

Prairie Dogs

Overview

Prairie dogs, occurring only in North America, are burrowing rodents belonging to the squirrel family. Prairie dogs are diurnal and live in colonies, or “towns,” which sometimes contain thousands of individuals and extend for miles. There are five species of prairie dogs—the black-tailed prairie dog (*Cynomys ludovicianus*), white-tailed prairie dog (*Cynomys leucurus*), Gunnison’s prairie dog (*Cynomys gunnisoni*), Utah prairie dog (*Cynomys parvidens*), and Mexican prairie dog (*Cynomys mexicanus*)—all of which may be considered rare (Hoogland 2006a). After 200 years of shootings, poisonings, conversion of habitat, and more recently plague, prairie dog numbers are a fraction of what they once were. Two of the species (Utah and Mexican) are listed as threatened or endangered under the Endangered Species Act (ESA). The black-tailed and white-tailed prairie dogs are currently under review by the U.S. Fish and Wildlife Service (USFWS) to determine whether the species might warrant protection under the ESA. In 2008, the USFWS determined that some populations of the Gunnison’s prairie dog are a candidate for listing.

The black-tailed prairie dog, the most abundant, widespread, and conspicuous of the species, generally occurs east of the other prairie dogs and occupies about 6,600-6,900 acres of land managed by the National Park Service (NPS) in the western U.S. (USFWS 2004; Sidle et al. 2006). Because this is the most abundant/widespread prairie dog species in the American Southwest, it is the focus of this Overview. However, the Gunnison’s prairie dog also occurs in the Southwest and is discussed.



PHOTO: ROB BENNETTS

Burrowing owls

OVERVIEW



PHOTO: RON SINGER

Figure 1. Black-tailed prairie dogs (note black tip of tail)

Although their consideration as a keystone species is controversial, the prairie dog has a pronounced impact on its ecosystem (Kotliar et al. 2006). Prairie dogs increase habitat diversity and contribute to grassland ecosystem processes. Prairie dogs clip the vegetation and maintain open habitats preferred by some animals (e.g., such as the horned lark [*Eremophila alpestris*] and mountain plover [*Charadrius montanus*]). Many species, such as American badgers (*Taxidea taxus*), prairie rattlesnakes (*Crotalus viridis*), burrowing owls (*Athene cunicularia*), and the federally endangered black-footed ferret (*Mustela nigripes*), prey on prairie dogs or use their burrows for shelter.

Distribution

The historic range of the black-tailed prairie dog extended to the east, north, and south of the combined ranges of the white-tailed, Gunnison’s, and Utah prairie dogs (Hoogland 2006a). Overlap in the ranges of the species is so small that location can be used to identify species. Mexican and black-tailed prairie dogs generally live at lower elevations than the other species (Hoogland 2006a).

Black-tailed Prairie Dogs

Living on grassy plains or prairies, the historic range of the black-tailed prairie dog included parts of Canada, Mexico, and eleven states. Today it occurs from extreme south-central Canada to northeastern Mexico and from the Rocky Mountains east to about the 98th meridian (which passes through the Dakotas, Nebraska, Kansas, etc. on south), still inhabiting



parts of eleven states. Six of these states—Arizona, Colorado, Kansas, New Mexico, Oklahoma, and Texas—are in the four Inventory and Monitoring (I&M) Networks of the American Southwest, and five of the states—Montana, Nebraska, North Dakota, South Dakota, and Wyoming—are outside of the area. Of the area of NPS-managed lands occupied by the black-tailed prairie dog, the vast majority are in three parks (Badlands NP, Theodore Roosevelt NP, and Wind Cave NP) outside of the Southwest (Sidle et al. 2006).

Estimates of prairie dog populations are usually based on the amount of occupied habitat, rather than on the number of individual animals (USFWS 2009). Density of black-tailed prairie dogs typically ranges between two and 18 animals per acre, depending on the region, season, and climate. Temporal variations in density may also result from plague, poisoning, or recreational shooting. Historically, black-tailed prairie dogs were thought to have occupied 80 to 100 million acres range-wide. Today, the species is thought to occupy 2.1 million acres of habitat.

Within the American Southwest, the black-tailed prairie dog is known to occur within or directly adjacent to several national park units. Within the Southern Plains Network (SOPN), the species occurs at Fort Larned National Historic Site (NHS) (FOLS) in Kansas and Bent's Old Fort NHS (BEOL) and Sand Creek Massacre NHS (SAND) in Colorado. At SAND, a prairie dog complex occupies approximately 228 acres of the park and is expected to expand if left undisturbed (Sovell 2008).

The black-tailed prairie dog is not known to occur at this time within any parks of the Sonoran Desert Network (SODN), although historically the species occurred at/near Coronado National Monument (NM) (CORO), Fort Bowie NHS (FOBO), and probably Chiricahua NM (CHIR). There is currently a population south of Coronado, in Sonora, Mexico, and there was a recent reintroduction of the species in Sonoita, Arizona



Horned lark

PHOTO: ROBERT SHANTZ

(see “Status” section for more details). In the CHDN, there was an attempt to restore prairie dogs at Guadalupe Mountains NP (GUMO), but it was unsuccessful (Sidle et al. 2006). The species also occurred historically at Amistad National Recreation Area (NRA) (AMIS), Carlsbad Caverns NP (CAVE), and possibly Fort Davis NHS (FODA) and White Sands NM (WHSA).

Gunnison's Prairie Dogs

Gunnison's prairie dog habitat occurs in four states—Arizona, Colorado, New Mexico, and Utah (Hoogland 2006a; USFWS 2008). Populations of this species occur in either higher elevations (referred to as montane populations) or lower elevations (referred to as prairie populations) (USFWS 2008). The montane habitat occurs in the northeastern portion of the range—in central and south-central Colorado and north-central New Mexico; about 35-40% of the species' current range consists of this habitat. The prairie habitat occurs in the southwestern portion of the range—in southeastern Utah, southwestern Colorado, northwestern New Mexico, and northern Arizona; about 60-65% of the species' current range consists of this habitat. In the montane habitat prairie dogs occupy grass-shrub in low valleys and mountain meadows, and in the prairie habitat prairie dogs occupy short-grass and midgrass prairies. Of potential habitat within the prairie dog's range, 43% occurs on private lands, 27% on state and federal lands, and 30% on tribal lands.

Of the four networks in the Southwest, the Gunnison's prairie dog occurred historically and occurs today primarily within the Southern Colorado Plateau Network (SCPN). Historically, the species occurred within at least ten parks in the SCPN. It presently occurs within El Malpais NM (ELMA), El Morro NM (ELMO), Chaco Culture NHP (CHCU), and Petrified Forest NP (PEFO), and it may occur at Aztec Ruins NM (AZRU), Hubbel Trading Post NHS (HUTR), and Mesa Verde NP (MEVE). Although a few acres of habitat may be inhab-



PHOTO: BRYAN HARRY

American badger

ited at AZRU, a die-off due to the sylvatic plague occurred in the last decade. Within the SOPN, the species is known to have inhabited Pecos NHP (PECO); however, the habitat is no longer supportive of prairie dogs due to the encroachment of juniper and pinyon.

Physical Description

Prairie dogs have small ears, relatively large black eyes, a short tail, and muscular legs. They are recognized as falling into two subgroups, with the black-tailed and Mexican in one group, and the remaining three species, including the Gunnison's, in the other group. A physical difference between the two subgroups is that black-tailed and Mexican prairie dogs have black-tipped tails that are long (2-3 inches), while the other species have white- or gray-tipped tails that are shorter (1-2 inches) (Hoogland 2006a). Another difference that is noticeable at colony-sites is that black-tailed and Mexican prairie dogs do not hibernate, as opposed to the other species which stay underground for about four months during late fall and winter.

The black-tailed prairie dog is so named because of its characteristic, black-tipped tail (Figure 1). The species is approximately 14-17 inches long and weighs one to three pounds. The black-tailed prairie dog's fur is buff-colored and it often blends with the color of the soil. Male prairie dogs are larger than females, except perhaps for females in late pregnancy (Hoogland 2006b). For prairie dogs that survive their first year, males often live 2-3 years (and up to 5) and females often live 4-5 years (and up to 8).

The Gunnison's prairie dog is about 12-15 inches long and weighs between 1.4 and 2.6 pounds (USFWS 2008), with males usually larger than females. Their coloring is yellowish buff with blackish hairs intermixed. Noticeably darker in color are the tops of their heads, sides of cheeks, and eyebrows. The species varies from other species in its group by having hairs in the tip of its tail that are grayish-white instead of pure white (Figure 2).

As important as a description of the prairie dog itself, is that of its colony-site. Colony-sites may extend for miles and contain hundreds of mounds that surround the burrow entrances. Black-tailed prairie dog mounds may be as high as 2.5 feet, with a diameter up to 7 feet (Hoogland 2006c). Because black-tailed prairie dogs eat or clip grasses and other plants that grow taller than about 12 inches, vegetation at colony-sites is relatively short. In contrast, within colonies of Gunnison's prairie dogs, shrubs are often more than 20 inches tall (Hoogland 2006a).



PHOTO: ROBERT SHANTZ

Figure 2. Gunnison's prairie dogs (note whitish tail)

Ecology

This section provides a brief description of the ecology of the black-tailed prairie dog, and notes some differences between the black-tailed and Gunnison's prairie dogs. Detailed ecological information on the two species are available elsewhere, such as in *Conservation of the Black-Tailed Prairie Dog: Saving North America's Western Grasslands* (Hoogland 2006) and in *Colorado Gunnison's and White-tailed Prairie Dog Conservation Plan* (Colorado Division of Wildlife 2008). Various websites also provide information and pictures on the species (e.g., http://www.nps.gov/archive/wica/prairie_dog.htm).

Prairie dogs are an important component of the ecosystems they inhabit. They directly and indirectly influence grasslands through their grazing and burrowing and as prey (Kotliar et al. 2006). Through their foraging and clipping of vegetation to maintain their habitat, as well as the mixing of subsoil and topsoil during excavations, prairie dogs affect the redistribution of minerals and nutrients, encourage penetration and retention of moisture, and affect plant species composition (Kotliar et al. 2006). Although they reduce the biomass of vegetation,



PHOTO: VICTORIA DIETZ

Mountain plover

they often also enhance the digestibility, protein content, and productivity of grasses and forbs at colony-sites (especially young colony-sites) that are preferred by large herbivores.

Prairie dog burrows and colony-sites provide shelter and nesting habitat for a variety of animals, including insect and arachnid species, burrowing owls (*Athene cunicularia*), mountain plovers (*Charadrius montanus*), horned larks (*Eremophila alpestris*), and black-footed ferrets (*Mustela nigripes*). Among the animals that consume prairie dogs are black-footed ferrets, American badgers (*Taxidea taxus*), long-tailed weasels (*Mustela frenata*), bobcats (*Felis rufus*), coyotes (*Canis latrans*), ferruginous hawks (*Buteo regalis*), golden eagles (*Aquila chrysaetos*), prairie falcons (*Falco mexicanus*), bull snakes (*Pituophis melanoleucus*), and prairie rattlesnakes (*Crotalus viridis*). Additional mammals occasionally prey on prairie dogs (e.g., various fox species).

Within colonies, prairie dogs live in family groups called coterie. The size of a coterie ranges from 1 to 26, but a coterie generally consists of 1 breeding male, 2-3 adult females, and 1-2 yearling offspring of each gender (Hoogland 2006a). A coterie maintains a well-defined territory that is defended from prairie dogs of other coterie. Most females live their entire lives within their natal territory, while most males remain in the natal territory for only one year (Hoogland 2006b). After their first year, males disperse to another territory within the colony-site, or to another colony.

Most black-tailed prairie dogs reach sexual maturity and mate in the second February-March following birth. Female black-tailed prairie dogs have one litter of young per year. Breeding takes place in late January through early March, and gestation length is typically 34-35 days. On average, young emerge from the natal burrow 41 days after birth. The most common litter size is 3. The main causes of mortality for black-tailed prairie dogs are predation, infanticide, and inability to survive the winter (Hoogland 2006b).

The Gunnison's prairie dog is an important member of the sagebrush ecosystem, where it creates and maintains habitat and provides food for other wildlife. Coterie size ranges from 2 to 19 individuals; a coterie may consist of one male and one female, one male and multiple females, or multiple males and multiple females (Colorado Division of Wildlife 2008). The breeding season for this species lasts for about 2-3 weeks in mid-March to mid-May. Females of this species also produce one litter per year, and young emerge from burrows at 28-35 days of age.

Gunnison's prairie dog populations appear less able to recover from the sylvatic plague compared to other prairie dog species (USFWS 2008). This may be because the species has not



PHOTO: BRYAN HARRY

Coyote

yet developed a resistance because the disease has not been within its range for long (about 70 years). For both black-tailed and white-tailed prairie dogs, partial or complete recovery has been reported for populations following reductions due to plague; however, little to no recovery to previous levels has been reported for montane Gunnison's populations, even after long periods of time. The USFWS noted that it considers sylvatic plague to be the most significant factor affecting the species (USFWS 2008).

Status in the American Southwest

Black-tailed Prairie Dogs

The area once inhabited by the black-tailed prairie dog has dramatically declined due to a number of factors, including intensive control programs, conversion of habitat to agriculture, disease (sylvatic plague), unregulated recreational shooting, and urbanization. The sylvatic plague, caused by the bacterium *Yersinia pestis*, is a disease transmitted by fleas; it can be contracted by many different mammals and may kill nearly all prairie dogs in an infected colony (USGS 2008). Management of the black-tailed prairie dog varies substantially across its range where its consideration by different states includes extirpated, species of special concern, wildlife, small game species, rodent, and vertebrate pest (USGS 2009). In Arizona, for example, a multi-partner reintroduction effort released 74 black-tailed prairie dogs from a ranch in New Mexico into the Las Cienegas National Conservation Area near Sonoita in late 2008 (Arizona Game and Fish Department 2008). The ultimate goal of the reintroduction effort is to bring this "critical keystone" species back to Arizona to where it once existed.

The USFWS designated the black-tailed prairie dog as a candidate species for listing under the ESA in 2000 (USFWS 2000). However, in 2004, the USFWS concluded that the prairie dog was no longer a candidate species, due to an earlier underestimate of the area inhabited by prairie dogs, and a likely overestimate of the threat posed to prairie dogs from plague

(USFWS 2004). As of 2009, the USFWS is again reviewing biological information on the species to determine whether to propose adding it to the federal list of threatened and endangered species. Comments were accepted from the public on this review until January 30, 2009 (USFWS 2009).

In the late 1990s, in response to the USFWS considering the black-tailed prairie dog for listing, representatives from the eleven states within the prairie dog's range formed the Interstate Black-tailed Prairie Dog Conservation Team (Luce et al. 2006). The team developed a plan—*A Multi-State Conservation Plan for the Black-tailed Prairie Dog, Cynomys ludovicianus, in the U.S.* The goal of the plan was to maintain 1.6 million acres inhabited by prairie dogs, and to increase the area inhabited to 1.7 million acres by 2011. Table 1 shows the area inhabited by black-tailed prairie dogs in 2003 and the 2011 goal for states in the I&M Networks in the Southwest.

Table 1. Area in 2003 and goals for 2011 for states in the Southwest occupied by black-tailed prairie dogs. Taken from Luce et al. (2006).

State	Acres Occupied in 2003	Goal for Acres Occupied in 2011
Arizona	0	4,598
Colorado	631,578	255,966
Kansas	130,619	148,707
New Mexico	60,045	87,197
Oklahoma	64,263	68,708
Texas	197,149	293,350

Gunnison's Prairie Dog

Numbers of Gunnison's prairie dogs have decreased for the same reasons as those described for the black-tailed prairie dog. In Spring of 2008, the USFWS announced that populations of the Gunnison's prairie dog in central and southern Colorado and north-central New Mexico (i.e., those occupying "montane" habitat) met criteria for protection under the ESA. However, listing of the species is considered a lower priority than the listing of other species, so the Gunnison's prairie dog was placed on the list of Candidate Species.

The Interstate Black-tailed Prairie Dog Conservation Team was expanded in 2002 to include management of the Gunnison's and white-tailed prairie dogs (Colorado Division of Wildlife 2008). State wildlife agencies within the range of the Gunnison's began coordinating management efforts and formed a working group. All states within the range of the prairie dog are managing the species, including by developing long-term monitoring protocols.

Management Activities

Because prairie dogs are both an important component of the ecosystem and, in some cases, damaging to other resources within and adjacent to the parks, their management is important and complex. It is NPS policy to conserve and recover prairie dogs wherever possible. However, populations can be controlled for purposes of human health and safety, good neighbor relations, and to stop or prevent damage to park resources and facilities.

Black-tailed Prairie Dogs

At FOLS, prairie dogs may be damaging historic wagon ruts of the Santa Fe and Oregon trails. At BEOL, their activities have threatened a prairie restoration site, and at both BEOL and SAND they have threatened archeological sites and caused concerns with adjacent landowners who do not want prairie dogs to move from the park onto their land. In the last few years, managers at FOLS and BEOL have removed prairie dogs in response to these concerns. At SAND, the NPS is developing a black-tailed prairie dog management plan with the goal of managing for long-term, self-sustaining prairie dog populations while avoiding negative impacts to adjacent landowners.

The management plan under development at SAND discusses management options for controlling prairie dogs, including: use of vegetative barriers and/or grazing management to discourage colony expansion; conservation easements; use of fencing and other visual barriers to prevent colony expansion; live trapping and translocation of prairie dogs; directed sport shooting to site-specific areas; and use of approved rodenticides to control populations. To avoid adverse impacts to vegetation from high prairie dog densities, the plan suggests a goal of maintaining 10 prairie dogs per acre at SAND. Under the plan, monitoring of both prairie dogs and vegetation would be conducted (Sovell 2008).



Prairie rattlesnake

PHOTO: ROY WOOD

Additional information is needed on the prairie dog populations at SAND, FOLS, and BEOL, their dispersal to adjacent lands, the degree of damage they may cause, and the results of control efforts. To address these needs, a project is beginning at FOLS, BEOL, and SAND, as well as Scotts Bluff National Monument in Nebraska. The project (*Status and Management of Black-tailed Prairie Dogs on Small Cultural National Parks of the Western Great Plains*), by Cully (USGS) and Willson (NPS) will collect mark-recapture data for multiple years. At each park the study will establish baseline information on the distribution, abundance, population growth rates, and dispersal of resident prairie dogs. Monitoring was already underway at BEOL, but the new study will provide additional information.

At FOLS, researchers will map prairie dog burrows and determine whether they are active or inactive, which will assist in assessing soil disturbance in and near the trail ruts. They will also identify the occurrence of species associated with prairie dog colonies at each park. The project results will be valuable in developing science-based management plans to control adverse impacts of prairie dogs on park resources and adjacent lands, while conserving prairie dogs and associated species.

Gunnison's Prairie Dog

As discussed previously, Gunnison's prairie dog populations may have a more difficult time recovering from the sylvatic plague than other species. Outbreaks of plague at PEFO, within the SCPN, killed most colonies in the park. High populations at AZRU were leading to potential concerns for vegetation and adjacent land owners, but a die-off due to plague in the last decade reduced populations and eliminated the concerns for other resources. Development of a management plan for prairie dogs at PEFO has been noted as an ongoing need.

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PHOTO: CURTIS CARLEY

Black-tailed prairie dogs