ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMAJF02040
Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Mustela nigripes* (Audubon and Bachman, 1851)
COMMON NAME: Black-footed Ferret
SYNONYMS: *Putorius nigripes* Audubon and Bachman, 1851
FAMILY: Mustelidae

AUTHOR, PLACE OF PUBLICATION: J. Audubon and J. Bachman, 1851. Vivip. Quad. No. Amer, 2:297. *Mustela nigripes* Miller and Bull, 1912. U.S. Nat. Mus., 79:102.

TYPE LOCALITY: Fort Laramie, Goshen County, Wyoming.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: One of 14 living species in genus *Mustela*; 1 of five species found in North America; 1 of 2 species found in Arizona, the other being *M. frenata* (long tailed weasel). Only North American member of the subgenus *Putorius* (ferrets). There are no subspecies in the species *M. nigripes*. Some have suggested that *M. nigripes* may be conspecific with Old World *M. eversmanii* (Wilson and Reeder 2005). However, the two have been accepted as distinct species by all major North American sources for many years.

DESCRIPTION: Medium sized mustelid, typically weighing 1.4-2.5 lbs (645-1125 g) and measuring 19-24 inches (48-60 cm) in total length. Yellowish buff to whitish above, with brownish wash on back. The underparts are a lighter cream or buff color. It has a black-tipped tail, black feet and legs, and a black "mask" across the eyes. Young ferrets are slightly lighter in color. Well-developed claws on the front paws, large ears, and relatively large eyes that give off a green reflection at night from artificial light. Females average 10% smaller than males in linear measurement. Mastoid process is notably angular. Skull has 34 teeth (Hillman and Clark 1980, Anderson et al. 1986).

AIDS TO IDENTIFICATION: Weasels and mink lack the dark mask; weasels are brown above and white below; mink are uniformly dark brown or black. The kit fox is similar in color, but has longer legs, ears, and muzzle, as well a bushy tail and lacks black feet and mask.

ILLUSTRATIONS:
Color photo (Whitaker, 1996: plate 249).
Color photos (BFFRIT, 1998: 1-4).
Color photos (Line, 1997: 21,26).

Color photos (Belitsky, 1993: 19-20).
Color drawing (Burt and Grossenheider, 1980: plate 6).

TOTAL RANGE: Formerly the Great Plains from South Alberta and South Saskatchewan South to west Oklahoma, Texas, New Mexico and Arizona. Currently, the species has been reintroduced into Arizona, Colorado, Kansas, Montana, New Mexico, South Dakota, Utah, Wyoming, Chihuahua, Mexico, and Saskatchewan, Canada.

RANGE WITHIN ARIZONA: Currently, populations have been reintroduced at Aubrey Valley (1996) and Espee Ranch (2007), Coconino County. Historical: Western Coconino County eastward north of the Mogollon Rim in the range of the Gunnison's prairie dog; possibly ranged south of the Rim in the habitat of the Black-Tailed Prairie Dog in Graham, Apache, and Cochise Counties.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Primarily a solitary nocturnal predator, appearing above ground at irregular intervals and for irregular durations (Clark et al. 1986). Less active in winter; inactive for periods of up to 6 nights and days (Rickart 1987). Extreme specialist, depending on prairie dogs for food and shelter requirements (Biggins 2006). Ferret densities at the last known wild population near Meeteetse, Wyoming, were found to be linearly correlated with white-tailed prairie dog (*Cynomys leucurus)* colony size (Forrest et al. 1985). Fresh, untamped earth at entrance of prairie dog burrow often indicates occupancy by ferrets (Prairie dogs tamp down mounds of excavated earth) (Whitaker 1996). Ferrets avoid spending long periods of time above ground, instead bounding in zigzag fashion from burrow to burrow. An individual can visit as many as 400 burrows a night. This behavior helps ferrets dodge a multitude of predators including: coyotes, badgers, golden eagles, great horned owls, and other raptors (Richardson 1986). Vocalization includes calls for threat, defense, greeting, mating, and sounds by young. Calls heard often are labeled as "bark", "huff-hiss", "growls", "ungh", and "chattering-bark" (Clark et al 1986). Information on life expectancy is limited, but the mean life expectancy of free-ranging ferrets in the Meeteetse population was 0.9 years (Biggins et al. 2006).

REPRODUCTION: Both sexes reach sexual maturity at one year and breed from mid-March through early April. Gestation is 42-45 days, litters consist of 2-5 young, with an average of 3.5 (Wilson and Ruff 1999). Young stay with their mother until the fall, when they disperse (Forrest et al. 1985). At birth, they resemble small mice, with shut eyes and no visible markings.

FOOD HABITS: Prairie dog (*Cynomys* spp.) obligate. Field observations and diet samples support that ferrets feed almost entirely on prairie dogs, although other species of vertebrate prey have occasionally been reported (Hillman 1968, Oldemeyer et al. 1993, Miller et al. 1996).

HABITAT: Historically found throughout the Great Plains, mountain basins, and semi-arid grasslands of North America wherever prairie dogs occurred (Hillman and Clark 1980). An estimated 40-60 ha (99-148 acres) of prairie dog colony is needed to support 1 ferret (Forrest et al. 1985). The reintroduction sites in Aubrey Valley and Espee Ranch, Arizona, are characterized as Plains and Great Basin Grassland community where the annual precipitation is an average of 9.8-11.8 in (25-30 cm).

ELEVATION: In Aubrey Valley they range from 5,250-6,234 ft (1600-1900 m).

PLANT COMMUNITY: Intermountain and prairie grassland. The common vegetation in Aubrey Valley includes blue gramma *(Bouteloua gracilis*), broom snakeweed (*Gutierrezia sarothrae*), sagebrush (*Artemisia* sp.), four-wing saltbush (*Atriplex canescens*), and winter fat (*Eurotia lanata*), interspersed with forbs and bounded by pinyon-juniper (*Pinus edulis-Juniperus* sp.) ridges (Pender 1992). The common plant species associated with *Cynomys gunnisoni* (the ferrets main prey item) in New Mexico includes: blue grama grass, crested wheatgrass (*Agropyron cristatum*), red three-awn (*Aristida longiseta*), cheatgrass (*Bromus tectorum*), sixsweeks fescue (*Vulpia octoflora*), Indian ricegrass (*Oryzopsis hymenoides*), squirreltail grass (*Sitanion hystrix*), sagebrush, broom snakeweed, and rabbitbrush (*Chrysothamnus* sp.) (BISON 2000).

POPULATION TRENDS: Black-footed ferret populations declined precipitously as a result of declines in prairie dog numbers and habitat from the late 1800's to approximately 1960. These declines in prairie dog populations were correlated with habitat destruction from conversion of prairie to cropland, poisoning due to prairie dog control programs, and disease, primarily the introduction of sylvatic plague (Biggins 2006). The ferret was considered possibly extinct in 1979, but a remnant population was discovered near Meeteetse, Wyoming in 1981 (Lockhart et al. 2006). All surviving ferrets from this population were removed during 1985-1987, in response to disease outbreaks, and used to establish a captive breeding population. All extant populations, captive and reintroduced, descend from 7 founder animals from the Meeteetse population (Garrelle et al. 2006). Despite extensive searches rangewide, no wild populations have been discovered since 1987, and it is unlikely that any undiscovered wild populations remain (Hanebury and Biggins 2006, Lockhart et al. 2006).

As of 2018, there are 447 known black-footed ferrets at 30 reintroduction sites, with 18 sites active, 9 sites inactive and 3 in unknown status. There was a decline of approximately 40% of wild breeding adults documented from 2008 to 2015 (Santymire and Graves 2019).

Ferrets were reintroduced to Arizona, designated as nonessential experimental populations, in the Aubrey Valley in Coconino County in 1996, and Espee Ranch in Coconino County in 2007. Before reintroduction, the last known black-footed ferret in Arizona was found in 1931 (AZGDF 2014). The Aubrey Valley population is considered self-sustaining (USFWS 2013).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1967), XN = Non Essential
STATE STATUS: 1 (AZGFD, AWCS 2022)
[1A (AGFD SWAP 2012)]
[WSC (AGFD, WSCA 1996 in prep)]
[Endangered, AGFD, TNW 1988]
OTHER STATUS: Group 2 (NNDFW, NESL 2000, 2005, 2008)

MANAGEMENT FACTORS: Decrease in occupied habitat and population numbers of prairie dogs (decrease of approximately 96 percent from historically occupied habitat); disease, primarily nonnative sylvatic plague; Conversion of approximately 112 million ac (45 million ha) of native prairie into cropland; loss of habitat to urbanization; recreational shooting of prairie dogs; secondary poisoning from zinc phosphide or anticoagulant rodenticides; climate change; lack of genetic variation; lack of management and protection of prairie dogs;

PROTECTIVE MEASURES TAKEN: Designated Endangered in 1967. Six facilities with captive breeding programs; the USFWS's National Black-footed Ferret Conservation Center (NBFFCC; Colorado), the National Zoo's Smithsonian Conservation Biology Institute (Virginia), the Louisville Zoological Garden (Kentucky), the Toronto Zoo (Ontario, Canada), the Cheyenne Mountain Zoo (Colorado) and the Phoenix Zoo (Arizona) (Santymire and Graves 2019). Distemper vaccination of captive and newly released ferrets and monitoring and management of wild-born ferrets has successfully managed distempter to the point it is not considered a threat to recovery (USFWS 2013). Dusting with insecticide and vaccination have been undertaken to manage plague outbreaks. Matchett et al. (2010) reported ferret survival significantly improved when plague vaccinations were given to ferrets or when Deltamethrin (insecticide) was applied to prairie dog burrows, even in the absence of a discernable die-off of prairie dogs. Vaccination distribution via oral baits to protect prairie dogs has been successful in laboratory settings (Rocke et al. 2008, Abbott and Rocke 2012). Outdoor pen rearing of captive born ferrets and acclimation pens at release sites have increased post-release survival rates (Biggins et al. 2011).Artificial insemination in ferret captive breeding has helped preserve genetic diversity (Howard et al. 2006).

SUGGESTED PROJECTS: Suggested actions to ameliorate threats to the black-footed ferret identified in the recovery plan include: 1. Conserve and manage a captive ferret population of reasonable size and structure to support genetic management and reintroduction efforts; 2. Identify prairie dog habitats with the highest potential for supporting future freeranging populations of ferrets; 3. Establish free-ranging populations of ferrets to meet downlisting and delisting criteria; 4. Ensure sufficient habitat to support a wide distribution of self-sustaining ferret populations; 5. Reduce disease-related threats in wild populations of ferrets and associated species; 6. Support partner involvement and conduct adaptive management through cooperative interchange.

DRAFT

LAND MANAGEMENT/OWNERSHIP: BIA – Hualapai Indian Reservation (Aubrey Valley), State of Arizona, private (Espee Ranch).

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ADDITIONAL INFORMATION:

State and federal agencies, in cooperation with Native Americans, private landowners, conservation groups, the North American zoo community and the Black-footed Ferret Recovery Implementation Team, have been actively reintroducing black-footed ferrets back into the wild. The goal is to establish 10 or more self-sustaining, black-footed ferret populations. By the year 2010, biologists hope to have 1,500 ferrets established in the wild (Black-footed Ferret Recovery Implementation Team 1998).

Efforts are being made to construct outdoor preconditioning pens at certain reintroduction sites. Ferrets housed in such pens will live and breed in natural prairie dog burrows and encounter live prairie dogs. Studies have shown that such preconditioning significantly increases a black-footed ferret's chance of survival in the wild. (BFFRIT 1998)

In 1997, the Aubrey Valley prairie dog complex was comprised of 16 towns with a total acreage of 29,656 ac (12,001 ha). This is up from 19,368 ac (7838 ha) estimated in 1996 for 21 towns identified. Prairie dog density estimates ranged from 3.94 to 11.15 prairie dogs per hectare (mean = 6.52). (Van Pelt et al, 1998).

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