

# Great Sand Dunes

NATIONAL MONUMENT

Colorado





# Great Sand Dunes NATIONAL MONUMENT

At the eastern edge of the famous San Luis Valley of south-central Colorado lies a great expanse of the highest piled inland sand dunes in the United States. Paralleling for almost 10 miles the base of the heavily forested, snow-capped Sangre de Cristo Mountains, whose peaks reach elevations of more than 14,000 feet above sea level, these dunes rise from the flat valley floor in striking contrast to the towering mountain background. This unique spectacle, together with the many interesting natural phenomena resulting from the presence of the mammoth sandpile, makes the area well qualified to hold a place as one of the units of the farflung National Park System.

As an American, you are joint owner with other Americans of the more than 57 square miles of this beautiful area that is Great Sand Dunes National Monument. The National Park Service administers the area for you and your neighbors and your guests from other countries. The superintendent and his staff ask only that you cooperate with them in keeping the monument free from litter, and that you leave the plantlife, the wild animals, and the other natural features as you find them. In this way, you will make your own visit more enjoyable, and you will be helping others to enjoy this unusual natural wonder.

## About Your Visit

*Visitor center—your first stop.* The visitor center contains a series of interesting exhibits that explain the natural history, prehistory, and history of the Great Sand Dunes area. Your understanding—and thus your enjoyment—of the things you see in the monument will be greatly increased if you will first stop at the visitor center and study the exhibits.

*Accommodations.* Within the monument, accommodations are limited to a campground and picnic area with

wood, water, and tables. Provisions and gasoline may be obtained at Hooper and Mosca, both of which are approximately 25 miles west of the monument on Colo. 17, and at Alamosa, 38 miles southwest of the monument. Major approach road to the monument is Colo. 150, which leaves Colo. 17 one mile north of Mosca.

*Self-guiding nature trail.* The Monteville Trail provides an enjoyable half-hour stroll through a small valley. Significant trailside features are explained in a leaflet, which you should obtain at the visitor center before starting your walk.

*Photography.* The dunes in their many shapes are at their best for the photographer when the slanting rays of the early morning or late afternoon sun make each feature stand out in bold relief against long shadows. If you are interested in black and white pictures, you can use a filter to emphasize the shadows, the ripple marks, the knifelike ridges, the steep slip faces, and the texture of the sandy surfaces. Camera settings on the dunes should be similar to those used for beach or snow scenes.

*Sand impressions.* Early morning is also the time when tracks left by animals and insects and the tracery formed by windblown plants reveal the story of life in this harsh environment. These evidences of the night's activity are soon erased by the shifting sands.

*The following observations are made for the protection of the natural beauty of the monument as well as for your comfort and convenience:*

**Be careful with fire! Campfires may be built only within constructed fireplaces.**

All plants and animals within the monument are protected; they must be left undisturbed and unharmed. For this reason, dogs and cats brought into the monument must be kept on leash or otherwise under physical control at all times.

Hunting or shooting in the monument is strictly prohibited.

Please help keep the premises clean by placing your trash in the fireplaces or refuse containers.

**Under no circumstances attempt to drive automobiles over the sands to the dunes.**

Be careful not to get your car stuck in the loose sand near the parking and picnic areas.

## The Valley—A Natural Trap

The San Luis Valley, whose floor ranges from 7,500 to 8,000 feet above sea level and is 3 times the size of the State of Delaware, owes its altitude and configuration to disturbances in the earth's crust that occurred a long time ago. The sand dunes, too, owe their existence indirectly to the great crustal movements, but their present shapes and posi-

tions are due to the tireless winds that blew through the valley yesterday, last week, and last year.

Scores of millions of years ago, geologists explain, an inland sea extended the length of the continent, from the western part of the Gulf of Mexico to the Arctic Ocean, roughly following the trend now marked by the Rocky Mountains. Land masses lay to the east and west of this long and relatively narrow trough. The trough was marked out by zones of weakness in the earth's crust.

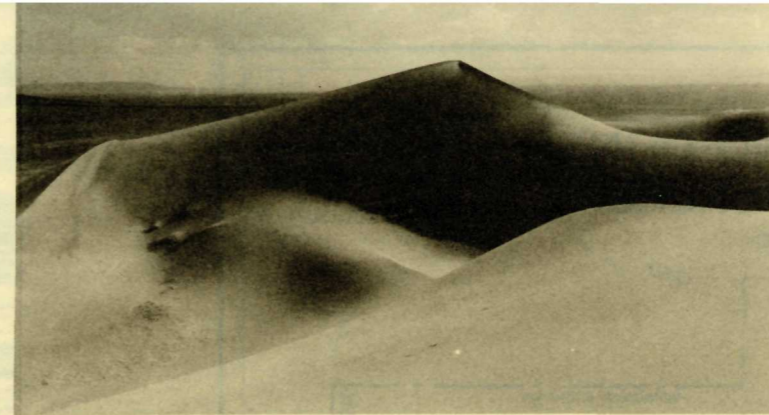
Then unmeasurable pressures within the earth's crust slowly began to exert themselves in the region of the inland sea. Gradually, over a period of millions of years, the floor of the sea was forced upward, and what had been sediments compacted into layers at the bottom of the sea became rocky crests of high mountains. This mighty heaving bent and fractured the rock layers. Accompanying the tremendous earth movements were the volcanoes that were born, erupted intermittently, and died during much of the long period of convulsion and afterward; their legacy appears today as basaltic lava and beds of ash.

Colorado was well toward the center of the elongated arena. And the San Luis Valley, a structural basin bordered by faults (fractures in the earth's crust) on the east and perhaps also on the west, is one product of the struggles that went on there.

To the east and northeast of the valley lie the Sangre de Cristo Mountains; to the west, the San Juan Mountains; and to the south, the San Luis Hills. Thus was formed a natural trap, with the mouth facing the southwest, the direction from which the prevailing winds blow.

For hundreds of thousands of years, streams that head in the mountains have transported sand and gravel and silt down into the valley, where they have deposited their loads

Shifting patterns in the sand.



The graceful outlines of wind-shaped dunes.

on their flood plains. And there the sediments became subjected to the force of the winds, southwest winds blowing through the mouth of the valley trap.

## Wind and Sand

Geologists are not in complete agreement as to the origin of the Great Sand Dunes. One school of thought holds that the light sandy soil of the San Luis Valley is the only source. According to this theory, the soil is transported by the wind which sweeps across the wide valley from the southwest. On reaching the formidable barrier presented by the lofty Sangre de Cristos, these prevailing winds sweep upward and funnel through Mosca, Medano, and Music Passes, the lowest gaps in the range. In rising to reach these passes, the wind loses much of its velocity and drops its burden of sand at the foot of the mountains. Another theory holds that the bulk of the sand was brought into the horseshoelike trap by Medano Creek and other streams from the mountains to the north and east, and that the windborne material has only added to the mass. Whatever their origin, the particles have continued to accumulate through the centuries. They have been shifted, sorted, and piled by the wind into the great dunes whose ever-changing crests rise to 600 feet above the valley floor.

Early photographs reveal that there has been little change in the dune mass over the years. But the ceaseless winds cause striking changes in the shape and appearance of the ridges, particularly after storms from the northeast. Then the opposing winds cause the dune ridges to shift until they seem at times to lean backward. When storms have passed, the southwest winds again take over, restoring the ridge contours to their original shapes. At times, the southwest winds are strong enough to cause sand plumes to rise from the ridgetops and curl over the downslopes.

Only a few streams enter the valley, and the principal flow follows the melting of snow in the mountains. Medano

Creek forms the eastern boundary of the dune mass for several miles before it disappears into the sand. East of the creek is an area of small dunes, formed from sand which blows across the streambed when it is dry. These smaller dunes leave graphic evidence of their movement in the form of skeleton trees, smothered as the windblown grains alternately cover and then uncover them.

## Plants and Animals

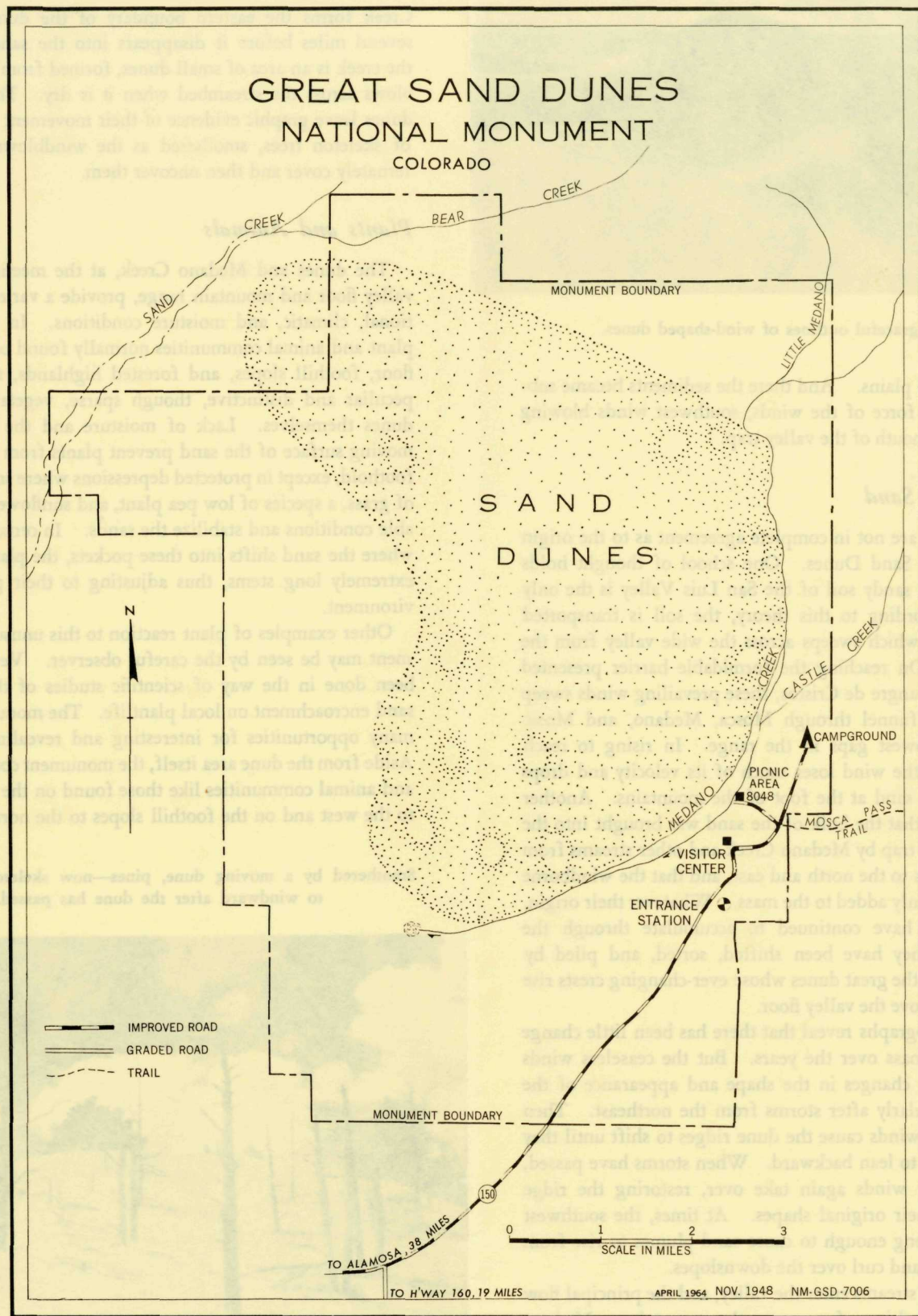
The dunes and Medano Creek, at the meeting place of valley floor and mountain range, provide a variety of elevational, climatic, and moisture conditions. In addition to plant and animal communities normally found on the valley floor, foothill slopes, and forested highlands, there is the peculiar and distinctive, though sparse, vegetation of the dunes themselves. Lack of moisture and the continually moving surface of the sand prevent plants from obtaining a foothold, except in protected depressions where small patches of grass, a species of low pea plant, and sunflowers find suitable conditions and stabilize the sands. In certain locations where the sand shifts into these pockets, the plants develop extremely long stems, thus adjusting to their peculiar environment.

Other examples of plant reaction to this unusual environment may be seen by the careful observer. Very little has been done in the way of scientific studies of the effect of sand encroachment on local plantlife. The monument offers many opportunities for interesting and revealing research. Aside from the dune area itself, the monument contains plant and animal communities like those found on the valley floor to the west and on the foothill slopes to the north and east.

Smothered by a moving dune, pines—now skeletons—emerge to windward after the dune has passed.







Shallow Medano Creek.

Rabbits, ground squirrels, coyotes, magpies, and other small mammals and birds that are characteristic of the rabbitbrush and grassland of the valley floor abound along the southwestern edge of the dune area. And chipmunks, mule deer, jays of several species, and other creatures that are typical of the pinyon-juniper-ponderosa pine belt of the foothill region are at home in the eastern and northern parts of the monument.

Observers have counted 139 species of birds within the boundaries of the monument.

The upper waters of Medano Creek contain trout, although the stream does not attract many fishermen because it is almost inaccessible.

**Prehistory and History**

Archeological research in the San Luis Valley, although limited, indicates that this region was occupied about 10,000 years ago by nomadic hunters. Two of their campsites, which have been excavated, yielded spear points—called Folsom points—in association with bones of what is believed to be an extinct species of bison. From about 10,000 years ago to the historic period, various other groups came here.

During much of relatively recent times, the valley was probably controlled largely by historic Ute Indians, but other groups visited the area. Among the periodic visitors were certain Puebloan groups and the Apache from the south, and the Comanche, Cheyenne, and Arapaho from the east and north. Only the Ute Indians made the valley their permanent home.

Spanish explorers, moving northward from New Mexico along the Rio Grande, are known to have reached the San Luis Valley. Juan Bautista de Anza, returning in 1779 from a punitive expedition against the Comanche Indians

on the headwaters of the Arkansas River, crossed Medano Pass and traveled through the valley.

In the winter of 1806-7, Lt. Zebulon Pike's expedition, exploring the territory acquired through the Louisiana Purchase, entered the San Luis Valley by way of Medano Pass and raised the United States flag at a temporary fort on the Conejos River. Pike included in his journal a description of the dune area. Later, other explorers, including John W. Gunnison (in the summer of 1853), viewed the dunes. Permanent settlement in the San Luis Valley began early in the 1850's.

**Administration**

Great Sand Dunes National Monument, established on March 17, 1932, is administered by the National Park Service, U.S. Department of the Interior.

The National Park System, of which this area is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and enjoyment of its people.

Development of this monument is part of MISSION 66, a 10-year conservation program to unfold the full potential of the National Park System for the use and enjoyment of both present and future generations.

A superintendent, whose address is Box 60, Alamosa, Colo., 81101, is in immediate charge of the monument.

**America's Natural Resources**

Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

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