

The Sand Hills at a Glance

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The Sand Hills area covers about 19,300 square miles, most of the west-central part of Nebraska and a small area of south central South Dakota. This grass covered sand-dune area, the largest area of grass-covered dunes in the world, was formed by blowing sand and reached its present size during the last 8,000 years.

Rainfall varies from an average of 17 inches per year in the west to 23 inches in the east. Average annual snowfall ranges from 22 inches along the southern border to 45 inches per year in the north.

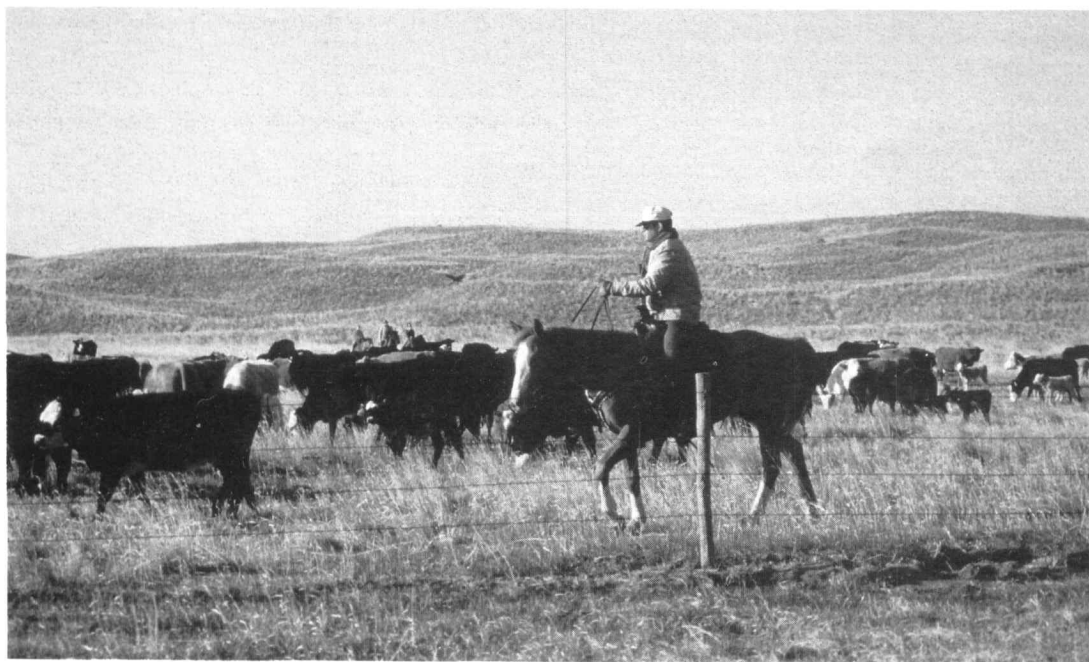
A shallow depth to groundwater is of major benefit for much of the Sand Hills, which overlay the Ogallala and other portions of the High Plains Aquifer. Since groundwater is very close to, or at, the ground surface in many areas, numerous lakes, marshes and wet meadows can be found in low lying areas.

Typical warm season grasses found on upland areas include sand bluestem, prairie sandreed, little bluestem, switchgrass, indiangrass, blue grama, hairy grama, sand lovegrass, and sand dropseed. Subirrigated meadows, with a depth to groundwater of 3 to 4 feet, support big bluestem, indiangrass, prairie cordgrass, sand paspalum, and switchgrass.

Cool season grasses found on upland sites include needleandthread, prairie junegrass, western wheatgrass, and sedges. Wet meadow communities include species such as bluejoint reedgrass, northern reedgrass, and numerous sedges. A variety of introduced grasses and legumes are also found in these low lying areas such as reed canarygrass, timothy, redtop, Kentucky bluegrass, and red clover.

Wet meadows (Subirrigated and Wet Subirrigated sites) with predominantly native vegetation in good condition with average plant vigor can be stocked at 1–1.4 Animal Unit Months (AUMs)/acre. Average upland Sands and Choppy Sands sites are usually stocked between 0.3–0.7 AUMs/acre. Variance in stocking rates on individual range sites is directly related to plant composition, plant vigor and available moisture.

Sand Hills riparian areas consist mainly of low lying subirrigated meadows, bench meadows located next to rivers, and woodland areas adjacent to the Niobrara River and its tributaries.



Herding cows and calves to the branding pen. Photo by Gary McCoy, NRCS.



Fluctuating ground water levels provide unique management challenges as ranchers balance native hay production with valuable wetland habitat for wildlife. Photo by Marla Shelbourn.

Most cropland acres are irrigated by center pivots because droughty conditions, sandy soils, considerable slopes, and the availability of ground water make such irrigation necessary and profitable. Crops commonly raised include corn, dry edible beans, alfalfa, and small amounts of popcorn, potatoes, and small grains. Dryland forage crops include sudan, millet and alfalfa.

General cow/calf operations center on spring calving herds, or late summer/early fall calving herds. Some ranchers have a combination of both. Some producers are now moving from the traditional March and April calving season to late May and June. They feel this allows them to more closely match their highest protein forage with the increased nutrient requirements of the gestating and lactating cow. The later date also helps them avoid calving deaths often associated with spring blizzards.

A drive through the Sand Hills area will provide a look at mostly Hereford/Angus cross cows with some influence of exotic breeds. Ranchers have found the 1,050–1,150 pound cow to be well suited to the Sand Hills environment.

Animal Unit Equivalents (AUEs) for most cow/calf pairs will range from 1.3 to 1.5 AUEs for the summer grazing season. (May 15–October 15.)

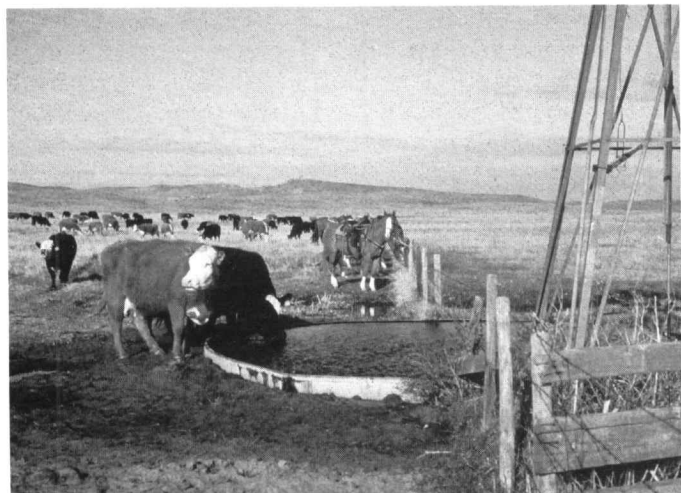
Calves normally wean at 450–500 pounds, depending on management and breed type. Many are marketed through local sale barns directly after pre-conditioning and weaning. Other calves are backgrounded on the unit before being sold or moved to the feedlot. Calves born in late summer and fall are often carried over to run on grass the following year, then marketed at one year of age.

Many ranchers in the Sand Hills area have moved from the traditional, summerlong, grazing of one pasture, to two-three-and four pasture rotation systems with one grazing period per pasture during the growing season. This partial summertime rest allows pastures to maintain desirable grass species with good vigor. Several ranchers have experienced success with more intensive grazing systems that may include 12–21 pastures (paddocks) with multiple grazings during the growing season. The overall success of these systems, and the related benefits to the land, are directly related to the individual ranch management.

Winter feed consists of stock-piled forage in ungrazed or lightly grazed Sand Hills pastures, wet meadow regrowth following summer haying, and prairie hay. Some ranches with limited hay resources rely only on small amounts of upland prairie hay, winter grazed pastures, and high protein cake. Operations with center pivot irrigation often have access to alfalfa hay as a winter protein supplement.

Wet meadow hay is generally harvested from July 1st–August 31st. The fluctuating height of the water table often determines when these meadows can be harvested with haying equipment. Some meadows are alternately hayed and grazed to maintain desirable warm season grasses in good health and vigor. Hay is routinely stacked (5–6 tons/stack) or baled in big round bales (1,300–1,600 lbs/bale).

Meadow regrowth after haying is commonly referred to as “aftergrass” or “aftergrowth”. This high quality regrowth is normally grazed in the fall after frost. Ranchers frequently graze this forage with recently weaned calves.



Shallow depth of groundwater provides water for large herds of cattle in planned grazing systems. Photo by Gary McCoy, NRCS.



Hay crew taking their noon break in the shade of the slide stacker in Cherry County. Photo by Marla Shelbourn.

Major resource concerns in the area are water quality and quantity, excessive wind erosion of highly erodible soils, and the overall health and vigor of rangeland. Interest in subirrigated meadow management and riparian area management has increased significantly in the past five years.

The Natural Resources Conservation Service provides technical assistance to landowners to encourage installation of conservation practices in the Sand Hills. These improvements include cross fencing of pastures and livestock water development to allow implementation of planned grazing systems. Brush management is used in the southwest to assist with the control of sand sagebrush. Range seeding is implemented on areas that were formally cropland to improve plant composition and overall production. Eastern red cedar control has become an important range practice to reduce unwanted trees in pastures in the northeast, east and south. A limited number of prescribed burns are used to control red cedar encroachment in the wet meadows.

Many Sand Hills ranches are currently managed by the original owner's second-or third-generation family. Along with inheriting the land, they have also inherited their ancestors' conservation ethic. The rolling sand dunes, now covered with grass, are unforgiving of management mistakes. Areas that become open to the wind can take years to heal over with vegetation. Due to the fragile nature of the resource, and the ranchers' commitment to maintaining their grasslands and meadows in the best possible condition, the Sand Hills have been well managed for generations. As more information becomes available on riparian area management and wet meadow management, many land owners are adding these tools to their conservation strategies.

In an effort to remain economically viable in an ever fluctuating cattle market, many ranchers are turning to enterprise diversification. The raising of bison and elk has gained popularity in the past decade. The strong market for

breeding animals, and their natural ability to exist in the Sand Hills, has made these animals a profitable addition or alternative to cattle.

Fee hunting has become increasingly popular in the past 10 years. The open expanse of the Sand Hills lends itself well to people who want to experience the solitude of the hills and the excellent hunting opportunities.

Sand Hills wildlife include big game populations of white-tailed deer and mule deer. Grouse, pheasants, turkeys, ducks, geese and mourning doves are the major upland and migratory game bird species. Some pronghorn antelope are found in the north central and western reaches. Numerous other waterfowl species and songbirds also inhabit the area.

Recreational opportunities in the Sand Hills include hunting, fishing, camping, hiking, bird watching, photography, canoeing, tubing, biking and cross-country skiing. The US Forest Service, US Fish and Wildlife Service and Nebraska Game and Parks Commission independently manage over 360,000 acres of public land. Many of these areas allow public access year-round with excellent facilities.

The Sand Hills are a unique ecosystem and special rangeland resource for Nebraska. The traditional ranching operations are an ecologically sound way to use the grasshills, and the sparse population means personal relationships and friendly residents predominate. Historically well-managed, the Sand Hills will prove to be a valuable rangeland resource for the next generation.

Reference Literature

An Atlas of the Sand Hills, Ann Bleed and Charles Flowerday, Editors

Resource Atlas No. 5a

First Edition: March 1989

Second Edition (expanded): May 1990

Conservation and Survey Division

Institute of Agriculture and Natural Resources

University of Nebraska-Lincoln

Editor's Note: This paper is one of a series describing some of the resources and features of Nebraska which may be of interest to attendees at the SRM Annual Meeting in Omaha in 1999.



Bull elk grazing in the observation pasture at Ft. Niobrara National Wildlife Refuge. Photo by Marla Shelbourn.

Marla Shelbourn is a Range Management Specialist at the Valentine field office. She has been employed by the SCS/NRCS for the past 17 years. Some of this article's text is based on her observations while working in 7 field offices serving the Sand Hills area. Her hands-on experience in the ranching industry complement her professional knowledge as she provides range assistance on nearly 3 million acres in her home county. The most challenging aspect of her job is working with ranchers to tailor usable grazing systems to match the needs of their livestock operations, while also protecting the fragile Sand Hills prairie. She would like to thank Charles Flowerday, Conservation and Survey Division, Jim Swinehart, Geologist, at the University of Nebraska-Lincoln, and the NRCS Range Management Specialists serving the Sand Hill area, for their constructive input on the article.