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Migrating dune inundates Route 6

By Susan Seligson

With the persistence of Sisyphus, the mythological Greek king condemned for eternity to push a boulder up a mountain only to have it roll down when he neared the top, the state Department of Public Works clears sand off Route 6 after each windstorm to prevent migrating sand dunes from engulfing the highway.

The state highway maintenance foreman in Truro routinely dispatches a crew with front-end loaders and a dump truck to scoop up the sand and take it to the sanitary landfill, where it is used for cover material.

But the dune is not a mere maintenance problem. It is also a constant reminder of the drastic ways in which man alters his environment. Almost totally lacking in vegetation, the dune is not a natural, but a disturbed, landscape, said Graham Giese, scientist at the Provincetown Center for Coastal Studies. It is one of the many casualties of the massive deforestation of the Outer Cape that began as early as the 17th century.

Provincetown's sandy land mass was relatively stable until the early settlers leveled miles of Outer Cape forests for pasture, crops and wood. Colonists cleared the woods for pasture and to build boats and houses. Throughout the 1800's cordwood was cut extensively to evaporate seawater in making salt. Without stabilizing vegetation, wind forms like the dunes that border Route 6 have nothing to stop them from constant shifting.

Provincetown, the hook of Cape Cod, is geologically unique among Cape towns because it is comprised almost completely of sandy material, making it more prone to wind and wave erosion than other areas, Giese said. While the rest of the Cape, largely glacial in origin, contains silt and clay as well as sand, the hook was formed from sandy sediment. Instead of providing solid ground for stabilizing vegetation, there is only shifting sand, moved by water and often violent winds.

In a description of Provincetown by a soil scientist at the University of Massachusetts, John M. Zak said the soils here are infertile, "the land is eroded, recurrent fires are common, light intensities are extremely high, and desiccating winds blow almost continuously."

"Under such environmental conditions, little but pioneer vegetation is found anywhere," Zak said. "This lack of vegetation leaves the sand dunes free to shift as increasing winds blow."

Dr. Stephen Leatherman, director of the National Park Service Cooperative Research Unit, and Dr. Fred Anders, assistant director, have studied migrating dunes in the Province Lands. The Seashore commissioned the study about a year ago.

The scientists compared aerial photographs of the dunes taken since 1938 to determine how fast they are moving and changes in the amount of dune vegetation.

After studying photographs taken in 1938, 1954, 1962, 1971 and 1978, the scientists mapped the dunes for each year, Anders said. They later overlapped the maps to see how the dunes have changed since 1938.

Categorizing the dunes into "non-moving, slow-moving and fast-moving," Anders and Leatherman found that the fastest-moving dune, the one bordering Route 6 near Pilgrim Lake, moves an average of 20 feet each year.

"The dunes that migrate rapidly are the ones the Seashore is most concerned with," Leatherman said. "Our study also proposes management techniques to stabilize these dunes."

Giese stressed that wind and wave erosion, the forces that shaped the Outer Cape during the past hundreds of years from rocky cliffs, remain slowly but consistently at work. If the migrating dune was left to pursue its own course without human intervention, it would continue

across Provincetown and eventually to the sea.

"It's a great thing for Provincetown" that the state built Route 6, Giese said. Because the highway is under state jurisdiction, Provincetown doesn't have to foot the bill for the costly removal of sand from the road. In a 1967 report for the Department of Public Works, Zak estimated that 10,000 cubic feet of sand are removed each year as a result of the creeping inland dune. In addition to the tremendous cost of removing the sand, and the threat of additional dunes nearing the highway, the windblown sand permanently damages car windshields and hinders visibility.

Some of the earliest British settlers recognized that deforestation presents serious erosion problems, Giese said. As early as 1714 and again in 1826 moving dunes had to be stabilized to protect Provincetown. Pine branches were placed on the inland side of dunes to shelter the sand and catch beach grass seed, and allow other plants to grow

to stabilize the dunes. Beach grass, mostly American beach grass, called *Ammophila breviflora* fern, was also planted to cover the moving dunes.

The Seashore still plants beach grass to prevent further erosion of sandy areas. In many areas pedestrians and off-road vehicles (ORV's) are prohibited from treading on fragile dunes. But seeding the coastal dunes is often a frustrating endeavor because constant and vigorous winds won't allow new plants to take root.

Giese said many people believe the dunes should be left to "take their natural course." But the dunes are not natural land forms, he said. They were unnaturally stripped of their stabilizing vegetation. The migrating dune that plagues state highway workers is just a mass of sand, he said.

"There is no question the dune has been disturbed by man and needs to be stabilized," Giese said.

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Seashore to restrict dune walking

By Carl Goldberg

With no fanfare and no public discussion, Seashore Superintendent Herbert Olsen will put new regulations into effect next month that will dramatically limit walking in the dunes.

Olsen said Tuesday a 30-minute time limit for parking in the dune parking lot on Route 6 will be imposed, fences will be erected at the tops of dunes around the lot, and rangers will be stationed seven days a week in the parking lot to control crowds that walk to the dunes.

The pedestrian limits come three months after a heated battle in April over Seashore regulations banning off-road vehicles from the dunes and bay beaches of Provincetown.

The walking limits combined with the ORV ban will effectively eliminate almost all human presence from most of the dunes.

So far, however, the proposed walking limits have provoked no vocal opposition comparable to the storm of public protest before the ORV ban went into effect, because no one was forewarned until now.

This move represents a marked difference in Seashore procedure in implementing the management policies. The ORV bans were debated at two public hearings and at a Seashore Advisory Commission meeting before Olsen acted. The walking limits are apparently a unilateral decision by the superintendent.

Olsen's decision in April to ban ORVs from much of the Seashore was backed by many environmentalist groups, although some thought it was not severe enough. It was opposed by many Provincetown residents, as well as by the selectmen and ORV enthusiasts from other towns and states.

The walking limits will not be as far-reaching as the ORV ban because they affect only the main access to the dunes. Less travelled dune routes to bay beaches like Herring Cove and Hatches Harbor or throughout the dunes next to the Beech Forest and out to Race Point will not be affected.

The rationale for the walking limits, however, is virtually the same as that of the ORV ban: preservation of beach grass and other vegetation in a sensitive area.

Olsen said studies made by the Seashore show heavy foot traffic destroys the beach grass that stabilizes the dunes and keeps them from eroding.

"We are trying to permit as much public use as possible without damaging the area," Olsen said.

Mary-Jo Avellar, chairman of the Provincetown selectmen and a staunch opponent of Olsen's ORV limits, said Tuesday she also opposes his pedestrian regulations.

She accused Olsen of taking away "the right of people to use a recreational park for recreational purposes."

"They can't drive in it and now they can't walk in it," Avellar said angrily.

The new regulations are not, however, a total bolt from the blue, despite their sudden announcement and severe effects.

The problem of dune erosion dates back to the 18th century, when early settlers, needing wood for building and burning, cut down the trees that then grew in a forest atop the dunes.

Although they are resplendent with a unique natural beauty, the dunes are an unstable phenomenon created by man. They shift with the winds, the pull of gravity and be-

neath the feet of pedestrians. The Seashore, when it took over in 1960, inherited the problem of controlling the dunes.

Aimed at preventing the further destabilization and consequent erosion of the dunes, the new restrictions are the most comprehensive proposed so far.

The 30-minute parking limit will, Olsen hopes, keep walkers from going very far into the dunes or making the tempting trek across the dunes to the ocean.

Snow fencing along the crest of the dunes around the parking lot will physically limit foot access to all areas except the slopes around the parking lot.

Park rangers will also be on duty seven days a week to enforce the parking time limit and explain to visitors why they should not walk deep into the dunes.