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## Settlement and Change

“Many have sustained great damage by the indiscrete firing of the woods.”

*Plymouth Colony Records 1638*

Early Pilgrim writings describe Cape Cod as a forest of luxuriant woods, “... juniper, birch, holly, vines, some ash, and walnut; wood for the most part open and without underwood ...” “But the practice of the time was to hold this land for the common use of everyone. This was its downfall, for its use became a matter of first come, first served. Those who exploited it reaped its benefits. So before long, the wealth of the forest found its way into all aspects of Colonial life.

The Province Lands’ forests provided tar, turpentine, and potash; wood was used for homes, ship repairs, and fuel; and land was cleared for farming and the raising of cattle and sheep that grazed without restriction. Inevitably, the forests dwindled as early settlers took more from the land than it could produce. With few controls upon its use the cover of life was destroyed and the soil deteriorated. By 1800, most Lower Cape forests had vanished.

Without tree cover the land was unprotected. And the fierce Province Lands winds began to tear away the soil. Sand movement was so pronounced by 1714 that Provincetown was in danger of being obliterated. Houses were even built on pilings so the sand could pass beneath, unopposed.



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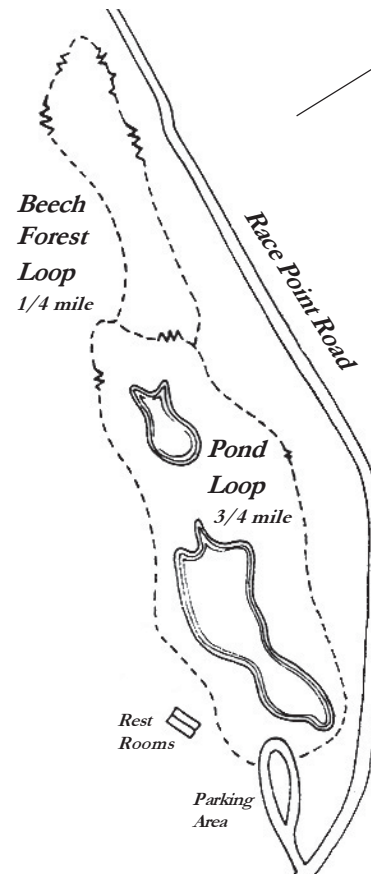
Text: Mike Whatley

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In an effort to halt the abusive uses, Colonial and Federal laws were repeatedly enacted. Most were ignored. In desperation, beach grass was planted on 1,400 acres of sand in the early 1800s in an effort to save the town. Finally, in 1893, the Commonwealth of Massachusetts began a major program to plant trees and shrubs.

Yet today, the sand dunes are still moving and portions of the beech forest are still being buried. So the effort to stabilize the land goes on. With time - and care - the diversity of life that the Pilgrims found in the Province Lands may return.



# BEECH FOREST TRAIL



“... encompassed about to the very sea with oaks, pines, juniper, sassafras and other sweet woods...”

excerpt from *Mourt's Relations*  
A chronicle of the Plymouth Colony

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## *Birth of a Sandy Hook*

When glaciers retreated northward from this land some 150 centuries ago, they left a landscape far different from the world of beaches and sand dunes we see today.

At first, the sea was as much as four hundred feet below its present level and the land that would become Cape Cod was distinguishable only as the high area of a great mound of sandy soils. Even the fishing shoals of Georges Bank, about 100 miles to the east, were exposed by this lowered sea level. "Cape Cod" was thereby protected from the erosive power of easterly storms for a while. But meltwaters from the great glaciers poured into the oceans as warmer climates returned, and the sea slowly submerged the "banks." Storms then assaulted the eastern shore of this highest land.

Sea level continued to rise, and waves cut away the earth. The eroded soil was sorted by size in the surf and carried as sediment along the coast according to the direction of the waves. Bars of sand formed from these sediments, wherever irregularities existed in the coastline, and extended from several to tens of feet each year. A mile, perhaps two miles, of the eastern coastline of Cape Cod was removed by this erosion. And all the while, the rising sea flooded the coastline.

Although many Cape ponds were formed in depressions left by melting blocks of glacial ice, the dune ponds are different. In some instances, shallow ponds formed when sand was blown from low-lying areas. Other ponds lie in swales between small, former spits. All these areas became water-filled when the ground water was lifted by the salt water beneath it. Most are not more than two or three feet deep.

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The Province Lands "fist" is a relatively recent addition to Cape Cod. It began to form about 5,000 years ago. And with the addition of sand, the great peninsula continues to slowly expand westward as glacial sediments are transported from the south. The sand and gravel of Truro's outer cliffs will nourish these famous beaches for a while, but inevitably the nourishing landforms will be eroded away by the relentless action of the sea. The growth of the Province Lands will end and its erosion will begin.

## *From Beach to Beech*

No land is without life for long. And so it was with the Province Lands. Beach grass was one of the early colonizers of this land, then a forest of black oak, white oak and pitch pine gradually covered the stabilized dunes. By the time the Pilgrims landed, most of the land was forested.

With life comes soil. And soil moderates the extreme conditions to which life is exposed. So what was once hot, arid, sterile sand became shaded, moist, and nutrient-rich. To the Pilgrims, the soil of the Province Lands was a "crust of the earth a spit's [spade's] depth excellent black earth." Under these gentler conditions there flourished plants that would not otherwise be able to do so. These include plants present along the trail today: mayflower, spotted wintergreen, starflower, red maple, and of course, beech.

The beech forest then, is the product of centuries of development. It represents the last stage in the sequence of changing plants on Cape Cod. Given the climate and the nature of the local soils, it is the ultimate cover of life. No other forms will replace it. Without such catastrophes as fire, it will perpetuate itself.

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Prior to Western settlement, beech forests were far more common in the Province Lands. Now, this is one of the few surviving patches from that once rich past.

## *Life of the Pond*

Water is the essence of life. Where it is abundant, life is in profusion. Where it is scarce, plants and animals adapt to economize the limited supply, or fail to survive. This range of conditions is conspicuous by the dune ponds.

Uphill from water, only pines are growing well. Their roots extend deep and wide in the earth to obtain the little water that sand holds. But close to the pond there is a noticeable change. Other plants are able to reach this life-sustaining liquid and survive. These include tupelo, red maple, inkberry, swamp azalea, and sheep laurel. Even if no water is visible, these plants are indicators of water-saturated earth within a few feet of the ground surface. The pond itself is an exposed portion of this same water table.

Within the dunes ponds, life is in profusion. Nutrients are abundant and there are few stresses - other than space - that limit growth. Arrowhead, pickerel weed, golden club, and floating heart grow luxuriantly.

But even here life is controlled by changes in the water level. The water level rises and falls from one to two feet each year, according to seasonal rainfall and evaporation, and at times shallow portions of the ponds are exposed.

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