Interpretive Guide to the Beach

Six thousand years into the past, Pinery Provincial Park was nothing more than a 5,800 acre tract of lake bottom. Through a dramatic sequence of events known collectively as sand dune succession, the park slowly rose from the water to its present state. Since dune succession is still occurring, one only has to wander down to the shoreline in order to envisage the series of changes through which this park originated.

By looking at the bottom of this page, you will see the cross-sectional map of the beach stretching from the shoreline back to the mature oak forest. If you make your way slowly and use this pamphlet, this area will become a living museum through which 800 years of Pinery's past is animately illustrated.
1. The Shoreline: A Source of Sand

The methodical action of waves hitting the shoreline, although seemingly innocent, is the source of all the sand in this park. By cupping your hands and scooping up some water, you will soon discover a thin layer of sand settling out. The origin of this material is from erosion of the shoreline to the northeast. Strong longshore currents bring the sand to the park, where through wave action, it is deposited on the beach. Once on shore, the north winds quickly dry and blow it inland. Six thousand years ago, this shoreline was situated at the main park entrance. The continual deposition of sand, coupled with lowering lake levels, has resulted in its migration to the present position.
This interface between land and water attracts a variety of wildlife species, including one particular insect, the mayfly.

After spending a full year in an aquatic larval stage, mayflies crawl up on shore and transform into winged adults. The lives of these newlyformed adults are somewhat hampered in that they lack the necessary mouthparts with which to feed. Due to this impediment, they survive for only one or two days. During their short airborne existence, the males congregate in large numbers and perform a disco-like display, attempting to attract mates. These synchronized up-and-down flights have been witnessed by many campers around nightfall. Its effectiveness is demonstrated through the consistent annual appearance of these interesting members of the insect world.
2. The Beach: Pinery's Womb

This strip of windblown sand may best be referred to as the womb of Pinery, in that all the sand dunes evident throughout this park have arisen from such beaches.

The requirements for the building of the dunes are two-fold; a source of blowing sand and the presence of obstacles. Look around for a piece of driftwood and you can witness the actual phenomenon of dune formation unfolding. As sand-laden winds pass over the wood, they come into contact with a pocket of "dead air". At this point, the sand falls out of the wind and builds up on the leeward side of the obstacle. Since the extent of the sand buildup is controlled by the height of the obstacle, the miniature or embryo dunes formed around debris are incapable of attaining any appreciable size.

For sand dunes to continue growing, they must come up against a barrier that also grows, namely beach plants. You have probably noticed that the beach is devoid of this vegetation. Such is the case because these primary plants are incapable of competing with the thousands of daily sunbathers. Hence, their presence is restricted only to the more remote areas of the shoreline.
The most common of the exiled plants, the cactus-like sea rocket, is well suited for surviving under harsh conditions on the beach. Its stem is rubbery, so in the face of strong winds, the plant bends rather than snapping in half. Also, its leaves are thick and waxy in order to conserve water in times of extreme heat (sometimes reaching 66°C).

Even though these plants are superior to debris in the formation of sand dunes, they still have one important drawback - that being they are annuals. The sand built up over the course of the summer quickly blows away in the fall as these natural barriers die and decay.

3. First Dune - Down to the Grass Roots

The existence and size of this, the first true sand dune, is attributed to another group of plants known as the sand dune grasses. The specific species involved are sand reed and to a lesser extent, marram grass. Like the beach plants, the structures of these grasses also readily resist sand abrasion, wind breakage and water loss. Confronted by high winds capable of blowing seeds many miles away, these plants have evolved a dual system of reproduction. In addition to the conventional seed production, they send out rhizomes or horizontal stems under the surface to push up new growth short distances away.
Each year the sand builds up around these grasses as it does around the beach plants. The success of these species as dune formers, lies in that they are perennials rather than annuals. In the fall, only the above-ground vegetation dies. The extensive and interwoven network of roots remains year round to bind the growing pile of sand in place. These roots may be seen on the windward side of the first dune where severe storms have eroded away parts of the ridge.

With the onset of spring, new growth sprouts up through the ridge to present a new and even higher barrier to sand movement. Following the increasing height of the dune, the roots accordingly move upwards on the plant stem to hold the additional sand buildup against wind erosion. The results of this process over a period of around 100 years, is the mound of sand on which you are now standing.

There are many more plants other than grasses on this dune. Can you identify them?
The silvery colour of biannual wormwood makes it easy to distinguish. In the past, wormwood was used in place of hops for brewing beer and also, later used in making a liquor.

In medieval England, it was made into a type of love potion. It is said that if a person anointed one's body with a wormwood concoction on St. Luke's Eve (October 18th) that night, he or she would dream of the one that he or she would marry. Its success is limited.
4. Interdunal Meadow - The Unusual and Secretive

This protected valley between successive dunes tends towards a savannah-like appearance with its grasslands interspersed with low lying shrubs. Due to the limited cover afforded by this habitat, the wildlife found here are, for the most part, secretive in their habits.

The prairie warbler is a fitting example of one such species. In the case of most campers, this small yellowish bird is more often heard than seen. Its call, a series of ascending zees, echoes throughout the interdunal area from the spring to early summer. For those who are interested in viewing the prairie warbler, zeroing in on the familiar calls with a pair of binoculars, will often prove successful.

This warbler is of considerable importance to the naturalists of Pinery because its entire Canadian range is restricted to a few local sand dune areas along the lower Great Lakes. In fact, many dedicated naturalists have visited Pinery for the sole purpose of seeing this relatively rare bird. The breeding status of the prairie warbler here is shrouded in mystery since to-date, no nests have been officially found. If you are fortunate enough to come across such a nest, please pass the information on to the park interpretive staff.
Another often overlooked inhabitant of the interdunal meadow is the doodlebug or larval antlion. Its presence is distinguished by the existence of small funnel-shaped depressions in the sand. The antlions themselves are semi-buried at the bases of these excavations. The pits serve as ingenious devices for catching ants and other small insects. As the unwary prey walks over to the edge of the trap, he begins to slide down the incline on the moving sand. Trying to climb back, the ant is like us trying to get out of a gravel pit in that the more you struggle to get out, the further down you slide. As the grains of sand begin to reach the base of the funnel, the doodlebug becomes aware that dinner is close at hand. He enhances the rate of descent of the prey by using his large mandibles or jaws to flip sand out of the bottom of the pit. This causes the sides to collapse at a faster rate. When the prey is within range, the well-adapted predator grabs the prey, crushes it with his jaws and consumes it. Aren't we lucky that they are only about half an inch long!
An air of permanency and stability is felt as one ascends the second dune. The fragility and sparseness of the preceding sections transform into a taller and denser environment. The large shade-intolerant trees of red cedar and black and dwarf oak symbolize the onset of a forest community. In time, white and red oaks along with pines will appear and shade out the cedars, resulting in the climax forest so typical of Pinery.

The new varieties of plant life here are also capable of sustaining a much greater diversity of wildlife. Foods such as the fruits of chokecherry, fragrant sumac and wild grape are present and readily utilized by many species of birds and mammals.

Many more places are available to raise young such as tree cavities for racoons and Great Crested Flycatchers. A whole web of life, interdependent on each other and on the vegetation, has been created over a period of 800 years.
Protective Measures

The role of management in this section of Pinery lies in maintaining the protective layer of surface vegetation on the dunes. If you look about you, you will see the consequences of the destruction of plant life. Wind-gorged ditches over the first dune symbolize the effect of shortcuts to the beach. Trampled vegetation on the windward side of the second dune has resulted in huge bowl-shaped pits known as blow-outs. The resultant blowing sand often piles up behind the second ridge forming enormous mounds called moving dunes. Being unstable and under the influence of the wind, these mounds shift approximately 3 m. per year. Everything in their paths is buried, including trees, roads and comfort stations.
Many projects are underway to combat this erosion. The first of many boardwalks over the dunes was recently constructed off the Wilderness Trail. By channelling the 400,000 or so annual park visitors over such boardwalks, the future of the vegetation will be ensured.

What about the erosion that has already occurred? Working closely with the University of Western Ontario, the Ministry of Natural Resources has undertaken a program of dune rehabilitation. This program consists of the planting of dune grasses in the eroded areas to once again stabilize the sand.
The Future?

With proper management techniques and greater public awareness, this park can be enjoyed by millions of visitors for years to come. The implementation of the Visitor Services Program has been a strong start in enlightening those who wish to know more about their natural surroundings. Through the actions of this program school groups are now being constantly conducted through the park free of charge and introduced to the concepts of sand dune succession. The efforts being made to conserve the dune system by fencing off critical areas are being explained and justified to visitors who will understand the advantages of protecting the peculiar landscaping of Pinery Provincial Park. Visitor Services draws out the significant features of Pinery through other methods such as extensive hikes and interpretive evening programs. Now that Pinery has been classified as a Natural Environment area, all plans can be directed towards preserving a historic and very special place for generations to frequent in the future.
Summary

You can see that concerned efforts are being made to preserve and protect not only the beautiful fresh water beach of Pinery, but the ancient dune system that lies behind it. Indeed, Pinery itself rests on the heritage of several thousand years of sandy development. The process of sand dune succession is a dynamic phenomenon and one which can be obliterated so easily. Archaeologists, geologists and geomorphologists need this unique terrain in which to access the history and impact of such a formation. Your children need it in order to experience a miracle that is as old as the pyramids of Egypt. Lastly, you need it. You are the only one who can take the trouble to appreciate such a fragile natural wonder and pass on your understanding and concern to others. Enjoy your opportunity.
PINERY’S TRAILS

1. Riverside Trail is a 1 km gently rolling trail that meanders along the banks of the Old Ausable River Channel. Self-guided.

2. Bittersweet Trail is a 1.5 km trail that passes through a mature pine-oak forest to the banks of the Old Ausable River Channel. Self-guided.

3. Hickory Trail is a 1 km trail that passes through stands of shagbark hickory and red oak.

4. Wilderness Trail is a 3 km trail that travels through some of the more remote forests in the park and then on a boardwalk across the dunes to a viewing platform overlooking Lake Huron.

5. Lookout Trail is a 1 km trail that travels up one of the largest dunes in the park to a spectacular view of the Thedford Bog.

6. Cedar Trail is 2.3 km trail that passes through a low savannah-like forest and returns along the banks of the Old Ausable River Channel.

7. Pine Trail is a .8 km trail that travels through quiet stands of Red Pine.

8. Nipissing Beach Trail is a 2 km trail with a substantial climb to the top of the highest dune ridge in the park. Both the lake and the Thedford Bog can be seen from the peak on this trail.

9. Carolinian Trail is a 1.8 km trail that passes through a lush forest that contains tulip tree, ash, beech and many more species which are not common in other areas of the park.

Guided nature walks will be conducted on all of these trails throughout the spring, summer and fall. Please check the park brochure for the location of the trails.