ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMAFB06010
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Cynomys ludovicianus*
COMMON NAME: Black-tailed Prairie Dog; Arizona Black-tailed Prairie Dog
SYNONYMS:
FAMILY: Sciuridae

AUTHOR, PLACE OF PUBLICATION: Mearns, Bull. Amer. Mus. Nat. Hist. 2:303. 1890.

TYPE LOCALITY: Subspecies *arizonensis*: Point of Mountain, near Willcox, Cochise County, Arizona.

TYPE SPECIMEN: Subspecies *arizonensis* was collected by Mearns in 1885 at Point of Mountain near Willcox, Cochise County, Arizona, and was originally described in 1890 as a new species, the Arizona prairie dog (*Cynomys arizonensis*).

TAXONOMIC UNIQUENESS: Five species are recognized in the genus *Cynomys*, belonging to two subgenera (Wilson and Reeder 2005, American Society of Mamalogists 2023). The white-tailed subgenus, *Leucocrossuromys*, consists of *C. parvidens*, *C. leucurus*, and *C. gunnisoni* (the only one to occur in Arizona). The black-tailed subgenus, *Cynomys*, consists of *C. ludovicianus* (Black-tailed Prairie Dog) and the Mexican endemic *C. mexicanus*.

Two subspecies of black-tailed prairie dog have been recognized, the nominate form and the Arizona prairie dog (*C. ludovicianus arizonensis*) (Hall 1981, Hoogland 1996). These two subspecies have been the subject of several investigations regarding their taxonomic status, including those of Hollister (1916), Pizzimenti (1975), Hansen (1977), and Chesser (1981, 1983). Genetic studies suggest that the Arizona form does not qualify for subspecies status (Chesser 1981). Regardless of the differing conclusions, it is generally believed that *C. l. arizonensis* is only slightly differentiated from *C. l. ludovicianus*, so for convenience **it is acceptable to regard this species as monotypic** (Hicks and Van Pelt 2009)**.** Hoffmeister (1986) also considered the species as monotypic. However, from a conservation and evolutionary standpoint, the difference of these two subspecies may have significant management implications, and the two are still recognized (Wilson and Reeder 2005). According to Hoffmeister (1986), the *C. l. arizonensis* specimen from Willcox, demonstrated a difference at the $P < .05$ level for hind foot with no significant difference in the other 17 measurements.

DESCRIPTION: The black-tailed prairie dog (BTPD) is a large, burrowing, ground squirrel belonging to a group of four other prairie dog species found only in North America. It is the largest of all *Cynomys* species weighing 700-1500 g (24.69-52.91 oz), and measuring 28-33 cm (11-13 in) from nose tip to rear end. They have short, black-tipped tail (usually greater than 7.0 cm (2.75 in); 15%-30% of the body length) and small ears. There are no distinguishing markings on their yellowish brown fur; belly is lighter. The 22 teeth include sharp incisors for clipping plant leaves and stems. Females have four pair of functional mammae.

AIDS TO IDENTIFICATION: *Cynomys gunnisoni* also occurs in Arizona, though not within the historic range of *C. ludovicianus*. The tail of *C. gunnisoni* is tipped with white, and there are five pairs of functional mammae.

ILLUSTRATIONS:

Color photos (*In* https://animaldiversity.org/accounts/Cynomys_ludovicianus/

Color photo (George Andrejko, *in* https://awcs.azgfd.com/species/mammals/cynomys-ludovicianus)

TOTAL RANGE: The species is distributed through northern Chihuahua and Sonora Mexico, west Texas, eastern and southern New Mexico, and southeast Arizona northward through eastern Colorado and the western plains states to southern Saskatchewan Canada (Burt and Grossenheider 1976). The subspecies *arizonensis* ranges from northern Sonora, Mexico north into west Texas, southern and eastern New Mexico, and formerly into southeast Arizona. The subspecies *ludocicianus* ranges from New Mexico and north Texas north through Oklahoma, Kansas, Nebraska, Colorado, Wyoming, Montana, North Dakota, South Dakota, and into Canada.

RANGE WITHIN ARIZONA: Formerly southeast Arizona, from the west side of the Huachuca Mountains eastward, and from Bonita southward through the Sulphur Springs Valley, but extirpated by 1961. The Arizona Game and Fish Department started to re-establish BTPD in 2008 within the Las Cienegas National Conservation Area in SE Arizona. Four small colonies have been established by 2012, The goal of this Department program is to have BTPD occupying 7,100 acres in 3 of the 4 counties of the historic distribution (Cochise, Graham, Pima and Santa Cruz).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Prairie dogs are diurnal, active only during daylight hours, and spend a lot of time feeding and socializing. They live in towns, which can cover 1 to 1000 acres. Within the towns, each family or coterie of prairie dogs occupies a territory of about one acre. The basic prairie dog coterie comprises one adult male (at least 2 years old), three or four adult females, and several yearlings or juveniles (Hoogland and Foltz 1982). Large coteries with two or more males occasionally occur. Females remain in their coterie for life, whereas males

usually leave within 12-14 months after weaning. The coterie system deteriorates in spring during gestation and lactation (King 1959). An organizational level higher than the coterie, is the ward (King 1959), a town subdivision described according to topographic features. Black-tails do not hibernate during winter. They may remain underground for several days during bad weather (a month or more has been documented in severe winter conditions), but on clear days they will be visible again. According to Hoffmeister (1986), black-tailed prairie dogs have been studied in detail in Colorado, Wyoming and South Dakota. The main predators of these prairie dogs are black-footed ferrets and badgers. The life span for animals in the wild averages 3-4 years, but females can live to eight years. BTPD have an extensive system of vocalizations and visual cues for communication; they have different alarm calls for different predators (e.g., hawk vs. coyote).

REPRODUCTION: The breeding system is harem-polygynous, with most females copulating with one male and males with several females. Females are in estrous for several hours of only one day per year, though if conception fails they can undergo a second estrous. According to Hoffmeister (1986), for the species as a whole, breeding occurs in late February and young are born in late March to early April. Gestation averages 35 days. Adult females give birth to 1-8 "pups," which remain underground until early May, when they come above ground to forage on green vegetation. Usually, only about 3 pups survive to this stage. They reach almost adult size by the end of the summer. Though most adult females become pregnant, juvenile mortality is high with only one half of copulating females weaning a litter. Minimum breeding age is two years for both sexes.

FOOD HABITS: They consume a wide variety of grasses, weeds and shrubs, feeding on the stems, leaves and seeds, however, forbs are preferred over grasses. They have also been known to eat insects. This vegetative diet also provides moisture from the plants themselves; they do not need a source of water. When above ground vegetation is in short supply, roots are dug as a required food supply. Food items are apparently not stored below ground.

HABITAT: Dry, flat, open plains and desert grasslands. Since prairie dogs do not like tall grass (<30cm preferred), they will choose a site with little vegetation, often in areas heavily grazed by cattle. Slope should be <10%. Burrows are usually quite visible because of the large mound of dirt around the entrance. The mounds provide both a vantage point (often to detect predators) and protection from flooding. Fine to medium textured soils are preferred presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils. Colonies are commonly found on silty clay loams, sandy clay loams, and loams, with very little gravel and good drainage. More specifically, <30% clay, ~50% sand and >70% silt (Roe and Roe, 2003). Tunnels extend downward 3-10 feet, then horizontally for another 10-15 feet, and average 4-5 inches in diameter. These systems are arranged so that wind blows through and provides ventilation. Several tunnels are excavated from the main tunnel to provide nesting and resting areas, and to avoid the hotter part of summer days. A chamber is dug from one of these tunnels and used as the bathroom. When it becomes full, another is dug.

ELEVATION: Elevation range is from 2,300 – 7,200 ft. (700 – 2,200 m).

PLANT COMMUNITY: Short to mid-height, Plains and Desert grasslands.

POPULATION TRENDS: *Cynomys ludovicianus* once occurred in considerable numbers in Arizona but were extirpated by 1961. In 2008, the Arizona Game and Fish Department initiated a re-introduction program within the historic range in SE Arizona. As of 2013, four small colonies have been stocked.

The Global Status appears to be secure but at a greatly reduced level (NatureServe 2023). Throughout its range, there are many occurrences and large populations (millions), but the extent of both occupied habitat and abundance have been reduced from historic levels by about 98%. Overall threats (see Management, below) are rated as moderate and not as serious as previously believed.

The Global Short-term Trend is declining in some areas, increasing in others; overall trend at present probably stable or slightly decreasing, with a long-term outlook of slow decline (USFWS 2002). The largest increases are in South Dakota, where the populations are recovering from past persecution in an area that is still plague-free (S. Linner, USFWS, pers. comm.). Some of the past abundance and trend information is in question, and USFWS (2002) emphasized the danger of determining trends based on abundance estimates derived in different ways at different times.

A small stable population exists in Canada (Laing, 1988 COSEWIC report; USFWS 2000). Range and abundance continue to decline in Mexico, where the largest remaining black-tailed prairie dog complex exists. From 1988 to 1996, range decreased by 80 percent and occupied habitat declined by 34 percent (see USFWS 2000).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:

CCA (AZGFD 2009)
NW (USDI, FWS 2009)
[UR (USDI, FWS 2008)]
[PTN (WildEarth Guardians 2007)]
[Rc (USDI, FWS 2005)
NW (USDI, FWS 2004b)
[C+ (USDI, FWS 2004a)]
[C (USDI, FWS 2000, 2001, 2002]
[UR (USDI, FWS 1999)]
[PTN (National Wildlife Federation 1998, Biodiversity Legal Foundation 1998)]
[SC (USDI, FWS 1996)]

[C2 at subspecies *C. l. arizonensis* (USDI, FWS 1985, 1989, 1991, 1994)]

STATE STATUS: 1 (AZGFD, AWCS 2022)
[1A (AGFD SWAP 2012)]
[WSC (AGFD, WSCA 1996 in prep)]
[Endangered (AGFD, TNW 1988)]

OTHER STATUS: Forest Service Sensitive, in NM. USDA, FS Region 3, 2013 (not known to occur on FS land in AZ)
Bureau of Land Management Sensitive (USDI, BLM 2008, 2010, 2017)
LC (IUCN, Cassola 2016)
[Forest Service Sensitive at subspecies *C. L. ludovicianus* (USDA, FS Region 3 2007)]
[Forest Service Sensitive (USDA, FS Region 3 2000)]
[Forest Service C2 at subspecies *C. l. arizonensis* (USDA FS Region 3 1988)]
Determined Threatened (Secretaria de Medio Ambiente 2000, 2010)
[Determined Threatened, Secretaria de Desarrollo Social 1994]

MANAGEMENT FACTORS: According to NatureServe (2023), threats fall into four main categories. 1) Exotic disease, particularly sylvatic plague (*Yersinia pestis*) to which prairie dogs are highly susceptible. Outbreaks have been documented to kill more than 99% of BTPDs in a colony, so plague is still of concern to local populations and long term persistence. However, given that about 10% of the historical range is both plague-free and available, limited immune response has been observed in some individuals, and some sites have demonstrated the ability to recover to pre-plague levels, the USFWS (2004) has concluded that plague no longer appears to be as significant a threat as previously thought and is not likely to cause the BTPD to become an endangered species in the foreseeable future. 2) Loss of habitat to agriculture and urbanization. This was undoubtedly a major factor in the previous decline of the BTPD, but has become more stabilized in more recent years and is no longer a significant threat. 3) Habitat fragmentation and its many effects (Miller et al. 1994). Fragmentation of habitat can be a serious threat at the local level because it can lead to inbreeding or the remaining colony can be heavily impacted by catastrophic events such as a plague. 4) Control activities by government, private organizations, and individuals via poisoning and shooting. The range-wide extermination programs that targeted prairie dogs from 1900 till now certainly contributed to the massive reduction in population and range. BTPDs were considered agricultural pests or as competitors to cattle for rangeland resources. Poisoning, using various products, was the eradication method of choice. Hoogland (2005) states that poisoning on federal, state and private lands have increased since the species was removed from the candidate list by the USFWS in 2004, but the USFWS does not believe this

activity can drive the species towards endangered status in the foreseeable future, even though they acknowledged the possibility of potentially significant local population reductions. Today, such poisoning efforts generally target local, problem populations by land managers and are directed towards control, not extermination. The USFWS (2004) also acknowledged that recreational shooting can significantly reduce populations at specific sites and that even extirpation may have occurred in isolated circumstances, but that recovery from very low numbers have also been documented so that recreational shooting does not constitute a significant threat.

BTPD Re-Introduction in Arizona: In 2008, 74 BTPDs were trapped at the Ladder Ranch in New Mexico and released at Las Cienegas National Conservation Area in Pima County, SE Arizona. At least four offspring were observed the following spring. In 2009, another 107 prairie dogs were released, some at the original site and the remainder at a new, second site, also within Las Cienegas NCA.

This reintroduction program, implemented by the Arizona Game and Fish Department, is consistent with the objectives of the Black-Tailed Prairie Dog Conservation Assessment and Strategy (Van Pelt, 1999), the Draft Interagency Management Plan for Black-Tailed Prairie Dogs in Arizona (Van Pelt et al, 2001), and the BLM Resource Management Plans for the Las Cienegas NCA. In addition to the AZGFD and BLM, other participants in the Arizona BTPD Working Group include the Arizona State Land Department, Malpai Borderland Group, the Phoenix Zoo, U.S. Forest Service, U.S. Army Fort Huachuca and other interested parties, including private citizens. This reintroduction program followed a 12-step process that included compliance with all applicable regulations and public input, and took nearly eight years before the first actual release.

AZGFD personal assessed over 77,000 acres (31,000 ha) in the Safford BLM district, and concluded that either due to soil types or vegetative cover, these areas were unsuitable. A University of Arizona study (Koprowski and Coates, 2004), funded through the AZGFD Heritage Program, assessed potential lands in the San Pedro Riparian NCA, Fort Huachuca, and the Las Cienegas NCA. Vegetation at the first two sites, either too shrub-invaded or too high a density of non-native tall grasses, respectively, rendered these sites unsuitable. However, on the Las Cienegas NCA, over 15,000 acres (6,000 ha) were identified where the soils, slope and vegetation most closely resembled the habitat found at the nearest currently extant BTPD colony at the Ejido Morales, near Cananea Municipality in Sonora, Mexico.

Many other details were also identified and executed. Source populations were identified in New Mexico, southwestern Texas, Chihuahua and Sonora, Mexico. Approximately 60-100 animals would be released at the initial site, and it was thought that translocation of intact family groups (coteries) could augment the success of the reintroduction. Site preparation included reducing vegetation to a height conducive to BTPD, and installing man-made burrows and acclimation cages. Due to plague concern, all animals were dusted to kill fleas at the capture site, and any animals that died within 2-weeks of release were necropsied to

determine cause of death. Monitoring protocols were planned for different phases of the program.

By 2011, three sites had been stocked within the Las Cienegas NCA. The fourth site was prepared, but draught conditions limited the availability of BTPDs for translocation, so no animals were released. Due to the extreme draught conditions, each of the first three colonies experienced population declines from high predation and low forage availability. Each required augmentations to maintain stability and genetic integrity. Eighty animals from two sources (New Mexico and Mexico) were released to augment populations at the first three sites, and the fourth site received its first animals in September 2012. In 2011, the University of Arizona began a survivorship study at the new colonies. Trapping animals to implant pit tags and painting their fur with unique symbols allowed both the University and the Department to monitor individual animals. It was quickly realized that the with the drought conditions and limited forage availability, the prairie dogs were travelling well outside their colonies and into the tall grass in search of food. This made them more vulnerable to predation by coyotes and raptors, and populations declined rapidly. The number of offspring produced each year was also low. From 2009-2011 a total of 34 pups emerged, with only 10 in 2011. To combat these issues, the program decided to provide supplemental food (an Herbivore Chow donated by the Phoenix Zoo). Initially, the supplemental feeding succeeded in reducing predation mortalities. In 2012, the feeding was begun earlier in March with the hope of increasing the production of offspring. The result was a virtual population explosion when 132 pups emerged, and this technique is now standard operating procedure for new colony establishment, especially during drought periods. This also allowed the program to source animals for the fourth colony from the first three colonies. Ultimately, once the Las Cienegas colonies are stabilized, they will be used for source animals to establish new colonies in two additional counties in SE Arizona.

PROTECTIVE MEASURES TAKEN: USFWS (Federal Register, 25 March 1999) found that a petition to list this species as threatened under the U.S. Endangered Species Act presented substantial information indicating that listing may be warranted; a status review was initiated. USFWS (2000,2001,2002) determined that listing as Threatened is warranted but precluded by actions of higher priority. USFWS (May 2004) determined that listing as Threatened is not "warranted-but-precluded," since they received important new information that they are currently analyzing. USFWS (Aug 2004) determined that the proposed rule to list this species as Threatened is not warranted, and it is no longer considered to be a candidate species for listing. This is based on recent distribution, abundance, and trend data that indicates that the threats to this species are not as serious as earlier believed (see Management Factors, above). After the first petition was filed to list the species, there was an effort among 11 western states to begin a conservation program, and the Prairie Dog Conservation Team was formed. The PDCT developed a multi-state plan which provided guidelines under which individual states could develop their own state management plan. The state commitments in these agreements, and the resulting state management plans for BTPD, contributed to the Service's decision to remove this species from the candidate list. In Arizona, this effort evolved into the Arizona Black-Tailed Prairie Dog Working Group, which decided to focus re-establishment efforts on State Trust and federal lands.

Most existing regulations involving BTPDs are inadequate for long-term conservations goals (Hicks and Van Pelt 2009). Across its range, the BTPD has various classifications, ranging from agricultural pest to nongame mammal. In four states (CO, KS, ND and SD) it is classified as a pest and there are various levels of either state or local mandatory controls in effect. In AZ, CO and TX, there are various hunting regulations and bag limits under some conditions. However, currently in AZ, while the re-establishment program in underway, there is no open hunting season (which also precludes recreational shooting) for BTPD.

SUGGESTED PROJECTS: Inventories and monitoring are needed rangewide, to determine locations and sizes of colonies, ownership, and presence of plague. Also needed are comparative ecological studies of proposed source and introduction sites to determine suitability, and on-site studies of introduction and management of existing colonies in other areas. Other areas where work is needed are prairie dog/predator interactions, long-term effects of prairie dogs on communities (flora, fauna, soils), and prairie dog subspecies status. Research is especially needed on floral/faunal interactions in the less studied portions of the prairie dog's range, such as southern and northern range limits.

LAND MANAGEMENT/OWNERSHIP:

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Bill Van Pelt, Arizona Game and Fish Department, Phoenix.

ADDITIONAL INFORMATION:

In 1972 a reintroduction was attempted at the Audubon Research Ranch, Elgin, Arizona, but failed.

D.A. McCullough and R.K. Chesser of Texas Tech University in Lubbock, Texas, stated in an abstract from the 1985 SWAN meetings in Glendale, Arizona, that they used immunoelectrophoresis to investigate the relationships within *Cynomys*. Their results indicate "this technique can be utilized to depict specific differences but that the conservative nature of the immunological reactions may not be adequate for separation of lower levels of classification."

The Great Plains ecosystem evolved with bison, prairie dogs, and fire as major forces/processes; bison and fire are effectively gone, and the prairie dog is vastly reduced. The black-tailed prairie dog is a keystone species upon which many other prairie species depend, but now "may be as functionally extinct as the bison" (M. Gilpin, pers. comm. in Miller and Cully 2001). Black-footed ferret (*Mustela nigripes*, G1) is almost completely dependent on prairie dogs for food. Mountain plover (*Charadrius montanus*, G2), burrowing owl (*Speotyto cunicularia*, G4), ferruginous hawk (*Buteo regalis*, G4), and swift fox (*Vulpes velox*, G3) are among those animals that are found in greatest numbers on prairie dog towns. The highly fragmented nature of the Great Plains makes dispersal and gene flow between populations problematic. NatureServe (2023).

Two BTPD colonies are still extant in Sonora, Mexico, just south of Las Cienegas NCA. In 2011, AGFD and CEDES personnel completed density mapping at these colonies using the Biggens et al method. The La Mesa colonies had 177.2 acres, and the population estimate was 1,351 individuals with a 95% confidence interval of 931 to 1,771 animals. The Las Palmitas colony had 146 acres, with a population estimate of 1,905 individuals and 1,440 to 2,371 animals at the 95% C.I. 60 animals from these colonies were trapped and relocated to Las Cienegas to expand the genetic base (AGFD, 2011).

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