



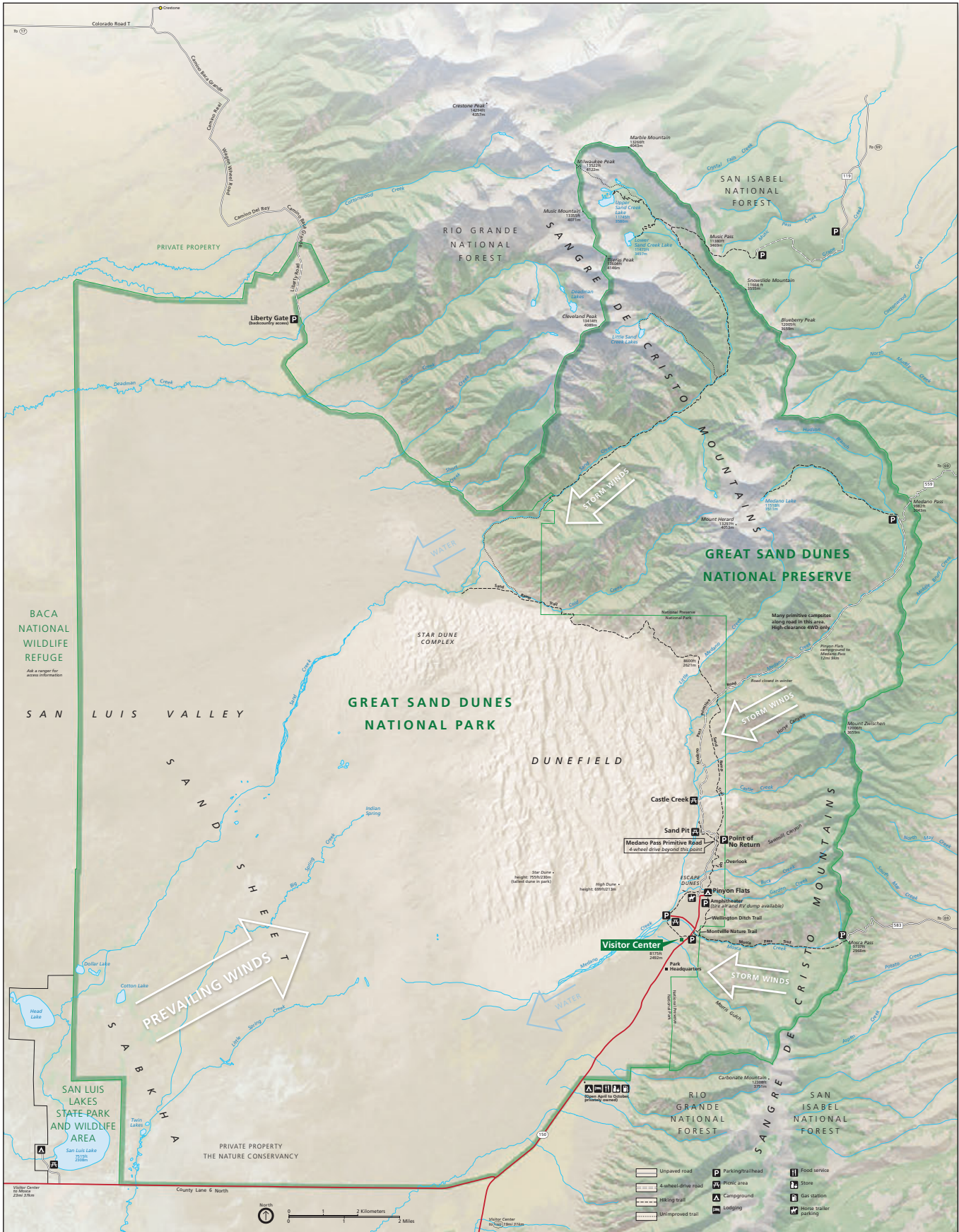
Foundation Document

Great Sand Dunes National Park and Preserve

Colorado

January 2017





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Mission of the National Park Service

The National Park Service (NPS) preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The NPS core values are a framework in which the National Park Service accomplishes its mission. They express the manner in which, both individually and collectively, the National Park Service pursues its mission. The NPS core values are:

- **Shared stewardship:** We share a commitment to resource stewardship with the global preservation community.
- **Excellence:** We strive continually to learn and improve so that we may achieve the highest ideals of public service.
- **Integrity:** We deal honestly and fairly with the public and one another.
- **Tradition:** We are proud of it; we learn from it; we are not bound by it.
- **Respect:** We embrace each other's differences so that we may enrich the well-being of everyone.

The National Park Service is a bureau within the Department of the Interior. While numerous national park system units were created prior to 1916, it was not until August 25, 1916, that President Woodrow Wilson signed the National Park Service Organic Act formally establishing the National Park Service.

The national park system continues to grow and comprises more than 400 park units covering more than 84 million acres in every state, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands. These units include, but are not limited to, national parks, monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, and the White House. The variety and diversity of park units throughout the nation require a strong commitment to resource stewardship and management to ensure both the protection and enjoyment of these resources for future generations.



The arrowhead was authorized as the official National Park Service emblem by the Secretary of the Interior on July 20, 1951. The sequoia tree and bison represent vegetation and wildlife, the mountains and water represent scenic and recreational values, and the arrowhead represents historical and archeological values.

Introduction

Every unit of the national park system will have a foundational document to provide basic guidance for planning and management decisions—a foundation for planning and management. The core components of a foundation document include a brief description of the park as well as the park’s purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes. The foundation document also includes special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

A primary benefit of developing a foundation document is the opportunity to integrate and coordinate all kinds and levels of planning from a single, shared understanding of what is most important about the park. The process of developing a foundation document begins with gathering and integrating information about the park. Next, this information is refined and focused to determine what the most important attributes of the park are. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating in one document the essential information that is necessary for park management to consider when determining future planning efforts, outlining key planning issues, and protecting resources and values that are integral to park purpose and identity.

While not included in this document, a park atlas is also part of a foundation project. The atlas is a series of maps compiled from available geographic information system (GIS) data on natural and cultural resources, visitor use patterns, facilities, and other topics. It serves as a GIS-based support tool for planning and park operations. The atlas is published as a (hard copy) paper product and as geospatial data for use in a web mapping environment. The park atlas for Great Sand Dunes National Park and Preserve can be accessed online at: <http://insideparkatlas.nps.gov/>.



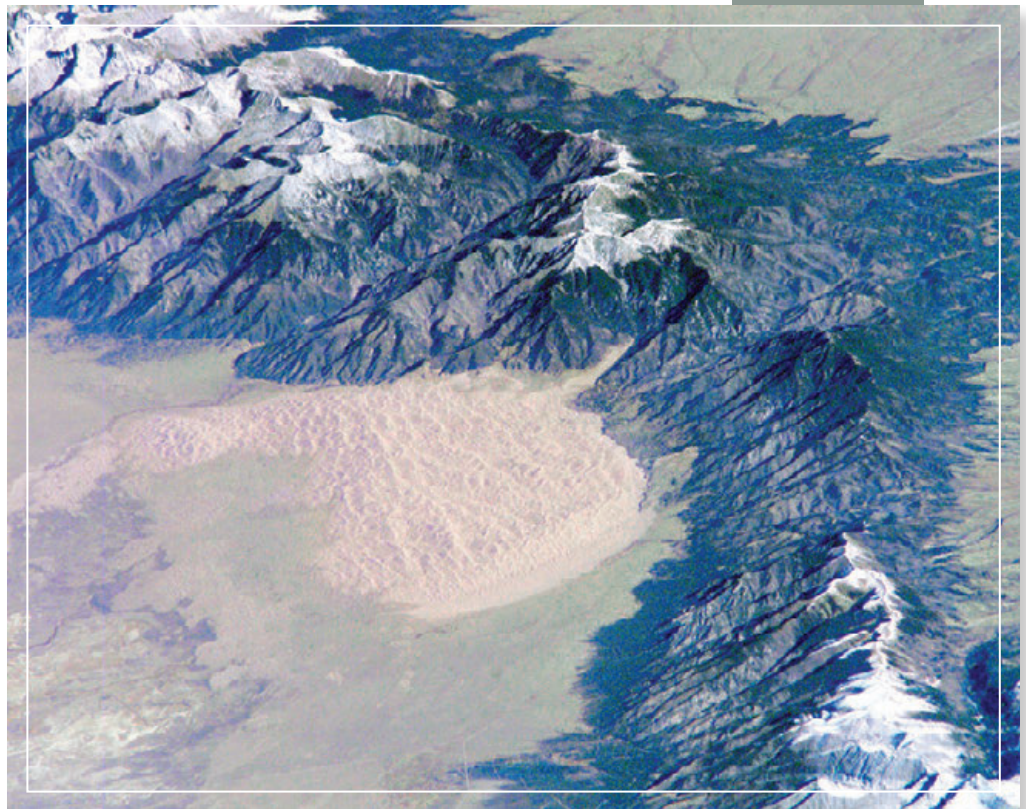
Part 1: Core Components

The core components of a foundation document include a brief description of the park, park purpose, significance statements, fundamental resources and values, other important resources and values, and interpretive themes. These components are core because they typically do not change over time. Core components are expected to be used in future planning and management efforts.

Brief Description of the Park

Great Sand Dunes National Park and Preserve is in the San Luis Valley of south-central Colorado at an elevation of 8,175 feet. The dunes lie on the eastern edge of the valley at the base of the Sangre de Cristo Range. The dunefield is part of the nearly 150,000 total acres of the park and preserve that also protects alpine lakes, tundra, six peaks over 13,000 feet, ancient spruce and pine forests, large stands of aspen and cottonwood, grasslands, and wetlands. The San Luis Valley is bordered by Poncha Pass on the north, the San Juan Mountains on the west, and the Sangre de Cristo Range on the east. To the south, the San Luis Valley extends into New Mexico along the Rio Grande River. Blanca Peak, the fourth-highest mountain in Colorado, towers over the valley, just southeast of the park and is sacred to some native peoples. This high mountain valley is the northern part of the Rio Grande Rift, a valley created by tectonic forces rather than erosional processes.

The park is part of a fragile, dynamic system that influences and sustains the tallest dunes in North America. The dunefield, roughly 30 square miles, is a huge deposit of pure, fine-grained sand nestled against the Sangre de Cristo Range. It is actually one giant dune with many smaller dunes superimposed on the surface. It sits between Sand and Medano Creeks, which carry sand from the east and north sides of the dunefield and redeposit it where southwesterly winds can transport it back to the dunefield, which is constantly being shaped by wind. The sand sheet surrounds the dunefield and is stabilized by grasses and other low-growing plant life. The sabkha (a sand deposit hardened by minerals) is west of the sand sheet and is cemented by minerals deposited by seasonal wetlands. Streams originating from high alpine lakes in the adjacent Sangre de Cristo Range recycle wind-blown sand back to and around the dunes and feed the underground aquifers for the San Luis Valley residents' wells, local agriculture, and livestock. Over time, sand, wind, and water combine and join forces to shape the ever-changing dunefield.





A dramatic diversity of healthy life zones, supported by a lack of artificial noise and light, provides distinct communities of plant and animal life. Just above the dunefield, at the base of the mountains, short shrubs give way to sparse pinyon-juniper woodland. With rising elevation, the pinyon-juniper forest transitions into denser mountain forests of fir, pine, and aspen. Higher still is the subalpine life zone, where hardy stands of spruce and fir mingle with rocky talus slopes. Forest communities of bristlecone and limber pine grow on rocky ridges and outcrops where other tree species are unable to thrive. Near the crest of the mountains is the rocky, snowy alpine zone. Each life zone supports specially adapted plant, animal, and insect life. Elevations in the park range from over 13,000 feet to 7,500 feet at its lowest, all within approximately 15 miles.

American Indian groups hunted and used wild plant resources near the Great Sand Dunes as early as 10,000 to 12,000 years ago. Through time, the region appears to have been continuously used on an intermittent basis because of its reliable water and plentiful food resources. Beginning around AD 1400 Indian groups that we now know as Apaches, Arapahos, Cheyennes, Comanches, Kiowas, Navajos, and Utes seasonally used the San Luis Valley and its many resources. Oral histories among various groups of native peoples suggest that the presence and description of the dunes was the earliest form of known documentation.

The Spanish arrived in the San Luis Valley in the late 1500s and their cultural influence remains today. In 1807, Zebulon Pike and his men climbed over the crest of the Sangre de Cristo Range and into the valley. Pike documented the expedition's first glimpse of the Great Sand Dunes. Miners, homesteaders, ranchers, farmers, and migrant workers labored in this area over the years. In the 1920s, local pride and income from tourists encouraged residents of the area to press for national monument status, which came to pass in 1932. A congressional act in 2000 expanded the monument to a national park and preserve, largely a result of better knowledge of water's complex role in the dunes system. Today, the park bears evidence of past human use and occupation in many forms.

Visitors experience sand, sun, wind, and water in this land of elemental contrasts. At the foot of the dunes, Medano Creek's surging waters provide a delightful contrast to the barren sand surface in the spring and early summer. In addition to the dunes, visitors can enjoy mountain forests, expansive grasslands, wildlife viewing, stargazing, and surprisingly accessible designated wilderness opportunities.

Park Purpose

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Great Sand Dunes National Park and Preserve was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The park unit was established by presidential proclamation on March 17, 1932, and made into a national park and preserve through a congressional act on November 22, 2000 (see appendix A for enabling legislation and associated legislative acts). The purpose statement lays the foundation for understanding what is most important about the park.

From the crest of the Sangre de Cristo Range to the floor of the San Luis Valley, GREAT SAND DUNES NATIONAL PARK AND PRESERVE provides long-term stewardship of the tallest dunes system in North America and its supportive ecosystems. The park and preserve provides exceptional opportunities to experience, understand, and study the rare convergence of natural processes, associated natural and cultural resources, scenery, and designated wilderness.

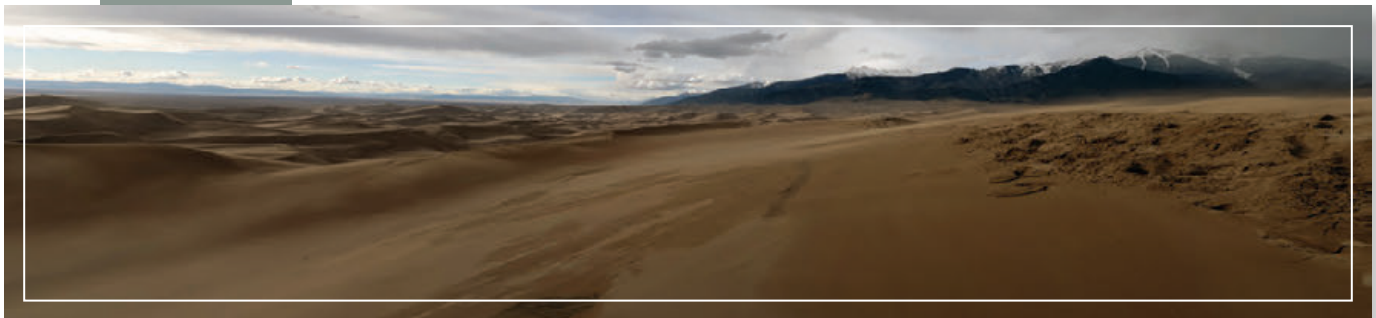


Park Significance

Significance statements express why a park's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Great Sand Dunes National Park and Preserve, and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and systemwide context. They focus on the most important resources and values that will assist in park planning and management.

The following significance statements have been identified for Great Sand Dunes National Park and Preserve. (Please note that the sequence of the statements does not reflect the level of significance.)

1. Great Sand Dunes National Park and Preserve contains the tallest dunes in North America, spectacular and diverse, continually shaped by a dynamic wind and water system.
2. Great Sand Dunes National Park and Preserve protects a globally significant water- and wind-driven system. Mountain streams provide for the transport of sand, recharge of aquifers, and produce the rare hydrologic phenomenon of surge flow. The wind provides energy to transport the sand, continually shaping the dunes.
3. Great Sand Dunes National Park and Preserve provides immersive and diverse opportunities to visitors of all ages for recreation, exploration, and education in the scenic settings of the dunefield, adjoining creek environments, and soaring mountain peaks.
4. Great Sand Dunes National Park and Preserve hosts a great diversity of plants and animals, including insect species found nowhere else on Earth. The system, which spans high desert to alpine life zones, supports rare biological communities that are mostly intact and functional.
5. The greater dunes system has special importance to people of various cultures through time. It contains some of the oldest known archeological sites in the United States and is recognized for the culturally diverse nature of human use.
6. The park and preserve includes two distinct designated wilderness areas. The expansive dunefield of the Great Sand Dunes Wilderness is an easily accessible, highly resilient, and high-density use area, though solitude is readily found through a short hike into the dunefield. The immediately adjacent Sangre de Cristo Wilderness protects the wilderness character of some of the highest peaks in the Rocky Mountains, allowing for primitive forms of recreation and contemplative solitude.
7. The knowledge and understanding gained from scientific research at Great Sand Dunes played an important role in the establishment of the park and preserve and continues to inform management, understanding, and protection of the greater dunes system. This dynamic laboratory provides ongoing research opportunities to enhance our understanding of Earth and planetary science.



Fundamental Resources and Values

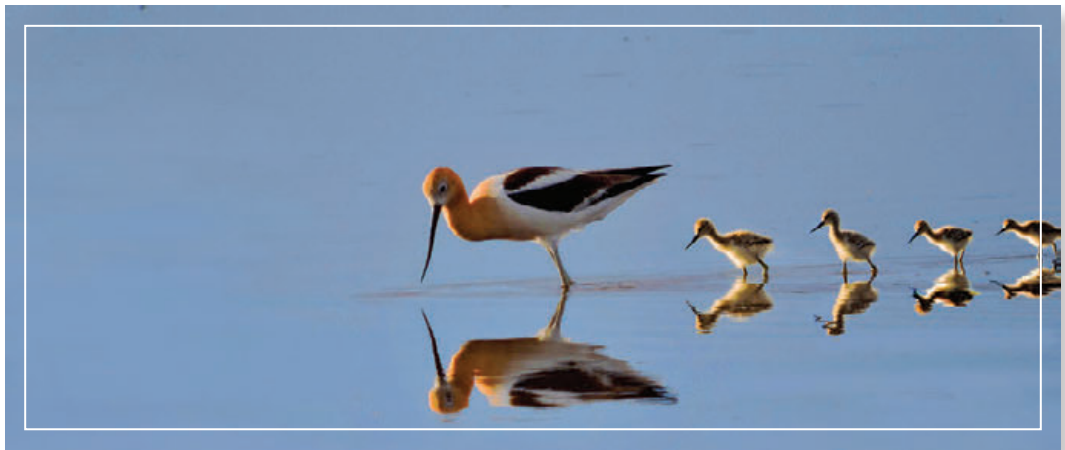
Fundamental resources and values (FRVs) are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. Fundamental resources and values are closely related to a park's legislative purpose and are more specific than significance statements.

Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those qualities that are essential (fundamental) to achieving the purpose of the park and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park purpose and/or significance could be jeopardized.

The following fundamental resources and values have been identified for Great Sand Dunes National Park and Preserve:

- Dunes System.** The dune system of Great Sand Dunes National Park and Preserve is one of the most complex systems of its kind on the planet. From the sabkha and the sand sheet on the San Luis Valley floor, to the tundra and crests of six peaks over 13,000 feet elevation in the Sangre de Cristo Range, a dynamic yet fragile interaction of sand, wind, streams, groundwater, vegetation, and mountains interplay to form the entire system. The flowing Medano and Sand Creeks surround the dunes, and in addition to providing opportunities for enjoyment, are the lifeline of the dune system transporting sand from the east and north side of the dunefield and redepositing it where southwesterly winds recirculate the sand back onto the dunes. The dunefield itself covers 30 square miles and is constantly shaped and reshaped by high velocity, bidirectional winds funneled in and out of the valley through three relatively low passes in the Sangre de Cristo Range. Extending as much as 20 miles westward from the Sangre de Cristo Range, the sand sheet deposit is primarily composed of low-relief, vegetation-stabilized sand dunes. The sabkha stretches farther west in the valley and is characterized by sand grains held together by evaporated minerals (salt), which harden the sand so wind cannot shape it into dunes. Seasonal ponds and other wetlands on the sabkha support a rare ecosystem. In addition, the preserve comprises thousands of acres of a diverse mountain life zone with alpine lakes that feed the creeks that help create the dunes. Great Sand Dunes protects and provides for the study of a complex and dynamic dune system that encompasses the entire park.
- Water.** Great Sand Dunes National Park and Preserve protects and conducts ongoing scientific research of surface and ground waters that are fundamental to the dune system. The streams, wetlands, and groundwater connect and interact to bind the entire, unique ecosystem together. Wind and water work in concert to sculpt the dunes while Medano Creek generates one of the world's best examples of surge flow and sand waves. High, alpine lakes in the Sangre de Cristo Mountains collect and hold snow through the winter, releasing it in icy streams in late spring. These streams and creeks feed confined and unconfined aquifers, interdunal ponds, and wetlands that create a complex hydrological system, critical to the formation and maintenance of the dunes. The waters of the park, designated as outstanding for their quality, also maintain special legal status, as a federal reserved water right. The expansion of the monument to a national park and preserve in 2000 was the result of a greater knowledge of the critical role of water in protecting the dune system.





- Natural Diversity.** Great Sand Dunes National Park and Preserve contains remarkable natural biological diversity, which is due largely to its range of elevation zones and mix of wet and desert habitats. The park and preserve protects and provides seven different life zones determined by elevation, latitude, climate, and exposure to sunlight within which balanced and sustainable populations of native wildlife and plants comprise an important habitat, sustained by natural processes. The subsurface and aboveground flow of the streams and wetlands foster a diverse interchange of creekside vegetation including some of the oldest narrowleaf cottonwoods, and a thriving community of native wildlife. The salt-encrusted plain of the sabkha creates a harsh environment that appears as a cemented crust from the leaching of alkaline minerals in which few plants such as saltbush and saltgrass can grow. Wetlands in the sabkha attract migratory birds including the sandhill crane and American white pelican. The sand sheet and grassland supports grasses and shrubs that grow over and stabilize old dunes and support many animals including elk, mule deer, pronghorn, white-tailed jack rabbits, coyotes, and ground-nesting and shrubland birds, along with unique insects. The dunefield supports at least five endemic species of insects and hardy grasses growing in swales between dunes, but little in the way of wildlife, other than those that wander through sections of the dunes. The montane forests and pinyon-juniper woodlands occupy higher elevations of the preserve (8,000–9,500 feet) and support contrasting habitats and plants that attract a wide variety of wildlife. At the upper reaches of the preserve, the subalpine remains cold and damp all year with hardy trees able to withstand heavy snows and broad meadows that are vibrant with wildflowers in the summer. Even higher, the treeless alpine tundra is a fragile environment, both rugged and highly erosive from wind blasting, supporting only the hardiest of small plants that grow close to the ground or in between rocks. Both the subalpine and alpine tundra provide habitat for a wide variety of wildlife from insects, including mosquitos, to beaver, marmot, and pika, as well as elk, bears, and bighorn sheep. The park not only protects the diverse resources within the various life zones, but provides for the study of the natural diversity to facilitate appropriate management.

- Human Connections.** The Great Sand Dunes have served as a prominent visual and cultural marker, drawing people physically and spiritually for thousands of years. The Great Sand Dunes and surrounding mountains and valley floor have inspired a deep emotional connection beginning with indigenous peoples, to later explorers and settlers, and the historic and modern local communities surrounding the park and preserve. For American Indians, there are sacred sites throughout the park, including a cluster of culturally modified trees listed in the National Register of Historic Places. During the time of western exploration and settlement, the valley became a discrete cultural region rich in Hispanic culture and place names that remain today. Contemporary communities were critical in the expansion of the monument to a park and preserve, and in protecting the water rights of the park and the valley as a whole. Archeological sites ranging from Paleo-Indian dating to approximately 12,000 years ago to the historic era are scattered throughout the park and preserve as evidence of the culturally diverse nature of the human interplay with the landscape and the resources found there. The park manages resources and endeavors to facilitate meaningful visitor experiences in understanding the past and maintaining an ongoing connection to the Great Sand Dunes and surrounding area.
- Visitor Opportunities.** Great Sand Dunes National Park and Preserve offers unbridled opportunities to experience an accessible yet remarkably complex environment where recreational, educational, and inspirational experiences of an extremely diverse nature are available to visitors of all ages and abilities. From climbing and descending the high dunes to playing in the surge flow of Medano Creek, the dunefield presents visitors with activities in an environment that can be found in few places globally. Beyond the dunefield, exploring the wetlands, grasslands, and the mountain environments allow visitors to see and experience various plants and wildlife in a natural setting, with visitors able to hunt and fish in the preserve. Throughout the park and preserve, visitors can enjoy the relative quiet and natural sounds, while taking in incredible views of the dune mass with the backdrop of the high peaks of the Sangre de Cristo Range or the valley floor below, and an exceptional nocturnal experience, including naturally dark night skies.
- Wilderness.** Great Sand Dunes National Park and Preserve protects two designated wilderness areas within the boundaries of the national park and preserve: the 35,955-acre Great Sand Dunes Wilderness and the approximately 40,000-acre Sangre de Cristo Wilderness. In addition, more than 53,000 acres of proposed wilderness are managed by the park as designated wilderness. Visitors can easily access both designated wilderness areas due to the proximity of roads to the area, but still find ample solitude and isolation to enjoy the unconfined recreational opportunities, along with relatively clean air and clear views. There are no developed campgrounds, few trails, and limited signage in designated wilderness, allowing wilderness areas to remain largely undeveloped.



Other Important Resources and Values

Great Sand Dunes National Park and Preserve contains other resources and values that are not fundamental to the purpose of the park and may be unrelated to its significance, but are important to consider in planning processes. These are referred to as “other important resources and values” (OIRV). These resources and values have been selected because they are important in the operation and management of the park and warrant special consideration in park planning.

The following other important resources and values have been identified for Great Sand Dunes National Park and Preserve:

- Historic Resources.** The historic resources within Great Sand Dunes National Park and Preserve represent a diverse range of historic and contemporary ties to the dunes, and demonstrate the varied historical experiences in and around the park. Prior to settlement, various explorers traveled through the area, some using the eastern branch of the Old Spanish Trail that skirts around the dunes. Many of the various communities that settled the region did so for subsistence purposes. Historically, ranching was a primary attraction to the land and various historic resources reflect this, such as the Medano Ranch Headquarters, listed in the National Register of Historic Places and the Trujillo Homestead sites, a designated national historic landmark. Mining was also important in the area and mining camps around the park resulted in settlements and infrastructure used by miners to live and work in the region. Later, when the park was designated a monument, the Works Progress Administration constructed administrative buildings for the operation of the park, including the Superintendent’s Residence, a uniquely designed territorial adobe style building now listed in the National Register of Historic Places.



Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from, and should reflect, park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all park significance statements and fundamental and other important resources and values.

Interpretive themes are an organizational tool that reveal and clarify meaning, concepts, contexts, and values represented by park resources. Sound themes are accurate and reflect current scholarship and science. They encourage exploration of the context in which events or natural processes occurred and the effects of those events and processes. Interpretive themes go beyond a mere description of the event or process to foster multiple opportunities to experience and consider the park and its resources. These themes help explain why a park story is relevant to people who may otherwise be unaware of connections they have to an event, time, or place associated with the park.

The following interpretive themes have been identified for Great Sand Dunes National Park and Preserve:

- Great Sand Dunes National Park and Preserve protects a globally significant water- and wind-driven dune system—including extraordinary examples of reversing dunes (creating the tallest dunes on the continent) and creeks that demonstrate surge flow (a rare hydrologic phenomenon)—a system so unusual that it inspires extensive scientific study and provides an unexpected freedom in the pursuit of rejuvenating recreation.
- The unexpected combination of massive dunes surrounded by alpine peaks, a desert valley, and creeks flowing on the surface of the sand forms a unique scenic landscape that inspires awe and wonder and encourages us to share that beauty with others.
- Experiencing the park’s nighttime starscape, soundscape, and nocturnal life stimulates a deep appreciation of, delight in, and reliance on one’s own, complete set of senses—just one more way that Great Sand Dunes National Park and Preserve makes you feel more alive.
- This landscape—presently composed of dunes, mountain passes, and water in an arid environment—has been a cultural crossroads over thousands of years, and retains its special and sacred significance to many diverse cultures today, prompting us to ponder the places that are special in our own lives.
- Protecting and appreciating the health of the park’s endemic species, biological diversity, and unusual ecological juxtapositions encourages development of stewardship and wilderness ethics.



Part 2: Dynamic Components

The dynamic components of a foundation document include special mandates and administrative commitments and an assessment of planning and data needs. These components are dynamic because they will change over time. New special mandates can be established and new administrative commitments made. As conditions and trends of fundamental and other important resources and values change over time, the analysis of planning and data needs will need to be revisited and revised, along with key issues. Therefore, this part of the foundation document will be updated accordingly.

Special Mandates and Administrative Commitments

Many management decisions for a park unit are directed or influenced by special mandates and administrative commitments with other federal agencies, state and local governments, utility companies, partnering organizations, and other entities. Special mandates are requirements specific to a park that must be fulfilled. Mandates can be expressed in enabling legislation, in separate legislation following the establishment of the park, or through a judicial process. They may expand on park purpose or introduce elements unrelated to the purpose of the park. Administrative commitments are, in general, agreements that have been reached through formal, documented processes, often through memorandums of agreement. Examples include easements, rights-of-way, arrangements for emergency service responses, etc. Special mandates and administrative commitments can support, in many cases, a network of partnerships that help fulfill the objectives of the park and facilitate working relationships with other organizations. They are an essential component of managing and planning for Great Sand Dunes National Park and Preserve.

For more information about the existing special mandates and administrative commitments for Great Sand Dunes National Park and Preserve, please see appendix C.

Assessment of Planning and Data Needs

Once the core components of part 1 of the foundation document have been identified, it is important to gather and evaluate existing information about the park's fundamental and other important resources and values, and develop a full assessment of the park's planning and data needs. The assessment of planning and data needs section presents planning issues, the planning projects that will address these issues, and the associated information requirements for planning, such as resource inventories and data collection, including GIS data.

There are three sections in the assessment of planning and data needs:

1. analysis of fundamental and other important resources and values
2. identification of key issues and associated planning and data needs
3. identification of planning and data needs (including spatial mapping activities or GIS maps)

The analysis of fundamental and other important resources and values and identification of key issues leads up to and supports the identification of planning and data collection needs.

Analysis of Fundamental Resources and Values

The fundamental resource or value analysis table includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.

Fundamental Resource or Value	Dunes System
Related Significance Statements	Significance statements 1, 2, 3, 4, 5, 6, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • The system is currently stable and continues to function. This is in part due to the efforts to establish water rights and to acquire additional land within the legislated boundary. • The park continues to partner with neighbors for protection of the dune system. • Scientific research on the dune system informs larger global and interplanetary understanding of dunes. The park participates in the International Planetary Dune Conference. • Studying the dunes system also provides an opportunity to research optically stimulated luminescence (a technique used to date materials). <p>Trends</p> <ul style="list-style-type: none"> • Stable with natural migratory conditions for dunes in certain locations. • Desert scrub is potentially decreasing, which holds the dune particles in place. • Monitoring over an extended period of time (beginning with aerial photos from the 1930s) shows continual loss of interdunal ponds and wetlands in the northeast part of the dunes and dunefield.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Climate change – At low flows, when there is less volume of water in Medano Creek, surge flow is impacted, which may change the location and amount of sand transported and deposited by the creek. • Lack of volume of water in Medano Creek may change surge flow duration, which may change the location and amount of sand deposition. This is driven by snowpack and projected climate change. • Wolf Springs Ranch diverts 15 cubic feet per second from May 15 to July 15, through a decreed senior right, temporarily reducing Medano Creek’s flow and affecting the live terminus. If vegetation communities are altered by climate change, pathogens, grazing, or drought, then the character of the dunefield may be altered. <p>Opportunities</p> <ul style="list-style-type: none"> • Use new science to develop and update educational and interpretive programs to foster resource stewardship. • Improve product offering to enhance education opportunities for the public. • Maintain good relationships with neighbors and the community for protection of the dune system. • Acquire water rights from Wolf Springs Ranch for Medano Creek to restore it to 100% original function. • Continue to facilitate visits from researchers in the Earth and planetary science fields.
Data and/or GIS Needs	<ul style="list-style-type: none"> • Data to understand how lower discharge and change in timing will affect surge flow and sand transport. • Continue dune migration studies and reporting.
Planning Needs	<ul style="list-style-type: none"> • Resource management plan (update). • Planning for adaptation to climate change. • Transportation plan.

Fundamental Resource or Value	Dunes System
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • National Environmental Policy Act of 1969 • Clean Water Act • Clean Air Act of 1977 (42 USC 7401 et seq.) • Wilderness Act of 1964 • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • Museum Properties Management Act of 1955, as amended <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (§1.4) "Park Management" • NPS Management Policies 2006 (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS Management Policies 2006 (§4.1) "General Management Concepts" • NPS Management Policies 2006 (§4.1.4) "Partnerships" • NPS Management Policies 2006 (§4.2) "Studies and Collections" • NPS Management Policies 2006 (§4.4.1) "General Principles for Managing Biological Resources" • NPS Management Policies 2006 (§4.6) "Water Resource Management" • NPS Management Policies 2006 (§4.7) "Air Resource Management" • NPS Management Policies 2006 (§4.7.2) "Weather and Climate" • NPS Management Policies 2006 (§4.8.1) "Protection of Geologic Processes" • NPS Management Policies 2006 (§4.8.2) "Management of Geologic Features" • NPS Management Policies 2006 (§4.9) "Soundscape Management" • NPS Natural Resource Management Reference Manual 77 • Director's Policy Memorandum 12-02, "Applying National Park Service Management Policies in the Context of Climate Change" • Director's Order 24: NPS Museum Collections Management





Fundamental Resource or Value	Water
Related Significance Statements	Significance statements 1, 2, 3, 4, 5, 6, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • There is good water quantity due to protections provided by decreed surface/groundwater rights, outstanding resource waters, proposed subdistricting, and protections provided by the U.S. Bureau of Reclamation’s Closed Basin Project. • Water quality is generally good, but there may be potential for decreasing quality in Medano Creek due to visitor density and use in this area. • The stream systems in the park are designated as eligible as wild and scenic rivers. • The creeks in the former national monument qualify for outstanding waters designation (State of Colorado, Water Quality Control Commission). The expansion, including Deadman Creek and other creeks, need evaluation for outstanding waters. • There is ongoing scientific research conducted on the network of wells to inform groundwater levels; studies of interdunal ponds and wetlands; studies to understand changing water levels, dune moisture, recharge, age-dated water, and surge flow, along with water quality monitoring. <p>Trends</p> <ul style="list-style-type: none"> • Water quantity is stable, but could change due to climate change and/or water development threats. • Water quality trend is unknown. • There are improving trends (i.e., less deposition) in snow chemistry for nitrogen and sulfate while mercury levels are stable.

Fundamental Resource or Value	Water
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change – Both temperature and precipitation are projected to increase, but higher temperatures lead to greater water deficits (aridity) and lowered snowpack and snow water equivalent. Increases in temperature lead to water deficits, especially at elevations below 10,000 feet. While precipitation is expected to increase, it will fall as rain rather than snow, resulting in earlier spring stream flow. Higher water deficit has been linked to changes in vegetation, wildfire regimens, wetlands, and amphibian populations. • Climate change – Increases in water deficit have been linked to lower fuel moisture and increase continuity of fuels. Evidence shows increased frequency of wildfires resulting from water deficit, increased burn areas due to greater fire intensity, even when fire is being actively suppressed, and a lengthening of the fire season. • Climate change – Changes in fire frequency and intensity impacts particulates and therefore contributes to water quality impacts. • Climate change – With faster snowmelt, high spring flows increase flood risk and are likely to result in substantial changes in sediment transport and channel formation processes. • Water development threats – Although there is not currently an active water development plan to export water from the area, the potential still exists. The NPS Water Rights Branch needs to be kept informed and updated of this potential threat. • Future increase in visitation may impact water quality, particularly in high visitor use areas, through fecal coliform contamination resulting from swimming in Medano Creek and camping near the upper reaches of Sand and Medano Creeks. • Wolf Springs Ranch diverts 15 cubic feet per second from May 15 to July 15, through a decreed senior right, reducing Medano Creek’s flow and affecting the live terminus. • Emerging contaminants in wet and dry deposition (e.g., endocrine disruptors, pesticides). <p>Opportunities</p> <ul style="list-style-type: none"> • Work with Colorado Department of Water Resources to comply with the new groundwater rules. • Continue to work with Rio Grande Water Conservation District, U.S. Forest Service, state engineers, and local stakeholders to protect San Luis Valley from development and trans-basin water diversion to the Colorado Front Range and other urban concentrations. • Restore the natural water and wetlands regimen on Medano Ranch after acquisition. • Partner with Western National Parks Association to highlight the importance of the water process and climate change as it relates to snow pack (e.g., through grants, funding projects, products). • Acquire full water rights to Medano Creek. • Investigate the “disappearing creeks” wherein water is flowing in the morning, but not in the evening or the reverse. This is a known, but not understood phenomena, especially in the park’s intermittent creeks in the sands such as Cold Creek. • New opportunities exist to address climate change through interpretive and educational exploration of the impacts on water, precipitation patterns, and habitats including mitigation and restoration actions.

Fundamental Resource or Value	Water
Data and/or GIS Needs	<ul style="list-style-type: none"> • Evaluate and continue well and stream gauge monitoring to protect water rights. • Continue piezometric boundary wells monitoring by the U.S. Bureau of Reclamation. • Continue wetland monitoring by NPS Rocky Mountain Inventory and Monitoring Network. • Monitor live terminus of Sand and Medano Creeks. • Collect and analyze data regarding visitor use and resource impacts along Medano Road. • Continue and expand data collection and reporting water quality data, particularly in high visitor use areas and as it relates to climate change. • Evaluate creeks in the expanded park area for designation on the outstanding natural resource waters list. • Air quality monitoring—Interagency Monitoring of Protected Visual Environments sampling.
Planning Needs	<ul style="list-style-type: none"> • Complete the ungulate management plan. • Medano Ranch water management plan. • Complete water monitoring plan. • Medano Road visitor use management plan. • Planning for adaptation to climate change.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • National Environmental Policy Act of 1969 • Wilderness Act of 1964 • Clean Water Act • Clean Air Act of 1977 (42 USC 7401 et seq.) • Executive Order 11514, “Protection and Enhancement of Environmental Quality” • Secretarial Order 3289, “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources” • Museum Properties Management Act of 1955, as amended <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (§1.4) “Park Management” • NPS <i>Management Policies 2006</i> (§1.6) “Cooperative Conservation Beyond Park Boundaries” • NPS <i>Management Policies 2006</i> (§4.1) “General Management Concepts” • NPS <i>Management Policies 2006</i> (§4.1.4) “Partnerships” • NPS <i>Management Policies 2006</i> (§4.2) “Studies and Collections” • NPS <i>Management Policies 2006</i> (§4.4.1) “General Principles for Managing Biological Resources” • NPS <i>Management Policies 2006</i> (§4.6) “Water Resource Management” • NPS <i>Management Policies 2006</i> (§4.7) “Air Resource Management” • NPS <i>Management Policies 2006</i> (§4.7.2) “Weather and Climate” • NPS <i>Natural Resource Management Reference Manual 77</i> • Director’s Policy Memorandum 12-02, “Applying National Park Service Management Policies in the Context of Climate Change” • Director’s Order 24: <i>NPS Museum Collections Management</i>

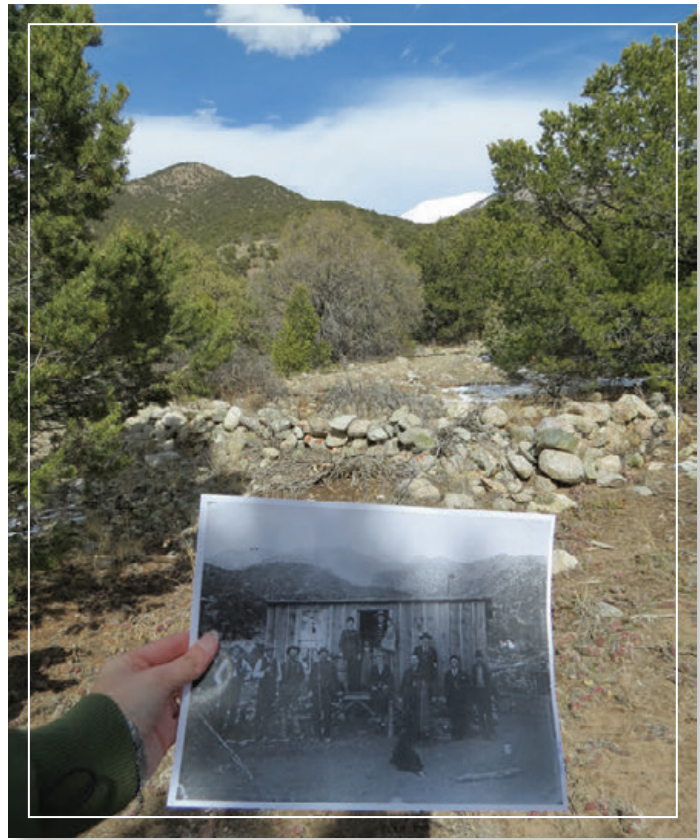
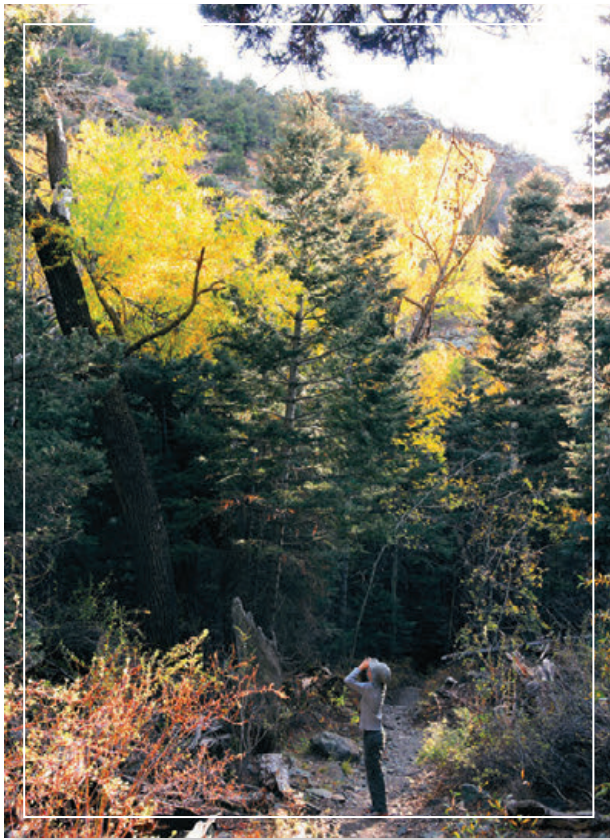
Fundamental Resource or Value	Natural Diversity
Related Significance Statements	Significance statements 4, 6, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Systems that are well studied (such as riparian and wetlands) are generally in good condition. • The condition of the alpine system is good based on limited available data. • For other systems not well studied, such as pinyon-juniper, montane, subalpine, and desert scrub, there is not sufficient information to establish a condition or trend. • There is currently an incomplete understanding of insects due to lack of natural history and taxonomic information for species that are not considered of economic importance (i.e., agricultural, forestry). • There is a lack of information about the globally significant vegetation community of Deadman Creek (cottonwood-juniper community). This community additionally is found along portions of Mosca Creek, Medano Creek, Cedar Canyon, and Cottonwood Creek, but the best occurrence is Deadman Creek riparian corridor. • There are concerns about elk populations and distribution. • There is a lack of information about many different species, including bighorn sheep, pronghorn, neotropical birds, beavers, etc. Therefore, the condition of these species is unknown. • There are two native fish species that inhabit the park. The Rio Grande cutthroat trout is a species of special concern that has been petitioned for listing under the federal Endangered Species Act, although listing was determined not warranted in 2014. The Rio Grande sucker is a state endangered species. • For some species, the isolated dune environment restricts gene flow for flora and fauna. Ongoing scientific research is expanding the knowledge in this area. • The NPS Rocky Mountain Inventory and Monitoring Network is monitoring the ecological health of the wetlands. • The U.S. Forest Service partners with the National Park Service and Colorado State University (among others) to study high elevation five-needle pines and white pine blister rust. • There is ongoing monitoring in the alpine areas of the park to better understand climate change and its potential impacts on the region. • The park is participating in the international Global Observation Research Initiative in Alpine Environments program; the site is in the preserve near the headwaters of Medano Creek. • A fire history study was recently completed that indicates the park is within its natural range of variability (Colorado State University). • The lack of artificial noise and light in the park supports a diversity of healthy life zones. <p>Trends</p> <ul style="list-style-type: none"> • Protection through park, preserve, wilderness designations, Clean Air Act Class I, and cooperation with adjacent land managers and communities helps protect natural processes, though trends are generally unknown. • Though wetlands are in good condition generally, they may be declining in quality due to pressure from ungulate grazing, stream channelization, nitrogen deposition, and climate change. • The alpine life zone is in stable condition in the short term, though there is a limited extent of data collected to inform this trend. • Insects – Stable, from what the park knows. • Deadman Creek community is probably changing due to unavoidable weather/ climate changes.

Fundamental Resource or Value	Natural Diversity
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Rapid climate change is a threat to all natural diversity (wetlands, alpine life zone, insects, vegetation, changes in fire frequency and intensity, and changes to nonnative plants, distribution, wildlife, etc.). • Climate change – With faster snowmelt, high spring flows increases flood risk likely to affect ecological processes that are sensitive to changes in the distribution of high-flow events such as habitat stability, biodiversity, and trophic structures. • Climate change – Shifts in climate patterns are expected to result in dramatic changes to forested lands including contraction and northward displacement of alpine habitats by subalpine spruce-fir and aspen forests, along with possible expansion of grass and shrublands into present-day forested areas, or changes in vegetation community structure in alpine areas. • Nonnative plants (such as leafy spurge, Russian knapweed, and Canada thistle) can become an issue when they have reduced competition from native species. The location of the park makes it especially vulnerable to the introduction of nonnative plants due to its upwind location from a large agricultural area. • Water development outside the park and preserve boundary can affect the San Luis Valley water table and have a dramatic impact on the dunes system of the park. • Increased air pollution from industrial operations outside the park may pose a threat to air and water quality in the long-term. • Hunting activity outside park boundaries and within the national preserve affects movement of animals, specifically elk. Data show that elk move into the park, where hunting is not permitted, during hunting seasons. Large concentrations of ungulates such as elk can adversely impact habitat conditions. • Air pollution is probably causing harmful effects due to acidification and nutrient enrichment from excess deposition of nitrogen and sulfur, impacts on ozone sensitive plants, and mercury and pesticides contamination. • The park's arid shrubland and grassland, wetland, and alpine are sensitive to nutrient enrichment which can alter plant communities and reduce biodiversity, including helping invasive plant species to grow faster and out-compete native vegetation adapted to lower nitrogen conditions. High elevation lakes are sensitive to both nutrient enrichment and acidification. Ground-level ozone often reaches levels that cause injury to ozone-sensitive plants including quaking aspen, skunkbush sumac, coneflower, and sandbar willow. Airborne toxics, including mercury and pesticides have been deposited with rain or snow and can accumulate in park wildlife, resulting in reduced foraging efficiency, survival, and reproductive success. <p>Opportunities</p> <ul style="list-style-type: none"> • Interagency and interdisciplinary research and management with surrounding partners and others on the ground in the San Luis Valley. • Coordinate with Colorado Parks and Wildlife to acquire data about ungulates, bears, fish, and other wildlife species they monitor. • Explore ongoing opportunities through federal air quality programs (e.g., regional haze and ozone programs) to work cooperatively with other federal and state air quality agencies and local stakeholders to reduce air quality impacts in the park. • Continue improving park sustainability and environmental leadership through the park's Environmental Management System, and pursuing NPS Climate Friendly Park status. • Expand interpretative and educational tools to communicate the connections between natural resources, air quality, water quality, night sky, scenic views, natural sounds, cultural landscapes, wilderness, visitor opportunities, human health, climate change, and other associated resources.

Fundamental Resource or Value	Natural Diversity
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Study sand sheet cottonwood stand sustainability. • Assess wetland response to ungulates and climate change. • Determine insect taxonomy and distribution. • Conduct five-needle pine susceptibility to white pine blister rust and climate change transplant recovery studies. • Determine elk distribution, abundance, and impacts on habitat and other wildlife species. • Collect data on how birds use shrubland areas. • Collect data on amphibians. • Collect data on nonnative plants. • Establish baseline data on bighorn sheep, pronghorn antelope, neotropical birds, beavers, bears, etc. • Collect data on Deadman Creek juniper-cottonwood community. • Conduct weed inventory on Baca Ranch lands. • Climate change vulnerability assessments for select resources. • Air quality monitoring—Interagency Monitoring of Protected Visual Environments sampling. • Additional studies to examine pollution dose-response relationships in sensitive park ecosystems.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Complete the ungulate management plan. • Five-needle pine management plan. • Exotic plant management plan. • Planning for adaptation to climate change. • Medano Road visitor use management plan. • Fishery management plan. • Aquatic resources management plan for the conservation of native species.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • National Environmental Policy Act of 1969 • Wilderness Act of 1964 • Endangered Species Act of 1973, as amended • National Invasive Species Act • Lacey Act, as amended • Migratory Bird Treaty Act • Bald and Golden Eagle Protection Act • Clean Water Act • Clean Air Act of 1977 (42 USC 7401 et seq.) • Federal Noxious Weed Act of 1974 • Executive Order 11514, “Protection and Enhancement of Environmental Quality” • Executive Order 13112, “Invasive Species” • Secretarial Order 3289, “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources” • Museum Properties Management Act of 1955, as amended

Fundamental Resource or Value	Natural Diversity
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (§1.4) "Park Management" • NPS Management Policies 2006 (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS Management Policies 2006 (§4.1) "General Management Concepts" • NPS Management Policies 2006 (§4.1.4) "Partnerships" • NPS Management Policies 2006 (§4.2) "Studies and Collections" • NPS Management Policies 2006 (§4.4.1) "General Principles for Managing Biological Resources" • NPS Management Policies 2006 (§4.4.2) "Management of Native Plants and Animals" • NPS Management Policies 2006 (§4.6) "Water Resource Management" • NPS Management Policies 2006 (§4.7) "Air Resource Management" • NPS Management Policies 2006 (§4.7.2) "Weather and Climate" • NPS Management Policies 2006 (§4.9) "Soundscape Management" • NPS Management Policies 2006 (§4.10) "Lightscape Management" • NPS Natural Resource Management Reference Manual 77 • Director's Order 18: Wildland Fire Management • NPS Reference Manual 18: Wildland Fire Management • Director's Policy Memorandum 12-02, "Applying National Park Service Management Policies in the Context of Climate Change" • Director's Order 24: NPS Museum Collections Management





Fundamental Resource or Value	Human Connections
Related Significance Statements	Significance statements 1, 3, 4, 5, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Archeological site condition assessments need to be updated in the Archeological Sites Management Information System (ASMIS) database. • Archiving park records (natural and cultural resources, administrative records, and special projects) is nearly complete for those under park control. Many are likely to be found in nonfederal repositories, particularly for natural history studies. • Because archeological sites are periodically exposed and reburied in areas of active sand, vertical stratigraphy is affected, but sites gain increased physical protection from sand coverage. • There is a limited capacity for park staff to protect archeological sites. • Lithophone research is currently underway. • There have been a number of studies including a traditional use study and ethnographic overview and assessment, in consultation with traditionally associated tribes, to better understand the human connections to the park. • Tribal relationships are excellent due to past and ongoing management actions and continued outreach and communication. • Most museum baseline documents have not been developed; those that are extant are out of date. Note that the baseline documents also include the records in the Interior Collections Management System database. <p>Trends</p> <ul style="list-style-type: none"> • Culturally modified trees (living artifacts) are dying as part of natural processes.

Fundamental Resource or Value	Human Connections
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Impacts from climate change on the preservation of resources relating to human connection to the park including cultural and natural resources. Specifically, resources along streambanks, especially tall cut banks, are threatened by more extreme fluctuations in stream flow. Archeological sites will be buried/exposed at a more rapid rate if there are dry periods with more wind to increase sand movement. Changes in precipitation could impact historic structures. Changes in vegetation or erosion may impact archeological sites. • Increased visitation means potential looting, illegal collection, and vandalism. • Threats to culturally modified trees: forestry pathology (insects, disease, age, change in weather patterns). • Archeological resources are vulnerable to theft. • Fire poses a threat to some archeological sites such as culturally modified trees and wikiups (temporary shelters made from tree saplings). • Actively research the location of collections in nonfederal repositories and establish accountability for them through accessioning and cataloging. Failure to establish ownership and responsibility for these collections constitutes a threat. <p>Opportunities</p> <ul style="list-style-type: none"> • Continue to conduct archeological site investigations and condition assessments. • Federal agencies in the San Luis Valley developed an interagency/intertribal memorandum of understanding focused on the Native American Graves Protection and Repatriation Act, but during annual meetings a full range of issues and opportunities are addressed to include all consultation. This is a unique entity in this valley and good model for other areas. • Coordinate with U.S. Forest Service and other agencies on areas under joint/cooperative management (Deadman Creek, Duncan, Liberty, Antelope Springs, etc.). • Continue stewardship/curation of U.S. Forest Service artifacts from Duncan, as well as U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and The Nature Conservancy collections from park-associated areas in park collections. • Enhance or develop tribal youth and local youth educational opportunities such as the youth archeology camp. • Incorporate information from future plans and studies into the visitor center exhibit plan. • Create opportunities for future cultural demonstrations by tribes and local community members (i.e., cooking, crafts, traditional lifeways). • Leverage special designation (national historic landmark, etc.) to obtain additional funding for research and protection. • Create more visitor opportunities to see the culturally modified tree grove. • Continued formal consultation and informal relationship building provides a good opportunity to maintain the current excellent relationships with tribes. • If a bison herd is in place at Great Sand Dunes, pursue opportunities to interact/ collaborate with the tribes regarding bison management. • Find more advanced ways to “patrol” culturally sensitive areas because many archeological sites are in wilderness or proposed wilderness that are not trail accessible. Could include overflights, cameras, and an evaluation of hiking versus driving, etc. • There are opportunities to educate visitors about climate change impacts on people and ways of life, such as how the archeological record demonstrates how people have responded to climate change in the past.

Fundamental Resource or Value	Human Connections
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Archeological inventories and National Register of Historic Places evaluations in previously unsurveyed areas. • Condition assessments of known archeological sites, including an update to the ASMIS database. • Complete and rectify national register nominations and determinations of eligibility for prehistoric and historic sites. • Documentation of sand movement exposing and burying archeological sites. • Medano Ranch Headquarters and other potentially historic structures condition assessment and consultation with the Colorado Office of Archaeology and Historic Preservation. • Cultural landscape inventory for Medano Ranch Headquarters. • Update museum core documents. • Baseline plant study. • Information on collections in nonfederal repositories. • Complete traditional use study (ongoing). • Complete ongoing archeological project.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Resource management plan (update). • Complete visitor experience and resource protection plan for backcountry and wilderness areas. • Culturally modified trees preservation plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archeological and Historic Preservation Act of 1974 • American Indian Religious Freedom Act of 1978 • Archaeological Resources Protection Act of 1979 • Native American Graves Protection and Repatriation Act of 1990 • Wilderness Act of 1964 • Clean Air Act of 1977 (42 USC 7401 et seq.) • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13007, "Indian Sacred Sites" • Executive Order 13175, "Consultation with Indian Tribal Governments" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • Museum Properties Management Act of 1955, as amended <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (§1.4) "Park Management" • NPS <i>Management Policies 2006</i> (chapter 5) "Cultural Resource Management" • Director's Order 24: <i>NPS Museum Collections Management</i> • Director's Order 28: <i>Cultural Resource Management</i> • Director's Order 28A: <i>Archeology</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • Department of the Interior Policy on Consultation with Indian Tribes • Director's Policy Memorandum 14-02, "Climate Change and Stewardship of Cultural Resources"



Fundamental Resource or Value	Visitor Opportunities
Related Significance Statements	Significance statements 1, 2, 3, 4, 5, 6, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • In general, visitor opportunities are good. A great variety of resources result in a similarly great variety of opportunities for visitors. • Some campground sites are too small for modern recreational vehicles. • Cyclist safety can be threatened when they ride on the roads because there are no bike lanes (bike paths are called for in the general management plan). • There are no public restrooms at the entrance station. When lines are long, visitors use the restroom in park headquarters. In response to high visitation, in the summer of 2016, the park rented porta-potties and located them throughout the developed area, including one near the entrance station, to provide additional facilities for visitors. • Public access to diverse resources (grasslands, preserves, north end of the park) are all only on foot or by horse. Much of this is wilderness. • Frontcountry area (developed area) still has a national monument infrastructure while serving a national park and preserve that is larger and more complex than it was when the infrastructure was designed and built. • Hunting and fishing are permitted in the preserve. • Horseback riding is permitted in a majority of the park and preserve except in a small area around the frontcountry (visitor center, dunes play area, and campground).

Fundamental Resource or Value	Visitor Opportunities
<p>Current Conditions and Trends</p>	<p>Conditions (continued)</p> <ul style="list-style-type: none"> • Medano Road is a primitive, extreme, four-wheel-drive road and opens based on seasonal conditions. It is not heavily maintained for transportation, but rather for recreation, and for this purpose is in good condition. • Interpretive programming changes based on available staff and the majority of programming takes place during the park’s busy season. • The dark night sky, for the most part, reflects the natural environment. There is negligible impact on dark adaptation in any direction. The park is pursuing International Dark Sky Park designation. • An acoustic inventory from 2009 showed that primary noise in the park came from aircraft, but that natural sounds predominate. • Current views from the park are mostly untouched by visual intrusions and most park development is compatible with the natural setting. • The visitor center receives 30%–35% of park visitors. These numbers increase during the winter with visitor demographics changing throughout the year. • Scenic views are sometimes obscured by pollution-caused haze with visibility relatively unchanged the past decade. Average natural visual range is reduced from about 180 miles (without the effects of pollution) to about 125 miles because of pollution at the park. The visual range is reduced to below 80 miles on high pollution days. <p>Trends</p> <ul style="list-style-type: none"> • Changes in visitation – Visitation in the front country has increased over the past four years and it is likely that visitation in the backcountry has also increased. Cycling (mountain bikes and fat tire bikes) is also increasing. A formal visitor use survey was conducted for the backcountry in the summer/fall of 2015 and the data gathered during that survey will be used in the development of a visitor experience and resource protection plan for backcountry and wilderness areas, scheduled to begin in fiscal year 2017. • Visitor services and facilities – Decisions about staffing and funding are made in an effort to provide services to the greatest number of visitors and to focus on highest potential threats/impacts to resources. In winter (the park’s off-season) the campground is closed, visitor center hours are reduced, and there are fewer interpretive/education programs and law enforcement patrols. • Although the park is offering fewer interpretive programs, overall attendance figures are higher. Night-sky focused programs are especially popular and for the past several years, the park has hired an Astro-Ranger. • In recent years, the park has moved away from providing formal programs at the sand dunes/dunes lot. Attendance at those programs was minimal. Afternoon programs, during the summer when the sand is often hot at that time of day, are offered at the visitor center and/or on shaded trails and are very well-attended. Visitors are seeking expanded and varied experiences throughout the day and night, i.e., sandboarding and astrophotography are gaining in popularity, along with the more traditional evening programs. • In response to increased interest in environmental education programs, the park is leveraging limited staffing by offering not only the traditional on-site programs, but also by focusing on off-site programs developed and presented in partnership with other organizations (such as youth camps) and by providing on-line opportunities year-round. The park is striving for quality, rather than quantity and has restructured the education program to offer more in-depth programs, with smaller ranger/student ratios, and which meet state standards for curriculum. A greater social media presence by the park is resulting in an expanded connection to the visitor base and a potential increase in visitation as a result of increased awareness of the park. • Increased sales in the Western National Parks Association bookstore.

Fundamental Resource or Value	Visitor Opportunities
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Limited resources make it difficult to regularly monitor some visitor areas (e.g., Sand Creek, and other areas farther away from the high visitor use areas). This is due in part to the way backcountry permits are/are not issued for different areas of the park. • Infrequent noise from park facilities, operations, nearby development, transportation, aircraft, and visitor uses impacting acoustic environment. • Visitor safety is a greater concern as extreme recreation (such as sandboarding) increases. • On busy days, congestion and parking on the road is a threat to visitor safety (pedestrians and enjoyment). • Climate change – projections for earlier runoff and decreased flow in May to August in Medano Creek will impact visitor use. The result could mean a reduction in visitors, reduction in length of visitor stays, and reduced visitor enjoyment of the Great Sand Dunes. • Some development outside the park (solar panels, cell phone towers, etc.) could threaten the viewshed surrounding the park. • The Federal Aviation Administration has approved unmanned aircraft (drone) testing in the San Luis Valley, which potentially presents both threats and opportunities for Great Sand Dunes. Park staff will continue to work with local, state, and federal partners to comply with regulations and to explore opportunities for legal, appropriate use of drones in support of park operations. • Potential threats to the dark night sky include artificial light from park facilities and operations, nearby towns and development, or visitors. In addition, at night, air pollution scatters artificial lights, increasing the effect of light pollution on the night sky. • Air pollution-caused haze sometimes diminishes scenic views and comes from emissions sources including coal-fired power plants, vehicle exhaust, oil and gas production, agriculture, fire, and dust. • Ground-level ozone sometimes reaches levels that can make breathing difficult for sensitive groups including children, the elderly, people with existing health problems, and active adults are the most vulnerable. <p>Opportunities</p> <ul style="list-style-type: none"> • Complete visitor use studies for both front and backcountry to determine if more/fewer commercial use authorizations or commercial services are appropriate, i.e., horseback riding, jeep tours, other guided recreational opportunities. • Pursue an International Dark Sky status. • Reduce noise from park operations and conduct outreach to visitors and partners regarding noise reduction opportunities and strategies. • Create/expand opportunities for visitors to have experiences beyond what was traditionally offered/possible prior to park and preserve designation. Examples include partnering with the U.S. Fish and Wildlife Service on a joint visitor information center on the Baca Wildlife Refuge, access to the Medano Ranch (after acquisition by the National Park Service), further study of the possible meteor crater along the Liberty Road, etc. • Continue restoration of Sand Creek drainage, including restoration of native trout, to improve resource conditions and to provide visitor opportunities for recreational fishing. • Process and use data gathered during the 2015 visitor use survey to inform the development of a visitor experience and resource protection plan for backcountry and wilderness areas, scheduled to begin in fiscal year 2017. • Continue improving park sustainability and environmental leadership through the park's Environmental Management System, and pursuing NPS Climate Friendly Park status. • Explore ongoing opportunities through federal air quality programs (e.g., regional haze and ozone programs) to work cooperatively with other federal and state air quality agencies and local stakeholders to reduce air quality impacts in the park. • Expand interpretative and educational tools to communicate the connections between visitor opportunities, natural resources, air quality, water quality, night sky, scenic views, natural sounds, cultural landscapes, wilderness, human health, climate change, and other associated resources.

Fundamental Resource or Value	Visitor Opportunities
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Gather and analyze visitor data for both front and backcountry areas. • Continued monitoring and documentation of acoustic resources / night skies. • Visual resource inventory. • Air quality monitoring—Interagency Monitoring of Protected Visual Environments sampling.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Complete visitor experience and resource protection plan for backcountry and wilderness areas. • Frontcountry visitor use management plan. • Commercial services plan. • Transportation plan. • Accessibility self-assessment and transition plan. • Visual resource management plan. • Medano Road visitor use management plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Clean Air Act of 1977 (42 USC 7401 et seq.) • Americans with Disabilities Act of 1990 • Architectural Barriers Act of 1968 • “Accessibility Guidelines” (36 CFR 1191.1) • Rehabilitation Act of 1973 • NPS Concessions Management Improvement Act of 1998 <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (§1.4.6) “Park Resources and Values” • NPS <i>Management Policies 2006</i> (§1.6) “Cooperative Conservation Beyond Park Boundaries” • NPS <i>Management Policies 2006</i> (§4.4.1.2) “Genetic Resource Management Principles” • NPS <i>Management Policies 2006</i> (§4.6) “Water Resource Management” • NPS <i>Management Policies 2006</i> (§4.7) “Air Resource Management” • NPS <i>Management Policies 2006</i> (§4.9) “Soundscape Management” • NPS <i>Management Policies 2006</i> (§4.10) “Lightscape Management” • NPS <i>Management Policies 2006</i> (chapter 7) “Interpretation and Education” • NPS <i>Management Policies 2006</i> (chapter 8) “Use of the Parks” • NPS <i>Management Policies 2006</i> (chapter 9) “Park Facilities” • NPS <i>Management Policies 2006</i> (chapter 10) “Commercial Visitor Services” • Director’s Order 6: <i>Interpretation and Education</i> • Director’s Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i> • Director’s Order 47: <i>Soundscape Preservation and Noise Management</i> • NPS <i>Transportation Planning Guidebook</i>





Fundamental Resource or Value	Wilderness
Related Significance Statements	Significance statements 1, 3, 4, 6, and 7.
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Wilderness stewardship building blocks documents were finalized for both the Great Sand Dunes and Sangre de Cristo Wilderness Areas in August 2012. These documents provide a baseline assessment of wilderness character and indicate that overall, both the formally designated and proposed wilderness areas within the park and preserve are healthy and in good condition. • There are few developments in the designated and proposed wilderness areas within the national park and preserve and since designation of those areas, there have been efforts to improve wilderness character and quality, i.e., removal of signage, treatment of nonnative, noxious weeds (leafy spurge), etc. • Currently, park operations and management actions take place in both designated and proposed wilderness areas without benefit of minimum requirements analyses or other formal processes for assessing the impacts management actions and operations have on the quality and character of wilderness. • Great Sand Dunes is a Clean Air Act Class I area. • Overall air quality condition warrants significant concern based on NPS Air Resources Division benchmarks using in-park visibility and interpolated data from more distant monitors. <p>Trends</p> <ul style="list-style-type: none"> • Visitation has been steadily increasing in the Great Sand Dunes Wilderness. There are inconclusive numbers regarding visitation to the Sangre de Cristo Wilderness. • The number of backcountry permits issued for overnight use in Great Sand Dunes Wilderness has been increasing. The park does not issue backcountry permits for the Sangre de Cristo Wilderness. • There is a continued commitment from the park to remove nonnative species, which improves natural qualities but negatively (temporarily) affects the untrammeled quality. • From 2005 to 2014, the trend in visibility at the park remained relatively unchanged, but trends for other indicators are unknown because there is not sufficient on-site monitoring and reporting.

Fundamental Resource or Value	Wilderness
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Trash and debris, i.e., children’s sand toys, litter from picnics, etc., occur in and along Medano Creek downstream from the dunes parking lot and impacts wilderness quality and character. • There could be a potential decline in wilderness character due to overcrowding, though the Great Sand Dunes Wilderness is typically resilient to visitation. • Unintended, negative impacts on wilderness character and quality when actions/practices/decisions are made by the park without first completing required analysis documents. • Night sky light pollution from nearby and distant urban centers. • Potential concentrated use in portions of wilderness, particularly at Great Sand Dunes Wilderness beach and upper Sand Creek Basin. • High level of commercial overflights. There is an existing memorandum of understanding to manage military overflights. • Unmanned aircraft may become an issue in the near future. • Climate change is projected to decrease alpine areas, impact high-alpine lakes, and cause changes in vegetation types. These changes in base resources will affect wilderness areas and visitors’ wilderness experience. • Air quality diminishes natural quality and scenic views and comes from emissions sources including coal-fired power plants, vehicle exhaust, oil and gas production, agriculture, fire, and dust. <p>Opportunities</p> <ul style="list-style-type: none"> • Continue volunteer trash patrols. • Educate outfitters and permit holders on wilderness ethics. • Interagency wilderness partnership/management—U.S. Fish and Wildlife Service and U.S. Forest Service. • Pursue a dark night sky designation. • Develop education and outreach programs, such as the Ambassadors for Wilderness program, to further understanding of, appreciation for, and stewardship of wilderness resources and values. • Coordinate with all park data and planning needs to ensure that wilderness mandates are met. • The park and the NPS Rocky Mountain Inventory and Monitoring Network are monitoring changes in the alpine zone through the international Global Observation Research Initiative in Alpine Environments protocol. • Explore ongoing opportunities through federal air quality programs (e.g., regional haze and ozone programs) to work cooperatively with other federal and state air quality agencies and local stakeholders to reduce air quality impacts in park. • Continue improving park sustainability and environmental leadership through the park’s Environmental Management System, and pursuing NPS Climate Friendly Park status. • Conduct outreach to visitors and partners to increase awareness about the importance of park air quality, scenic views, and natural sound protection.
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Data to understand impacts on wilderness character from visitor use in all wilderness areas, formally designated and proposed, within park and preserve. • High-density visitor use data. • Perform a reevaluation of wilderness character monitoring to establish a trend. • Continued monitoring and documentation of acoustic resources / night skies. • Continue alpine zone monitoring to inform understanding of climate change.

Fundamental Resource or Value	Wilderness
Data and/or GIS Needs (continued)	<ul style="list-style-type: none"> • Air quality monitoring—Interagency Monitoring of Protected Visual Environments sampling. • Visual resource inventory. • Rewrite the Wilderness Stewardship Building Blocks documents for both wilderness areas.
Planning Needs	<ul style="list-style-type: none"> • Complete visitor experience and resource protection plan for backcountry and wilderness areas. • Visual resource management plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Wilderness Act of 1964 • Clean Water Act • Clean Air Act of 1977 (42 USC 7401 et seq.) • National Parks Overflight Act of 1987 • Secretarial Order 3289, “Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources” <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • Director’s Order 41: <i>Wilderness Stewardship</i> • Director’s Order 47: <i>Soundscape Preservation and Noise Management</i> • NPS Reference Manual 41: <i>Wilderness Stewardship</i> • NPS <i>Keeping It Wild in the National Park Service User Guide</i> • NPS <i>Management Policies 2006</i> (§1.4) “Park Management” • NPS <i>Management Policies 2006</i> (§1.6) “Cooperative Conservation Beyond Park Boundaries” • NPS <i>Management Policies 2006</i> (§4.1) “General Management Concepts” • NPS <i>Management Policies 2006</i> (§4.1.4) “Partnerships” • NPS <i>Management Policies 2006</i> (§4.7) “Air Resource Management” • NPS <i>Management Policies 2006</i> (§4.7.2) “Weather and Climate” • NPS <i>Management Policies 2006</i> (§4.9) “Soundscape Management” • NPS <i>Management Policies 2006</i> (§4.10) “Lightscape Management” • NPS <i>Management Policies 2006</i> (chapter 6) “Wilderness Preservation and Management” • Director’s Policy Memorandum 12-02, “Applying National Park Service Management Policies in the Context of Climate Change”





Analysis of Other Important Resources and Values

Other Important Resource or Value	Historic Resources
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • Historic resources determined to be eligible for or listed in the National Register of Historic Places are in varied condition—Superintendent’s Residence is fair, Medano Ranch is poor, Teofilo Trujillo is being protected and is in fair condition, Pedro Trujillo (currently on land owned by The Nature Conservancy) is in good condition and has been stabilized, remodeled, repaired, and protected by recently constructed fencing. • Historic resources determined to be ineligible for the national register have not been maintained. These determinations, however, were based solely on the structures and did not include evaluation of the associated archeological components. Subsequent field evaluations recommend eligibility of the archeological components of some of these historic resources and have been entered into the state’s archeological database as “recommended eligible.” <p>Trends</p> <ul style="list-style-type: none"> • Medano Ranch Headquarters (national historic district) is a complex of buildings and corral system that are in deteriorating condition. Once the ranch is acquired by the National Park Service, as outlined in the park’s general management plan, formal assessments and planning will be required to determine what, if any, appropriate actions should be taken. • The Superintendent’s Residence is in stable condition because it is continuously used and is being maintained and protected. • The Teofilo Trujillo site is currently in stable condition because it has been protected through the erection of a fence but has not been stabilized. The fence was constructed as part of a collaborative effort with partners. There has been archeological testing at this site, resulting in a recommendation of eligibility for listing in the National Register of Historic Places based on archeological significance. This site is a national historic landmark.

Other Important Resource or Value	Historic Resources
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Looters and vandals pose a threat to historic resources throughout the park. • Wildfires could impact historic resources. • Increased visitation to historic sites could lead to greater impacts on the resources from visitors. • Climate change poses a threat to historic resources and associated archeological components due to changes in the environments in which they exist. Resources along streambanks, especially tall cut banks, are threatened by more extreme fluctuations in stream flow. Archeological components of historic sites will be buried/exposed at a more rapid rate if there are dry periods with more wind to increase sand movement. Changes in precipitation could impact historic structures. Changes in vegetation or erosion may impact archeological components of historic sites. • The Big Spring Creek road, a historic resource, goes through some archeological sites and is in the vicinity of other sites where human remains were exposed in the past. <p>Opportunities</p> <ul style="list-style-type: none"> • Once the Medano Ranch is acquired by the National Park Service, the park will assume management of the Ranch Headquarters complex. There will be opportunities to consider adaptive re-use, stabilization, maintenance, removal, etc. • Work to acquire more state and national funding and partnership opportunities. • Work in partnership with Western National Parks Association to provide additional interpretation opportunities for historic resources. • Continue and expand education programs with a focus on history and place. Include any newly acquired lands/resources in future education programs on-site at the visitor center or online. • Incorporate climate change and the impacts on historic resources into educational programming. • University of Colorado at Denver LiDAR (light detection and ranging) has been completed for the Trujillo Homesteads National Historic Landmark and Medano Ranch Headquarters. Use the Medano Ranch Headquarters LiDAR in interpretation and educational programs and for future park management, data, and analysis. • Develop Facility Management Software System work orders related to the Superintendent's Residence to accurately address deficiencies in the building and seek future funding.
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Historic resource condition assessments. • Complete and rectify national register nominations and determinations of eligibility for prehistoric and historic sites. • Update the List of Classified Structures database following acquisition of expansion lands. • Continued investigations into the location of the eastern branch of the Old Spanish Trail route. • Condition assessments of known archeological sites associated with historic resources, including an update to the ASMIS database. • Medano Ranch Headquarters and other potentially historic structures condition assessment and consultation with the Colorado Office of Archaeology and Historic Preservation. • Cultural landscape inventory for Medano Ranch Headquarters. • Input all Medano Ranch facilities into the Facility Management Software System database (upon acquisition). • Update museum core documents.

Other Important Resource or Value	Historic Resources
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Revisit general management plan decisions regarding Medano Ranch and its potential use, potentially through a development concept plan or general management plan amendment (upon acquisition).
<p>Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Historic Site Act of 1935 • Archeological and Historic Preservation Act of 1974 • Archaeological Resources Protection Act of 1979 • Native American Graves Protection and Repatriation Act of 1990 • Clean Air Act of 1977 (42 USC 7401 et seq.) • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13175, "Consultation with Indian Tribal Governments" • "Protection of Historic Properties" (36 CFR 800) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • Museum Properties Management Act of 1955, as amended <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (§1.4) "Park Management" • NPS Management Policies 2006 (chapter 5) "Cultural Resource Management" • Director's Order 24: NPS Museum Collections Management • Director's Order 28: Cultural Resource Management • Director's Order 28A: Archeology • The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation • The Secretary of the Interior's Standards for the Treatment of Historic Properties • Department of the Interior Policy on Consultation with Indian Tribes • Director's Policy Memorandum 14-02, "Climate Change and Stewardship of Cultural Resources" • Director's Policy Memorandum 15-01, "Addressing Climate Change and Natural Hazards for Facilities"



Identification of Key Issues and Associated Planning and Data Needs

This section considers key issues to be addressed in planning and management and therefore takes a broader view over the primary focus of part 1. A key issue focuses on a question that is important for a park. Key issues often raise questions regarding park purpose and significance and fundamental and other important resources and values. For example, a key issue may pertain to the potential for a fundamental or other important resource or value in a park to be detrimentally affected by discretionary management decisions. A key issue may also address crucial questions that are not directly related to purpose and significance, but that still affect them indirectly. Usually, a key issue is one that a future planning effort or data collection needs to address and requires a decision by NPS managers.

The following are key issues for Great Sand Dunes National Park and Preserve and the associated planning and data needs to address them:

- **Visitor Capacity/Congestion.** Visitation is on the rise. Nearly 300,000 people visited the park in 2015—a 20+% increase over 2014 numbers. 2016 saw additional increases (300,000 visitors as of September 30). Although peak visitation continues to occur during the summer, the park is experiencing increased visitation during fall, winter and spring months that were traditionally the park’s “shoulder season” and traditionally have been relatively quiet. These increases, particularly during peak season, affect visitor experience and enjoyment and visitor safety. There are potential impacts on resources and additional demands on park infrastructure. High visitor numbers result in traffic congestion, parking problems, and an inability to accommodate the number of visitors wanting to camp in Piñon Flats Campground, the park’s only campground.

On busy days, it is common to have lines of cars waiting at the park’s entrance station and bottlenecks at various points along roadways when there is wildlife to view. Parking lots at the visitor center, dunes lot, amphitheater, and the horse trailer lot fill to capacity, often before noon during peak visitation periods. Once parking lots are full, visitors resort to parking along the road and in pullouts and then walking to their destinations along roads that have no shoulders and no suitable walkways, compounding problems in already congested areas and creating potential for vehicle/pedestrian accidents and impacts on air quality, viewsheds, and soundscapes.

Use of the Medano Pass Primitive Road and the 25 backcounty campsites and special points of interest along that road (i.e., Point of No Return, Sand Pit, Castle Creek) is also increasing. Vault toilets exist at Sand Pit and Castle Creek, but at no other locations along the road. Human waste may become a concern, particularly during peak season. Parking space is limited and during periods of high use, visitors are apt to park out of designated areas, creating safety issues and damaging resources. The road crosses Medano Creek nine times before reaching the summit, and there are potential impacts on resources by vehicles, i.e., stream banks, water quality, etc. Resource damage can also occur when vehicles drive out of the established roadway, to pass oncoming vehicles, to get around vehicles that are stopped or stuck, etc.

Campground capacity is a concern for front-line staff. Trends indicate that Piñon Flats Campground fills earlier in the day, starting earlier in spring and extending later in fall, and is full every night from mid-May into September (depending on weather). Inevitably, a number of visitors are turned away, unable to camp, and they are justifiably disappointed. Park staff is understandably frustrated at not being able to meet visitor expectations. The campground has a total of 88 sites for individuals/families, arranged in two loops (44 sites in each loop) and 3 larger sites in the “Group Loop.” One loop is managed under a reservation system (Recreation.gov) and the other on a first come, first-served basis. Reservations can be made up to six months in advance and these are quickly taken. The first come, first-served loop typically fills by mid-morning during the summer. Turning away visitors is problematic, while making all campsites available on a reservation-only basis would be problematic, too, because the park would lose the flexibility to fill sites when there are cancellations.



As called for in the park’s general management plan, park management needs to explore options to address crowding, congestion, and capacity issues and impacts on resources. Options to consider could include expanding existing parking areas or adding new areas either inside or outside the park, mowing roadsides or adding road shoulders to improve safety, construction of hiking/biking paths, relocation of the entrance station to a less congested area away from park headquarters, managing entry into the park through a lottery system, operating a shuttle system, expanding Piñon Flats Campground, or identifying other locations in the park for additional camping, etc. These actions could be controversial, costly, and would have their own associated impacts on visitor opportunities and experience as well as on resources. Any significant management actions would be planned and implemented in compliance with all legal requirements and requisite public involvement. In the meantime, the park should continue to explore and expand on communication tools/methods to provide visitors with information about peak visitation periods, available campsites, etc.

- *Associated planning and data needs:* Visitor use surveys, entrance station data, high-density visitor use data, transportation plan, frontcountry visitor use management plan
- **Acquisition of the Medano Ranch.** The Nature Conservancy (TNC) owns the Medano Ranch, 12,000 acres of which lie within the legislated boundaries of the national park. In fiscal year 2016, the National Park Service received \$6.852 million in Land and Water Conservation Fund money to acquire that portion of the ranch within the park boundary. Park management is working closely with The Nature Conservancy to complete the purchase. The target date for completing the transaction is December 2017. With the acquisition of these new lands comes a variety of opportunities and complex challenges for the park, including stewardship of additional natural resources (large ungulates, national natural landmark site, nonnative plants, water/hydrologic regimes) and significant cultural resources (world class archeological sites, national historic landmark and national register properties), public access and opportunities for visitor education, outreach and recreation, designation of lands determined as eligible wilderness, etc.

Medano Ranch Headquarters: The park’s general management plan highlights opportunities, upon acquisition, for adaptive use and maintenance of buildings in the Medano Ranch Headquarters complex (listed in the National Register of Historic Places) for offices, housing, research support, environmental education center, etc. The buildings within the complex are not currently used and are in various stages of deterioration and disrepair. Prior to taking any action, extensive evaluation and planning would be needed, including consultation with the Colorado Office of Archaeology and Historic Preservation and others in compliance with section 106 of the National Historic Preservation Act.



Water management: The general management plan calls for the discontinuation of agricultural activities currently taking place on the ranch, i.e., surface irrigation of meadows and haying to provide forage for a managed herd of approximately 2,000 bison owned by The Nature Conservancy, and restoration of natural hydrologic processes. Given the importance and sensitivity related to water management and use, additional studies and planning would be done prior to taking any actions. Park management would need to better understand impacts on wetlands, groundwater supplies, downstream users, federal water rights, the Closed Basin Project, and to assure that all management actions comply with applicable regulations and requirements.

Elk and bison management: Once the ranch is acquired by the National Park Service, the general management plan calls for an elk management plan, currently underway as part of an ungulate management environmental impact statement, which also addresses bison management after the Medano Ranch is purchased. The elk population in the eastern San Luis Valley has grown significantly in recent decades and there are concerns about impacts on sensitive resources and agricultural operations. Implementation of the ungulate management plan would include active, appropriate management of elk within NPS boundaries, in coordination/collaboration with the state and U.S. Fish and Wildlife Service.

Visitor access and opportunities: As outlined in the general management plan, based on the presence of significant and sensitive resources, the Medano Ranch would not be open to general public visitation and use, but the ranch headquarters could be used as a base for guided tours/trips, education center, and special events.

Wilderness designation: The formal wilderness study and recommendation completed as a part of the general management plan identified 53,000 acres of land included in the national park as eligible for wilderness designation. Most of the 12,000 acres of the Medano Ranch within the park boundary is part of the eligible wilderness.

When the land purchase is complete and the park assumes responsibility for the new lands and resources, it will be critical to have a greater understanding of the myriad complex, interrelated issues in order to successfully manage them. Park management will consider actions called for in the general management plan but may also want to develop new direction and guidance that will be more relevant and effective in addressing current and future issues and opportunities.

- *Associated planning and data needs:* Complete the ungulate management plan, Medano Ranch water management plan, environmental sites assessment (prior to acquisition of Medano Ranch land), Medano Ranch Headquarters condition assessment and consultation with the Colorado Office of Archaeology and Historic Preservation, cultural landscape inventory for Medano Ranch Headquarters, staffing needs assessment, update the comprehensive interpretive plan (to include newly acquired lands), planning necessary to complete formal designation of lands identified as eligible for wilderness designation in the general management plan / wilderness study

- **Acquisition of Subsurface Mineral Rights on the former Baca Ranch.** A portion of the former Baca Ranch lies within the boundaries of the park. The National Park Service owns the surface mineral rights on those lands, but the subsurface mineral rights are held by a private entity, Lexam Explorations, Inc., which has engaged in gas and oil exploration activities in the past. The resolution of this split estate (severed mineral rights) is an important issue for the park for two reasons. First, most of the former Baca Ranch was identified as eligible for wilderness designation by the formal wilderness study and recommendation completed as a part of the general management plan. Mineral rights held privately would not automatically prevent these lands from becoming wilderness, but it would complicate the development and support of wilderness legislation. Second, until those rights are acquired by the National Park Service, the potential for Lexam to sell those subsurface rights to another party will continue to exist. An appraisal of the subsurface mineral values is the key first step to addressing this issue. Without an appraisal, it is not possible to evaluate the costs for purchase of these rights in order to plan for wilderness designation.
 - *Associated planning and data needs:* Appraisal of subsurface mineral rights, planning necessary to complete formal designation of lands identified as eligible for wilderness designation in the general management plan / wilderness study
- **Park Infrastructure.** Poor network connectivity has a significant impact on park operations. Service is provided by a small, locally owned company without the resources to replace aging, outdated lines. Access to internet is not consistent and is typically slow, impacting employees (slow computer connections) and visitors (cash register transactions contribute to lines at the entrance station and visitor center sales area). Much of the infrastructure of the park is aged and does not adequately meet the demands of current park operations, although major projects are underway in fiscal years 2017 and 2018 to replace the water systems in the park’s headquarters area and Piñon Flats Campground. Buildings have system deficiencies that merit assessment, such as roofs, windows, utilities, energy efficiency, etc. The office space assigned to Facility Management and Fee Program staff is inadequate and plans are being made for adaptive reuse and/or rehabilitation of existing space to modernize and improve work areas. As identified by the housing needs assessment conducted in fiscal year 2014, there is a need for additional housing—one unit for permanent employees and one for seasonals/temps. As outlined in the visitor capacity/congestion section of this document, roads, parking lots, and hiking/biking paths need to be assessed and potential alternatives evaluated. The size of the campground limits the number of visitors the park can accommodate, and many of the sites are not big enough for modern recreational vehicles.
 - *Associated planning and data needs:* Facilities inspections/assessments, staffing needs assessment, transportation plan
- **Extreme Recreation.** Various types of “extreme” recreation activities are becoming more popular and mainstream for visitors in areas of the park and preserve where such activities are permitted, including sandboarding on the dunes, and mountain biking, fat-tire biking and four-wheel driving on Medano Road. With these changes in recreation come the need for management to monitor trends and consider impacts on resources, wilderness, visitor experience, and safety.

For the most part, visitors participating in sandboarding do so in the general management plan-designated Dunes Play Zone, an area of the Great Sand Dunes Wilderness defined in the park’s general management plan as one where opportunities for primitive and unconfined recreation are possible, but in which there is a low expectation of solitude because it is an area easily accessible from the main dunes parking area and tends to have high concentrations of visitors during busy times. Sandboarding in the Dunes Play Zone could impact visitor experience and safety and could cause visitor conflicts and potential injuries associated with varied types of recreation occurring in a high-use area.

When sandboarding takes place beyond the Dunes Play Zone in more remote, less visited areas of the Sand Dunes Wilderness, it presents a potential impact on wilderness character by impacting opportunities for solitude expected in wilderness. In the future, it may be appropriate for management to consider limiting sandboarding to the Dunes Play Zone or designating a specific area outside the Dunes Play Zone where it is permitted, to prevent the impacts on wilderness character and visitor experience. Such decisions, however well-intentioned, would also have impacts and could be viewed as constraints on the opportunity for unconfined wilderness recreation. Designating a specific zone for the activity could also increase the potential for injury to visitors by concentrating the activity in a specific area rather than allowing visitors to choose where to engage in the activity.

Other types of recreation that are on the rise include jeeping / four-wheel driving and mountain biking (or fat-tire biking) on Medano Road. Each of these carries inherent risks to visitors and these risks increase when multiple types of dissimilar and generally conflicting recreation occur in the same area. As mentioned in the visitor capacity/congestion section of this document, increased use and crowding along Medano Road present potential negative impacts on resources as well.

Park management needs data to better understand the types and location of extreme recreation in the park and preserve and the numbers of visitors participating in such activities. This information would be critical to the park's success in addressing impacts on resources in the frontcountry, backcountry and wilderness areas, and in providing visitor information and education, resource and visitor protection, and emergency response.

- *Associated planning and data needs:* Visitor use surveys, data related to sandboarding and mountain/fat-tire bicycle use, high-density visitor use data, protocol for gathering data and organizing incident reports /annual search-and-rescue report, patrol logs, complete visitor experience and resource protection plan for backcountry and wilderness areas, frontcountry visitor use management plan

Planning and Data Needs

To maintain connection to the core elements of the foundation and the importance of these core foundation elements, the planning and data needs listed here are directly related to protecting fundamental resources and values, park significance, and park purpose, as well as addressing key issues. To successfully undertake a planning effort, information from sources such as inventories, studies, research activities, and analyses may be required to provide adequate knowledge of park resources and visitor information. Such information sources have been identified as data needs. Geospatial mapping tasks and products are included in data needs.

Items considered of the utmost importance were identified as high priority, and other items identified, but not rising to the level of high priority, were listed as either medium- or low-priority needs. These priorities inform park management efforts to secure funding and support for planning projects.



Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	Planning Needs	Priority (H, M, L)	Notes
Dune System; Human Connections	Resource management plan (update)	H	This information would be used to update a resource stewardship strategy, especially on the newly acquired land. It would also address impacts on resources from climate change.
Water; Natural Diversity; Key Issue	Complete the ungulate management plan	H	This is critical to complete the land transfer.
Natural Diversity	Exotic plant management plan	H	This is important for resource management and preservation.
Human Connections; Visitor Opportunities; Wilderness; Key Issue	Complete visitor experience and resource protection plan for backcountry and wilderness areas (Federal Lands Recreation Enhancement Act funded for fiscal year 2017)	H	These data would guide a comprehensive approach to wilderness and backcountry management to better address needs identified in the general management plan regarding carrying capacity for areas of concern. In the short-term, minimum requirements analysis documents would be needed prior to taking any action in the wilderness. This document would be needed for longer-term planning.
Visitor Opportunities	Commercial services plan (funded for fiscal year 2017)	H	The park currently has limited visitor services and a plan would identify what is necessary and appropriate for the future. This is necessary for developed areas of the park and preserve, along with backcountry and wilderness areas.
Visitor Opportunities; Key Issue	Frontcountry visitor use management plan	H	A plan is needed to understand how visitors are using the developed area of the park, including the dunes play management zone.
Water; Natural Diversity; Visitor Opportunities	Medano Road visitor use management plan	H	A study and plan are necessary specifically on Medano Road to evaluate and make management suggestions on capacity, resource impacts, additional infrastructure needs (i.e., vault or composting toilets), etc.
Water; Key Issue	Medano Ranch water management plan	H	Complete water management plan for Medano Ranch lands (after acquisition by the National Park Service) to include consideration of the existing ditch system and potential capping of artesian wells. This is critical to complete the land transfer and understand water management for the park and the greater San Luis Valley. A component of this plan would address the restoration of natural hydrology on Medano Ranch lands.
Natural Diversity	Fishery management plan	H	Planning and compliance is necessary for the Sand Creek restoration project. Currently, there are nonnative fish in Sand Creek that need to be removed.
Key Issue	Planning necessary to complete formal designation of lands identified as eligible for wilderness designation in the general management plan / wilderness study	M	The mineral rights are currently owned by a private entity. An appraisal of the subsurface mineral values is the key first step to addressing this issue. Without an appraisal, it is not possible to evaluate the costs for purchase of these rights in order to plan for wilderness designation. After such data are acquired, additional planning would be necessary prior to wilderness designation.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	Planning Needs	Priority (H, M, L)	Notes
Water	Complete water monitoring plan	M	The park needs to determine the number of wells and gauges to strategically continue monitoring into the future and to build monitoring programs for streams, water quality, and ecological monitoring. In addition, all future monitoring needs to be reasonable based on staff resources and/or the ability to access the data remotely.
Historic Resources	Revisit general management plan decisions regarding Medano Ranch and potential use, potentially through a development concept plan or general management plan amendment (upon acquisition)	M	Acquisition of Medano Ranch by the National Park Service would be a major addition to park resources and would require updated planning.
Key Issue	Update the comprehensive interpretive plan (to include newly acquired lands)	M	A comprehensive interpretive plan helps the park guide the message for visitors and would need to be updated to include new information from newly acquired lands.
Dune System; Visitor Opportunities; Key Issue	Transportation plan	L	The transportation plan would allow the park to address congestion and parking issues for visitors to the park. Proposals to solve this problem were outlined in the general management plan, but have not been addressed through planning in recent years despite increases in seasonal visitation.
Natural Diversity	Five-needle pine management plan	L	This is important for long-term management of a native tree species with important ecosystem values in the face of a nonnative and lethal pathogen.
Dune System; Water; Natural Diversity	Planning for adaptation to climate change	L	This planning stems from an initiative from the NPS Climate Change Response Program to assess and prepare for climate change in the four areas of emphasis—science, adaptation, mitigation, and communication.
Natural Diversity	Aquatic resources management plan for the conservation of native species	L	While this is a need, it would fall under the auspices of a resource stewardship strategy.
Human Connections	Culturally modified trees preservation plan	L	Updated plan for treatment and preservation of the culturally modified trees within Indian Grove (national register property), to include periodic prophylactic spraying for beetles, which has been done in the past and is required every two to three years.
Visitor Opportunities	Accessibility self-assessment and transition plan	L	This plan would aid the park with accessibility, both physical and programmatic, of the park and park programs.
Visitor Opportunities; Wilderness	Visual resource management plan	L	Using the visual resources inventory as a baseline, this plan would identify goals, objectives, and strategies for protecting the important characteristics of the scenic setting for recreation activities and would also support wilderness management.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Water	Continue piezometric boundary wells monitoring by Bureau of Reclamation	H	It is a legal requirement to undertake this monitoring because these data are required to ensure continued federal in situ water rights for the park.
Water	Continue wetland monitoring by NPS Rocky Mountain Inventory and Monitoring Network	H	This is part of the Vital Signs Monitoring Program.
Natural Diversity	Study sand sheet cottonwood stand sustainability	H	This data need ties to groundwater and climate monitoring. Cottonwoods are critical for biodiversity of the riparian areas. These data help inform the ungulate management plan.
Natural Diversity	Assess wetland response to ungulates and climate change	H	These data need to be acquired through monitoring and reporting by NPS Rocky Mountain Inventory and Monitoring Network. This is critical for the ungulate management plan.
Natural Diversity	Determine elk distribution, abundance, and impacts on habitat and other wildlife species	H	These data are also related to the ungulate management plan.
Natural Diversity	Collect data on amphibians	H	These data need to be acquired through monitoring by NPS Rocky Mountain Inventory and Monitoring Network. Some amphibians are species of concern for the park. These data are tied to the groundwater decree and ungulate management plan.
Wilderness	Data to understand impacts on wilderness character from visitor use in all wilderness areas, formally designated and proposed, within park and preserve	H	There is a need for data on both the Great Sand Dunes Wilderness Area and Sangre de Cristo Wilderness Area (especially from the east side with Music and Medano Passes). It would include processing data gathered from the backcountry visitor use survey. There are currently some data from specific areas in the backcountry, but the park does not have the data collected for the entire area. This would serve to inform the visitor experience and resource protection plan for wilderness and backcountry areas and is identified as a need in the general management plan.
Wilderness; Key issue	High-density visitor use data	H	Data needed to understand visitor use in the park's higher visitor use areas (including dune play zone and frontcountry areas) and on new emerging recreation trends such as sandboarding and four-wheeling.
Visitor Opportunities; Wilderness	Continued monitoring and documentation of acoustic resources / night skies	H	The park is in the process of being designated as an International Dark Sky Park. This will help protect wilderness character and visitor experience. Continued monitoring would help compare against baseline conditions and establish trends.
Wilderness	Continue alpine zone monitoring to inform understanding of climate change	H	Global Observation Research Initiative in Alpine Environments is an international program. There are many applications for these data—education, biological resources, management of wilderness.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Water; Natural Diversity; Visitor Opportunities; Wilderness	Air quality monitoring— Interagency Monitoring of Protected Visual Environments sampling	H	Currently, monitoring is going on and needs to be maintained and expanded. As part of monitoring, the park and preserve should establish a National Atmospheric Deposition Program monitoring site within the park to improve understanding of air pollutant deposition levels and impacts. Wet and dry deposition and impacts of pollution on water quality are critical for water management. This would help inform pollution in the alpine areas and everywhere downstream. Pollution is a hormone/gene disruptor in fish species. In addition, ongoing in-park air quality monitoring should provide updated visibility condition information. In addition, monitoring should allow for investigation of park ozone pollution levels and impacts on resources.
Historic Resources	Historic resource condition assessments	H	These data are needed specifically for the Superintendent's Residence both for inclusion in the List of Classified Structures database and because in 2017 a facility condition assessment is to be completed to develop a plan for maintaining the structure. Repairs are scheduled for 2018. Assessment would also need to be conducted on additional historic structures on Medano Ranch after the pending land transfer.
Human Connections; Historic Resources	Condition assessments of known archeological sites, including an update to the ASMIS database	H	This information is required to be updated regularly.
Human Connections	Complete traditional use study (ongoing)	H	This would provide the basis for research and understanding of how traditionally associated tribes and others connect to and use the land. It would be particularly useful to include the expanded lands in this study. This is ongoing, and is useful for building on the ethnographic overview and assessment.
Key Issue	Visitor use surveys	H	These data are needed for a frontcountry visitor use management plan. These are also important data for the backcountry to understand what visitors are doing and where (for example, the locations and number of visitors participating in four-wheeling).
Key Issue	Environmental sites assessment (prior to acquisition of Medano Ranch land)	H	This is mandated as part of the land acquisition process. It is to be completed and funded through the NPS Lands Office and informs the appraisal.
Key Issue	Staffing needs assessment	H	This information is needed to address park operations, especially acquisition of new land. This would help inform where to concentrate staff resources and how staffing might need to change after the land transfer. It is also important to understand staffing needs with regard to housing and infrastructure.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Natural Diversity	Conduct weed inventory on Baca Ranch lands	H	Park managers need to verify the distribution of noxious weeds on 40,000 acres of unsurveyed managed lands and bring them under the management of existing noxious weed management efforts. This area is different from others in the park because of the historic use of cattle in this area.
Natural Diversity	Climate change vulnerability assessments for Rio Grande cutthroat trout	H	This assessment is ongoing in partnership with the U.S. Geological Survey.
Natural Diversity	Climate change vulnerability assessments for Medano Creek	H	It is critical to understand discharge and timing of flow in Medano Creek and how it affects dune formation and visitor use. This assessment is ongoing.
Natural Diversity	Climate change vulnerability assessments for wetlands vegetation	H	It is critical to understand how climate change will impact wetland vegetation and ungulate management. This assessment is ongoing.
Key Issue	Appraisal of subsurface mineral rights	H	This is important because the wilderness designation of the former Baca Ranch is tied to these private mineral rights.
Natural Diversity	Climate change vulnerability assessments of wildland fire regime	M	It is critical to understand how fire regime and fire intensity is projected to change with climate change.
Water	Evaluate and continue well and stream gauge monitoring to protect water rights	M	This relates to sustainability of monitoring that is already ongoing.
Water	Continue and expand data collection and reporting water quality data, particularly in high visitor use areas and as it relates to climate change	M	These data should include monitoring of streams, atmospheric deposition, water quality including fecal and total coliform testing, contaminants, and ecological monitoring (e.g., aquatic, insects, diatoms). There are currently no problems with water quality related to Medano Creek, but it needs to be monitored.
Natural Diversity	Conduct five-needle pine susceptibility to white pine blister rust and climate change transplant recovery studies	M	Blister rust is microclimate driven, particularly where fog hangs in canyons. This study would help understand phenotypic resistance to blister rust. The U.S. Forest Service is contributing to the effort, and the National Park Service can look to partner with the U.S. Forest Service.
Natural Diversity	Collect data on nonnative plants	M	The park needs to collect data on nonnative plants as part of the noxious weed plan, but there only a few of the weeds on the noxious weed list in the park. Part of data collection is for the park to make efforts to do early detection whenever possible. In addition, data will allow for monitoring trends to determine if there are emerging threats and determine how best to conduct eradication when required.
Wilderness	Perform a reevaluation of wilderness character monitoring to establish a trend	M	This is due in one year (on a five-year cycle). It is typically accomplished by a wilderness fellow in cooperation with the U.S. Forest Service, through the American Conservation Experience program.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Historic Resources	Update the List of Classified Structures database following acquisition of expansion lands	M	The List of Classified Structures database will need to be updated with all structures on land that will be transferred to the park, but there is no reason to do this until the transfer occurs. In addition to updating the List of Classified Structures database, the ASMIS database will need to be synced to the List of Classified Structures database after updates have been made.
Human Connections; Historic Resources; Key Issue	Medano Ranch Headquarters and other potentially historic structures condition assessment and consultation with the Colorado Office of Archaeology and Historic Preservation	M	These data would help the park to gain an understanding of the specific conditions and general cultural landscape character of newly acquired resources. It would provide information with which to update the List of Classified Structures database. It would also inform management decisions about the newly acquired property.
Human Connections; Historic Resources; Key Issue	Cultural landscape inventory for Medano Ranch Headquarters	M	After acquisition of the Medano Ranch lands, a cultural landscape inventory would help better understand and manage this resource.
Historic Resources	Input all Medano Ranch facilities into the Facility Management Software System database (upon acquisition)	M	This would be required to request or spend money on facilities in the transferred area. Requesting or spending funds on facilities is not permitted until such facilities are documented in the Facility Management Software System database.
Human Connections	Archeological inventories and National Register of Historic Places evaluations in previously unsurveyed areas	M	While archeological surveys have been conducted in many areas of the park, there are still some parts where this work is still outstanding and should be done. The wetlands would be among the highest priority areas for surveys.
Wilderness	Rewrite the Wilderness Stewardship Building Blocks documents for both wilderness areas	M	The Sangre de Cristo Wilderness Stewardship Building Blocks (2012) and the Great Sand Dunes Wilderness Stewardship Building Blocks (2012) have inaccuracies that do not accurately describe specifics about wilderness character. New documents should be generated. For the Sangre de Cristo Wilderness area, work should be done in coordination and collaboration with the U.S. Forest Service because of joint management responsibilities.
Natural Diversity	Climate change vulnerability assessments of amphibians	L	While amphibians are known to be susceptible to climate change and wetland drying, this assessment is low priority because managers are unlikely to manage amphibians in relation to climate change.
Natural Diversity	Climate change vulnerability assessments of park vegetation	L	While vegetation is known to be susceptible to climate change, this assessment is low priority because managers are unlikely to manage landscape vegetation in relation to climate change.
Natural Diversity	Climate change vulnerability assessments of endemic insects	L	This assessment is low priority because managers are unlikely to manage endemic insects in relation to climate change.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Dune System	Data to understand how lower discharge and change in timing will affect surge flow and sand transport	L	The water discharge from Sand and Medano Creeks is critical to ongoing processes that form and maintain the dunes. Changes to the discharge amounts and timing could have impacts on the sand dunes system. Data would allow researchers to assess potential changes and the resulting impacts.
Dune System	Continue dune migration studies and reporting (potentially through LiDAR and other types of data)	L	LiDAR was done in 2014 and provides baseline data. Additional data collection, potentially even conducting LiDAR again, would provide a means to monitor movement and mass of the dunes.
Water	Monitor live terminus of Sand and Medano Creeks	L	This would help maintain the park's existing water rights.
Water	Collect and analyze data regarding visitor use and resource impacts along Medano Road	L	These data are related to water quality in Medano Creek. Too many visitors to the area may result in impacts on resources and the park needs a better understanding of how many visitors can enjoy the resources without negative impacts.
Water	Evaluate creeks in the expanded park area for designation on the outstanding natural resource waters list	L	Because park waters are already designated on the outstanding natural resource waters list, park managers need to apply the same protocol to new lands including Baca Ranch land and Medano Ranch to designate water on those lands as well.
Natural Diversity	Determine insect taxonomy and distribution	L	Because insects are important to the ecosystems of the park and there are some endemic species, this information is important for the preservation of resources. There is large-scale protection of the dunes and the insects therein by the surrounding federal agencies, so this is a low priority because there are not immediate resource protection issues.
Natural Diversity	Collect data on how birds use shrubland areas	L	Numerous bird species both migrate and are resident in the area; however, additional information is needed on both wetland and upland use, particularly if there are changes in grazing intensity. The U.S. Fish and Wildlife Service refuges in this area are studying wetland birds, but not upland birds as much.
Natural Diversity	Establish baseline data on bighorn sheep, pronghorn, neotropical birds, beavers, bears, etc.	L	There is little information regarding population, distribution, etc., for these animals.
Natural Diversity	Collect data on Deadman Creek juniper-cottonwood community	L	This area was designated globally rare by the Colorado Natural Heritage Program and baseline data with ongoing monitoring would help with management.
Visitor Opportunities	Gather and analyze visitor data for both front and backcountry areas	L	This is needed to address visitor experience issues in many areas of the park including entrance station and visitor center operations, infrastructure necessary to accommodate visitors, monitoring for visitor impacts to resources, etc. A visitor per dollar needs analysis on an annual basis would allow park management to shift priorities for operations.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Human Connections; Historic Resources	Complete and rectify national register nominations and determinations of eligibility for prehistoric and historic sites	L	Existing National Register of Historic Places nominations and determinations of eligibility for prehistoric and historic sites need to be updated to include significant archeological resources and cultural landscape features for areas previously evaluated and determined eligible based solely on the extant historic structures. In addition, new nominations need to be written for sites and clusters of sites already formally recommended as eligible for listing in the national register. Fairly current field recommendations of eligibility exist for almost all documented archeological sites. For example, the Stewart's Cattle Guard site should be formally listed in the National Register of Historic Places. This work would be done in consultation with the Colorado Office of Archaeology and Historic Preservation.
Historic Resources	Continued investigations into the location of the eastern branch of the Old Spanish Trail route	L	Previous research indicates the eastern branch of the Old Spanish Trail passed through the park, but it is unclear exactly where the trail was. There is an active Old Spanish Trail association that could assist this effort. There is an archeological site just east of the park that has produced Old Santa Fe Trail-era artifacts.
Human Connections	Complete ongoing archeological project	L	A comprehensive archeological project began in the early 2000s and remains unfinished. Some deliverables from the Smithsonian and other parts of this project are still outstanding. It would be beneficial to find additional funding to complete the draft report that remains unfinished from 2009.
Human Connections	Documentation of sand movement exposing and burying archeological sites	L	This would help cultural resource managers better understand where archeological sites are being disturbed due to sand movement.
Key Issue	Data related to sandboarding and mountain/fat-tire bike use	L	These data should include information about use of sandboards and mountain / fat-tire bikes, locations where visitors are participating in these activities, reported injuries, unreported injuries, etc. Search and rescue in wilderness is related to this activity.
Key Issue	Protocol for gathering data and organizing incident reports / annual search and rescue report	L	Can be done in-house.
Key Issue	Patrol logs	L	Need to standardize patrol logs to ensure data collected are valid. This is necessary to quantify visitor use (observational trend data versus anecdotal—if there is actual recorded documentation from patrol logs that is consistent and standardized). Can be done in-house.
Key Issue	Entrance station data	L	This information is needed to address congestion and infrastructure issues.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Human Connections; Historic Resources	Update museum core documents	L	Many of the data and plans associated with management of the museum collections are old and need to be updated. This is especially important in the context of management of the archeological and archival collections. Necessary documents may include a scope of collection statement, fire protection survey, emergency operations plan, structural fire plan, collection management plan, integrated pest management plan, housekeeping plan, collection condition survey, and collection storage plan. This would also include the information in the Interior Collections Management System database.
Natural Diversity	Additional studies to examine pollution dose-response relationships in sensitive park ecosystems	L	Studies would evaluate impacts of pollution on the ecosystems present in the park and preserve, including surveying for ozone-sensitive plant foliar injury and monitoring pesticides and other toxic contaminants in park biota.
Visitor Opportunities; Wilderness	Visual resource inventory	L	The inventory would identify scenic quality and NPS/visitor values of scenic views and serve as the basis for developing a visual resource management plan.
Human Connections	Baseline plant study	L	Given new regulations regarding federally recognized tribes gathering plants in park units, a baseline plant study would provide a basis of information from which to work if a tribe requests to gather plants within the park and preserve boundaries.
Human Connections	Information on collections in non federal repositories	L	There may be a considerable amount of park records in non-federal repositories, particularly for natural history studies, and obtaining information on such collections would help the park have a greater understanding of all collections that exist, both within NPS ownership and elsewhere.
Key Issue	Facilities inspections/assessments	L	Park facilities in currently developed areas need to be inspected and assessed for necessary operational updates.



Part 3: Contributors

Great Sand Dunes National Park and Preserve

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Lisa Carrico, Superintendent
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NPS Partners

Kris Illenberger, Park Store Manager, Western National Parks Association
John Todd, Field Operations Manager, Western National Parks Association

Others

Adrienne Anderson, NPS Archeologist (retired)

Appendixes

Appendix A: Enabling Legislation and Legislative Acts for Great Sand Dunes National Park and Preserve

Summary of Legislative History of Great Sand Dunes National Park and Preserve

- Presidential Proclamation No. 1993, March 17, 1932 (47 Stat. 2506) established Great Sand Dunes National Monument under the auspices of the Antiquities Act (34 Stat. 225).
- Presidential Proclamation 2681 on March 12, 1946 authorized the addition of 44,784.63 acres of land transferred from public domain. Presidential Proclamation 3138 from June 7, 1956 redefined the acreage of lands within the authorized boundaries. Congressional act of November 10, 1978 (Public Law 95-625, 92 Stat. 3474) added approximately 1,109 acres of land to the monument and subsequent congressional act of October 12, 1979 (Public Law 96-87, 93 Stat. 665-666) amended the previous act by changing the additional acreage to 1,190 acres. Federal Register notice on September 15, 2011 authorized the transfer of administrative jurisdiction of the lands identified in the Great Sand Dunes National Park and Preserve Act. (Not included in this appendix.)
- Congressional act of October 20, 1976 (Public Law 94-567, 90 Stat. 2692) designated nearly 91% (33,450 acres) of the monument as wilderness and 670 acres as potential wilderness to be known as the Great Sand Dunes Wilderness.
- On August 19, 1993, the Colorado Wilderness Act of 1993 (Public Law 103-77, 107 Stat. 756) designated the Sangre de Cristo Wilderness, which includes lands in the Rio Grande National Forest that later became part of the Great Sand Dunes National Park and Preserve. (Not included in this appendix.)
- On November 22, 2000, the Great Sand Dunes National Park and Preserve Act (Public Law 106-530, 114 Stat. 2527) authorized the establishment of Great Sand Dunes National Park and the abolishment of Great Sand Dunes National Monument when sufficient land has been acquired to warrant designation of the unit as a national park. In addition, the Act authorized the establishment of Great Sand Dunes National Preserve through transfer of land from the Rio Grande National Forest to management by the National Park Service, revising the boundary.
- Federal Register notice of September 24, 2004 (FR Doc. 04-21473) designated Great Sand Dunes as a national park after the National Park Service assumed management for 31,000 acres of land adjacent to the monument, as authorized by the “Great Sand Dunes National Park and Preserve Act.” (Not included in this appendix.)

Presidential Proclamation 1993 of March 17, 1932, Established Great Sand Dunes National Monument (47 Stat. 2506)

GREAT SAND DUNES NATIONAL MONUMENT—COLORADO

March 17, 1932.

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

Great Sand Dunes National Monument, Colo. Preamble.

WHEREAS it appears that the public interest would be promoted by including the lands hereinafter described within a national monument for the preservation of the great sand dunes and additional features of scenic, scientific, and educational interest;

Area enlarged. Vol. 34, p. 225.

NOW, THEREFORE, I, HERBERT HOOVER, President of the United States of America, by virtue of the power in me vested by sec. 2 of the act of Congress entitled "AN ACT For the preservation of American antiquities," approved June 8, 1906 (34 Stat. 225), do proclaim and establish the Great Sand Dunes National Monument and that, subject to all valid existing rights, the following-described lands in Colorado be, and the same are hereby, included within the said national monument:

Description.

SIXTH PRINCIPAL MERIDIAN

- T. 25 S., R. 73 W., secs. 31 and 32;
- T. 26 S., R. 73 W., secs. 3 to 11, inclusive;
secs. 14 to 23, inclusive;
- T. 27 S., R. 73 W., secs. 3 to 10, inclusive;
secs. 15 to 22, inclusive;

NEW MEXICO PRINCIPAL MERIDIAN

- T. 40 N., R. 12 E., secs. 1 and 2;
sec. 11, NE. ¼;
secs. 12, 13, 24, and 25;
- T. 41 N., R. 12 E., sec. 10, lots 1 to 4, inclusive;
sec. 11, lots 1 to 4, inclusive;
sec. 12, lots 1 to 4, inclusive;
secs. 13 to 15, inclusive;
secs. 22 to 27, inclusive;
secs. 34 to 36, inclusive;

and unsurveyed land which upon survey will probably be described as:

- Fractional T. 40 N., R. 13 E.;
- Fractional T. 41 N., R. 13 E.;
- Fractional T. 42 N., R. 13 E.; secs. 30 and 31.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

Reserved from settlement.

The Director of the National Park Service, under the direction of the Secretary of the Interior, shall have the supervision, management, and control of this monument as provided in the act of Congress entitled "AN ACT To establish a National Park Service, and for other purposes," approved August 25, 1916 (39 Stat. 535-536), and acts additional thereto or amendatory thereof.

Supervision, etc.

Vol. 39, p. 535; Vol. 41, p. 732.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

DONE at the City of Washington this 17th day of March, in the year of our Lord nineteen hundred and thirty-two, and of [SEAL] the Independence of the United States of America the one hundred and fifty-six.

HERBERT HOOVER

By the President:
HENRY L STIMSON
Secretary of State.

[No. 1994]

Public Law 106-530 of November 22, 2000, Established Great Sand Dunes National Park and Preserve (114 Stat. 2527)

PUBLIC LAW 106-530—NOV. 22, 2000

114 STAT. 2527

Public Law 106-530
106th Congress

An Act

To provide for the establishment of the Great Sand Dunes National Park and Preserve and the Baca National Wildlife Refuge in the State of Colorado, and for other purposes.

Nov. 22, 2000
[S. 2547]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Great Sand Dunes National Park and Preserve Act of 2000”.

Great Sand Dunes National Park and Preserve Act of 2000.
16 USC 410hhh note.
16 USC 410hhh.

SEC. 2. FINDINGS.

Congress finds that—

(1) the Great Sand Dunes National Monument in the State of Colorado was established by Presidential proclamation in 1932 to preserve Federal land containing spectacular and unique sand dunes and additional features of scenic, scientific, and educational interest for the benefit and enjoyment of future generations;

(2) the Great Sand Dunes, together with the associated sand sheet and adjacent wetland and upland, contain a variety of rare ecological, geological, paleontological, archaeological, scenic, historical, and wildlife components, which—

(A) include the unique pulse flow characteristics of Sand Creek and Medano Creek that are integral to the existence of the dunes system;

(B) interact to sustain the unique Great Sand Dunes system beyond the boundaries of the existing National Monument;

(C) are enhanced by the serenity and rural western setting of the area; and

(D) comprise a setting of irreplaceable national significance;

(3) the Great Sand Dunes and adjacent land within the Great Sand Dunes National Monument—

(A) provide extensive opportunities for educational activities, ecological research, and recreational activities; and

(B) are publicly used for hiking, camping, and fishing, and for wilderness value (including solitude);

(4) other public and private land adjacent to the Great Sand Dunes National Monument—

(A) offers additional unique geological, hydrological, paleontological, scenic, scientific, educational, wildlife, and recreational resources; and

- (B) contributes to the protection of—
 - (i) the sand sheet associated with the dune mass;
 - (ii) the surface and ground water systems that are necessary to the preservation of the dunes and the adjacent wetland; and
 - (iii) the wildlife, viewshed, and scenic qualities of the Great Sand Dunes National Monument;
- (5) some of the private land described in paragraph (4) contains important portions of the sand dune mass, the associated sand sheet, and unique alpine environments, which would be threatened by future development pressures;
- (6) the designation of a Great Sand Dunes National Park, which would encompass the existing Great Sand Dunes National Monument and additional land, would provide—
 - (A) greater long-term protection of the geological, hydrological, paleontological, scenic, scientific, educational, wildlife, and recreational resources of the area (including the sand sheet associated with the dune mass and the ground water system on which the sand dune and wetland systems depend); and
 - (B) expanded visitor use opportunities;
- (7) land in and adjacent to the Great Sand Dunes National Monument is—
 - (A) recognized for the culturally diverse nature of the historical settlement of the area;
 - (B) recognized for offering natural, ecological, wildlife, cultural, scenic, paleontological, wilderness, and recreational resources; and
 - (C) recognized as being a fragile and irreplaceable ecological system that could be destroyed if not carefully protected; and
- (8) preservation of this diversity of resources would ensure the perpetuation of the entire ecosystem for the enjoyment of future generations.

16 USC 410hhh-
1. **SEC. 3. DEFINITIONS.**

In this Act:

- (1) **ADVISORY COUNCIL.**—The term “Advisory Council” means the Great Sand Dunes National Park Advisory Council established under section 8(a).
- (2) **LUIS MARIA BACA GRANT NO. 4.**—The term “Luis Maria Baca Grant No. 4” means those lands as described in the patent dated February 20, 1900, from the United States to the heirs of Luis Maria Baca recorded in book 86, page 20, of the records of the Clerk and Recorder of Saguache County, Colorado.
- (3) **MAP.**—The term “map” means the map entitled “Great Sand Dunes National Park and Preserve”, numbered 140/80,032 and dated September 19, 2000.
- (4) **NATIONAL MONUMENT.**—The term “national monument” means the Great Sand Dunes National Monument, including lands added to the monument pursuant to this Act.
- (5) **NATIONAL PARK.**—The term “national park” means the Great Sand Dunes National Park established in section 4.
- (6) **NATIONAL WILDLIFE REFUGE.**—The term “wildlife refuge” means the Baca National Wildlife Refuge established in section 6.

(7) PRESERVE.—The term “preserve” means the Great Sand Dunes National Preserve established in section 5.

(8) RESOURCES.—The term “resources” means the resources described in section 2.

(9) SECRETARY.—The term “Secretary” means the Secretary of the Interior.

(10) USES.—The term “uses” means the uses described in section 2.

SEC. 4. GREAT SAND DUNES NATIONAL PARK, COLORADO.

(a) ESTABLISHMENT.—When the Secretary determines that sufficient land having a sufficient diversity of resources has been acquired to warrant designation of the land as a national park, the Secretary shall establish the Great Sand Dunes National Park in the State of Colorado, as generally depicted on the map, as a unit of the National Park System. Such establishment shall be effective upon publication of a notice of the Secretary’s determination in the Federal Register.

(b) AVAILABILITY OF MAP.—The map shall be on file and available for public inspection in the appropriate offices of the National Park Service.

(c) NOTIFICATION.—Until the date on which the national park is established, the Secretary shall annually notify the Committee on Energy and Natural Resources of the Senate and the Committee on Resources of the House of Representatives of—

(1) the estimate of the Secretary of the lands necessary to achieve a sufficient diversity of resources to warrant designation of the national park; and

(2) the progress of the Secretary in acquiring the necessary lands.

(d) ABOLISHMENT OF NATIONAL MONUMENT.—(1) On the date of establishment of the national park pursuant to subsection (a), the Great Sand Dunes National Monument shall be abolished, and any funds made available for the purposes of the national monument shall be available for the purposes of the national park.

(2) Any reference in any law (other than this Act), regulation, document, record, map, or other paper of the United States to “Great Sand Dunes National Monument” shall be considered a reference to “Great Sand Dunes National Park”.

(e) TRANSFER OF JURISDICTION.—Administrative jurisdiction is transferred to the National Park Service over any land under the jurisdiction of the Department of the Interior that—

(1) is depicted on the map as being within the boundaries of the national park or the preserve; and

(2) is not under the administrative jurisdiction of the National Park Service on the date of enactment of this Act.

SEC. 5. GREAT SAND DUNES NATIONAL PRESERVE, COLORADO.

(a) ESTABLISHMENT OF GREAT SAND DUNES NATIONAL PRESERVE.—(1) There is hereby established the Great Sand Dunes National Preserve in the State of Colorado, as generally depicted on the map, as a unit of the National Park System.

(2) Administrative jurisdiction of lands and interests therein administered by the Secretary of Agriculture within the boundaries of the preserve is transferred to the Secretary of the Interior, to be administered as part of the preserve. The Secretary of Agriculture shall modify the boundaries of the Rio Grande National Forest to exclude the transferred lands from the forest boundaries.

16 USC 410hhh-2.
Effective date.
Notification.
Federal Register,
publication.

16 USC 410hhh-3.

(3) Any lands within the preserve boundaries which were designated as wilderness prior to the date of enactment of this Act shall remain subject to the Wilderness Act (16 U.S.C. 1131 et seq.) and the Colorado Wilderness Act of 1993 (Public Law 103-767; 16 U.S.C. 539i note).

(b) MAP AND LEGAL DESCRIPTION.—(1) As soon as practicable after the establishment of the national park and the preserve, the Secretary shall file maps and a legal description of the national park and the preserve with the Committee on Energy and Natural Resources of the Senate and the Committee on Resources of the House of Representatives.

(2) The map and legal description shall have the same force and effect as if included in this Act, except that the Secretary may correct clerical and typographical errors in the legal description and maps.

(3) The map and legal description shall be on file and available for public inspection in the appropriate offices of the National Park Service.

(c) BOUNDARY SURVEY.—As soon as practicable after the establishment of the national park and preserve and subject to the availability of funds, the Secretary shall complete an official boundary survey.

SEC. 6. BACA NATIONAL WILDLIFE REFUGE, COLORADO.

(a) ESTABLISHMENT.—(1) When the Secretary determines that sufficient land has been acquired to constitute an area that can be efficiently managed as a National Wildlife Refuge, the Secretary shall establish the Baca National Wildlife Refuge, as generally depicted on the map.

(2) Such establishment shall be effective upon publication of a notice of the Secretary's determination in the Federal Register.

(b) AVAILABILITY OF MAP.—The map shall be on file and available for public inspection in the appropriate offices of the United States Fish and Wildlife Service.

(c) ADMINISTRATION.—The Secretary shall administer all lands and interests therein acquired within the boundaries of the national wildlife refuge in accordance with the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.) and the Act of September 28, 1962 (16 U.S.C. 460k et seq.) (commonly known as the Refuge Recreation Act).

(d) PROTECTION OF WATER RESOURCES.—In administering water resources for the national wildlife refuge, the Secretary shall—

(1) protect and maintain irrigation water rights necessary for the protection of monument, park, preserve, and refuge resources and uses; and

(2) minimize, to the extent consistent with the protection of national wildlife refuge resources, adverse impacts on other water users.

SEC. 7. ADMINISTRATION OF NATIONAL PARK AND PRESERVE.

(a) IN GENERAL.—The Secretary shall administer the national park and the preserve in accordance with—

(1) this Act; and

(2) all laws generally applicable to units of the National Park System, including—

(A) the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (16 U.S.C. 1, 2-4); and

16 USC 410hhh-4, 668dd note.

Effective date. Federal Register, publication.

16 USC 410hhh-5.

(B) the Act entitled “An Act to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance, and for other purposes”, approved August 21, 1935 (16 U.S.C. 461 et seq.).

(b) GRAZING.—

(1) ACQUIRED STATE OR PRIVATE LAND.—With respect to former State or private land on which grazing is authorized to occur on the date of enactment of this Act and which is acquired for the national monument, or the national park and preserve, or the wildlife refuge, the Secretary, in consultation with the lessee, may permit the continuation of grazing on the land by the lessee at the time of acquisition, subject to applicable law (including regulations).

(2) FEDERAL LAND.—Where grazing is permitted on land that is Federal land as of the date of enactment of this Act and that is located within the boundaries of the national monument or the national park and preserve, the Secretary is authorized to permit the continuation of such grazing activities unless the Secretary determines that grazing would harm the resources or values of the national park or the preserve.

(3) TERMINATION OF LEASES.—Nothing in this subsection shall prohibit the Secretary from accepting the voluntary termination of leases or permits for grazing within the national monument or the national park or the preserve.

(c) HUNTING, FISHING, AND TRAPPING.—

(1) IN GENERAL.—Except as provided in paragraph (2), the Secretary shall permit hunting, fishing, and trapping on land and water within the preserve in accordance with applicable Federal and State laws.

(2) ADMINISTRATIVE EXCEPTIONS.—The Secretary may designate areas where, and establish limited periods when, no hunting, fishing, or trapping shall be permitted under paragraph (1) for reasons of public safety, administration, or compliance with applicable law.

(3) AGENCY AGREEMENT.—Except in an emergency, regulations closing areas within the preserve to hunting, fishing, or trapping under this subsection shall be made in consultation with the appropriate agency of the State of Colorado having responsibility for fish and wildlife administration.

(4) SAVINGS CLAUSE.—Nothing in this Act affects any jurisdiction or responsibility of the State of Colorado with respect to fish and wildlife on Federal land and water covered by this Act.

(d) CLOSED BASIN DIVISION, SAN LUIS VALLEY PROJECT.—Any feature of the Closed Basin Division, San Luis Valley Project, located within the boundaries of the national monument, national park or the national wildlife refuge, including any well, pump, road, easement, pipeline, canal, ditch, power line, power supply facility, or any other project facility, and the operation, maintenance, repair, and replacement of such a feature—

(1) shall not be affected by this Act; and

(2) shall continue to be the responsibility of, and be operated by, the Bureau of Reclamation in accordance with title I of the Reclamation Project Authorization Act of 1972 (43 U.S.C. 615aaa et seq.).

(e) WITHDRAWAL.—(1) On the date of enactment of this Act, subject to valid existing rights, all Federal land depicted on the

map as being located within Zone A, or within the boundaries of the national monument, the national park or the preserve is withdrawn from—

- (A) all forms of entry, appropriation, or disposal under the public land laws;
- (B) location, entry, and patent under the mining laws; and
- (C) disposition under all laws relating to mineral and geothermal leasing.

Applicability.

(2) The provisions of this subsection also shall apply to any lands—

- (A) acquired under this Act; or
- (B) transferred from any Federal agency after the date of enactment of this Act for the national monument, the national park or preserve, or the national wildlife refuge.

(f) WILDERNESS PROTECTION.—(1) Nothing in this Act alters the Wilderness designation of any land within the national monument, the national park, or the preserve.

(2) All areas designated as Wilderness that are transferred to the administrative jurisdiction of the National Park Service shall remain subject to the Wilderness Act (16 U.S.C. 1131 et seq.) and the Colorado Wilderness Act of 1993 (Public Law 103-77; 16 U.S.C. 539i note). If any part of this Act conflicts with the provisions of the Wilderness Act or the Colorado Wilderness Act of 1993 with respect to the wilderness areas within the preserve boundaries, the provisions of those Acts shall control.

16 USC 410hhh-6.

SEC. 8. ACQUISITION OF PROPERTY AND BOUNDARY ADJUSTMENTS.

(a) ACQUISITION AUTHORITY.—(1) Within the area depicted on the map as the “Acquisition Area” or the national monument, the Secretary may acquire lands and interests therein by purchase, donation, transfer from another Federal agency, or exchange: *Provided*, That lands or interests therein may only be acquired with the consent of the owner thereof.

(2) Lands or interests therein owned by the State of Colorado, or a political subdivision thereof, may only be acquired by donation or exchange.

(b) BOUNDARY ADJUSTMENT.—As soon as practicable after the acquisition of any land or interest under this section, the Secretary shall modify the boundary of the unit to which the land is transferred pursuant to subsection (b) to include any land or interest acquired.

(c) ADMINISTRATION OF ACQUIRED LANDS.—

(1) GENERAL AUTHORITY.—Upon acquisition of lands under subsection (a), the Secretary shall, as appropriate—

- (A) transfer administrative jurisdiction of the lands to the National Park Service—
 - (i) for addition to and management as part of the Great Sand Dunes National Monument, or
 - (ii) for addition to and management as part of the Great Sand Dunes National Park (after designation of the Park) or the Great Sand Dunes National Preserve; or

(B) transfer administrative jurisdiction of the lands to the United States Fish and Wildlife Service for addition to and administration as part of the Baca National Wildlife Refuge.

(2) **FOREST SERVICE ADMINISTRATION.**—(A) Any lands acquired within the area depicted on the map as being located within Zone B shall be transferred to the Secretary of Agriculture and shall be added to and managed as part of the Rio Grande National Forest.

(B) For the purposes of section 7 of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601-9), the boundaries of the Rio Grande National Forest, as revised by the transfer of land under paragraph (A), shall be considered to be the boundaries of the national forest.

SEC. 9. WATER RIGHTS.

16 USC 410hhh-7.

(a) **SAN LUIS VALLEY PROTECTION, COLORADO.**—Section 1501(a) of the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575; 106 Stat. 4663) is amended by striking paragraph (3) and inserting the following:

“(3) adversely affect the purposes of—

“(A) the Great Sand Dunes National Monument;

“(B) the Great Sand Dunes National Park (including purposes relating to all water, water rights, and water-dependent resources within the park);

“(C) the Great Sand Dunes National Preserve (including purposes relating to all water, water rights, and water-dependent resources within the preserve);

“(D) the Baca National Wildlife Refuge (including purposes relating to all water, water rights, and water-dependent resources within the national wildlife refuge); and

“(E) any Federal land adjacent to any area described in subparagraph (A), (B), (C), or (D).”.

(b) **EFFECT ON WATER RIGHTS.**—

(1) **IN GENERAL.**—Subject to the amendment made by subsection (a), nothing in this Act affects—

(A) the use, allocation, ownership, or control, in existence on the date of enactment of this Act, of any water, water right, or any other valid existing right;

(B) any vested absolute or decreed conditional water right in existence on the date of enactment of this Act, including any water right held by the United States;

(C) any interstate water compact in existence on the date of enactment of this Act; or

(D) subject to the provisions of paragraph (2), State jurisdiction over any water law.

(2) **WATER RIGHTS FOR NATIONAL PARK AND NATIONAL PRESERVE.**—In carrying out this Act, the Secretary shall obtain and exercise any water rights required to fulfill the purposes of the national park and the national preserve in accordance with the following provisions:

(A) Such water rights shall be appropriated, adjudicated, changed, and administered pursuant to the procedural requirements and priority system of the laws of the State of Colorado.

(B) The purposes and other substantive characteristics of such water rights shall be established pursuant to State law, except that the Secretary is specifically authorized to appropriate water under this Act exclusively for the purpose of maintaining ground water levels, surface water

levels, and stream flows on, across, and under the national park and national preserve, in order to accomplish the purposes of the national park and the national preserve and to protect park resources and park uses.

(C) Such water rights shall be established and used without interfering with—

(i) any exercise of a water right in existence on the date of enactment of this Act for a non-Federal purpose in the San Luis Valley, Colorado; and

(ii) the Closed Basin Division, San Luis Valley Project.

(D) Except as provided in subsections (c) and (d), no Federal reservation of water may be claimed or established for the national park or the national preserve.

(c) NATIONAL FOREST WATER RIGHTS.—To the extent that a water right is established or acquired by the United States for the Rio Grande National Forest, the water right shall—

(1) be considered to be of equal use and value for the national preserve; and

(2) retain its priority and purpose when included in the national preserve.

(d) NATIONAL MONUMENT WATER RIGHTS.—To the extent that a water right has been established or acquired by the United States for the Great Sand Dunes National Monument, the water right shall—

(1) be considered to be of equal use and value for the national park; and

(2) retain its priority and purpose when included in the national park.

(e) ACQUIRED WATER RIGHTS AND WATER RESOURCES.—

(1) IN GENERAL.—(A) If, and to the extent that, the Luis Maria Baca Grant No. 4 is acquired, all water rights and water resources associated with the Luis Maria Baca Grant No. 4 shall be restricted for use only within—

(i) the national park;

(ii) the preserve;

(iii) the national wildlife refuge; or

(iv) the immediately surrounding areas of Alamosa or Saguache Counties, Colorado.

(B) USE.—Except as provided in the memorandum of water service agreement and the water service agreement between the Cabeza de Vaca Land and Cattle Company, LLC, and Baca Grande Water and Sanitation District, dated August 28, 1997, water rights and water resources described in subparagraph (A) shall be restricted for use in—

(i) the protection of resources and values for the national monument, the national park, the preserve, or the wildlife refuge;

(ii) fish and wildlife management and protection; or

(iii) irrigation necessary to protect water resources.

(2) STATE AUTHORITY.—If, and to the extent that, water rights associated with the Luis Maria Baca Grant No. 4 are acquired, the use of those water rights shall be changed only in accordance with the laws of the State of Colorado.

(f) DISPOSAL.—The Secretary is authorized to sell the water resources and related appurtenances and fixtures as the Secretary deems necessary to obtain the termination of obligations specified

in the memorandum of water service agreement and the water service agreement between the Cabeza de Vaca Land and Cattle Company, LLC and the Baca Grande Water and Sanitation District, dated August 28, 1997. Prior to the sale, the Secretary shall determine that the sale is not detrimental to the protection of the resources of Great Sand Dunes National Monument, Great Sand Dunes National Park, and Great Sand Dunes National Preserve, and the Baca National Wildlife Refuge, and that appropriate measures to provide for such protection are included in the sale.

SEC. 10. ADVISORY COUNCIL.

16 USC 410hhh-8.

(a) **ESTABLISHMENT.**—The Secretary shall establish an advisory council to be known as the “Great Sand Dunes National Park Advisory Council”.

(b) **DUTIES.**—The Advisory Council shall advise the Secretary with respect to the preparation and implementation of a management plan for the national park and the preserve.

(c) **MEMBERS.**—The Advisory Council shall consist of 10 members, to be appointed by the Secretary, as follows:

(1) One member of, or nominated by, the Alamosa County Commission.

(2) One member of, or nominated by, the Saguache County Commission.

(3) One member of, or nominated by, the Friends of the Dunes Organization.

(4) Four members residing in, or within reasonable proximity to, the San Luis Valley and 3 of the general public, all of whom have recognized backgrounds reflecting—

(A) the purposes for which the national park and the preserve are established; and

(B) the interests of persons that will be affected by the planning and management of the national park and the preserve.

(d) **APPLICABLE LAW.**—The Advisory Council shall function in accordance with the Federal Advisory Committee Act (5 U.S.C. App.) and other applicable laws.

(e) **VACANCY.**—A vacancy on the Advisory Council shall be filled in the same manner as the original appointment.

(f) **CHAIRPERSON.**—The Advisory Council shall elect a chairperson and shall establish such rules and procedures as it deems necessary or desirable.

(g) **NO COMPENSATION.**—Members of the Advisory Council shall serve without compensation.

(h) **TERMINATION.**—The Advisory Council shall terminate upon the completion of the management plan for the national park and preserve.

SEC. 11. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated such sums as are necessary to carry out this Act.

Approved November 22, 2000.

Appendix B: Related Federal Legislation

Congressional Act of October 20, 1976 (PL 94-567, 90 Stat. 2692), Designated The Great Sand Dunes Wilderness Area

An Act

Oct. 20, 1976
[H.R. 13160]

To designate certain lands within units of the National Park System as wilderness; to revise the boundaries of certain of those units; and for other purposes.

Wilderness areas.
Designation.
16 USC 1132
note.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in accordance with section 3(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132(c)), the following lands are hereby designated as wilderness, and shall be administered by the Secretary of the Interior in accordance with the applicable provisions of the Wilderness Act:

Great Sand
Dunes
National
Monument,
Colo.

(d) Great Sand Dunes National Monument, Colorado, wilderness comprising thirty-three thousand four hundred and fifty acres, and potential wilderness additions comprising six hundred and seventy acres, depicted on a map entitled "Wilderness Plan, Great Sand Dunes National Monument, Colorado", numbered 140-20,006-C and dated February 1976, to be known as the Great Sand Dunes Wilderness.

Public Law 103-77 of August 13, 1993, Designated The Sangre de Cristo Wilderness Area

103d Congress

An Act

Aug. 13, 1993
[H.R. 631]

To designate certain lands in the State of Colorado as components of the National Wilderness Preservation System, and for other purposes.

Colorado
Wilderness Act
of 1993.

16 USC 539i
note.

16 USC 539j
note.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE AND DEFINITIONS.

(a) **SHORT TITLE.**—This Act may be cited as the "Colorado Wilderness Act of 1993".

(b) **DEFINITIONS.**—(1) As used in this Act with reference to lands in the National Forest System, the term "the Secretary" means the Secretary of Agriculture.

(2) As used in this Act with respect to lands not in the National Forest System, the term "the Secretary" means the Secretary of the Interior.

SEC. 2. ADDITIONS TO THE WILDERNESS PRESERVATION SYSTEM.

(a) **ADDITIONS.**—The following lands in the State of Colorado are hereby designated as wilderness and, therefore, as components of the National Wilderness Preservation System:

16 USC 1132
note.

(10) Certain lands in the Rio Grande and San Isabel National Forests and lands in the San Luis Resource Area administered by the Bureau of Land Management which comprise approximately 226,455 acres, as generally depicted on four maps entitled "Sangre de Cristo Wilderness Proposal (North Section)", "Sangre de Cristo Wilderness Proposal (North Middle Section)", "Sangre de Cristo Wilderness Proposal (South Middle Section)", and "Sangre de Cristo Wilderness Proposal (South Section)", all dated January, 1993, and which shall be known as the Sangre de Cristo Wilderness.

Appendix C: Inventory of Special Mandates and Administrative Commitments

Special Mandates

- **Wilderness.**

- In 1976, Congress designated the Great Sand Dunes Wilderness (Public Law 94-567, 90 Stat. 2692) (October 20, 1976), incorporating more than 30,000 acres of the park into the national wilderness system. Today, the total Great Sand Dunes Wilderness is composed of 32,643 acres and is entirely within the boundaries of the park and preserve, and therefore, managed by the National Park Service. It is bordered by the Sangre de Cristo Wilderness to the east and the Baca National Wildlife Refuge to the west. The area includes portions of Medano Ranch and the former Baca Ranch.
- The Great Sand Dunes Wilderness includes a diverse landscape of grasslands, wetlands, conifer and aspen forests, alpine lakes, tundra, with a centerpiece of the tallest dunes in North America. Wind, water, high mountain peaks, and sand carved the unique landscape where the seemingly gentle dunes nestle against the rugged alpine peaks of the Sangre de Cristo Mountains. This is the only wilderness defined as a saltbush-greasewood ecosystem with hardy plants including blowout grass, Indian ricegrass, scurfpea, and prairie sunflower. The wilderness is also the only place where the Great Sand Dunes tiger beetle and the giant sand treader camel cricket can be found.
- The Sangre de Cristo Wilderness (Public Law 103-77) (August 13, 1993) was established as part of the Colorado Wilderness Act. This wilderness area contains 219,776 acres, a portion of which is in the preserve. The Medano Pass four-wheel-drive primitive road passes through an excluded corridor in the wilderness area and can be accessed from the west side through Great Sand Dunes National Park. The Sangre de Cristo Wilderness is co-managed by the U.S. Forest Service and the National Park Service.
- As part of the national wilderness system, these lands are administered “for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness.” The National Park Service will strive to manage the wilderness to perpetuate natural processes and minimize human impacts. Motorized equipment and equipment used for mechanical transport is prohibited on federal lands designated as wilderness.

- **Clean Air Act.**

- Great Sand Dunes National Park and Preserve is designated a Class I area under the Clean Air Act Amendments of 1977 (42 USC 7401 et seq.) which provides special protection for air quality, sensitive ecosystems and clean, clear views. Under section 169A, “Congress declares as a national goal the prevention of any existing impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.” State and federal permitting authorities must consult with the National Park Service regarding new sources of air pollution and impacts on park air quality related values must be considered in the permitting process. Further, the act requires NPS involvement in natural regulatory efforts aimed at eliminating human-caused visibility impairment in all Class I areas. This designation bestows an “affirmative responsibility” on federal land managers to integrating air resource management into NPS operations and planning for the protection of air quality and related values, including visibility, plants, animals, soils, water quality, cultural resources, and public health, from adverse air pollution impacts.

- **Water Resources.** The Secretary of the Interior is to obtain and exercise required water rights, fulfilling the purposes of the national park and preserve, provided:
 - Such water rights are appropriated and administered pursuant to the procedural requirements of Colorado state law.
 - The purposes and other substantive characteristics of water rights are established according to state law, except that the Secretary of the Interior is specifically authorized to appropriate water exclusively for maintaining groundwater levels; surface water levels; and stream flows on, across, and under the national park and preserve; to accomplish the purposes of the national park and preserve; and to protect park resources and park uses.
 - Water rights are established without interfering with: (a) any exercise of a water right for a nonfederal purpose in the San Luis Valley that existed when the Great Sand Dunes Act of 2000 was passed, and (b) the Closed Basin Project.
 - Except for those rights already established for the national monument and for Rio Grande National Forest, no federal reservation of water may be claimed or established for the national park or preserve.
- **Hunting, Fishing, and Trapping.**
 - **National Preserve.** Hunting, fishing, and trapping shall generally be permitted on land and water in the preserve, in accordance with applicable federal and state laws. Areas may be designated where, and limited periods established when, no hunting, fishing, or trapping are permitted for reasons of public safety, administration, or compliance with applicable law (Great Sand Dunes Act of 2000).
 - **National Park.** Fishing is allowed in the national park. Hunting and trapping are not allowed in the national park.
- **Domestic Livestock.**
 - On former state or private land where grazing was permitted when the Great Sand Dunes Act of 2000 was passed, and which is acquired for the national park or preserve, the Secretary of the Interior, in consultation with the lessee, may permit continued grazing by the lessee at the time of acquisition. Where grazing was permitted on federal land when the Great Sand Dunes Act of 2000 was passed, the Secretary may permit continued grazing unless it would harm the resources or values of the national park or preserve. Permits for grazing are subject to applicable law and regulations. The Secretary may accept voluntary termination of leases or permits for grazing within the national park or preserve (Great Sand Dunes Act of 2000).
- **Closed Basin Project.**
 - The Closed Basin Division, San Luis Valley Project (Closed Basin Project) is in a topographic depression (the Closed Basin) in the San Luis Valley. The purpose of the project is to pump and deliver unconfined groundwater and available surface flows in the Closed Basin to the Rio Grande River via a 42-mile conveyance channel. The project helps Colorado meet its water delivery commitment to New Mexico and Texas under the Rio Grande Compact of 1939, and helps the United States meet its water delivery commitment to Mexico under a treaty dated May 21, 1906. The project also delivers water to the Alamosa National Wildlife Refuge.

Features of the Closed Basin Project within the national park are not to be affected by the park expansion. Management responsibility for the Closed Basin Project features within the national park is to remain with the U.S. Bureau of Reclamation (Great Sand Dunes Act of 2000).

Existing Park Special Designations

- **National Register of Historic Places.**
 - The Superintendent's Residence (monument headquarters) was the largest and most ambitious project undertaken at the Great Sand Dunes by the Works Progress Administration during the late 1930s development and clean-up program at the monument. The architectural design centered on the idea of rusticity, a movement championed by Stephen T. Mather, the first NPS director. The Spanish influence and semi-desert conditions at the Great Sand Dunes resulted in the use of native materials to construct an adobe building. The Superintendent's Residence reflects the territorial style of Colorado adobe construction (rather than Hispanic style). It has a gabled roof rather than a flat roof, and the design is one of a corridor with an enclosed courtyard, suggesting the concept of a plaza, as reflected by other buildings in territorial adobe style. The property remains an excellent example of adobe construction in the National Park Service and Colorado.
 - Indian Grove consists of a concentration of 72 culturally modified ponderosa pine trees. A stand of about 200 ponderosa pine trees encompasses the general area surrounding the site. Ethnographic and historic data, along with consultation with traditionally associated tribes, suggests that the trees were peeled by American Indians. The data suggest that the bark was peeled to procure inner or outer bark or bark substances such as pitch or sap for food, medicine, and as raw construction or building materials, including for waterproofing. Dendrochronological analysis (dating trees by using patterns of annual growth rings) suggests the trees were peeled from approximately 1816 to the early 1900s, with the majority peeled 1816–1846. Indian Grove provides great research potential to yield important information on American Indian social history and subsistence strategies.
 - Medano Ranch Headquarters (National Historic District) is on land owned by The Nature Conservancy, but an expected land transfer would result in co-management between the National Park Service and the U.S. Fish and Wildlife Service. The Medano Ranch Headquarters was an integral part of a major cattle ranching operation from 1877 to 1947. The complex consists of a main ranch house and other associated buildings, housing and support facilities for ranch workers, and animal and storage facilities with a large, complex corral system. The ranch is significant because of its role in the development of cattle ranching in the San Luis Valley from the early open range days of the 1870s through World War II, a period that reflects the evolution of ranching through time. It is also significant for its architecture with the buildings exhibiting classic examples of the variety of materials, cultural influences, and use/reuse of structures, and for the notable construction techniques found on ranches of great longevity.
- **National Historic Landmark.**
 - The Trujillo Homesteads (national historic district and national historic landmark) encompass two 19th-century Hispanic ranching properties: (1) the 1865 homestead of Teofilo and Andrellita Trujillo, and (2) the 1879 homestead of their son Pedro and his wife Sofia. Both Trujillo sites are on land currently owned by The Nature Conservancy as part of the Medano-Zapata Ranch and co-managed with the National Park Service and the U.S. Fish and Wildlife Service, but the Teofilo and Andrellita Homestead will be within park boundaries after the expected land transfer.

- Teofilo traveled north in 1865 from his Taos area home, settling on an isolated and undeveloped site with his wife, Andrellita. He became one of the first permanent residents to claim land and develop a ranch in an area considered the domain of indigenous people. Over almost four decades, the Trujillo families erected houses and agricultural facilities, expanding their holdings to nearly 1,500 acres. They created a system of irrigation ditches providing water to the lush hay meadows and became leading raisers of cattle, sheep, horses, and other agricultural products. In 1902, conflict over Teofilo grazing his sheep on open-range lands led to cattlemen killing a large number of his sheep and burning the Trujillo's ranch headquarters to the ground. Shortly thereafter, both generations of the family sold their homesteads and moved to other locations in the San Luis Valley.
- The Teofilo and Andrellita Homestead site lies about three-quarters of a mile east-northeast of the Pedro and Sofia Trujillo ranch headquarters. The site includes the archeological remains of at least two and possibly three structural features with several concentrations of cobbles on the site, and artifacts scattered throughout the site. The Pedro and Sofia Trujillo homestead site includes the ranch headquarters and consists of a two-story, log ranch house, a log stable, and a large corral area. The site also includes landscape features, two significant archeological concentrations in the vicinity of the structures, and five additional concentrations of artifacts that probably represent discrete dumping episodes. Additional artifacts are scattered throughout the site.
- The homesteads are significant for their association with the northward movement of Hispanic Americans into a newly acquired region of the American frontier, specifically the San Luis Valley. The homesteads are also significant for the exceptional representation of the lives of Hispanics on the American frontier, both in the ways in which they preserved their traditional culture and the cultural interplay between their traditional culture and those of whites and American Indians in this region. They are also associated with a pattern of violence and intimidation experienced by early Hispanic ranchers as large cattle operations expanded and consolidated their holdings. The properties' history reflects the clash of cultures as various groups vied over land. The ranch is also significant because of its archeological potential to yield valuable information about cultural change and adaptation from pre-contact occupation and use through current-day agricultural use.
- **National Heritage Area.**
 - A portion of the park is in the Sangre de Cristo National Heritage Area, designated by Congress in 2009 in recognition of the rich natural resources, variety of recreational opportunities, and unparalleled history of the San Luis Valley. The heritage area recognizes the San Luis Valley as the cradle of Colorado's earliest settlement and an important confluence of Hispanic, white, and American Indian cultures.
- **National Natural Landmark.**
 - Big Spring Creek is a spring-fed gaining stream formed by groundwater discharging from an unconfined aquifer. The stream flows out over an eolian sand sheet, forming emergent wetlands that support a diversity of rare species and plant communities in an otherwise arid landscape. The meandering creek provides an excellent example of natural geologic and hydrologic patterns.
- **Outstanding Waters Designation.**
 - The state of Colorado has designated Medano and Sand Creeks (including their tributaries and wetlands) as Colorado Outstanding Waters, which afford them the highest level of water-quality protection to prevent any degradation.

Administrative Commitments

Title / Agency / Organization	Purpose / Description	Dates	Responsible Party/Parties
Memorandums of Understanding			
Alamosa County Sheriff Office	Law enforcement / search and rescue	2/4/2016	Chief ranger
Saguache County Sheriff Office	Law enforcement / search and rescue	Pending	Chief ranger
Custer County Sheriff Office	Law enforcement / search and rescue	Pending	Chief ranger
Huerfano County Sheriff Office	Law enforcement / search and rescue	Pending	Chief ranger
Mosca-Hooper Volunteer Fire Department	Structural fire	Expires 9/25/2019	Chief ranger
Colorado Parks and Wildlife	Law enforcement	Expired – needs renewal	Chief ranger
U.S. Fish and Wildlife Service	Remote access weather station	Ongoing	
National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, affiliated tribes	Inadvertent discovery protocol including Native American Graves Protection and Repatriation Act protocol	Ongoing with renewal every five years	Superintendent and chief of resources
Memorandums of Agreement			
U.S. Bureau of Reclamation	Information technology agreement related to monitoring of wells	Ongoing	Chief of resources
U.S. Bureau of Reclamation	Back-up space agreement concerning continuity of operations	Ongoing	Superintendent
General Agreements			
Dr. Rick Ruiter	Medical advisor	Expires 8/28/2017	Chief ranger / EMS coordinator
San Luis Valley Medical Center	Hospital	Expired – needs renewal	Chief ranger / EMS coordinator
Special Park Uses			
Wolf Springs Ranch	Wolf Springs Ranch owns water rights on the Hudson Ditch and needs access to maintain it		
Colorado Division of Water Resources (CDWR)	The Hudson Ditch has stream gauging equipment that is maintained by the CDWR		

Title / Agency / Organization	Purpose / Description	Dates	Responsible Party/Parties
Special Park Uses (continued)			
Wolf Springs Ranch	Wolf Springs Ranch owns water rights on the Medano Ditch and needs access to maintain it		
Colorado Division of Water Resources	The Medano Ditch has stream gauging equipment that is maintained by the CDWR		
Colorado Division of Water Resources	Sand Creek has stream gauging equipment that is maintained by the CDWR	Ongoing	Chief of resources and park geologist
Colorado Division of Water Resources	Medano Creek has stream gauging equipment that is maintained by the CDWR	Ongoing	Chief of resources and park geologist
Colorado Division of Water Resources	Deadman Creek has stream gauging equipment that is maintained by the CDWR	Ongoing	Chief of resources and park geologist
Colorado Division of Water Resources	Big Spring Creek has stream gauging equipment that is maintained by the CDWR	Ongoing	Chief of resources and park geologist
Colorado Division of Water Resources	Little Spring Creek has stream gauging equipment that is maintained by the CDWR	Ongoing	Chief of resources and park geologist
The Nature Conservancy	The Nature Conservancy owns water rights on Big Spring Creek and needs access to maintain its ditches and diversion structures	Ongoing	Chief of resources and park geologist
The Nature Conservancy	The Nature Conservancy owns water rights on Little Spring Creek and needs access to maintain its ditches and diversion structures	Ongoing	Chief of resources and geologist
Bureau of Reclamation	The Bureau of Reclamation operates the Closed Basin Project	Ongoing	Superintendent
Rio Grande Water Conservation District	The Rio Grande Water Conservation District holds the water rights for the Closed Basin Project	Ongoing	Superintendent
Colorado Division of Water Resources	The CDWR can access the closed basin project for water rights purposes	Ongoing	Superintendent

Title / Agency / Organization	Purpose / Description	Dates	Responsible Party/Parties
Rights-of-way			
San Luis Valley Rural Electric Association	Electric powerline; San Luis Valley Rural Electric Association accesses to provide and maintain electrical service		
Fairpoint Communications	Telephone line; Fairpoint accesses to provide telephone and data service		
Special Use Permits			
Special use permits	Commercial filming – 12 Wedding – 1 Other special uses – 2	FY 2015	
Commercial Use Authorizations			
Cottonwood Gulch	Hiking/backpacking	Expires 12/31/2016	Chief ranger
Sangre De Cristo Outfitter	Hunting guide	Expires 12/31/2016	Chief ranger
Colorado Outward Bound	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
Camp Thunderbird	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
Lutheran Outdoor Ministries	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
The Road Less Traveled	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
Colorado Outdoor Education Center	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
Mosca Pass Outfitters	Campground store	Expires 12/31/2017	Chief ranger
Mosca Pass Outfitters	Vending services	Expires 12/31/2017	Chief ranger
Zapata Ranch	Horseback rides	Expires 12/31/2016	Chief ranger
Zapata Ranch	Hiking and photo workshop	Expires 12/31/2016	Chief ranger
Ramah Outdoor Adventures	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
J and J Guides and Outfitters	Hunting guide	Expires 12/31/2016	Chief ranger
Wilderness Ventures	Overnight backpacking trips	Expires 12/31/2016	Chief ranger
Heart of the Rockies	Hunting guide	Expires 12/31/2016	Chief ranger

Title / Agency / Organization	Purpose / Description	Dates	Responsible Party/Parties
Commercial Use Authorizations (continued)			
Santa Fe Photographic Workshops	Photo workshops	Expires 12/31/2017	Chief ranger
Dan Ballard Photography	Photo workshops	Expires 12/31/2017	Chief ranger
ParksPlusHiking	Guided hiking	Expires 12/31/2016	Chief ranger
Interagency Agreements			
San Luis Valley Interagency Fire Management Unit	Overall direction and oversight of wildland fire, fuels, and aviation	In effect 5/15/2015	Superintendent / chief ranger
U.S. Geological Survey	Operation of Indian Springs weather station	Started in 2005 and modified annually	Chief of resource management and park geologist
U.S. Geological Survey	Trout research on Sand Creek	2014–2019	Chief of resource management
U.S. Geological Survey	Snow chemistry monitoring	2008 and modified annually	This agreement is not with the park, it is with NPS Rocky Mountain Inventory and Monitoring Network
U.S. Geological Survey	Snow water equivalent	No agreement currently in place – data are collected by NRCS and accessed and used by the NPS	This agreement is not with the park, it is with Natural Resources Conservation Service (Department of Agriculture)
U.S. Forest Service / U.S. Bureau of Land Management	Curatorial storage	Started 2014 and modified annually	Chief of resource management
U.S. Bureau of Reclamation	BP well monitoring network	Started in 2013 but has not been renewed since 2014. Monitoring is ongoing.	Chief of resource management
U.S. Fish and Wildlife Service	Remote Automated Weather Stations fire weather station	Ongoing	Chief ranger
Natural Resources Conservation Service	SNOTEL (snow telemetry) site on Medano Pass for monitoring snow depth and water content	Ongoing	Chief of resource management and park geologist

Title / Agency / Organization	Purpose / Description	Dates	Responsible Party/Parties
Cooperative Agreements			
Adams State University	To support internships, research and professional development of undergraduate and graduate students	2011–2016 and will be renewed in 2017	Chief of interpretation and visitor services
Trout Unlimited	Sand Creek trout project	2015–2020	Chief of resource management
Colorado State University-Colorado Natural Heritage Program	Enhanced wetland monitoring for ungulate management plan	2015–2020	NPS Rocky Mountain Inventory and Monitoring Network
Colorado State University-Colorado Natural Heritage Program	Alpine zone monitoring – Global Observation Research Initiative in Alpine Environments Program	2013–2018	NPS Rocky Mountain Inventory and Monitoring Network
Cooperating Association Agreements			
Western National Parks Association	Supports the park store through product selection and staffing	Ongoing (established at the WASO level)	Jim Cook, Executive Director
Task Agreements			
Southwest Conservation Corps	Supports facilities management by providing trail laborers for maintenance and construction projects	Annual	Chief of facilities management
Student Conservation Association	Supports facilities management by providing trail laborers for maintenance and construction projects	Annual as funding allows	Chief of facilities management
Intergovernmental Agreements			
Colorado State Patrol	Law enforcement dispatch	Expires 2019	Chief ranger
Interpark Agreement			
Rocky Mountain National Park fire management officer	Delegation of authority for duties and actions related to wildland fire management and fuel management	In effect 5/5/2015	Superintendent

Appendix D: Past and Ongoing Park Planning and Data Collection Efforts

Data or Planning Document	Year
Siebenthal. <i>Geology and Water Resources of the San Luis Valley, CO.</i>	1910
Toll. <i>Report to NPS Director Albright on GRSA. A pre-monument designation report.</i>	1931
NRCS <i>Soil Survey of Alamosa County.</i>	1968
<i>Interpretive Prospectus: Great Sand Dunes National Monument.</i> Mosca, CO.	1971
<i>Great Sand Dunes National Monument Interpretive Prospectus.</i> Mosca, CO.	1981
Martorano. <i>GRSA Culturally Modified Trees, Thesis, Colorado State University.</i>	1981
Mangimeli. <i>Thesis. Dendroclimatic analysis of upper and lower tree-line species in the Sangre de Cristo Mountains of Colorado.</i>	1981
Mangimeli. <i>Report to GRSA. A dendroclimatological research project for GRSA.</i>	1982
<i>National Register Information System: Superintendent's Residence, Great Sand Dunes National Monument.</i> Mosca, CO.	1989
Cooper, Severn. <i>Wetlands of the San Luis Valley, Colorado.</i>	1992
<i>Resource Management Plan Great Sand Dunes National Monument.</i> Mosca, CO.	1992
<i>Statement for Management: Great Sand Dunes National Monument.</i> Mosca, CO.	1993
<i>Resource Management Strategy. Great Sand Dunes National Monument.</i> Mosca, CO.	1994
<i>Great Sand Dunes National Monument: Scope of Collection Statement.</i> Mosca, CO.	1996
Jodry, Stanford. <i>Changing Hydrologic Regimes and Prehistoric Landscape Use in the Northern San Luis Valley, Colorado.</i>	1996
Judis (GRSA). <i>GRSA Curatorial Housekeeping Plan.</i>	1996
Judis (GRSA). <i>Culturally Scarred Tree Plan.</i>	1997
Chatman, M., D. Sharrow, and A. Valdez. <i>Water Resources Management Plan, Great Sand Dunes National Monument, Colorado.</i> Fort Collins, CO.	1997
<i>Great Sand Dunes National Monument Strategic Plan 1998–2002.</i> Mosca, CO.	1997
Rowlands. (USGS). <i>Stand structure of a piñon-juniper woodland in GRSA and the effects of historical wood harvesting.</i>	1997
Grissino-Mayer et al. <i>A multicentury reconstruction of precipitation for GRSA, Southwestern Colorado.</i>	1998
Meko. <i>Dendrohydrologic study of cottonwood trees in GRSA.</i>	1998
Rondeau et al., <i>Saguache County, Closed Basin Biological Inventory Volume I: A Natural Heritage Assessment Final Report.</i> Prepared for The Nature Conservancy.	1998
Sarr and Sanderson. <i>Saguache County, Closed Basin Biological Inventory Volume II: A Natural Heritage Assessment of Wetlands and Riparian Areas in the Closed Basin, Colorado Final Report.</i> Prepared for CO DNR and US EPA.	1998
Hammond. <i>Measuring changes in areal extent of historic wetlands at GRSA, 1936–1995 (thesis).</i>	1998
<i>Baseline Water Quality Data Inventory and Analysis: Great Sand Dunes National Monument.</i> Fort Collins, CO.	1998

Data or Planning Document	Year
Kittel. <i>A classification of riparian plant associations of the Rio Grande and Closed Basin Watersheds, CO.</i>	1999
Reams. <i>The environmental history of GRSA and vicinity: A final report.</i>	1999
Schenk (editor). <i>Hydrologic, Geologic and Biologic Research at GRSA and vicinity, Colorado. Proceedings of NPS Research Symposium No. 1.</i>	1999
Mickelsen. <i>Baseline Geologic Resources Inventory Report at GRSA.</i>	1999
HRS Consultants. <i>Hydrogeologic investigation Sand Creek and Indian Springs [sic] area, GRSA.</i>	1999
Pineda, P. M., R. J. Rondeau, and A. Ochs. <i>A Biological Inventory and Conservation Recommendations for the Great Sand Dunes and San Luis Lakes, Colorado.</i> Fort Collins, CO.	1999
The Road Inventory of Great Sand Dunes National Monument (Colorado). Sterling, VA.	1999
Pineda. <i>Invertebrate inventory of Indian Spring Natural Area, Saguache County, CO. Field season 1999.</i>	2000
Wurster and Cooper. <i>Analysis of interdunal wetland disappearance at GRSA.</i>	2000
Madole. <i>Geomorphology of the Indian Spring Area.</i>	2001
Martorano, M. A. <i>Burned Area Emergency Rehabilitation (BAER) Cultural Resources Interim Report, Great Sand Dunes National Monument, Colorado.</i> Golden, CO.	2001
Riley. <i>Population dynamics and ecological characteristics of Cleome multicaulis, a rare annual wetland halophyte of the San Luis Valley, CO.</i> (dissertation).	2001
Muths and Street. <i>NPS Inventory and Monitoring Project – Amphibians and Reptiles Inventory of GRSA.</i>	2002
Martorano, M. A. <i>Final 2001 Field Season Cultural Resources Interim Report, Great Sand Dunes National Monument and Preserve, Colorado.</i> Lakewood, CO.	2002
Soils and Foundation Investigation Additions to Great Sand Dunes Visitor Center, State Highway 150, Alamosa County, Colorado. Pueblo, CO.	2002
Environmental Assessment Renovation of Visitor Center: Great Sand Dunes National Monument and Preserve. Mosca, CO.	2002
Pineda and Kondratieff. <i>Natural History of the GRSA tiger beetle, Cicindela theatina rotger.</i>	2003
Valdez. <i>Mammal inventory at GRSA and FLFO. (USGS).</i>	2003
Ferguson. (USGS). <i>Investigation of water quality in the GRSA, Saguache County, CO. (Outstanding waters designation).</i>	2003
Clean Water Act Water Quality Designated Uses and Impairments: Great Sand Dunes National Monument and Preserve. Fort Collins, CO.	2003
Great Sand Dunes National Park and Preserve Land and Vegetative Cover Classification. Alamosa, CO.	2003
Spackman Panjabi. 2002. <i>GRSA Vascular plant inventory.</i>	2003
Spackman Panjabi. 2003. <i>GRSA Vascular plant inventory.</i>	2004
HRS Consultants. <i>Numerical Ground Water Model for GRSA.</i>	2004
Harte. (USGS). <i>Seepage investigation of Deadman Creek, Sand Creek, Big Spring Creek, and Little Spring Creek.</i>	2004

Data or Planning Document	Year
Rupert. (USGS). <i>Ground-water flow direction, water quality, recharge sources, and age. GRSA. 2000–2001.</i>	2004
Miller, L., and K. King. <i>Great Sand Dunes National Monument and Preserve Coliform Risk Analysis.</i> Mosca, CO.	2004
Thomas. <i>GRSA Coliform risk analysis.</i>	2004
Wood and Rew. <i>Nonnative plant survey at GRSA.</i>	2005
Zuellig. (USGS). <i>Benthic Macroinvertebrate Surveys in Sand Creek Drainage, GRSA.</i>	2005
Giroir. <i>Final Report on the General Avian Inventory GRSA, 2004–2005.</i>	2005
Jacobi. <i>Progress report of white pine blister rust pruning project. Mosca Pass Trail – GRSA (Colorado State University).</i>	2005
Marin et al., <i>20th century dune migration at GRSA, relation to drought variability.</i>	2005
Soil Investigation Report. Woodland Park, CO.	2005
Environmental Assessment / Assessment of Effect: <i>Rehabilitate Main Park Roads.</i> Mosca, CO.	2005
White, D. R. M., Ph.D. <i>Seinanyédi. An Ethnographic Overview of Great Sand Dunes National Park and Preserve.</i> Santa Fe, NM. (NOT FOR DISTRIBUTION).	2005
Greater Sand Dunes Interagency Fire Management Plan <i>Environmental Assessment / Assessment of Effect.</i> Mosca, CO.	2005
McCalpin. <i>Active faults and seismic hazards to infrastructure at GRSA. Final report.</i>	2006
Schoenecker, K. A. et al., <i>2005 Annual Progress Report – Elk and Bison Grazing Ecology in the Great Sand Dunes Complex of Lands.</i> Fort Collins, CO.	2006
McCalpin, Dr. J. P. <i>Active Faults and Seismic Hazards to Infrastructure at Great Sand Dunes National Monument and Preserve; FINAL REPORT, v. 2.0.</i> Crestone, CO.	2006
Great Sand Dunes National Park and Preserve <i>Geologic Resource Evaluation.</i> Washington, D.C.	2006
The Road Inventory of Great Sand Dunes National Monument and Preserve GRSA – 1470. Sterling, VA.	2006
Great Sand Dunes National Park and Preserve, San Luis Valley National Wildlife Refuge Complex, and Medano-Zapata Ranch. <i>Greater Sand Dunes Interagency Fire Management Plan.</i> Arlington, VA.	2006
Latchininsky. <i>Literature study and monitoring strategies for eight insect species of GRSA (RM CESU project).</i>	2007
Davidson et al. <i>Elk movements in response to hunting pressure in the GRSA area, Colorado.</i> Workshop/conference proceedings.	2007
Andelt. <i>Occupancy of random plots by white-tailed and gunnisons prairie dogs (journal publication) – also an ongoing/periodic project through CPW.</i>	2007
Andersen. <i>Road Impacts on the Baca NWR (Literature Review).</i>	2007
Final General Management Plan/ <i>Wilderness Study / Environmental Impact Statement.</i> Mosca, CO.	2007
Centennial Strategy for Great Sand Dunes National Park and Preserve. Mosca, CO.	2007

Data or Planning Document	Year
Harte, J. J., A. D. Valdez, and S. A. Stevenson. <i>Seepage Investigation of Deadman Creek, Sand Creek, Big Spring Creek, and Little Spring Creek: September 22, 23, and 24, 2004. Great Sand Dunes National Park and Preserve, Colorado.</i> Fort Collins, CO.	2007
Landers et al. <i>The Fate, Transport, and Ecological Impacts of Airborne Contaminants in Western National Parks (USA).</i>	2008
Bevilacqua et al. <i>Final report on the 2007 archeological inventory and site condition assessments at GRSA.</i>	2008
Graves. <i>Mitchell Ponds reclamation plan.</i> (eventually an ARRA project).	2008
Intermountain Region New Deal Resources: <i>Research Findings for Great Sand Dunes National Park and Preserve.</i> Lakewood, CO.	2008
Lynch, E. <i>Great Sand Dunes National Park and Preserve: Acoustic Monitoring Report.</i> Fort Collins, CO.	2008
Larmore, S. et al. <i>Archeological Investigations at the Arroyo Del Arenal Site (5SH2373) Great Sand Dunes National Park and Preserve, Saguache County, Colorado.</i> Durango, CO.	2008
Doerner. <i>Dendrochronology Analysis, GRSAPP.</i>	2008
Doener. <i>Dendrochronology Analysis, GRSAPP, FLFO.</i>	2009
Zimbelman. <i>The rate of granula ripple movement on Earth and Mars.</i>	2009
Cummings, L.S., et al. <i>Pollen, Phytolith, and Macrofloral Analyses at Sites 5SH1912, 5SH3386, 5SH3418, 5SH3439, 5SH3445, 5SH3484, and 5SH3503, and AMS Radiocarbon Dating at Site 5SH3418, in the Great Sand Dunes National Park, Colorado.</i> Golden, CO.	2009
Boundary Piezometer Installation Environmental Assessment. Mosca, CO.	2009
Environmental Assessment. <i>Interagency Land Exchange Between the U.S. Department of the Interior, Bureau of Land Management and the Colorado State Board of Land Commissioners. Fremont, Saguache, Conejos, and Alamosa Counties, Colorado Number CO-500-08-0008-EA. To Support Consolidation of Lands within Great Sand Dunes National Park and Preserve and within The Baca National Wildlife Refuge.</i> Lakewood, CO.	2009
2008 Test Excavations in Great Sand Dunes National Park and Preserve, Saguache, Alamosa, and Huerfano Counties, Colorado. Lakewood, CO.	2009
Herberling and Hopton (editors). <i>San Luis Basin Sustainability Metric Project: A methodology for evaluating regional sustainability.</i> (EPA).	2010
Farris. <i>Summary of resource concerns and impacts from the Medano Fire in GRSA, June/July 2010.</i>	2010
Salas, et al. <i>Vegetation classification and mapping project report.</i> GRSA.	2010
Kirkham. <i>Surficial deposits and preliminary assessment of the potential for sediment-laden flows in the area burned by the 2010 Medano Fire,</i> GRSA.	2010
Ashton, I. et al. <i>Alpine vegetation composition, structure, and soils monitoring for Great Sand Dunes National Park and Preserve – 2009 Summary Report.</i> Fort Collins, CO.	2010
Tercek, M. T., Ph.D. <i>Climate Zonation Analysis for Glacier National Park, Rocky Mountain National Park, Great Sand Dunes National Park, Little Bighorn Battlefield National Monument, Grant-Kohrs Ranch National Historic Site, and Florissant Fossil Beds National Monument.</i> Gardiner, MT.	2010
Ray, C. <i>Resource Brief. "Pikas in Peril" Research in Great Sand Dunes NPP.</i> Boulder, CO.	2010

Data or Planning Document	Year
Ashton, I. <i>Alpine vegetation composition, structure, and soils monitoring for Great Sand Dunes National Park and Preserve – 2010 Summary Report</i> . Fort Collins, CO.	2010
Martorano, et al. <i>Archeology of Great Sand Dunes National Park and Preserve</i> .	2011 DRAFT
Salas, D., et al. <i>Vegetation Classification and Mapping Project Report: Great Sand Dunes National Park and Preserve</i> . Denver, CO.	2011
Road Inventory and Condition Assessment: <i>Great Sand Dunes National Park and Preserve GRSA – 1470 Cycle 5 Report</i> . Sterling, VA.	2011
San Luis Valley and Central Sangre de Cristo Mountains Reconnaissance Survey Report. Mosca, CO.	2011
Geary. <i>Sea of Sand: A history of Great Sand Dunes National Park and Preserve</i> .	2012
Lindsey. (USGS). <i>Geology along Mosca Pass Trail, GRSA</i> .	2012
Ray, C. <i>Rocky Mountain Network Resource Brief. "Pikas in Peril" Research in Great Sand Dunes National Park and Preserve</i> . Boulder, CO.	2012
Bogdanova, T. <i>Sangre de Cristo Wilderness Stewardship Building Blocks</i> . Mosca, CO.	2012
Bogdanova, T. <i>Great Sand Dunes Wilderness Stewardship Building Blocks</i> . Mosca, CO.	2012
Sangre De Cristo National Heritage Area Management Plan. Mosca, CO.	2012
Sharp. <i>Visitor understanding of the implications of invasive species and climate change at GRSA</i> .	2012
Schoenecker. <i>Ecology of bison, elk, and vegetation in an arid ecosystem</i> . (dissertation).	2012
Andersen. (USGS). <i>Productivity-hydrology relationships in riparian narrowleaf cottonwood (Populus angustifolia) along lower Deadman Creek, GRSA</i> .	2013
Ray. <i>Pikas in peril: multi-regional vulnerability assessment of a climate-sensitive sentinel species</i> .	2013
Grauch and Ruleman. <i>Identifying buried segments of active faults in the Northern Rio Grande Rift using aeromagnetic LiDAR and gravity data, south-central Colorado</i> .	2013
Flanagan Pritz, et al. <i>Contaminants of Emerging Concern in Fish from Western U.S. and Alaskan NPS</i> .	2014
Eagles-Smith, et al. <i>Mercury in Fishes from 21 National Parks in the Western United States</i> (USGS publication).	2014
Livo, Lauren. GRSA Herpetile Database.	2014
Wockner et al. <i>Modeling elk and bison carrying capacity for GRSA, Baca NWR, and TNC's Medano Ranch, CO</i> . (USGS pub).	2014
Briggs, J. <i>Great Sand Dunes National Park and Preserve Acoustical Monitoring 2009</i> . Fort Collins, CO.	2014
Climate Change Resource Brief: <i>Recent Climate Change Exposure of Great Sand Dunes National Park and Preserve</i> . Fort Collins, CO.	2014
Superintendent's Compendium of Designations, Closures, Permit Requirements and Other Restrictions Imposed Under Discretionary Authority. Mosca, CO. (separate documents exist for park and for preserve).	2014
Sibold. <i>GRSA Medano Creek fire history</i> .	2015

Data or Planning Document	Year
<i>Schoettle, et al. Establishing the science to sustain high-elevation five-needle pine forests threatened by novel interacting stresses in four western national parks.</i>	2015
<i>Zeigenfuss and Schoenecker. Development of a grazing monitoring program for GRSA, CO.</i>	2015
<i>Harte. Water rights summary for the Medano Ranch area of GRSA as of May 2015.</i>	2015
<i>Park Visitation and Climate Change – Park-Specific Brief. Great Sand Dunes National Park: How Might Future Warming Alter Visitation? Fort Collins, CO.</i>	2015
<i>RSG. Final Report: Great Sand Dunes National Park and Preserve Backcountry Visitor Use Study. Technical report prepared for the National Park Service. White River Junction, VT.</i>	2016
<i>Great Sand Dunes National Park and Preserve List of Classified Structures.</i>	2016
<i>Great Sand Dunes National Park and Preserve (GRSA): Species Full List with Details.</i>	2016
<i>Restoration planting options for limber pine in the Southern Rocky Mountains.</i>	2016
<i>Rocky Mountain Regional Snowpack Chemistry Monitoring Study Area.</i>	Ongoing
<i>Ungulate Management Plan/EIS.</i>	Ongoing
<i>Hydrology & Wetlands Ecology Study.</i>	Ongoing
<i>Native Fish Conservation Project (restoration of native Rio Grande Cutthroat Trout in Sand Creek Drainage).</i>	Ongoing
<i>Visitor Experience and Resource Protection Plan for Wilderness and Backcountry Areas.</i>	Ongoing
<i>Congestion Management Report.</i>	Ongoing
<i>Comprehensive Interpretive Plan.</i>	Ongoing
<i>Traditional Use Ethnographic Study.</i>	Ongoing
<i>Unit Wilderness Workshop.</i>	Planned



Appendix E: Traditionally Associated Tribes

**Arapaho Tribe of the Wind River
Reservation, Wyoming**
PO Box 396
Fort Washakie, WY 82514

**Cheyenne and Arapaho
Tribes, Oklahoma**
PO Box 167
Concho, OK 73022

Comanche Nation, Oklahoma
PO Box 908
Lawton, OK 73507

Jicarilla Apache Nation, New Mexico
PO Box 507
Dulce, NM 87528

**Pueblo of Santo Domingo
Kewa Pueblo, New Mexico**
PO Box 99
Santo Domingo Pueblo, NM 87052

Kiowa Indian Tribe of Oklahoma
PO Box 369
Carnegie, OK 73015

**Navajo Nation, Arizona,
New Mexico & Utah**
PO Box 7440
Window Rock, AZ 86515

**Northern Cheyenne Tribe of
the Northern Cheyenne Indian
Reservation, Montana**
PO Box 128
Lame Deer, MT 59043

Ohkay Owingeh, New Mexico
PO Box 1099
Ohkay Owingeh, NM 87566

Pueblo of Acoma, New Mexico
PO Box 309
Acoma, NM 87034

Pueblo of Cochiti, New Mexico
PO Box 70
Cochiti, NM 87072

Pueblo of Isleta, New Mexico
PO Box 1270
Isleta, NM 87022

Pueblo of Jemez, New Mexico
PO Box 100
Jemez Pueblo, NM 87024

Pueblo of Laguna, New Mexico
PO Box 194
Laguna, NM 87026

Pueblo of Picuris, New Mexico
PO Box 127
Penasco, NM 87553

Pueblo of Pojoaque, New Mexico
78 Cities of Gold Road
Santa Fe, NM 87506

Pueblo of San Ildefonso, New Mexico
2 Tunyo Po
Santa Fe, NM 87506

Pueblo of Sandia, New Mexico
481 Sandia Loop
Bernalillo, NM 87004

Pueblo of Santa Ana, New Mexico
2 Dove Road
Santa Ana Pueblo, NM 87004

Pueblo of Santa Clara, New Mexico
PO Box 580
Espanola, NM 87532

Pueblo of Taos, New Mexico
PO Box 1846
Taos, NM 87571

Pueblo of Zia, New Mexico
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

**San Juan Southern Paiute
Tribe of Arizona**
PO Box 1989
Tuba City, AZ 86045

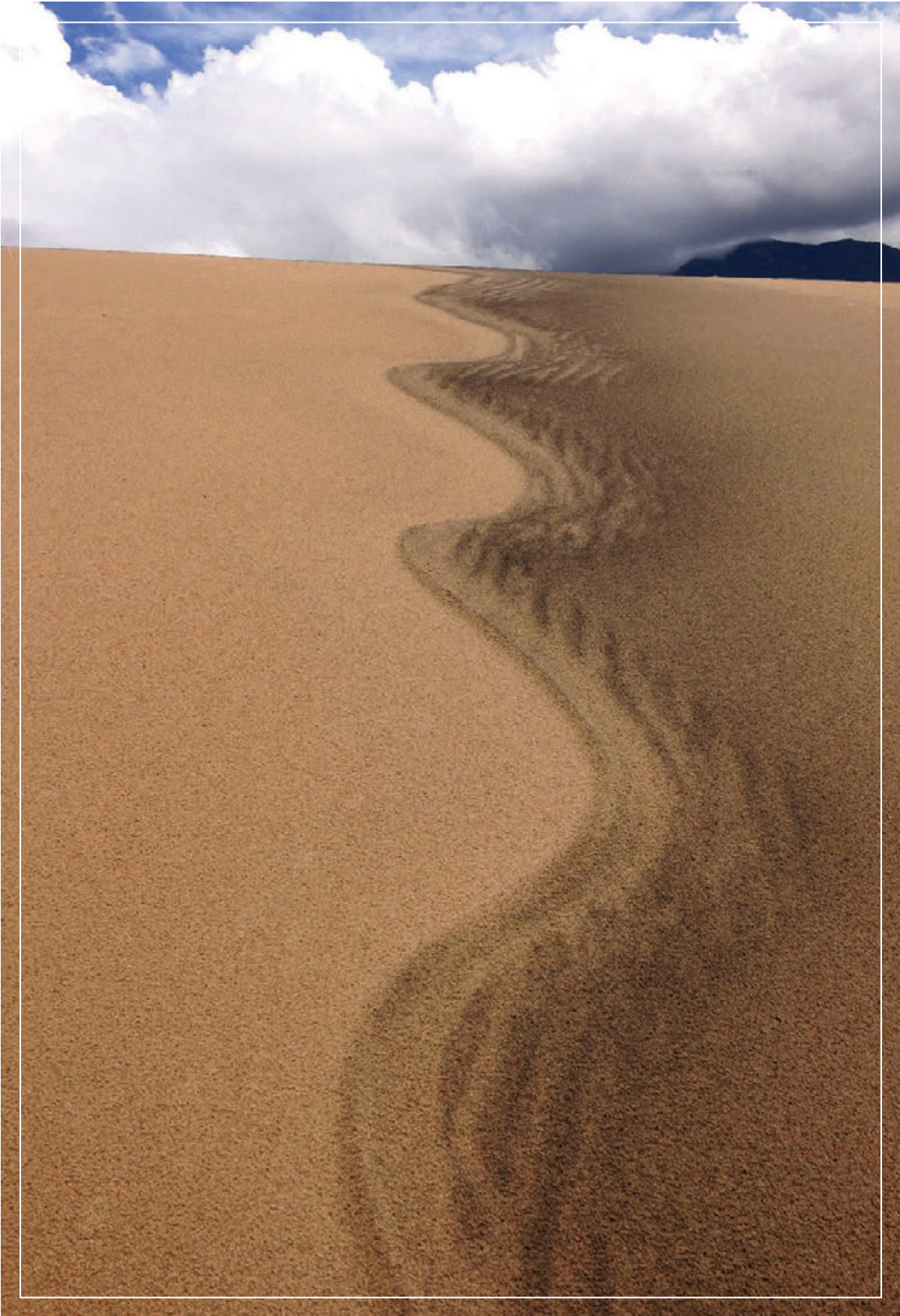
**Southern Ute Indian Tribe of the
Southern Ute Reservation, Colorado**
PO Box 737
Ignacio, CO 81137

**Ute Indian Tribe of the Uintah &
Ouray Reservation, Utah**
PO Box 190
Ft. Duchesne, UT 84026

**Ute Mountain Tribe of the Ute
Mountain Reservation, Colorado,
New Mexico & Utah**
PO Box JJ
Towaoc, CO 81334

White Mesa Ute
PO Box 7096
White Mesa, UT 84511

**Zuni Tribe of the Zuni
Reservation, New Mexico**
PO Box 339
Zuni, NM 87327-0339



**Intermountain Region Foundation Document Recommendation
Great Sand Dunes National Park and Preserve**

January 2017

This Foundation Document has been prepared as a collaborative effort between park and regional staff and is recommended for approval by the Intermountain Regional Director.



1-7-2017

RECOMMENDED

Lisa Carrico, Superintendent, Great Sand Dunes National Park and Preserve

Date



1/20/17

APPROVED

Sue E. Masica, Regional Director, Intermountain Region

Date



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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