

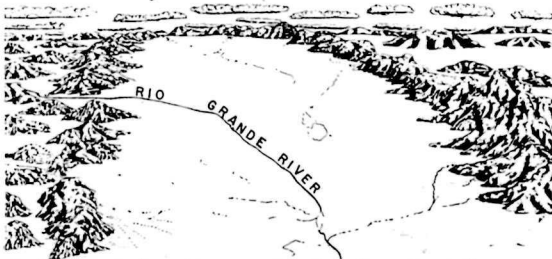
Montville Trail



**PRICE 10 CENTS IF YOU
TAKE THIS BOOKLET HOME**

**GREAT SAND DUNES NATIONAL MONUMENT
COLORADO**

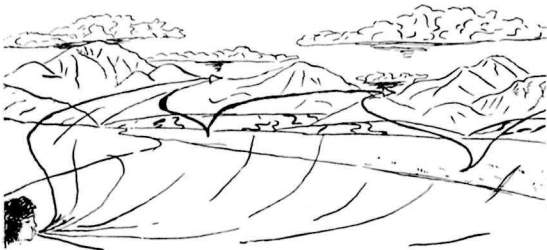
HOW THE GREAT SAND DUNES WERE FORMED



1. Millions of years ago the San Juan and Sangre de Cristo Mountains were uplifted. Streams, draining these mountains, have dropped their sediments in the valley.



2. A great bed of sandy soil and silt has been deposited in the San Luis Valley. For ages this soil has been blown toward the mountains by the southwest wind.



3. When the silt laden wind reaches the mountains it rises and funnels through Mosca, Medano, and Music Passes. In doing this it loses its velocity and drops its load of sand at the base of the mountains.



4. For thousands of years the wind has been dropping its load of sand and now a large part of the San Luis Valley is piled at the base of the Sangre de Cristos in the form of the Great Sand Dunes.

NATIONAL PARKS AND MONUMENTS

The National Park Service was established as an agency of the U. S. Department of the Interior in 1916 to preserve the marvels of nature's handiwork in such areas as Great Sand Dunes National Monument. Yellowstone National Park, created in 1872, was the first National Park in the world to be dedicated to the principle of preservation for the enjoyment and inspiration of all the people of this and future generations. This continues today to be the guiding principle of the National Park Service, which administers 192 areas set aside for their scenic, scientific, historic, and archeologic values. The National Parks and Monuments have been called the "crown jewels of America" and they are yours to protect and treasure for Americans of the future.

KEEP AMERICA BEAUTIFUL!

HOW TO USE THIS BOOKLET

This booklet is your guide to the Montville Trail, a nature trail which begins at the registration desk. It provides easy walking all the way, and about 30 minutes are required to make the round trip.

Various features of interest along the trail are indicated by numbered stakes, corresponding to numbered paragraphs in this leaflet which answer many of your questions about this area.

You may purchase this booklet by dropping 10c in the slot in the registration desk, or use it free of charge, replacing it in the desk when you leave.

FEEL FREE TO ROAM

There are no poisonous reptiles or dangerous animals within the Monument, so feel free to roam and explore.

FOR THE PHOTOGRAPHER

The dunes are a fine subject for pictures. The best are taken in morning or late afternoon when there are shadows on the dunes. Without shadows the dunes appear flat. Use an exposure meter if you have one, as the light can be deceptive.

HELP CURE LITTERBUGS!

MONTVILLE TRAIL

1. OLD TOLL GATE AND POST OFFICE. On this location the old toll house and stage station was maintained while the Mosca Pass Toll Road was still in operation. Even after the charter was bought by the state of Colorado and tolls were no longer collected, a post office was still located here under the name of Montville, but closed its doors about 1898.

Mr. Coley King, the last postmaster of Montville, has identified the short juniper stub marked by the white stake as the remnant of one of the toll gateposts.

During the later years of the post office, Mr. King and his brother and deputy postmaster, Will King, kept a small grocery store and a team of horses to help pull wagons over the Pass. At that time a fruit orchard thrived just to the east of the present road and south of the upper picnic grounds.

2. ROCKY MOUNTAIN MAPLE (*Acer glabrum*). Maples of this species are usually shrublike, but under favorable conditions may reach tree size. In the fall the leaves turn various shades of yellow and red, providing a beautiful sight. The familiar boxelder, extensively planted as a shade tree in the west, is also a member of the maple family.

The various kinds of maples may usually be recognized by their lobed, opposite leaves and typical winged seeds. The seeds, as well as buds and flowers, provide food for many kinds of birds and mammals.

3. **THINLEAF ALDER** (*Alnus tenuifolia*). This large shrub with the reddish-brown bark belongs to the birch family and is sometimes confused with mountain birch. Larger and more treelike specimens occur a short distance up this creek. Alders are browsed to some extent by livestock and help to check soil erosion along mountain streams.

4. **WHITE FIR** (*Abies concolor*). Firs are usually quite common between elevations of 8,000 to 11,000 feet, and, with spruce, form dense forests. You can always tell firs from other evergreen trees if you will remember that needles of firs are flat and flexible. Instead of hanging down, as do most conifers, fir cones stand erect on the upper branches like candles on a Christmas tree. Cones are almost never found on the ground, as they break apart while on the tree, and fall scale by scale, leaving only the central spike of the cone projecting from the branch.

Pinyon at Station 7



5. **SKUNKBUSH SUMAC** (*Rhus trilobata*). The smelly foliage gives the unflattering name to this member of the sumac family. Although a close relative of poison-ivy, it is not poisonous. Indians ate the fuzzy red berries, used them in making dyes, and used the stems in basketry. Pioneers made a lemonade-like drink of the berries.

6. **TRUE MOUNTAIN-MAHOGANY** (*Cercocarpus montanus*). Sometimes known as deerbrowse, these plants are useful in protecting soil from erosion, and are an important source of food for deer and other wildlife. The foliage is also relished by cattle and sheep, and, if you look closely at the shrubs, you can see the old browse line caused by heavy grazing before the area became a National Monument.

The wood is very hard, and was sometimes used by Indians in making digging sticks and tool handles. When in fruit the plant is quite attractive, as the seeds have feathery, corkscrew-like tails which aid them in penetrating the ground.

7. **PINYON** (*Pinus edulis*). This small pine, associated with various kinds of juniper, covers most plateau areas in the Southwest. A pinyon and juniper woodland is often called a *pigmy forest*. The trees are usually straggly and rarely exceed 30-35 feet in height. Large trees may reach an age of 250-350 years.

All pines produce seeds which are important food for squirrels and birds. Seeds of the pinyon are nutlike and quite delicious. They have long been eaten by Indians, and may now be purchased in many grocery stores. The nuts are produced in pairs at the base of each cone scale. Pinyon resin is used by Indians to waterproof baskets and to cement turquoise stones in their jewelry.

8. **PLAINS PRICKLYPEAR** (*Opuntia polyacantha*) and **SNOWBALL CACTUS** (*Pediocactus simpsonii*). Better examples of pricklypear will be seen farther along the trail, but here you can compare its flat-jointed type of growth with that of the small, round snowball cactus, or "mountain cactus." Because of its small size and numerous spines, snowball cactus is sometimes called "pincushion cactus." Its delicate pink blossoms open only when the sun shines, and appear in late May or early June. The *pads* of the pricklypear are stems, not leaves.

You may be surprised to find cactus growing up here so far from hot, dry deserts. Actually Great Sand Dunes is in a semi-desert area if we define a desert as "a region of uncertain and deficient rainfall." Normally at this elevation of over 8,000 feet, you would expect to find heavy growth of ponderosa pine and Douglas-fir. However, the prevailing southwest winds lose much of their moisture in rising over the high mountains to the west, leaving only a small amount of rainfall (about 8 inches per year) for Great Sand Dunes and the surrounding area. Because of this, many typical desert and semi-desert plants grow here.



The Dunes as seen from Station No. 9. Note long windward slopes of dunes, showing that the prevailing wind is from the southwest.

9. DUNES OVERLOOK. From this point is an excellent view of the Great Sand Dunes. Rising more than 600 feet from the valley floor, they are the highest piled inland sand dunes in the United States.

Most people wonder how the dunes were formed. To answer this question we must go back in geologic time to the building of the Rocky Mountains. During that period huge sections of the earth's surface were pushed up to form the Sangre de Cristo Mountains on the eastern border of the San Luis Valley and the San Juan Mountains on the west, which you can see far across the valley. The Rio Grande and other streams draining these mountains have dropped their loads of sediment in the San Luis Valley, and, through the ages, have built up a huge bed of light, sandy soil. Prevailing southwest winds pick up this sandy soil and carry it toward the Sangre de Cristo Mountains. As the winds push up over the mountains they lose velocity and the sand is dropped, thus gradually building up the gigantic dunes that are spread below you.

This process continues even today, adding slowly to the size of the dunes and gradually pushing them higher up the mountain. Places can be seen where the dunes have gradually engulfed stands of ponderosa pine and Douglas-fir, leaving only the tops of these trees as gaunt skeletons projecting from the sand.

From here you can see the San Luis Lakes to the southwest. The line of cottonwood trees just this side of the dunes marks the stream bed of Medano (MAY-dah-no) Creek. *Medano* is a Spanish word for dune. Water flows here only during the spring season of wet years.

10. **ROCKY MOUNTAIN JUNIPER** (*Juniperus scopulorum*). This and other species of juniper are indicator plants of the Upper Sonoran Life Zone, so named because of climatic similarity to the highlands of northern Mexico. The Rocky Mountain juniper seldom exceeds 30 feet in height and is characterized by more or less drooping branches. It grows as far north as Alberta and British Columbia, but does not extend into Mexico.

11. **WATERLOGGED PINYONS**. Pinyons don't like wet feet, preferring rather dry, well-drained slopes. Seepage from the ditch above has killed these unlucky ones.

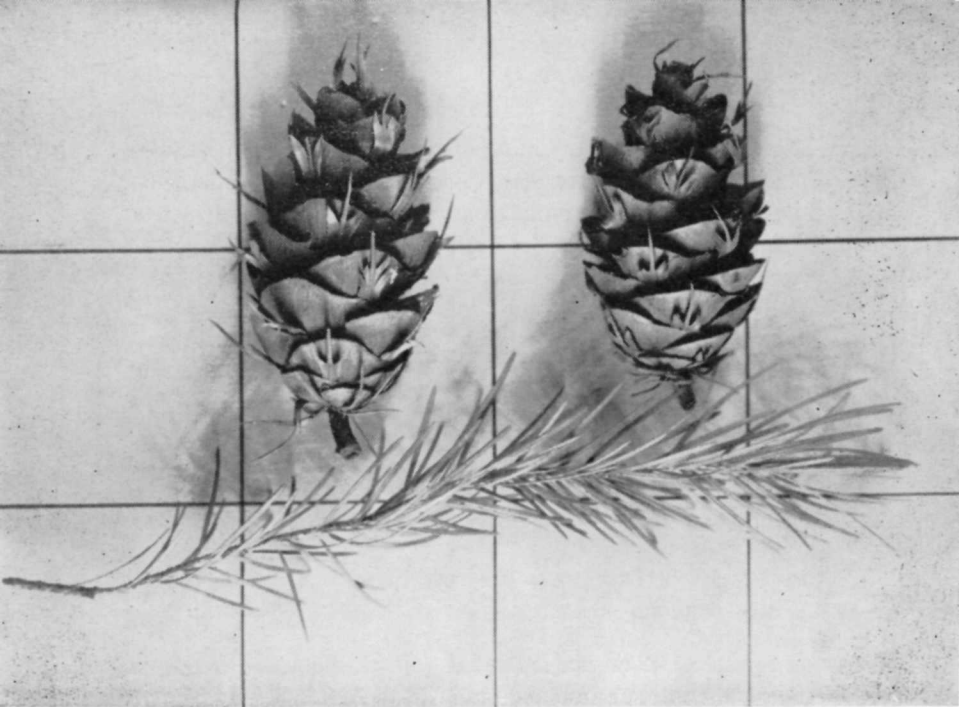
12. **NARROWLEAF COTTONWOOD** (*Populus angustifolia*). This small tree is usually quite abundant along streams in the Rocky Mountain region. Because of the long, narrow leaves it is sometimes mistaken for a willow to which it is closely related. In autumn the leaves turn a bright yellow-orange and present a striking appearance.

13. **SMALL SOAPWEED** (*Yucca glauca*). Most yuccas occur in hot, dry deserts farther south, but this species is common in the cold, dry areas of this region. The name *soapweed* comes from the large quantity of soapy material in the roots and stems, which has long been used as soap by the Indians. Roots and central portions of the stalk are pulverized and then placed in water, where they are rubbed until suds develop. The soap thus produced is said to be especially effective when used as a shampoo.

Fiber from yucca leaves has been used for making rope, mats, sandals, and cloth. During June and early July beautiful, waxy-white flowers are borne on a central stalk.

14. **MOUNTAIN SNOWBERRY** (*Symphoricarpos oreophilus*). During summer months the snowberry usually has an abundance of small, bell-shaped, pinkish flowers. The waxy-white berries which develop in the fall are ornamental, and snowberries are an important wildlife food in the Western States. Birds are especially fond of the berries, which may remain available on bushes until late in the winter when other food is scarce. Twigs and foliage form a large part of the diet of the Rocky Mountain mule deer, which is common in and near Great Sand Dunes. In addition to providing food, the bushes are used as nesting and protective shelter by birds and smaller animals such as rabbits, chipmunks, and ground squirrels.

15. **DOUGLAS-FIR** (*Pseudotsuga menziesii*). When you go to the lumberyard and buy "Oregon pine" you really are buying Douglas-fir. In the Pacific Northwest this becomes a gigantically tall tree, often as much as 300 feet in height, and one of the most important timber trees of that region. It is of much less importance in the Rocky Mountain area, however.



*Douglas-fir cones and foliage on background of 2-inch squares.
Note three-pointed bracts on the cones.*

The small winged seeds are important food for squirrels and other rodents, and in winter the needles provide food for the blue grouse. Look at one of the small cones and notice the papery, three-pointed bracts which provide the best means for identifying Douglas-fir.

16. QUAKING ASPEN (*Populus tremuloides*). This beautiful member of the willow family and relative of the narrowleaf cottonwood, which you have previously seen, is one of the most widespread trees in North America. Throughout the southwest it is most common at elevations of 7,500 to 9,500 feet in what is called the Canadian Life Zone, where climatic conditions and vegetation are similar to those of southern Canada.

The quaking aspen is one of nature's pioneers, for it is one of the first trees to grow on areas that have been burned over or otherwise denuded of vegetation. Eventually the sun-loving aspens are crowded out by pines and firs, which grow taller and cut off the sunlight. Thus, most aspen groves are temporary, and in time will be replaced by various kinds of cone-bearing trees.

In the autumn the leaves turn a brilliant yellow, and it is not uncommon to see whole mountainsides covered with their golden color.

Much of the natural beauty of these aspens has been destroyed forever by thoughtless name carvers.

17. HISTORICAL MARKER. This bronze marker was donated by the Native Daughters, Chipeta Club, of Alamosa, Colorado. The plaque is

mounted on granite, so common to the Rockies. Early explorers and adventurers followed the routes of the local passes enroute westward. Their failures and successes make very exciting historical reading.

18. HISTORY OF MOSCA PASS. Mosca Pass Trail crosses Mosca Creek just above this station and then follows the sunny, south-facing side of the canyon to the Pass, about 4 miles from here. At this station the trail follows the route of the old toll road built over Mosca Pass by Frank Hastings in 1871. T. B. Seeley and D. Holly, later owners, sold the charter to the state in the late 1800's and the road finally fell into disuse. A severe thunderstorm washed it out completely in 1905 or 1906, and only traces of the old road can be seen, higher in the canyon. The present trail, constructed by the Forest Service, was built on the hillside above the road out of the reach of storms.

Many early explorers and settlers used Mosca Pass, including Fremont on the ill-fated journey of 1848 which ended in La Garita Canyon. At that time the Pass was called Roubideau's Pass, as Antoine Roubideau was supposed to have driven two-wheeled carts over it to his fur trading post on the Gunnison in 1837. Ruxton, the traveling English army officer, wrote of crossing it in 1846.

19. COMMON CHOKECHERRY (*Prunus virginiana*). The black, "puckery" cherry of this shrub is highly prized for use in jams and jellies. This particular plant is not typical, as chokecherries in this region usually grow in thickets at a slightly higher altitude. The white flower clusters appear in June.

20. WOODS ROSE (*Rosa woodsii*). You will easily recognize this thorny plant, for wild roses are much the same the country over. The red fruits, called hips, are important food for birds and mammals, and rosebush thickets provide nesting and protective cover.

21. TRUMPET GOOSEBERRY (*Ribes leptanthum*). Gooseberries and currants harbor one stage of the white pine blister rust, which is quite destructive to the five-needled pines. Because of this, the shrubs are being eradicated wherever important stands of white pine occur. Fortunately, this has not been necessary in southern Colorado. Note the long, sharp thorns on this plant.

22. BUSH ROCKSPIREA (*Holodiscus dumosus*). Because of the creamy blooms and seed clusters which sometimes stay throughout the summer, this shrub of the cliffs is often called "creambush," "foambush," "mountain-spray," or "ocean-spray." Strange as it may seem, this plant is a member of the rose family, along with the chokecherry and mountain-mahogany you saw earlier.

23. **WAX CURRANT** (*Ribes cereum*). Generally speaking, currants may be distinguished from gooseberries by their lack of spines. Berries of both plants are valuable food for wildlife, and the plants are browsed by both domestic animals and deer.

24. **OLD STORE LOCATION.** A store or commissary was located at this point during the early days of the toll road. Probable length and width of the building can be determined by noting the size of the leveled area.

25. **WESTERN VIRGINSBOWER or "CLEMATIS"** (*Clematis ligusticifolia*). Several species of clematis are grown as ornamentals and are very handsome climbing plants. The clusters of plumed seeds are even more attractive than the flowers. Indians formerly used this plant as a remedy for sore throats and colds, and it is said that the crushed roots were placed in the nostrils of tired horses to revive them.

26. **RUBBER RABBITBRUSH** (*Chrysothamnus nauseosus*). Rabbitbrush is a very common and widespread member of the sunflower family found through most of the Southwest. The bushes are particularly attractive late in summer when they are literally covered with small, bright yellow flowers. Rabbitbrush is considered a pest by stockmen, as it is not palatable to cattle, and tends to increase on overglazed land at the expense of more desirable plants.

The latex of this and some other species contains a fair grade of rubber, but not in commercially important quantities.

27. **END OF THE TRAIL.** This is the end of the trail and we hope you have enjoyed the walk. Please return this leaflet to the register stand or, if you desire, *you may purchase it by dropping 10c in the slot in the registration desk.*

WE HOPE YOU ENJOYED YOUR VISIT

WHAT IS MISSION 66?

MISSION 66 is a 10 year development program, now in progress, to enable the National Park Service to help you to enjoy and to understand the Parks and Monuments, and at the same time, to preserve their scenic and scientific values for your children and for future generations.

CONSERVATION—YOU CAN HELP

If you are interested in the work of the National Park Service and in the cause of conservation in general, you can give active expression of this interest, and lend support by alining yourself with one of the numerous conservation organizations which act as spokesmen for those who wish our scenic heritage to be kept unimpaired for the enjoyment of future generations.

Names and addresses of conservation organizations may be obtained from the ranger.

This booklet is published in cooperation with the National Park Service by the
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*which is a non-profit distributing organization pledged to aid in the
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