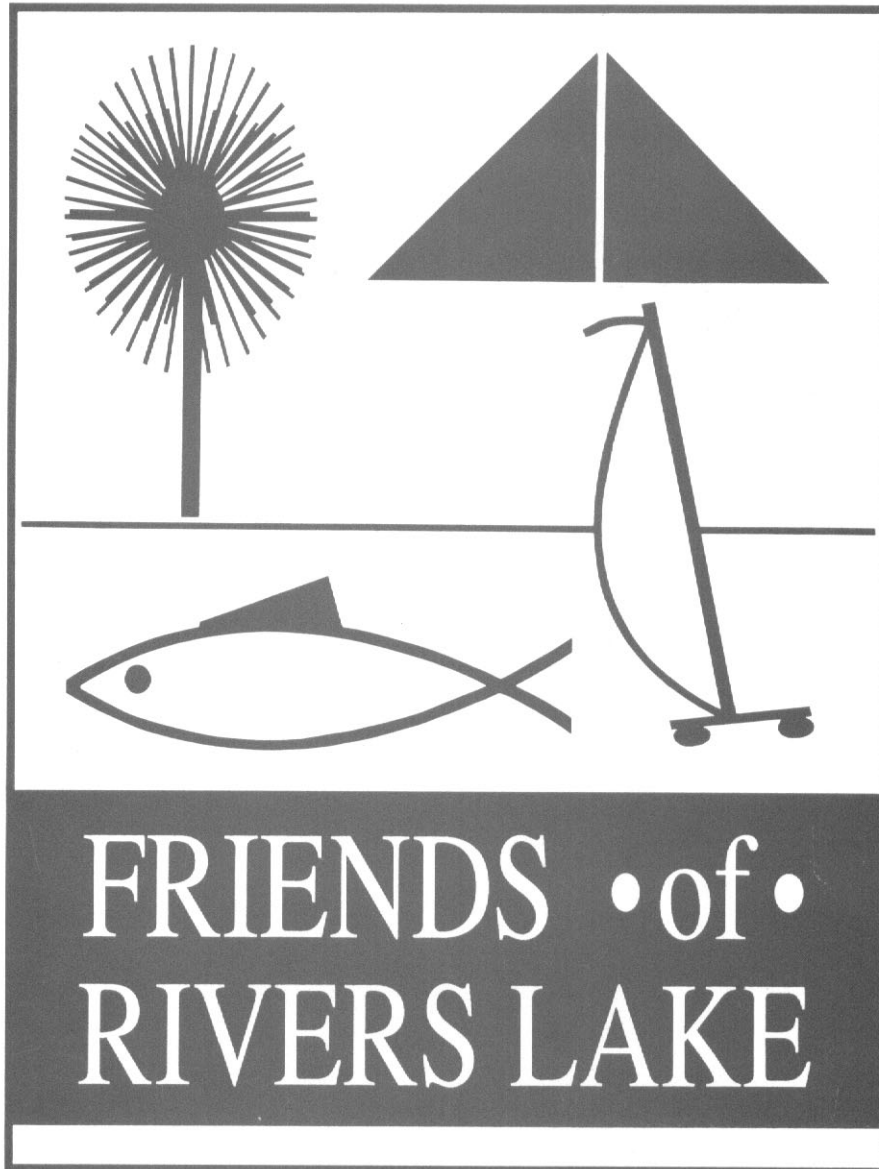


**A User Needs Survey of
Rivers Provincial Recreation Park
Manitoba**



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RIVERS PROVINCIAL RECREATION PARK
MANITOBA**

by Richard C. Rounds

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PREFACE

The Friends of Rivers Lake is a committee of citizens dedicated to the enhancement and sustainability of not only the Lake itself, but also the adjoining Provincial Park and its recreational potential. Formed early in 1990, the Committee has moved quickly to define a survey of regional residents, lobby government for financial and logistical support to make needed changes, and rally public support for the project. Ultimate goals are to enhance and secure the Lake as both a physical and economic resource for the Town of Rivers and the surrounding region.

The Rural Development Institute of Brandon University was established to link the research capabilities of the academic community with the needs of rural Manitoba. RDI works with, rather than for rural residents, and welcomed the invitation of the Friends of Rivers Lake to assist in the design and compilation of a survey that addressed the needs of a rural area. No study is ever complete or definitive. Survey research, however, often results in identification of the major concerns of people, and helps direct remedial efforts toward a fruitful end. We wish the residents of the Rivers area all the success possible as they strive to improve the regional resource base not only for themselves, but also for future generations. Partial funding for the research was derived from private monies held at RDI, and the Social Sciences and Humanities Research Council of Canada, through its Aid to Small Universities Grant. The Friends of Rivers Lake procured partial funding for printing and dissemination of the surveys.

ACKNOWLEDGEMENTS

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1990

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INTRODUCTION

The Prairie Farm Rehabilitation Administration was requested to investigate the possibility of creating a large water storage reservoir in the valley of the Little Saskatchewan River (formerly Minnedosa River) in 1956. A study of the topography and geology of the river's basin, development history, existing structures and meteorological and hydrometric data resulted in location of a good site near the Town of Rivers, Manitoba (PFRA, 1961).

The resulting Rivers Dam was completed by 1960 and lies about 3 km east of the Town of Rivers (Figure 1). The dam consists of rolled earth with a maximum height of 22 m and a length 1200 m. A reinforced concrete chute spillway was designed for a discharge of 10,000 cfs, with a 50 percent greater flood capacity. The river's grade of approximately 3 m per mile resulted in a reservoir at normal full supply level of 24,500 acre-feet of water. At design flood level, the lake would contain 40,000 acre-feet. The surface area at the two stages is 1,670 acres (675 ha) and 2,240 acres (907 ha), respectively.

Original purposes for the impoundment were water supply for the Town of Rivers and the City of Brandon, irrigation and stockwatering for agriculture, water for cooling the thermogenerating plant in Brandon, and recreation (Manitoba Department of Natural Resources, 1960). The reservoir is 9.7 km long and 610 m at the widest point. Maximum depth near the dam is 17 m. Inflow is usually sufficient to maintain full supply level and a continuous discharge of 21 cfs. During extreme drought the discharge may be reduced to 10 cfs to satisfy minimum requirements of down-stream users. The reservoir has been officially given the name Lake Wahtopanah (Manitoba Surveys and Mapping, memo, 1990), which means "canoe people", and is a reference to a band of Assiniboine Indians encountered by Lewis and Clark in 1804. Locally, the reservoir is often called Rivers Lake.

The Town of Rivers began as a railroad centre in 1907 and was incorporated into a town in 1913. The Town enjoyed growth and prosperity until 1976, when the local Air Base was closed. The loss of population caused a loss of business and many closures resulted.

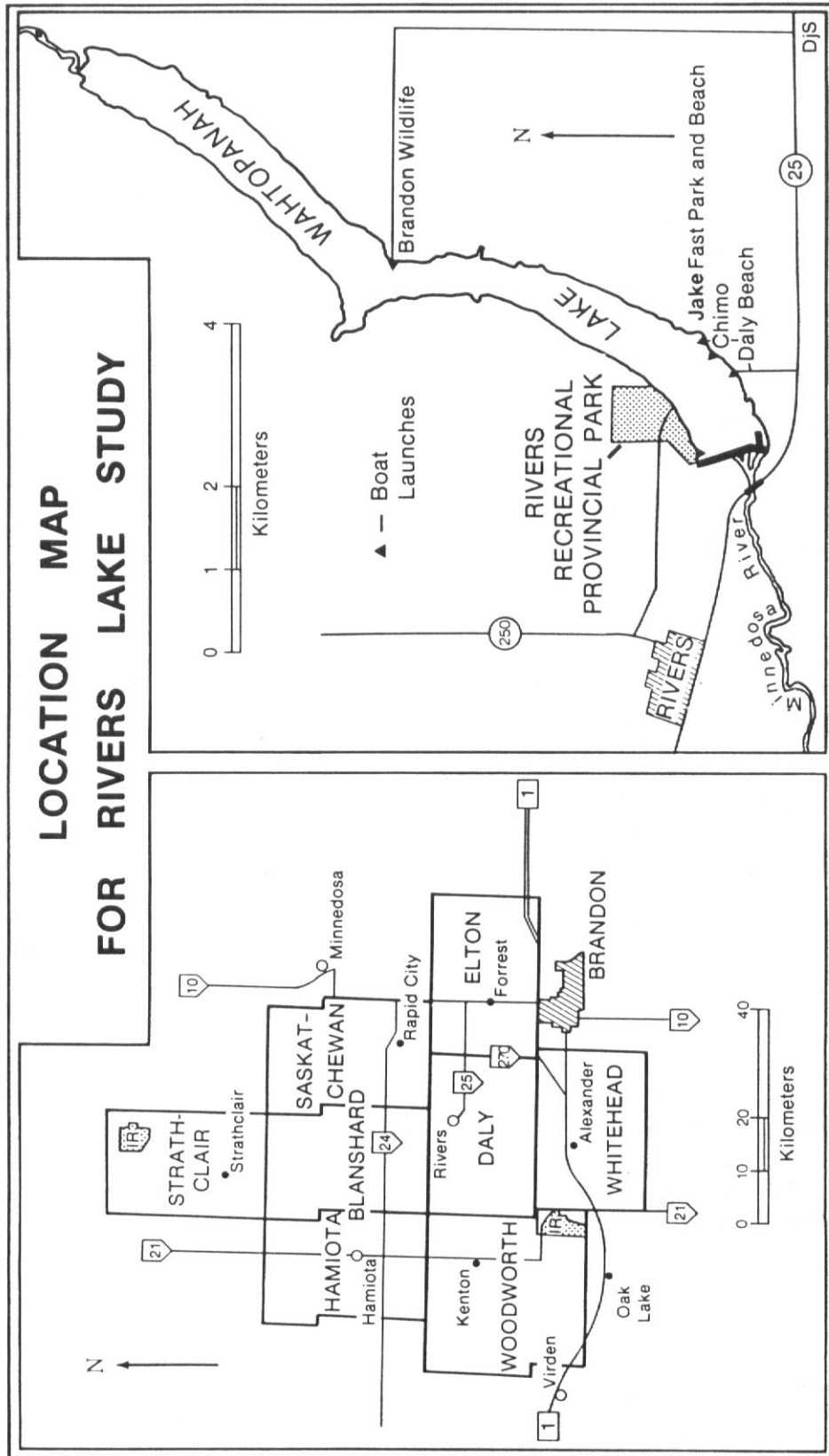
Current efforts to attain long-term security for the Town include re-vitalization of the Rivers Lake recreational complex. Leroy Stevenson, the Mayor of Rivers, recently described the Lake and Provincial Park as "at one time ... an excellent fishing area [with] a beautiful beach and camp sites. It was a major 'tourist' area." Recent deterioration has reduced both tourism and local use.

A group of concerned citizens formed the "Friends of Rivers Lake" early in 1990. The Committee called a series of meetings with government personnel, and asked for assistance from local residents. The mandate was the preservation, promotion and improvement of a viable recreation area. Short-term goals include the following:

- 1) Assure efficiency, safety and location of the boat launch
- 2) Increase use of the beach and swimming area
- 3) Improve docking facilities adjacent to the campsites
- 4) Maintain park facilities and improve water quality in the Lake
- 5) Increase fish populations, and
- 6) Increase public awareness of water pollution and the park's potential.

Figure 1

Location Map for Rivers Lake Region



Initial long-term goals were listed as follows:

- 1) Initiate a major water sampling study to determine water quality problems and solutions
- 2) Organize efforts to remove weeds from the swimming and campsite areas and replenish sand in the swimming area
- 3) Work with Provincial Parks to upgrade and relocate the boat launch
- 4) Develop day-use docking facilities for the campsites
- 5) Review fishing regulations and suggest revisions, and
- 6) Remove rocks and other hazards from the lake area near the campground (Porter, 1990).

To achieve these goals, this cooperative study was instituted between The Friends of Rivers Lake and the Rural Development Institute of Brandon University. A long-term water quality study also is being conducted in cooperation with the Manitoba Department of Environment. The Committee submitted some initial requests to the Manitoba Department of Natural Resources in spring 1990. Efforts during 1990 will be reviewed later in the Results section of this report.

Recreational Use of Rivers Provincial Recreation Park

A provincial park was developed at Rivers Lake during the early 1960's. The Rivers Lake Provincial Recreation Park contains 30 regular campsites, 20 seasonal campsites, and 18 overflow campsites (Figure 2). The campground occupies about two-thirds of the park area, and is separated from a large beach and play area by a main road and parking lot. The Provincial boat launch is located at the southern limit of the park adjacent to the main dam, and four other access points are located on the Lake outside of the Park. Water, firewood, parking lots and washrooms are distributed throughout the park. Showers and change rooms are located at the beach.

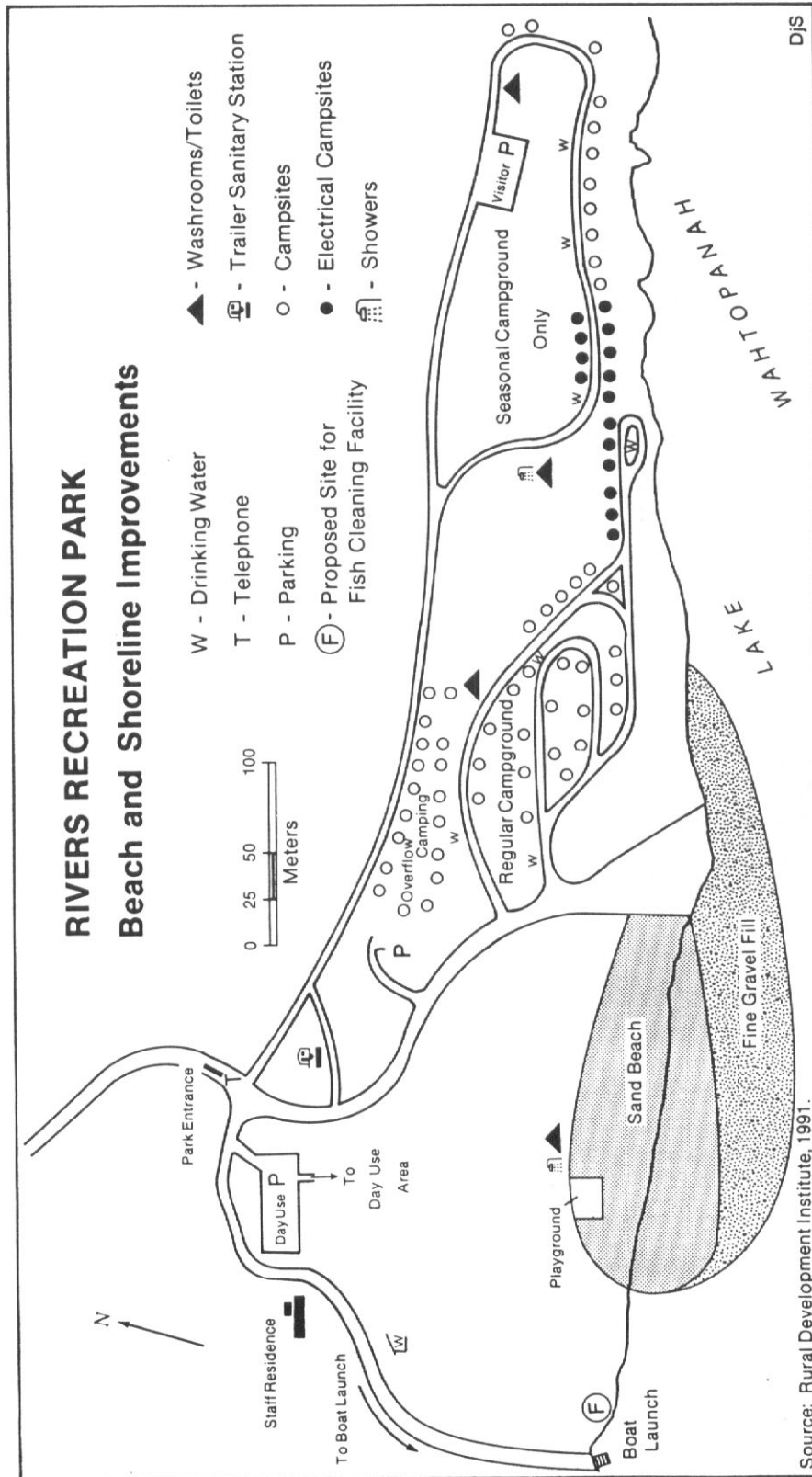
Data on use of the park are difficult to interpret because of periodic changes in recording methods, changes in the park facilities, and changes in values of the dollar. Partial data were first recorded in 1968, when 379 permits were sold (Table 1). The number of camping permits sold varied considerably from year to year, but generally increased to a peak in 1986, and rapidly declined since.

Twenty-six new campsites were opened in 1976 and 20 seasonal campsites were added in 1982. Additions were made when percent occupancy values for existing sites reached about 50 percent and suggested increasing demand (Table 1). Between 84 percent and 96 percent of visitors have been Manitoba residents throughout the 1968 - 1988 period. Rivers Lake, therefore, is a locally used resource that attracts few non-residents. The type of equipment used reveals changing trends in camping. The number of people using tents and tent trailers decreased as the number of housetrailers and motorhomes increased.

Although some of the annual changes in campground use can be explained by poor weather or changes in recording, no systematic assessment has occurred concerning problems or potentials. The downturn in use since 1986, however, caused concern amongst community leaders and lead to several initiatives to revitalize the campground and engender more use. Because of the proximity of the park to the town, it is viewed as a potentially important economic generator through tourism and employment.

Figure 2

Rivers Provincial Recreation Park



Source: Rural Development Institute, 1991.

DJS

Table 1 Use of Rivers Campground, 1968 - 1988

Year	No. unit days	No. permits sold	% occupancy	Origin campers (%)			Type equipment used (%)							Revenue			
				Mb	Cdn	USA	Other	Tent	Tent trailer	House trailer	Camper trailer	Camper truck	Motorhome		Camper/Van	Other	
1968	—	379	—	94	4	2	0	—	—	—	—	—	—	—	—	—	\$1,800.00
1969	—	524	—	93	4	3	0	—	—	—	—	—	—	—	—	—	2,025.00
1970	3,240	470	37	89	3	3	0	—	—	—	—	—	—	—	—	—	2,567.50
1971	3,229	462	45	93	0	3	0	22	42	25	—	—	—	—	11	—	2,497.00
1972	3,190	531	44	94	4	2	* ^a	28	46	19	4	—	—	—	3	—	2,555.50
1973	4,372	598	76	88	8	4	0	20	44	23	11	—	—	—	2	—	2,897.00
1974	4,522	642	53	91	5	3	1	24	38	27	8	—	—	—	3	—	3,283.00
1975	4,096	619	57	90	8	2	*	16	37	33	10	4	—	—	*	—	4,600.00
1976	1,541	769	22 ^b	84	13	3	*	23	29	28	12	4	—	—	4	—	3,337.50
1977	1,373	694	20	91	6	3	*	18	27	33	13	3	—	—	6	—	3,487.00
1978	1,734	599	24	90	7	3	*	17	27	38	11	5	—	—	2	—	4,668.00
1979	1,477	702	23	89	8	2	1	13	30	33	12	9	—	—	3	—	4,798.00
1980	1,688	725	24	91	6	2	1	12	26	38	14	6	—	—	4	—	5,278.00
1981	2,592	814	56	90	5	4	1	11	16	39	10	7	15	2	—	—	7,890.00

Table 1 con't.

Year	No. unit days	No. permits sold	%	occupancy	Origin campers (%)				Type equipment used (%)						Revenue	
					Mb	Cdn	USA	Other	Tent	Tent trailer	Housetrailer	Camper truck	Motorhome	Camper/Van		Other
1982 ^C	2,984	687	32		92	6	1	1	15	16	41	9	6	10	3	8,388.40
1983	4,101	786	34		93	6	1	0	18	20	35	9	8	2	8	9,605.00
1984	4,273	847	39		96	2	2	*	17	16	36	8	8	13	2	11,730.99
1985	4,281	842	38		95	4	1	0	11	16	39	10	11	9	4	11,713.50
1986	4,285	943	32		96	3	1	0	13	15	27	10	18	16	1	11,599.00
1987	3,180	614	24		96	3	1	*	10	10	40	10	14	12	4	9,379.00
1988	2,934	545	23		93	6	1	*	18	12	26	15	15	10	4	8,797.00

5

a = less than 1%

b = possible cause of decrease is that campground sites were specified

c = seasonal sites opened

Source: Data were provided by the Parks Branch, Manitoba Department of Natural Resources (Brandon Office).

Although native fish populations lived in the Little Saskatchewan River and would eventually have stocked Lake Wahtopanah, a major fish enhancement program has been pursued since 1960 (Table 2; Fisheries Branch, 1990). Seven different species have been released during the last 30 years, but emphasis has changed through time. For example, rainbow trout and largemouth bass were stocked between 1960 and 1965, but have neither survived nor been stocked in recent years. Smallmouth bass and perch were stocked in limited numbers in the early 1970's. Muskellunge and northern pike have been introduced on several occasions.

By far the greatest enhancement attempt has involved walleyes (locally called pickerel). Millions of fry and eyed eggs have been stocked in nearly every year. Walleye are the most popular species for angling, and form the base of sport fishing use of the Lake.

Table 2 Fish stocking records of Wahtopanah Lake 1960 - 1990

Year	Species Planted	Number	Age	Year	Species Planted	Number	Age
1960	Walleye	1,000,000	Eyed Eggs	1971	Walleye	200,000	Fry
1960	Rainbow Trout	40,000	Fingerlings	1972	Smallmouth Bass	5,000	Fingerlings
1960	Largemouth Bass	6,075	Fingerlings	1972	Perch	3,000	Adult
1961	Walleye	170,000	Eyed Eggs	1973	Perch	5,000	Adult
1961	Rainbow Trout	40,000	Fingerlings	1975	Walleye	500,000	Fry
1962	Rainbow Trout	50,000	Fingerlings	1978	Northern Pike	675	Adult
1962	Largemouth Bass	7,500	Fingerlings	1978	Northern Pike	540	Adult
1963	Walleye	500,000	Eyed Eggs	1980	Walleye	300,000	Fry
1963	Rainbow Trout	40,000	Fry	1982	Walleye	500,000	Fry
1963	Largemouth Bass	17,000	Fingerlings	1983	Walleye	300,000	Fry
1964	Rainbow Trout	4,000	Yearlings	1984	Walleye	300,000	Fry
1964	Rainbow Trout	20,000	Fingerlings	1985	Walleye	200,000	Fry
1964	Largemouth Bass	16,000	Fingerlings	1986	Walleye	250,000	Fry
1965	Rainbow Trout	5,000	Yearlings	1987	Walleye	300,000	Fry
1965	Rainbow Trout	10,000	Fingerlings	1987	Muskellunge	100,000	Fry
1966	Walleye	300,000	Eyed Eggs	1988	Walleye	500,000	Fry
1966	Muskellunge	10,000	Fry	1989	Walleye	300,000	Fry
1969	Northern Pike	875	Adult	1989	Walleye	500,000	Fry
1969	Perch	1,475	Adult	1990	Walleye	600,000	Fry
1971	Smallmouth Bass	3,000	Fingerlings				

Although the Lake does not experience winter kill, the status of the fishery is highly variable. The pike, perch and sucker populations are self-reproducing, but the walleye population is dependant on annual stocking. Surveys in 1987 and 1988 found a limited number of walleye fry from natural reproduction, but numbers were insufficient to sustain viable populations (Bruederlin, 1990). Apparently the rainbow trout and bass populations neither survived nor reproduced. The status of muskellunge populations is unknown.

Water-related problems have occurred on Lake Wahtopanah. Although general mercury levels are low, a limited sample of walleyes suggested possible contamination in 1988. Of greater concern is frequent annual fish kills caused by collapse of extreme build-ups of algae in the Lake. Although some kill has occurred in the Lake, most occurs just below the dam in the Little Saskatchewan River (Yake, 1980; Bruederlin 1987). When dense algal growth dies it consumes oxygen and may cause short-term oxygen depletion in all or portions of water bodies.

Studies on water quality suggest that Lake Wahtopanah has frequent algal concentrations above 12 micrograms/litre which may be considered nuisance algae levels (Hughes, 1982). Excessively high levels of chlorophyll *a* were noticed in the lake in 1979 and 1980. Coordinate Secchi disc water clarity readings were only "fair" in Lake Wahtopanah. The overall water conditions, as measured by trophic status indices (TSI) for chlorophyll *a* and Secchi disc criteria, clearly place the Lake into high mesotrophic to eutrophic status. This was particularly pronounced in 1979 and 1980, but much reduced in 1981 (Hughes, 1982). Although the Lake is basically eutrophicated, annual fluctuations (apparently relating to weather and water flow conditions) suggest that significant variation occurs over time. Maximum problems occur in late July and August.

Statement of Purpose

This study was designed to ascertain the opinions and attitudes of regional residents regarding the past problems and future use of Rivers Lake and its Provincial Park. Issues were identified by long-time residents who were familiar with the entire history of the Lake. Both the long-term and short-term goals expressed by the Friends of Rivers Lake were incorporated.

METHODS

A questionnaire was designed by members of the Friends of Rivers Lake (FRL) with assistance from the Rural Development Institute (RDI) of Brandon University. Brochures and questionnaires were printed by RDI, delivered to FRL, and subsequently distributed to approximately 3000 households in the area near the reservoir. The questionnaire was inserted in the Hamiota Echo on May 16, 1990, with an accompanying article. The Echo has the largest circulation in the region. Recipients included residents in Rivers, Rapid City, Oak River, Kenton, Hamiota, Forrest, Newdale, Alexander and Strathclair. Rural residents in the RMs of Daly, Blanchard, Saskatchewan, Hamiota, Woodworth, Strathclair, Whitehead and Elton also were included. Members of the Brandon Wildlife Association received questionnaires from their organization, and some questionnaires were distributed by sporting goods stores in Brandon.

Questions were designed to allow ease of response, but scaled to permit discrimination among answers. Information sought included 1) prioritization of desired uses of the lake, 2) a rating of current services with emphasis on beach and campground conditions, 3) prioritization of new facilities, 4) a series of questions regarding the history, current use and needs for boat launching and fishing, 5) single issues regarding the lake, and 6) socio-demographic characteristics of respondents. A copy of the questionnaire is provided in Appendix A. Survey forms were returned either to Friends of Rivers Lake or the Rural Development Institute. Data were coded, entered into a computer and analyzed by the staff at RDI.

RESULTS

A low percentage of returns was expected because of the non-targeted distribution and collection of questionnaires. A total of 121 usable returns comprise the data for this report. This approximates 5 percent of the total number distributed. A single return, however, usually represents a family unit. About 10 percent of the returned forms indicated that they reflect consensus of several related family units who jointly discussed the questionnaire. Each completed survey, however, is treated as a single response in the data. Not all questions were answered by all respondents, so the total number of responses varies.

Characteristics of Respondents

Sixty-eight men (57 percent), 39 women (32 percent) and 12 joint or family (10 percent) respondents returned questionnaires (Figure 3). Most surveys (90 percent) were returned from an area within 50 km of the Lake, with the Town of Rivers (44 percent), the RM of Daly (19 percent) and the RM of Blanchard (14 percent) accounting for more than three-fourths of the respondents (Figure 3). Only one non-resident of Manitoba returned a survey form. The average age of respondent was approximately 45 years. Only 7 percent of those answering the questionnaire were less than 25 years old, but 31 percent were more than 55 years old (Figure 3). Most respondents, therefore, are long-term residents of the area near Rivers Lake.

Use and Perceptions of the Rivers Lake Recreation Complex

Rivers Lake and the associated recreational facilities are used for a variety of activities (Table 3 and Figure 4). More than half of the 121 respondents listed fishing, picnicking, swimming, boating and camping as current activities. Fishing was most frequently mentioned, but swimming received the highest overall priority rating. Fishing, picnicking and camping were high priorities and nearly equal in value. Combined with swimming, the four activities strongly suggest a family orientation with a mix of opportunities for recreation for all members as an important aspect of visitation. Although frequently mentioned, boating was not as highly prioritized as the other activities.

The other five listed activities were not only listed less frequently but also assigned lower priority. This reflects an accurate rating among uses because mean priorities are independently derived for each activity rather than weighted by number of responses. Waterskiing received a priority approximately equal to that of boating, and may suggest a relationship. Hiking and cross-country skiing were mentioned by about 25 percent of respondents, but were not high priority activities, and cottaging and sailing were both infrequently mentioned and low priority activities (Table 3). Overall, 503 responses by 121 respondents suggests the listing of an average of 4 or 5 activities per person, strengthening the view that the area fosters family use. Four activities are rated with higher than the overall mean priority of 3.16, while six uses are rated below average. Readers are cautioned to read bar charts for each use independently because the left axis count values are not standardized and direct comparisons should not be made (Figure 4).

Figure 3

Sex, Place of Residence and Ages of Respondents to the Rivers Lake Questionnaire

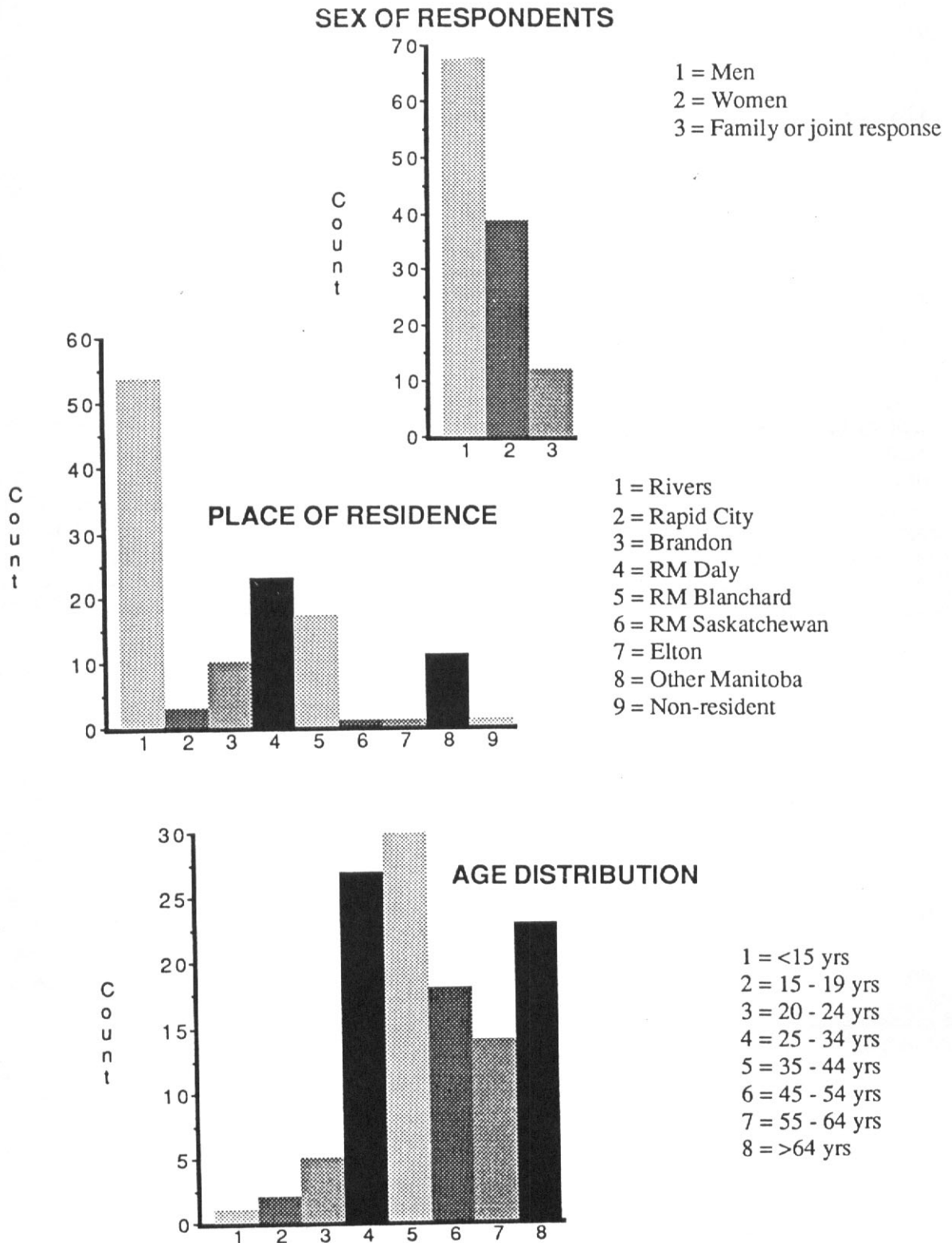


Table 3 Priorities of ten uses listed for Rivers Lake

Use	No. responses	Priority rating									\bar{x} priority
		1	2	3	4	5	6	7	8	9	
Fishing	84	32	15	11	12	3	5	3	3	0	2.77
Picnicking	76	16	28	11	8	0	8	4	1	0	2.74
Swimming	75	29	16	14	6	0	8	1	1	0	2.4
Boating	69	21	18	11	10	6	2	0	0	1	3.51
Camping	68	15	17	19	8	0	7	1	1	0	2.74
Waterskiing	45	4	9	9	8	3	5	5	0	2	3.97
Hiking	29	1	1	8	5	3	2	3	3	3	5.03
Cross country skiing	29	5	2	7	5	3	1	2	0	4	5.10
Cottaging	16	3	2	2	0	4	1	0	3	1	5.43
Sailing	12	3	1	1	1	0	4	0	2	0	6.33
Totals	503	129	109	93	63	22	43	19	14	11	$\bar{x} = 3.16$

Visitors to the provincial park were asked to evaluate the services presently available (Table 4 and Figure 5). A seven-point scale ranging from exceptional to not acceptable was applied independently to nine services. An overall average rating of 3.76 was calculated from responses, suggesting that present services rate only as satisfactory. Among services the picnic facilities, campsites, park maintenance, roads, showers/washrooms and garbage collection ranked on the good side of satisfactory, while the boat launch and fish cleaning facilities were rated on the poor side of satisfactory.

In total, people did not distinguish clearly among services, and nearly every category received both good and poor ratings. This suggests a wide range of acceptability in the quality of services expected. The fact that most values lie near the mid-point of the scale, therefore, probably reflects the range of users, changes in seasonal conditions, and tolerances of individuals. Because people often are "kind" in their ratings, the "satisfactory" rating probably reflects mediocrity in the services, and would not engender either use or avoidance of the area. Unacceptability of one service, such as the boat launch, could directly discourage other uses such as fishing, boating and waterskiing, and indirectly reduce use of other services. Because of the inter-related nature of a water-based recreation experience, any weakness may discourage participation.

Figure 4

Priority of Present Activities Listed by Users of Rivers Lake

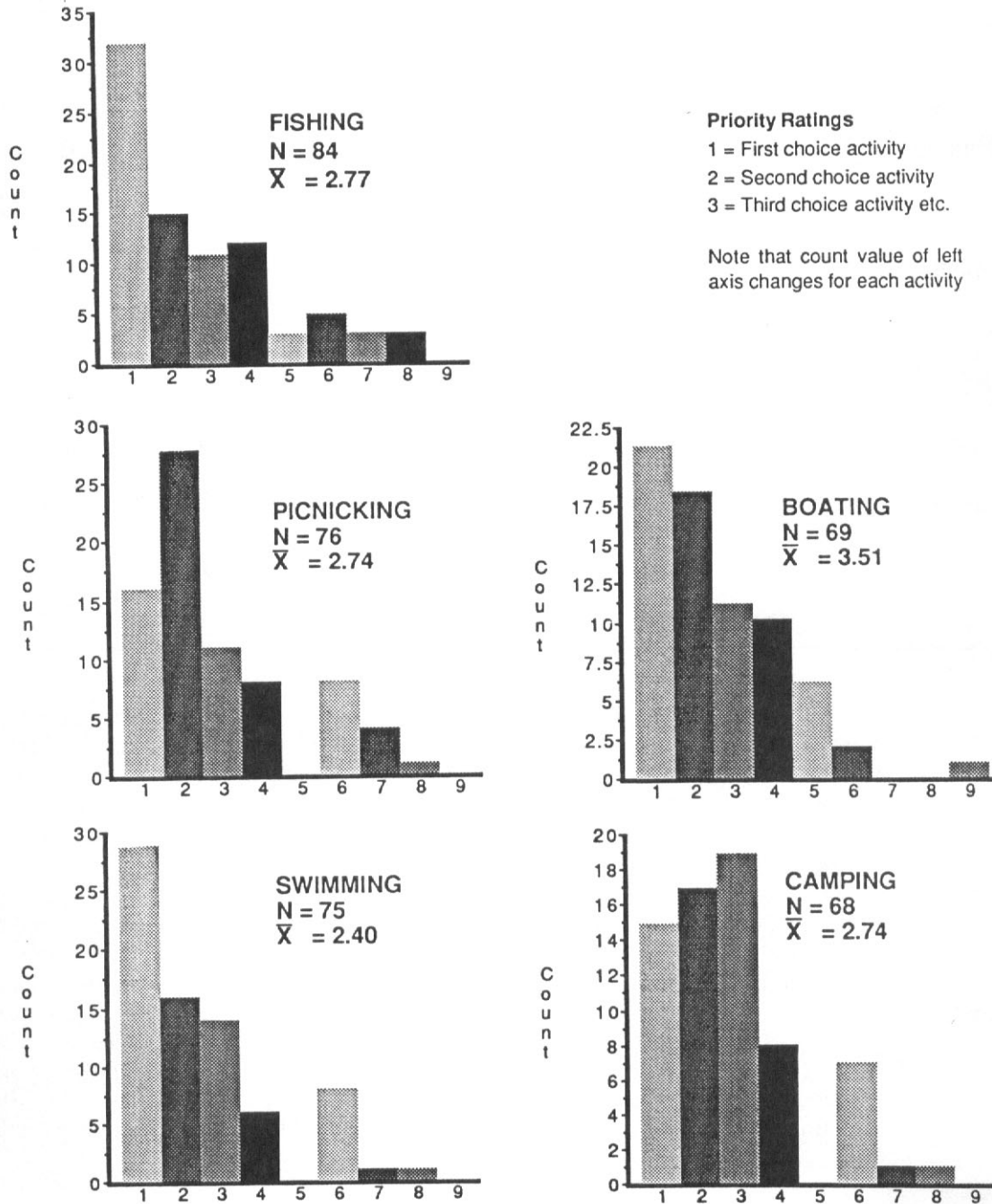
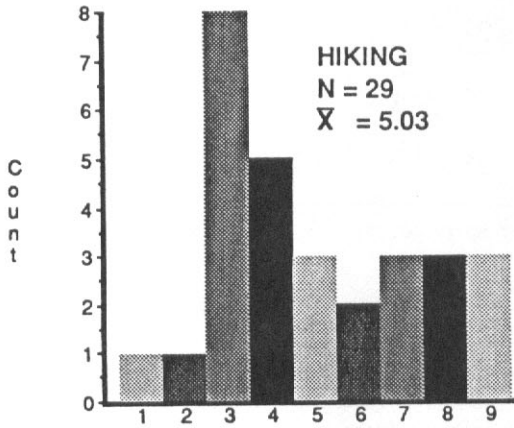
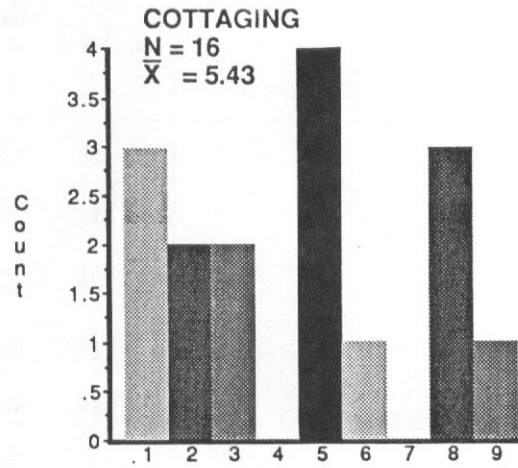
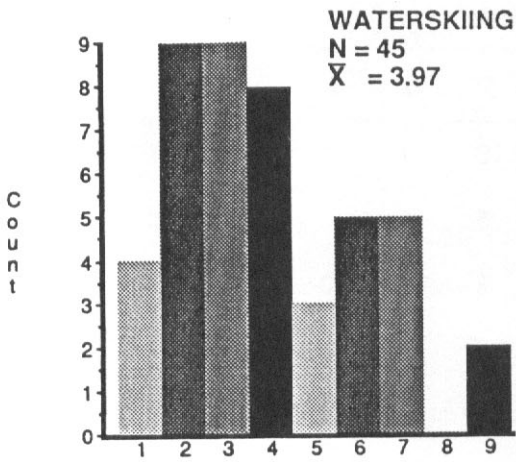


Figure 4 Continued



Priority Ratings

- 1 = First choice activity
- 2 = Second choice activity
- 3 = Third choice activity etc.

Note that count value of left axis changes for each activity

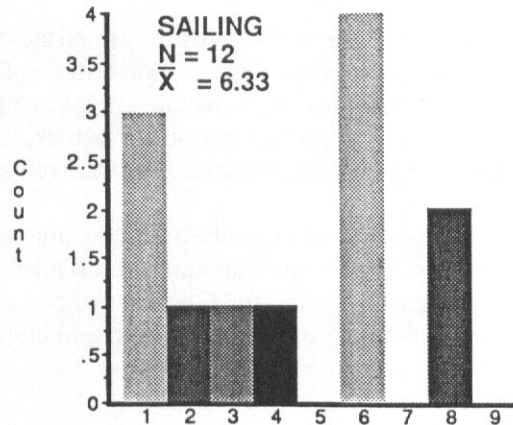
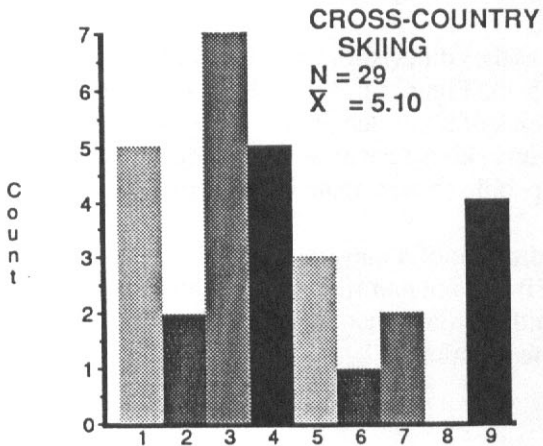


Table 4 Evaluation of available services at Rivers Lake

Service	No. responses	Evaluation scale ¹							\bar{x} priority
		1	2	3	4	5	6	7	
Picnic facilities	96	1	15	33	35	10	1	1	3.47
Park maintenance	95	6	12	35	29	5	6	2	3.43
Roads	91	3	6	32	37	8	3	2	3.63
Campsites	86	5	16	31	22	9	3	0	3.27
Showers/washrooms	85	3	17	23	25	12	1	4	3.53
Boat launch	83	1	2	7	12	28	10	23	5.24
Children's playground	83	2	12	15	28	22	2	2	3.84
Garbage collection	78	2	16	32	25	2	0	1	3.17
Fish cleaning facilities	64	1	1	9	25	15	5	8	4.55

¹ A rating of 1 = exceptional; 2 = very good; 3 = good; 4 = satisfactory; 5 = poor; 6 = very poor; 7 = not acceptable

A separate evaluation was made of the beach area of the campground. Based on the 7-point scale, 101 respondents rated the beach slightly less than satisfactory (\bar{x} = 4.2). Thirty-eight respondents rated the beach as poor (n=15) or very poor (n=23), suggesting that the beach may be deterring use of the area.

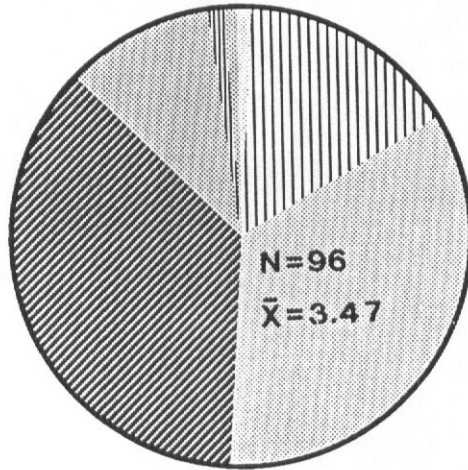
When asked to prioritize reasons why they rated the beach as they did, visitors clearly identified water quality and lake bottom characteristics as the main criteria (Table 5 and Figure 6). Algal blooms in summer, aquatic weed growth and a soft muddy substrate are known problems of the beach area. The quality of sand above water line was a third important reason for ratings. Boats and skiers near swimmers, dogs on the beach and loud radios were infrequent problems, but annoyed some people enough to be high priority items.

Prior knowledge of water quality problems allowed definition of a question regarding potential control. When asked if chemical control should be used on algae if it was not harmful to the health of swimmers, 103 persons (94 percent) said yes, and 6 persons (6 percent) said no. Safe chemical control, therefore, would be acceptable to users of the park, and may expand management options.

Figure 5

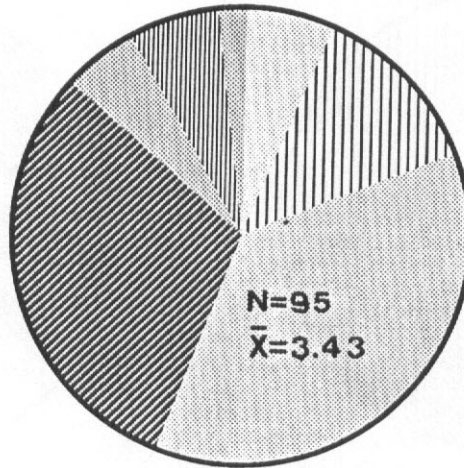
Evaluation of Services Available at Rivers Lake

PICNIC FACILITIES

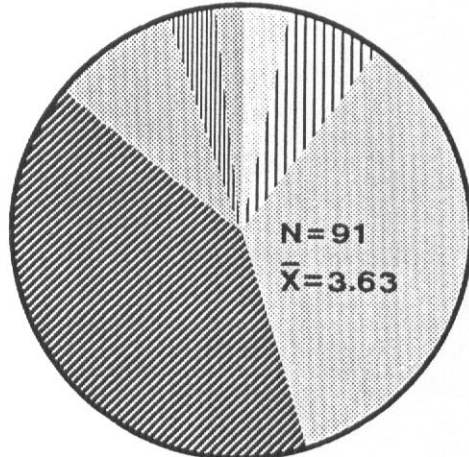


- 1 = Exceptional
- 2 = Very good
- 3 = Good
- 4 = Satisfactory
- 5 = Poor
- 6 = Very poor
- 7 = Not acceptable

PARK MAINTENANCE



ROADS



CAMPSITES

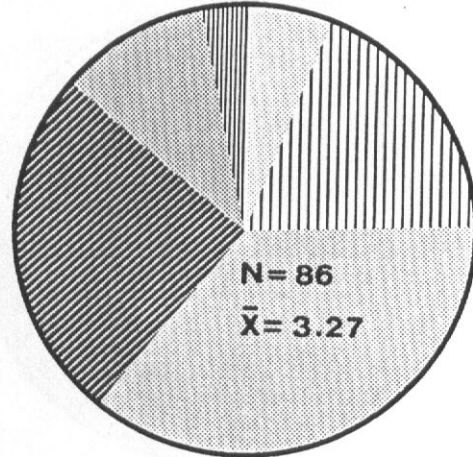
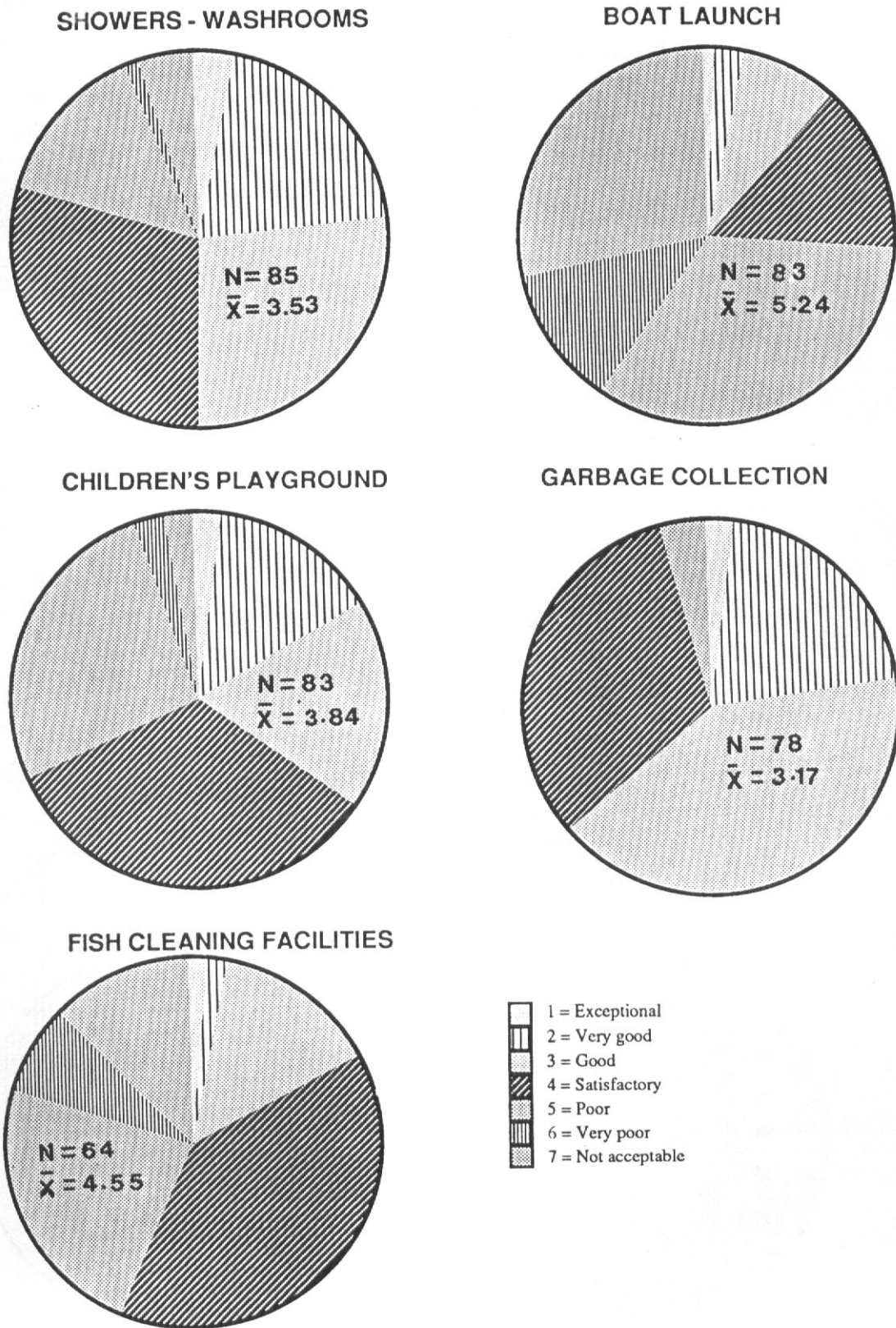


Figure 5 Continued



Although reasons for evaluating the campground were not sought, a single evaluative question was asked. Ninety-two respondents rated the campground at 3.3 on a 7-point scale. Fifty-eight percent (n=50) rated the campground as exceptional (n=5), very good (n=14) or good (n=31), while only 10 rated it as poor or very poor.

Table 5 Priority of seven reasons for rating condition of beach at Park/Campground of Rivers Lake

Reason	No. responses	Priority rating							\bar{x} priority
		1	2	3	4	5	6	7	
Water quality	73	49	15	0	7	0	2	0	1.48
Lake Bottom	69	26	0	39	0	4	0	0	1.68
Quality of sand	41	4	10	20	0	5	2	0	2.78
General cleanliness of beach	34	3	5	11	12	2	0	1	3.27
Boats/skiers near swimmers	11	3	2	0	3	0	3	0	4.55
Dogs	8	1	1	3	0	1	2	0	4.25
Loud radios	6	1	0	1	1	0	3	0	5.33
Totals	242	87	33	74	23	12	12	1	$\bar{x} = 2.50$

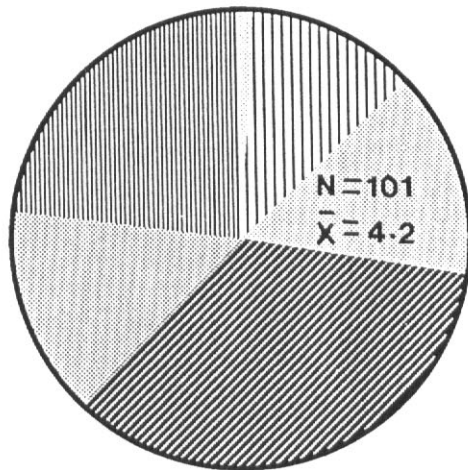
Respondents were asked to list the boat launch they use (Figure 1). Twenty-two of 44 responses (50 percent) listed the Provincial Park launch, 9 (20 percent) the Brandon Wildlife Association launch, 6 the Daly Beach launch, 4 the Jake Fast Park access and 1 the Chimo launch. The Park launch, therefore, receives most use as a public access point to the Lake.

Because of long-standing complaints about the boat launch associated with the park, a series of potential improvements were prioritized by respondents to the questionnaire (Table 6 and Figure 7). All eight improvements received highest priority responses (first and second choices), but a change of location received both the greatest number of responses and the highest priority rating. Steepness, the presence of rock hazards and inadequate water depth likely caused the desire to change locations as they ranked second, third and fourth in priority. None of the priority values for improvements deviated greatly from the overall priority of 2.65, suggesting that the boat launch suffers from a variety of problems. The number of responses to the last three listed improvements, however, was considerably lower than the number for the first five suggestions.

Figure 6

Beach Rating and Priority of Reasons for Beach Rating at Rivers Lake

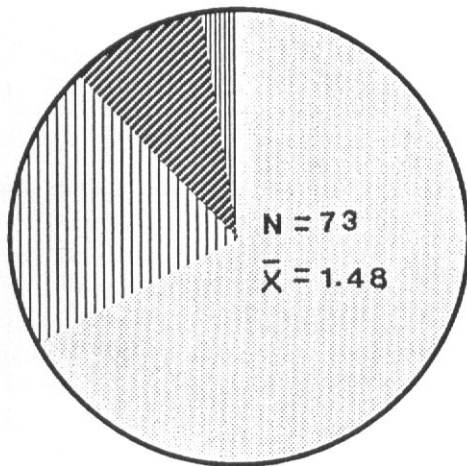
OVERALL BEACH RATING



- 1 = Exceptional
- 2 = Very good
- 3 = Good
- 4 = Satisfactory
- 5 = Poor
- 6 = Very poor
- 7 = Not acceptable

Priority of Reasons for Beach Rating

WATER QUALITY



LAKE BOTTOM

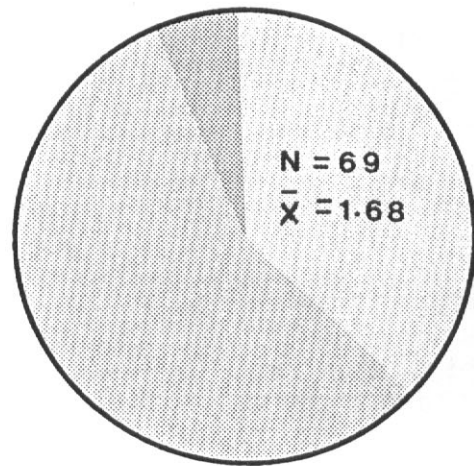
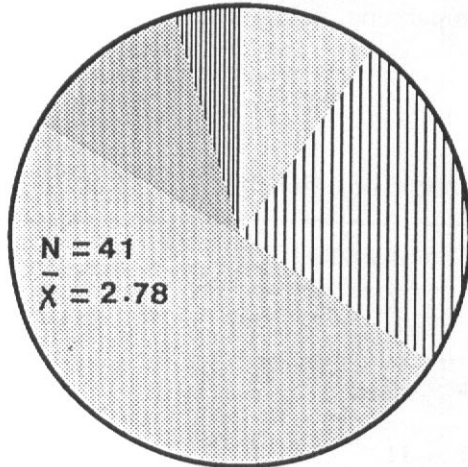
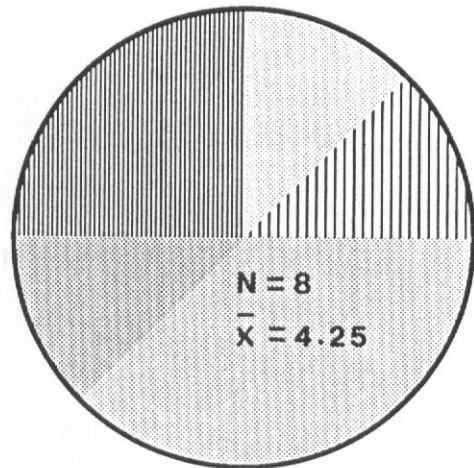


Figure 6 Continued

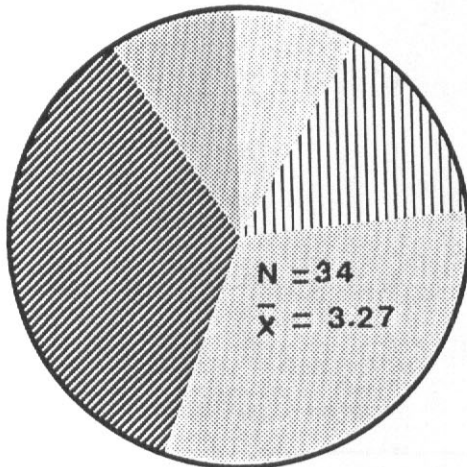
QUALITY OF SAND



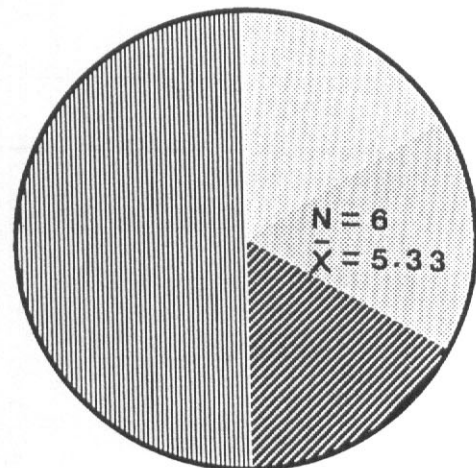
DOGS ON BEACH



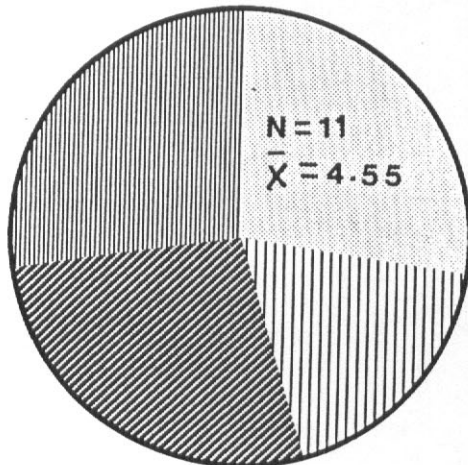
CLEANLINESS OF BEACH



LOUD RADIOS



BOATS NEAR SWIMMERS



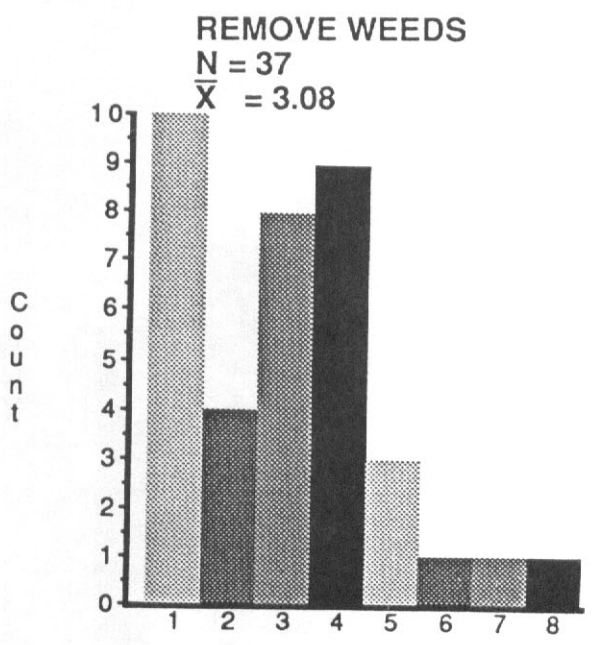
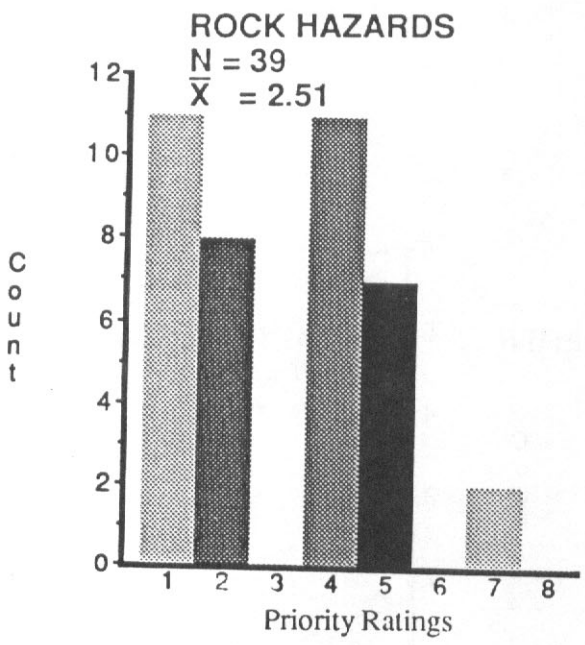
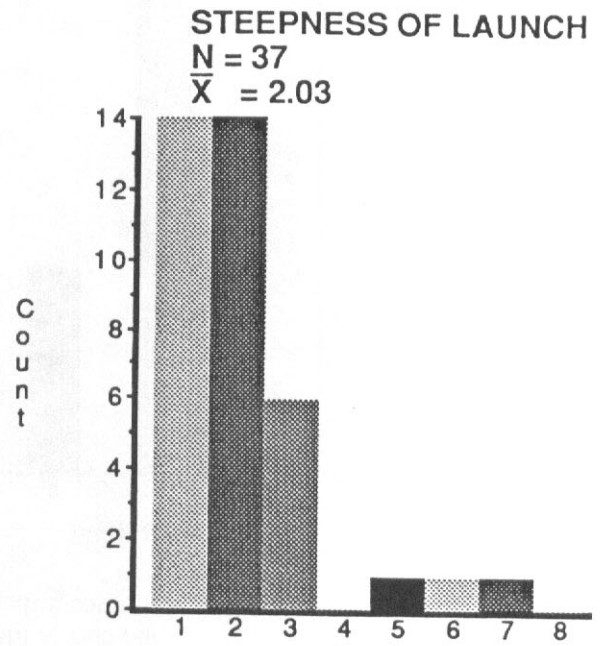
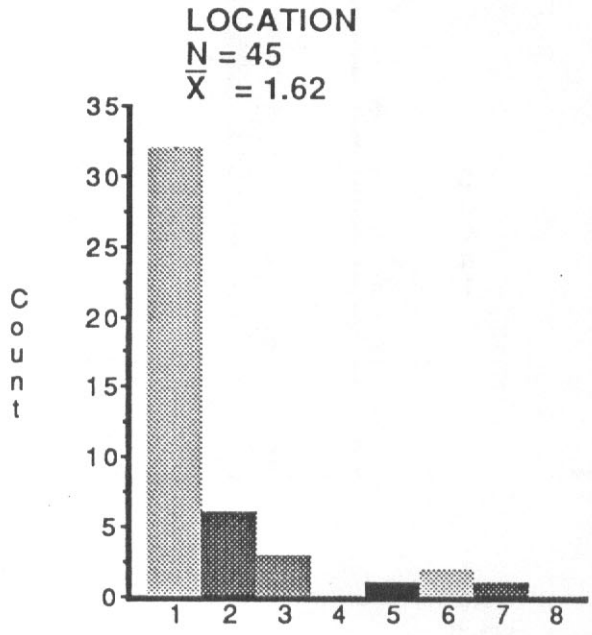
When asked if they had reduced or ceased use of the Provincial Park boat launch because of problems, 56 (73 percent) said yes and 20 (27 percent) said no. Forty-six percent of respondents felt that the boat launch was safe and 54 percent felt that it was not safe. Seventy-nine of 83 respondents (95 percent) would like to have a day use dock at the park. The preferred location is adjacent to the campsite (n=68). Other suggested locations include on the lakeside of a dike around the swimming area, near the present boat launch, where it originally was located between the beach and the campground, and right in the campground.

Table 6 Priority of eight improvements to the Provincial boat launch at Rivers Lake

Improvement	No. responses	Priority rating								\bar{x} priority
		1	2	3	4	5	6	7	8	
Location	45	32	6	3	0	1	2	1	0	1.62
Rock hazards	39	11	8	0	11	7	0	2	0	2.51
Steepness of launch	37	14	14	6	0	1	1	1	0	2.03
Remove aquatic weeds	37	10	4	8	9	3	1	1	1	3.08
Additional docking	34	8	5	12	0	5	2	2	0	2.82
Depth	16	2	6	0	5	1	0	2	0	2.69
Design	15	1	8	2	0	2	0	2	0	2.87
More parking	12	6	2	2	0	1	0	1	0	3.17
Totals	235	84	53	33	25	21	6	12	1	$\bar{x} = 2.65$

Figure 7

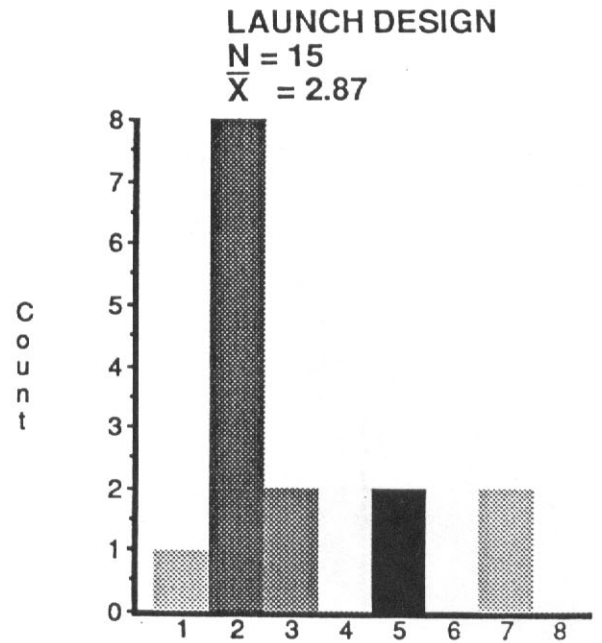
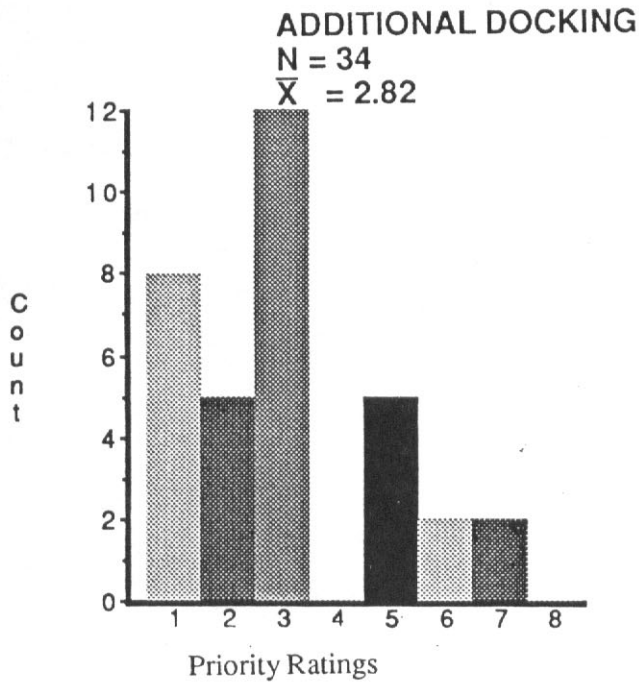
Prioritized Improvements Suggested for the Provincial Boat Launch at Rivers Lake



1 = First choice improvement
 2 = Second choice improvement
 3 = Third choice improvement etc.

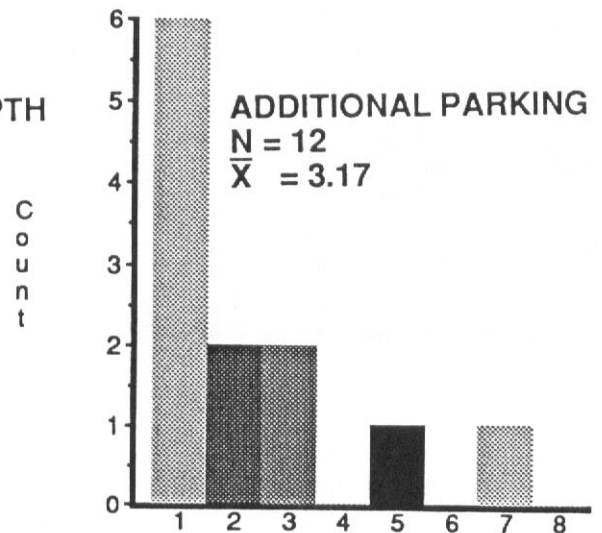
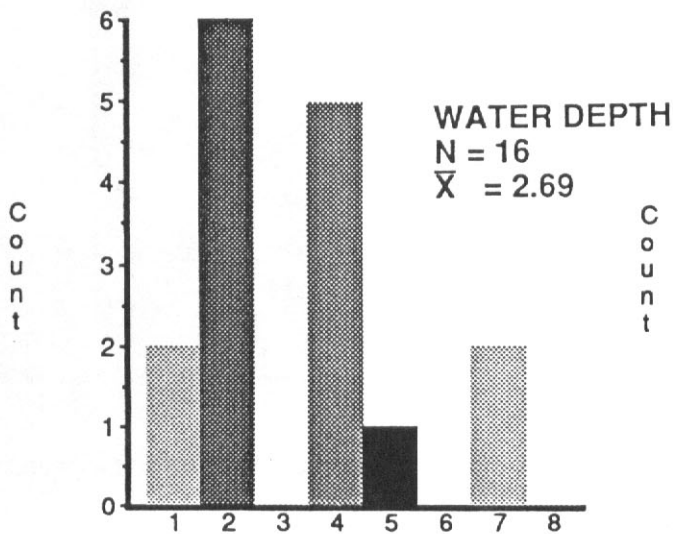
Note that count value of left axis changes for each graph

Figure 7 Continued



1 = First choice improvement
 2 = Second choice improvement
 3 = Third choice improvement etc.

Note that count value of left axis changes for each graph



Rivers Lake has been a heavily-used fishing resource for many years. Seventy respondents (73 percent) rated the reservoir as a preferred fishing lake, while 26 (27 percent) did not. When asked to rate the quality of fishing on a 7-point scale, an average rating of 3.88 resulted, indicating that fishing is satisfactory (Figure 8). About 90 percent of persons rated fishing nearly equally as either good, satisfactory or poor, showing a consensus in the center of the evaluative scale.

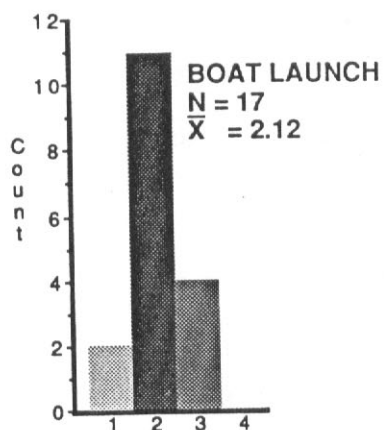
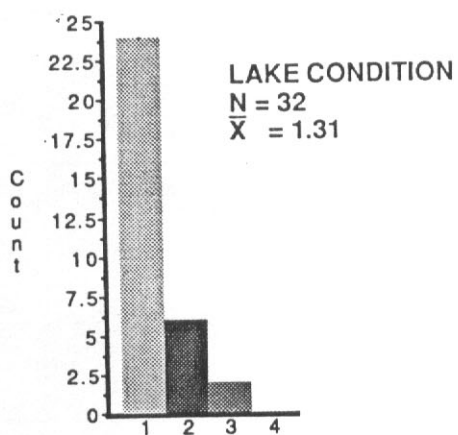
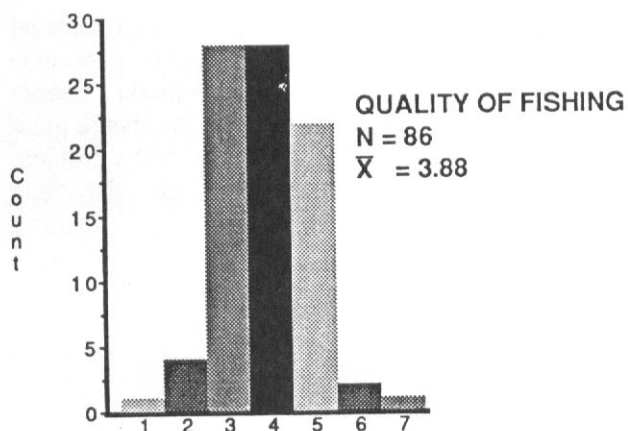
Those who rated fishing as poor, very poor or not acceptable were asked to prioritize problems associated with fishing (Table 7 and Figure 8). The general condition of the lake was both most frequently mentioned and received highest priority ratings. Comments suggest that both muddy water and algal blooms detract from fishing. The number of fish caught ranked second in numbers and priority, but fish size was not as great a concern. The only access problem assessed was that of the boat launch, and it was considered a problem by fishermen. Eighty-six (96 percent) of 92 respondents said they would be willing to accept a fish catch size limit to enhance fish reproduction in the future.

Table 7 Priority of improvements suggested by persons listing poor quality fishing

Reason	No. responses	Priority rating				\bar{x} priority
		1	2	3	4	
Condition of lake	32	24	6	2	0	1.31
Fish quantity	22	9	7	4	2	1.96
Boat launch facility	17	2	11	4	0	2.12
Fish size	9	1	4	4	0	2.33
Totals	80	36	28	14	2	$\bar{x} = 1.78$

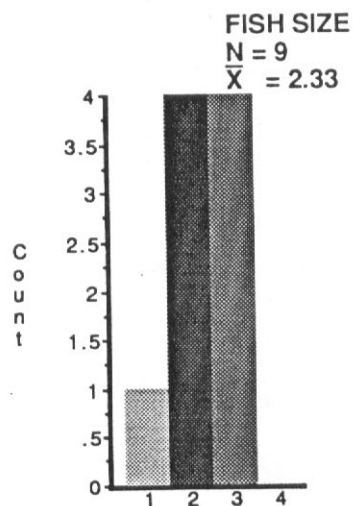
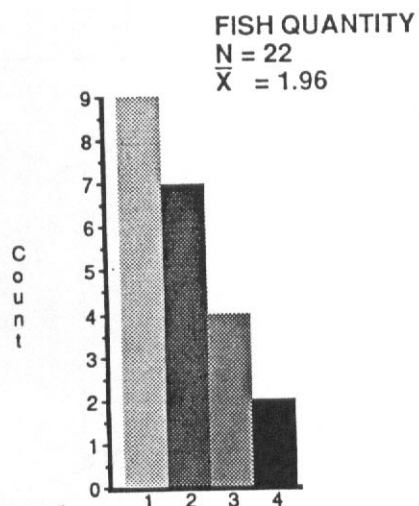
Figure 8

Quality of Fishing and Priorized Reasons for Assigning Poor Ratings to Quality of Fishing at Rivers Lake



Priority Ratings
1 = First choice
2 = Second choice
3 = Third choice
4 = Fourth choice

Note that count values of left axis change for each reason listed



A final series of responses were sought for the future planning of the park. The questionnaire included a prioritization of what new facilities or expanded facilities people would like to see at the provincial park. Respondents were asked to prioritize only three items, but many prioritized all choices. Complete data are presented in Table 8 and Figure 9. The question was phrased in a manner to elicit priorities under conditions of limited funding.

All nine facilities listed received not only responses but also first and second choice selections. Electrical campsites and better playground equipment ranked first and second in both number of responses and mean priority. Fish cleaning facilities received third highest priority, but was not as frequently mentioned as three other facilities. People would like to have more picnic shelters in the park. A series of trails to accommodate hiking, nature walks, bicycles and cross-country skiers might accommodate all users if temporally and spatially controlled access was incorporated.

Table 8 Priority assigned to nine additional or expanded facilities at Rivers Lake

Facility	No. responses	Priority rating									\bar{x} priority
		1	2	3	4	5	6	7	8	9	
Electrical campsites	54	38	11	0	3	0	1	0	1	0	1.44
Better playground equipment	51	16	14	16	0	2	1	0	2	0	2.29
Picnic shelters	44	8	15	14	3	0	0	2	2	0	2.68
Nature/hiking trails	35	4	9	7	8	0	2	2	3	0	3.37
Concession stand	28	7	8	5	1	2	3	1	0	1	3.07
Fish filleting/cleaning	25	9	8	5	0	0	1	1	0	1	2.48
Bike trails	23	1	5	7	0	2	6	0	2	0	3.57
Cross country ski trails	23	4	5	5	3	1	1	1	3	0	3.61
Canoe rentals	18	2	4	6	2	1	1	1	1	0	3.44
Totals	301	89	79	65	20	8	16	8	14	2	$\bar{x} = 2.80$

Figure 9

Priority Ratings for Additional or Expanded Facilities at Rivers Lake

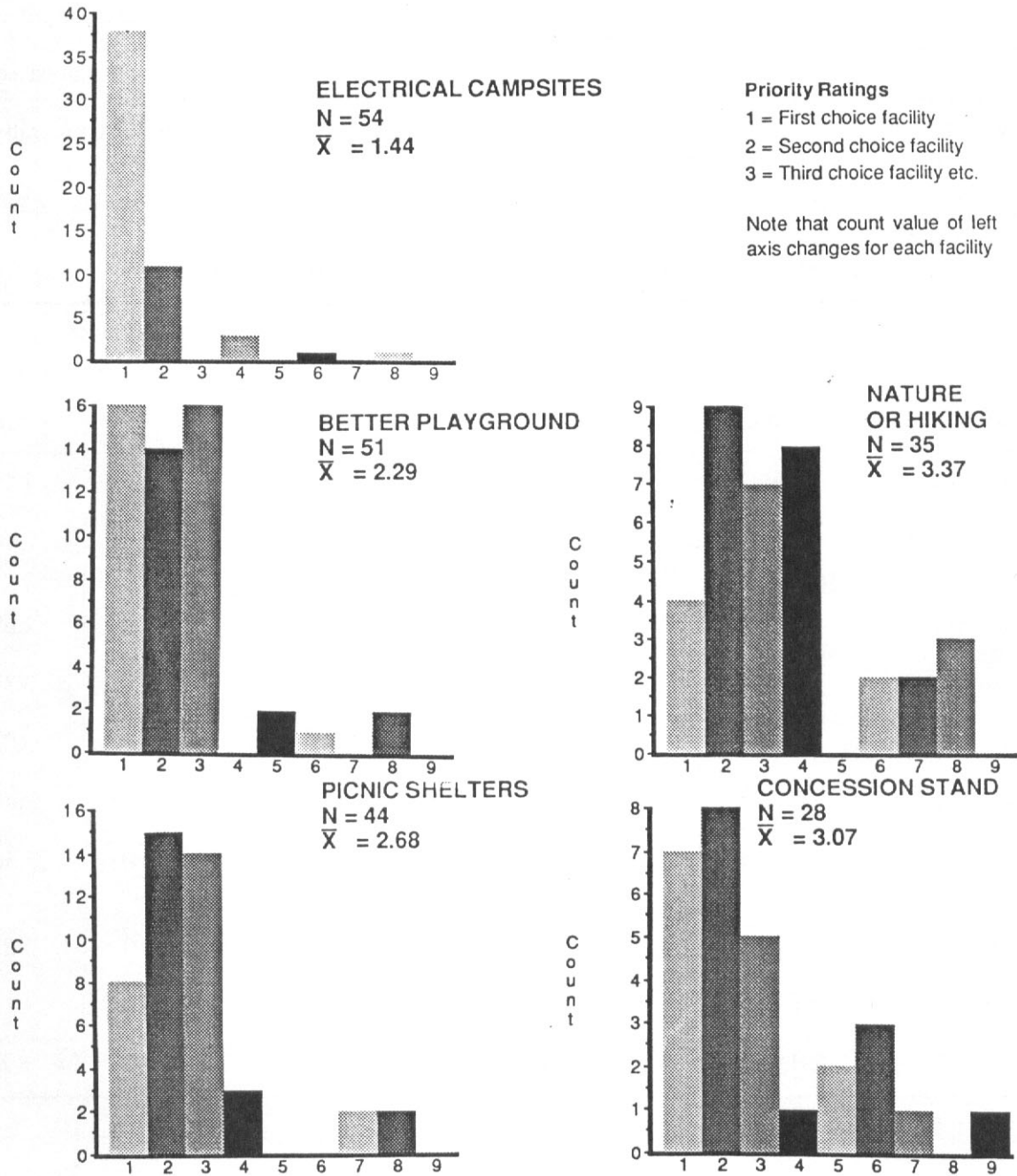
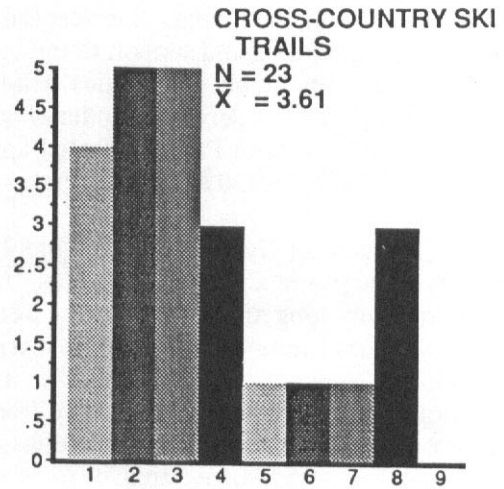
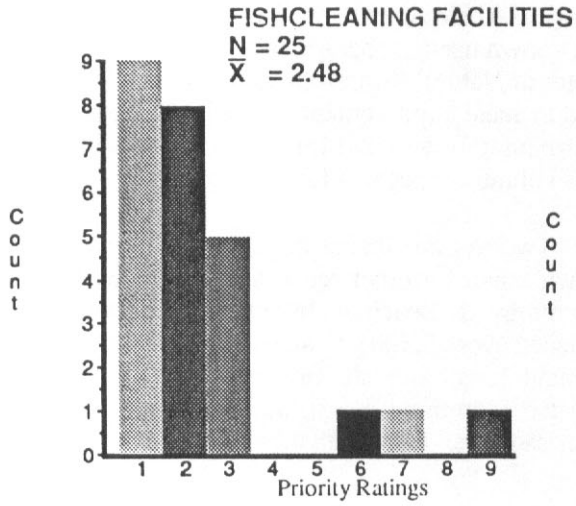
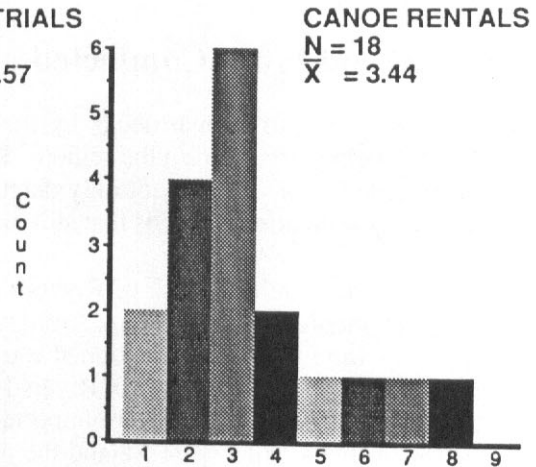
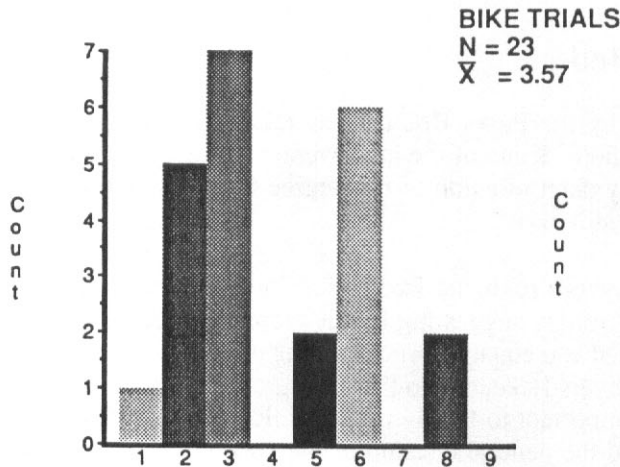


Figure 9 Continued



1 = First choice facility
 2 = Second choice facility
 3 = Third choice facility etc.

Note that count value of left axis changes for each facility



ANALYSIS AND DISCUSSION

Changes in Summer 1990

During spring of 1990, the Friends of Rivers Lake (FRL) held several meetings with government officials in an effort to secure funding and support to initiate known needed changes to the Park at Rivers Lake. On August 2, 1990, the Honourable Harry Enns, Minister of Natural Resources, announced a \$10,000 grant to the FRL from the Special Conservation Lottery Fund to make improvements at the Park (Redfern, 1990). In addition, Manitoba Provincial Parks allocated approximately \$40,000 for improvements in the Park. A contract was signed in fall 1990 and a local group of volunteers began a fall campaign of work.

The beach area was totally renovated (Figure 2). Two to three inches of surface material was removed from the above water line area (the Lake was drawn down for other reasons, allowing easy access) and deposited in the swimming area after all rocks were removed. Beach quality sand was obtained, 1,150 yd³ were moved by volunteers, and an 8 inch layer was placed over a 5,500 yd² area both above and below normal water line (Figure 2). Rocks were cleared from a much larger area and fine gravel was spread to improve the lake bottom. This area extends not only from the swimming beach, but also along the shore to the campground to improve boat beaching conditions for campers. Approximately 5,000 yd³ of crushed gravel were distributed over a 25,000 yd² area.

The Parks Branch of Manitoba Natural Resources improved the boat launch and campground during the summer of 1990. The slope of the boat launch was reduced, 14 new pads were installed, one section of floating dock was replaced and one was added. Channel deepening near the launch is planned for December 1990 if weather permits.

In the campground, sites were enlarged and levelled, 20 new picnic tables were distributed, 30 amp electrical service was installed in six regular campsites and nine seasonal campsites (Figure 2), and roads were graded. The children's playground was relocated near the beach facilities, new sand was laid down, the area was confined by a perimeter, and existing equipment was placed in the area. Climbing bars will be added in spring 1991. New signing will be installed in the Park in 1991, and a fish cleaning shack will be erected near the boat launch.

Survey Results and Work Completed

The immediate response to known needs by the Parks Branch was carried out at the same time as questionnaires were being circulated in the region. Some of the improvements, therefore, address some of the evaluations reported. This allows not only determination of the degree to which problems have been addressed, but also identification of needs that still exist.

The most common and preferred use of Rivers Provincial Recreation Park involves a combination of swimming, camping, picnicking and fishing, strongly suggesting family recreation (Table 3 and Figure 4). All of these activities were frequently mentioned and equal priorities among uses. Repairs to the beach and swimming area completed by the Friends of Rivers Lake, and to the campground, playground, boat launch and picnic areas by the Parks Branch all are important to family use activities. Repairs to the boat launch were most needed (Table 4 and Figure 5), and the general cleanup of the Park corresponds to the overall evaluation of existing services as only "satisfactory".

Work on the beach addressed three of the four highest priority reasons determining use (Table 5 and Figure 6). Improvement to the lake bottom, the quality of sand on the beach and a general cleanup were deemed necessary by regional users.

Improvements to the boat launch, however, may not satisfy the expressed needs for improvements (Table 6 and Figure 7). All eight needed improvements received high mean priority ratings, but the number one priority was a change of location. All work completed during summer 1990 occurred on the presently undesirable launch site. The question that remains is whether or not removal of rocks, and slope and design work will make enough change to engender use. Additional docking and parking, aquatic weed problems and deepening of the area may be necessary in the future. The boat launch may remain as a contentious issue because so many problems received high priority ratings that complete change may be necessary to satisfy the public.

Installing 15 electrical campsites directly responded to the most frequently mentioned and highest rated priority for facilities in the Park (Table 8). Whether or not 15 sites are sufficient will be addressed by demand. Renovation of the playground has been completed, and, with installation of additional equipment in spring 1991, should improve use of this highly prioritized component. Similarly, construction of new fish cleaning facilities in 1991 addresses the third highest priority, but planned location of the facility near the boat launch may decrease its effectiveness for campground patrons.

Future Improvements

To a great extent all of the changes completed may not increase use of Rivers Lake for recreation unless the dominant issue of water quality is addressed. The condition of the lake was the number one problem listed by swimmers (Table 5), and fishermen (Table 7), and was at the base of many poor ratings and high priority needs. It is very important, therefore, that the water quality study be not only completed, but also expanded to include as many remedial options as possible. The fact that 94 percent of respondents said they would accept safe chemical control of aquatic weeds and algae suggests the magnitude of the problem, and allows a greater potential for management.

If significant eutrophication results from point source inputs, easy correction should be possible. If general agricultural runoff is implicated, control will be more difficult, but environmental management techniques may reduce problems. Water quality improvement may require inspection of the entire drainage basin from Riding Mountain National Park to Rivers Lake. Nutrients from agricultural cropping and livestock practices, domestic sources and small towns all may form part of the problem. The extremely high chlorophyll *a* and poor water clarity readings that occur periodically in late summer suggest extreme nutrification, and only a concentrated system-wide effort will reduce the problem. In essence, what appears to be a recreational issue is in reality a reflection of a systemic water resource problem that culminates in eutrophication of Rivers Lake. Treatment at the source of the problem will have greater long-term remedial effect than simply treating the end product.

Fishing is a major activity and attraction. Although none of the actions to date, and most suggested improvements do not effect fishing directly, all improvements to the Park improve accommodations and services that fishermen may want. Although the condition of the lake was of greatest concern to fishermen, the number and size of fish also were mentioned (Table 7). The stocking records indicate that an extensive long-term program has been in operation. It would be senseless to impose fish size limitations to walleyes if the population is not naturally reproducing. If fish numbers are a problem, either increasing stocking or decreasing mortality are suggested. Improved biological management may hinge upon improved water quality, and only a coordinated multi-resource approach may address the fisheries questions. If effective, improvements to the boat launch will help improve access for fishermen.

Remaining medium to high priority items are extensions of activity centred improvements. A clear need was expressed for better fish cleaning facilities. Planned construction in 1991 may eliminate this need, but placement of the facility near the boat launch, and thus away from the campground, may deter from use. Location should be assessed before construction, or two facilities might serve the public better. The addition of day-use docking facilities near the campground remains a need that has not been addressed. Similarly,

more picnic shelters were desired by many visitors and should be considered in future construction plans. Some of the remaining problems are more regulatory than facility based. For example, establishment or enforcement of rules should alleviate user conflicts such as boating-skiing near the swimming area, dogs on the beach, and loud music. Similarly, if the location of the boat launch continues to be a problem in spite of improvements, relocation to a site adjacent to the campground may require some re-zoning of areas, or changes in vehicular and pedestrian traffic patterns.

Overall, the private and public efforts to improve the Provincial Recreation Park should improve both perception and use of the area. Long-term use, however, may depend upon improving water quality and maintaining a viable fishery. The remaining physical needs of the users of the Park are identified and could be completed easily in a short-term private-public joint effort over the next few years. The much more complicated resource problems may require a series of research and management steps for effective resolution. These should be started immediately.

One of the primary reasons for upgrading and adding to the Rivers Lake recreation potential is that of increasing tourism and economic benefits to the region. Data suggest that more than 90 percent of users are Manitobans, and informal research suggests that most are regional residents. As facilities improve, and if water quality can be improved through time, a concentrated effort should be made to advertise the facility in Winnipeg, Saskatchewan and the States of Minnesota, North Dakota and Montana. The quality of early season fishing would be a major attraction, and family vacations in early to mid-summer should be enhanced by beach improvements. Use should not be encouraged in late summer until algae problems are controlled. The principal reason for returning to an area is an enjoyable experience. The Friends of Rivers Lake and the Provincial government should coordinate an advertising campaign to promote the facilities during those seasons when the resource is at its best.

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APPENDIX A

Friends of Rivers Lake Survey Questionnaire

The brochure accompanying this questionnaire describes the aims and objectives of our organization as attempting to achieve better utilization of this natural resource by working to improve opportunities that users identify to us. Accordingly, we very much need your support by taking a few brief minutes to complete this questionnaire. You can make a difference. Your response — your ideas — and your support by obtaining a membership would be important for our success. However, we need your questionnaire response to begin our activities. If you have previously responded to this questionnaire, you need not reply. Thanks for your response.

Yours for a better future for **OUR** Rivers Lake.

Please help us by responding with your answers and comments. If you do not wish to respond to a question, or have no opinion, simply leave it blank.

For what purposes would you use Rivers Lake? Please list priorities for use by giving your first choice number 1, second number 2, etc.

_____	Water Skiing	_____	Fishing
_____	Campground	_____	Picnicking
_____	Cottage	_____	Boating
_____	Swimming	_____	Hiking
_____	Sailing	_____	Cross Country Skiing
_____	Other (specify) _____		

How would you rate the following existing park services and facilities at this Provincial Park?

	Exceptional	Very Good	Good	Satisfactory	Poor	Very Poor	Not Acceptable
Park Maintenance	_____	_____	_____	_____	_____	_____	_____
Picnic Facilities	_____	_____	_____	_____	_____	_____	_____
Garbage Collection	_____	_____	_____	_____	_____	_____	_____
Campsites	_____	_____	_____	_____	_____	_____	_____
Children's Playground	_____	_____	_____	_____	_____	_____	_____
Roads	_____	_____	_____	_____	_____	_____	_____
Showers/Washrooms	_____	_____	_____	_____	_____	_____	_____
Boat Launch	_____	_____	_____	_____	_____	_____	_____
Fish Cleaning Facilities	_____	_____	_____	_____	_____	_____	_____

Please indicate below the reasons for any poor, very poor or not acceptable ratings.

How do you rate the condition of the beach at the park/campground?

Exceptional ___ Very Good ___ Good ___ Satisfactory ___ Poor ___ Very Poor ___ Not Acceptable ___

If you answered poor, very poor or not acceptable, what is your reason for this rating? Please list your priorities for poor ratings by assigning number 1 to the first choice, etc.

_____	Lake Bottom (Rock, mud, weeds)	_____	Water Quality
_____	Quality of sand	_____	Loud Radios
_____	Dogs	_____	Boats/Skiers near swimmers
_____	General Cleanliness of Beach	_____	Other (specify) _____

If chemical control of algae was found to be effective in swimming areas, but not harmful to the health of swimmers, would you approve of its use?

Yes _____ No _____

The overall condition of the campground is:

Exceptional ___ Very Good ___ Good ___ Acceptable ___ Poor ___ Very Poor ___ Not acceptable ___

If your answer is poor, very poor, or not acceptable, what is the reason for your rating?

Recognizing that there is limited funding available for constructing new facilities, what additional facilities would you like to see located at the park/campground? (Please mark top 3 priorities by assigning number 1 to first choice, etc.)

_____	Bicycle Trails	_____	Picnic Shelters
_____	Electrical Campsites	_____	Better Playground Equip.
_____	Concession Stand	_____	Cross Country Ski Trails
_____	Nature/Hiking Trails	_____	Canoe Rentals
_____	Fish Filleting/Cleaning	_____	Other (specify) _____

Which boat launch do you presently use?

What improvements would you like to see at the Provincial Boat Launch. Please indicate priorities by placing number 1 for first choice, etc.

_____	Location	_____	Rock Hazards removed
_____	Design	_____	More Parking
_____	Steepness of Launch	_____	Additional Docking
_____	75 cm (30 inches) free water	_____	Remove aquatic weeds
_____	Other (specify) _____		

Have you reduced or ceased use of the Provincial Park Launch because of these short comings?

Yes _____ No _____

Do you feel it is safe to use the Provincial Park Launch.

Yes _____ No _____

Do you feel a day use dock is required?

Yes _____ No _____

If yes, where? Adjacent to campsite _____ Other (specify) _____

Do you consider Rivers to be a preferred fishing lake.

Yes _____ No _____

How do you rate the quality of fishing in the lake?

Exceptional ___ Very good ___ Good ___ Satisfactory ___ Poor ___ Very Poor ___ Not Acceptable ___

If fishing is poor, very poor, or not acceptable, why not? Please prioritize why by assigning number 1 to the first reason, etc.

_____	Condition of lake	_____	Boat launch facility
_____	Fish size	_____	Fish quantity
_____	Other (specify) _____		

Would you approve/accept a fish catch size limit to enhance fish repopulation?

Yes _____ No _____

We need to know some things about you. Please fill in the questions below.

Where do you live?

_____	Rivers	_____	RM of Saskatchewan
_____	Rapid City	_____	RM of Elton
_____	Brandon	_____	Man. location other than those listed (specify)
_____	RM of Daly	_____	Sask., Ont.
_____	RM of Blanchard	_____	Other (specify) _____

What is your age category?

_____	Under 15	_____	35 - 44
_____	15 - 19	_____	45 - 54
_____	20 - 24	_____	55 - 64
_____	25 - 34	_____	Over 64

What is your sex? Female _____ Male _____

Would you consider volunteering some time to a clean-up effort?

Yes _____ No _____

If yes, Name _____ Phone _____

Other comments (attach additional comments if desired)
