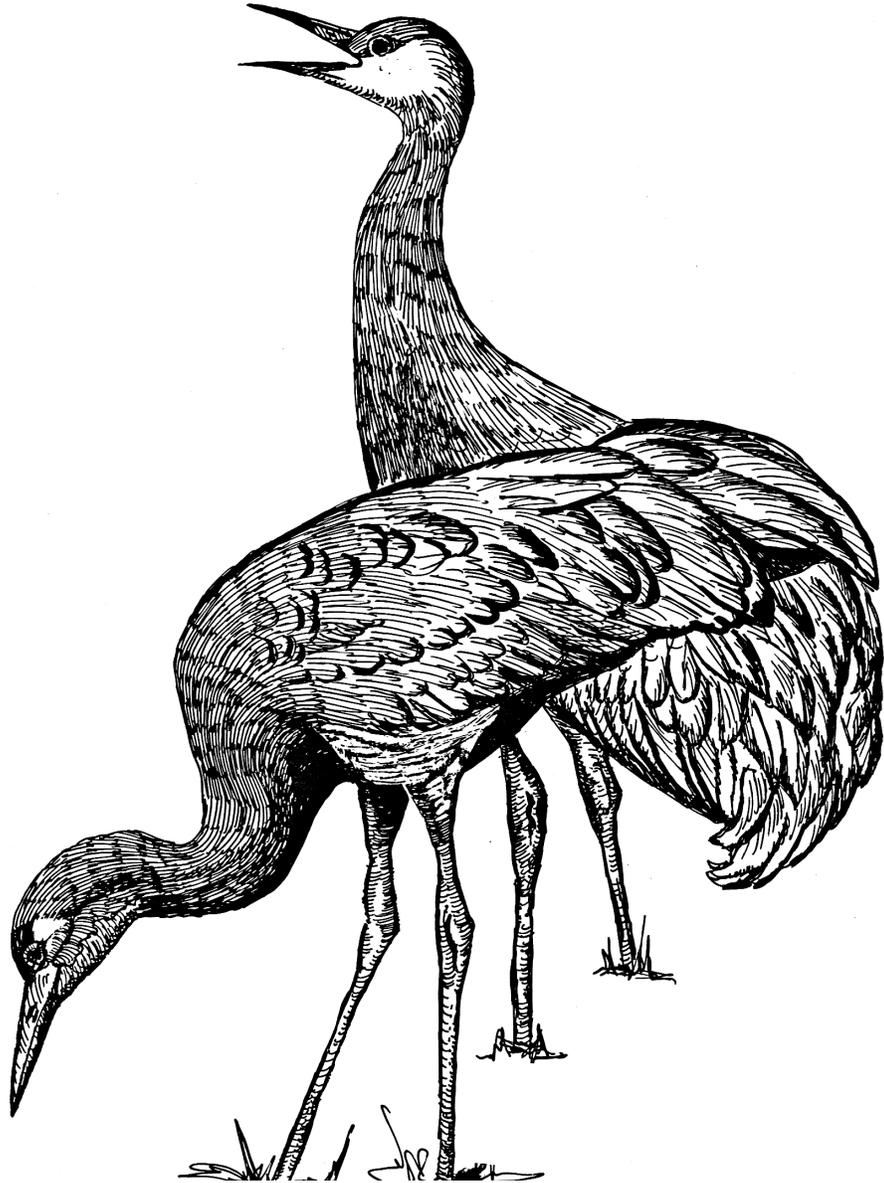


4 Affected Environment



4 Affected Environment

GENERAL OVERVIEW OF REFUGE

The refuge is six miles northeast of Sturgis, South Dakota, and is part of the Lacreek National Wildlife Refuge Complex headquartered in Martin, South Dakota. The refuge is within the boundary of Bear Butte State Park and is managed by the SDGFP. Sacred to the plains Indian tribes, the butte itself is the place where the god Maheo imparted to Sweet Medicine (a mythical hero) the knowledge from which the Cheyenne derive their religious, political, social, and economic customs. The butte site is a national natural and historic landmark. It is within the boundaries of Bear Butte State Park but is not on the refuge.

PHYSICAL ENVIRONMENT

AIR QUALITY

The National Ambient Air Quality Standards include maximum allowable pollution levels for particulate matter (a measure of microscopic liquid or solid particles that is respirable in the lungs), ozone, sulfur dioxide, nitrogen dioxide, lead, and carbon dioxide.

Air quality in the area of the refuge is considered good, with no nearby manufacturing sites or major air pollution sources. Carbon from automobiles and diesel engines, prescribed fire activities on the refuge, and dust associated with wind-blown sand and dirt from the roadways and fields contribute to particulate matter.

CLIMATE

January and February are the coldest months of winter. Late winter and early spring is western South Dakota's snow season. March is typically the snowiest month of the year.

Late spring is western South Dakota's rainy season, when the area receives over a third of its annual moisture. Precipitation in May comes mostly in showers. By June, thunderstorms are a common occurrence. June marks the peak of severe weather season.

Mid-summer around the Black Hills is warm and dry with plenty of sunshine. Sporadic afternoon and evening thunderstorms occur nearly every day in the summertime over the Black Hills. They usually produce only brief showers. Rainfall decreases as summer draws to a close.

Sunny, mild days and cool nights are typical during the months of September and October. The average first freeze occurs sometime between late August and



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Mink

September in the Black Hills. Winter weather starts sometime between November and December in the Black Hills. Snowfall averages about 5 inches each month, but most snow is light, as a typical month has only 2 days when more than 1 inch of snow falls.

PHYSIOGRAPHIC, GEOGRAPHY, AND SOILS

Bear Butte is a laccolith located in the Black Hills, an area of uplifted Precambrian on the Wyoming–South Dakota state line. Bear Butte is made of magma that never reached the surface to generate an eruption. The magma intruded to a shallow level and then stopped, cooled, crystallized, and solidified. Erosion then stripped the overlying layers of rock away. Bear Butte is at the east end of a linear belt of volcanic centers that continues westward about 60 miles to Devils Tower. The rock is called a trachyte based on its mineral composition, which includes alkali feldspar, with small amounts of biotite, hornblende, and pyroxene. Bear Butte rises 1,253 feet above the surrounding plain.

WATER RESOURCES

The Bear Butte Lake Project created the limited-interest refuge around Bear Butte Lake. It was a natural lake enhanced through the construction of a dam to capture runoff. An easement was established for the use of all water from an artesian well, which has since stopped flowing, and was abandoned by the state in May 1987. The SDGFP holds Water License #844-1 for 520 cubic feet-per-second from dry draws to stabilize Bear Butte Lake levels for recreational purposes (priority date April 12, 1968).

BIOLOGICAL RESOURCES

This section describes the existing and potential plant and animal communities in the refuge.

HABITATS

The refuge's habitats comprise mixed-grass prairie in the uplands with a very rapid transition to a lacustrine, or lake habitat, in the permanently impounded area within the high-water mark behind the dam. The plant community of the mixed-grass prairie is greatly influenced by precipitation and the great annual variability that occurs. The tall-grass prairies to the east receive greater annual precipitation than the short-grass prairies to the west. The plant community of the mixed-grass prairie reflects this difference, with species from both the tall- and short-grass prairies found here. Grasses dominate the uplands, including the native, cool-season species of western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Stipa viridula*), and needle and thread grass (*Stipa comata*). Exotic cool-season grasses, including smooth brome grass (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), and crested wheatgrass (*Agropyron cristatum*), have invaded the site and make up a significant portion of the plant community.

The remainder of the plant community comprises smaller percentages of the following: slender wheatgrass (*Agropyron caninum*), bluebunch wheatgrass (*Agropyron spicatum*), barnyard grass (*Echinochloa crusgalli*), little bluestem (*Schizachyrium scoparium*), foxtail barley (*Hordeum jubatum*), June grass (*Koeleria pyramidata*), marsh muhly (*Muhlenbergia racemosa*), rough leaf ricegrass (*Oryzopsis asperifolia*), Indian ricegrass (*Oryzopsis hymenoides*), western wheatgrass (*Pascopyrum smithii*), Timothy (*Phleum pratense*), Canada bluegrass (*Poa compressa*), Canby's bluegrass (*Poa canbyi*), inland bluegrass (*Poa interior*), squirreltail (*Sitanion hystrix*), needle and thread grass (*Stipa comata*), and porcupine grass (*Stipa spartea*).

The lake portion is primarily a deep-water habitat, supporting little to no emergent wetland vegetation. If the ongoing drought continues indefinitely, emergent

vegetation such as cattail and hardstem bulrush will likely become established and increase in dominance over time along the lake margins until a large runoff event fills the lake and returns it to deep-water habitat once again.

AQUATIC HABITAT

The refuge provides aquatic habitat for a range of plants and animals. Western painted turtles, blotched tiger salamander, and the upland chorus frog are found on the refuge. A variety of snakes including the western plains and wandering garter snake are found near water. The eastern yellow-bellied racer, bull snake, and prairie rattlesnake are abundant.

BIRDS

Bird populations on the refuge are dependent on the use and availability of natural resources, including water levels on the lake. Documentation of bird occurrence and use is not well developed for this refuge. Water birds seen on the refuge include American white pelicans, western grebes, double-crested cormorants, Canada and snow geese, mallards, and blue-winged and green-winged teals. Birds of prey seen on the refuge include Swainson's and red-tailed hawks and American kestrel. Shorebirds include killdeer, lesser yellowlegs, and upland sandpipers. Sharp-tailed grouse, American coot, burrowing owls, and black-billed magpie are also seen on the refuge. Bird use will likely follow a predictable pattern. As the lake remains dry, very shallow water will be found for short periods after rainfall and snow melt events. Shorebird, wading bird, and dabbling duck use will increase. If emergent vegetation becomes well established as a result of the low water conditions, species use will increase for marsh wrens, red-winged blackbirds, and other species that prefer this for nesting and feeding. When water returns after heavy runoff events, submerged aquatic vegetation will return, along with use by diving ducks, American white pelicans, and other species preferring



Canada geese taking flight

this more open water and the habitat it provides. A complete list of birds that occur on the refuge is in appendix E.

FISH

Bear Butte Lake has a surface area of 180 acres and a maximum depth of 13 feet. The lake is owned and managed by the SDGFP. Currently there are four primary game and forage and four secondary species of fish that occur in the lake. An extended drought completely dried up the lake in the late winter of 2006–07. As a result, the game fisheries was lost. When the lake fills again from a significant runoff event and weather patterns appear to be able to provide average rainfall to maintain water levels, the state may consider restocking the lake with game fish species. When there was sufficient water in the lake the primary game fish are large mouth bass, yellow perch, black crappie, and northern pike. Secondary species are green sunfish, fathead minnow rock bass, and black bullhead.

MAMMALS

Mammals that occur on the refuge include the common raccoon, black-tailed prairie dog, northern pocket gopher, deer mouse, eastern cottontail and whitetail deer, and bison.

THREATENED AND ENDANGERED SPECIES

There have been no official confirmed sightings of whooping cranes, although they do occur in Meade County. When the lake is full and boating and camping are at a peak, the water depth is not hospitable for cranes; they are much more likely to use the lake when the water level is low and boating is difficult to impossible, and public use is low as a result. The bald eagle was removed from the federal list of threatened and endangered wildlife and plants in August 2007. The bald eagles is listed as a state threatened species.

CULTURAL RESOURCES

The region is sacred to Native Americans of the plains who consider the Black Hills to be the *axis mundi*, the center of the world.

Bear Butte's geological feature was an important landmark and religious site for plains Indian tribes dating back 10,000 years, well before Europeans reached South Dakota, and it continues to be today. The Lakota also call Bear Butte Mato Paha, or Bear Mountain. To the Cheyenne, it is Noahvose. The mountain is sacred to many indigenous peoples, who make pilgrimages to pray and leave prayer ties on the branches of trees along the trail that leads to the top of the butte.

Notable tribal leaders including Red Cloud, Crazy Horse, and Sitting Bull have all visited Bear Butte. These visits culminated with an 1857 gathering of many Native American nations to discuss the advancement of white settlers into the Black Hills.

U.S. Army cavalry commander George A. Custer, who led an expedition of over a thousand men into the region, camped near the mountain. Custer verified

the rumors of gold in the Black Hills. Bear Butte then served as a landmark that helped guide the rush of invading prospectors and settlers into the region.

SPECIAL MANAGEMENT AREAS

WILDERNESS

To be designated a wilderness area, lands must meet certain criteria as outlined in the Wilderness Act of 1964:

- Generally appear to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable;
- Have outstanding opportunities for solitude, or a primitive and unconfined type of recreation;
- Have at least 5,000 acres of land, or be of sufficient size as to make practicable its preservation and use in an unimpaired condition, and;
- May also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Bear Butte National Wildlife Refuge does not meet the criteria for a wilderness area.

Bear Butte itself was placed on the National Register of Historic Places in 1973 and became a national natural landmark in 1965. The National Natural Landmark program recognizes and encourages the conservation of outstanding examples of our country's natural history. It is the only natural areas program of national scope that identifies and recognizes the best examples of biological and geological features in both public and private ownership.

The trail leading to the summit is designated a national recreation trail. As part of the George S. Mickelson Trail, which spans 114 miles across four counties, this "crown jewel" of the state park system provides a unique educational and recreational experience for visitors of all ages. Winding through the heart of the Black Hills with numerous bridges and tunnels, this rail-trail brings to life the area's rich history with stories of Native Americans, miners, railroad workers, and many others.

Due to the configuration of the refuge within the state park, it does not have these designations as a national register property, national natural landmark, or a national recreation trail.

VISITOR SERVICES

Because the refuge is located within Bear Butte State Park, a number of park facilities exist. The park offers a hiking trail around Bear Butte Lake; 16 nonelectric campsites; fishing for bullheads, crappies, and northern pike; and the use of boats with 25-horsepower or smaller motors. There is a wheelchair-accessible fishing dock. A horse camp is provided on the southeast side of the lake. Two miles of natural trail exists around Bear Butte Lake; however, horseback riding is only allowed west of Highway 79. The park's hiking trail connects

to Centennial Trail, which leads horseback riders through the Black Hills. The horse camp with primitive sites, water, and corral is available on a first-come, first-served basis only. Hunting, especially deer and waterfowl, is very popular in the area. The state does not allow hunting in some sections of the park; however, hunting on open areas of the state park occur on a very infrequent basis. Uncased firearms and bows are prohibited year-round in the designated campground and within the park east of Highway 79.

SOCIOECONOMIC ENVIRONMENT

This section characterizes current socioeconomic conditions in Meade County, South Dakota.

Bear Butte is located in Meade County, South Dakota. According to the 2000 census, the county has a population of 24,253–8,805 households and 6,700 families. The average household size is 2.66 and the average family size is 3.05. The racial makeup of the county is 92.65% white, 2.10% Hispanic or Latino, 2.04% Native American, 1.48% black or African American, 0.63% Asian, 0.07% Pacific Islander, 0.61% from other races, and 2.52% from two or more races. According to the 2000 census, educational, health and social services are the largest industries, followed by retail-trade arts, entertainment, recreation, accommodation, and food services. The median family income is \$40,537 per year.

Hard-surfaced state and federal highways bisect the county in both north-south and east-west directions.

Sturgis is the nearest city to the state park and the refuge. As of the 2000 census, the city had a total population of 6,442. The median income for a household in the city is \$30,253 and the median income for a family is \$38,698. The racial make up is similar to the rest of the county.

Every August the city hosts one of the largest annual motorcycle events in the world. The campground at Bear Butte State Park is used by motorcycle enthusiast during the motorcycle rally. The number of campground and state park users increase during this period.



Picnic Shelter

Tom Koerner / USFWS

