Level 4 Potential Conservation Area (PCA) Report

Name Great Sand Dunes **Site Code** S.USCOHP*055

IDENTIFIERS

Site ID 1895 **Site Class** PCA

Site Alias None

Network of Conservation Areas (NCA)

NCA Site ID	NCA Site Code	NCA Site Name
-		No Data

LOCATORS

Nation United States **Latitude** 374425N

State Colorado **Longitude** 1053408W

Quad Code	Quad Name
37105-H6	Crestone
37105-G6	Sand Camp
37105-F6	Medano Ranch
37105-E6	Dry Lakes
37105-E5	Twin Peaks
37105-F5	Zapata Ranch
37105-G5	Liberty
37105-G4	Medano Pass
37105-H5	Crestone Peak
37105-G7	Deadman Camp
37105-F7	Hooper East

County

Saguache (CO)

Alamosa (CO)

Watershed Code	Watershed Name
13010003	San Luis

SITE DESCRIPTION

Minimum Elevation	7,525.00	**Feet**	2,294.00	**Meters**
Maximum Elevation	8,600.00	**Feet**	2,621.00	**Meters**

Site Description

The Great Sand Dunes site is the major part of an eolian depositional system that covers approximately 800 square kilometers (310 sq. mi.) in the San Luis Valley of Colorado (Fryberger et al. 1990) and ranges in elevation from 2,290m to 2,620m (7,525 to 8,600 feet). This system has three recognized geomorphological entities, Province I, Province II, and Province III (Andrews 1981 in Fryberger et al. 1990). Province I is the dry lakes area on the upwind portion of the depositional system. Province II is the extensive sand sheet that lies between the main sand dune mass and the dry lakes area. Province III is the main sand dune mass existing at the downwind end of the system. This site encompasses nearly all of Province II and all of Province III. The most active sand component is the large dune mass at the Great Sand Dunes National Monument, covering about 85 square kilometers (33 sq. mi.) (Fryberger et al. 1990). Province II is an extensive vegetated sand sheet composed of a mosaic of stable and shifting sand components. The stable sand component is characterized by rabbitbrush (*Chrysothamnus nauseosus*), needle-and-threadgrass (*Hesperostipa comata*), and rice grass (*Oryzopsis hymenoides*), while scurf pea (*Psoralea lanceolata*), skeleton weed (*Lygodesmia juncea*), and blowout grass (*Redfieldia flexuosa*) characterize the shifting sand component. The sand sheet also includes scattered groups of parabolic dunes with very little vegetation, and a springline. At the springline, winds scour out depressions down to the water table and expose interdunal wetlands. Although the vegetation components vary among these springs, they may be characterized by coyote willow (*Salix exigua*), baltic rush (*Juncus balticus*), bulrush (*Scirpus pungens*) and less frequently the globally rare slender spiderflower (*Cleome multicaulis*). Province III is also known as the main mass of active dunes and is perhaps the most visible component of the Great Sand Dunes site. This province is comprised of the large star dunes that are mostly devoid of vegetation and tower up to 210m (700 feet) from the valley floor. Although its appearance is deceptively dry, the subsurface is actually very damp. The main sand dune mass is stabilized by adhesion when the dry wind blown sand encounters a water source. Spring runoff from the Sangre de Cristo mountain

range, most visibly characterized by Sand and Medano creeks is the most obvious and plentiful water source. Sand Creek's union with the dune mass begins in the northeast and rounds out the northeastern, northwestern, and western edges of the dune mass, slicing through the northern portion of the sandsheet. Medano Creek merges with the dunes some 6.6-km (4 mi) to the southeast of Sand Creek, and rounds out the eastern and southeastern reaches of the dune mass, traversing the southern portion of the sand sheet. Sand Creek supports a newly described riparian vegetation type of narrowleaf cottonwood (*Populus angustifolia*) and shifting sand.

Key Environmental Factors

The sands that constitute Provinces II and III are believed to originate from the ancestral Rio Grande River (Fryberger et al. 1990). Presently, southwest winds drive sand from the Rio Grande River northeastward toward Medano Pass, where winter easterlies have caused the dunes to advance slowly and also grow vertically. As the winds rise over the Sangre de Cristo Mountain Range, they lose their velocity due to the cooler temperatures present at higher elevations and the sand is deposited at the base of this mountain range. As Sand and Medano creeks wind their way through this system during the spring and summer, they carry sediment away from the dune mass, which is later picked up by prevailing winds, and redeposited. Provinces II and III are maintained by hydrological adhesion, which stabilizes this system although internally it is very dynamic.

Climate Description

Less than 35cm (13.8 in.) of precipitation fall in this area per year, with summer temperatures averaging 18.3C (65F) (July), and winter temperatures averaging -7C (19F) (January). True to its eolian characteristic, windy days in this area are frequent, and winds often will contain gusts of 90 to 125 kilometers per hour (55 to 75 mph). The floral and faunal components of the area are further defined by a very brief growing season of about 60 frost-free days.

Land Use History

(The following anthropological history is summarized from Carter 1990). The earliest known inhabitants of the Great Sand Dunes area were Clovis and Folsom peoples who inhabited the area from 10,500 to 11,000 years ago. These were hunter-gatherer cultures who hunted large game such as mammoth and bison. In post-archaic times, the Utes were the predominant tribe in the San Luis Valley from the late 16th to early 20th century. At that time, the Utes were nomadic, taking advantage of the plentiful game and plants in the mountains during the summer and returning to the foothills and other protected areas as the weather turned colder. As early as the mid-15th century, Spanish explorers were traveling throughout much of the southwest, searching for precious minerals. Zebulon Pike made the first known documentation of the dunes in 1807. He and other explorers entered the San Luis Valley through Medano and Mosca passes. In 1871, Mosca Pass was converted into a toll road. Pioneers, trappers, and prospectors traveling into the valley used this road. Farming, mining, and ranching were the chief industries of the San Luis Valley in the early 1900s. In 1932, Great Sand Dunes was declared the 36th National Monument of the National Park Service. Currently, major land uses at the site include recreation on the National Monument and bison and cattle ranching on the adjacent private, state, and federal lands. Recreation includes hiking, camping, sandboarding, skiing on the dunes, and wading in Medano Creek.

Cultural Features

No Data

SITE DESIGN

Site Map Y - Yes **Mapped Date** 11/30/1998

Designer Rondeau, R.J., P.M. Pineda and A. Ochs

Boundary Justification

The boundary encompasses the furthest reaches of open sand dune habitat as well as the sparsely vegetated edges and the associated grass and shrublands containing isolated dunes. Both Medano and Sand creeks are included because of their important role in maintaining sand dune landform.

Primary Area 110,124.82 **Acres** 44,566.11 **Hectares**

SITE SIGNIFICANCE

Biodiversity Significance Rank B1: Outstanding Biodiversity Significance

Biodiversity Significance Comments

The Great Sand Dunes ecosystem is the most outstanding site in the San Luis Valley. Six endemic species of insects (five beetles and one robber fly) are known from this ecosystem, including *Cicindela theatina* (Great Sand Dunes tiger beetle), *Amblyderus triplehorni* and *Amblyderus werneri* (ant like flower beetles),

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Hypocaccus sp. (undescribed Histerid beetle), *Eleodes hirtipennis* (circus beetle), and *Proctacanthus* n.sp. (undescribed robber fly) (M. J. Weissmann 1995). Although there are approximately 900 insects known from the Great Sand Dunes, experts have estimated that at least 2,000 insects possibly reside here (Weissmann and Kondratieff 1999). In addition to the rare and rich invertebrate assemblage found here, a wide variety of plants, plant communities, and vertebrates also are of biological significance. To the north approximately 10,000 acres are dominated by *Hesperostipa comata - Oryzopsis hymenoides* grassland (needle-and-threadgrass with rice grass). Interdunal and isolated wetlands provide important habitat for unusual plant communities and rare plants. Several of these wetlands have small populations of the globally rare *Cleome multicaulis* (slender spiderflower). This system is also important habitat for the endemic mammals of the San Luis Valley, especially *Dipodomys ordii montanus* (Ord's kangaroo rat), *Perognathus flavus sanluisi* (silky pocket mouse), *Perognathus flavescens relictus* (plains pocket mouse), and *Thomomys talpoides agrestis* (northern pocket gopher).

Other Values Rank No Data

Other Values Comments

No Data

LAND MANAGMENT ISSUES

Land Use Comments

Currently, major land uses at the site include recreation on the National Monument and bison and cattle ranching on the adjacent private, state, and federal lands. Recreation includes hiking, camping, sandboarding, skiing on the dunes, and wading in Medano Creek.

Natural Hazard Comments

No Data

Exotics Comments

No Data

Offsite

Subdivisional and agricultural developments, ranching, hydrological alterations.

Information Needs

Need to determine the effects of altered hydrology and water development on the Great Sand Dunes ecosystem. The roles that fire and grazing play in this ecosystem also need to be studied.

ASSOCIATED ELEMENTS OF BIODIVERSITY

Element State ID	State Scientific Name	State Common Name	Global Rank	State Rank	Driving Site Rank
19571	*Perognathus flavescens relictus*	Plains Pocket Mouse Subsp	G5T2	S2	No
16874	*Sphinx dollii*	A Sphinx Moth	G4G5	S2?	No
18080	*Cleome multicaulis*	slender spiderflower	G2G3	S2S3	No
22340	*Oreocarya pustulosa*	catseye	G5TNR	S1	No
21837	*Daihinibaenetes giganteus*	Giant Sand Treader Cricket	GNR	S1	No
20205	*Oncorhynchus clarkii virginalis*	Rio Grande Cutthroat Trout	G4T3	S3	No
18654	*Schoenoplectus pungens* Herbaceous Vegetation	Bulrush	G3G4	S3	No
21789	*Schinia avemensis*	Gold-edged Gem	G1G3	SNR	No
24912	*Alnus incana - Salix (monticola, lucida, ligulifolia)* Shrubland	Thinleaf Alder-Mixed Willow Species	G3	S3	No
19007	*Pyrgus xanthus*	Xanthus Skipper	G3G4	S3	No
24765	*Hesperostipa comata - Achnatherum hymenoides* Herbaceous Vegetation		G2?	S1	No
18080	*Cleome multicaulis*	slender spiderflower	G2G3	S2S3	No
17332	*Perognathus flavus sanluisi*	Silky Pocket Mouse Subsp	G5T3	S3	No
19571	*Perognathus flavescens relictus*	Plains Pocket Mouse Subsp	G5T2	S2	No
23369	*Amblyderus triplehorni*	Great Sand Dunes Anthicid Beetle	GNR	SNR	No
17593	*Cicindela theatina*	San Luis Dunes Tiger Beetle	G1	S1	Yes
24765	*Hesperostipa comata - Achnatherum hymenoides* Herbaceous Vegetation		G2?	S1	No
24659	*Salix exigua* / Barren Shrubland	Coyote Willow/Bare Ground	G5	S5	No

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19797	*Spermophilus tridecemlineatus blanca*	Thirteen-lined Ground Squirrel Subsp	G5T3	S3	No
24541	*Populus angustifolia / Alnus incana* Woodland	Montane Riparian Forest	G3	S3	No
18080	*Cleome multicaulis*	slender spiderflower	G2G3	S2S3	No
23311	*Amblyderus werneri*	Great Sand Dunes Anthicid Beetle	G1?	S1	Yes
19973	*Buteo regalis*	Ferruginous Hawk	G4	S3B,S4N	No
21213	*Amphispiza belli*	Sage Sparrow	G5	S3B	No
22389	*Polites rhesus*	Rhesus Skipper	G4	S2S3	No
22969	*Redfieldia flexuosa - (Psoralidium lanceolatum)* Herbaceous Vegetation		G1?	S1	Yes
19571	*Perognathus flavescens relictus*	Plains Pocket Mouse Subsp	G5T2	S2	No
21032	*Eleodes hirtipennis*	A Circus Beetle	GNR	S1	No
24645	*Alnus incana* / Mesic Forbs Shrubland	Thinleaf Alder/Mesic Forb Riparian Shrubland	G3	S3	No
24523	*Achnatherum hymenoides - Psoralidium lanceolatum* Herbaceous Vegetation		G3Q	S1	No
18074	*Euphilotes rita coloradensis*	Colorado Blue	G3G4T2T3	S2	No
18080	*Cleome multicaulis*	slender spiderflower	G2G3	S2S3	No
18080	*Cleome multicaulis*	slender spiderflower	G2G3	S2S3	No
24765	*Hesperostipa comata - Achnatherum hymenoides* Herbaceous Vegetation		G2?	S1	No

REFERENCES

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168479	Weissmann, J.J. and B.C. Kondratieff. 1999. An inventory of arthropod fauna at Great Sand Dunes National Monument, Colorado. Entomological contributions in memory of Byron A. Alexander. University of Kansas Natural History Museum Special Publication 24: 69-80.
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ADDITIONAL TOPICS

Additional Topics

No Data

VERSION

Version Date 11/30/1998

Version Author Rondeau, R.J., P.M. Pineda and A. Ochs

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