



WEST PARK, DELTA, MANITOBA
design in a fragile environment
edward bruce mclachlan

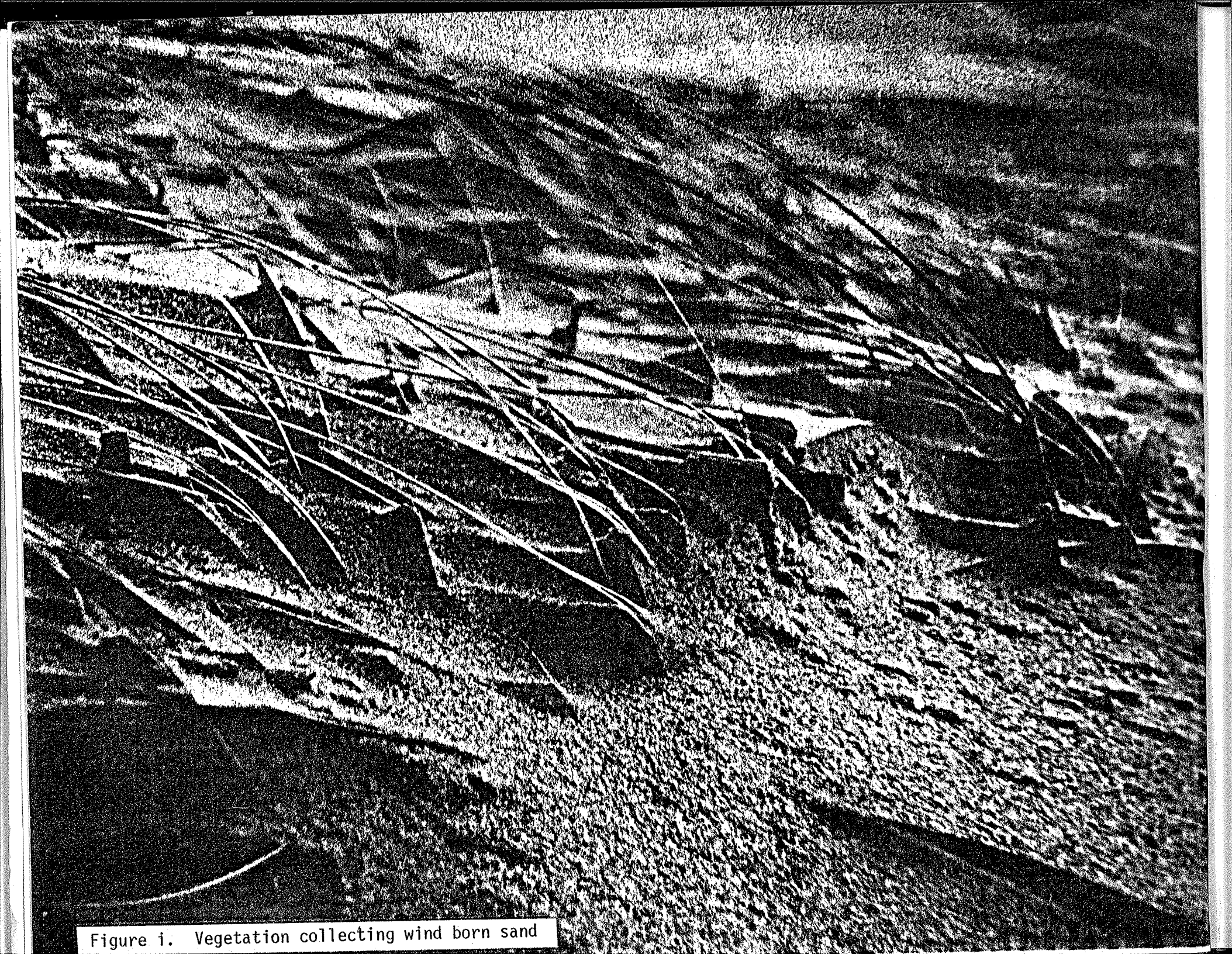


Figure i. Vegetation collecting wind born sand

The University of Manitoba

West Park, Delta, Manitoba

- Design in a Fragile Environment

A Practicum submitted to the
Faculty of Graduate Studies in partial
fulfillment of the requirements for the
degree of Master's of Landscape Architecture

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I would like to thank my advisors, Professor Charles H. Thomsen, Dr. Jennifer M. Shay and Dr. Robert W. Newbury for their help and encouragement, as well as the people of Delta, my friends and family for their enthusiasm and continued interest in my work.

Abstract

Beach oriented recreation has traditionally based itself on the fulfillment of two basic requirements; first, access to suitable water and beach resources, and second, land adjacent to the beach to service man and his accoutrements (shelter and transportation). When put into the context of the south shore of Lake Manitoba the effect has been disastrous. The seemingly endless sandy beaches have seen a high priority placed on their development, while the physical dimensions and ecology of the adjacent beach ridge have thoroughly compounded the problems of accommodating man.

The historical and present day examples of man's negligence in developing this resource are blatantly obvious, yet they have not been recognized and as such have had no effect on man's present use or attitudes towards the landscape.

By using the existing facility of West Park as an example, this study attempts to summarize man's history of development, use and impact on the landscape, and to propose a means to better husband the resource, guaranteeing a high quality recreation facility for future generations.

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Figure 1. South Shore of Lake Manitoba from the Air



Introduction

The south shore of Lake Manitoba is characterized by a low, narrow sand ridge which separates the lake from the extensive marshes located to the south.

During periods of low lake levels, wind activity erodes the exposed lake bed. Sand is transported and deposited at the first windbreak. This process, coupled with the processes of ice scouring and wave action, particularly in large storms, has over the centuries built up and molded the ridge. This facilitates a vegetation succession from hydric to mesic communities. Many parts of the ridge have developed into thickly wooded forest. While providing a microclimate favourable to a diverse number of plants, the forest also stabilizes the inherently erodible ridge and ensures the continued collection of wind born sand.

As access through the marsh to the beach ridge improved, recreational development increased. The long sandy beaches backed up by the forested ridge made it ideal for summer homes and other beach oriented recreation facilities. The nature of these facilities was to utilize the resource for pleasure. Seldom did this use correspond to the ecological realities of the ridge. There is strong evidence to suggest that the site degradation that has occurred is closely associated to site design and management and that with the present use pattern the survival of the resource itself is being challenged.

The purpose of this study is to re-think the use and design of an existing facility, rather than to analyze the potential for new facilities. It is seen as a valuable way of demonstrating a more satisfactory integration of environmental processes and small scale site development.

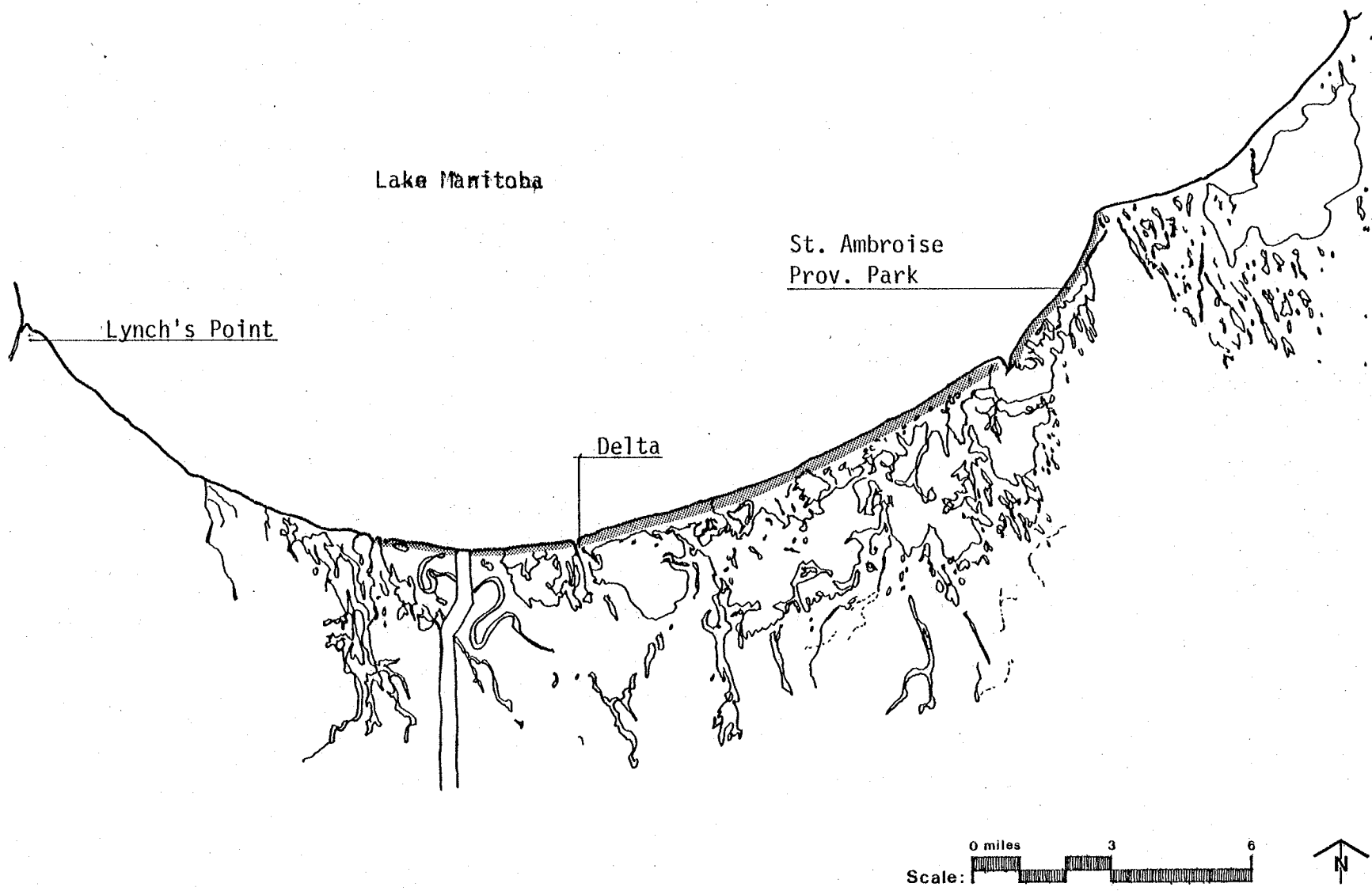


Figure 2. South Shore of Lake Manitoba

Site Selection

West Park at Delta is one of three public recreation facilities located on the south shore of Lake Manitoba. It was selected as the study site as it exemplifies many of the ecological problems typical of small scale development on the beach ridge and stands in strong contrast to neighboring sections of undisturbed forest.

The Delta area itself has historically been the most active recreation spot on the beach ridge. While starting out as a transportation link between lake steamers and the railway, it soon became a mecca for trainloads of excursionists out to enjoy the beaches. Over the years the emphasis of use has changed to the extent that West Park is the only public facility in the area surrounded by a concentration of private cottages.

As the only public facility in the area it has been used intensely. To accommodate this use all of the level dry land has been cleared of the native shrubs and herbs. Where turf grasses have not taken over, the humus layer has been trampled off, exposing the sand to the wind and subsequent erosion. This erosion is especially evident on the highest portion of the ridge which separates the parking and camping area from the beach. Here, pathways have removed the vegetation resulting in blowouts. This and the removal of the willows to create more beach has resulted in erosion and depletion of the ridge by the same process that created it, the wind.

Inherent in this depletion of the resource is the depletion of the recreational experience. This is not necessary and with proper site design and management this ecological and visual degradation can be avoided or alleviated.

Study Objectives

The main objective of this study is to relate the recreational activities, the layout and the management of West Park more directly to ecological realities of the site.

Ancillary to this is the development of an understanding of the ecological processes affecting the beach ridge, the historical significance of recreation in the area and the recreational activities present at West Park and their impact on the landscape.



Figure 3. West Park from the air

Regional Context

Lake Manitoba is a remnant of Glacial Lake Agassiz. The evolution of Lake Manitoba has gone through several major phases, each being associated with a change in the lake's level. These in turn governed any alluvial activity (*Gilliland 1965*). As a result of the final phase, which has seen a rise in the lake level, the south shore has developed into a low sand ridge.

At its present level, Lake Manitoba has a surface area of 1,850 square miles, a drainage area of 31,000 square miles and a maximum depth of 29 feet. The shallow profile of the lake allows for the creation of wind tides which can, in a short period of time, raise the windward level of the lake several feet.

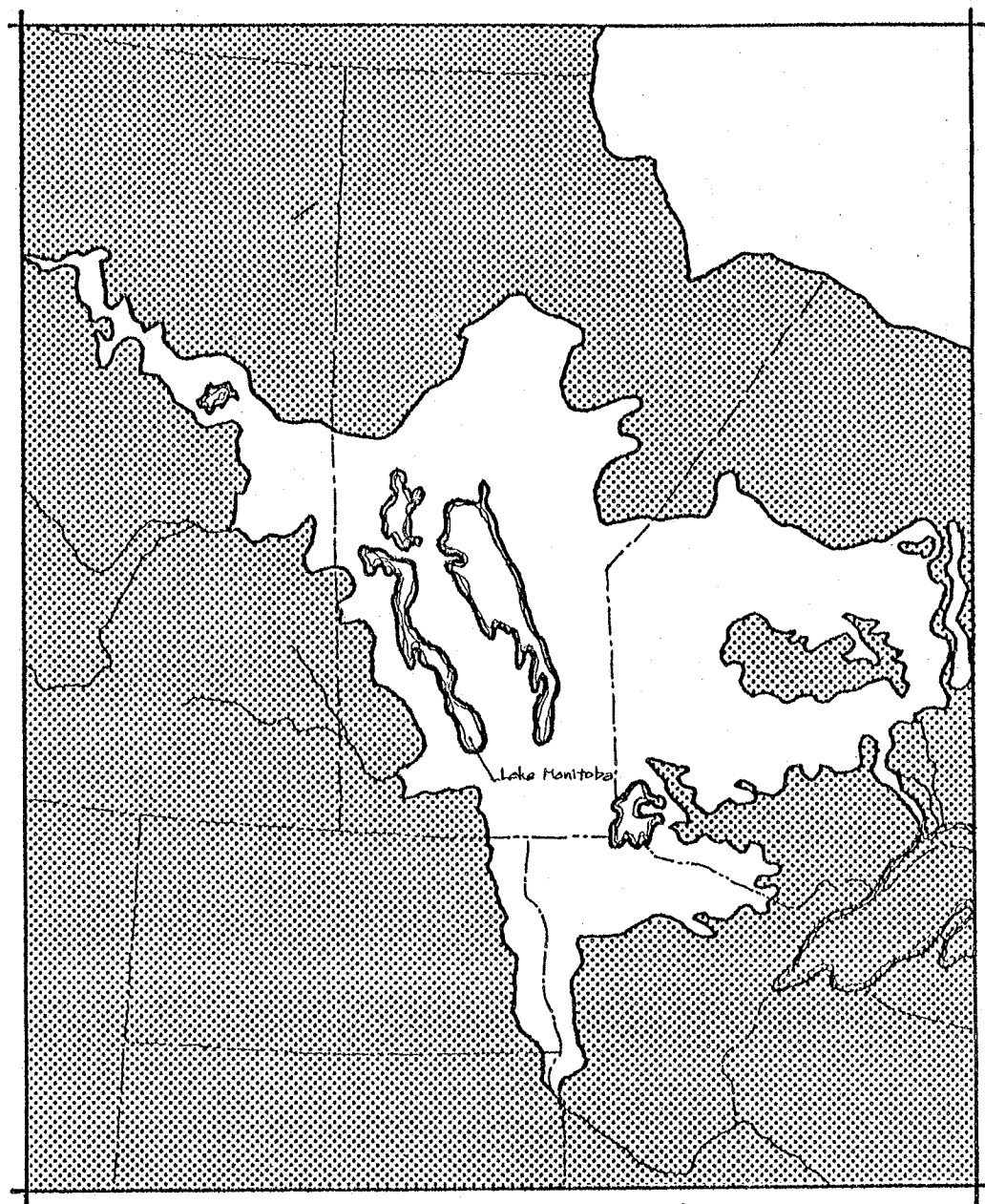


Figure 4. Schematic drawing, Glacial Lake Agassiz (Elson 1967)

Lake Manitoba Regulation

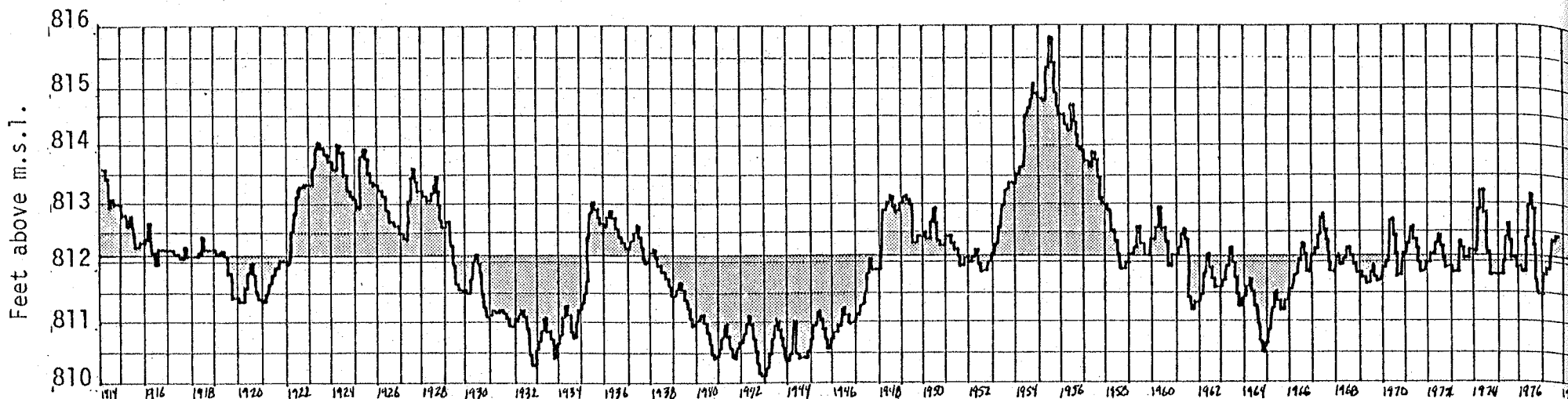


Table 1. Lake Manitoba Water Levels 1914-1977 (Water Resource Branch)

Since 1961 the level of Lake Manitoba has been regulated by the installation of the Fairford Dam at the outlet of the lake. The projected level of the regulation is 812.17 feet above m.s.l. which is the 50 year average from 1918 - 1967.

Although the long range impact on the beach ridge by this regulation is not fully understood, there are some major implications. The wave energy from major storms will be concentrated in a narrower range having a greater impact on the emergent zone of vegetation and the lake edge of the beach ridge. The lake currents will remain constant, whereas prior to the regulation they changed with any major fluctuations.

Climate Table 2

(*Bossenmaier 1968*)

	Portage la Prairie
Mean Monthly temperatures below 32°F	November to March
Mean monthly temperatures above 50°F	May to September
Maximum recorded temperature	106°F (40°C)
Minimum recorded temperature	-46°F (-42°C)
Precipitation annual mean	18.5"
Precipitation April to October mean	14.5"
Evapotranspiration loss annual mean	27.2"
Moisture deficit - annual mean	9.6"
Growing season mean moisture deficit	11.4"
Marsh ice-out	May 1 - 15
Freeze-up	November 1 - 15
Vegetative growing season	170 - 180 days

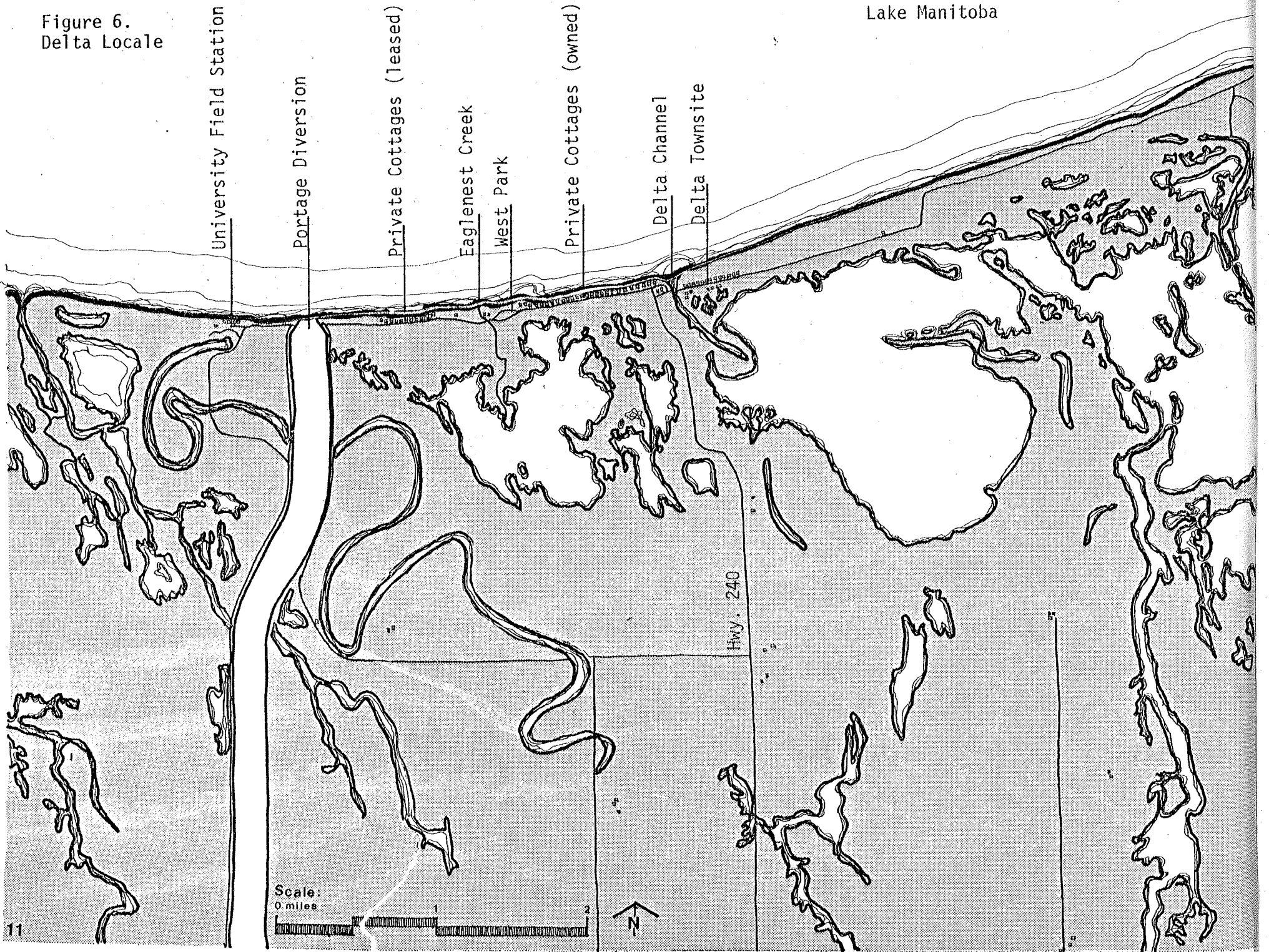
(*Evans, 1973*)

	Delta	Winnipeg
Rainy days	75	90
Mean annual snowfall	45.5"	54"
Number snow days	41	53

Two important factors to consider with reference to the climate are:

1. The annual mean moisture deficit of 9.6" illustrates the importance of winter snow accumulation on the beach ridge and the need for vegetation associations capable of conserving available moisture.
2. The size of Lake Manitoba exerts a general cooling effect on the climate except in late summer. "Mean daily temperatures at Delta are 2.3°F (1.28°C) below Winnipeg in January, 6.2°F (3.44°C) in February and 1.6°F (0.89°C) in July. August and September means are 0.5°F (0.28°C) and 1.6°F (0.89°C) above Winnipeg respectively." (*Evans, 1973*)

Figure 6.
Delta Locale



Historical Context

Delta became a name and place when, in 1900, J.J. Hill and the Portage Northwestern Railway Company pushed a rail line north from Portage la Prairie to Lake Manitoba. The station on the beach ridge was named Delta. It was the fourth station on the line, the first being Alpha. Here, a pier was constructed out into the lake 1,100 feet to facilitate the unloading of steamboats and barges (figure 7) loaded with gypsum, lumber and fish.

With the railway link to Lake Manitoba many fishermen built permanent homes and settled at Delta. By 1902 several major changes had occurred. Totogan (now Lynch's Point) had taken over the majority of the lake/rail trade, the C.P.R. secured the title to the land between Delta Channel and Eaglenest Creek, stopping any further rail expansion along the ridge, and the Portage Northwestern Railway Company was

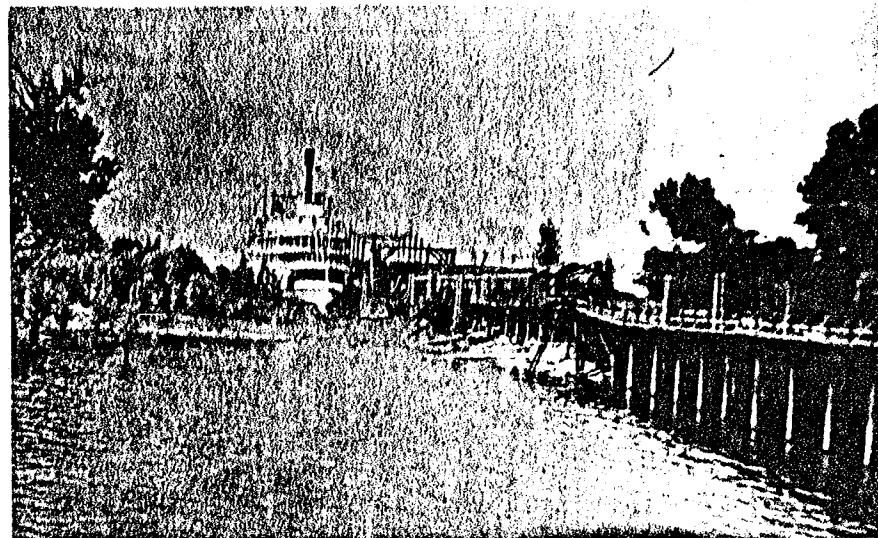


Figure 7. Steamer and Train at Delta, 1900



Figure 8. Armstrong Fish Sheds, circa 1902

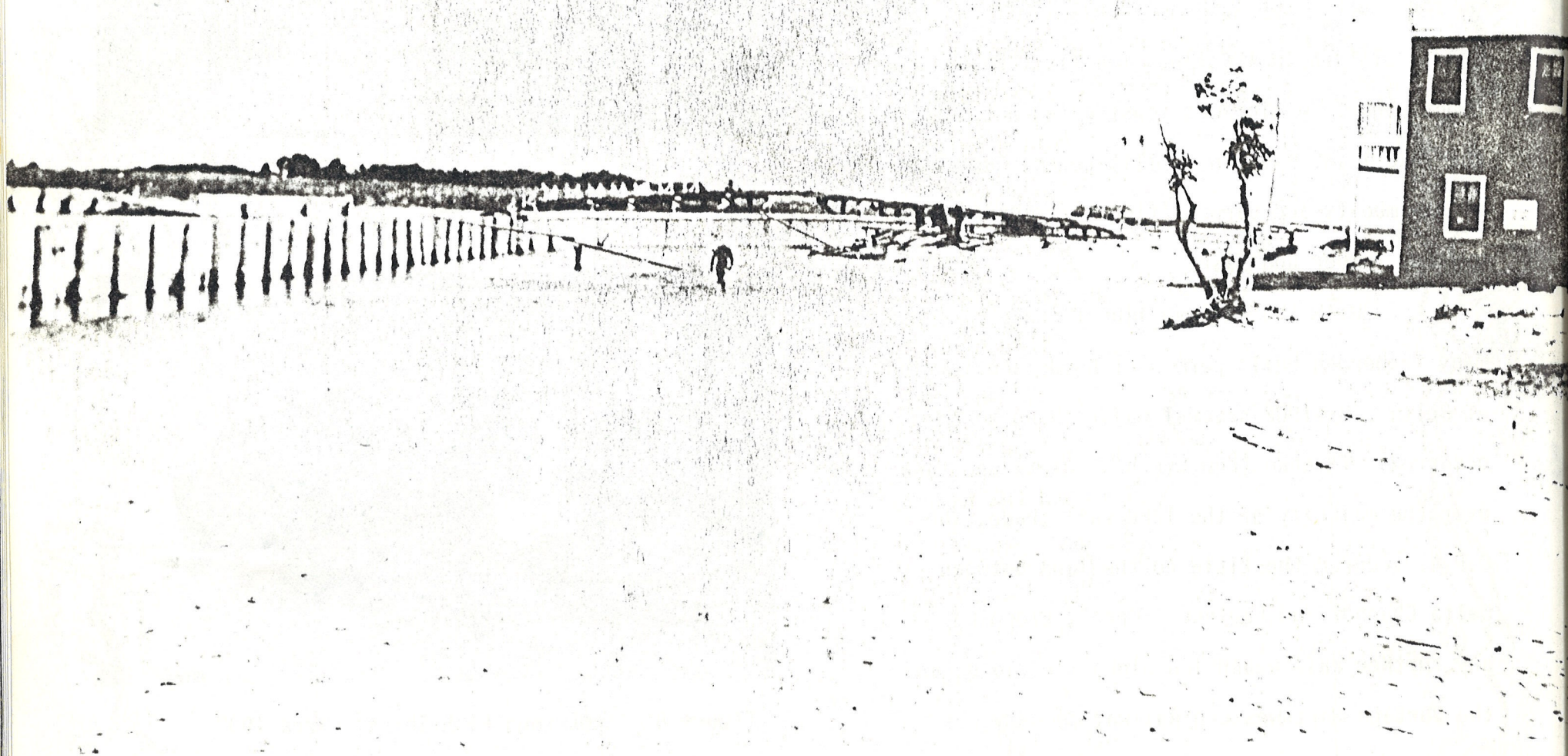


Figure 9. Erosion at Delta Channel, circa 1902

acquired by the Canadian Northern Railway Company. Only two years after Delta was founded the boom of recreation excursionists was in full swing (figures 10 and 11) and the railway changed over to more of a passenger service than a freight carrier. The services (stores, hotel, dance hall), to support this growing trade, soon appeared and clustered around the Delta Channel and the railway station.

It was not long, with this concentrated use, before the fragile nature of the beach ridge became evident. By 1913 the pier had been destroyed by ice action on the lake. The intensity of use around the railway station, store and channel, so exposed the sand (figure 9) that wind and wave action had eroded the channel to the extent of

Coronation Day at Delta

Do not hesitate to be there and drink in the fresh breezes from Lake Manitoba. It will do you good.

An Excursion under the auspices of the Portage Orangemen will be run to Delta, the popular summer resort, via C. N. R. on Coronation Day,

Saturday, August 9th, 1902.

Splendid opportunity to use your bathing suit; bring it along. Twenty large sail boats will be on the beach for use of excursionists. A gala time is in store for all.

Be there when the train goes and escape the sweltering heat for one day anyway.

Fare for Round Trip: From Winnipeg, \$1.25; Oakville, 85c; Portage la Prairie, 50c. Children half fare. Tickets good to return Monday morning.

THOS. WATERS,
Secretary

F. A. CONNER,
Chairman

Figure 10. From the Portage Daily Graphic, August 2, 1902. Approximately a thousand people would flock to Delta on a summer weekend.



Figure 11. Excursionists on Beach and Pier, circa 1901

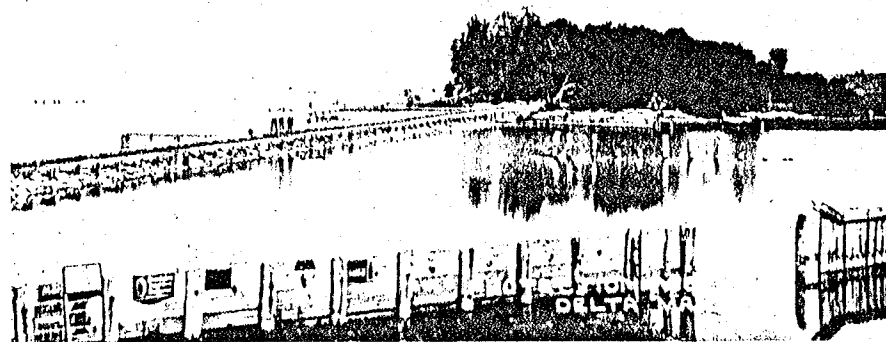


Figure 12. Protection Works, circa 1920's

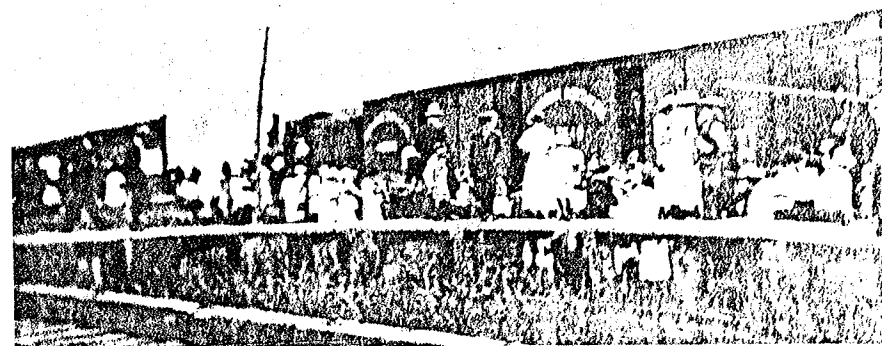


Figure 13. Train at Delta, circa 1915

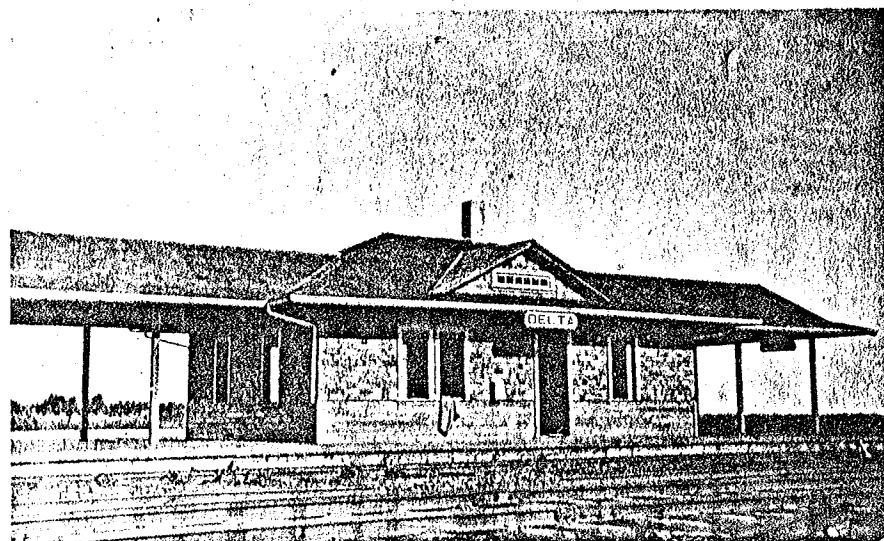


Figure 14. Station last used 1941, burned down in 1950's



Figure 15. MacDonald Bros. Store and Hotel circa 1920's. Built by Mr. Palmer

endangering the fish sheds and railway. The result was the construction of a breakwater sealing off the channel from the lake.

Between 1900 and 1913 many prominent Portage la Prairie residents built summer homes on the ridge on the land then owned by the C.P.R. (figure 16). As the C.P.R. would not sell portions of their holdings, the cottage owners under J.J. Garland formed a syndicate (now the Delta Beach Association) and purchased the C.P.R. land. They then filed Plan 427 subdividing the beach ridge into cottage lots approximately one half acre in size. This plan covered the land from Eaglenest Creek to the C.N.R.'s holdings by the Delta Channel. These lots were then put up for sale, although it was not until the late 1930's that the majority of lots were sold and the subdivision filled in. Since that time many of the



Figure 16. Cottage, circa 1905. Note Cottonwoods next to cottage



Figure 17. The Beach, circa 1905, prior to cottages



Figure 18. Children at the beach



Figure 19. Picnic on meadow, circa 1920

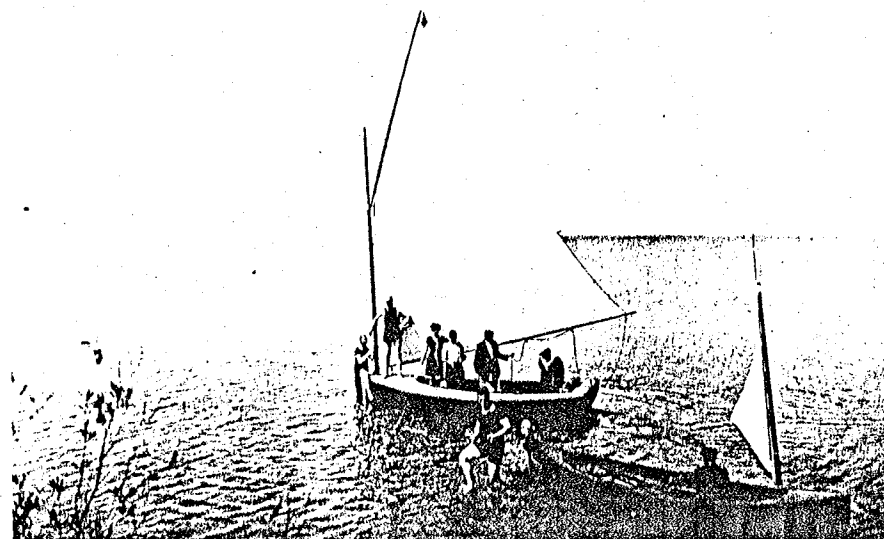


Figure 20. Sailing, circa 1920

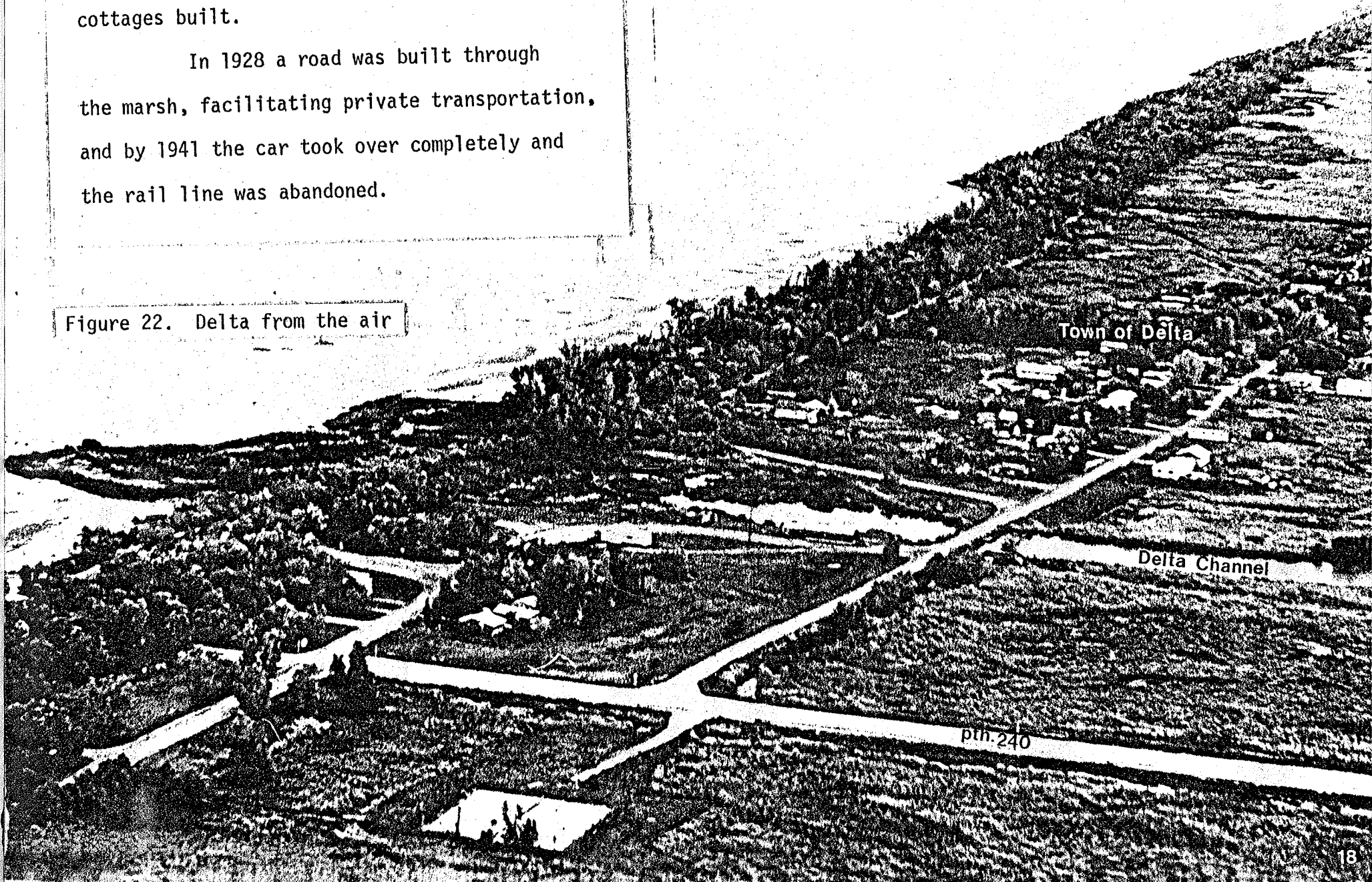


Figure 21. At the cottage, circa 1910

original lots have been subdivided and new cottages built.

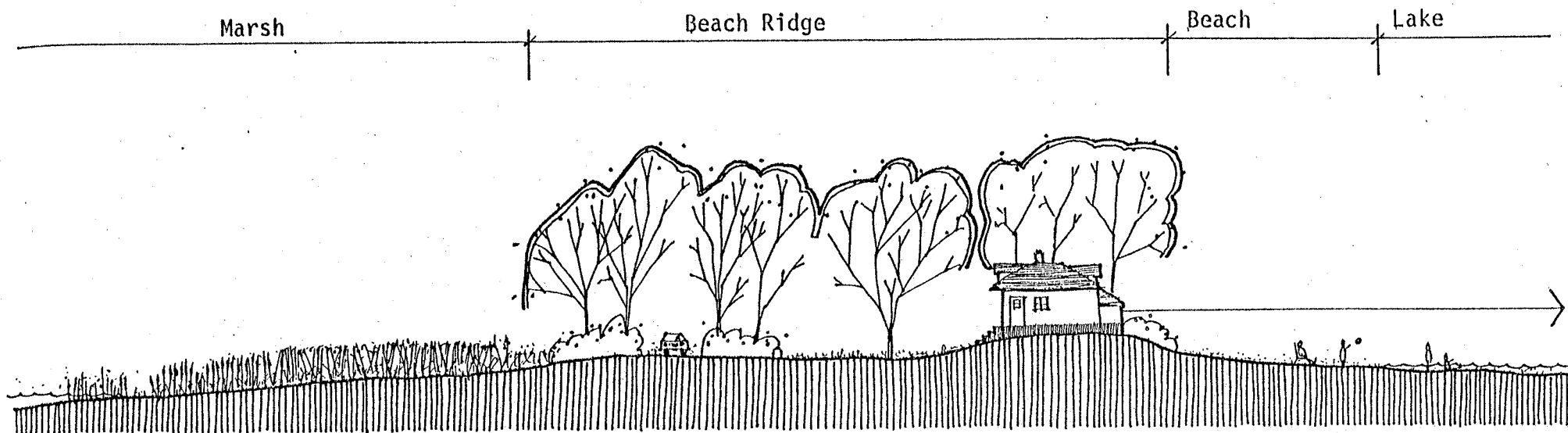
In 1928 a road was built through the marsh, facilitating private transportation, and by 1941 the car took over completely and the rail line was abandoned.

Figure 22. Delta from the air





19 Figure 23. Cottages at Delta. Note foreshore erosion.



Typical Cottage Profile Figure 24

While individual cottages may not have an appreciable impact on the beach ridge, when viewed collectively the cottages at Delta have caused some significant changes to the environment.

- removal of emergent vegetation through the active use of the beach.
- siting of the cottage is usually on the highest most exposed sections of the ridge for protection from flooding and to provide a view of the lake.
- foreshore shrubs are cleared for access to the beach.
- Poplars are selectively removed in fear of wind throw damage to cottages.
- cleared lawn area usually to the south of the cottage, removes moisture conserving ground vegetation and organic matter.
- access for and parking of vehicles further removes vegetation and compacts the soil.



Figure 25. boating on eaglenest creek circa 1910

West Park

West Park came into being in the late 1930's when the Municipality of Portage la Prairie acquired Lots 1, 2, 5-14, of the original subdivision, from Mr. S. M. MacDonald who ran the hotel and store in Delta. Lots 3 and 4 (now cottage no. 100) are today surrounded by the park and are privately owned. It was in the late 1930's and 1940's that the park saw its most active use. Several thousand people were said to have been packed onto the beach on a hot weekend and the park itself became an instant parking lot.

As West Park is the only public beach in the area, and is only 14 miles north of Portage la Prairie, it has, over the years, developed a large following of local residents who use it as a picnic site/beach facility or overnight campground. Although the municipality provided a



Figure 26. Cottage lot no. 100

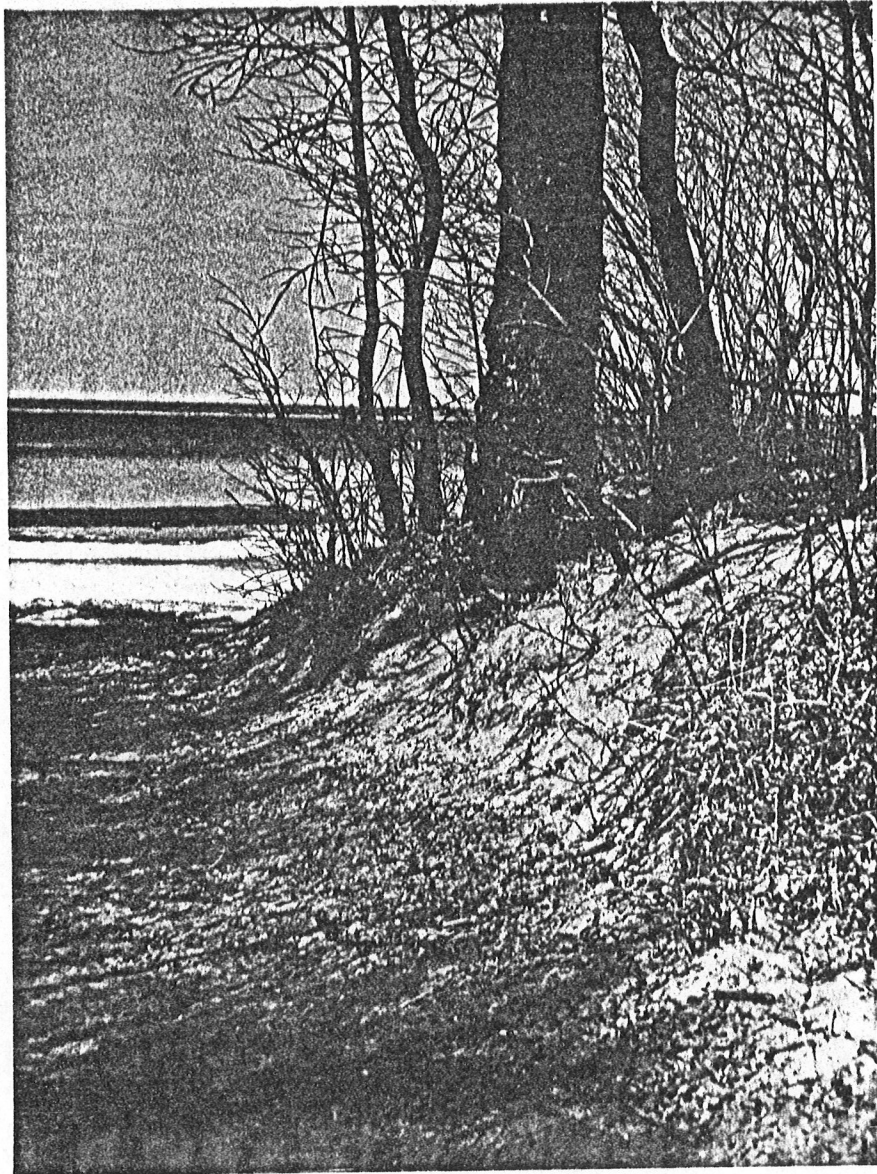


Figure 27. Pathway erosion

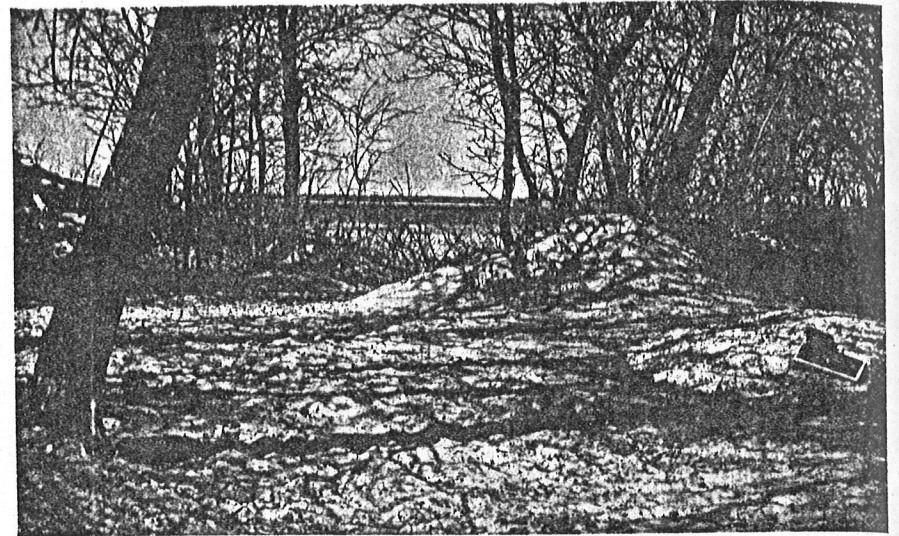


Figure 28. Overall erosion

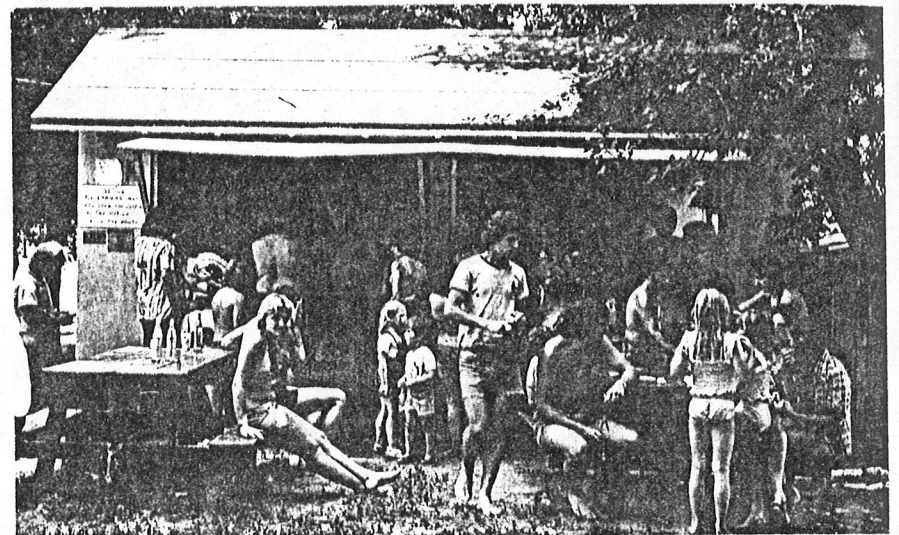


Figure 29. Concession stand

few facilities (a concession stand, one wash-room facility, several vault privies, telephone, a picnic shelter, two delapidated change houses, and hydro for trailers), it has on the whole left the park to be run by the people, placing very few restrictions on behavior or use. Several things that are generally expected but not provided are potable and/or washing water, firewood and picnic tables. As a result the park now stands as a shocking example of man's misuse of a resource (similar in context to the Delta Channel in the early 1900's) and is on the brink of irreversible damage.

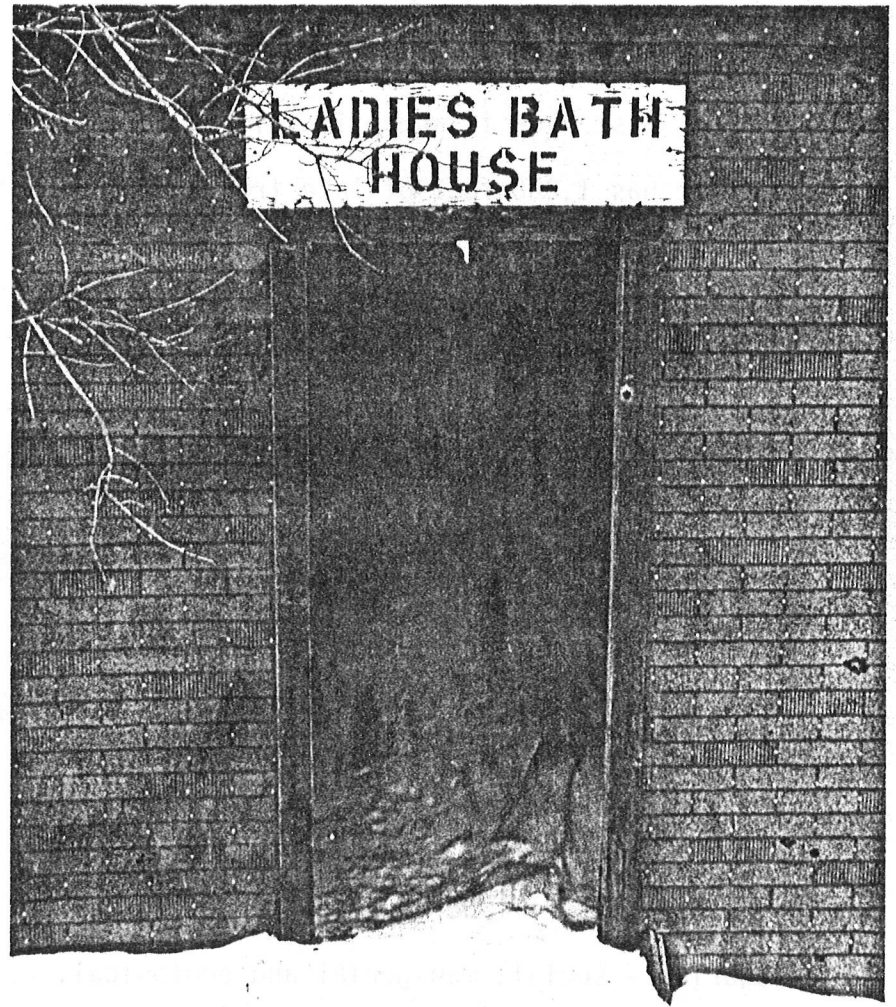


Figure 30.

West Park is approximately 15 acres in area. It has 1,850 feet of lake frontage, of which 1,150 feet is exposed beach. On a warm summer day between 300 to 500 people will be enjoying the beach/water at one time. Even though the park is relatively small for this heavy use, the intensity of use varies over the site. The most dense concentration of people occurs between the concession stand and the changing houses. Here, cars, trucks, tents, tent trailers and picnickers are shoulder to shoulder (see adjacent photos), and the resulting conflicts are the most obvious. The nature of these conflicts will be described under three categories - social, managerial and ecological.

The social conflicts that occur with the use of West Park are closely related to the lack of definition in the layout of the park and the conflicting spacial requirements of the different user types. Day use of the park is

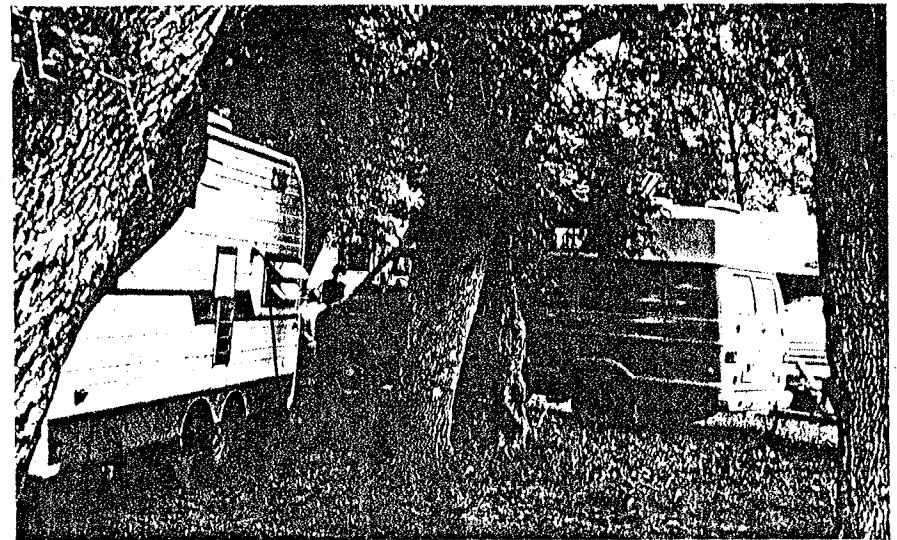


Figure 31. West Park camping



Figure 32. Traffic and parking congestion

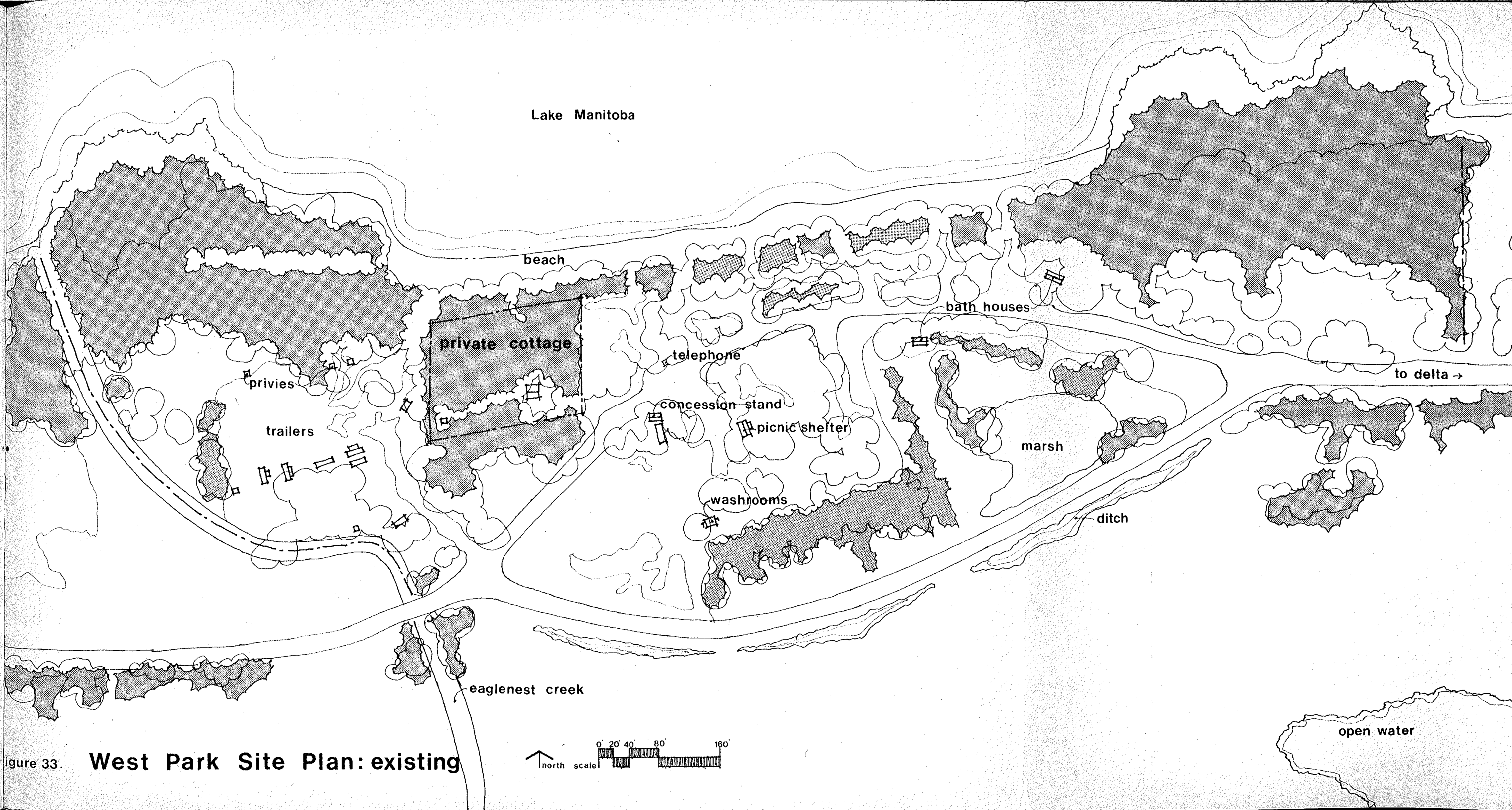


Figure 33. West Park Site Plan: existing

Table 3.

User Origin, Mode of Recreation and Length of Stay, compiled from the Municipality of Portage la Prairie overnight permit receipt books May to August, 1977. (Note: These figures do not contain the 4 permanent trailers or their length of stay.)

<u>User Home Address</u>	<u>No. of Permits</u>	<u>% Total</u>
Portage la Prairie	91	33
Rural Manitoba	79	29
Winnipeg	54	19
Other Provinces	18	7
Brandon	14	5
Unknown	16	6
Out of Country	<u>3</u>	1
	<u>275</u>	

	<u>Mode of Recreation and Length of Stay</u>											
	<u>Trailers</u>		<u>Tents</u>		<u>Tent Trailers</u>		<u>Campers</u>		<u>Motor Homes</u>		<u>Total</u>	
	<u>No.</u>	<u>Nights</u>	<u>No.</u>	<u>Nights</u>	<u>No.</u>	<u>Nights</u>	<u>No.</u>	<u>Nights</u>	<u>No.</u>	<u>Nights</u>	<u>No.</u>	<u>Nights</u>
May - June	8	19	30	62	9	13	3	4	1	1	51	99
July 1st weekend	(9	12)	(22	36)	(17	24)	(1	1)	-	-	(49	73)
July	40	128	65	171	61	142	13	27	2	2	181	470
August	13	162	13	36	8	26	8	28	1	1	43	253
Total	61	309	108	269	78	181	24	59	4	4	275	822
% Total	22	38	40	33	28	22	9	7	1	1		
Average length of stay	5		2.5		2.3		2.5		1		3.0	

free and overnight users are charged (permits issued at the concession stand), \$1.50/night for tents, \$2.00/night for trailers and 75¢/night for hydro.

The park is basically laid out as a "first come first served" facility, with the exception being the area set aside for trailers only. The car has taken over as the dominant element. On a busy day nearly all cleared level land (be it one foot away from someone's tent or blocking a path to the beach) becomes a parking spot. The main generator of this car traffic is the day user (approximately three times as many day users as overnight users). The ease of access to Portage la Prairie and the Portage Plain makes West Park an ideal location to service this population, which comes often on the spur of the moment to have a swim or enjoy a family picnic. Facilities for this



Figure 34. Parking

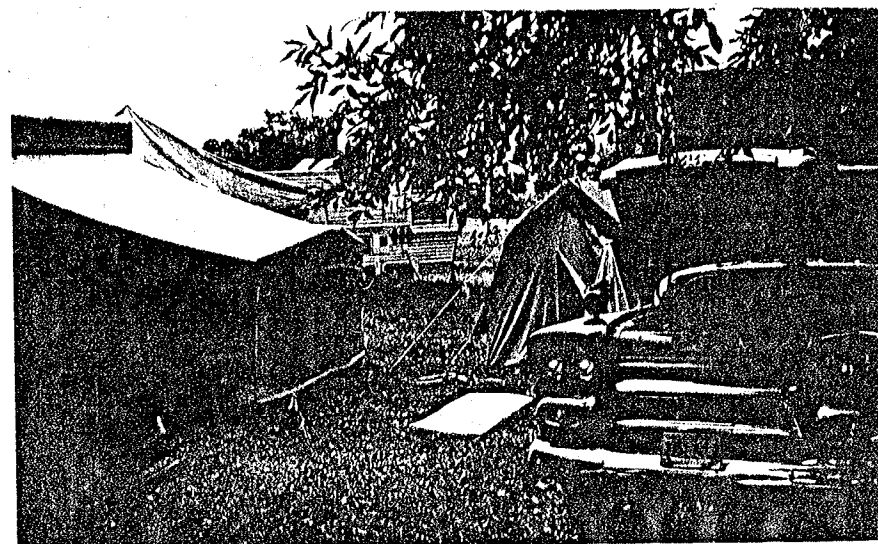


Figure 35. Camping congestion



Figure 36. Parking encroaching on beach.
Note pathway erosion



Figure 37. Concession stand

type of use are lacking. The concession stand is heavily used by this group but washroom and changing facilities are inadequate. Much of the land that is ideal for having a picnic is occupied by cars for parking and their resultant density, with their heat, fumes, noise, dust and danger element, has an overall deleterious effect on the recreational experience.

The overnight user (particularly the tent and tent trailer user), on the other hand, is often at the mercy of the day users. Selection of a camping spot is at the discretion of the camper, once the permit has been obtained. There is no assurance however, that the site surrounding the tent or tent trailer will not become a parking lot when the park is busy, or that the camper will have any visual privacy at all. The majority of overnight users, like the day users, are from the general area (Table 3).



Figure 38. Day-use parking

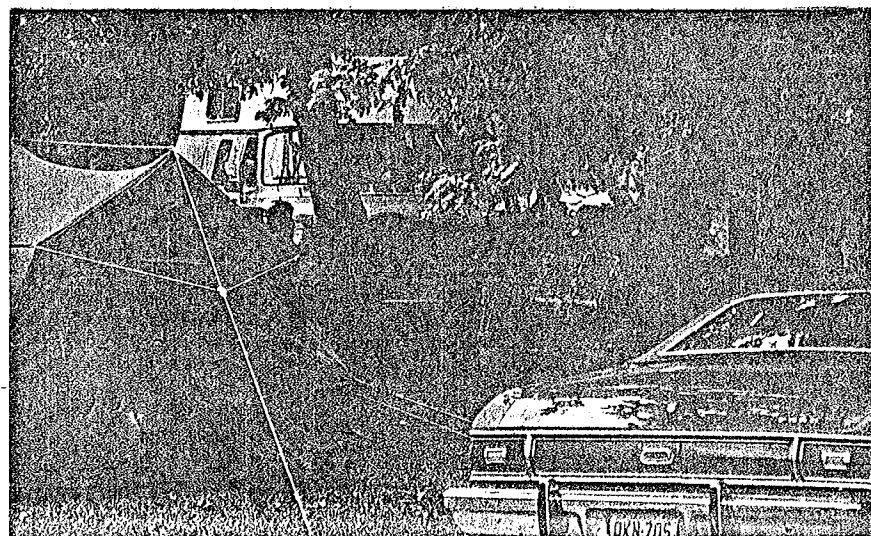


Figure 39. Parking vs tenting



Figure 40. July 1st, 1978, a relatively busy day, saw, at one time, 180 people in the water, 170 people on the beach, approximately 100 picnickers, 170 vehicles, 25 tents, 20 trailers, 6 tent trailers, at West Park.

Those in trailers on the average stay twice as long as those in tents or the tent trailers, and as a result the trailers are segregated away from the day users, avoiding any conflict over space. While the trailers do have hydro hookup, there is no potable water on the site and many use either boiled lake water or bring water from town. Washroom facilities are inadequate, there being only a few vault privies at the trailer site and no pump out station for the trailers with toilets.

The tents and tent trailers, being more transitory (average length of stay 2.5 and 2.3 days respectively) are located with the day users and run into conflicts over space, privacy and inadequate facilities. One facility that is often overlooked in small campgrounds is a children's play structure, which would be especially useful when a wind tide on the lake restricted the use of the beach.



Figure 41. Day-use vs overnight use



Figure 42. Beach inundated by wind tide

The park is owned and operated by the Municipality of Portage la Prairie. The municipal officials do not feel any real commitment to the park because they feel that it is too small to be of any significance. The concession stand is leased out to local residents and while the operators appear to be in charge of on site management, they are obliged only to maintain the concession stand, its service and to sell overnight camping permits.

Although the layout of the park itself is a managerial problem, demonstrating a basic lack of understanding of the environment, it also illustrates some other major conflicts. Firstly, the lack of control over access and use/misuse of the site and the subsequent lack of ability for on site control, shows the absence of any overall use policy. Secondly, the park maintenance, both in terms of provision

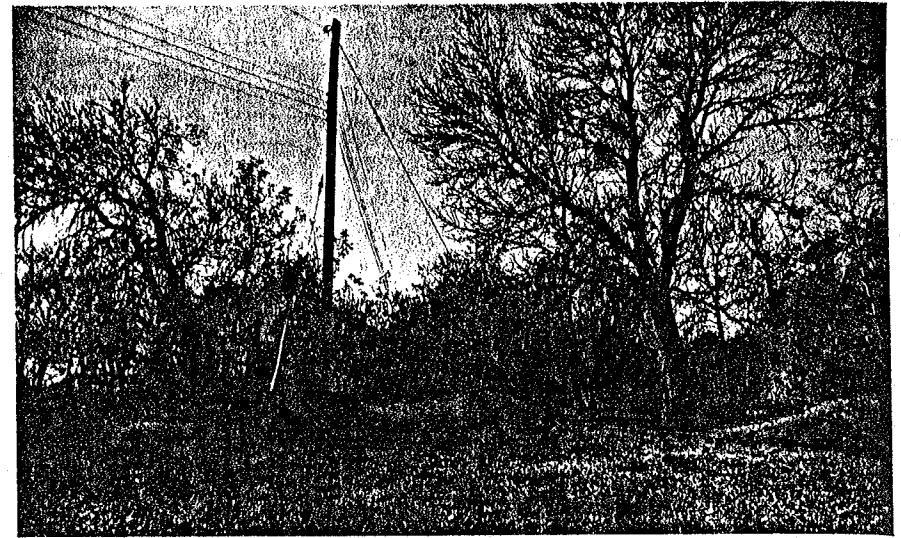


Figure 43. Approximately 2 1/2 feet of soil lost

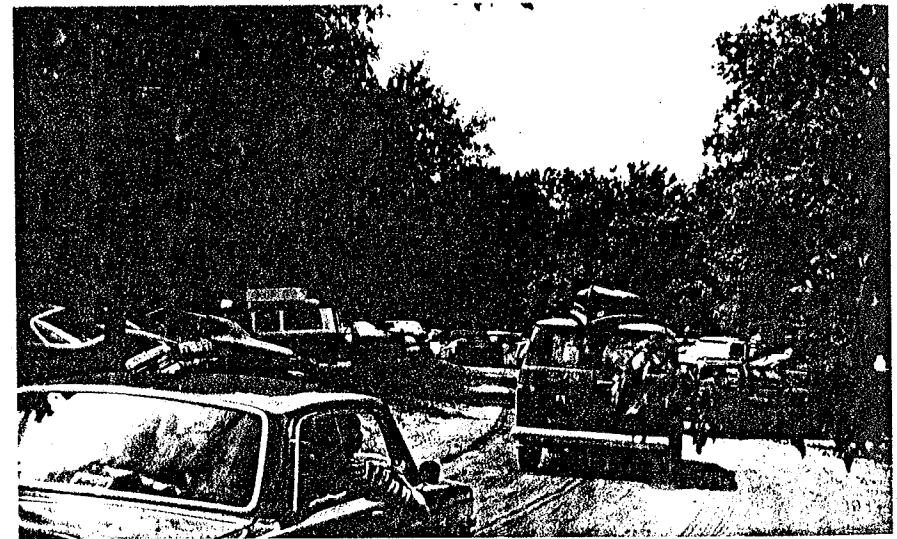


Figure 44. Traffic congestion

and upkeep of facilities, is after the fact rather than preventative and is in the unfortunate position of always trying to catch up. This has ramifications right down to the lack of concern that many users express towards the park and its facilities.

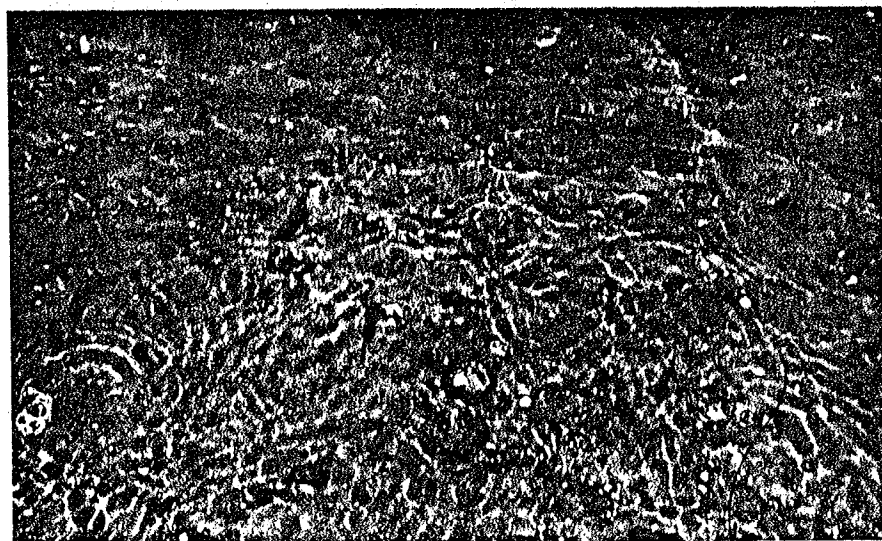


Figure 45. Bottle caps and litter in water

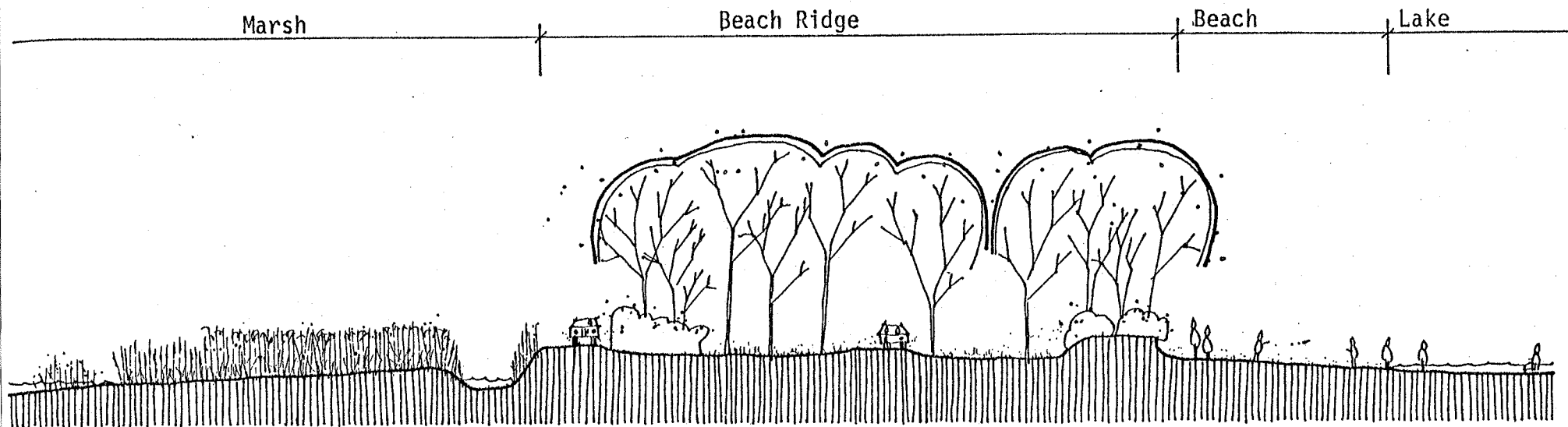


Figure 46. Impact of the car is everywhere

Table 4., Quarter Method, (Cottam and Curtis 1949) Tree Density & Dominance Calculations for West Park and an Adjacent Property

	<u>Adjacent Property</u>	<u>West Park</u>
1. Mean Distance	6.05 ft.	10.09 ft.
2. Total No. Trees/acre	1190 t/ac.	427.9 t/ac.
3. Relative Density:		
Maple	65%	36.4%
Ash	25%	47.8%
Elm	5%	4.5%
Willow	-	6.8%
Cottonwood	5%	-
Hackberry	-	4.5%
4. Relative Dominance:		
Maple	24.8%	30.1%
Ash	31.8%	52.4%
Elm	2.6%	4.6%
Willow	-	10.2%
Cottonwood	40.9	-
Hackberry	-	2.7%
5. Basal Area per Tree	98.3	45.5
6. Absolute Density - t/ac.		
Maple	773.5	155.8
Ash	297.5	204.5
Elm	59.5	19.3
Willow	-	29.1
Cottonwood	59.5	-
Hackberry	-	19.3

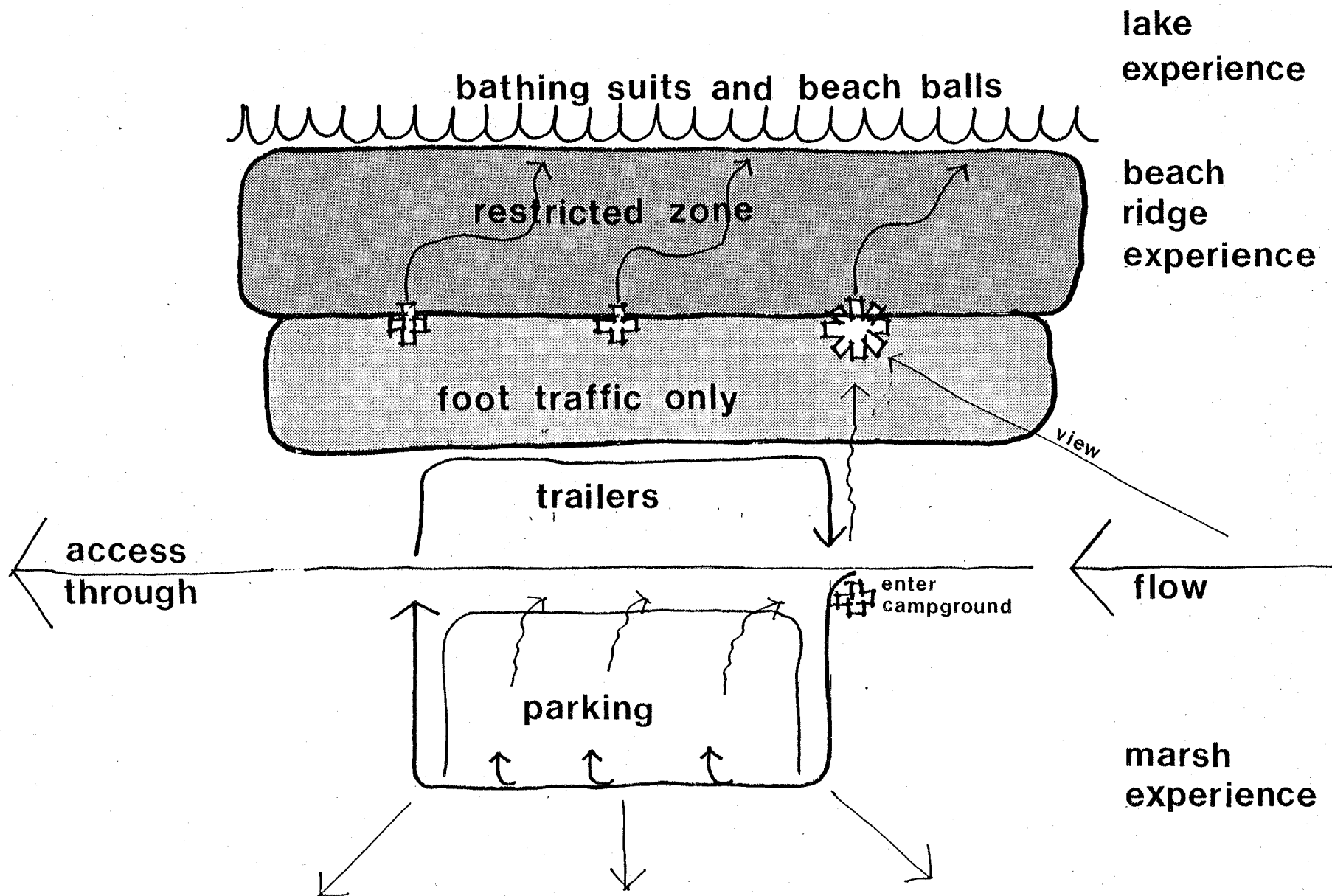
The development and use of West Park has meant the clearing of the existing shrub and ground vegetation from the level dry land. This initial clearing and the continual use of the park (particularly the uncontrolled use of the car) has prevented the growth of any new trees or shrubs. The effect of this is very obvious when compared to cottage no. 100, which is surrounded by the park. Here, the lot was not cleared and was left in a natural state. In comparison (Table 4), the cottage site has a more luxuriant growth, a much denser canopy and a higher percentage of young trees (mostly Manitoba Maple). There was also no sign of wind damage to the trees on the cottage site, while there were several dramatic examples of wind thrown and broken trees in the park.



West Park Profile Figure 47.

Some of the major aspects of the conflicts between the use of West Park and the ecology are:

- the emergent vegetation has been removed through the active use of the beach;
- the foreshore shrubs have been cleared for greater beach areas;
- the dry level land has been cleared for camping and parking, removing the moisture conserving ground vegetation and organic matter, as well as restricting the growth of young trees, resulting in a decrease in the tree canopy;
- the highest, most exposed section of the ridge has been breached in numerous places, removing the vegetation and thus exposing the sand to the wind. This has resulted in the erosion of deep channels.
- the unrestricted use of the car has resulted in further disturbance to the soil and varying degrees of soil compaction on the site.
- the absence of firewood has meant the damage or destruction of many trees and shrubs.



Conceptual Plan:

Figure 48.

West Park Design Proposal

If West Park is considered as a resource for future generations, then a commitment has to be made by the government, either municipal or provincial, to ensure the quality of the environment and the recreational experience. As can be seen from the examples of Delta at the turn of the century and the present situation at West Park, people, when allowed to use this resource at their own convenience, will through their enthusiasm destroy it. In the context of an environment as fragile as this, the design and management of the facility is of paramount importance.

This proposal to redesign the layout and management of West Park is seen as an attempt to better service the existing use within the context of the ecological realities of the beach ridge. One of the most pervasive problems at West Park is the accommodation of the car on the site.

The redesign of West Park is built around the development of a hierarchy of manageable impact (Figure 48.), with cars at one extreme and bathing suits and beach balls at the other. This hierarchy is necessary to allow for different uses and user preferences and to reduce the user impact in the ecologically sensitive zone adjacent to the beach. With the breakdown of this hierarchy into zones, the emphasis becomes placed on the boundaries where the orientation and control of the flow of users takes place.

This orientation must be an ongoing process, with the visitor's first view into the park (to the concession stand) later reinforcing the movement from the parking lot to concession stand to the beach, the site revealing itself piece by piece ending in the element of surprise when the beach is reached.

This proposal (Figure 49.) proposes some major changes to the existing park. They are:

- the reforestation and restriction of use of the beach ridge adjacent to the beach;
- access to the beach by means of fenced pathway and boardwalk over the highest, most exposed portion of the ridge;
- the extension of the beach 150 feet to provide more usable dry beach;
- development of a parking lot south of the perimeter road to control the use of the car to a manageable zone (190 normal vehicles, 13 long wheel base or tandem units);
- tree and shrub plantings in the parking lot to visually extend the beach ridge past the road into what was formerly wet meadow;
- elimination of the road through the centre of the park, access to be controlled at entrance booth;
- thirty-seven campsites (13 individual tent sites, 4 small group tent sites, 12 tent trailer sites and 8 trailer sites) separated by planting strips, no parking associated with the sites, drop-off zone for tents and supplies provided. Washroom facilities, children's play structure, water and firewood provided in tent and trailer areas;
- concession stand and washroom/change facilities for day use provided on pathway to beach. Firewood and picnic tables also provided;

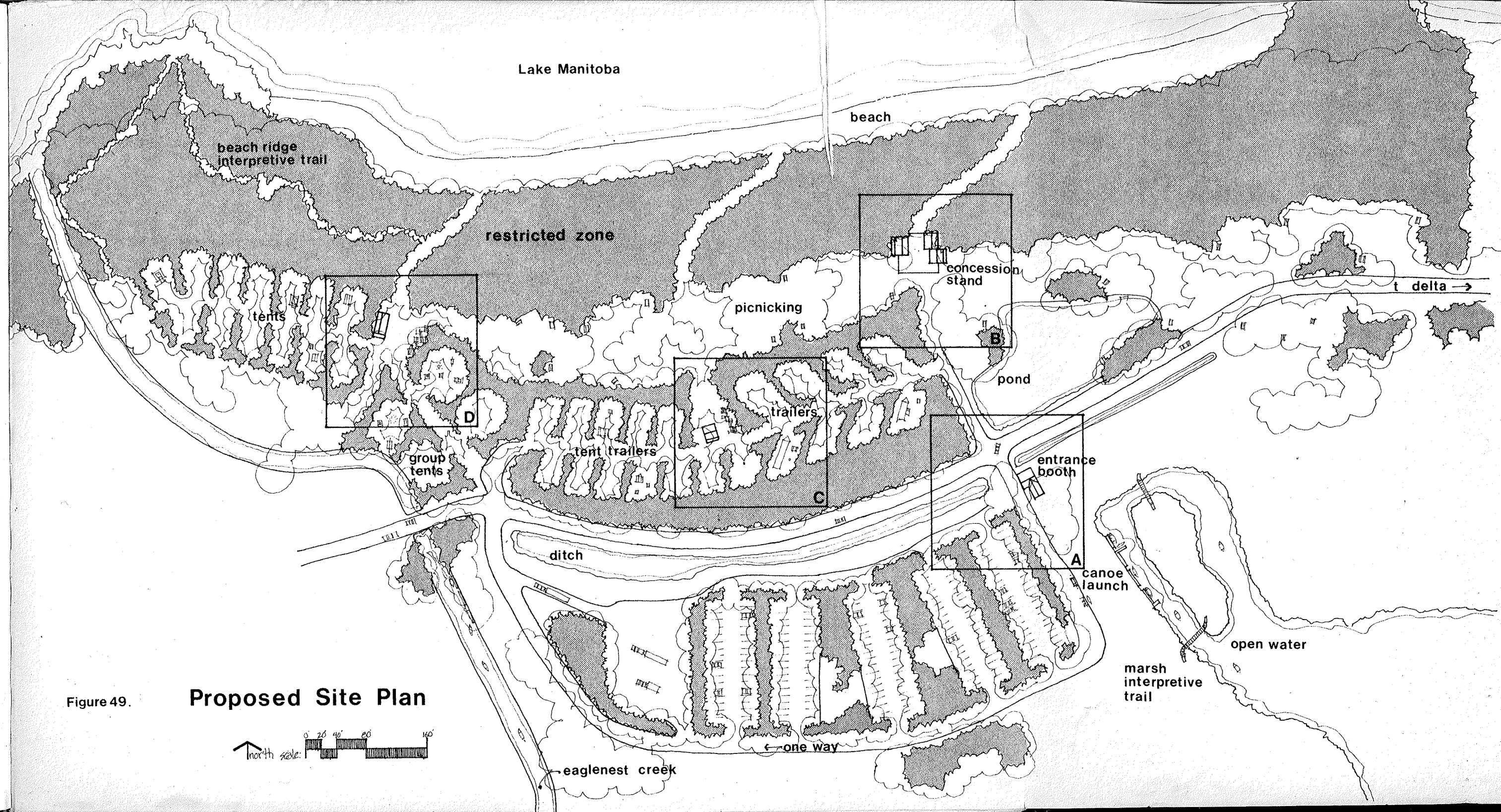


Figure 49.

Proposed Site Plan

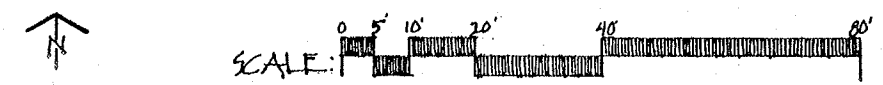
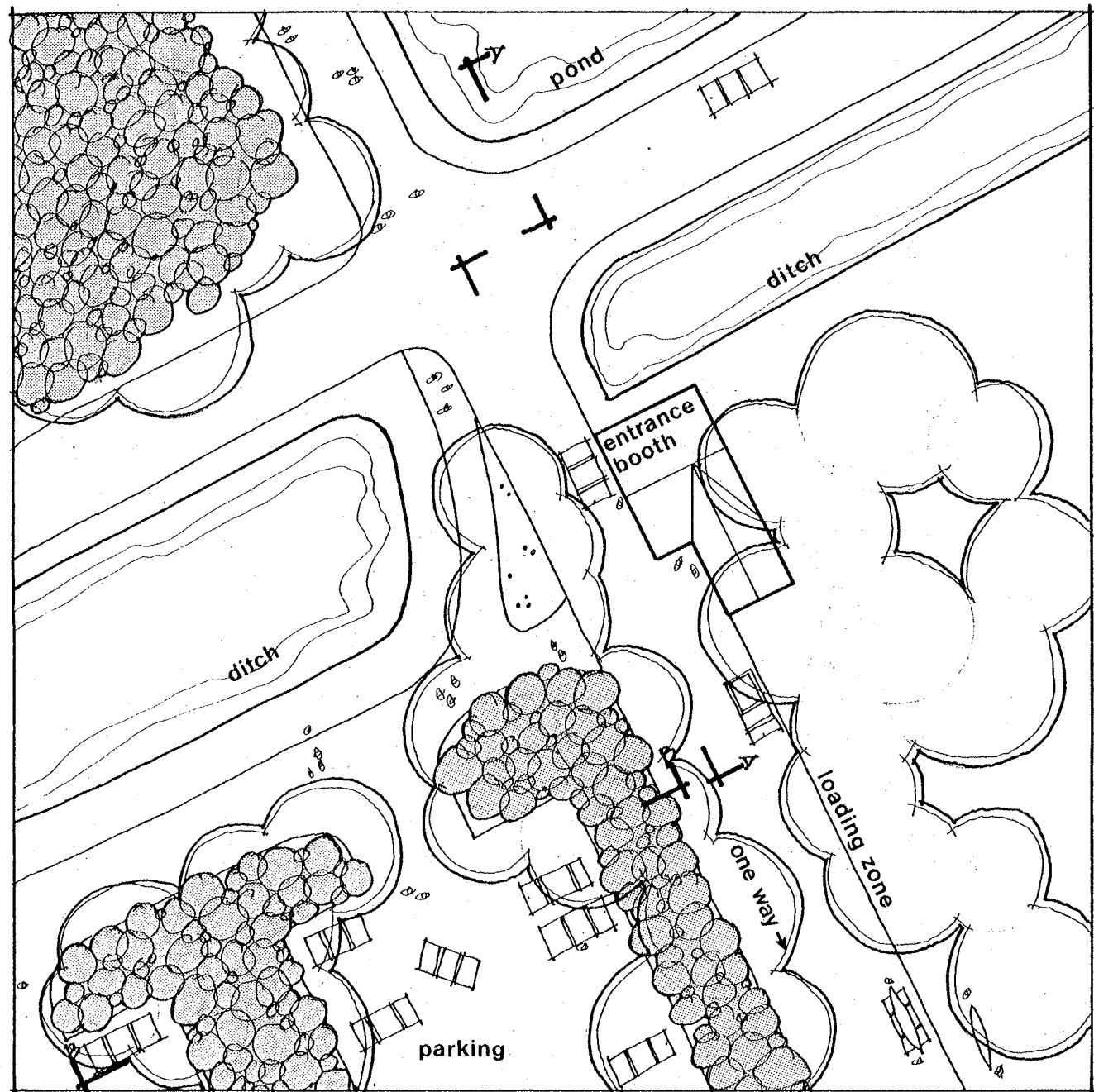
- dredging out of the existing ditches, the marsh in the park, Eaglenest Creek and an extension of the open water of the marsh to give more visual contact with water (image of the marsh) and provide canoe access into the marsh;
- the development of marsh and beach ridge interpretive trails to help explain the environment and the changes made in the park to the visitor;
- cottage lot no. 100 would be acquired and preserved in its natural state.

Access to the site is regulated by controlling the car, through separation of the parking from the rest of the park. The entrance booth acts as the control agent. Here, permits are issued, fees collected, information on the park given out, and if need be (e.g. park full), access restricted. It also provides washroom facilities (pump out) and storage for maintenance equipment. The planting in the parking lot is treated as an extension of the beach ridge to give the visitor the feeling of having parked on the beach ridge rather than in the marsh and to break down the perceived scale of the lot.

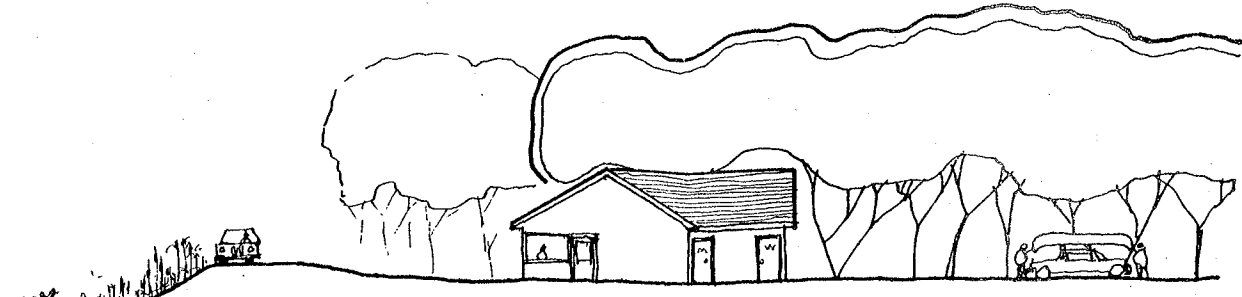
The parking allows for a maximum of 400 to 500 day users and approximately 100 overnight users. After parking, the visitor would continue as a pedestrian towards the entrance booth, then to the concession stand which is in view several hundred feet away.

Adjacent to the entrance booth is a pull-over zone for the unloading of canoes or picnic supplies. The extension of the open water of the marsh and the dredging of Eaglenest Creek provides access to one cell of Delta Marsh, which can be further reduced in size if the impact by canoeists is too great. The dredging of the ditches and pond (which are interconnected to the marsh) would be to a depth of 4 or 5 feet with a 4:1 profile to slow down the infilling by emergent vegetation, the fill being used to build up the adjacent land. The decision to re-open Eaglenest Creek to Lake Manitoba would have to be made in conjunction with a marsh management plan and even so would not be seen as a means of launching boats into Lake Manitoba.

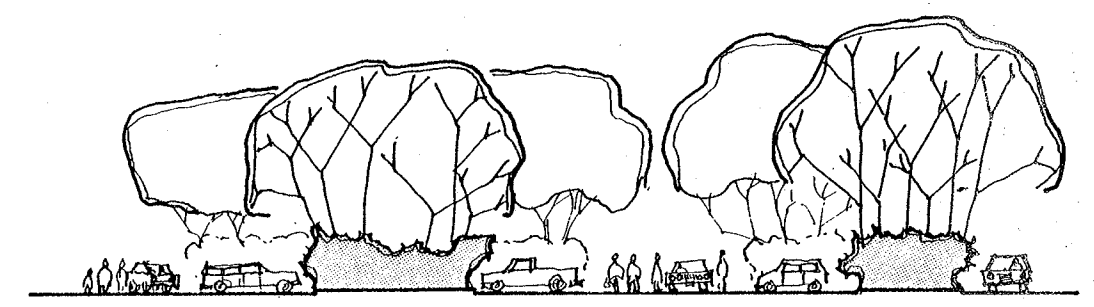
separation of the parking from the
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Detail A



section A-A
 entrance booth
 washrooms
 storage
 loading zone



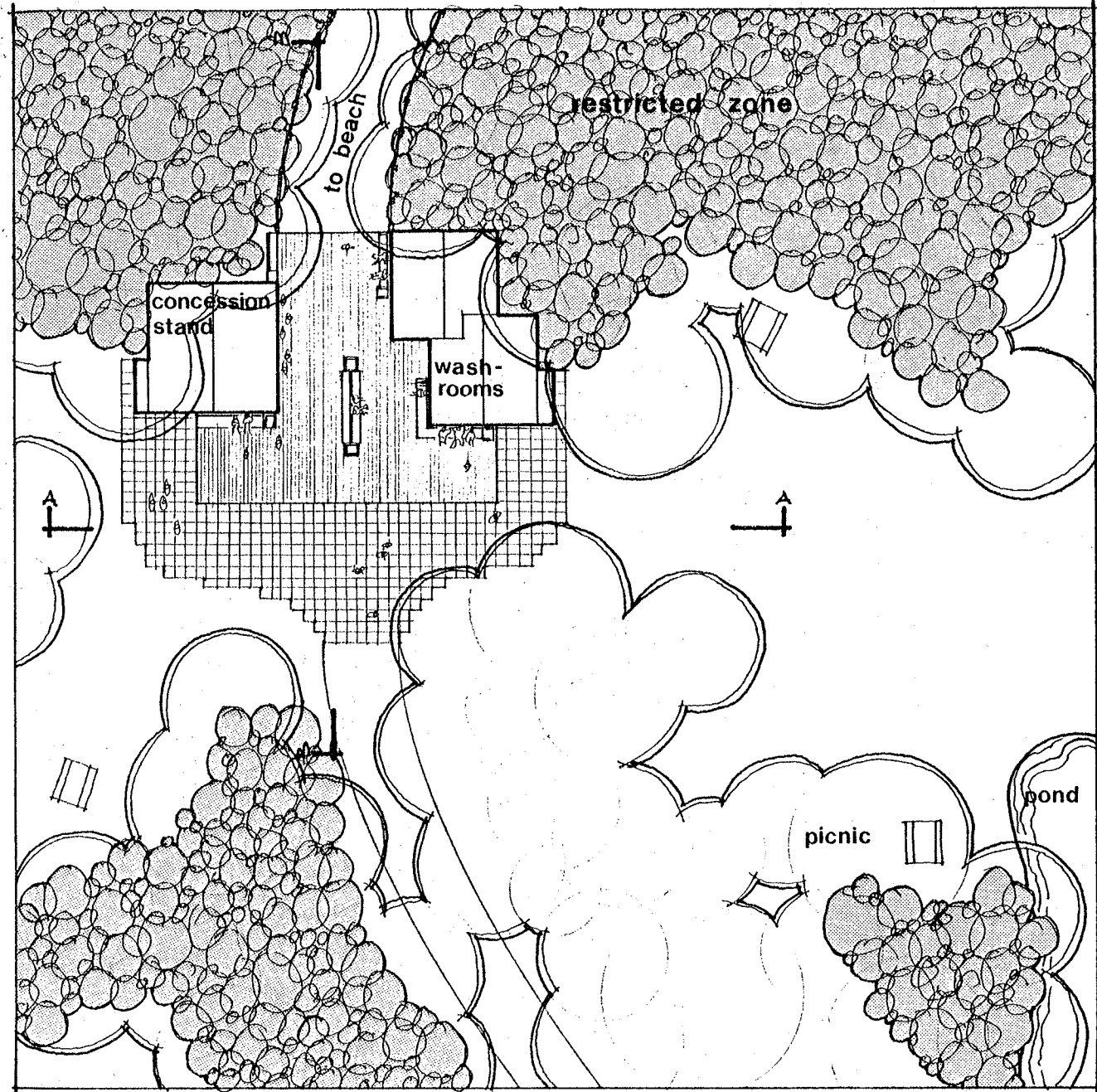
section B-B
 parking

Entrance Booth Figure 50.

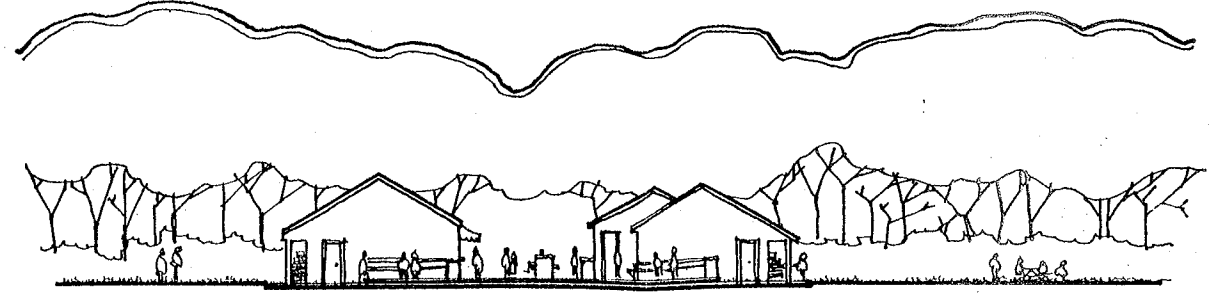
The concession stand is the major focal point in the park and is located on the boundary between the restricted use zone and the picnic zone. As such it acts as the main access point to the beach. The concentrated activity around it can be managed by the use of reinforced turf and wooden decking. The facilities here include concession stand (fast food service), washrooms (pump out system), showers (pressurized lake water system), changing rooms, pay telephone, firewood storage, seating and garbage receptacles. To repel easy access into the forested zone adjacent to this facility, the boundary would be planted heavily with thorny shrubs (e.g. hawthorn, rose and American currant) and vines (e.g. hop, virginia creeper and bittersweet). Nowhere would this zone be open enough to allow visual access to the beach (for species list see page 51), discouraging people from creating new paths.

The area for picnicking is maintained as turf with shade trees and is open enough for ball games. Picnic tables and barbeque/fireboxes are provided, firewood is stored at concession stand.

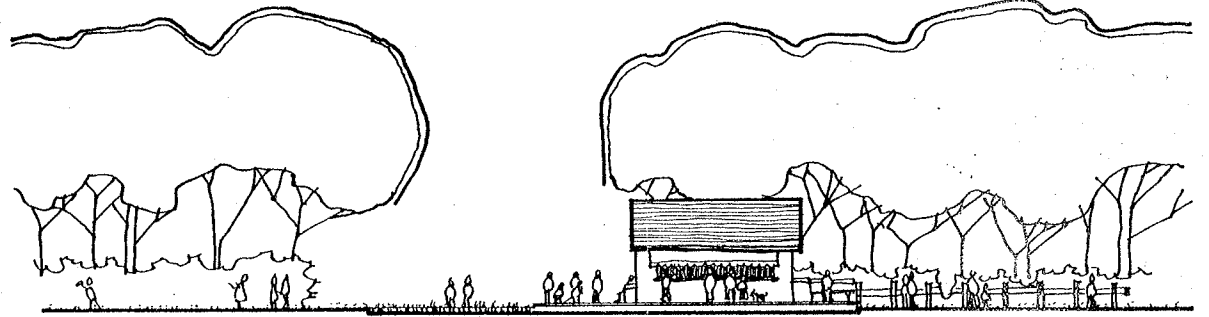
located on the boundary between
 access point to the beach. The con-
 and wooden decking. The facilities
 tem), showers (pressurized lake water
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 d be planted heavily with thorny
 ginia creeper and bittersweet).
 (for species list see page 51),
 and is open enough for ball games.
 oncession stand.



Detail B



section A-A concession stand
 washrooms
 change rooms/showers
 pay telephone
 firewood supply
 picnicking



section B-B reinforced turf
 deck
 fenced path to the beach

Concession Stand

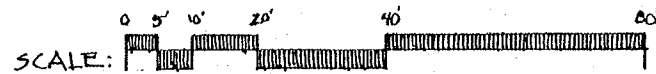
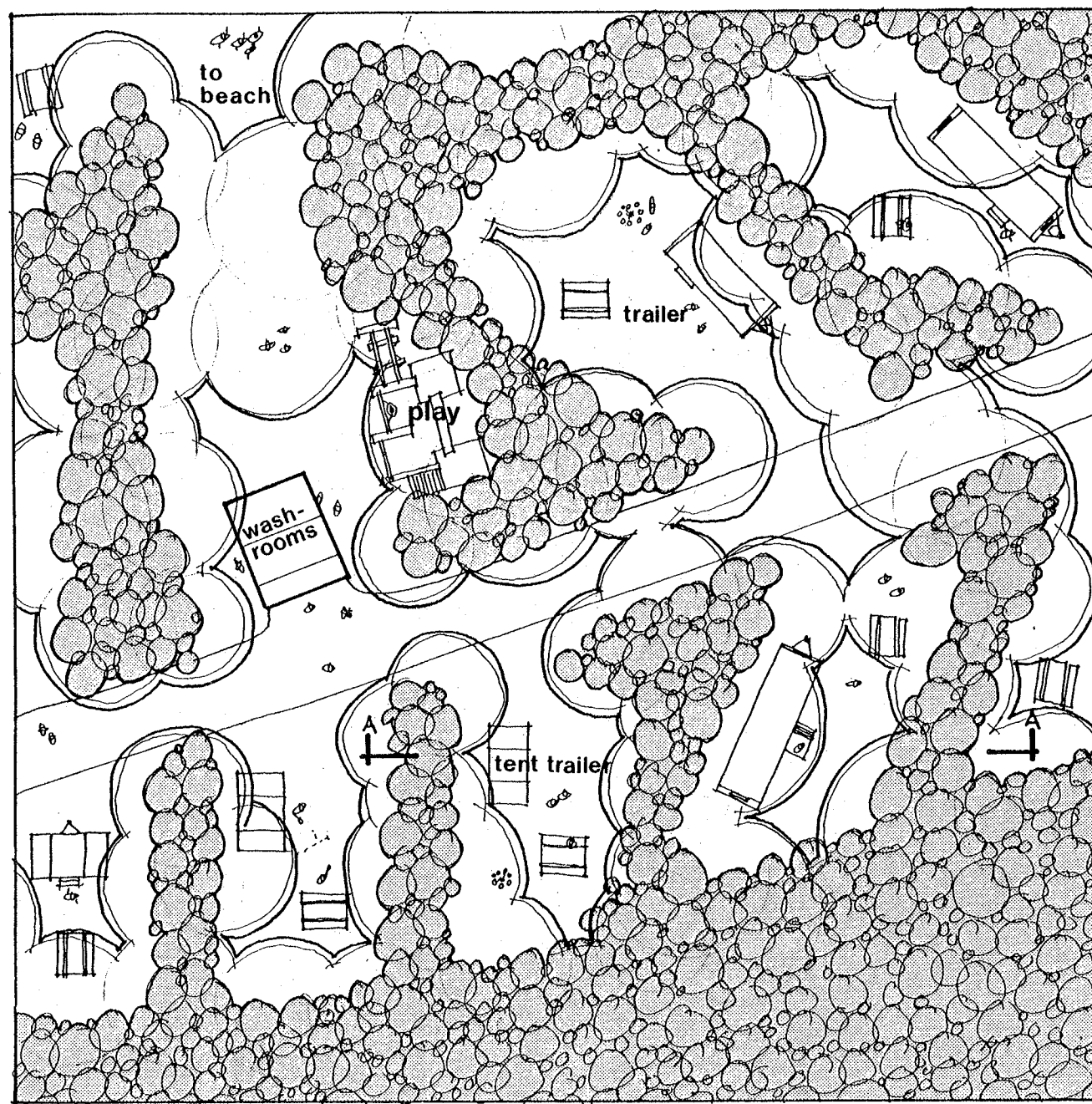
Figure 51.

Access to the trailer site is by means of a one way loop road. The road is for service and drop-off purposes only, as the cars would be parked in the parking lot. Tent trailer sites (12) are 30 feet x 50 feet and have hydro, picnic table, fire-ring, and a garbage receptacle. Trailer sites (8) are 30 feet x 60 feet, diagonally oriented, and have the same facilities. Washroom facilities, which include toilets, showers (pressurized lake water system), drinking water (trucked in if well is not feasible), firewood supply and trailer pump out system (sewage removed by truck), are centralized along the path to the beach. A childrens' play structure, especially required when the beach is inundated by a wind tide, is also located here.

The campsite inter-plantings (see page 51 for species list) are to provide a greater degree of undisturbed areas for plant succession to occur and to allow for a more diverse tree age and species composition. The ground cover of the campsite should maintain a protective organic mulch on the soil surface, preventing soil compaction and reducing surface run off. Where light conditions and the amount of traffic allows, grassed surfaces should be maintained, but where this is impractical, a 3 to 4 inch layer of wood or bark chips should be installed, except in the area adjacent to the fire-ring, to lessen the chance of ground fires in dry weather.

The road is for service and drop-trailer sites (12) are 30 feet x 50 feet. Trailer sites (8) are 30 feet x 60 feet, which include toilets, (if it is not feasible), firewood is stored along the path to the beach. A wind tide, is also located

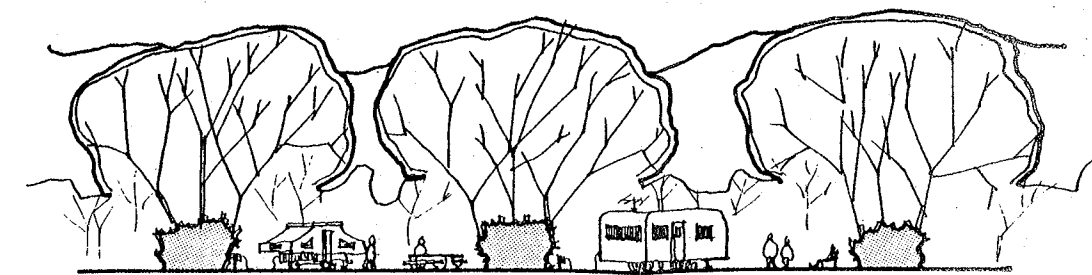
to provide a greater degree of diverse tree age and species composition. Organic mulch on the soil surface, conditions and the amount of traffic. A 3 to 4 inch layer of wood mulch, to lessen the chance of



Detail C

Trailer Site

Figure 52.



- section A-A
- trailer and tent trailer sites
 - hydro
 - picnic table
 - fire ring
 - garbage receptacles

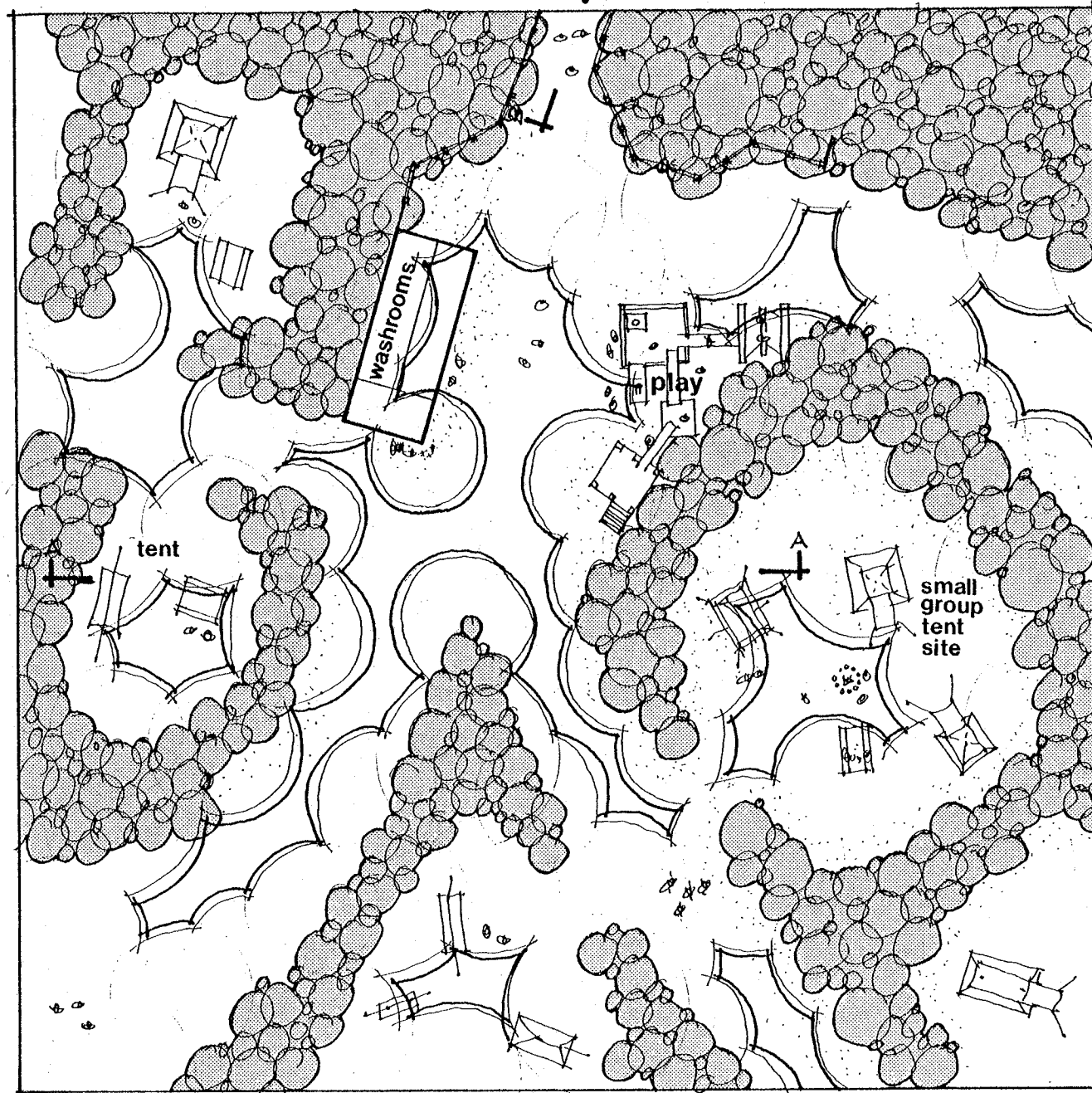
 - washrooms
 - showers
 - firewood supply
 - drinking water
 - trailer pump out station

 - play structure

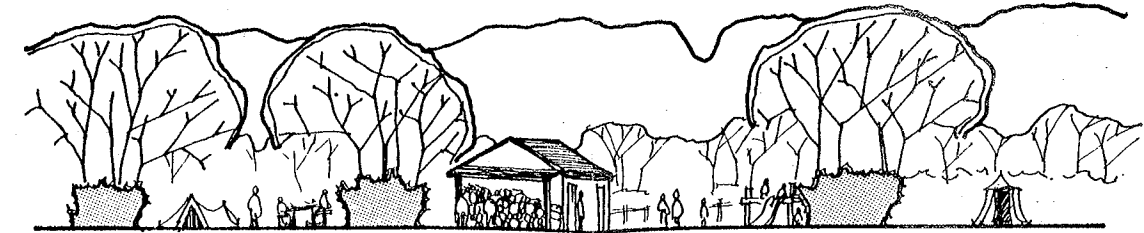
There are two different types of tent sites provided, individual sites which are 30 feet x 50 feet and small group sites 60 feet x 60 feet. It was noted that many of the tenters, particularly teenagers or young couples, visited the park in groups with 3 or 4 tents. These users (usually perceived as rowdier in nature), are catered to with 4 sites separated from the other tenters by a pathway and the washroom facilities. As there is no road access allowed to the campsites (service vehicle access to the washroom building is provided), a drop-off zone for unloading gear and supplies is available. The washroom facilities and childrens' play structure for the tenters is similar to the other facilities and is located at the junction of a pathway to the beach.

The pathways to the beach tranverse the forested ridge diagonally to the north-east to restrict the exposure of the path to the wind. A low running fence would restrict people to the pathways which should have a 3 to 4 inch layer of wood or bark mulch maintained on them. On the highest most exposed portions of the ridge, adjacent to the beach, raised boardwalks and stairs would reduce the effect of trampling and erosion along the pathways. The boundary between the beach and the forest should be monitored for damage and a low retaining fence be installed if damage is too severe. If a lifeguard is not deemed necessary for the beach (shallow profile of the lake seen as relatively safe), then a lifebuoy rack should be installed at the end of each pathway.

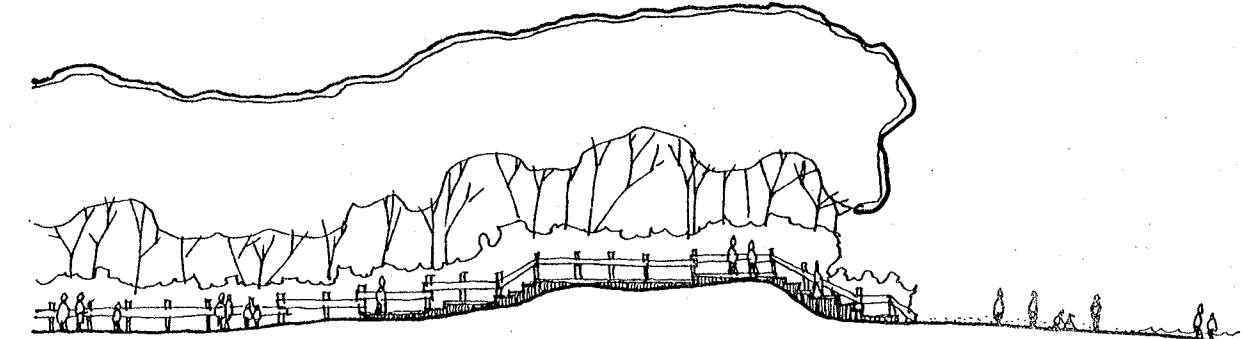
sites which are 30 feet x 50 feet
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Detail D



section A-A washrooms showers drinking water firewood supply play structure tent site picnic table fire ring garbage receptacle



section B-B fenced pathway and boardwalk to the beach

Tent Site

Figure 53.

Implementation of a project of this scale would have to be staged over 5 years, at the minimum, and it would take at least 10 to 15 years for the plantings to develop into the barriers envisioned in the proposed plan. These estimates could vary either way depending on the Governmental commitment (money available), and the development scheme opted for. The schemes could vary in cost and short term effect as dramatically as comparing the planting of nursery grown stock only with that of on site propagation of the plant material. The former would have a much more immediate effect but would accordingly have a much higher installation price.

The staging of construction (Figure 54.) would follow two main phases. The first phase would entail the dredging of the water bodies, the regrading of the adjacent sites, and the construction of the parking area. With the parking lot operable then the second phase could take place. This would mean the elimination of the inner road, the preparation of the planting beds (working organic matter and top soil into the existing sandy soil to preserve moisture), the planting or propagation of plant material and the construction of the service facilities and interpretive trails. With the radical change in layout the park would have to be closed for at least one season and/or make use of temporary fencing to direct and control movement patterns while the vegetation is establishing.

The trees and shrubs proposed for the reforestation and interplantings would be primarily native to the local *Acer negundo*, *Fraxinus pennsylvanica*, *Salix amygdaloides*, *Populus deltoides*, *P. balsamifera*, *P. tremuloides*, *Ulmus americana*, *Celtis occidentalis*, *Prunus virginiana*, *Cornus stolonifera*, *Rosa sp.*

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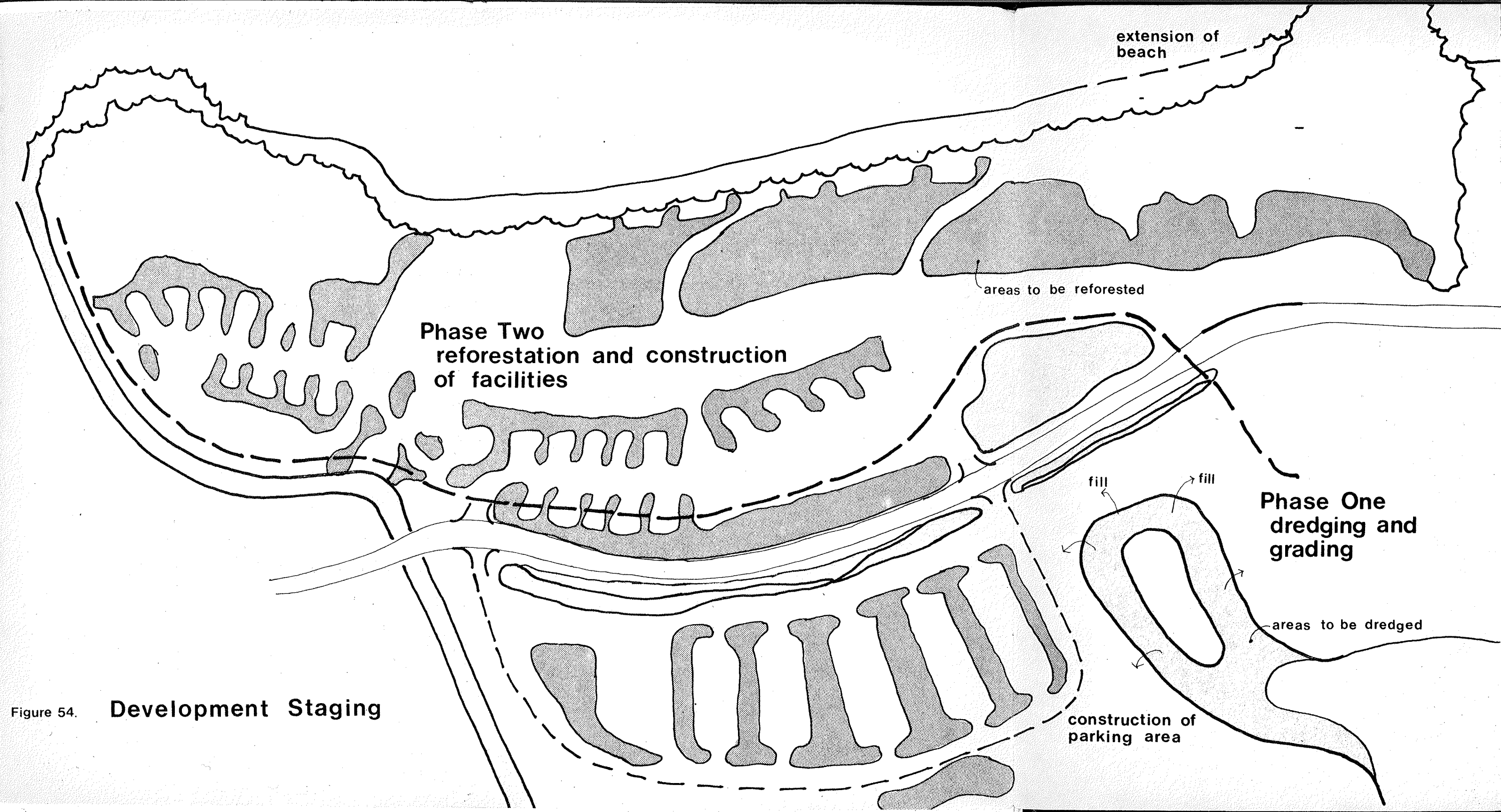


Figure 54. **Development Staging**

Rubus idaeus, *Viburnum sp.*, *Ribes americanum* and *Alnus rugosa*. In addition to these *Crataegus sp.* and the vines *Parthenocissus inserta*, *Humulus lupulus* and *Celastrus scandens* would be planted along boundaries to help prevent user penetration.

Along with the implementation of a park system of this nature, a preventative maintenance management program would have to be developed. This would entail the monitoring of changes in the landscape with remedial actions being taken before a major problem arises, e.g. the changing of a pathway to suit user habits and preferences. This and the continual maintenance of the facility, e.g. cleaning of garbage and provision of firewood, are of the utmost importance if the quality of the environment and the recreational experience are to be preserved.

Conclusion

This study has traced the history of Delta, and in particular, the use of the beaches and the beach ridge for active recreation. The proposed method of accommodating this active use on such a fragile environment represents both an understanding and an interpretation of the ecology of the beach ridge that reflects man's use and the processes of his impact on the landscape.

Changes in the structure of the beach have been occurring at West Park over the past 60 years of man's contact. The rate at which they have been happening and the implications of this degradation have become increasingly more severe every year. With the loss of over two feet of soil (Figures 27 and 43.) from the ridge in the past 30 years and the increasing soil compaction over the whole site, the campground is now on the brink of irreversible damage. There are no longer any young trees growing up to fill in the canopy. Even the moisture-conserving groundcover has been stripped off, leaving a situation where soon the remaining vegetation will be unable to adapt to the changing situation.

Something must be done now if we are at all concerned about the future of this resource. Not only is a physical restructuring of the park required but also a new mental attitude towards recreation and its impact. We must come to terms with ourselves and accept the idea that what is happening is of our own making and is a result of our enthusiasm to recreate.

The structure of the proposed redevelopment is appropriate as a first step towards a more sensitive physical and philosophical integration of recreation and the environment. The development of a hierarchy of

impact within the park allows for more detailed design, construction and maintenance programs to occur in response to specific user characteristics. The use of this hierarchy also allows areas such as the foreshore zone of the beach ridge to be protected from random trampling by concentrating user traffic within an easily monitored area. This area would be designed to control the impact while insuring a high quality recreational experience.

Since West Park's inception, the municipality has carried on a policy of minimal involvement with the park. While some progress has been attempted with the addition of toilet facilities, it is apparent that so far neither economic incentives nor social priorities have been strong enough to insure, even on a minimum basis, a satisfactory social or ecological solution.

This study has demonstrated that a solution is readily available and that what is required is a strong commitment by those involved in the decision-making process.

Figure 55. Lakeshore vegetation succession



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Appendix I Background Material :

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Supplemental Work

- Existing Landform, West Park
- Existing Tree Inventory
- Existing Shrub Inventory
- Existing Ground Cover Inventory
- Penetrometer tests, West Park and adjacent property
- History of land ownership of West Park
- Photographic History of Delta and Region
- Series of Design Proposals and Details

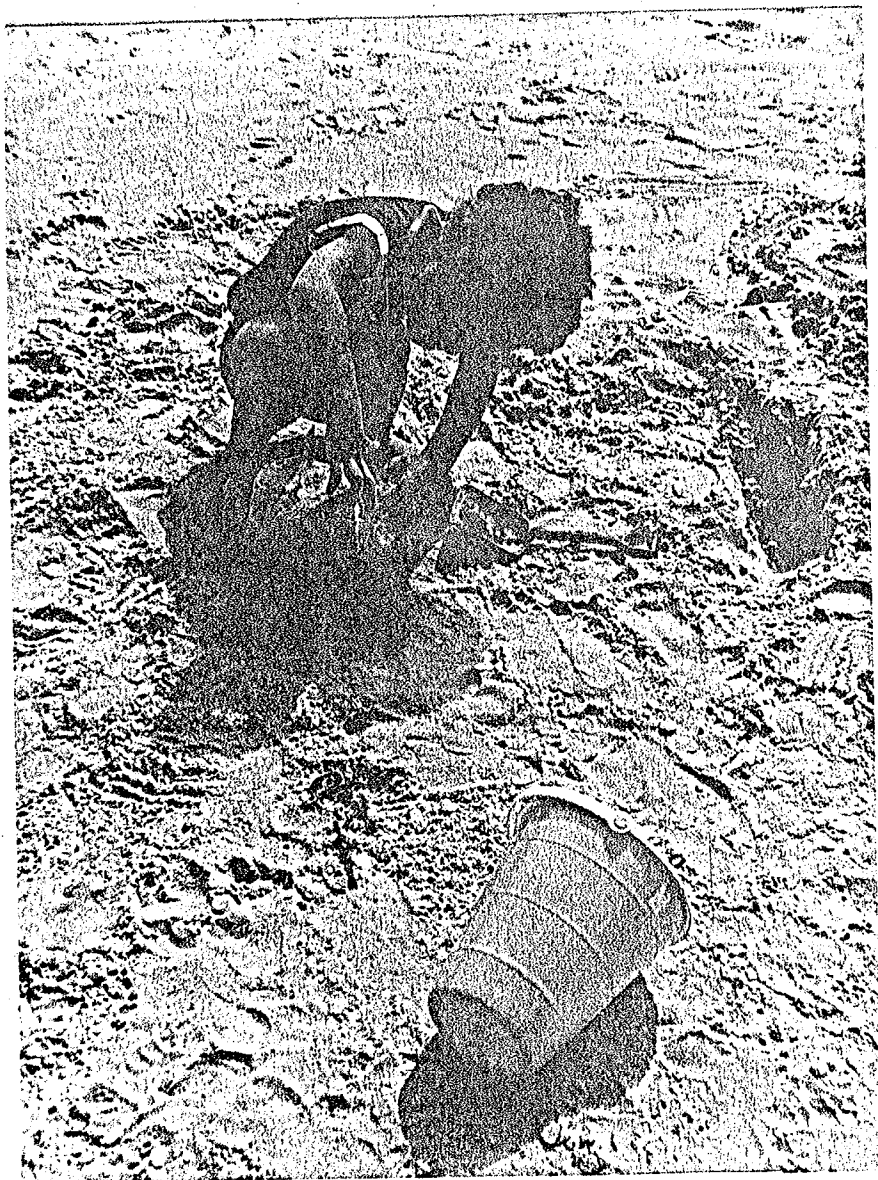


Figure 56. Children's use of the beach

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Manitoba Provincial Archives	11, 20
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Dave Morrish	30