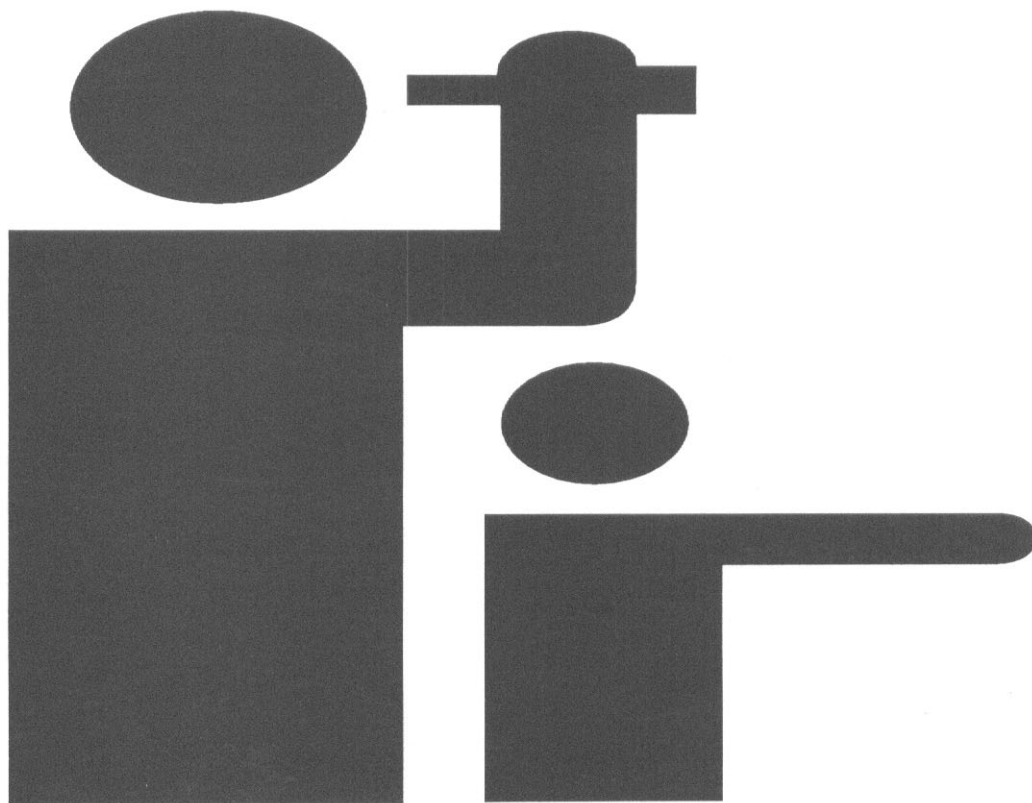


HUMAN INTERVENTION IN THE CLEAR LAKE BASIN
OF RIDING MOUNTAIN NATIONAL PARK

VISITOR SERVICES



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**HUMAN INTERVENTION IN THE CLEAR LAKE BASIN
OF RIDING MOUNTAIN NATIONAL PARK
VISITOR SERVICES**

by

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PREFACE

With the townsite of Wasagaming as a central visiting point, the Clear Lake Basin in Riding Mountain National Park has developed into a popular resort area since the turn of the century. The beauty of the region has attracted a variety of visitors ranging from overnight campers, to summer cottagers and day-users. Most come in search of a place to vacation, relax and pursue recreational activities in a natural setting.

Human intervention in biological, ecological and environmental processes and conditions has created a long and diverse history of exploitation and manipulation of area land use. A common result is conflict with the National Parks dual policy of preserving resources as well as providing recreational opportunities. A master plan for Riding Mountain National Park, completed in 1977, called for a restriction on any further expansion of recreational activities within the park and more emphasis on conservation and interpretation functions. Previous development in the Park, however, produced intensive settlement of Wasagaming and the north shore of Clear Lake by cottagers and extensive use of prime waterfront areas on the south-west shore by private organizations, such as church camps. Substantial construction of recreational facilities for tourists at Wasagaming provide waterfront opportunities for boating, fishing and swimming. Shore areas are heavily utilized for campground and picnic sites, hiking, bicycling and horseback riding trails. Sports such as tennis, golf and lawn bowling also were developed. An adjoining highway system transports visitors from the east, north and south to the Park. Each activity has had a lasting impact on the ecosystem.

This is one of a series of inter-related reports that are meant to review human intervention in the Clear Lake Basin. Emphasis here is placed on identifying visitors, indicating their number, origin, age, gender, education and income level, analyzing why they come to Riding Mountain, and illustrating how their demands influence the park ecology and management strategies.

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INTRODUCTION

Vacationing in national parks has long been a popular tourist activity for Canadians. In Riding Mountain National Park, there has been a steady increase in attendance by visitors from 409,519 in 1952 (Jackson 1960) to over 1,150,000 during the 1989-90 season (Canadian Parks Service 1989-90). Use of the five campground sites in the Park numbered 26,290 party-nights¹ during the 1989-90 season (Canadian Parks Service 1989-1990).

In 1985-86, more than 27,052 golfers teed off on the 18-hole golf course, 10,644 people played on the tennis courts and 1,874 visitors participated in lawn bowling. A total of 28,170 individuals utilized the six self-guiding trails and more than 49,608 used the Interpretive Centre to learn about the park (Canadian Parks Service 1985-86).

According to 1988 statistics, Manitoba residents account for 85 percent of vacationers (Wallace-Brown 1988), which is an increase from 75 percent in a 1967 survey (Nixon 1967). Party-size typically ranges from two to four people, with a composition of 41 percent families and 34 percent couples. Percentages of males and females generally are equal in each age group. The most common occupational categories of visitors are professional, retired, homemaker and managerial. There is no dominant income bracket for visitors, but those earning \$20,000-\$40,000 per year form the largest group. Day-users comprise 53 percent of park users while 47 percent stay overnight in the park. The usual length of visit ranges between one and three nights. Time spent in Wasagaming averages six hours for day-users while overnight guests average seven or more hours in the townsite. First time users make up only nine percent of vacationers; a large majority (91 percent) are repeat visitors (Wallace-Brown 1988).

Among passive activities, picnicking and restaurant dining, pleasure driving/sight-seeing and shopping are most common. Among the most popular active sports are swimming, golfing, hiking, motorboating, fishing, bicycling and photography (Nixon 1967, Wallace-Brown 1988).

Most activity in Riding Mountain National Park occurs around the Clear Lake Basin and, in particular, the townsite of Wasagaming. The extent of development of this land area to accommodate recreational functions, both before and after establishment of the National Park in 1930, concerns officials. Through planning and management, they must balance recreational land use so as to minimize conflict with the National Parks mandate to preserve and protect the environment and interpret its natural value for visitors.

The purpose of this report is to review available visitor use statistics to demonstrate how human impact has affected both the positive and negative development of the Clear Lake Basin. The report cites original sources for all information. Other documentation includes an annotated bibliography and a reference bibliography. The authors are responsible for the content of the report. Questions and comments are welcome.

1 Parks Canada defines a party-night as one night of campground use by one group of people occupying a campsite.

Physical Characteristics of the Clear Lake Basin

To understand why people are attracted to Riding Mountain National Park, and the Clear Lake Basin in particular, it is necessary not only to be acquainted with the physical characteristics of the area but also to look at activities in which visitors engage. Riding Mountain National Park is located on a 2,976 km² tract of land in southwestern Manitoba. It lies 97 kilometres north of Brandon and 274 kilometres west of Winnipeg. Several main highways are in close proximity (Riley 1984). The Trans-Canada Highway and Yellowhead Route connect with Highway 10 running north-south through the Park. These routes provide easy access to the Park.

The Park is an example of the Manitoba Escarpment which rises 475 metres from the Manitoba Lowlands and marks the transition from the first to second prairie level (Parks Canada 1987). Riding Mountain provides an example of the role that glaciers, wind and water have played in sculpting the landscape (Parks Canada 1987). Attendant vegetation consists of combined aspen, spruce and mixed hardwood forests as well as prairie grasslands. Wildlife includes an abundance of deer, elk, moose and black bears, along with smaller concentrations of other mammals. Numerous fish, birds, insects and reptiles also inhabit the area. There is much in the environment to attract visitors for sport, camping, sightseeing and interpretation.

Clear Lake Basin and the townsite of Wasagaming lie in the southcentral area of the Park. Unlike most shallow, eutrophic, prairie lakes, Clear Lake has cool temperatures and clear water. It is the deepest (35 metres) and largest lake in the Park, and is maintained by a small drainage basin of about 125 km² that contains six streams, of which only three flow continuously (Rawson 1935). Major features of the drainage basin include Octopus Lake, Octopus Creek, Ominnik Marsh and South Lake. The only outlet is Wasamin Creek (Figure 1).

Since the lake's long axis faces the prevailing winds, the shoreline is exposed and partially barren. The shoreline comprises 60 percent coarse gravel and stones, 30 percent sand and 10 percent emergent vegetation (Rawson 1935). Both the lake and shoreline provide a setting for a variety of activities such as power boating, waterskiing, sailing, canoeing, pedal boating, wind surfing, fishing, swimming, camping, picnicking and sightseeing. Most waterfront activity takes place around the Wasagaming townsite which has been intensively developed with campgrounds, cottage subdivisions, commercial accommodations, businesses, a main breakwater, swimming, and boat rental and launching sites. According to Hoole (1972), the waterfront at Wasagaming does not have high natural capacity for water-oriented, recreational activities. It is better suited to camping and cottage development. The shoreline is rocky with little natural sand or gravel formation.

Better waterfront sites for recreational day-use development are located on the southwestern areas and the north shore. These areas are accessible by gravel road from a junction of Provincial Highway 10 at Onanole (Hoole 1972) or by the Highway 10 bypass. The north shore is part of an off-shore shallows which is made up of firm sand. These shallow waters appear to provide better swimming conditions than on the south side where off-shore slopes are greater (Peiluck 1971). The southwest shore of the lake is developed in that several church groups maintain camps and have sponsored waterfront activities over the years (Figure 1). The off-shore slope is good for bathing, although the bottom is not always sandy. Access to the shore is somewhat difficult because the shore rises quickly. Topography at the east end of the lake is steeper and more rugged and provides good viewing points of the lake. Coarse-textured beach in this area allows for some swimming and bathing areas. A boat launching site, popular among waterskiers, is located here. There is little potential for further development of recreational facilities in the east end as it is already utilized by the access roads to the Superintendent's residence, wishing well and golf course (Hoole 1972). Finally, the southern and western shores are less attractive for recreational use. Much of the southshore, including Ominnik Marsh and South Lake, forms an important habitat for fish and waterfowl populations that are protected from human activity (Peiluck 1971).

HISTORICAL PERSPECTIVES ON VISITOR USE

The Canadian National Parks system includes 28 national parks. Riding Mountain joined the system in 1930. Though each park has its own unique history of development, a single regulating body was set up to preserve and control these lands. The *National Parks Act* of 1930 states that:

the Parks are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to the provisions of this Act and the regulations, and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations (Parks Canada Policy, Section 4 1979: 7).

Although the basic philosophy is that national parks form part of Canada's national heritage and must be conserved, the policy statement allows for controlled development. In order for Canadians to vacation in a natural wilderness setting, where they can benefit from, enjoy and be educated by natural surroundings, services and facilities must be available to provide accommodation near recreational and interpretive activities. On the other hand, extensive development has an impact on the environment, usually resulting in misuse or overuse of natural resources. This may undermine the mandate to leave parks unimpaired for future generations.

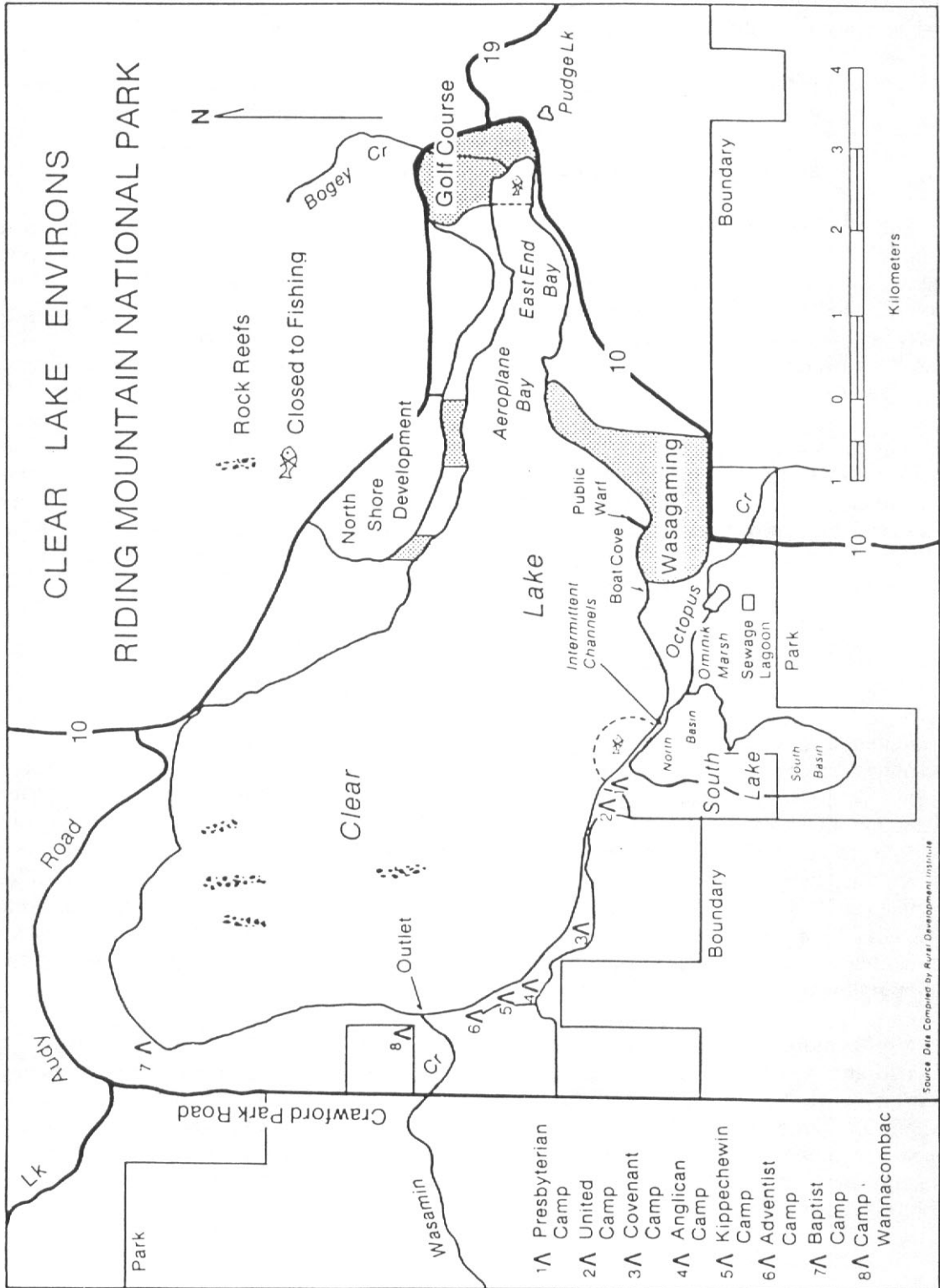
Administrators responsible for planning and management of parks must strive for a balance that meets both goals. One way to accomplish this task is to analyze the positive and negative aspects of human intervention in a park over many years. According to Riley (1984: 2), by surveying "who uses a park, where they come from, how and why they use it and what they are seeking, policies may be formulated which satisfy visitor goals and needs, while complying with the national parks system policies and mandate." Also, any misuse of the ecosystem can be identified and corrected.

Pre-park Human Activity

Human intervention in the Riding Mountain area, in the form of manipulation and exploitation of the resources, can be traced back to the post-glacial era when the land, newly freed of ice, began to support life forms. Archaeological excavations around the Baptist Camp area on the northwest shore of Clear Lake and at the Aeroplane Bay and Boat Cove sites (Figure 1), during the early 1970s, show evidence of tools, grooved axes, pottery and other artifacts which denote Cree culture. These date back approximately 1,750 years. It appears that the Cree were among the first to occupy the highland territory in Riding Mountain National Park (Jamieson 1974). The Assiniboine evidently used the area as they roamed the prairie in search of bison (Redman 1978), and although they may have frequented the higher timber lands, there is no archaeological or written evidence that they inhabited the Riding Mountain area (Ringstrom 1981). Ojibway and Saulteaux in-migration occurred during the early 1800's.

A series of foot and horse trails created by Aborigines developed into the area's first highway system. In fact, Riding Mountain received its name from the fact that the easiest way for travellers to negotiate the rugged territory was to ride a horse (Parks Canada 1977), and various trails were constructed in the vicinity of Riding Mountain. Once the Canadian Pacific Railway reached Brandon in 1881, the number of settlers increased rapidly. Immigrants from Europe and the United States, and settlers from eastern Canada established homesteads on the fertile plains around Riding Mountain and used the highlands as a source of timber and food (Redman 1978).

Figure 1



The impact of settlers on the environment was considerable, and much of it was negative. Homesteaders required wood for lumber to build houses, barns, and fences, for fuelwood, and to supply ties to the railroad companies. Initial clearing of their own acreages surrounding Riding Mountain provided enough lumber in the beginning. As demand increased, however, requirements resulted in harvesting the heavily timbered Riding Mountain area. Clearing of land for timber and farming, along with continual cutting of natural grasslands for hay, cattle grazing and fire barriers have disturbed the valuable chernozemic soil base (Canadian Parks Service 1987). Permits for hay cutting, grazing and timber removal were not discontinued until the late 1960s and early 1970s. The result has been considerable resource degradation (Lothian, Vol. I 1976).

The Canadian government realized that in addition to providing natural beauty, forests must be conserved to prevent soil erosion and flooding, and to protect wildlife and natural resources. Settlers were prevented from removing timber illegally from the timber reserve, the boundaries were marked (Oleson [n.d.]), and logging was allowed only under strict supervision.

In spite of regulations, during the next 20 years portable-mill owners were guilty of overcutting and denuding large tracts of reserve land. In 1906, in an effort to stop abuses, the government instituted the *Forest and Park Act*, which transferred control of Riding Mountain Timber Reserve from the Lands Branch to the Forest Branch of the Department of the Interior (Thomas [n.d.]; Parks Canada 1977; Redman 1978). The *Dominion Forest Reserve Act* placed restrictions on hunting and fishing and designated 216 squares miles of the forest reserve as a game preserve where wildlife would be protected (Parks Canada 1977; Thomas [n.d.]).

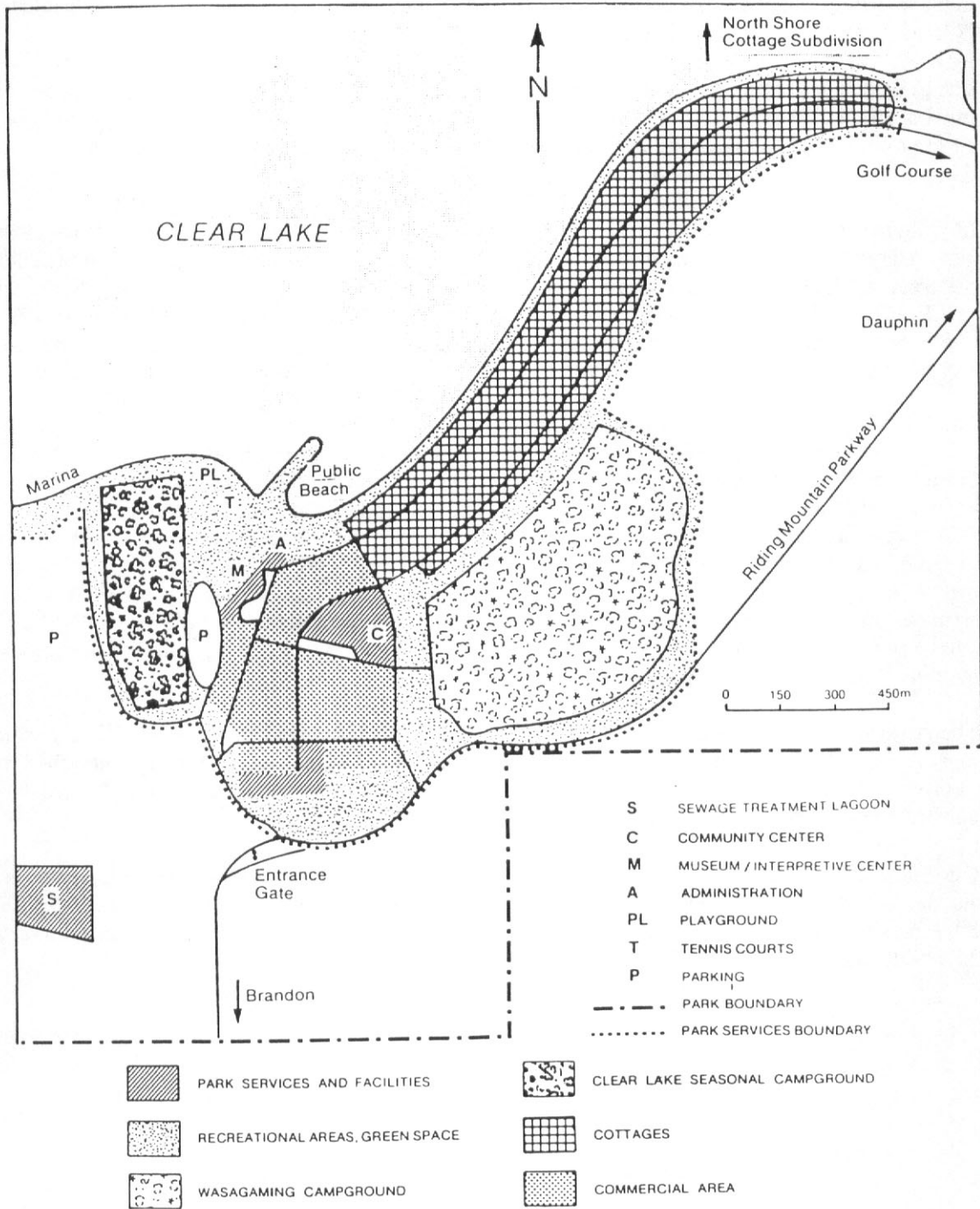
Land development for visitor use in the forest reserve was restricted to building cabins for hunters and picnic sites for campers on the shores of Clear Lake until 1914. An early report also suggested establishing a summer resort in the Clear Lake area, since the people residing there could be expected to aid in conserving reserve land (Oleson [n.d.]), and the area was surveyed for subdivision. The first lots were built on what is now Wasagaming Drive. Permits for leasing land on which to build cottages were available on a yearly basis for a fee of ten cents per foot of frontage (Ringstrom 1981). L.B. Gusdal was the first to file for a building site in 1917 (Thomas [n.d.]), and more than 50 log cabins were situated along the lake by 1920 (Oleson [n.d.]). The first business was opened on the lake shore in 1925 (Lothian, Vol. III 1979). In 1928, the Forestry Branch created a second subdivision on the north shore of Clear Lake (Figure 1). It consisted of nine blocks, each containing from 10 to 18 lots (Lothian, Vol. III 1979).

The government spent a total of \$104,799.52 to build recreational facilities on Clear Lake's south shore (Ringstrom 1981). Improvements included a pier, installation of a telephone system, digging wells and toilets for tourists and campers, and construction of government cabins for rangers and foresters. Much of the lumber to construct buildings came from an area which is presently the site of the golf course.

On 25 January, 1930, the federal government announced that a national park would be established at Riding Mountain and that it would embrace the whole escarpment (Parks Canada 1977; Thomas [n.d.]). In June 1930, James Smart was appointed Acting Park Superintendent. The official opening was held on 26 July 1933, amidst much celebration (Oleson [n.d.]).

Figure 2

Land Use Designation in Wasgaming



Source: Community Plan, 1988 (modified)

Early Development of Visitor Services

Labour and money were required to build facilities to bring Riding Mountain up to national park standards. Though the Great Depression marked the low point in Canada's economic history, it came at a fortuitous time for the development of Riding Mountain National Park. According to Parks Canada (Lothian, Vol. III 1979: 106-107), ... "Funds voted by Parliament for unemployment relief not only provided assistance for the unemployed but also permitted a rapid development of roads, buildings and amenities that otherwise might have been deferred for some years." Four relief camps were established and housed up to 1,200 men at any time (Lothian, Vol. I 1976; Parks Canada 1977). During the next ten years, a great deal of human intervention occurred in land use of the Clear Lake Basin.

Much of the manipulation was constructive but some excesses resulted in exploitation of resources. The regional transportation network was improved. Construction of Highway 10 north to Dauphin replaced the old Strathclair and Thompson trails. A new road (Norgate) connected Park Headquarters to the eastern Park boundary. This is now Highway 19 (Figure 1) (Parks Canada 1977; Lothian, Vol. III 1979). The main streets in the townsite such as Ta-Wa-Pit and Wasagaming Drives were built by relief workers. Ease with which visitors could reach the Clear Lake area was improved.

Expansion of Clark's Beach subdivision had top priority in development plans. New surveys were completed to include a business section, a campground and a picnic area. Part of the lakeshore was developed as a public area while other sites were selected for administration headquarters. The townsite's name was changed from Clark's Beach to Wasagaming (Cree for clear water) (Lothian, Vol. I 1976). Since administration now occurred on a full year basis, private development of visitor services in the townsite was encouraged. Restaurants, a summer hotel, and the Idylwyld bungalow cabins were constructed to accommodate tourists (Lothian, Vol. III 1979).

The Clear Lake Seasonal Campground (Figure 2) became one of the first projects completed by relief workers. Five acres at the west end of Wasagaming were divided into blocks and 581 camping lots and 25 outdoor kitchen shelters were involved by 1935. A jamboree hall was added to provide a place for entertainment. Electricity was installed in 1936 making camping more attractive (Lothian, Vol. III 1979). Many visitors became seasonal campers and paid a license fee to reserve a lot each summer. At first, only tents were used. Gradually wooden floors were added, then primitive shacks with tent roofs. Later, portable cabins and trailers were allowed (Lothian, Vol. I 1976). In time, so many seasonal campers occupied the campground lots that Park visitors on short camping trips had no place to stay. The National Park mandate of providing services for all Canadians thus was not being met. This issue was addressed in 1955 with the construction of the Wasagaming (Figure 2) and Lake Katherine Campgrounds (Parks Canada 1977).

Park headquarters was constructed during the 1930's by relief workers. It provided space for the superintendent's office, general office space and an information bureau. Scandinavian craftsmen built a park museum next to park headquarters. It contained display cases to hold exhibits of geological and ethnological specimens and artifacts (Lothian, Vol. III 1979). This eventually became the Interpretive Centre and contains a lecture hall to acquaint visitors with park features (Figure 2).

Several recreational facilities were installed by labour gangs within the central townsite area. A public picnic site was laid out, and covered shelters with tables and benches allowed use in all weather conditions. A children's playground equipped with swings, slides and giant chess/checkers boards is still in use today. Tennis courts were constructed west of the picnic area in 1932. Two years later, a tennis pavilion was added. The facilities were considered good enough to host district and provincial championships (Lothian, Vol. III 1979) (Figure 2).

On the waterfront, the old wharf was replaced by a breakwater extending 680 feet (210 metres) into Clear Lake (Lothian, Vol. I 1976). In addition to protecting a swimming area, it contained docking facilities for boat rentals and private boats. The beach was improved and change rooms for bathers installed.

The most ambitious recreational project undertaken in the 1930s was construction of an 18-hole golf course. It was situated on hilly land that provides a beautiful view of the eastern end of Clear Lake. Construction was facilitated by earlier clearing of the timber. The golf course was the fulfilment of a promise made by Charles Steward, Minister of the Interior, when he visited the area in 1928 to choose a National Park site (Lothian, Vol. III 1979). Both a club house and proshop were added and by 1933 the 18-hole layout was complete. Today it is considered one of the best courses in all of Canada's National Parks and attracts many visitors.

PARK OBJECTIVES AND POLICIES

Until 1969, there existed no definite statement of National Parks policy. The *National Parks Act* of 1930 was open to interpretation by the administration of each park (Jenning 1971). The focus of development at Riding Mountain from its inception in 1930 centred around designing a seasonal resort community at Wasagaming to meet recreational needs of people in the area. Emphasis was placed on long term visitors in three respects. First, two summer cottage subdivisions were built on Clear Lake. Second, lots could be leased on a long term basis. Finally, a campground where visitors could rent space for a whole season was constructed. In addition, private church groups were allowed to set up summer camps along some of Clear Lake's best shoreline. Even today, local people talk about going to the cottage at Clear Lake rather than visiting Riding Mountain National Park (Hoole 1972). Tourists who wish to spend a short time appreciating and learning about a National Park received less attention.

Parks Canada has the major task of educating people about the idea that a national park has three separate but equal objectives. First, it is the objective of Riding Mountain National Park to protect and manage natural and cultural resources of the Southern Boreal Plains, Plateaux and Manitoba Lowlands, ensuring that natural processes evolve (Parks Canada 1987). In this way, future generations will enjoy park settings. Second, the Park provides opportunities for the general public to appreciate, enjoy and learn about environments stressing particular natural, cultural and historical themes. Third, Riding Mountain National Park offers a variety of services and recreational opportunities for visitors to use which are compatible with park environmental and zoning plans (Parks Canada 1987).

Park Zoning

National Parks are classified according to the purpose of the park and the degree of protection required (Riley 1984). Both have an effect on the type of activities pursued in a given park. Riding Mountain is ranked as a Class A wilderness park with provision for outdoor recreation in natural conditions (Riley 1987). Guidelines in the *Riding Mountain National Park Management Plan* (1987) indicate that each park is zoned into areas where limits can be set on what uses can occur.

Zone I includes sections that require special preservation. Visitor use is limited because of the fragility of the resources or historical/cultural significance of features. The Okanese Cemetery, an example of Aboriginal culture, and the Manitoba Escarpment were designated as special preservation areas.

Zone II wilderness refers to areas where priority is given to protecting natural or primitive conditions. People may use the area as long as nature is left undisturbed. Access in wilderness areas is gained by hiking, bicycling or on horseback. Vehicles are not permitted. Ninety-one percent of Riding Mountain National Park is zoned wilderness (Parks Canada 1987).

Zone IV - Recreation designation allows the development of interpretive and recreational activities and facilities as permitted by Park policy. Access by motor vehicle is allowed. Clear Lake is in this zone and includes the lake surface and shoreline up to the roads encircling the lake, except for the townsite of Wasagaming. Special facilities within this zone are church camps, group camps, picnic sites and the golf course.

Zone V - Park Services include developed areas which support high visitor use. Its basic purpose is to promote services and administrative functions necessary to support visitors during their visit, and to permit effective operation and management of the whole Park (Parks Canada 1987). The townsite of Wasagaming is designated as a visitor centre. It includes park administration buildings, interpretive centres, commercial services and accommodations, recreational facilities (both public and private), privately owned cottages and cabins, public campgrounds, municipal services, park and picnic areas, and various roads and pathways (Parks Canada 1987).

Wasagaming Townsite

Attitudes toward the development of Wasagaming as a visitor centre changed over the years. The first 20 years of Riding Mountain National Park history saw a conscious effort to encourage visitation (Parks Canada 1987), and long-term cottaging and camping were allowed. Private investment in businesses and commercial accommodations flourished to keep up with visitor demands.

During the 1950s, affluence and the automobile allowed more people to travel to vacation sites, and Riding Mountain began to attract visitors from outside the local area. Needs for these people were different from those who cottaged in the Park, and conflicts occurred in land use. Management philosophy began to change from sponsoring private development of Park land to emphasizing use for all members of the public (Parks Canada 1987). It was at this point that the new camping facility was opened in Wasagaming.

In the late 1960s and early 1970s, it was felt that Wasagaming had developed beyond the level of a visitor services centre in its recreational role (Hoole 1972). The idea of allowing privileged use of certain areas of land was questioned. Park administration began to talk about instituting policies that would halt cottage leasing and private use of camps. Group camps would replace the church camps and cottage lots would be turned over to Park use or left undisturbed.

Public outcry was loud and immediate. If there was to be a new master plan for Riding Mountain National Park, citizens felt they should have some input (Jennings 1971). After considerable deliberation, which included public participation, a management plan was instituted in 1977. It was a compromise. Park policy accepted the continued occupancy of privately owned cottages but the policy of attrition would be enforced. No new lots would be available to the public. When cottagers wished to sell, the Crown would have first option to buy and use the land as they saw fit, following Park policy. Church groups were allowed to stay but they were required to accept public use in the off-season. A license of occupation replaced legal right of land. No new leases to private organizations would be issued (Parks Canada 1977).

The principle of containment would apply to Wasagaming as a visitors centre as no further expansion would occur. Maintenance of existing facilities would be undertaken but new development would be confined to areas outside the Park, such as Onanole (Parks Canada 1987). Policy statements of 1979 reaffirmed

preservation as top priority. They also indicated an awareness that co-operation with local residents and local governments was essential, because good-will is needed to settle land use conflicts.

The interpretive role of the Park assumed greater importance at this time. Visitors were encouraged not only to learn about and enjoy the natural environment, but also to respect and protect it. Exhibits, films and instruction were offered by the Interpretive Centre to help people understand nationally significant resources (Parks Canada 1987). Most interpretation is thematic, using hiking trails and viewing stations to instruct visitors about the Park's ecological and cultural attributes.

During the 1980s, policy reflected renewed interest in tourism and, owing to an economic downturn, officials accepted the idea of private investment in certain areas, such as building of a marina (Prairie and Northern Region, Planning Division 1988). Private funding, however, has not been forthcoming.

VISITOR USE STATISTICS AND PROFILES

According to the *Riding Mountain National Park Management Plan* (1987: 34) "Current visitation and future trends and projections are important determinants of plan decisions and influence how specific visitor services should be resolved." Since the Park's inception, statistics have been kept that record park attendance, campground party-night counts and individual facility use. Major surveys of park visitor use have been conducted to provide a profile of visitors (Nixon 1967; *Facility Use Survey* 1972; *Clear Lake Boating Survey* 1976; *Summer Backcountry Use Study* 1976; Riley 1984; Hanna 1985; *Riding Mountain National Park Management Plan* 1987; Wallace-Brown 1988). Questions such as numbers of visitors, origin, their reasons for visitations and use of facilities are included (Riley 1984). Park officials look for trends in an effort to satisfy visitor needs while complying with policies and mandates.

Attendance levels and visitor profiles over a 25-year period are summarized below (Table 1). Because surveys were conducted for different purposes and in various formats (e.g. interviews, self- or staff-administered questionnaires, gate counts), data may not be valid statistically and caution in interpretation is advised. In 1986, Parks Canada altered the format in which it records attendance figures. Results, however, permit a general analysis of Riding Mountain National Park visitors.

Park attendance figures indicate that visitation increased from 409,519 in 1952 (Jackson 1960) to more than 1,150,000 in 1989-90 (Parks Canada 1990). Attendance over the years varied both in trend and rates of change (Table 1). Between 1967 and 1978, visitor attendance increased at an average annual growth rate of three to four percent from a total of 682,939 visitors in 1967 to 951,417 visitors in 1978 (Ferr 1983, 1984). During the next several years, however, visitations decreased with the greatest decrease of 13 percent occurring between 1979 and 1980. Trends varied since 1980, which is in line with a 1982 ten-year forecast that projected a minor yearly increase of less than one percent to a total of 960,000 by 1993 (Parks Canada 1987). Data collected during 1989-90 and 1990-91 show that these estimates, in fact, were low. Overall, based on April to March calculations, decreases occurred in six years, change of less than one percent in three years, and increases in seven years. Attendance, therefore, does not show a strong trend. In fact, the 965,427 figure for 1977 was not reached again until 1989 (Table 1).

Traffic flow fluctuates with the seasons. When the Park first opened, use was limited mainly to the snow free months from April to September. July and August constituted the high season and represented 33 percent of yearly park attendance. In 1990, July statistics show 206,961 visitors, and those for August 192,401, for a total of 399,362 people (Parks Canada 1990). These numbers are near the top end of the 1982 10-year projections, which called for between 250,000 to 420,000 summer visitors (Parks Canada 1987). However, the 1990 summer records represent a decreasing percentage of the yearly total because use during other seasons has increased rapidly.

Table 1 Attendance at Riding Mountain National Park, 1973 - 1990

Year	Annual attendance (April - March)	% Change over previous year	Year	Annual attendance (April - March)	% Change over previous year
1973-74	916,588	16.9	1982-83	870,884	3.3
1974-75	883,546	-3.7	1983-84	937,487	7.1
1975-76	794,706	-11.2	1984-85	891,816	-5.1
1976-77	915,348	13.2	1985-86	806,249	-10.6
1977-78	965,427	5.3	1986-87	810,000	0.5
1978-79	951,417	-1.3	1987-88	860,000	5.8
1979-80	952,986	0.2	1988-89	950,000	9.5
1980-81	839,329	-13.3	1989-90	1,010,000	5.9
1981-82	842,436	0.4	1990-91	1,150,000	12.2

May, June and September account for 26 percent of 1990 attendance, and totalled 310,783 people (Parks Canada 1990). Projections in 1982 indicated that attendance would reach 280,000 by 1993 (Parks Canada 1987). This figure was surpassed by 30,783 visits in 1990, but represents a 26 percent rather than the projected 29 percent growth rate.

Highest growth rates are occurring during the cool season. The total number of visitors during January to April and October to December 1990 was 474,130, representing 41 percent of the annual visitation. The winter ski season represents 27.6 percent, with a total of 342,176 visitors (Parks Canada 1990). Popularity of cross-country skiing and the downhill ski facilities at Mount Agassiz account for the increase. These changing patterns in attendance have implications for provision of services during the winter season.

Attendance at the five campgrounds in the Park during 1990 totalled 23,759 party-nights (Parks Canada 1990). This is considerably lower than the 10-year projection, which predicted 30,000 party-nights² by 1993 (Parks Canada 1987). Occupancy rates average 30 percent, with the Wasagaming Campground showing the highest rate.

Visitor Profiles

A profile of park visitors assists in planning and management. Data indicate that 80 percent of all visitors live in Manitoba (Ferr 1984; Parks Canada 1987; Wallace-Brown 1988). Among Manitoba residents, 15 percent are from Winnipeg, 31 percent from Brandon, 8 percent from Dauphin, 4 percent from Minnedosa

2 There appears to be some confusion in terminology of the studies. We assume "camper-nights" (Park Canada, 1987) and "party-nights" (Parks Canada, 1990) are one in the same as applied.

and 2 percent each from Erickson, Neepawa and Onanole (Wallace-Brown 1988). Residents of other provinces comprised 15 percent of all visitors, with Saskatchewan and Ontario accounting for the largest proportion. The remainder come from outside of Canada (Ferr 1984; Wallace-Brown 1988).

In 1967, most visitors came from within 200 miles (320 km) of Riding Mountain National Park (Nixon 1967), while in 1983, distance travelled had increased to a radius of 400 miles (640 km) (Riley 1984). With over 80 percent of visitors originating within Manitoba, it is likely that future use will be related to provincial population change and other variables such as motor vehicle ownership, personal income and transportation networks (Marshall 1973).

Time spent by visitors in the Park is important for facility and activity planning. Day-users constitute 53 - 55 percent of visitors, and spend an average of 6.5 hours in the Park each trip. Overnight users represent 45 - 47 percent of all visitors and most spend one, two or three nights in the Park (Nixon 1967; Riley 1984; Wallace-Brown 1988).

First-time users account for only 9 percent of all visitors, while 91 percent are repeat users. Of those visiting repeatedly, 25 percent have been frequenting Riding Mountain over a 25-year period, and 47 percent for more than 15 years. Most of these were cottage or seasonal campground users. Of those visiting 6 years or less, 78 percent stayed in campgrounds or park commercial hotels (Wallace-Brown 1988).

Party-size statistics show that the majority (63 percent) comprise parties of two, three or four individuals. Party composition falls into two main categories. Families with children represent 41 percent, and couples 34 percent of all groups (Wallace-Brown 1988).

Gender and age statistics indicate that the percentages of males and females are equal within age categories. While passive, social activities increase with age, participation in active recreational activities decreases with age (Riley 1984).

The following percentages of various occupational groups visit the Park: professionals (25 percent), retired persons (17 percent), homemakers (10 percent) and managerial/administrative workers (9 percent) (Riley 1984; Wallace-Brown 1988). Income levels of visitors reveal no obvious pattern, but the \$20,000 to \$40,000 annual income range represents the largest number of visitors (Parks Canada 1987).

VISITOR ACTIVITIES

Visitors participate in many water-based sports such as boating, swimming, fishing, windsurfing, waterskiing and bathing. Land-based sports include tennis, lawn bowling, golfing and volleyball. Other leisure activities include picnicking, dining, shopping, hiking and sightseeing. Involvement in each activity is summarized below.

Water-related Activities

Boating Facilities and Demand

The first site for boating activities was in the townsite of Wasagaming at the pier built in 1928. It provided docking facilities for boat rental and private boats as well as protection for a swimming and beach area. A concession at the main pier currently holds a commercial lease (renewal in 1991) and returns a percentage of gross income to the Park. In return it provides docking facilities, sale of gas, oil, fishing licenses, bait, tackle, limited fast food, guided cruises and rental of various water craft (Parks Canada 1983).

Private boat launching currently takes place at three sites on Clear Lake: 1) the Boat Cove; 2) the East End; and 3) the Spruce Grove Picnic Site (Figure 1) (Johnson and Brewster 1976). Several independent studies have determined that the Boat Cove is the only appropriate location on Clear Lake to build a boating facility (Routledge 1975; Parks Canada 1983). It is located immediately west of the Wasagaming townsite and is approximately 50 acres in area (Casperd 1961).

The Boat Cove site includes a long stretch of sandy, gravel beach sandwiched between a ridge on the east, occupied by the seasonal Clear Lake Campground, and a creek and another ridge to the west. South of the cove is the Ominnik Marsh, the drainage channel of which forms a complex area of vegetation where waterfowl and fish thrive. The area is heavily wooded with black poplar and spruce, and is reached by the Boat Cove Road which forms the eastern boundary, and an old truck trail used to build a ditch from the marsh to South Lake. The ditch was constructed primarily to carry waste from the overflow of the sewage lagoon located south of Ominnik Marsh to South Lake (Routledge 1975).

The Boat Cove contains two launching pads, four docks and an area to the west for unsupervised dry land storage for sailboats and catamarans. Temporary parking facilities and washrooms are available, but not gasoline. As early as 1961, proposals were prepared to upgrade launching facilities at the Boat Cove by constructing a full-fledged marina (Casperd 1961; Routledge 1975; Parks Canada 1983; Allan 1984). Need for a marina was accepted by the 1977 *Master Plan*, but funds have not been available.

Surveys indicated a demand for increased boating facilities. Casperd's (1961) proposal for a marina contained two boat surveys to determine the number of boats using Park services. A one day count during high season indicated that 205 boats were present in the campground areas, at the townsite, or beached at the cove, adjacent to cottages or at breakwater berths. A one day off-season count totalled 180 boats.

Johnson and Brewster's (1976) study was based on the number of boat launchings during a 44 day period in the summer of 1976. It was estimated that 5,973 boat launchings occurred at three sites: 1) Boat Cove - 4,298 (72 percent); 2) East End - 1,170 (19.6 percent); and 3) Spruce Grove - 505 (8.4 percent). A more intensive study by Allen in 1984 reported that cottagers at Clear Lake owned 213 boats, about half of which were outboards, and seasonal campers reported 352 boats, the vast majority of which were outboards (Table 2). Most launches occurred at the Boat Cove and East End sites (Table 3).

Boating activity on Clear Lake was extensive in 1984 (Table 4). More than 2,300 boating parties averaged 3.4 persons per party. On an average day 150 launches were made, and 614 "boating days" occurred. When projected, these values result in 18,230 launches for 22,005 "boat days," and when adjusted for party size, 74,938 "boating days". Boating constitutes a major summer activity on Clear Lake.

The *Clear Lake Boating Facility Design Study* carried out for Parks Canada in 1983 formulated the boat carrying capacity of Clear Lake. Taking the area of Clear Lake and subtracting shoreline areas used for swimming and boat launching (to a distance of 1.6 km from shore), a total of 2,332 ha of boatable area is available. The study then determined the spatial requirements for each boating activity (power, sail, fishing and waterskiing) and calculated a capacity of 370 boats. Since not all boats were in the water at any one time, a turn over factor of 4.50 was applied. Maximum boat capacity of Clear Lake was revised to 1,665.

Table 2 The number of boats owned by cottagers and seasonal campers, 1984¹

Type of boat	Cottager	Seasonal camper	Total	Percent
Sailboat	31	18	49	8.7
Canoe	45	44	89	15.8
Wind surfer	11	0	11	1.9
Rowboat	4	7	11	1.9
Outboard	101	276	377	66.7
Inboard	21	7	28	5.0
Total	213	352	565	100.00

¹ From Allan, 1984

Table 3 Average daily boat traffic at Clear Lake launch sites 1984¹

Type	Boat Cove	East end	Frith	Spruce	Other	Total
Sailboat	2.0	0.9	0.0	0.0	0.0	2.9
Canoe	3.1	1.5	0.7	0.5	1.1	6.9
Windsurf	1.5	0.4	0.0	0.0	0.2	2.1
Rowboat	0.2	0.1	0.0	0.0	0.1	0.5
Outboard	15.9	7.6	1.3	2.0	0.1	26.9
Inboard	0.9	0.2	0.0	0.0	0.0	1.1
Total	23.6	10.7	2.0	2.5	1.5	40.4

¹ From Allan, 1984

Table 4 Summary of boating activity at Clear Lake, 1984¹

Categories	No. of boating parties	No. of boat launches	No. of boat days	Average party size	No. of boating days
Transients	1158	4945	4535	3.15	14290
Renters	505	00	505	3.53	1787
Sub-total	1663	4945	5040	3.19	16077
Cottagers	161	1672	4053	3.32	13456
Renters	25	25	260	4.00	1040
Sub-total	186	1697	4313	3.36	14496
Campground	306	7405	8250	3.51	28960
Renters	11	178	187	3.51	655
Sub-total	317	7583	8437	3.51	29615
Onanole	175	4005	4215	3.50	14780
Total	2341	18230	22005	3.40	74938
Average per day		149.3	180.4		614.2

¹ From Allan, 1984

Swimming and Beach Activity

Supervised swimming traditionally occurs immediately southeast of the breakwater (Kolberg 1981). The beach was artificially created and is small. Pollution caused by intensive human use is a major problem, and excessive algae growth may occur owing to poor water circulation in the area protected by the breakwater. Kolberg (1981) suggested either that a pumping system be installed to cleanse the area, or the breakwater be breached with channels. Bathhouses and showers have been added to help control swimmer's itch.

The 1989 *Lifeguard Report* indicates that attendance at the beach for the months of July and August was estimated at 34,633 people, with 4,197 in the water. Figures were based on estimates made at 1500 hrs. daily, the busiest time of day (Heap 1989). Supervision of the area ceased in 1991.

Previous supervision was intended to prevent potentially dangerous situations from arising by restricting boats, fishing, wind surfing and waterskiing in the swimming areas. Lifeguards also used specialized life saving skills in emergency situations. During the summer of 1989, they responded to 59 incidents, two of which were water rescues (Heap 1989).

Swimming lessons were offered at the townsite beach until 1990. Red Cross certificates were earned by 153 students. Thirty-one more completed the Royal Life Saving Society courses during the summer of 1989 (Heap 1989).

Beach activities include sun bathing and organized games such as frisbee and volleyball. Visitor demand indicates that more beach space is needed. Studies have shown that a depth of 60 feet from water's edge to the back of the beach is necessary. Recommendations were made to extend Wasagaming Beach westward on the other side of the breakwater to accommodate more beach activities. Swimming, however, would be limited because of the rocky shore (Jackson 1960; Parks Canada 1977).

Non-supervised public and private beach and swimming areas are located around the lake. Church and group camps operate their own waterfront activities. The best beach area is at the Baptist Church Camp site on the northwest shore of the lake (Figure 1). A problem exists in that this beach is adjacent to a Zone I protected area containing the Okanesse Cemetery (Hoole 1972). In 1991, the entire Northwest shore and adjacent area was removed from Park control under rulings on Aboriginal treaty rights. Another good beach occurs on the southwest shore, near the Presbyterian and United Church camps (Hoole 1972). It currently is designed as a roadside picnic area, but many people use it for swimming.

Fishing

Sportfishing is another popular water activity. Although a complete analysis of this activity is presented in a separate report in this human intervention series, a summary is offered here in order to establish visitor use. Approximately one in four adult Canadians and most children indulge in angling for pleasure and food. In Riding Mountain National Park, the most common request for information concerns fishing. The number of licenses sold averages 4,000 per year (Parks Canada 1990). Sportfishing is popular for people of all ages, but a decline occurs after age 50. Nearly one-third of anglers are women, the sport is not income-related, and people from all walks of life enjoy it.

Fish native to Clear Lake include northern pike, lake whitefish, yellow perch, suckers and ciscoe. Northern pike were the most heavily fished species by anglers during the 1950s. Human intervention in the form of stocking of the lake with non-native fish resulted in a significant change in sportfishing. Attempts to introduce various trout species failed, since trout never were able to reproduce successfully (Kooyman and Hutchinson 1979). Walleye, however, have established a viable population and become the most popular fish with anglers. Whitefish, though prolific in Clear Lake, have never interested anglers.

Sportfishing also has been damaged by pollution. Mercury levels that exceed the maximum safety limits have been found in Clear Lake fish. The cause has not been determined, but fungicides used on the golf course may be involved (Kooyman 1970). Ministry officials post signs at Clear Lake warning anglers of the danger. Sportfishing is not excessive in Clear Lake but it is a form of human intervention that must be closely regulated to assure a viable fish population in the future. (A complete review of fisheries in Clear Lake is available in this series of human intervention documents).

Waterskiing and Wind Surfing

Both waterskiing and wind surfing have increased in popularity. Users typically are in the 15 - 35 year age group. Cottagers and seasonal campers who own power boats are the majority of practitioners. Boats and other equipment are available for rent from the main pier concession.

Safety is the major issue connected with these sports because congestion on the lake during peak summer weekends demands that caution be exercised so as not to interfere with other boats or fishing traffic. Regulations are in place preventing skiing or surfing near swimming areas (Heap 1989). Much of the launching activity for waterskiers takes place at the east end boat launch (Parks Canada 1978).

Potential conflicts among swimmers, power boaters, waterskiers, sailboaters, windsurfers, and fishermen, all operating in the same space, make water safety a significant issue for park management. Waterfront rules regulating the locations of activities for the lake must be enforced strictly. Boaters, waterskiers and windsurfers who penetrate the swimming zone are reported to wardens. Swimmers are encouraged not to swim outside of supervised areas. Size of boats is regulated.

On-Shore Recreational Activities

On-shore recreational activities also are important to visitors. Picnicking, camping, hiking, bicycling, golfing, playing tennis and lawn bowling are most popular. Restaurant dining and shopping may be even more popular pastimes, but will not be discussed as recreation options in this report.

Picnicking

Because 53 - 55 percent of Park visitors are day-users, and 91 percent visit repeatedly (Wallace-Brown 1988), most people picnic at some time. The Park operates several picnic sites in the Clear Lake Basin. Most widely used is the Wasagaming site between Wasagaming Drive and the beach. Sheltered tables and benches are available, but the number is inadequate on peak weekends (Marshall 1973). Other day-use picnic grounds are available at Frith Beach and the Spruces to offset crowding. The latter also operates as a boat launching site. Both the Clear Lake Seasonal Campground and Wasagaming Campground provide their own picnic areas.

Playground

Near the Wasagaming picnic area is a children's playground that contains swings, slides, seesaws, a sandbox and a giant chess/checker board (Lothian, Vol. III 1979). A horseshoe pitch also is available.

Tennis

Six clay tennis courts were built in 1932 in the vicinity of the playground (Figure 2). Today they are hard-surfaced so that they dry quickly. A log pavilion was constructed in 1935 to provide dressing rooms and washroom facilities for players. According to Wallace-Brown (1988), nine percent of all visitors surveyed use the tennis courts. At times the courts have been used to host competitive tournaments.

Lawn Bowling

The lawn bowling green is another popular recreational facility in Wasagaming. It is located on Wasagaming Drive between Lily and Marigold streets. In addition to the green, a locker-room and concession booth operates from mid-June to Labour Day. Four percent of people surveyed in 1988 claim to have bowled regularly.

Camping

Camping occurred in Riding Mountain National Park long before it attained national park status, and development of suitable facilities was one of the first projects undertaken by relief workers in 1930. Clear Lake Campground was constructed on 5 acres (expanded to 15 acres in 1934) at the west end of Wasagaming along the lakeshore (Figure 2). The site was divided into blocks and contained 581 lots. A jamboree hall provided an entertainment centre, and kitchen shelters were erected. The campsite has grown from a few tents to a well-organized cabin subdivision supporting mainly seasonal campers. Each year, campers may renew their permit for the next year. Since this created a use monopoly by long-term campers, transient campers were disadvantaged by having to locate further away from Clear Lake.

This problem was rectified by construction of the Wasagaming Campground in the townsite (Figure 2). The new development opened in 1962 and contained 550 sites. Several sites are serviced with water, sewer and electrical hook-ups for trailers. Average stay during the peak season is three weeks (Lothian, Vol. III 1979). It is estimated that Wasagaming Campground has 80 percent of all visitor-nights in the Park (Ferr 1983, 1984). Four other campgrounds are located outside of the Clear Lake basin at Lake Katherine, Lake Audy, Moon Lake and Whirlpool Lake. Occupancy rates for all five transient campgrounds is 30 percent, and attendance levels for 1990 were estimated at 23,795 party-nights (Parks Canada 1990). This falls below the range of 27,000 to 33,000 projected by Ferr (1984). Use projections do not indicate an increase in campground utilization, suggesting that further expansion is not required.

Socio-economic analysis, however, recognizes a change in camping populations. Many more retirees are now camping, and need a more amenity-oriented facility in which health and safety standards and accessibility for the handicapped are provided (Parks Canada 1987).

Group and Church Camps

Group camping has been a traditional activity in Riding Mountain National Park. When first opened in 1933, six church groups made application to lease land for the purpose of operating camps each summer. The area leased by these groups is on some of the best shoreline on Clear Lake (Figure 1), with most camps lying on the southwestern shore where some sandy beach areas and good camping sites are located. The best location was occupied by the Baptist Camp, which had space for 66 campers (this site was abandoned in the 1980's, and is located in the area claimed by Aboriginal people). Capacities for the other church camps are as follows: Presbyterian Church Camp - 64 people in dorms; United Church Camp - 88 people in dorms; Covenant Church Camp - 100 people in dorms; Anglican Church Camp - 54 people in dorms; the Seventh Day Adventist Church Camp uses tents for an unspecified number of visitors (Parks Canada 1977).

The church camps operated without problems until 1969, when the new *National Parks Act* presented a conflict. National Parks were to be operated for the benefit of all Canadians and any private use of park land was to be discouraged. Riding Mountain National Park authorities reversed their thinking and announced intentions to remove all church camps by 1975.

Public response was strong and church groups presented briefs in Ottawa that detailed the valuable contributions they had made to the Park. Their views received serious consideration. When the *1977 Master Plan* was instituted, church groups were allowed to stay under certain conditions. First, occupancy rights were changed from long-term leases to licenses, so that if policy should change the church groups would have no legal right to remain beyond the term of license. Second, church groups were required to allow public use of their facilities in the off-season (Jennings 1971).

Group camps also operate in the vicinity of the Clear Lake Basin. Camp Manitou, located 13.3 km northeast of Wasagaming on the Riding Mountain Parkway is the largest such camp. Originally, it was built as an

army cadet camp and provides dormitory facilities for 165 users. Also included are a dining room, kitchen and recreation hall. Groups may book the facility on a first-come, first-served basis. Camp Kippichewan is a smaller, more remote site and provides 15 primitive camping sites for hikers. These camps cater to approximately 90 groups each year, representing 22,800 visitor nights (Ferr 1984).

Trail Use

There are 17 day-use and 15 overnight trails totalling 417 km within Riding Mountain National Park. Visitor uses of this network include hiking, cycling and horsebackriding during warm seasons, and snowshoeing and skiing in winter. There has been no systematic planning of routes, and most have been developed along old logging paths or Park patrol trails. Since most trails are in areas designated as wilderness, care is taken not to disturb the environment. Most trails are looped so that visitors return to the point of origin. At least 98 percent of trail-users indicate that they prefer shorter day-use trails to overnight backcountry trails. Most day-use trails are self-guided and information can be obtained from the Interpretive Centre. Day-use trails are designed to exhibit the Park's beauty and attractions, and are organized around a theme to instruct users about a particular natural resource or area of cultural significance.

The boardwalk trail through the Ominnik Marsh is a good example. One of the most popular trails, it was used by 39 percent of those surveyed in 1988 (Wallace-Brown 1988). The most often used trail is the Lakeshore Walk, which runs from the Boat Cove east through Wasagaming to the eastern end of the cottage subdivision. Problems of soil erosion must be dealt with along the trail. A number of riding trails lie near Clear Lake.

A bicycle-pedestrian pathway operates around the townsite area and continues out to Highway 10. Bikers must exercise caution when the trail traverses area roads. Other designated bicycle trails exist in the backcountry but are outside of the Clear Lake basin.

Road Systems - Park Access

Travel by motor vehicle is the main form of access to Riding Mountain National Park. Major highways such as the TransCanada and Yellowhead Route connect with Highway 10 running north to the Park (Riley 1984). Once inside the Park, the route becomes the Riding Mountain Parkway, owned and operated as National Park land. At the North Gate, it resumes its status as Provincial Highway 10. Highway 19, the Norgate Road, runs for 29 km and connects the Parkway with the East Gate entrance to the park and Highway 5. It also provides exits to Lake Katherine and Whirlpool Lake campgrounds. The Lake Audy road extends over 31 km west from the Parkway to the Crawford Park Road, bison enclosure, and Lake Audy. Portions of all of the roadways lie within the Clear Lake basin, and both their physical presence and the traffic they carry constitute human intervention.

Until recently the main Park road traversed a portion of the business section of Wasagaming. As visitations increased, traffic became congested and safety for pedestrians and cyclists became an issue. Traffic surveys in 1972 and 1976 indicated that Wasagaming was the intended destination of 50 - 60 percent of Park traffic entering from the South Gate. Thirty to 40 percent did not stop in the townsite but continued on to other points. Surveys stressed the need for a bypass that would divert through-traffic around Wasagaming (Parks Canada 1977). The business section could then be developed as a pedestrian-oriented area with cars routed to a large peripheral parking site.

In 1976, the Parks Canada Planning Division and the Department of Public Works conducted the *Wasagaming Roads and Parking Study* and produced plans for a new road system. The bypass involved 3,250 feet of new road, connecting Highway 10 just north of Octopus Creek with the Parkway near the present

entrance to Elkhorn Ranch. The function of the entrance road into Wasagaming was retained, but its alignment was changed to connect more efficiently with the bypass. This permitted a separate entrance to the Boat Cove, Clear Lake Seasonal Campground and day-use parking lot. It also cut off much of the visitor traffic from the downtown area. In addition, the road system allows collector roads such as Ta-Wa-Pit, Mooswa, Buffalo and Columbine Drives to lead to the Wasagaming Campground without entering Wasagaming Drive. Realignment of the intersection of the Parkway, and Lakeshore Road near the golf course provides a safer exit.

Roads within the townsite are maintained according to urban standards with curbs and gutters, 6.5 m driving lanes and asphalt surfaces (Prairie and Northern Development Office 1988). Although the proposed pedestrian mall has not materialized, foot and bicycle traffic is encouraged along Wasagaming Drive. Improvements to sidewalks, upgrading of lighting, addition of planters and street furniture, and installation of pedestrian crosswalks were undertaken.

Access to parking facilities was improved. The major parking area is situated immediately west of the business area (Figure 2). It has capacity for 500 vehicles and holds both day-use vehicles and over-flow camping vehicles (Marshall 1973). Day-users are encouraged to use this lot instead of tying up spaces near businesses for extended periods of time. Two other off-street parking areas are located east of the commercial district on Buffalo and Columbine Drives. Capacity in each is 40 - 50 vehicles. On-street parking along Wasagaming, Ta-Wa-Pit, Buffalo and Columbine Drives are filled to capacity most of the time. Lane-ways behind stores are maintained to handle service vehicles (Marshall 1973).

Bypass construction, maintenance of existing roads and provision of parking lots have resulted in disturbance of surrounding land. According to the *Wasagaming Roads and Parking Planning Unit Study* (1977: 19), the bypass "attempts to lessen the environmental impact by minimizing the length of the new road required, and by keeping the right-of-way primarily to areas which have already been disturbed by man." Landscaping was done to make new roads and parking sites blend in with the environment. Planting of trees screened visual scars and prevented noise pollution. Other forms of land disturbance include unsightly garbage dumps, gravel pits, logged areas and abandoned hydrological study sites. These blights on the landscape once were accepted, but now require rehabilitation.

HUMAN INTERVENTION RELATED TO VISITOR SERVICES

Intervention caused by both water- and land-based human activities may be a serious problem. There is no easy solution to land use conflicts when large numbers of people congregate to enjoy the natural beauty and attractions of the area. Riding Mountain National Park is obligated not only to provide facilities and opportunities for visitors to experience a park setting, but also to prevent and control destruction of resources. The most lasting means of accomplishing this task is to educate people in conservation practices. The Clear Lake Basin is the focal point of human activity and, therefore, the center of many conflicts arising from the dichotomy of Park's policy.

Human Intervention in Water Activities

All human activities on Clear Lake are a form of manipulation and exploitation of water resources. Clear Lake, the biggest and most actively used body of water in Riding Mountain National Park, is the main reason for the development of Wasagaming as a visitor centre. Clear Lake, however, is the major water source for the townsite, and there is concern about water pollution. The density of visitors, as measured by boater-days, approached 100,000 in 1987 (Canadian Parks Service 1987), and sheer numbers put a strain on the water quality, floral and faunal communities, and natural processes of the lake.

Man-made and natural pollution present potentially serious problems. Gas and oil contamination from motor boats and gas storage pumps form slicks and pollute the area. Garbage and trash carelessly discarded by boaters and bathers must constantly be cleared. Water quality also is affected by storm runoff from developed areas, and seepage of fertilizers and fungicides used on area farms and the golf course may have caused mercury levels in fish to increase beyond the safe levels (Kooyman and Hutchinson 1979). Signs warning of high mercury levels have been posted and will remain for the indefinite future (Lockhart 1986).

Chemical pollution also is caused by effluent from the Wasagaming sewage lagoon that flows into Ominnik Marsh, Octopus Creek, and South Lake. Discharge results in warmer temperatures and nutrification, which cause increased algae growth and stagnation of South Lake. This in turn may threaten fish spawning and induce winter kill (Cuerrier 1949b).

Human intervention by dredging the Clear Lake-South Lake channel and building dikes and ditches through the Octopus Creek and Ominnik Marsh areas may have interfered with fish migration patterns (Briscoe 1979). The installation of groins and culverts may have confused migrating fish and frightened them off.

Construction of the breakwater at Wasagaming Beach prevents lateral wave action from cleansing the swimming area and allows algae to grow. The algae attracts the snail parasite (*Cercariae*) that causes swimmer's itch. Chemicals such as copper sulphate (bluestone) have been added to the water in the past to help control the problem but may have affected fish populations. During recent years, the chemical has not been added, and water circulation was allowed by digging channels through the breakwater as an alternative control measure.

Human Intervention in On-shore Areas

Park management has the responsibility to provide opportunities for the public to enjoy and understand the natural environment and historical heritage of Riding Mountain National Park. It also must protect the park ecosystem from human degradation in the form of damage to vegetation and wildlife, land erosion and generalized pollution.

Vegetation has been altered by human intervention in several ways, the most significant of which is threatened damage from forest fires. Careless logging and land-clearing produced the majority of fires in Riding Mountain's early history. Large tracts of land were denuded, wildlife habitat was altered, and the forest's resources forever changed. Today, fires are caused by human carelessness in extinguishing campfires, arcing hydro wires and natural causes such as lightning, and major burns have occurred in the Park in recent years. National Park policy recommends that natural fires be allowed to burn and exert influence on the environment except where human safety, park buildings or neighbouring lands are threatened. Reasoning behind allowing some fires to burn is that they perpetuate the natural selection process in the forest. Decadent timber stands are removed and new growth is allowed to prosper (Canadian Parks Service 1987).

Logging, haying, and grazing, common during early settlement, continued by permit until the late 1960s when Park authorities realized that the preservation of unique examples of native flora were being threatened (Lothian, Vol I 1976). Loss of chernozemic soil occurred when grasslands and forests were destroyed.

A continuing problem concerns use of the old Aboriginal and settler routes that, although closed to vehicular traffic, are used for hiking, horse travel and bicycle trails. Numbers of visitors must be regulated so that heavy use will not destroy the natural vegetation surrounding the trails. Facilities such as camping sites, picnic areas and horse corrals must be kept to a minimum so that waste pollution, vandalism and excessive trampling of trails will not damage the ecosystem. This is especially important in the Clear Lake basin where visitor traffic is concentrated.

Land use change that disturbs the natural habitat or involves intensive human activity removes land from wildlife production and protection functions. Although not a problem away from the townsite, land use change is an historical problem within the Clear Lake basin both inside of the Park, and on lands adjoining the Park, and is discussed in detail in a separate report in this series.

The most wide-ranging human intervention, primarily through land use change, concerns disturbance of wildlife. Several different aspects are considered. Ungulates such as deer, elk and moose were used to roaming undisturbed throughout the Riding Mountain area. Although their populations were controlled naturally by forest growth and destruction cycles and winter severity, man has jeopardized their continuation to a much greater extent. Over-hunting in pre-park times caused reduction in many species (Oleson [n.d.]).

Recent problems relating to wildlife destruction include land use change, poaching and highway mortality. Although hunting is not allowed in Riding Mountain National Park, people have been known to kill game inside the Park, and then claim that they shot the animal outside park boundaries. To solve this problem, a zone just beyond Park boundaries has been declared a protected area (Riley 1984). Highway mortality is an ever-present danger within the Park, but road signage, speed limits and information programs help reduce collisions.

Within the townsite and along many areas of shoreline, natural processes have been obviated by development. Natural vegetation has been altered, human traffic has worn ground bare, and human presence interferes with animal behaviour. The fact that further development has stopped should contain damage to the currently affected area. Within this area, however, only plants and animals that can tolerate human presence will survive.

Damage to property by the Park's protected animals that stray onto private lands creates a climate in which neighbouring landowners destroy wildlife. Co-operation with local people is deemed vital to maintaining positive attitudes toward Park resources.

Bears are particularly vulnerable to human intervention. Intensity of camping in the Clear Lake Basin results in availability of food which attracts bears to campsites. Bear-human conflicts arise both where bears destroy or harass campsites, and when wardens are forced to destroy bears to ensure human safety. In 1983, for example, 35 bears were killed after appearing regularly at visitor campgrounds looking for food (Riley 1984). New garbage regulations and containers reduced bear problems dramatically between 1988 - 1991.

Original populations of wolves and coyotes diminished during the settlement era of Riding Mountain. Humans killed them because they destroyed farm animals, out of fear, or for furs. Today the population of both animals averages about 65 animals and park authorities protect them (Canadian Parks Service 1987). The presence of bears, wolves, and coyotes near visitor service facilities will continue to be a problem. Excessive trapping during the fur trade era wiped out the original populations of otter, wolverine and martin, and nearly exterminated the beaver. Beaver were reintroduced in 1947 and 1958 (Canadian Parks Service 1987). Since then populations have exploded, creating several land use conflicts as beaver alter water channels causing flooding of farm land and park roads and facilities (Rounds 1980). Potential damage by beavers is greatest in the Clear Lake basin region.

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