These coastal sites are intended to provide the visitor with a more natural coastal setting than they would experience at either Hattie Cove or Oiseau Bay. They will also be points from which an individual may gain access to the park's interior. Emphasis will be placed on interpreting some of the park's cultural features located in the Bonamie Cove - Imogene Cove region.

Facilities that would be provided at these coastal sites include the following:

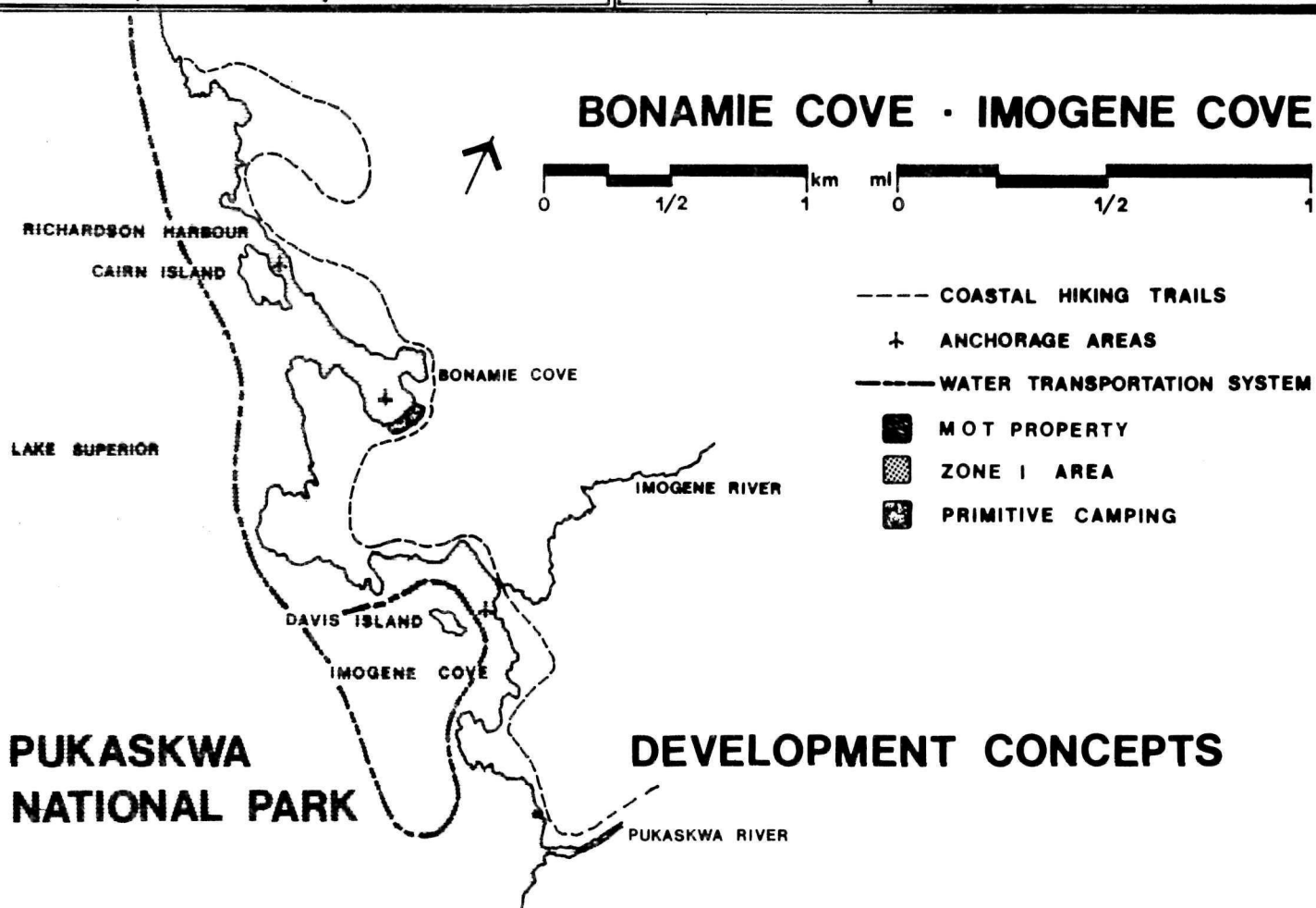
- terminals for the water transportation system;
- primitive campsites at Simons Harbour, Otter Cove and Bonamie Cove;
- hiking trails; and
- anchorage for private watercraft.

The major means of access to these coastal sites will be via the water transportation system. Docking facilities will be provided at Simons Harbour, Otter Cove and Imogene Cove.

Small primitive campsites will be established at Simons Harbour, Otter Cove and Bonamie Cove. A short hike of approximately one-half mile will be required from Imogene Cove to the campsite at Bonamie Cove. The anticipated levels of activity have to be determined and



BONAMIE COVE · IMOGENE COVE



resource studies have to be undertaken in order to identify potential development constraints.

A limited number of trails in addition to the coastal hiking trail will be established in the area of these sites. For example trails will lead from Simons Harbour to Tip Top Mountain, one of the highest points in Ontario; and provide access to various Pukaskwa Pit locations and to the Pukaskwa Depot, an old Abitibi Paper Company logging camp at Imogene Cove.

Offshore moorage for watercraft will be available at these sites and similar facilities will also be supplied in all harbours of refuge for emergency use.

3.4 Lurch-Birch Lakes, Gornupkagama Lake and Widgeon Lake

In order for the visitor to gain an appreciation of the park's interior in a more natural setting than that at Hattie Cove, three inland sites will be developed.

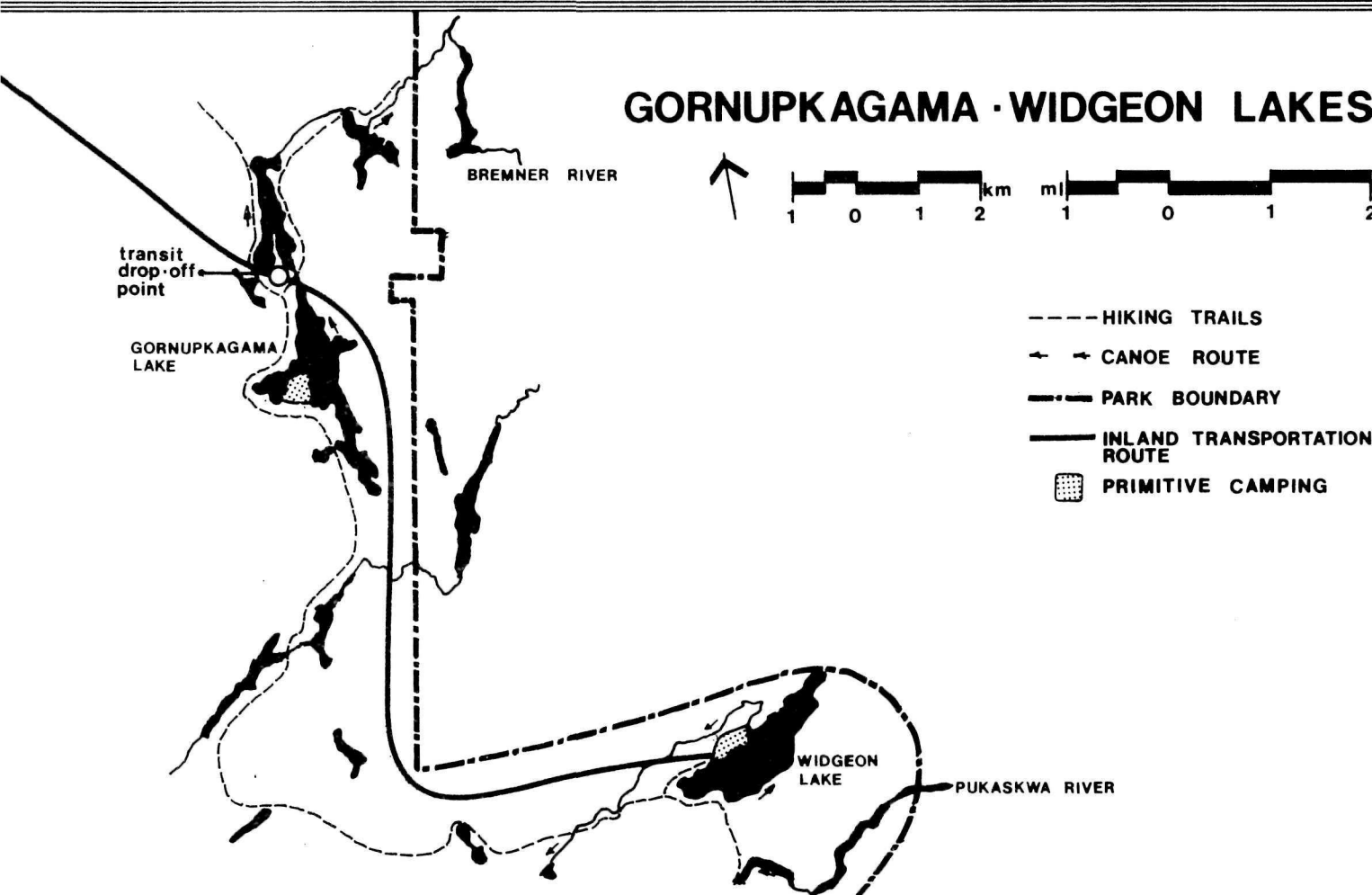
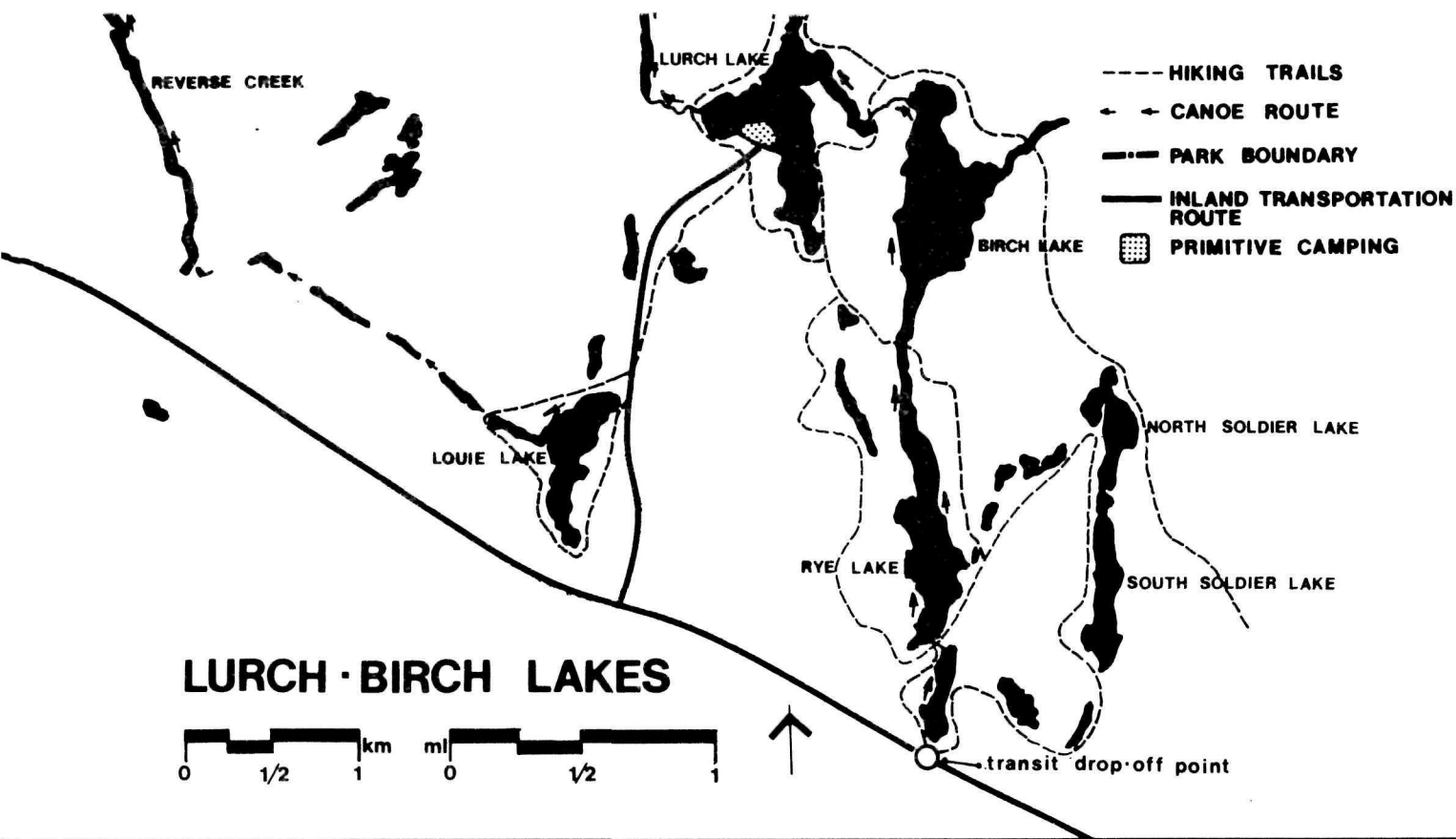
Facilities that would be provided at these sites include the following:

- primitive campsites;
- terminals for the inland transportation system;
- hiking trails and canoe routes;
- canoe storage and pick-up concessions; and
- seasonal administration.

A small primitive campground will be located on Lurch Lake, Gornupkagama Lake and Widgeon Lake. Individual campsites will be scattered throughout the areas and will be located at strategic distances from one another along canoe routes and hiking trails. The anticipated levels of activity have to be determined and resource studies have to be undertaken in order to identify potential development constraints. Pick-up and drop-off terminals for the inland transportation system will also be sited near these lakes.

Hiking trails will connect all the lakes in the region and will vary from short day-use trails to trips requiring more than one day. Canoe routes will include the Lurch-Birch-Rye Lakes system, the Pukaskwa River route beginning in the vicinity of Widgeon Lake, and the Oskabukuta-White Rivers route starting at either Lurch or Louie Lakes.

For those visitors wishing to rent a canoe to make use of the various canoe routes, a canoe pick-up and storage area will be provided at Lurch Lake. It most likely will be operated by the outfitting concession in Hattie Cove.



**PUKASKWA
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DEVELOPMENT CONCEPTS

In order to enhance the visitors' experience, a seasonal unmanned interpretation facility will be established in the area of the Lurch Lake. As part of the backcountry management program, a seasonal warden station will also be established in this region.

4. Circulation

Road access to the park will be by way of an extension of Highway 627 across the Pic River to Hattie Cove from Highway 17. Access to the remainder of the park will be achieved by the development of the two forms of public transportation: the land transportation and the water transportation systems. Private vehicles will be restricted to the Hattie Cove area.

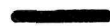
A common transit terminal will be established in Hattie Cove. Here the visitor will have the option of using the inland transportation route to gain access to interior sections of the park; the Oiseau Bay land transportation route to gain access to Oiseau Bay; or the water transportation system to reach Oiseau Bay, Simons Harbour, Otter Cove and the Bonamie - Imogene Coves area.

Four major hiking trails will be developed. These are the Lake Superior Coastal Trail, the Pukaskwa River Valley Trail, the Cascade River Valley Trail and the Interior Trail. In conjunction with these trails and the major campgrounds, day-use and over-night hiking trails will be developed.

Five major canoe routes will be available. These are the Pukaskwa River, the White River, the Oskabukuta - White rivers, the Lurch-Birch-Rye Lakes system and the coastline of Lake Superior.



ACTIVITY AREA



OISEAU BAY LAND TRANSPORTATION ROUTE



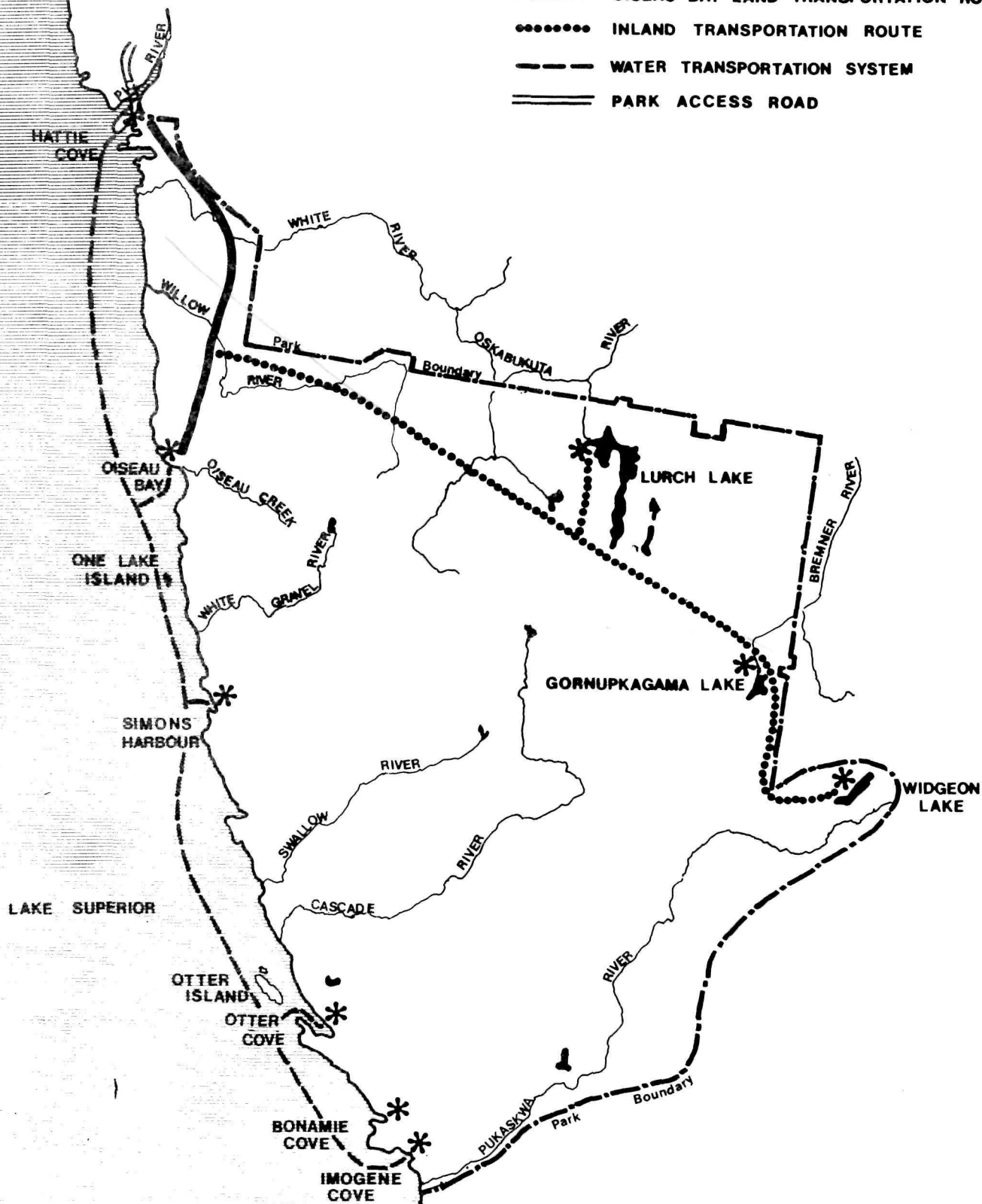
INLAND TRANSPORTATION ROUTE



WATER TRANSPORTATION SYSTEM



PARK ACCESS ROAD



PUKASKWA
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LAND & WATER
TRANSPORTATION SYSTEMS



4.1 Oiseau Bay Land Transportation Route

The primary purpose of this route is to provide controlled access to the Lake Superior coast and access to Oiseau Bay for tent campers, day users and hikers. Not only will this route provide guaranteed access to one of the more scenic areas of the park but it should also serve as an alternative to the water transportation system. It is anticipated that visitors will utilize both access alternatives and thereby gain further appreciation of the terrestrial and aquatic components of the park.

One designated drop-off point will be provided along the route for the start of the coastal hiking trail. Other additional stops and viewpoints may be established on development of an interpretation program.

The route spans the White River at the fourth rapids and the selection of this site provides a good foundation for the bridge abutments and spans. The corridor follows the valley of the Willow River, avoiding the more poorly drained areas of the central plain to the east and the caribou wintering grounds to the west and north of Oiseau Bay. Entering the Oiseau Bay area, the route is situated north of Oiseau Creek. This eliminates the need for bridge construction and enhances the camping and interpretive values by eliminating

potential conflicts with mechanized vehicles. This route terminates at the combined land and water Oiseau Bay transportation terminal.

Vehicles that will be used must be capable of carrying a large number of people and their equipment, and provide adequate window space for viewing.

4.2 Inland Transportation Route

The primary purpose of this route is to provide controlled access to the interior areas of the park and broaden the experience of the visitors to Pukaskwa by enabling them to participate in outdoor activities (e.g. camping, hiking and canoeing) that are compatible with the park. Public vehicles will be provided and will be capable of carrying passengers and their equipment to Lurch Lake, Gornupkagama Lake and Widgeon Lake.

The Umbata and Regan roads, two existing service roads that provide access to the powerline that lies within the park, will be closed once the inland transportation route becomes operational. Powerline service vehicles will then be allowed to use existing park roads.

Identification of a specific route has yet to be completed. However, the route will lie within the park boundaries and will separate from the Oiseau Bay land transportation route south of the White River.

4.3 Water Transportation System

This system will provide: access to coastal sites; opportunities for the visitor to experience the water component of the park; and provide transportation to Hattie Cove for those visitors who walked to the coastal sites from the inland.

Due to distance, it is anticipated that passenger vessels will operate more frequently between Hattie Cove and Oiseau Bay than between Hattie Cove and the other coastal sites. Passengers will be encouraged to complete the round trip from Hattie to Oiseau Bay by taking the Oiseau Bay land transportation route one way and the water transportation system the other, thereby exposing the visitor to the land and water components of the park.

All travel will be contingent on satisfactory water conditions.

4.4 Trails and Camping

Hiking, canoeing, and camping in Pukaskwa are considered to be desirable recreational activities that are compatible with the natural atmosphere of the park. They also enhance the visitors' experience and increase their appreciation of the park.

The hiking trails will form a circulation network that will be linked to activity areas and the land and water transportation systems. Four major trails are proposed:

- the Lake Superior Coastal trail that will follow the coastline from Hattie Cove to the mouth of the Pukaskwa River;
- the Pukaskwa River Valley trail that will extend from the mouth of the Pukaskwa River to Widgeon Lake;
- the Cascade River trail, that will begin in the Lurch Lake area and follow the Cascade River to Lake Superior; and
- the interior hiking trail that will join the Widgeon Lake, Gornupkagama Lake and Lurch Lake areas.

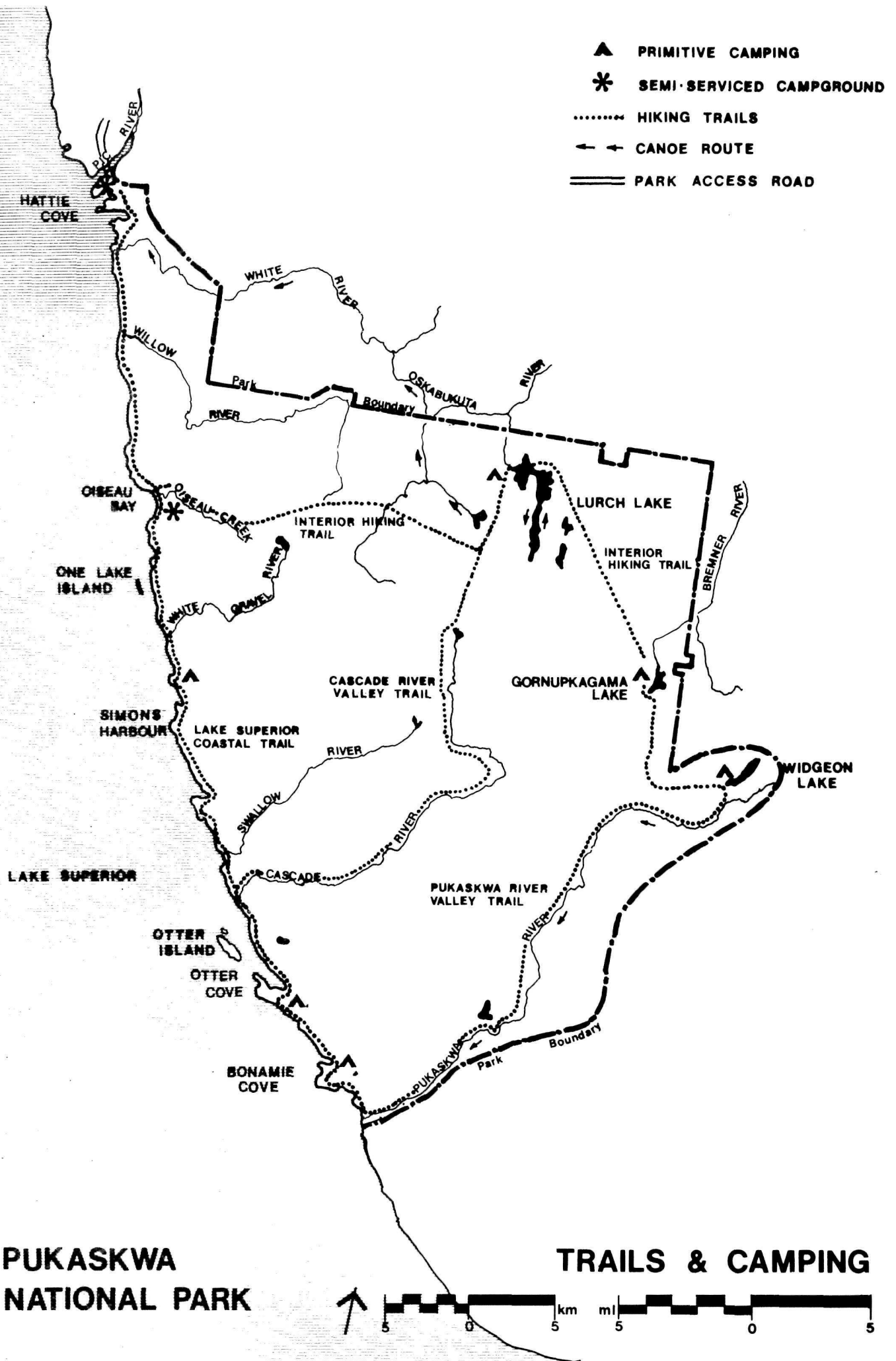
In addition, shorter trails for interpretation purposes, or to gain access to specific features, will also be established.

Access to a variety of canoeing opportunities will be provided. Due to the limited number of routes and seasonal variation of water levels on many streams, canoeing will not likely be a major park activity. Those routes that can be used for at least part of the year are as follows:

- the Pukaskwa River beginning at either Highway 17 or at Widgeon Lake and terminating at Lake Superior;
- the Lurch, Birch, Rye Lakes system, which is totally within the park;

PUKASKWA NATIONAL PARK

TRAILS & CAMPING



- the White River beginning at White Lake Provincial Park on Highway 17, or beginning in the Lurch Lake area and using the Oskabukuta River to reach the White River. These two routes would terminate at Lake Superior; and,
- the Lake Superior coastline whereby the canoeist could continue trips upon entering Lake Superior from the Pukaskwa River and White River, or paddle the Lake beginning and ending at any one of the coastal activity areas.

As a number of the routes extend beyond the park-boundary, co-ordination and co-operation in their development and maintenance on the part of Parks Canada and the Province of Ontario will be required.

With the exception of those campgrounds at Hattie Cove and Oiseau Bay all other campsites will be of the "primitive" type and will consist of little more than a cleared area and a toilet facility. These will be strategically placed along hiking trails and canoe routes and will be concentrated near the inland and coastal activity areas.

5. Zoning

Zoning for Pukaskwa is a method of protecting the area's character and attributes by the division of land into a series of areas within which specific activities are allowed and related management programs implemented.






The division of Pukaskwa into such a series of zones is based upon a recognition of the major geomorphological units and the sensitivity, capability and the proposed use of the landscape. The boundaries of the Park's special features will be established following more detailed studies. The Park will be zoned according to the system used in all national parks and is divided into the following classes:

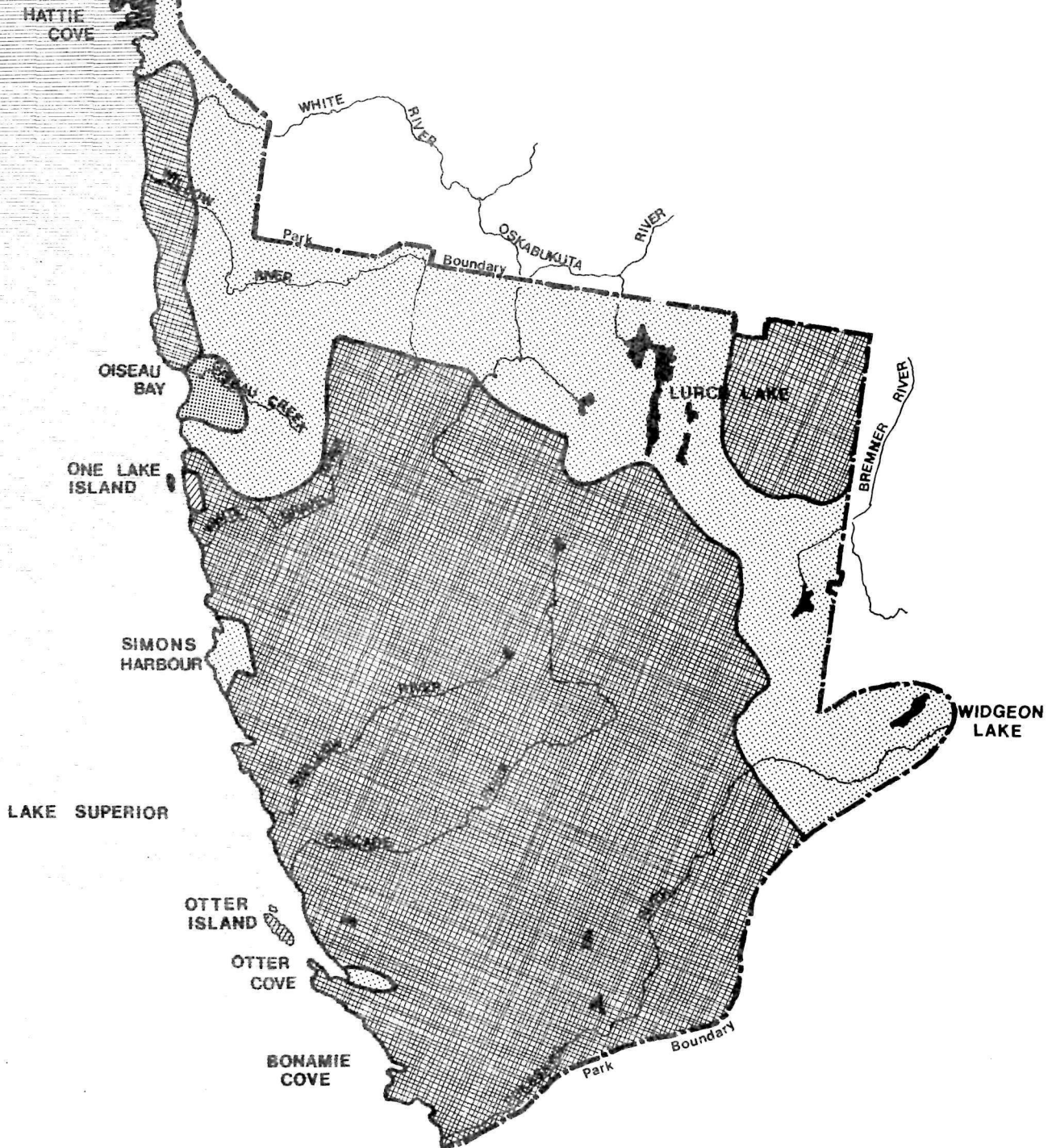
- | | |
|----------|------------------------------|
| Zone I | - Special areas; |
| Zone II | - Wilderness areas; |
| Zone III | - Natural environment areas; |
| Zone IV | - Outdoor recreation areas; |
| Zone V | - Intensive use areas |

Zone I - Special Areas

Lands contained within this zone are areas where, due to the uniqueness of the landscape and/or fragility of natural and cultural features, rigid controls will be exercised in the utilization of the land.

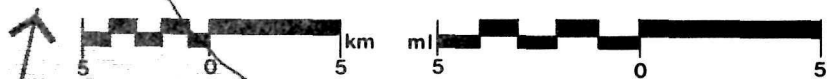
In Pukaskwa, special areas so far identified include "Pukaskwa Pits", blue heron and herring gull rookeries and woodland caribou wintering

-  ZONE I · SPECIAL AREA
-  ZONE II · WILDERNESS AREA
-  ZONE III · NATURAL ENVIRONMENT AREA
-  ZONE IV · GENERAL OUTDOOR RECREATION AREA
-  ZONE V · INTENSIVE USE AREA



**PUKASKWA
NATIONAL PARK**

ZONING



ground, Pitcher's Thistle, Northern Twayblade. If additional special areas are identified, the number of Class I areas will be increased. It is intended that access to these areas will be strictly controlled and management objectives will be directed towards ensuring the preservation of natural and cultural features.

Zone II - Wilderness Areas

Wilderness areas are in general more durable than special areas and in Pukaskwa consist of large land tracts which will be left subject to the process of natural evolution.

Wilderness areas will contain a representation of all the five major land systems (physiographic regions) located in the Park. Recognizing that a management objective for this class will be to ensure the maintenance of the existing interplay of natural processes, activities such as canoeing, hiking, primitive camping and nature study will be permitted in these areas, however, no motorized vehicles will be permitted.

Zone III - Natural Environment Areas

Natural environment areas are established for both the management and use of the natural landscape. Management objectives will stress evolutionary concepts. Compatible activities such as vehicular access routes, boat docking facilities, warden stations and primitive camping are envisaged for these areas.

Zone IV - General Outdoor Recreation Areas

The area contained within the Class IV zone includes the lands within which outdoor recreational facilities having a moderate influence on the environment will be located. Compatible activities or facilities will include access roads, campgrounds and day-use areas. In Pukaskwa, Oiseau Bay is the only area proposed for this category.

Zone V - Intensive Use Areas

The areas included within the intensive use classification will be lands in which more intensive outdoor recreational activities can be located. The objective in creating such zones has been to provide the necessary visitor and maintenance support facilities in areas where such development can be controlled to ensure a minimizing of environmental damage and also be convenient for the park visitor. Some facilities proposed for this area include motel accommodation, semi-serviced campgrounds, restaurants and intensive day-use facilities. Hattie Cove will be an Intensive Use Area.

The zoning scheme provides general direction and indicates the level of use and required degree of resource protection. However, in particular cases such as at Hattie Cove and Oiseau Bay where specific features requiring protection have been identified, detailed resource management and land use plans must be provided to ensure the protection of features in these relatively intensively used areas.

6. Park Operations

6.1 Administration

The year 'round administrative headquarters in Marathon will provide office space for the park superintendent, section heads and support staff. Seasonal administrative facilities will be located in the park compound and in the visitor reception centre. Control points such as entrance and campground kiosks will be established to monitor and regulate visitor access.

6.2 Maintenance

The maintenance compound facility will be located in Hattie Cove, far enough removed from the visitor use areas yet sufficiently close to provide an efficient service. This would service all land and water components of the park. Services that would be provided include the following:

- building and utility systems maintenance;
- roads, bridges, parking areas and grounds maintenance;
- motor vehicle maintenance and repair;
- marine equipment maintenance;
- petroleum products storage and dispensing;
- and
- general works administration.

6.3 Housing

Staff housing for section heads and mobile positions will be provided in Marathon. Accommodation will be provided in the vicinity of the maintenance compound for those individuals who work in the park for brief periods and do not have permanent residences near the park. Warden service patrol cabins will be located in various areas throughout the park.

6.4 Development Schedule

The development of Pukaskwa is expected to take fifteen to twenty years. It is intended that development by the end of the first six years will see an entrance road to Hattie Cove, basic facilities at Hattie Cove and Oiseau Bay, establishment of the coastal trail, and the operation of the water transportation system between Hattie Cove and Oiseau Bay. Subsequent development will deal with coastal and inland development sites, the inland transportation system, the water transportation system beyond Oiseau Bay, and development of the remaining trails.

6.5 Architectural Motif

6.5.1 Purpose

An architectural motif will be developed to direct the design of all park structures. In general, the spectacular natural elements present in the park should remain the dominant elements with respect to any proposed architecture.

GENERAL DEVELOPMENT SCHEDULE

| | <u>Year 1</u> | <u>Year 2</u> | <u>Year 3</u> | <u>Year 4</u> | <u>Year 5</u> | <u>Year 6</u> | <u>Future Years</u> |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| Park Entrance Road | ----- | | | | | | |
| Hattie Cove | ----- | | | | | | |
| Oiseau Bay | ----- | | | | | | |
| Water Transportation System | | | | | | | |
| Oiseau Bay | ----- | | | | | | |
| Coastal | | | | | ----- | | |
| Coastal Trail | ----- | | | | | | |
| Land Transportation System | | | | | | | |
| Oiseau Bay | ----- | | | | | | |
| Inland | | | | | | | ----- |
| Coastal Sites | | | | | | | ----- |
| Inland Sites | | | | | | | ----- |
| Other Trails | | | | | | | ----- |

6.5.2 Siting

The siting of park structures will be carefully chosen to minimize the visual impact of the buildings on the landscape. Such prominent locations as hilltops and ridges of the open Lake Superior shoreline will not be utilized for architectural developments.

6.5.3 Form and Massing

- a) The architecture requires unobtrusiveness and compatibility with the surroundings.
- b) Structures should have an openness and simplicity in form, using glass when necessary to unite interior and exterior spaces.
- c) The building form and mass should reflect the variety of exposures imposed by the various site locations in different parts of the park.

6.5.4 Materials

- a) The colour and texture of architectural exterior finishing materials should blend with the natural surroundings. Natural materials such as stone and natural, weathered, rough sawn wood should be used.
- b) Interior finishes may be the same as exterior finishes. Other contemporary materials can be used where budget and design needs dictate.

7. Factors Influencing Development and Management of the Park

7.1 Negotiated Agreements

To establish the Park, negotiations with the Province of Ontario and the Robinson-Superior Treaty Group were undertaken. Resulting from those discussions were:

- a) agreements dealing with the transfer of land, forest protection, Ontario Hydro, the continuance of rights for the Robinson-Superior Treaty Group, and the acquisition of private holdings within the park;
- b) the delineation of the park boundary;
- c) the delineation of the route for access to the park;
- d) the establishment of the main visitor service area at Hattie Cove. In this regard, the park boundary was extended to include this Hattie Cove area.

More specifically, the following agreements have been achieved:

7.1.1 Land Transfer Agreement

This agreement established the conditions for the transfer of the administration and control of public lands from the Province of Ontario to the Government of Canada, for the purpose of establishing Pukaskwa National Park.

7.1.2 Forest Protection Agreement

Under this agreement the Ontario Ministry of Natural Resources will provide forest-fire detection and

suppression services for the park for a specified period of time. Parks Canada will have the responsibility for the detection, assessment and suppression of forest tree insects and disease.

7.1.3 Ontario Hydro Agreement

Under this agreement Parks Canada will grant to Ontario Hydro a licence to occupy a strip of land for the purpose of maintaining and operating an existing 230 kv electrical power transmission line. This agreement operates solely as a licence and does not transfer any exclusive possessory right or leasehold interest to Ontario Hydro.

7.1.4 Robinson-Superior Treaty Group Agreement

Agreement between the Robinson-Superior Treaty Group and the Department of Indian and Northern Affairs with respect to maintenance of Treaty Rights in the park was reached in November 1974.

The agreement also make provision for the Robinson-Superior Treaty Group to retain their Treaty Rights of 1850 to hunt and fish. If agreed to by both parties, compensation can be negotiated at any time for the non-exercise of these rights.

Provision is also made for training of the Robinson-Superior people in various types of employment typical to a park operation

so that they might better compete for job opportunities. Also the park will provide the opportunity for members of the Treaty Group to become economically involved in operational aspects of the park.

7.2 Topography

Pukaskwa is dominated by a very irregular and rough rock knob terrain, thus greatly restricting the choice of suitable alternate areas for facility development.

7.3 Visitor Projections

Pukaskwa, by virtue of its relative isolation from major population centres, cannot be considered as a primary destination for a large number of users.

Knowledge of the number of potential users in the park at any given time has a number of valuable applications. However, reliable information has been difficult to obtain due to the fact that similar facilities in the region are lacking. Further studies and monitoring programs will be required particularly when the park becomes operational to provide a realistic data base for visitor use projections.

It is not the intent of this plan to cater to the needs of all possible visitor groups. For example, marina facilities to accommodate cruiser visitation to the park will not be provided, although harbours of refuge will continue to be made available to the boating public.

7.4 Circulation

In order to present Pukaskwa in an acceptable manner to the people of Canada, access to and within the park is a requirement.

7.5 Facilities

Visitor facilities are necessary to enhance the visitors' stay and experience in the park as well as to increase their awareness and appreciation of the values of Pukaskwa and national parks in general.

7.6 Resource Protection

The quality of the park would be enhanced through the maintenance of representative and outstanding natural and cultural features. It is the intent of this plan to maintain as much as possible the natural atmosphere that presently exists.

7.7 Financial and Manpower Resources

A basic factor that will influence the amount of development is the availability of manpower and financial resources.

7.8 Existing Legislation

The National Parks Act and Regulations and the National Parks Policy are the basis for the planning, management and operation of Pukaskwa National Park.

PART TWO
BACKGROUND INFORMATION

8. Park History

8.1 Native Occupation

As the continental glacier retreated to the east approximately 8500 years ago, early hunters bearing the cultural tradition of the Shield Archaic moved into the area of the north shore of Lake Superior.

Knowledge of these people is derived from the stone and copper tools and ornaments they left behind them and from their settlement patterns. Caribou and fish were probably the staples of their diet, while other animals and waterfowl would also have been eaten. The location of their settlements suggests that they must have used watercraft in the summer and snowshoes in the winter.

The way of life of the people of the north shore of Lake Superior changed little with the evolution of the Laurel culture about 700 B.C. Implements of chipped stone and tools of the locally available native copper were used to hunt moose and beaver and to catch fish. Most tools, however, were associated with working hides, wood and bone. Pottery was first used.

From about A.D. 1000 it is possible to identify the Native inhabitants of the north shore of Lake Superior with the ancestors of the Algonkian speakers of the historic period. These

people continued the way of life developed thousands of years before, hunting and fishing for their livelihood and making tools out of stone, copper and bone. They also smoked tobacco, made pottery vessels and decorated their clothing with beads. They lived in a loose association of several families that would hunt separately during the winter and band together during the summer. The scanty food supply limited the number of people who could survive in an area. At the arrival of the Europeans in the 17th century, the region was sparsely inhabited by the Ojibwa, the descendants of whom still live there today.

Within the park itself, fragments of this story are represented by a number of archaeological sites. One survey yielded a catalogue of 40 sites and 420 artifacts from prehistoric archaeological sites.

Most frequently represented were sites characterized by stone features known as Pukaskwa pits. They are found in a number of forms on cobble beaches within the park. There are five basic types of pits. Most common are the oval structures that are about seven by ten feet and are surrounded by a low wall a foot or two high with a door or opening on the side opposite the lake. Others are circular and much smaller and might have been used as food caches. A third type are called

"tent rings" and consist of a flat circular floor about twenty feet in diameter; these occur on the middle and upper beaches. On the highest beaches are found the more complex "apartment building" structures that have a rectangular, ten by twenty foot shape, and that sometimes occur in a series for a combined length of 9 meters (30 feet) or more; they often are associated with the oval shaped pits.

Age estimates of these structures vary although excavations just north of the park showed at least some of these to have been built by Laurel peoples. Further archaeological investigation within the park should yield information for the interpretation of these remains of the former nomadic hunters who once lived within the park.

8.2 Fur Trade

During the 17th century, the voyageurs ventured into the area and fur began to flow out of the region eastward to the St. Lawrence and Montreal. The first trading post in the vicinity was established by the French at the mouth of the Michipicoten River in 1725. In 1780 a French free trader built a post at the mouth of the Pic River, just north of the park. The latter changed hands many times and was taken over by the powerful Northwest Company in 1799. Finally, the Hudson's Bay Company absorbed the post in 1821, operating it until the late 1880s.

The fur trade is historically significant in that it opened the area to the Europeans, and also because it revolutionized the way of life of natives. In many cases, the Native people abandoned their traditional economy to get actively involved in the fur trade.

Traplines in the park fell into disuse during the last twenty years. Cree Indians from James Bay were brought into the area by the Ministry of Natural Resources for trapping in the northeast corner of the park. Within the last few years, trapping by the Cree Indians has terminated. However, a few traplines held by people of the Pic 50 Band at Heron Bay still exist. The most valuable species in the park area include beaver, mink, marten, muskrat and lynx.

8.3 Exploration

From the early 1600's to about 1850, explorers following the water routes paddled across the country. A few, like Alexander Henry, Louis Agassiz and J. J. Bigsby made journal entries describing the north shore and character of the country. Along the park coastline, Otter Head was the most memorable spot judging by the number of entries it received in diaries.

8.4 The Transcontinental Railroad

The building of the C.P.R. in 1883-1885, as master-minded by William Van Horne, provided another interesting episode in the history of

the park area. Nearby Peninsula, now called the Town of Marathon, became a teeming city of 12,000 persons almost overnight, and was subsequently almost deserted upon completion of the railroad. The latter passes a few miles north of the park and did much to open up the north shore.

8.5 Mining

Evidence exists that Native people mined copper on the north shore of Lake Superior as early as 5000 years ago. Within Pukaskwa, however, no major mineral discoveries have been made, although numerous claims have been staked. Davis Island, located at the mouth of Imogene Creek, was staked in 1872, and Mining Lake near Bonamie Cove in the early 1900s. An exploratory shaft was drilled in a magnetite lode in 1887 near McDougall Lake, but it was abandoned. Several other areas including Perry Lake, Louie Lake, Imogene River and Playter Harbour were staked. With the exception of the Playter Harbour area nothing has ever materialized. The Playter Harbour area has copper deposits and further study is required to determine the extent of the deposits. One of the more colourful incidents of the park's history involved the sale of stock in a reported tin deposit in Otter Cove in the late 1860s. The shareholders later discovered that the claim had been salted and the perpetrator was subsequently apprehended and incarcerated.

8.6 Logging Operations

Commercial logging operations in the park began in 1904 and continued in a sporadic fashion until 1930. The first operation was carried out from 1904 to 1910 by the Soo Woods Company from Sault Ste. Marie on a large white pine stand located one mile inland from the mouth of Imogene River. The Lake Superior Pulp and Paper Company began cutting at the mouth of the Pukaskwa River in 1917, then gradually moved approximately 32 kilometres (20 miles) inland along both branches of that river. Also logged within the park were the lower portions of both Tagouche Creek and Imogene River.

The depot at the mouth of Imogene River served as the company's base of operations until logging activities ceased in 1930. The site contained 23 buildings including the residences of the doctor, clerk, walking boss, blacksmith, etc. Only one of these buildings still stands today along with vestiges of the camp cemetery. Other camps were scattered throughout the area, housing crews totalling 250 men to 400 men.

During the winter months, the depot was totally isolated, save for the thin communications line afforded by the White River dog team trail. Supplies were hauled in by boat during the ice-free season and the winter harvest was tugged back to Sault Ste. Marie on the return journey.

Remains of the logging era in the park today are partially demolished camps, overgrown tote roads and a few dams.

8.7 Recent Activities

The north shore of Lake Superior has been accessible by water for centuries. It was linked to the rest of Canada by rail in 1885 and by road to Thunder Bay in 1953 and to Sault Ste. Marie in 1960. Despite this, the rugged area of Pukaskwa National Park remains in a natural state to this day.

In recent years, major uses of the park area have been associated with pleasure boaters along the shoreline, as well as trappers, hunters, anglers and commercial fishermen. Commerical fishing thrived in Lake Superior from 1920 to 1950, when the lake trout fishery declined, mostly as a result of the introduction of the sea lamprey. Today, a small commercial fishery is still in existence on the island immediately north of Otter Island. In 1970 a 230,000 V Ontario Hydro transmission line was constructed between Thunder Bay and Sault Ste. Marie. A segment of this line traverses the northeastern part of the park.

9. Resource Conservation

9.1 General Statement

For the entire park the primary resource management objective is to ensure that the natural character of Pukaskwa National Park is maintained and that natural processes are allowed to evolve with a minimum of interference by man:

- a) by ensuring that park development, visitor activities and park operations are compatible with the natural character of Pukaskwa; and
- b) by developing and implementing an integrated natural resources management program for the protection of resources and visitors;

Interrelated management plans will be developed for environmental components such as wildlife, fish, vegetation or for park units at different levels of detail. The park's natural resources will be divided into broad units. For each of these, specific resource management objectives and general resource use limitations and opportunities will be identified. For example, the Lake Superior shoreline will be a broad unit within which Hattie Cove and Oiseau Bay Development Areas will be sub-units for which detailed resource management plans will be prepared and implemented. Similarly, Woodland Caribou will be a subcomponent of the wildlife plan for which a more detailed resource management plan will be prepared. The component and unit plans will be interrelated in that their preparation and implementation will not be done in isolation.

9.2 Resource Description & Preliminary Analysis

9.2.1 Climate

9.2.1.1 Temperature

The mean annual temperature is 3°C (36°F) but there are wide local variations. Temperature decreases with elevation, except along the coast in spring and summer when it generally increases due to inversions caused by the lake. Temperature also varies as a factor of distance from the lake; the latter produces a gradient extending up to 16 kilometres (10 miles) inland, with higher summer temperatures and lower winter temperatures occurring as distance from the lake increases.

Mean temperatures along the coast in January, April, July and October are - 13°C (8°F), 2°C (35°F), 15°C (59°F) and 6°C (43°F) respectively. In the interior (Lurch-Birch Lakes area) mean temperatures for the same periods are - 17°C (1°F), 0°C (32°F), 16°C (60°F) and 5°C (40°F).

9.2.1.2 Precipitation

Precipitation varies widely from year to year and from area to area within the park, and ranges from 74 - 106 centimetres (29-43 inches) annually.

Mean annual precipitation along the shoreline is about 76 cm. (30 inches) of which 40% or 286 cm. (120 inches) falls as snow. In the

Lurch Lake area precipitation generally increases to 91 cm. (36 inches) annually, of which 55% or 520 cm. (200 inches) falls as snow. The snow season along the coast is approximately one month shorter than the interior.

9.2.1.3 Wind and Wave Height

Westerlies are the predominant winds in the park area, onshore flows occurring 75% of the time in all seasons. Prevailing surface wind direction may differ because of topographical obstructions. In addition, there are local lake and land breezes, generated by minor pressure differences.

Exposed coastline areas will experience frequent strong westerly winds with the greatest blows in late fall; those regions in valleys parallel to the shoreline will have long periods of calm, particularly in the summer.

Relatively calm water exists from June to August, with wave height greater than five feet occurring only about 2% of the time in July. In contrast, waves over five feet occur more than 50% of the time in the month of November.

9.2.1.4 Ice Cover

Many factors influence the formation and dissipation of ice on Lake Superior and on the park lakes and rivers. These include lake surface area,

depth, configuration and severity of winter. Rivers normally freeze later than the interior lakes (December 1 to 10 and November 20 to 30 respectively) and break up sooner (April 10 to 20 and April 20 to 30 respectively).

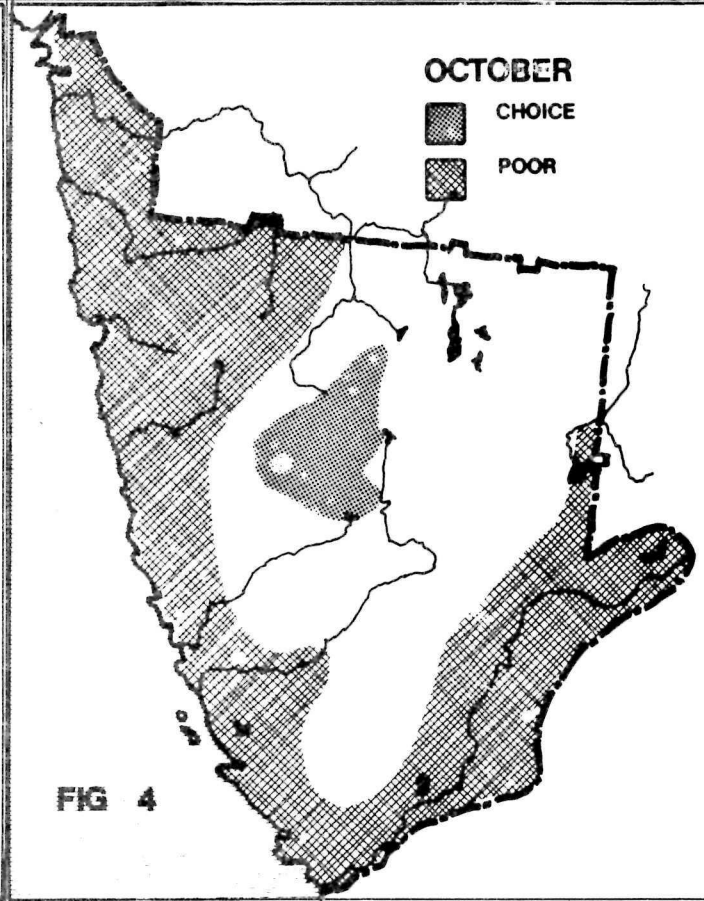
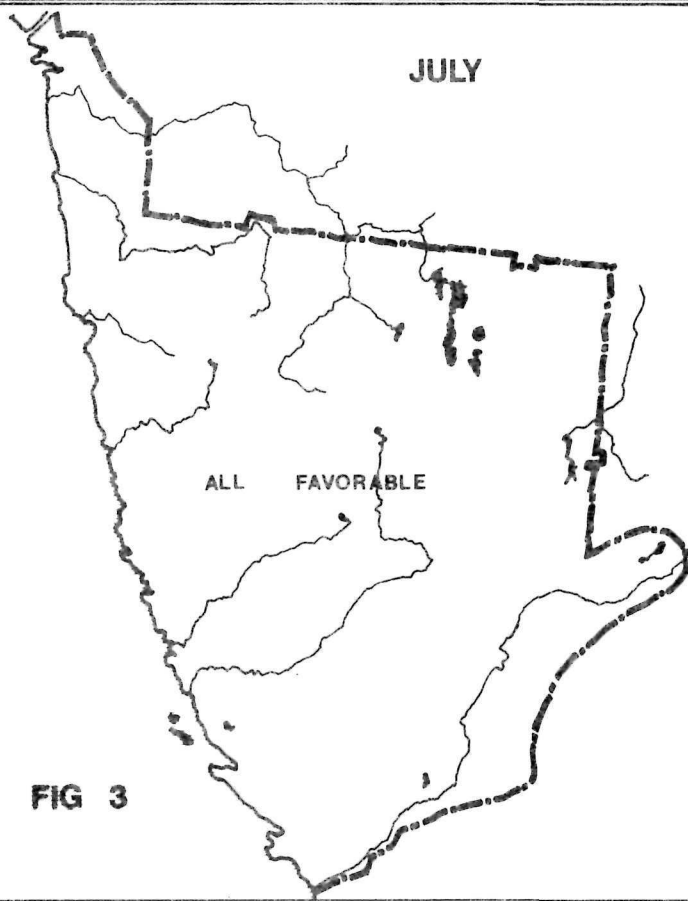
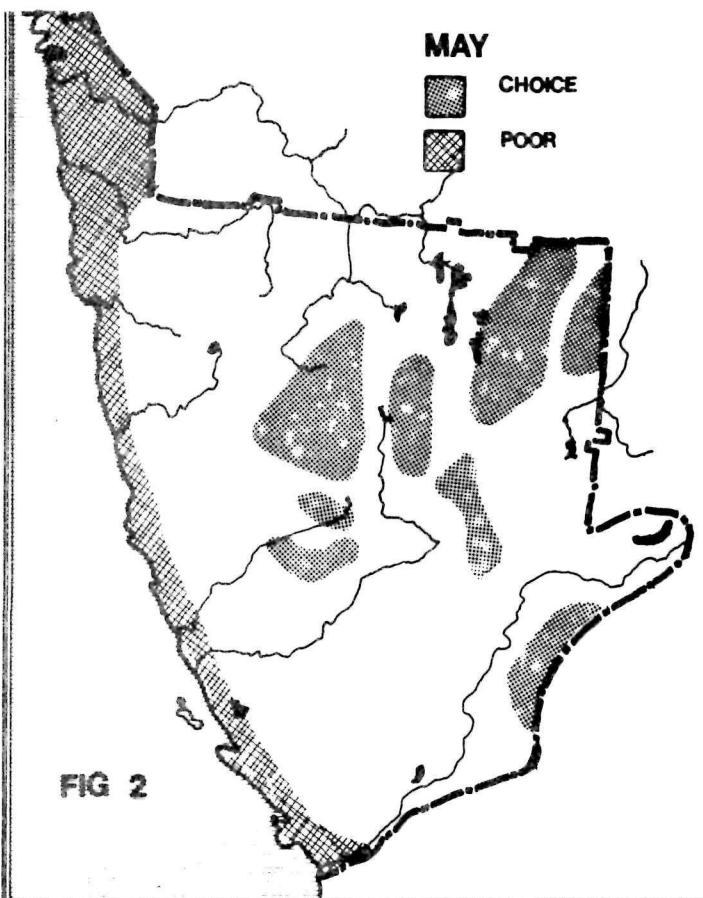
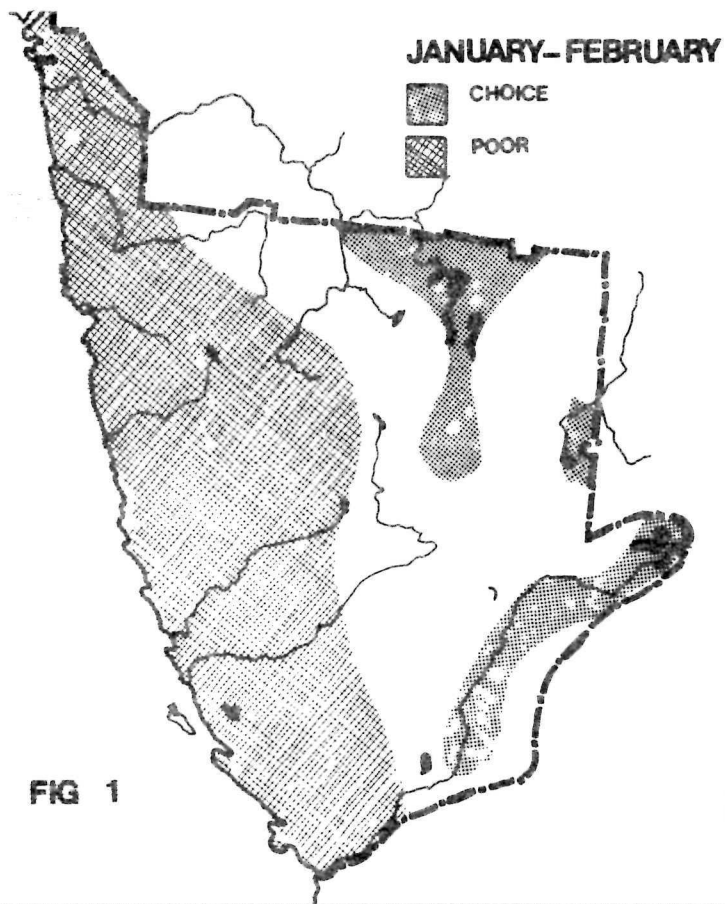
Ice cover on Lake Superior varies between 40% and 95% of the total surface area, depending on the severity of the winter.

9.2.1.5 Insolation

The coastal area of the park receives more hours of sunshine annually than do areas further inland. Between May and September, 45% to 58% of the daytime hours are sunny, July and August being the brightest months. In summer only 10% of the days are completely overcast. Days are dark in fall and winter, with sunshine on only 15% of the daytime hours in November.

9.2.1.6 Use Capability Analysis

Activity zones and areas to be avoided during certain periods of the year are shown on the map that follows. Figure 1 is the combined January and February map and shows that the best areas for use during that time are in the deep valleys perpendicular to the prevailing wind. This includes the Lurch and Birch Lakes area, the middle section of the Pukaskwa River valley and the Widgeon Lake area. Coastal and high elevation areas will



**PUKASKWA
NATIONAL PARK**

CLIMATE
(RECREATIONAL USE CAPABILITY)



be unpleasant because of strong cold winds and frequent snowfall or fog often reduce visibilities to zero.

In May (Fig. 2), surface water levels are high, but precipitation is relatively low due to contrasting water-land temperature differences and the northward migration of cyclonic storms. Some of the warmest areas are in the zone of the "lake-effect belt", but the coastal area experiences a higher frequency of cloud and fog. The most favourable activity areas thus occur on dry inland areas above the valley floors.

Climatic conditions in July (Fig. 3) will be favourable for park use in all areas, and though the relatively cold Lake Superior waters will not entice many swimmers. The ease of access, stable weather, light winds and reduced insect population of the area will draw concentrations of visitors. August and September are similar to July, but the greater precipitation and risk of frost in highland areas may dampen public interest.

Areas near the shore and the Pukaskwa Valley will be especially attractive in early October (Fig. 4), although bright mornings may be obscured by fog off the lake. Real changes occur during late October as snow accumulates on the inland highlands. The

lake keeps the shore area and the Pukaskwa Valley relatively warm, though cloudiness increases markedly. November and December are inhospitable, dark and wet months. Bad weather is more severe in the maritime belt, but heavy snowfalls occur in all areas.

9.2.2 Physical Geography

Pukaskwa lies within the Lake Superior Geological Province, near the southern edge of the Canadian Shield. The latter is an ancient and complex geologic formation, consisting of Precambrian, sedimentary and volcanic beds which were severely faulted and intruded by magmatic rocks. Several erosional intervals brought about widespread peneplanation of the mountains and subsequent continental glaciations have further abraded the landscapes and modified the hydrographic system.

The Lake Superior basin is a geosyncline, a vast bowl-shaped depression in the earth's crust; the configuration of the lake and its level have varied greatly over geological time.

9.2.2.1 Geologic History

The Lake Superior landscape was formed by long and complex geological processes that began more than 600 million years ago. The oldest known rocks in the area are the thick tracts of basalt, andesite, greenstone, slate and grawacke that date back to Keewatin (Lower Precambrian) time; these are amongst the

oldest rocks in the world. Following the geologic sequence, granitoid rocks cut through the former during Laurentian time and, after an erosion interval, were overlain with sandstones and shales during the Timiskaming Period.

The next major geologic episode was the Algoman Revolution, during which orogenic forces folded and recrystallized the existing Archean rocks; this movement was accompanied by substantial mineralization and granitic intrusions. The Eparchean Erosion Interval that followed lasted 200 million years and during this time the existing mountains were degraded to a low-lying peneplain.

The sea subsequently invaded the lowlands and the ensuing Animikie shale and sandstone formation was deposited. Following a period of erosion, additional lava and sediment were laid down during the Keweenawan Period, including massive eruptions in the centre of Lake Superior which brought about the creation of the geosyncline that forms the lake's basin. The Keweenawan Period ended with the deposition of the Bayfield-Jacobsville sandstone, which underlies 90% of Lake Superior. Preceding a further erosion interval (Lipalean), intrusions of diabase rocks occurred, as witnessed by the numerous existing dykes and sills.

Finally, the continental glaciations, dating from one million to 11 thousand years ago, scoured the landscape and left behind varying thicknesses of drift and characteristic glacial landforms. Crustal rebound has been taking place since the departure of the ice cap.

9.2.2.2 Bedrock Geology

All the bedrock contained within the limits of Pukaskwa consists of ancient, eroded Precambrian materials, severely faulted and largely intruded by more recent Precambrian rocks.

The major portion of the park lies in a vast area of massive granite and gneiss situated between bands of Keewatin greenstone. One band is located to the northwest, adjacent to the park boundary and the other to the southeast along the east arm of the Pukaskwa River.

The northern greenstone band is composed of mafic Keewatin (Early Precambrian) meta-volcanics including basalt, andesite and chert. This formation extends inland from Playter Harbour to Mussy Lake. The same minerals comprise the rocks of the southeastern band which extends from Imogene Cove inland to the Pukaskwa River and easterly to the University River outside the park boundary. An enclave of the same greenstone also occurs at Richardson's Harbour.

In the central area, the granite and gneiss are locally associated with different rock types. From Hattie Cove to Oiseau Bay, large areas of coarse, reddish-gray granite occur alongside green schists cut by granite dykes, while at Oiseau Bay, yellowish Laurentian (Early Precambrian) gneiss is cut by gray granitoid gneiss and pegmatite. In the White Spruce Harbour area, the rocks are granite or granitoid gneiss. At Otter Head, Huronian (Late Precambrian) gneiss is interbedded with green schist and at Pointe La Canadienne, granites give place to schists and several quartz veins outcrop in felsite schist.

In the interior, porphyritic granite and Huronian hornblende schist occurs at McDougall Lake, and black hornblende schist, red granite and granitoid gneiss occur near the Pukaskwa River. At Tip Top Mountain, Laurentian granitoid gneiss is intruded with diabase and pegmatic dykes. Throughout the park, diabase, quartz and gabbro dykes intrude the granite bedrock.

Mining has been attempted in several areas of the park, including McDougall Lake (gold), Louie Lake (copper, nickel, gold), Otter Cove (copper, gold silver) and an area east of Playter Harbour (copper), but none of these lodes proved to be rich enough to make extraction economically feasible.

9.2.2.3 Geomorphology

Pukaskwa offers a typical example of Canadian Shield topography. It is a relatively uniform, monotonous upland, characterized by rounded hills, scattered monadnocks and generally low local relief. The numerous glacial landforms are bedrock-controlled and the drift mantle is thin and discontinuous. It is an area of ancient mountains that have been eroded to a peneplain through millions of years of weathering and have been scoured and gouged by the continental glaciations.

9.2.2.4 Hills

These are the highest and the most rugged areas of the park. Local relief varies from 30 metres to 120 metres (100 to 400 feet) and the highest elevation reaches 636 metres (2,120 feet) above sea level on Tip Top Mountain, one of the highest points in Ontario. The latter is a monadnock, a dome-shaped residual mountain composed of Laurentian granitoid gneiss intruded by diabase and pegmatite dykes. It rises 450 metres (1,500 feet) above Lake Superior.

The topography of these areas is bedrock-controlled and very broken. Till hills are scattered throughout and the bedrock outcrops frequently. Soils are generally shallow and are made up of sand and sandy till. Along the Lake Superior shoreline, the hill formations are represented by the Bonamie and White Spruce Coastal Hills, a few miles inland by the Tip

Top and Cascade Hills and deep in the interior by the Reverse, Louie and Soldier Hills.

9.2.2.5 Dissected Uplands

These sectors of irregular and broken relief extend over large areas of the park. The topography is strongly influenced by the structure of the underlying bedrock. Local relief is in an intermediate range for the park area, varying from 15 metres to 25 metres (50 to 250 feet), with a few highlands rising 120 metres (400 feet) above the valley floors.

These formations are characterized by short, irregular linear valleys and ridges, largely a result of structural faulting and by bedrock-controlled till ridges and hills. Soils consist of sand, alluvium and glacial drift. Areas of this type occur along the Lake Superior shoreline as the Oiseau and Heron Coastal Plains, in the northern part of the park as the Lurch, Rye and Bremner Plains, in the interior as the McDougall, Cascade and Tagouche Plains and finally on the southeastern fringe of the park as the Windigo Plain.

9.2.2.6 Elevated Till Plains

These areas of heavier glacial deposits offer a more subdued local relief of between 15 metres to 45 metres (50 feet and 150 feet) and the average elevation of the plains is 390 metres (1,300 feet) above sea level. They are areas of rolling, bedrock-controlled terrain that have been heavily dissected by structural faulting and that present a very

broken appearance. Sand, sandy till, recent alluvium and organic deposits make up the overburden. Local wet depressions and rock outcrops are widespread.

Included in this category are the Swallow Plain in the centre of the park and the Stoney, Gornupkagama, Perry and Bertha Plains that lie along the southeastern boundary.

9.2.2.7 Interior Plains

These topographic units have an average elevation of 390 metres (1,300 feet) above sea level and they are not extensively dissected. They consist of an irregular valley or basin-type till plain, with scattered rock knolls and local depressions. Surface deposits are composed of silty sand, alluvium and organic sediments; rock outcrops occur occasionally. Grouped in this category are the Camp, Gravel and Willow Plains.

9.2.2.8 Fluvial/Lacustrine Plains

Two types of fluvial plains occur within the park. The Otter, Lower Pukaskwa, White Gravel and White River Plains are of lacustrine-deltaic origin, while the Swallow, Widgeon and Upper Pukaskwa Plains are of glacio-fluvial origin.

The lacustrine-deltaic units are generally gently undulating sandy plains with very little local relief except for isolated

bedrock knolls. Soils are sand with some silt and organic deposits. The Swallow, Widgeon and Upper Pukaskwa glacio-fluvial plains contain bedrock-controlled till knolls and the overburden is composed mostly of sand, with some alluvium and organic sediments. Rock outcrops, wet depressions and glacial landforms such as kames, eskers and drumlins are common, especially in the Widgeon Plain.

9.2.2.9 Glacial Landforms and Hydrology

The surface features of the park area were substantially influenced or altered by the continental glaciations. Hilltops were smoothed, rounded and polished by ice action. Deep grooves in some rock faces, as in Hattie Cove, attest to the erosive power of grinding stone and ice, which also gouged and deepened existing cracks and fissures forming rock-rimmed basins that are now occupied by lakes. Other erosional features include roche moutonnées, which are rock knolls whose shoulders were rounded and sides quarried by the advancing glacier.

Glacial depositional landforms are widespread in the area. Fields of erratic boulders are scattered over the park hills, valleys and lake bottoms; other glacial features such as eskers and kames, although not widespread occur in certain areas of the park. A major area of glacial outwash within the park occurs

along the upper Pukaskwa River and consists mainly of sand and gravel. It is suspected that the Pukaskwa River valley served as a minor spillway for glacial meltwaters, as did, in a major fashion, the broad river valley between Oiseau Bay and the White River. The latter, which is presently coated with thick Pleistocene deposits was probably part of a pre-glacial drainage system which was deepened and modified by glacial action.

Lacustrine deposits consisting of varved clays, silt and sand are much in evidence in the deltaic plains, especially in the White River Plain which extends all the way to Oiseau Bay. As a result of up-lift, the White and Willow Rivers are presently degrading these lacustrine deposits. Other water-wrought features include abandoned strandlines which are prominent at Imogene Cove and near the Pukaskwa River, wave-cut cliffs, cobble or boulder beaches and finally, active sandy beaches and spits.

Lake Superior occupies a geosynclinal basin that has been modified by glacial action and crustal rebound. The receding ice sheet and subsequent up-lift brought about changes in outlets which led to the creation of a series of lakes having successively lower water levels in the Superior basin.

The first major lake was Lake Duluth, which formed eleven to twelve thousand years ago and occupied that part of the basin that was ice-free. The first lake to occupy the entire basin was Lake Minong, which stood approximately 105 metres to 120 metres (350 feet to 400 feet) above the present lake level. Chronologically, succeeding lakes were Houghton Lake, Nipissing Great Lakes, Algoma Lake, Sault Lake and finally Lake Superior which stands 180 metres (602 feet) above sea level. The different lake stages have left their mark on the landscape in the form of ancestral shorelines in various areas of the park.

These abandoned beaches occur at 52.5 metres (175 feet) above Lake Superior near Bonamie Cove and at 30 metres to 139 metres (100 feet to 430 feet) near the Pukaskwa River; strongly cut terraces occur at 108 metres (360 feet) above the lake level at the White Gravel River and at various other elevations within the park, reflecting the shorelines of ancient lakes.

Rivers in the park are swift, short and have a limited drainage area. Very few rivers extend beyond 64 kilometres (40 miles) from Lake Superior. The vertical drop from the sources of the rivers to their mouths is considerable over short distances. For example, the Pukaskwa

River drops 210 metres (700 feet) over 64 kilometres (40 miles). As a result the water-courses are turbulent and are broken by frequent falls and rapids.

9.2.3 Vegetation

9.2.3.1 Forest Cover

Pukaskwa National Park is located on the southern edge of the Boreal Forest Region of Ontario. Forest cover in the park area is dominated by black spruce, jack pine, and white birch. Forest types vary quite markedly with moisture conditions, topography and soil characteristics.

A mixed forest consisting of black spruce (Picea mariana), white birch (Betula papyrifera), balsam fir (Abies balsamea), jack pine (Pinus banksiana), trembling aspen (Populus tremuloides), and white spruce (Picea glauca) is characteristic of the finer-textured valley soils. On till slopes and the tops of low hills the same association of species is found but with black spruce, jack pine, and white birch more predominant. Here mountain-ash (Sorbus decora) is also conspicuous.

Similarly, the coarser materials in valleys bear black spruce, jack pine, and white birch, with some balsam fir, trembling aspen, and white spruce also appearing. The predominance

of white birch in the valleys covered with rock rubble is particularly striking. The higher rocky elevations are sparsely covered with almost pure stands of black spruce and jack pine.

Tamarack (Larix laricina) and white cedar (Thuja occidentalis) are the usual companions of black spruce on wet soils.

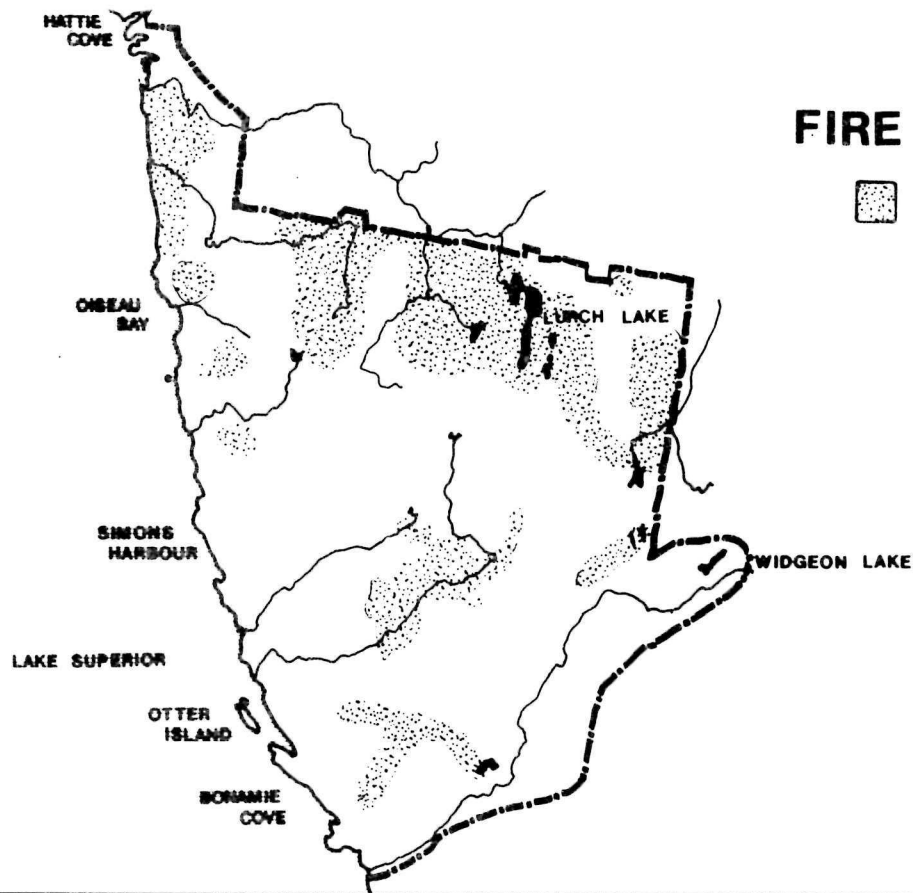
Portions of Pukaskwa National Park are in a transition zone between the Boreal and Great Lakes - St. Lawrence Forest Regions. The first evidence of Great Lakes - St. Lawrence forests are scattered occurrences of red maple (Acer rubrum) inland from Simons Harbour. Moving south towards the Pukaskwa River, red maple becomes more conspicuous though still insignificant. Red maple is joined by sugar maple (Acer saccharum) along the southern edges of the park. Two stands of yellow birch (Betula lutea) have been noted on the Swallow stands of white pine (Pinus strobus) can be found in the southern portions of the park.

9.2.3.2 Fires and Logging

Forest fires occur periodically in Pukaskwa. Most of the known fires were less than 4.05 hectares (10 acres) in size. The three largest burns, occurring in the 1930s, consumed over 48,000 hectares (120,000 acres)

of forest. A burn of approximately 4,000 hectares (10,000 acres) covered the coastal hills section from the White River mouth south to Morrison Harbour. A second slightly larger burn of 5,440 hectares (13,600 acres) occurred in 1931 in the Cascade River watershed. The largest burn occurred in 1936; it claimed approximately 40,000 hectares (100,000 acres) of forest in the northeastern portion from Louis Lake to Bremner River. Recent burns which occurred in 1964 include two small 4.05 hectares (10 acres) sites between Oiseau Bay and Simons Harbour. In 1975 a few small spot fires occurred and in 1976, eleven fires burned areas totalling less than 4.86 hectares (12 acres).

Forest succession following fires in areas where the humus was little harmed will typically see an abundance of birch sprouts producing a nearly pure clump birch forest. Seedling birch and aspen are usually present as well. Conifers will gradually follow to bring about a new climax stage. Where the humus has been destroyed, the re-establishment of a climax forest follows closely along the line of the rock shore succession, though usually more rapidly due to the presence of soil, numerous potential invaders and protections from wind.

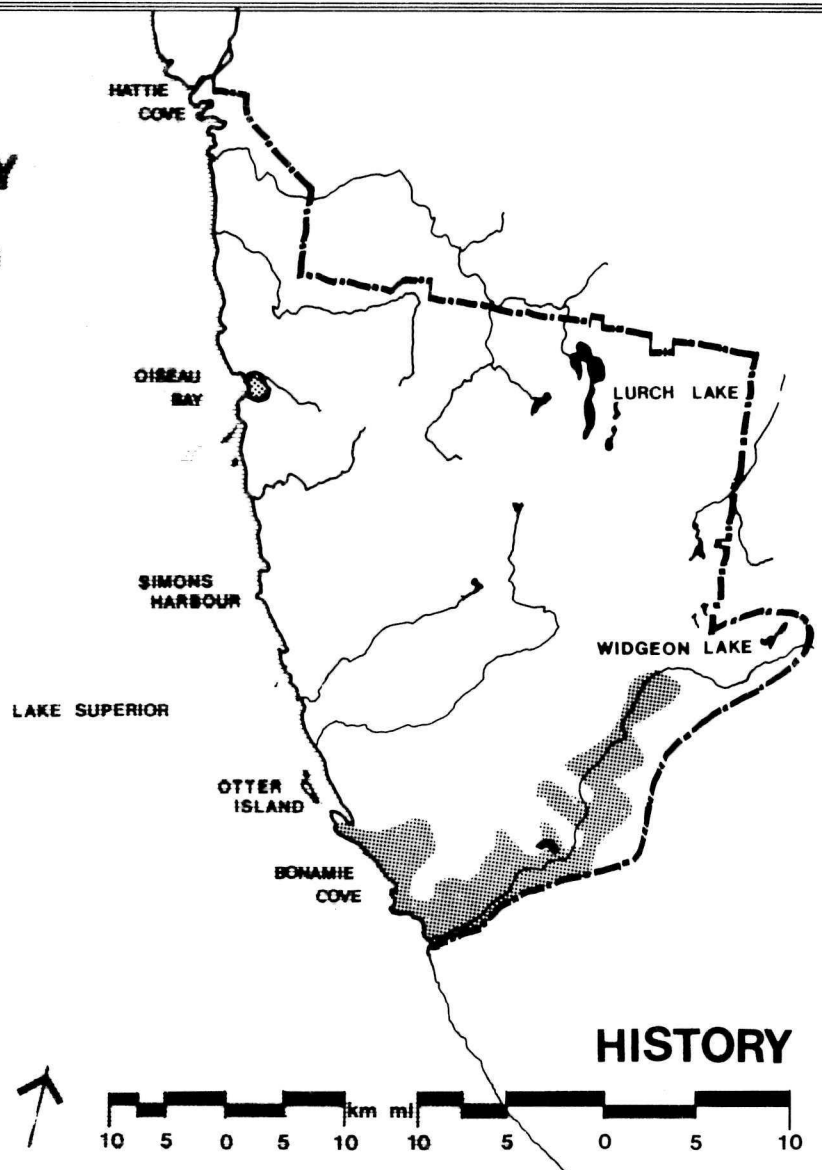


FIRE HISTORY

 EXTENT OF FOREST FIRE

LUMBERING HISTORY

 EXTENT OF LOGGING



**PUKASKWA
NATIONAL PARK**

HISTORY



Logging operations in the park have had an insignificant impact on the landscape. The rugged character of the park limited the logging operations to only a few suitable areas. A major pulp cutting program did occur from 1917 to 1930. This operation was confined to the Pukaskwa River area.

Selective cutting of jack pine occurred at Oiseau Bay in the early 1940s and lasted about two years. This operation provided square timber and piles for construction of the Town of Marathon. Evidence of booming operations can still be seen on the Pukaskwa and White Rivers. Old camps are also evident on Reverse Creek though the extent of this operation has yet to be determined.

9.2.3.3 Shrubs, Mosses and Herbs

The most prominent shrubs include mountain maple (Acer spicatum), red osier dogwood (Cornus stolonifera), blueberry (Vaccinium angustifolium), speckled alder (Alnus rugosa), and willow (Salix spp.). Other shrubs which commonly occur include gooseberries (Ribes spp.), red-berried elder (Sambucus pubens), ground juniper (Juniperus communis), creeping juniper (Juniperus horizontalis), service-berries (Amelanchier spp.), viburnums (Virburnum spp.), wild rose (Rosa spp.),

honeysuckles (Lonicera spp.), pin cherry (Prunus pensylvanica), Labrador tea (Ledum groenlandicum), bearberry (Arctostaphylos uvaursi) and sweet gale (Myrica gale).

Sphagnum mosses (Sphagnum spp.) are abundant in the wetter sites. Fruiticose lichens, particularly Cladonia alpestris, C. rangiferina, and C. mitis are prominent on exposed rock outcrops. Other conspicuous lichens along the coastline include Xanthoria elegans, Stereocaulon saxatile, and tree lichens (Usnea spp.).

9.2.3.4 Arctic Alpine Plants

Among the plants found on the Lake Superior shoreline are species of arctic-alpine affinity which have an extensive gap in their range between this location and the shore of Hudson and James Bays. It is believed these plants migrated to the shores of Lake Superior shortly after the retreat of the last glaciers and have been able to survive there until the present time because of the relatively cool microclimatic conditions produced by the lake.

The microclimatic differences between the immediate shoreline and areas further inland result from the large, open expanse of Lake Superior with its year long low water temperatures. The general effect on the land of this large body of water is to produce a maritime climate, with relatively high humidity and temperatures that are cooler in summer and warmer in winter than further inland. The Pukaskwa coastline is exposed to the prevailing westerly winds that blow the length of the lake. Waves at times reach up to 9 metres (30 feet) in height. In summer, warm westerly winds, cooled by the lake, become saturated and the water vapour later condenses forming a fog that blankets the Pukaskwa coast, often for long periods of time. Insolation especially during the summer, is quite high. In winter, the lack of vegetal cover and the general exposure prevent the accumulation of a protective blanket of snow, except in ravines. All of these climatic conditions have a distinct influence on the local vegetation.

To be able to cope with these rigorous conditions, shoreline plants must be low, resistant to cold, high winds and to dessication, and well adapted to frequent wetting.

The shoreline plant community in Pukaskwa National Park is described in terms of four broad site classes that vary in degree of

exposure, substrate type, and in species composition of plants present.

The four site classes are:

1. rocky shores exposed to Lake Superior;
2. rocky shores sheltered from the lake;
3. exposed cobbled beaches;
4. fairly sheltered sand beaches.

All sites are characterized by sparseness of vegetation, especially trees. At many of the more sheltered localities along the coast, shoreline communities distinct from the boreal forest are not apparent.

a) Exposed Rocky Shores

The dominant plants on these rocky shores are lichens, particularly crustose and foliose varieties, with mosses and small stands of shrubs and grasses becoming more frequent in cracks, sheltered ledges, and hollows as one moves away from the lake. Exposure to wind and water appear to control the plant distribution on these sites. Vascular plants of arctic-alpine affinity outnumber non-arctic species here.

Three intergrading zones can be distinguished as one moves inland: a lichen zone; a lichen-shrub zone; and a transition zone between the shoreline and the boreal forest that features stunted or immature trees. The degree of

development of each of these zones is dependent on exposure and thus varies with the topography.

The lichen zone extends up to 9 metres (30 feet) above the water level except where there are cliffs, as at Pointe La Canadienne and Otter Island. An unidentified black crustose lichen (possibly a Verrucaria) extends a few feet above the water to meet the lower range of Xanthoria elegans (Caloplaca elegans), a very conspicuous yellow foliose lichen. Many species of grey crustose and foliose lichens cover most of the rocky surface. The prominent bright green Rhizocarpon geographicum favours southern exposures. Higher up, the most noticeable lichens are Umbilicaria spp. that favour west and northwest exposed surfaces. The few vascular plants that survive in this zone are generally of arctic-alpine affinity. Saxifraga aizoon, with its characteristic lime encrusted, fleshy-leaved rosettes, seems to be restricted to this zone.

The lichen-shrub zone is considerably less barren in appearance than the lichen zone. Here, Parmelia replaces Xanthoria as the dominant genus of foliose lichen. Small rock pools are centres around which vascular plant development is concentrated, particularly grasses and such shrubs as Ledum and Andromeda.

The lichen-shrub zone grades into stunted trees that mark the fringe of the boreal forest. In this transition zone, mosses and fruticose lichens such as Cladonia alpestris and C. rangiferina appear on ledges and along joints in the rock.

b) Sheltered Rocky Shores

Sites at the mouth of Trapper Harbour, in the lee of a point in Simons Harbour and on the east shore of an island just west of Simons Harbour are representative of a sheltered rocky shore environment. While the substrate is identical and many of the plants are found similar to those on exposed rocky locations, differences in plant distribution are apparent. The lichen zone is extremely compressed, to a few feet or less in places, and a transition zone of low trees has apparently not developed. Arctic species are much less common on these sites than on the exposed rocky sites.

c) Exposed Cobble Beaches

Plant life is not apparent in the active wave zone. Higher up on the beach, beyond reach of normal wave action, an abundance of plants, predominantly lichens, occur. These beaches consist of reworked glacial material in the form of cobbles and boulders of various mineral compositions but mainly granitic. Cobbles and decaying driftwood provide substrates for the occasional moss colony and

for many lichens: foliose, crustose, and fruticose. Among the more prominent lichens are Parmelia spp. and three species of Cladonia: C. mitis; C. rangiferina; and C. alpestris. The latter species seems to show a preference for more exposed situations than do the other two. Various other Cladonia can be found on driftwood. Stereocaulon saxatile, looking somewhat like gray cauliflower, is common. Two lichens form bands parallel to the old strand lines emphasizing their step-like appearance. A black Umbilicaria sp. is prevalent on the terrace slopes of "risers" whereas Rhizocarpon geographicum favours the less exposed "treads". Generally, these cobble beaches support few vascular plants except around their margins where the boreal forest appears to be encroaching on a substrate of organic material derived from itself.

d) Sheltered Sandy Beaches

The density of vegetation on sand beaches generally increases as the rather abrupt limits of the boreal forest are approached. Non-arctic species out-number arctic species on these sheltered sandy sites. A number of plants have not been previously reported from the northeast shore of Lake Superior: Equisetum hyemale; Equisetum variegatum; Phleum alpinum; Poa compressa; and Elaeagnus angustifolia.

9.2.4 Fauna

The fauna found in Pukaskwa National Park is characteristically that of the Boreal Forest Region of Lake Superior. The following section will briefly consider those species which are scarce, conspicuous, or otherwise of interest to the park visitor.

9.2.4.1 Mammals

a) Woodland Caribou (Rangifer tarandus)

Woodland caribou are the largest of all North American caribou. While once considered abundant, these magnificent animals have shown significant reductions in numbers and range throughout Ontario. There are an estimated 12,000 caribou remaining in Ontario including some 200 to 300 animals in bands scattered over the 20,720 square kilometres (8,000 square mile) White River district.

Pukaskwa is on the southern edge of the woodland caribou range in Ontario. There are virtually no caribou south of a line from Agawa Bay on Lake Superior east to Lake Abitibi.

Continuing studies of caribou in Pukaskwa place the estimated minimum population size at fourteen to twenty. Predators undoubtedly play a major role in limiting the caribou population to this low number. The animals are known to frequent many areas along the coast of Lake Superior.

Summer sightings of caribou tracks show that caribou do utilize more areas of the coastline than just their known winter habitats, though more detailed information on the extent of their range has yet to be determined.

The Pukaskwa caribou show similar behavioural patterns to those of other caribou in Ontario. They are gregarious in winter, disperse over wider areas early in spring, and congregate again in small herds during the later fall on their more confined winter ranges.

Winter range is probably selected by caribou on the basis of snow conditions and the presence of lichens, which are more important as food in winter than in summer. Their winter range is a narrow band along the coast of Lake Superior.

Fire is a destructive element on caribou habitat since the preferred lichens are normally found in mature boreal forests. As such, every effort will be made to minimize fires in known coastal ranges.

b) Moose (Alces alces)

Moose have gradually replaced woodland caribou as the dominant ungulate over most of Northern Ontario. The White River District is known to have the second highest moose densities in the Province. Provincial surveys in 1959 and 1968 indicate densities of 4.07 and 7.72 moose per 16 square kilometres. Recent surveys indicate an estimated population of 600 moose in the park.

In winter, moose in Pukaskwa are largely restricted to river valleys where food and cover are more suitable than elsewhere. Large blocks of the park actually appear to be devoid of moose during the winter. Well used watersheds include the Pukaskwa, Cascade, Swallow, and White Gravel river systems. It is interesting that the coastal zone, excluding the main river systems, contain a sparse moose population.

With the coming of spring, moose disperse from the heavy coniferous cover of the river systems and range more widely throughout the park. No signs of range over-utilization have been detected to date.

c) White-Tailed Deer (Odocoileus virginianus)

White-tailed deer are scarce in Pukaskwa and are unlikely ever to become abundant. The lack of suitable range conditions and the typically severe snow depths will undoubtedly limit their presence in Pukaskwa.

Deer are poorly adapted to cope with deep snow and their movement are greatly restricted when depths reach 51 centimetres (20 inches) or more (note section on Climate). There are no deer yards in the park.

d) Beaver (Castor canadensis)

Beaver are common throughout most of the park. A study has been established to determine population trends and habitat interactions.

e) Timber Wolf (Canis lupus)

Surveys of other similar areas in Northern Ontario indicate a wolf density of one per 259 square kilometres (100 square miles). Observations made during other mammal surveys in the park indicate the wolf population to be approximately twenty-five. Some packs have parts of territories outside park boundaries and move freely in and out of the park.

A noteworthy feature of the moose-wolf-beaver habitat relationship is the apparent stability which now exists between predators, prey and the environment.

f) Black Bear (Ursus americanus)

Bears are common throughout the park and the White River District.

g) Lynx (Lynx canadensis)

Lynx appear to be relatively abundant throughout the park. Lynx populations are cyclic in nature, but have shown a rather constant decrease over the past thirty years in Ontario. In Pukaskwa, general trends of lynx population indicate a slight rise over the previous two years.

h) Red Fox (Vulpes vulpes)

Red Fox were apparently numerous around the Imogene Cove area during the winter of 1929-1930. Today, fox populations are monitored by track counts during systematic flight line surveys of large mammals. An actual estimate of fox numbers cannot be obtained by this method, but general trends emerge and recent indications are that fox are currently increasing, probably in response to increasing hare populations.

9.2.5 Birds

9.2.5.1 Waterfowl

Some of the many lakes and beaver ponds in Pukaskwa serve as breeding sites for small numbers of some species of ducks, such as mergansers, goldeneyes and black ducks. The Lake Superior shoreline, however, appears to be quite unattractive to waterfowl because of the unproductive character of its aquatic communities.

Canada Geese (Branta canadensis) and other migrating waterfowl follow the coast of Lake Superior making regular stops on the larger sand beaches of the park. Potential stopover locations for geese include Willow River, Fish and Cave Harbours, Oiseau Bay, White Gravel and White Spruce River areas, Bonamie Cove and Imogene River.

9.2.5.2 Other Birds

Two common nesting birds are the Great Blue Heron (Ardea herodias) and Herry Gulls (Larus argentatus). Both birds nest in colonies on some of the islands in Lake Superior. To date, many gull rookeries and two heron rookeries have been located.

Occasional Bald Eagles (Haliaeetus leucocephalus), Osprey (Pandion haliaetus) and a variety of hawks can be seen soaring high over the park. A number of other birds have been identified in Pukaskwa though the list is far from complete. More information should be forthcoming as the result of an avifauna study that has recently been completed.

9.2.6 Fish

9.2.6.1 Species

As with most lakes found on the Canadian Shield, the productivity of lakes in Pukaskwa is low.

Fish species native to Pukaskwa include speckled (eastern brook) trout (Salvelinus fontinalis), white sucker (Catostomus commersoni), lake chub (Couesius plumbeus), brook stickleback (Culaea inconstans) nine-spine stickleback (Pungitius pungitius), and a species of shiner that has yet to be identified.

Yellow perch (Perca flavescens) are common in some of the lakes along the Lake Superior shore. These perch were probably introduced into these waters. Pink salmon (Oncorhynchus gorbuscha) a recent introduction in Lake Superior, appears to be establishing a presence in the park.

Lake Superior contains many fish species, both native and introduced which can be found along the shoreline of the park. Some of these include, in addition to those already listed, rainbow trout (Salmo gairdneri), brown trout (Salmo trutta), yellow pickerel (Stizostedion vitreum), lake whitefish (Coregonus clupeaformis), and burbot (Lota lota).

9.2.6.2 Fishing Areas

a) Northern Lakes

These lakes represent the greatest potential for sport fishing. Louie and South Soldier

are more productive for trout, Lurch and Rye are second while Birch and North Soldier contain a few trout. Production of trout is limited by competition from large sucker and chub populations and poor reproduction success of trout (accessible spawning grounds are few).

b) Widgeon Lake

Angling is probably good in the winter and spring though not during the summer months. Trout production is limited by the competition arising from a large sucker population. The lake's outlet, Fox Creek, contains good spawning grounds and a large speckled trout population, some reaching up to seventeen inches.

c) Coastal Lakes

Trout stocked in some of the coastal lakes years ago have declined because reproduction is limited due to lack of accessible spawning grounds and competition from perch.

d) Lake Superior Shoreline

Angling is good at the mouths of the Pukaskwa, Imogene, Cascade, Swallow, White Spruce, White Gravel and Willow Rivers as well as in Otter Cove. Sporting species include lake, rainbow, speckled and brown trout, pickerel and whitefish; other species include chub, sucker and carp. Fishing is generally good during spring and fall and poor in July and early August.

Sudden violent storms occur regularly along the Lake Superior coastline. These storms combined with dense fogs make navigation and travel along shoreline extremely hazardous, particularly for the less experienced boatman. Angling along the coastline is available to those persons with larger boats, who know the boat's capability in waters as potentially hazardous as Lake Superior.

9.2.7 Zone I Special Areas

The zoning system employed by Parks Canada includes Zone I Special Areas. This classification affords maximum protection of special resources found within these zones. Special areas in Pukaskwa constitute a relatively small portion of the park area. Further studies undoubtedly will lead to the identification of additional features warranting special area protection. The following is a description of those features or values currently identifiable within the park that merit this status.

9.2.7.1 Great Blue Heron Rookeries

Great blue heron rookeries have been identified on islands in the park. Examples of these are those located in the Oiseau Bay area and in the vicinity of the mouth of the White Gravel River. The great blue heron is relatively common in Ontario but, as will be explained their nesting areas are sensitive to external influences and, therefore necessitate special area protection.

These birds generally establish colonies in the upper reaches of tall trees. The nests are large and usually constructed of twigs. The heron continue to enlarge and utilize the same nest each year. Each nest will contain from three to five eggs which are laid once a year.

While the chicks are in the nest, the birds will not tolerate excessive disturbance. Continued harassment may severely affect the health of the young birds and/or force them to abandon the sites completely.

9.2.7.2 Herring Gulls

Again, although Herring Gulls are common in Ontario, their nesting areas warrant special area protection. Breeding colonies are located on numerous bald rock islands adjacent to the mainland component of the park. The nests are usually poorly constructed of grass, moss or seaweed and are situated in depressions or crevices in the rock. The incubation period is less than thirty days. The eggs and chicks are susceptible to damage by careless human intrusions.

9.2.7.3 Arctic Alpine Flora

Plants of arctic-alpine affinity inhabit the exposed rocky shoreline of the park. There is an extensive gap in their range between this location and the shores of Hudson and James Bay. For this reason a representative

sample will be set aside for special area protection. Otter Island will be the location unless a more representative area is found.

9.2.7.4 Pitcher's Thistle (Cirium pitcheri)

Recent studies have located this plant in the Oiseau Bay area. At the present time it is felt that this is one of the most northerly extensions of its range. Based on this fact and its susceptibility to destruction it warrants special area protection.

9.2.7.5 Northern Twayblade (Listera borealis)

A plant of arctic affinity, the Northern Twayblade has only been located in one area of the park (Hattie Cove area). This and its range extension warrants special area protection.

9.2.7.6 Franklin's Ladyslipper (Cypripedium passerinum)

This plant is similar to the Northern Twayblade in that its range has been extended and it has only been found in one location in the park (Hattie Cove area). The Franklin's Ladyslipper will be afforded special area protection.

9.2.7.7 Caribou

Woodland caribou are, as previously indicated, scarce in the park. The animals generally restrict themselves to the coastline throughout the year where they can escape the deep snow in the winter and flies in the summer.

Caribou calving areas and winter range are the two critical habitats which must receive protection if the herd is to be preserved. Caribou possibly use islands as calving sites, a strong possibility that still must be verified.

The important aspect of winter range is low contact between wolves and caribou. Man can directly increase the chances of wolf/caribou contact in winter range by creating trails which both predator and prey will use. Therefore the resource management plan will consider restricting access along specific areas of the coast during the winter months.

Otter Island, One-Lake Island and a portion of the adjacent mainland, and the Caribou Lake-Oiseau Bay corridor will be afforded special area protection.

9.2.7.8 Pukaskwa Pits

These rock features are comprised of five basic formations. All Pukaskwa Pits structures will be protected and the most significant ones will be afforded special area status (Zone 1).

9.3 Resource Management Objectives

In the context of the broad summary objective of Resource Management as previously stated (Section 9.1), the necessary degree of resource management integration is reflected

in the following five categories of resource management objectives.

9.3.1 Vegetation

The resource management objective is to ensure the preservation and perpetuation of the natural vegetation mosaic successional trends, allowing them to progress naturally, while recognizing the specific habitat requirements of wildlife populations.

Sub-Objectives

1) To ensure maximum protection and if necessary to manage rare and/or special species, associations or representative samples of their habitat to ensure their perpetuation.

An overall vegetation management program cannot be dissociated from the protection of rare, unique and/or special associations. These will be the object of specific plans and management strategies to ensure their preservation and perpetuation. This is discussed in more detail under the objectives for special resources.

2) To consider the use of various management strategies and tools as part of an integrated land-use plan.

The preparation and implementation of a vegetation management plan should contribute to the accomplishment of approved vegetation and/or wildlife management objectives. For example, the preservation and perpetuation

of an important faunal species might require manipulation of its habitat by selective cutting or the use of induced controlled burning. To use fire as a management tool, safety of park visitors, facilities and adjacent lands will have to be assured.

The existing federal/provincial agreements related to insects, disease, fire detection and suppression will be considered in the preparation of the vegetation management plan. Cooperative programs with adjacent private and provincial land use agencies will also be established to respect or fulfil existing agreements as required.

9.3.2 Fauna

Objectives

The resource management objective is to reconcile Parks Canada's protection and preservation role and the rights of the Robinson-Superior Treaty Indian Group by developing, implementing and monitoring a wildlife management program.

Sub-Objectives

The wildlife studies program will be continued in order to establish such characteristics as species status, population levels and trends, habitat conditions and requirements, predator/prey inter-relationships, ecological importance. This information will serve as a basis to:

- 1) *protect rare and/or endangered species and their habitats.*

For example, the Woodland Caribou has been identified as a rare and endangered species in the park and thus their identified critical winter grounds will receive maximum protection.

- 2) *to protect habitats important to the perpetuation of other species.*

- 3) *to establish periodic harvest levels for ungulates and furbearers.*

It has been agreed that the rights of the Robinson-Superior Treaty Group will be allowed to continue in the park area. In order to reconcile those rights and the primary preservation mandate of Parks Canada, the wildlife management plan will constitute the framework within which those activities will take place. For example, for those species which are hunted and trapped, periodic harvest levels will be established through a continuing monitoring program.

Concurrently, Resource Conservation will participate in the preparation and implementation of an information program to explain our approach and strategies to members of the Treaty Group, local people and visitors.

- 4) *to ensure preservation of fish populations and habitats while recognizing the potential for sport fishing.*

In order to achieve this sub-objective a fish management plan will be developed and implemented. It will include identification of lakes where fishing can be allowed, establishing fishing limits to preserve fish populations and ensure natural reproduction, as well as means to improve the fishing potential.

5) to monitor populations and habitats in relation to all use activities and revise the management plans when necessary.

A plan will be prepared and implemented containing monitoring requirements for the surveillance of the effects of use activities. To this end, environmental indicators will be identified and when necessary management strategies applied to correct or minimize detrimental effects.

9.3.3 Special Resources

Objectives

The resource management objective is to ensure the protection and perpetuation of representative, unique, rare/endangered or fragile natural and cultural resources and processes through the selective use of specific resource management techniques.

Sub-Objectives

1) To ensure maximum protection of the Woodland Caribou population and its critical habitats.

Caribou is a rare/endangered species in the park. The population is estimated at 14-20 individuals located in the coastal area of the park. Critical habitats such as the wintering and calving areas have to be protected to ensure the survival of the species. Development of the park (e.g. transit route, trails) must be carried out in such a way that detrimental contact between man and caribou does not result.

To achieve this a specific resource management plan will be prepared for the caribou. It will be integrated with the overall wildlife plan.

2) *To protect and if necessary manage raptors and colonial birds especially those Great Blue Heron and Herring Gull rookeries identified.*

The offshore islands where rookeries are located are identified as Zone 1 special protection area because of their extreme sensitivity to disturbance.

3) *To protect and if necessary manage such rare plant species as Pitcher's Thistle, (Circium pitcheri) Northern Twayblade (Listera borealis) Franklin's Ladyslipper (Cypripedium passerinum) and to preserve other representative arctic-alpine flora or particular plant associations by setting aside special protection areas.*

The above floral species have been identified as rare. Arctic-alpine flora habitats are also rare in the park region as they are not located in their normal biogeographical distribution zones. Otter Island has been identified as a representative sample and will be set aside as a special protection area.

A particular stand of Jack Pine at Oiseau Bay is considered unusual and part of this stand will be protected.

4) *To protect special and unique cultural features such as the Pukaskwa Pits; and*

5) *To protect other species or features which may be identified in future studies and investigations.*

9.3.4 Development and Use

Objective

The resource management objective is to minimize the detrimental effects of park development, visitor activities and operations upon park resources and processes, while recognizing the need for compatible recreational activities.

Sub-Objectives

1) *To ensure that a consistent approach and methodology of environmental impact evaluation is applied to all proposed development and that specific strategies are developed and implemented to minimize the impact.*

The environmental consequences of the proposed development in Hattie Cove and Oiseau Bay are recognized and management strategies are being developed to minimize the impact of proposed activities and to protect special resources located in those general areas.

Environmental evaluations will be made of all other proposed developments their implementation.

2) To monitor the effects of development and activities on park resources and processes, and to establish standards and thresholds of permissible impact.

Monitoring requirements will be established to document effects of development on resources. The establishment of thresholds will permit determining if permissible impact is exceeded. Corrective measures will be taken when necessary and feasible.

3) To ensure the park operations and maintenance procedures are in harmony with the resource management objectives.

4) To develop resource management plans and strategies for Hattie Cove, Oiseau Bay, the Oiseau Bay land transportation corridor, Simons Harbour, Otter Cove, Bonamie Cove and Imogene Cove, the inland transportation corridor, inland development sites at Lurch - Birch Lakes, Gornupkagama Lake and Widgeon Lake, and other identified development proposals, in order of priority.

9.3.5 Regional Context

Objective

The resource management objective is to cooperate with adjacent provincial and private land-use agencies.

Sub-Objectives

1) To establish co-operative overall and specific resource management plans to respect existing agreements, to review and revise them when necessary and to develop other agreements when required in the best interests of the natural resources processes and regional land-use objectives.

10. Interpretation

10.1 Approach

This history of Pukaskwa reflects, to some extent, the history of Canada. The park's history is recent and much of it deals with the relationships of early Canadians to the lands.

Pukaskwa is a wilderness area . However, an interpretive program that attempts to present only this aspect may only appeal to a small group of users. For visitors without this penchant, there would be no appeal to their own experience.

Interpretation will attempt to show the park as it was when inhabited by the early Native peoples; what it was like as the early explorers paddled their way west, and the hard and simple life of trappers and loggers in the days when it was Man versus Nature.

With this perspective, the first phase of the interpretation program should attempt to make the wilderness more palatable to the non-devotee and give him an appreciation of what the park has to offer. Interpretation will subtly initiate visitors to the park and hopefully stimulate them through identification with the lives of early visitors and inhabitants.

Interpretive methods will vary throughout the park according to specific purposes and objectives within different units. At one end of the scale, interpretation will be geared to providing an overall introduction to the park and its values through media geared to reaching large numbers of people, while at the other end of the scale, interpretation for on-site users will utilize personal contact and pamphlets.

The interpretive program will provide a gradient of experiences that should channel particular types of visitors to areas and activities designed specifically for them. The basic concept is not to get everyone into the wilderness but to make it available to those who are seeking it. Perhaps even more importantly, interpretation should plant in the mind of the casual recreational user the concept that the park is valuable because it is wild and relatively undeveloped.

An interpretation plan will be developed to present in detail, the objectives and goals of interpretation for Pukaskwa; the relationships and objectives of the interpretive units that have been established; and the interpretive methods and media that will be used. Priorities will be indicated and will reflect the development schedule as established for the park.

10.2 Interpretive Units and Themes

The overall park theme that will be used to interpret Pukaskwa is Wild Shore of an Inland Sea. Six interpretive units and their respective themes have also been established as follows:

| UNIT-THEME | |
|------------|---|
| I | <u>The Coast - Wild Shore of an Inland Sea</u> |
| II | <u>White River Plains - Lake to the Sea</u> As water levels dropped, the highlands surrounding this area resulted in the creation of a lake within the sea. Now it is a flat, rather uniform lake bottom. |
| III | <u>Pukaskwa Plains - From Ice to Sea</u> The Pukaskwa river trickles through the bed of a great glacial spillway. When the river swept glacial meltwaters to ancestral Lake Superior, its power and magnitude were awesome. The effects of the ancient river are spread throughout the unit. |
| IV | <u>Cascade Mountains - Island on a Mountain Top</u> Being the highest elevations in the park, this land was the first to emerge above glacial ice and ancient lakes. |
| V | <u>Lurch Mountains - Ancient Shoals</u> Lower in elevation than the Cascade Mountains these highlands would have been shoals while the Cascades were islands. |

VI The Plateau - Sea Floors

The plateau is of relatively level topography and somewhat lower in elevation than the mountain units. It illustrates an ancient sea floor.

Sub-theme breakdowns include such topics as mountain building, erosion, glaciation, hydrology, Canadian life zone, climate, Lake Superior, time, man and his influence (i.e. prehistory, Pukaskwa Pits, fur trade, exploration, transportation, trapping, logging), perception of wilderness and concepts of vastness, power and the intrinsic order of natural processes, remoteness, and isolation and the impermanence of man.

10.3 Interpretive Media Considerations

10.3.1 Visitor Reception Centre

Initial contact with park visitors will occur in the visitor reception centre at Hattie Cove. This centre will handle large numbers and types of people. Rapid turn-over programs will give an introduction to the park and its values and will provide orientation to park facilities.

A range of activities and available experiences will be presented and requirements for achieving a varied experience will be outlined. Motivation of visitors to become personally involved with the land will be paramount. The visitor reception centre will also serve as headquarters for the interpretive staff.

10.3.2 Transportation Systems

10.3.2.1 Oiseau Bay Land Transportation Route

In locating this transportation corridor, an attempt will be made to maximize interpretive values. Walking trails or overlooks at nearby points of interest will be made accessible by this transportation route. Interpretation en route may be by personal or mechanized means.

10.3.2.2 Inland Transportation Route

The major task of interpretation on this system will be one of orientation. Activities, values and experiences available at Lurch and Birch Lakes, constraints of the environment, difficulties to be encountered, and types of acceptable and non-acceptable uses will be explained. Interpretation en route will be minimal. Off-site interpretation at the Hattie Cove transit terminus will be intensive.

10.3.2.3 Water Transportation System - Hattie Cove to Oiseau Bay

Interpretation en route will likely rely on personal interpreters to present the story of Lake Superior, the Pukaskwa coastline, and water transport from the time of the voyageurs. Users of the water transportation system will be encouraged to complete the loop from Oiseau Bay back to Hattie Cove by the Oiseau Bay land transportation route.

Further interpretation of the park's values will be presented for those users who plan to hike the trail systems emanating from Oiseau Bay.

10.3.2.4 Water Transportation System -
Oiseau Bay to Imogene Cove

Interpretation of the coastline and of Lake Superior will continue on this sector of the route; however, interpretation will not be as intensive as on the first leg of the journey from Hattie Cove to Oiseau Bay.

Features such as trappers' cabins and encampments, raised beaches, and Pukaskwa pits will be interpreted. Visitors will be prepared for further interpretive experiences at the Pukaskwa Depot.

10.3.3 Signs

Signs with brief interpretive messages are expected to be a major tool in the park for orienting the visitor.

10.3.4 Trails

The interpretive potential of all trails including canoe routes in the park will be maximized.

10.3.5 Publications

The best interpretive device for wilderness areas is the self-guided trail and accompanying pamphlet. When the interpretive program is fully operational, a newsletter of news-

letter of interpretive announcements and park biological comment will be issued regularly. Special Pukaskwa places will be photographed and the photos, with an interpretive message, will be distributed through posters and postcards.

10.3.6 Special Events

There will be activities to interpret particular features, e.g., wolf howls, owl hoots, etc.

10.3.7 On-Site Exhibits

On-site exhibits will be used to interpret features in the more intensively used areas such as Hattie Cove and Oiseau Bay. Elaborate exhibits will not be used in wilderness areas.

10.3.8 Campground Programs

Campgrounds are expected to be a major source of personal interpretive contacts. Larger campgrounds such as the one at Hattie Cove and Oiseau Bay will also contain outdoor theatres for evening talks.

10.3.9 Mass Media

A working relationship will be developed with the local press, radio and television stations to promote interpretive events and interpret the natural history of Pukaskwa as well as promote national park values in general.

10.3.10 Winter Interpretive Program

The feasibility of winter interpretive activities is being studied. Ski and snowshoe activities may be supplemented by preliminary slide presentations in the centre and guided walks on skis or snowshoes.

10.3.11 Extension Interpretation

A close liaison with area schools, art clubs, nature clubs and service organizations will be maintained. Special programs will be provided on request.

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