E LW-6 Loose

TERRY NOBLE

590 VALLEYWOOD CRESCENT, THUNDER BAY, ONTARIO P7B 5M7 • TELEPHONE (807) 767-3211

EARTH SCIENCE INVENTORY
SABLE ISLANDS PROVINCIAL NATURE RESERVE

T.W. NOBLE
B.A.M. PHILLIPS

1989

— *LANDFORM / VEGETATION INVENTORY AND ANALYSIS* —

PREFACE

The goal of this study is to evaluate the earth science significance of the Sable Islands Provincial Nature Reserve and to make recommendations on how the earth science resources should be managed to achieve the goals and objectives of the provincial park system.

The work program consisted of three phases: pre-field, field and report write-up. The pre-field stage consisted of reviewing all relevant information that pertained to the area and included the analysis of both thematic and topographic maps and two scales of aerial photographs (1:15,840 and 1:63,360). Field-work, which consisted of 8 man-days, was conducted during the first week of July, 1989, in conjunction with the life science survey which had similar goals.

Field-work consisted of ground-truthing information derived from aerial photo and map analysis. This was achieved by foot traverses of both pre-selected sites and sites noted while in the field. An aerial flight was not made over the study area. The authors have flown over it on other occasions.

The authors wish to acknowledge the assistance of Leo Heyens, Regional Park Planner, Northwestern Region for providing information and logistic support.

(3b) on which bush and tree growth has established itself. The lakeward edge of the peatland "floats" during periods of high water making surface access impossible throughout. While there is the one place where calcareous till is shown as underlying, shallow borehole records for the area reveal lacustrine sands/clays encountered under most places in the park area. Present erosion of the lakeward edge of the peatland will be noted under (4e).

Peat also occurs on the sheltered side of Sable Islands, along the Inside Channel. Where the dune system has been most stable, peat has accumulated behind, presently forming several lenticular-shaped peatlands along the landward edge of the islands. In places, where dune mobilization has occurred, peat vegetation has been exposed on the upper foreshore of the outer edge of the islands, demonstrating the geographic shift of island location with time (see Section iii).

4. Present Shoreline Type

The shoreline of the park area is relatively simple, with long lengths of similar type, but there is still an interesting variation. The outer shore of the Sable Islands faces Big Traverse Bay which provides a 45 kilometre fetch from the northwest, the prevailing wind and wave direction and that from which major storms are generated. Coupled with this is the fact that the flat floor of Big Traverse Bay is 33-36 feet deep across that fetch, permitting the generation of a heavy swell and powerful breakers in time of storm. The wave front, refracted slightly by Long Point, meets the shores of Pine and Sable Islands as sub-parallel breakers climbing the shallowing offshore face with increasing potential for destruction as lake level rises. Lake of the Woods is well known as a dangerous lake for boaters, calm conditions being capable of being replaced by extreme choppiness in a very short time. The inside channel is, in contrast, more sheltered, but is only about 1 to 1.5 metres deep over much of its area. As a result, even though the northwest fetch is only 4 kilometres at the mouth of the Rainy River, a severe chop can be quickly generated in a stiff wind even on a cloudless day. For the same reason, a less common southwesterly wind will generate a wave train which rises in wave height as it moves into and is squeezed by the narrowing Inside Channel. Surprisingly, even a rarer offshore easterly wind will generate waves that are capable of doing work on the inside, "protected" shore of the Sable Islands.

Water levels of Lake of the Woods have been controlled since the building of dams at the Kenora end of the lake in the 1890's. In 1925 an International Convention agreed on a water level range of 1056-1061.25 feet and current maps note the level as 1060 + or -. The current maximum permitted is 323.85m but this does not mean too much for the Sable Island area due to the ability of the onshore northwesterlies to pile water up in the southeastern end of Big Traverse Bay. At times, a violent current pours through the channels around and behind Pine and Sable Islands, attempting to compensate the much lower levels of Four Mile Bay and the Inside Channel. The reverse process can occur at times of high seasonal discharge of the Rainy River, the impounded waters in Four Mile Bay and the Inside Channel seeking to escape into Big Traverse Bay by the same routes. The point is that local water level oscillation is greater than for the Lake of the Woods as a whole, and the impact of permitted high general water level is perhaps at its greatest in this part of the lake. It is ironic that one of the more fragile type of coastal environments is found in this same area.

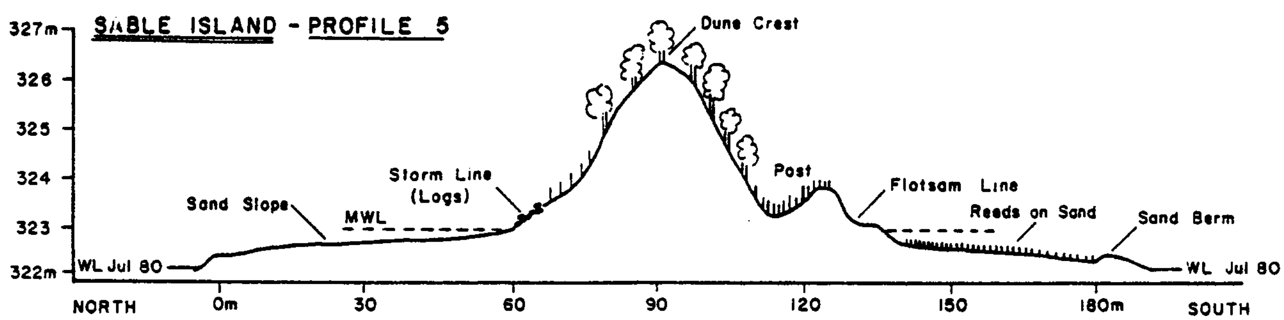
4a) Sand beach/dune complex

The Sable Islands are the Canadian portion of an 18km barrier system that stretches across the Rainy River end of Big Traverse Bay from Morris Point on the Minnesota shore to Quick Island on the Ontario shore. The Sable Islands, as the name implies, are composed of a line of sand dunes, variable in height and width along their length, stabilized by vegetation for the most part, but in places mobile and rapidly changeable in topography. Fronted by a sand beach and broad offshore shallows on the lakeward side, and by a narrow beach and peatland on the landward side, the feature is unusual in its origin (see Section iii), and is a landform more normally associated with marine tidal environments of New Brunswick and Prince Edward Island. Though local stories paint the dunes as once having reached sixty feet, the present dunes reach their highest, about 332m a.s.l. (less than thirty feet high) towards the southwest or distal end of the Sable system (3773E, 54163N). Towards the northeast the dunes are in places only a metre or so above lake level and are in serious deterioration, with deflation hollows and blowouts scoured to the water table (3793E, 54184N). A typical cross-section of the more stable part of the system is shown in Figure 14).

The width of the lakeward facing foreshore depends on prevailing water level. During low water periods a broad, undulating beach face is exposed, often with a narrow channel of water separating the main beach from one or more exposed offshore bars. Across this expanse of fine sand the wind blows, adding sand to the face of the dunes and hiding evidence of erosive activity at higher water levels. Finer sand is blown over the dune crest and assists the migration of the dunes, in lobate protrusions, into and sometimes exposed on the foreshore, and bone fossils have been found have been found, verifying that the label "Indian Mounds" on some of the older maps indicates use of the dunes as old burial sites, probably when they were larger and more stable than at present. Though too high an energy environment for reeds and grasses to colonize, the exposed foreshore soon supports the first stages of shrub growth such as willows. At high water the willows are swept back and forth like kelp in the wave break-zone while the

Figure 14

A Typical Cross-Profile of Sable Island



(from Phillips, 1987)

beach is reduced to a narrow strip at the dune base. The potential for erosion is high. Accumulation of flotsam, mainly uprooted trees, provides a natural breakwater at the dune base along much of the length of the system, but it is not sufficient to prevent wave erosion from being effective. During recent years, the system has suffered a severe toll from periods of high water, sediment eroded from the whole length of the islands being transported by beach and littoral drift processes towards the southwest distal end which has been growing and recurving into the Inside Channel.

4b) Overwash delta

Towards the northeast end of the Sable Islands, a breach has occurred which currently divides the barrier into two islands (3808E, 54203N). Whether this breach is dry land or awash depends upon prevailing water level. For example, in the low water level of 1980, Sable was one island with low narrow dunes at this point. In recent years, high water has widened the gap and formed a distinct overwash delta which projects in a sharp, steep transgressive edge into the Inside Channel. In tidal waters this would be called a "flood tide delta", but here a similar landform has been formed by wave action and the flow of water over the island, spreading the once dune sand into a crescentic delta, over the shallow top of which waves travel into the Inside Channel and have slightly recurved the remaining ends of the two islands from their former orientation. Because there is at times a flow from the Inside Channel out to Big Traverse Bay, there is also an ill-formed feature which would be known in tidal waters as an "ebb tide delta". It is not pronounced, being built on the already shallow, sloping offshore slope that fronts the Sable Islands. In marine barriers, the two are often almost mirror images and occur at each point at which the barrier is breached. This present breach is, under normal conditions, not a serious event in the life of a barrier, since a low water episode may well permit exposure, stabilization by vegetation and the formation of another protective line of dunes. Historically, this sequence has been repeated many times on the Sable barrier. However, the years of recent sustained high water levels have diminished the barrier to the point that it may require several seasons of lower than normal water level to reverse the trend.

4c) Sub-aqueous spit/platform

As comparative air photography well shows, the distal end of the Sable Islands has been growing at the expense of the erosion along its length. Longshore sediment transport lengthens or progrades a spit or barrier end, first by building a sub-aqueous platform by littoral drift, on which the visible surface feature then forms by beach drift. The distal end of the Sable barrier is composed of several fossil recurved spits, now covered by trees and trailing off into marshes, each being passed in turn as a new vigorous feature extended beyond it. The present end is composed of several small recurving forms building out on a bulbous platform that is sometimes exposed during low water phases. The latest form curves into and along the channel between Sable and Pine Island. The older ones curve into reed beds which occupy the less active inner part of the platform. The structure shows well on air photographs, and has grown in size considerably since the 1945 photos.

At the northeast end of the Sable barrier, a sub-aqueous bar or platform extends the island towards Quick Island, and at low water leaves only a narrow passage out of the Inside Channel. Local lore tells that Sable Island once joined to Quick island. The bar is sustained by occasional reverses of longshore transport as refracting waves pass between Quick and Burton Islands, but probably seldom has the opportunity to build an above water spit all the way to the rock island.

4d) Offshore sand bars, longitudinal and crescentic

The erosion of the outer shore of the Sable barrier and the transport of that debris to the southwest is compensated to a varying degree by the onshore transport of sediment from the shallow, sediment-rich shelf which lies immediately offshore. Exposed at low water, and very obvious to a swimmer at high water, are a series of longitudinal offshore sand bars, usually a suite of three or four running parallel to the shore. These bars are generated by breaking waves in shallow water, and migrate up the shelf slope towards the present beach, there forming isolated ribbons of water at low water periods, and ultimately being incorporated as part of the beach slope. It is from this source that the Sable barrier receives a majority of its sediment budget, being unattached to the land at its northern end, land which is, in any case, mostly rock and is not a sediment source by shore erosion. At some periods, the bar forms close to the shore are oblique to the shore and crescentic in plan shape. Roughly similar in size, they form a cuspate margin to the foreshore, and indicate the longshore transport of sediment as well as the onshore component. In either case, the presence of offshore bars demonstrates an abundant sediment source offshore and a process by which the Sable barrier was probably initiated and has since been sustained. Should the offshore sediment sink be affected in such a way as to reduce onshore renewal, or should shore erosion on the Sable barrier remain more rapid than that of renewal, the islands would shortly be greatly reduced and the barrier largely lost.

4e) Organic shore margin; often undercut; often no beach

While shore erosion on the outer side of the Sable barrier is clearly shown, only comparative photography reveals the extent to which the margin of the mainland peatland has been cut back over the years. Far from spreading into the Inside Channel, the peatland edge has suffered from effective wave action at times of high water, in places retreating as much as half a kilometre since 1945. Cut in a low bluff along much of its length, and fronted by reed beds which probably root in the vestiges of the peat materials, the peatlands are deteriorating at the expense of a widening Inside Channel. This is particularly true of the segment between 3795E, 54146N and 3805E, 54182N, which includes two sharp headlands between which is cut a smooth crescentic bay. While very shallow in front of this bluff, no beach is exposed even at low water.

The peatland portions on the inner side of the Sable barrier are similar, though based on eolian and overwash sands rather than lacustrine sediments. The shore margin, despite its protected nature, is still undergoing erosion at high water level periods, a bluff being common, and in recent years, a number of small trees being under cut and felled. At low water, a shelving beach slope is exposed, quickly colonized by reeds and grasses in contrast to the more exposed outer shore face.

4f) Nearshore or shallow reed beds

Characteristic of both the mainland peat margin and those segments of peatland on the inner side of the Sable barrier are extensive reed beds. Growing on the newly accumulated platform sediments or on the remnant materials from peatland erosion, the reed beds, to some extent, act as a breakwater. Erosion is certainly enhanced where the reeds are absent or sparse. Some patches of reed bed persist in the Inside Channel some distance from shore, growing on shallows that are protected from erosion to some extent. These probably represent remnants of more extensive reed beds at a time when the Inside Channel was narrower. The reed beds inside the distal end of Sable are particularly dense, but a thin belt of reeds is common along the inner shore, except where recently broken. At high water, the northeast end of the Sable barrier is composed of a reed bed built out on the sub-aqueous extension of the island.

4g) Rock shoal

To be complete, the occurrence of a rock shoal some two kilometres off the Sable barrier should again be mentioned. Though not a shoreline type as such, it serves to remind one that the rock surface is at all places not far below the surficial materials of which the park area is composed, and probably at no great depth across Big Traverse Bay.

4h) Rock shoreline (outside boundary)

While no rock shoreline occurs in the park area, the existence of rock shoreline immediately to the north of the boundary, and as Quick and Burton Islands is important in that it underscores the lack of sediment source from the north and east of the Sable barrier.

In summary, the shoreline of both the Sable barrier and the peat mainland is a very dynamic one, in which change is much more rapid than attempts have been made to record the area on maps. While shoreline types shown on the accompanying map will not be subject to much change, the details of plan and shape will vary, in places considerably, from the depiction on the 1:20,000 map sheets.

(iii) HYPOTHESIS

Since the Sable Island barrier is so special a landform in the context of inland lakes of Ontario, and since there seems to be good reason to fear that it is in a state of gradual deterioration, it is appropriate to delve into the origin of the feature and the reasons for its present condition. A simplified picture of geomorphological features of the barrier system as a whole is given in Figure 15.

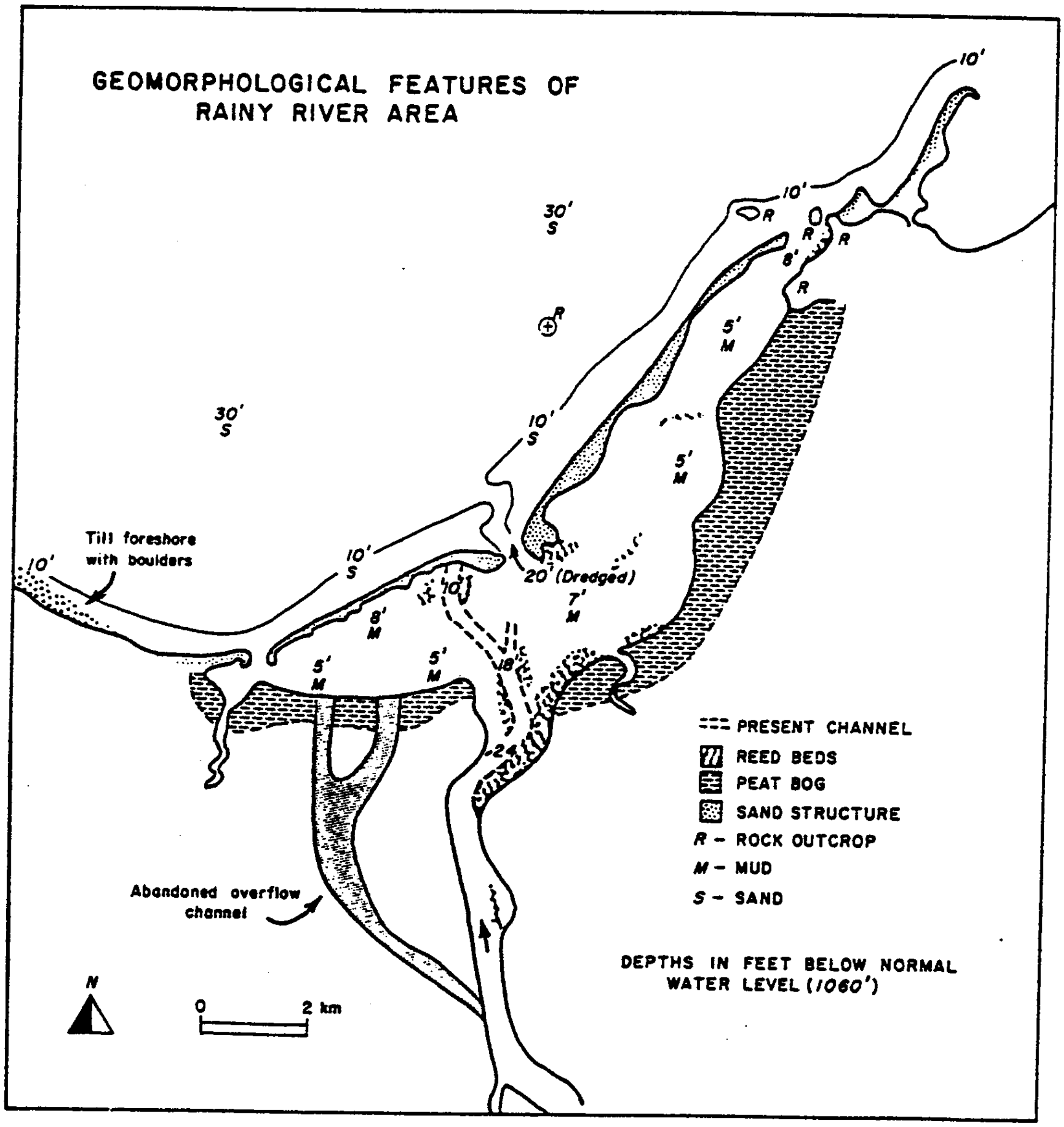
a) Historical Evidence

Duane Lund (1976) refers to a time when it was possible to "go by horse and buggy from Warroad to Rainy River on one long sandy beach", and states the building of the first control dam in 1892 (Rideout Bay) and the Norman dam in 1894, raised the level of Lake of the Woods by nine feet. It is very difficult to establish the absolute elevation of the lake prior to dam construction, though there is the record that between September, 1882 and May, 1895 the range of level was from 1056.8 feet to 1060.5 feet. In 1897 a map in a book by George Bryce notes "Lake of the Woods, 1062' Above the Sea". In 1925, an International Convention agreed upon a controlled water level between 1056 feet and 1061.25 feet, though this control was not successful all of the time. In 1927 the mean annual level was 1062.8 feet; in 1931 it was 1055.8 feet, and in 1950 it was 1063.8 feet. Recent maps note the level of the lake as 1060 feet, + or -.

If water level had risen nine feet, as noted by Lund, then all of Four Mile Bay and the Inside Channel other than the Rainy River channel, would have been dry land, and the history of Sable Island would have commenced with the flooding of those lands behind a line of coastal dunes, at that time. However, while a rise in mean lake level is the likely result of the dam construction, the Sable barrier is a much older feature.

Jacques de Noyen saw Lake of the Woods in 1688, and in 1731, Sieur de la Verendrye reached Fort St. Pierre (Fort Frances), and his nephew, La Jemeraye, went on to Winnipeg via Lake of the Woods. On a map of 1775 showing the northwestern part of North America, Alexander Henry the Elder includes a single long island across the mouth of the Rainy River, but does not name it. The 1823 travelogue of J.J. Bigsby, British Secretary and Medical Officer to the Boundary Commission, refers to Big Traverse Bay by its Indian name which meant "lake of the island of sand mounds", a clear early reference to Sable Island, which David Thompson's map of the same period shows as one island.

Figure 15



(from Phillips, 1987)

S.J. Dawson, in his 1859 "Exploration of the Country between Lake Superior and the Red River Settlement", shows Sable as two islands and Pine Island as a recurved spit originating on the Minnesota shore (Figure 16). A label against Sable Islands reads 'Indian Mounds", a clear reference to burial mounds that are common in the district. The largest on record lies at the southern junction of the Big Fork and Rainy Rivers, and is 45 feet high and 325 feet in circumference. The mounds were built between 200BC and 1000AD during the Laurel Culture period of Red Lake Indian settlement. This evidence firmly establishes the pre-historic antiquity of Sable Islands as a landform, though one which obviously changed with time. On the 1870 map of the route of the Red River Expeditionary Force from Lake Superior to Fort Garry, Sable is shown as one island, and Pine again as a spit.

With the publication of the 1886 Geological Survey of Canada map of the region, the first opportunity arises for reasonable cartographic comparison between the feature as it was then and as it was later (Figure 17). Sable is shown as one island on both the 1886 GSC and 1963 NTS sheets though a rather different shape and location is shown. The label "Sable Islands" is still used, which may date from the same label on the 1918 topographic map on which Sable is shown as several islands. Pine Island, a spit (Oak Point) on the 1886 map, is shown severed from the mainland on the 1963 map.

A pattern is discernible , the landform feature of Sable Island being a well established part of the scenery at least since prehistoric time, and quite possibly since the decline of Lake Agassiz. It is, however, a dynamic and greatly changeable landform in its plan shape and position (and its topography), affected as it will be by the variables of water level and the ratio between sediment supply and loss over time. Questions that need to be answered are: How is a barrier formed?; How is one sustained?; and what changes bring about its loss of stability.

b) Barrier Formation

Barrier beaches are "unconsolidated elongate bodies of commonly sandy or gravelly sediments lying above high tide level and separated from the mainland by a lagoon or marsh" (Komar, 1983), and they occur in all marine environments, though best developed where tidal range is low and wave energy is moderate. While much less documented, they also occur in tideless seas and large inland lakes. Fierce debate has taken place over their formation, and three models or theories have been proposed.

The emergence model (Figure 18a) involves changing water level. An offshore bar, a common feature of sediment-rich shallow offshore shelves, is exposed by falling water level and becomes a beach face, to be stabilized by vegetation, and later to develop a backshore dune system as sediment continues to

Figure 16

An Enlarged Portion of Dawson's 1859 Map

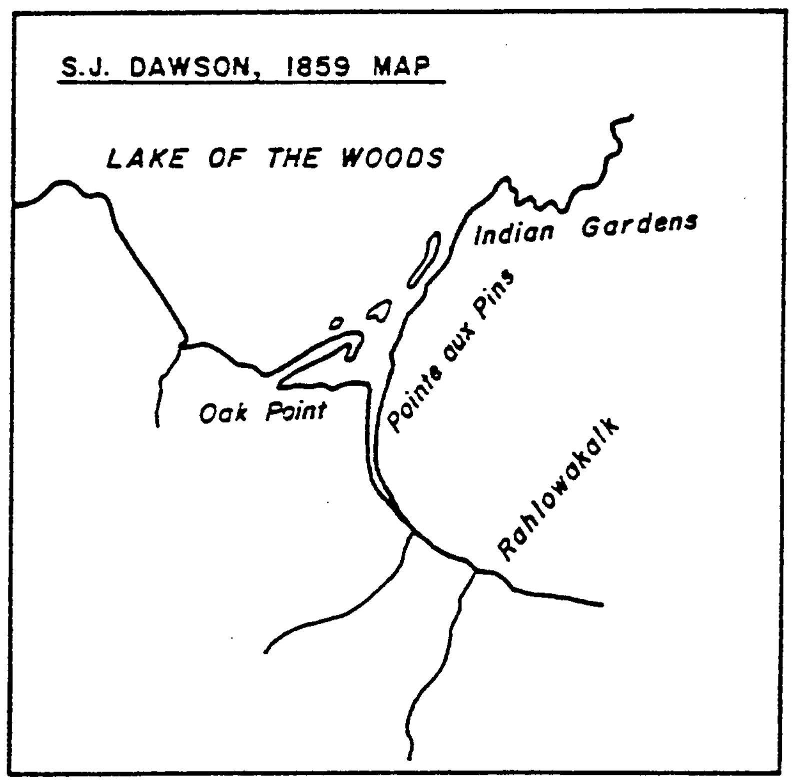


Figure 17

A Seventy-seven Year Comparison from topographic maps

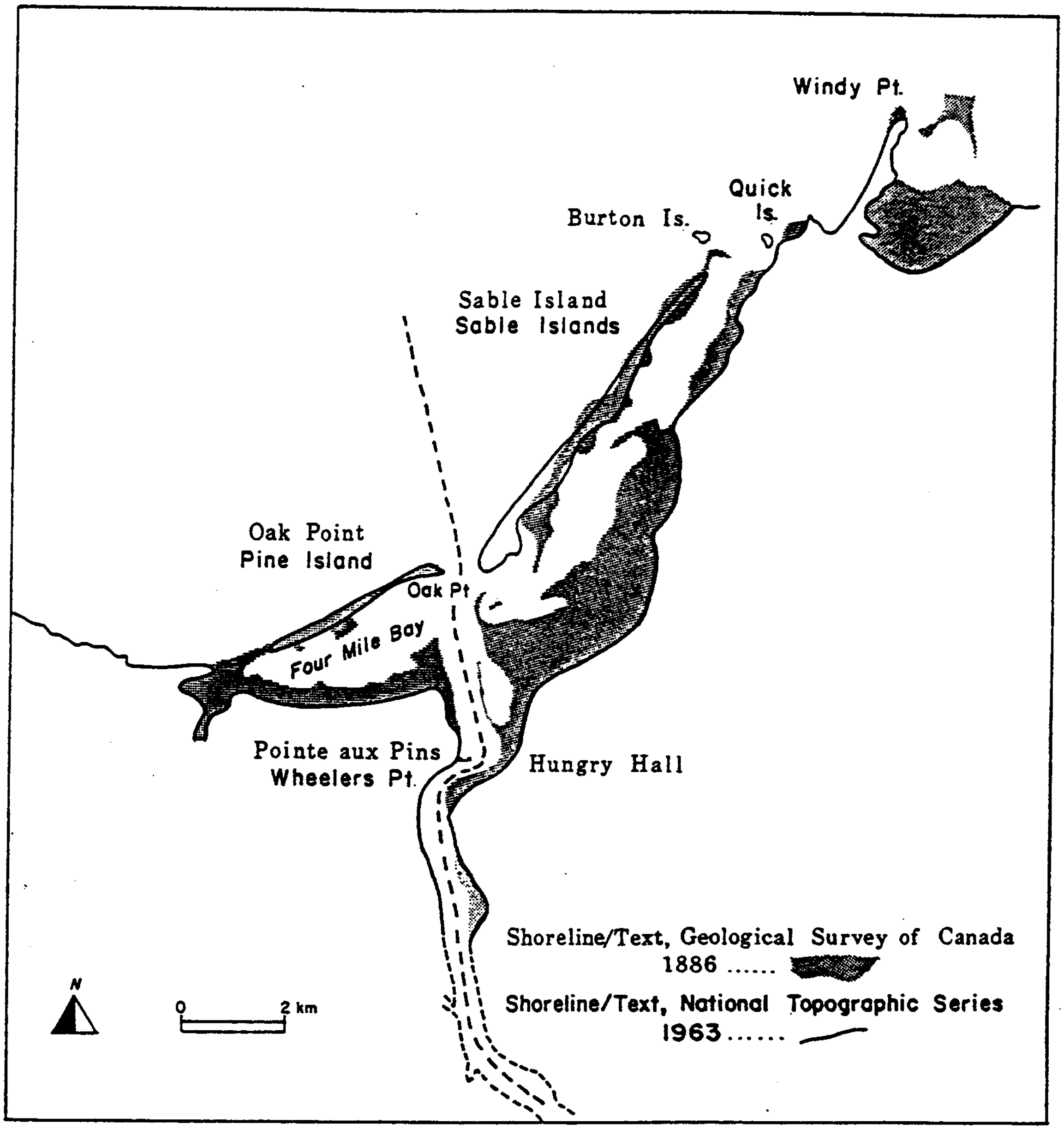
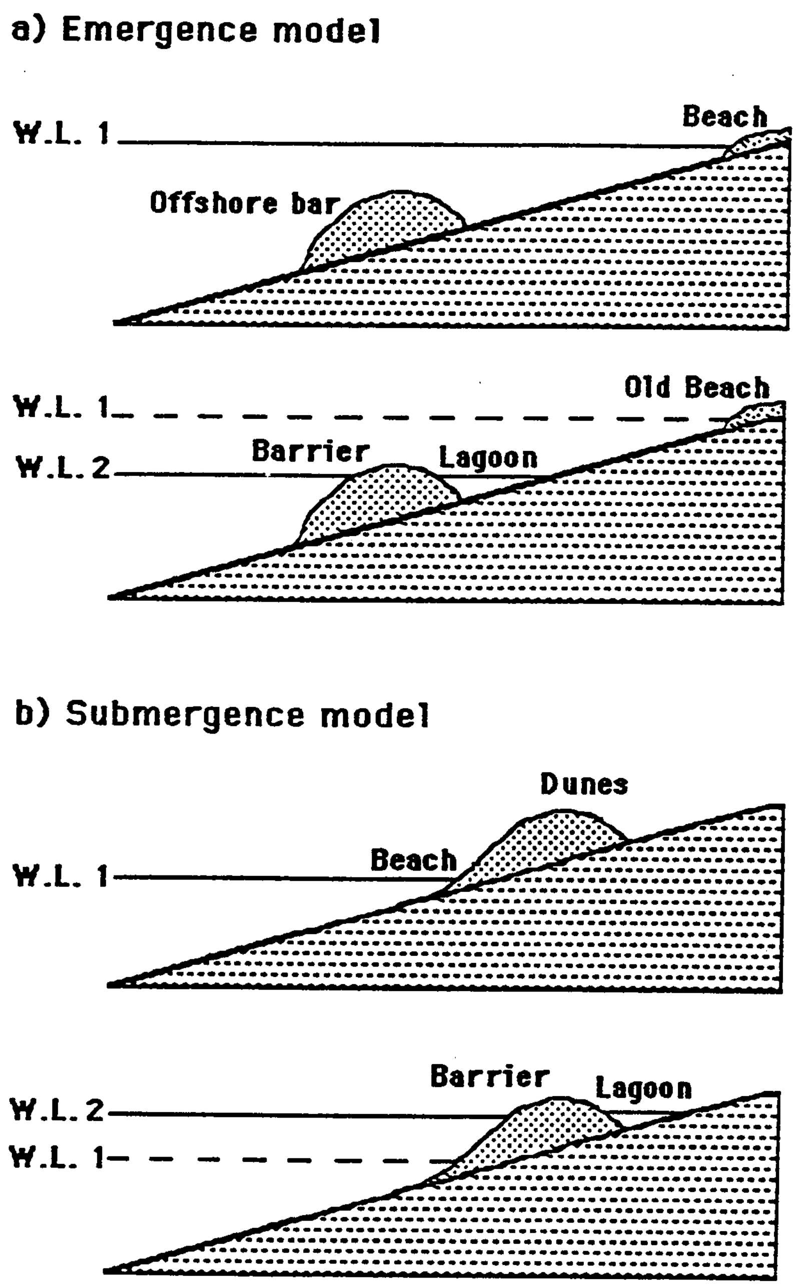


Figure 18

BARRIER FORMATION MODELS



accumulate. Since world sea levels during the post-glacial have been rising, save in those areas greatly affected by isostatic uplift, the theory does not account for many barriers, but for the case of Sable would fit reasonably with the history of decline of Lake Agassiz.

The submergence model (Figure 18b) requires a pre-existing storm beach and coastal dune system fronting a low-lying interior. Rising water level inundates the low area behind the beach/dune system, forming a lagoon and isolating the feature as a barrier. While this accounts for some marine barriers, in the case of Sable, this would require a substantial rise of water level to flood the lower floodplain of the Rainy River behind a coastal dune system. Such a rise is not compatible with the water level history known so far, unless it occurred with dam construction, which has been seen not to be the case.

The spit severance model (Figure 18c) requires no water level change and involves the construction of a long spit by longshore sediment transport, either sub-parallel to the shore or across an embayment. Subsequently, a severe storm event severs the spit from the mainland, forming a disconnected barrier.

One theory which is not acceptable, is the idea that onshore transport of sediment can build an offshore bar sufficiently to rise above the water and commence a barrier landform. It is now recognized that wave action will not permit sediment accumulation to break water level. Only a water level fall could initiate the bar to barrier transformation.

The fact of the matter is that all three models are applicable to specific occurrences, and theories of "Multiple Causality" are now more acceptable as explanations of most landforms. What of Sable?

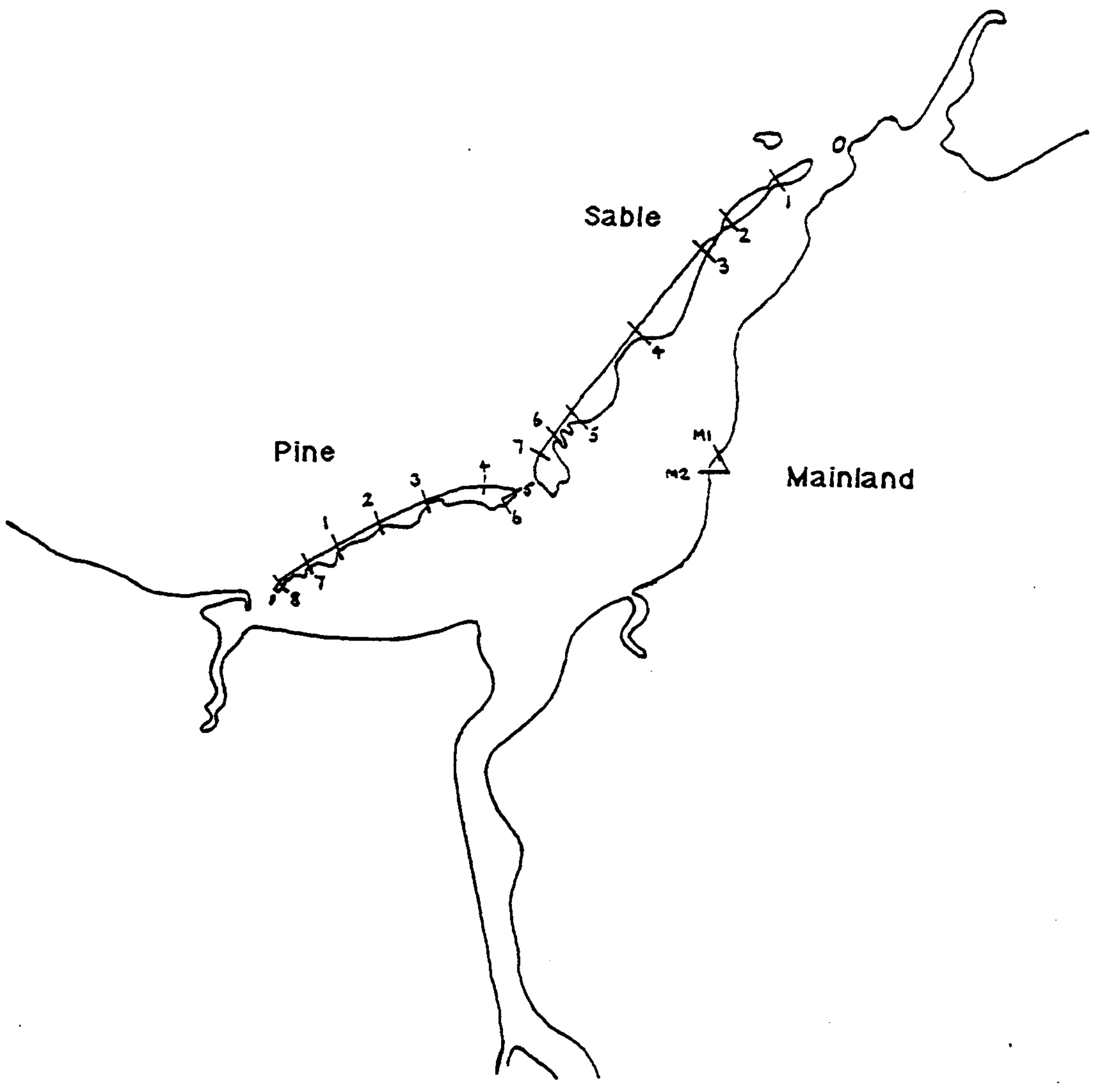
c) A Proposed Explanation

It is clear that the present Pine Island portion of the barrier system was formed by spit severance, the present Morris Point spit being a vestige of the longer predecessor, now separated by a gap into Four Mile Bay. The source of sediment for spit formation is easily seen in the friable till and glaciolacustrine cliffs which stretch which stretch south from Long Point, fronted by a shallow offshore shelf on which a lag of large boulders lies, some breaking surface. Morris Point and the severed end of Pine Island both now recurve into the Bay as a result of wave action, the latter less pronounced since generated only by a reversal of the normal northeasterly beach drift. However, it is only beach drift which has been interrupted by the severance, the littoral drift continuing to carry sediment across the offshore face in front of the gap and on up the length of Pine Island to form sub-parallel longitudinal bars which gradually feed the beach face with sediment. Pine Island itself has a history of breaching and mending, a now sealed former outlet still causing the distal

Figure 19

COASTAL CHANGE MONITORING PROGRAM

Location of Profile Lines
1981-1986



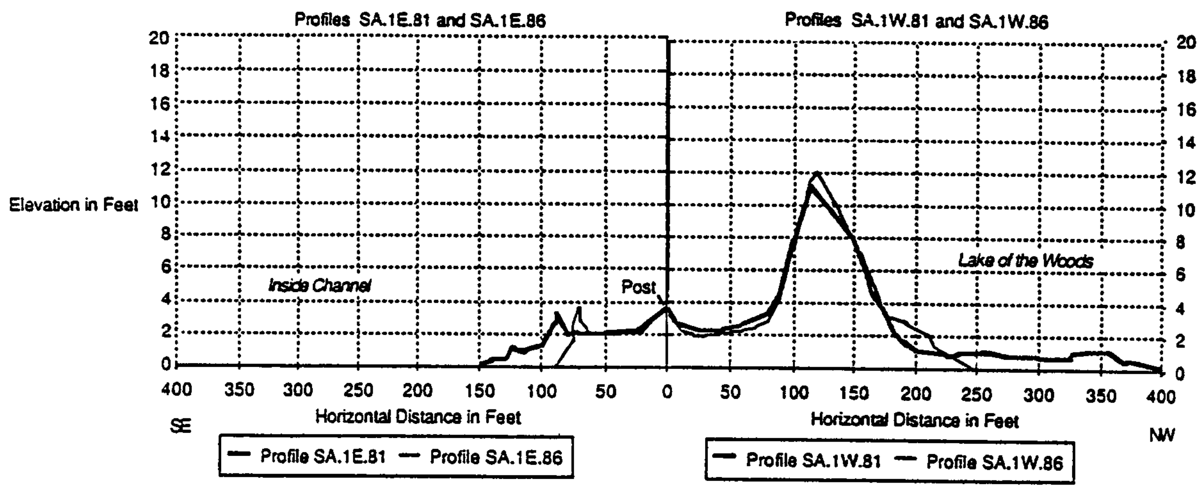
(from Phillips, 1987)

the time of set-up in 1980, water levels were low and profiles were extended for several hundred feet across the broad foreshore. The high water level of 1986 created a stark contrast, and clearly was the single most important in so greatly accelerating erosion. The field visit of 1989, for this project, revealed a worsening situation, though precise measurement is not due until 1991. Monitoring lines were also set up on the margin of the mainland peatland, but though a visible loss was recorded between 1980 and 1981, the margin was afloat in 1986 and the survey could not be conducted. A series of sequential photographs have been made at selected points to monitor the visible impacts of change, and the 1989 visit revealed much destruction since the 1986 survey. A sample of the results of this long term monitoring on Sable Island is given in Figure 20, though the greatest areal change between 1981 and 1986 had occurred on the distal end of Pine Island.

In summary, the Pine/Sable barrier system is a very special geomorphic and biological environment, of high preservation value in the Province of Ontario, and of equal importance to the State of Minnesota. The international factor in the uncertain future of the barrier system should not be denied, geomorphic processes, rare plants, shoals of fish and nesting pairs of birds unaware of the political boundary that arbitrarily subdivides the wholeness of the natural system.

Figure 20

Comparative Profiles - an Example from Sable Is.



(from Phillips, 1987)

CHAPTER III: PLANNING CONSIDERATIONS

(i) SIGNIFICANT FEATURES AND AREAS

Lacking bedrock outcrop the Sable Islands Provincial Nature Reserve consists of two principal areas, the mainland peatland and the offshore barrier islands. Both of these are contemporary landforms, though built upon the Lake Agassiz lacustrine clays deposited during water level decline in the late post-glacial period. These clays are progressively less overlain by organic materials towards the eastern margin of the park where clays are found at or close to the surface. Surface representation is thus limited to lacustrine processes and resultant landforms of a relatively limited time period.

The Sable Islands barrier is a unique situation within the region, indeed within the northern part of the Province, and is of a high level of significance. The mainland peatland is by itself of less significance since low-lying peatlands based on lacustrine clays are characteristic of many parts of the shoreline of Lake of the Woods. However, in this case the peatland is an integral part of a barrier/lagoon system and thus shares to a large extent in the unique nature of the Sable Islands holding. With the possible exclusion of some southern Ontario Parks (i.e., Frontenac Provincial Park) no other parks in the Province can offer lacustrine barrier/lagoon features of such value.

The Sable Island barrier was formed as a result of a relationship between an abundant sediment supply, coastal configuration and water level history which was unique to this part of Lake of the Woods (see Chapter II (iii). As such, it is the only landform of its kind in the present dynamic coastal system which represents the final stages of dissolution of Lake Agassiz and the subsequent water level oscillations of earlier versions of Lake of the Woods. Hypotheses of barrier island formation have principally considered tidal marine environments with little attention to non-tidal lacustrine environments. The origin of the Sable Islands barrier is by no means clear, and detailed study of this feature could well contribute to a greater understanding of barrier systems in general. In this context its scientific value is great and study of it would, in addition, enhance what is known of the evolution of Lake of the Woods. On this basis the Sable Islands barrier is of considerable natural value as a unit in the earth science system.

The interpretive value of this feature is high because its geomorphic components are clearly represented and permit its origin and history to be hypothesized. As such it aptly illustrates the lacustrine processes and landform theme in the recent geological history of the area. From an educational point of view the barrier feature provides type examples of onshore migration of longitudinal and crescentic bars, alongshore transport of sediment, formation of spit and platform structures, eolian processes in the beach-dune complex and the formation of lagoonal marshes and, finally, the effects of high water level erosion on these features. These, as noted above, are not to be found elsewhere in the region, at least in such a compact and dynamic form. The potential program value is high, though due to the highly sensitive geomorphic nature of the beach-dune complex in particular, reservation must be expressed concerning the detrimental impacts of an on-site visitation program.

From a geomorphological viewpoint the mainland peatland offers much less natural value and thus program value. Other than very minor shoreline features and exposures of the underlying Agassiz lacustrine clays, the area is relatively homogenous and lacks the visual impact of the islands. The area has value in that it represents events which are typical of the sedimentary environment of later phases of Lake Agassiz, the emergence of the lake floor and subsequent development of an organic cover. The only dynamic feature to be noted is the recession of the lagoonal edge of the peatland by wave action at high water levels, a process which has considerably increased the size of the lagoon in recent decades. While the coastal margin of the peatland may be observed from the water, the surface of the peatland is essentially not accessible due to waterlogged conditions. Any subsequent interpretive and education program would have to take this constraint into consideration.

(ii) Preliminary Environmental Assessment

The designation of Sable Islands as a Provincial Nature Reserve precludes intensive development within the park. For this reason, physical constraints to development have not been mapped. The Northern Ontario Engineering Geology Terrain Study (see References) for this area, however, provides an assessment of constraints to specific developments imposed by the local landform patterns. The park's status not withstanding, high water tables, organic soils and the susceptibility of much of the land base to wind and water erosion places a high constraint on most types of development.

(iii) RECOMMENDATIONS

A long-term management policy needs to combine a blend of careful geomorphic preservation and access and use of the park for scientific and educational purposes. Intensive recreational use of the park is not a desirable option. With this in mind the following recommendations are proposed:

1. The entire park area be considered principally as a protected area (i.e., Nature Reserve).

2. The mainland portion of the park be considered as a single unit for management purposes and that the central part presently under private ownership be ultimately acquired as should the Kreger-Rathbun holding. It is recommended that for the purposes of extending geological representation within the park that wave-washed rock outcrops beyond the north boundary be included within the park.

3. Since under all but dry conditions traversing the peatlands is difficult if not impossible, that access be permitted at the northeastern margin should the Kreger-Rathbun holding be added to the park. This is the only part of the park where Lake Agassiz clays are readily seen and are readily accessible. There is potential for boardwalk and/or viewing platforms at this location.

4. The Sable Islands barrier be recognized as a geomorphologically dynamic and sensitive area, in particular, the beach-dune complex. While low impact use by persons landing for picnicking, beachcombing and birdwatching is tolerable, it is essential that the dunes be protected from devegetation or physical damage by visitors. While scientific or interpretive uses are important, it would be inappropriate to set up structured trails which encourage heavy foot traffic. Visitation of a geographically erratic nature, would be of lower impact.

5. In view of the dynamic nature of the shoreline portions of the park that the jurisdiction of the park be extended to include at least 30 metres offshore of the mean highwater mark on the open water side and 200 metres on the lagoonal side as well as along the mainland shore. This would include the offshore bar sediment zone and the lagoonal marshes, and should be extended to include the whole of the subaqueous sediment platform that projects towards Quick Island and that which recurves into the lagoon from the southern end.

6. While low water episodes are not geomorphologically damaging, and, in fact, have some positive effects, every effort should be made to reduce the permitted level of high water and the duration of highwater episodes. Shore erosion is exacerbated by high water levels and is injurious to the preservation of the barrier.

7. Since the sediment source for the Sable Islands barrier is believed to have its origin on the Minnesota coast south of Long Point, that it be recognized that coordination with the United States authorities should be an intrinsic element of long-term management strategy.