



Stone, Sand, and Stream

Nestled against the rugged Sangre de Cristo Mountains, the Great Sand Dunes are the focal point of a wild natural system of high mountain peaks, sparkling streams, forceful winds, and billions of sand grains. Here majestic scenery also gives intimate glimpses of life's rich complexity.

These huge dunes—North America's tallest—are about 11 percent of a 330-square-mile deposit of sand. Eroded from mountains, then shattered by freezing and thawing, and tumbled by streams and winds, sand grains cycle through the dunes system. Plants stabilize most sand deposits out-

side the dunefield, where old dunes, now grass- and shrub-covered, are difficult to recognize.

Medano and Sand creeks edge the dunefield as the dunes system's lifeblood. Swift, shallow, and seasonal, they recycle sand as they water this arid valley. Habitats alongside them host a great deal of life's richness here, its biodiversity. The streams originate in the Sangre de Cristos of Great Sand Dunes National Preserve. High, cold mountains collect and hold snow from October into April, releasing it in icy streams in late-spring warmth. As community builders, the creeks feed the un-

derground aquifers for San Luis Valley residents' wells, local agriculture, and livestock. People have lived here for 11,000 years. In historic times Southern Ute, Jicarilla Apache, Navajo, gold miners, homesteaders, ranchers, and farmers have lived here, and migrant workers labored here. By the 1920s the dunes fed local pride and tourist income, and valley residents pressed for the national monument status under the Antiquities Act finally realized in 1932. The area's expansion in 2000 as a national park and national preserve was driven both by better knowledge of water's many and complex roles here and the American

people's desire to protect the dunes system—dunes, mountains, creeks, and wetlands—forever.

The map side of this brochure helps you visualize the relationship between the mountains, dunes, winds, and creeks, and how the creeks recycle sand for winds to create the tallest dunes. You will also find information to help you make the most of your visit more safely. The wealth of habitats making life so rich here will enrich your experience. Look beyond the dunes for further adventures among creeks, forests, grasslands, foothills, mountains, and wilderness.

Life zones are determined by elevation, latitude, climate, and exposure to sunlight. The range of elevations at Great Sand Dunes National Park and Preserve offers you many life zones to explore.

Stone

SEVEN LIFE ZONES OF GREAT SAND DUNES



ALPINE TUNDRA
American pika
© SHATTEL / ROZINSKI PHOTOGRAPHY



Alpine primrose



Dwarf phlox



Moss campion

Treeless alpine tundra occurs above 11,000 feet (3,350 meters), where winds blast rugged peaks ice-covered up to 10 months per year. Despite short growing seasons, small plants thrive by growing close to the ground and between rocks for wind protection. Animal life includes the American pika, yellow-bellied marmot, and Rocky Mountain bighorn sheep. In summer, watch for hawks, golden eagles, horned larks, and white-tailed ptarmigan. A warming climate threatens the habitat of pikas, marmots, and ptarmigan.



Rocky Mountain bighorn sheep
ALL IMAGES NPS UNLESS OTHERWISE NOTED



SUBALPINE
Peregrine falcon
© SHATTEL / ROZINSKI PHOTOGRAPHY



Colorado blue spruce



Shooting star



Blue columbine

Subalpine forest (9,500 to 11,500 feet; 2,900 to 3,500 meters) gets heavy snowfall, making it cold and damp all year. Hardy, stout trees, including Englemann and blue spruce, withstand heavy snow without breaking, while flexible subalpine firs bend to shed the snow's weight. Broad sunny meadows are wet and vibrant with summer wildflowers and mosquitoes. Watch for mule deer, elk, beaver, black bears, and northern harriers, gray jays, and Steller's jays.



Black bear
© SHATTEL / ROZINSKI PHOTOGRAPHY



MONTANE FOREST
Abert's squirrel
© SHATTEL / ROZINSKI PHOTOGRAPHY



Rocky Mountain juniper



Spitleaf Indian paintbrush



Claret cup cactus

Montane forests and piñon-juniper woodlands occupy like elevations (8,000 to 9,500 feet; 2,440 to 2,900 meters) but prefer different habitats. Montane species (Douglas fir, aspen, and narrow-leaf cottonwoods) thrive in wet drainages. Piñon pines and junipers prefer sunny hill-sides. The contrasting habitats and plants attract a wide variety of wildlife. Black bears forage for insects, berries, and rodents; bobcats range hillsides in search of rabbits, Abert's squirrels, and other small animals; pine siskins and juncos feed among the trees. Short wings and long, rudder-like tails allow the northern goshawk to fly through dense forest without colliding with branches.



Bobcat
© SHATTEL / ROZINSKI PHOTOGRAPHY

Sand



DUNEFIELD
Great Sand Dunes tiger beetle
© SHATTEL / ROZINSKI PHOTOGRAPHY



Prairie sunflower



Scurfpea



Skeletonweed

At a distance dunes look barren, but up close you see how life adapts to fill every niche. Seven insect species thrive here and nowhere else in the world, but only one mammal, Ord's kangaroo rat, lives in the dunefield, although coyotes, mountain lions, and elk wander through parts of it. Indian rice grass, blowout grass, and scurfpea, common in sandy dry areas, grow in the swales between dunes, anchored by their root systems. Here they survive the grit of windblown sands and the high surface temperatures.



Ord's kangaroo rat
© SHATTEL / ROZINSKI PHOTOGRAPHY



SAND SHEET & GRASSLAND
Short-horned lizard
© SHATTEL / ROZINSKI PHOTOGRAPHY



Starvation prickly pear



Small flower sand-verbena



Narrowleaf yucca

The vast sand sheet around the dunes makes up about 53 percent of the sand deposit. Grasses and shrubs, like rabbitbrush, prickly pear, and yucca, grow over old dunes, stabilizing them with their roots and reducing wind speeds with their branches and leaves. Many animals frequent the grasslands and sand sheet—elk, mule deer, pronghorn, white-tailed jack rabbits, and coyotes. Iridescent caterpillars that cling to rabbitbrush shrubs in the spring transform into green-striped rabbitbrush beetles in summer.



Elk
© SHATTEL / ROZINSKI PHOTOGRAPHY

Stream



SALT-ENCRUSTED PLAIN OR SABKHA
American avocet
© SHATTEL / ROZINSKI PHOTOGRAPHY



Baltic rush
© CHARLES PERCE



Inland saltgrass
BROTHER ALFRED BROUSSEAU, © SAINT MARY'S COLLEGE OF CALIFORNIA



Four-wing saltbush
© MICHAEL CHARTERS 2003

Low-lying salt-encrusted plains, or sabkha, make up 36 percent of the sand deposit west and south of the dunefield. Wetlands and patches of white, crusty sand dot this area. Alkaline minerals leached from the high water table cement the surface as a fragile crust. Few plants, like saltbush and salt-grass, tolerate this harsh area, although slightly higher and less alkaline areas nearby may host plants and animals of the sand sheet. Wetlands in the sabkha attract migratory birds, like the sandhill crane and American white pelican.



Sandhill crane
© SHATTEL / ROZINSKI PHOTOGRAPHY



STREAM SIDES & WETLANDS
American white pelicans
© SHATTEL / ROZINSKI PHOTOGRAPHY



Narrow-leaf cottonwood



Rocky Mountain iris



Broadleaf cattail

Medano and Sand creeks flow seasonally around the dunefield (see map on other side). They carve sand from its eastern, western, and northern edges and redeposit it to the south, where wind will recycle it back into the dunefield. Vegetation alongside creeks creates oases in which cottonwoods, willows, golden currants, and Wood's roses thrive. Watch for the red and yellow flash of western tangers and the bold, black-and-white of magpies. Subsurface flow from these streams feeds the wetlands that foster amazing life in the midst of a sandy desert.



American beaver
© SHATTEL / ROZINSKI PHOTOGRAPHY

Exploring the Park from Streams to Summits

More than Sand Dunes
The park is open 24 hours a day, year-round. Visitor center hours vary by season.

You can explore the mountains, diverse forests, and grasslands here as well as sand dunes. Each season

offers different experiences. Pick up a visitor guide, stop by the visitor center, or check the park website to learn more about the wide variety of programs and recreational opportunities.

Accessibility We strive to make our facilities, programs, and services accessible to all. For information go to a visitor center, ask a ranger, call, or check our website.

Safety *Don't rely on computer road mapping here.* The only paved-highway access is via US 160 and CO

150 from the south, or CO 17 and County Lane 6 from the west. • Lightning strikes can be fatal. If you see a thunderstorm, get off the dunes! Storms and cold weather can occur any time of the year. • Summer sand surfaces reach 140°F. Hike dunes in early mornings or evenings then. Wear closed-toe shoes and monitor pets'

feet. • Elevations range from 7,500 to nearly 14,000 feet. Seek medical advice about doing vigorous exercise. Elevation sickness symptoms are short breath, headache, and nausea. Drink lots of water.

Do not feed any wildlife. It is dangerous for you and unhealthy for them.

National Park Foundation.
Join the park community.
www.nationalparks.org



Medano Creek wave surges (seasonal)

More Information
Great Sand Dunes National Park and Preserve
11999 Highway 150
Mosca, CO 81146-9798
719-378-6300
www.nps.gov/grsa

Great Sand Dunes National Park and Preserve is part of the National Park System, which includes over 400 areas. Learn more about national parks and National Park Service programs in America's communities at www.nps.gov.

Emergencies call 911



Tall trees, Montville Trail



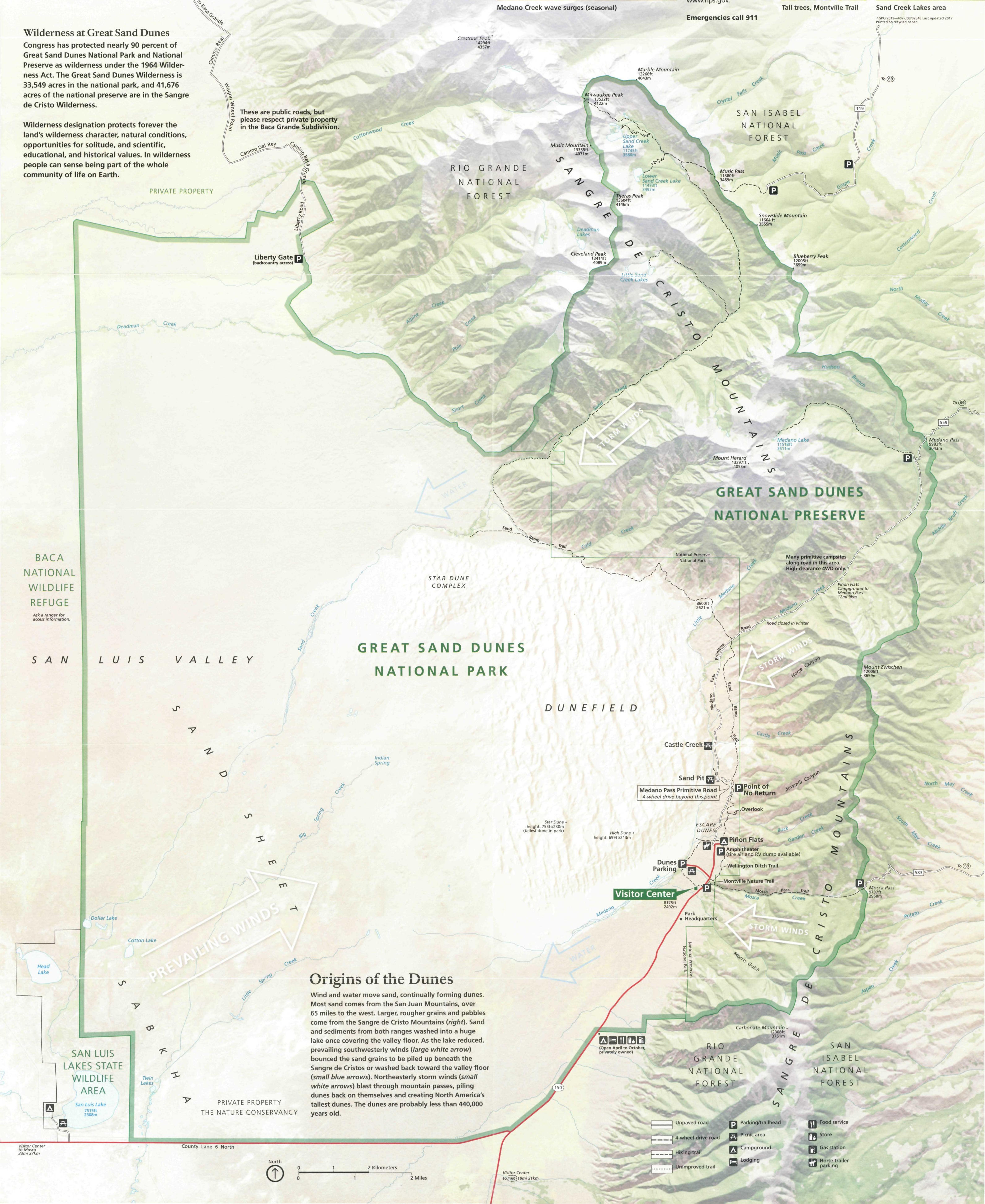
Sand Creek Lakes area

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Wilderness at Great Sand Dunes

Congress has protected nearly 90 percent of Great Sand Dunes National Park and National Preserve as wilderness under the 1964 Wilderness Act. The Great Sand Dunes Wilderness is 33,549 acres in the national park, and 41,676 acres of the national preserve are in the Sangre de Cristo Wilderness.

Wilderness designation protects forever the land's wilderness character, natural conditions, opportunities for solitude, and scientific, educational, and historical values. In wilderness people can sense being part of the whole community of life on Earth.



Origins of the Dunes

Wind and water move sand, continually forming dunes. Most sand comes from the San Juan Mountains, over 65 miles to the west. Larger, rougher grains and pebbles come from the Sangre de Cristo Mountains (right). Sand and sediments from both ranges washed into a huge lake once covering the valley floor. As the lake reduced, prevailing southwesterly winds (large white arrow) bounced the sand grains to be piled up beneath the Sangre de Cristos or washed back toward the valley floor (small blue arrows). Northeasterly storm winds (small white arrows) blast through mountain passes, piling dunes back on themselves and creating North America's tallest dunes. The dunes are probably less than 440,000 years old.