

There is some variability between models in projecting the effect of future climate change on Sprague's pipit habitat. One model projected that the Sprague's pipit's breeding range would experience a wetter climate by the end of this century (United States Global Change Research Program Great Plains 2009, p. 125). In contrast, another model suggested that much of the remaining suitable habitat for Sprague's pipit nesting would likely become drier due to climate change (Johnson *et al.* 2005, p. 871). Temperatures in the wintering range are also expected to rise, while precipitation is projected to decline (United States Global Change Research Program: Southwest 2009, p. 125). Substantial landscape changes are therefore expected in the wintering range (United States Global Change Research Program: Southwest 2009, p. 131). These changes in temperature and precipitation throughout the species' range may have a large impact on ecosystems (United States Global Change Research Program Great Plains 2009, p. 126; United States Global Change Research Program: Southwest 2009, p. 131) and thus the Sprague's pipit.

Long-term effects of global climate change on Sprague's pipit habitat could have significant, deleterious effects, and should be monitored in the future. However, the climate change models are based on projections with some uncertainty (Johnson *et al.* 2005, p. 869), and current data may not be reliable enough at the local level for us to draw conclusions regarding the degree to which climate change would affect Sprague's pipit and its habitat.

The petitioner states that harassment of birds from cropland may negatively impact the birds' energy stores during migration, when they may already be low on reserves (Hagy *et al.* 2007, pp. 62, 69). Also, the petitioner contends that poisoning of sunflower fields with grain bait used to kill blackbirds may impact Sprague's pipits, which have been documented in sunflower fields during migration (Hagy *et al.* 2007, p. 66). Sprague's pipits primarily feed on arthropods, including those in sunflower fields (Hagy *et al.* 2007, p. 66). However, the impacts of harassment and poisoning on Sprague's pipits are unlikely to be substantial. Some sunflower growers harass birds, primarily several species of blackbirds that feed on their crops. Any Sprague's pipits that are present in sunflower fields could be incidentally harassed out of those fields along with blackbirds and any other species present. There have been experimental efforts in the past to selectively poison blackbirds that feed

on sunflowers; however, these efforts have been limited to date and not applied on a systematic, widespread basis. Therefore, we deem the potential impacts of harassment and poisoning on Sprague's pipits to be primarily speculative and likely minimal at this time.

Summary of Factor E

We find the information presented in the petition and readily available in our files on the subject of climate change to be insufficiently specific to the Sprague's pipit; however, the Intergovernmental Panel on Climate Change (IPCC) states that warming of the climate is unequivocal (IPCC 2007, p. 15). We intend to investigate the effects of climate change on the Sprague's pipit and its habitat further in the status review for the species.

While all of the following factors may negatively impact the Sprague's pipit, on the basis of our evaluation of the material provided in the petition and available in our files, we determined that the petition does not present substantial evidence indicating that listing the Sprague's pipit may be warranted based on drought, climate change, harassment, or poisoning of cropland.

Finding

On the basis of our determination under section 4(b)(3)(A) of the Act, we have determined that the petition presents substantial scientific or commercial information indicating that listing the Sprague's pipit throughout all or a significant portion of its range may be warranted. This finding is based on information provided under Factors A and D. Because we have found that the petition presents substantial information that listing the Sprague's pipit may be warranted, we are initiating a status review to determine whether listing the Sprague's pipit under the Act is warranted. We will issue a 12-month finding as to whether the petitioned action is warranted.

The "substantial information" standard for a 90-day finding differs from the Act's "best scientific and commercial data" standard that applies to a status review to determine whether a petitioned action is warranted. A 90-day finding does not constitute a status review under the Act. In a 12-month finding, we will determine whether a petitioned action is warranted after we have completed a thorough status review of the species, which is conducted following a substantial 90-day finding. Because the Act's standards for 90-day and 12-month findings are different, as described above, a

substantial 90-day finding does not mean that the 12-month finding will result in a warranted finding.

We encourage interested parties to continue gathering data that will assist with the conservation and monitoring of the Sprague's pipit. You may submit information regarding the Sprague's pipit by one of the methods listed in the ADDRESSES section until the date shown in the DATES section of this document. After this date, you must submit information directly to the North Dakota Field Office (SEE FOR FURTHER INFORMATION CONTACT section below). Please note that we may not be able to address or incorporate information that we receive after the above requested date. The petitioner requested we designate critical habitat for this species. If we determine in our 12-month finding that listing the Sprague's pipit is warranted, we will address the designation of critical habitat at the time of the proposed listing rulemaking.

References Cited

A complete list of references cited is available on the Internet at <http://regulations.gov> and upon request from the North Dakota Field Office (see FOR FURTHER INFORMATION CONTACT).

Author

The primary authors of this notice are the staff members of the North Dakota Field Office (see FOR FURTHER INFORMATION CONTACT).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: November 19, 2009.

Sam D. Hamilton,

Director, U.S. Fish and Wildlife Service.

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS-R6-ES-2008-0111] [MO 92210 50083 B2]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Black-tailed Prairie Dog as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of a 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce our 12-month finding on a petition to list the black-tailed prairie dog (*Cynomys ludovicianus*) as threatened or endangered under the Endangered Species Act of 1973, as amended (Act). After review of all available scientific and commercial information, we find that listing the black-tailed prairie dog as either threatened or endangered is not warranted at this time. However, we ask the public to continue to submit to us any new information that becomes available concerning the status of, or threats to, the black-tailed prairie dog or its habitat at any time. This information will help us to monitor and conserve the species.

DATES: The finding announced in this document was made on December 3, 2009.

ADDRESSES: This finding is available on the Internet at <http://www.regulations.gov>. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, South Dakota Ecological Services Office, 420 South Garfield Avenue, Suite 400, Pierre, SD 57501; telephone (605) 224-8693. Please submit any new information, materials, comments or questions concerning this finding to the above street address.

FOR FURTHER INFORMATION CONTACT: Pete Gober, Field Supervisor, U.S. Fish and Wildlife Service, South Dakota Ecological Services Office (see **ADDRESSES** section). If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), requires that for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific and commercial information indicating that listing the species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding, we will determine that the petitioned action is: (a) not warranted, (b) warranted, or (c) warranted but the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are threatened or endangered, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and

Threatened Wildlife and Plants. Such 12-month findings must be published in the **Federal Register**.

Previous Federal Actions

We received a petition dated October 21, 1994, from the Biodiversity Legal Foundation and Jon C. Sharps, to classify the black-tailed prairie dog as a Category 2 candidate species. Category 2 includes taxa for which information in our possession indicates that a proposed listing rule was possibly appropriate, but for which sufficient data on biological vulnerability and threats were not available to support a proposed rule. We reviewed the petition and on May 5, 1995, we concluded that the black-tailed prairie dog did not warrant Category 2 candidate status.

On July 31, 1998, we received a petition from the National Wildlife Federation dated July 30, 1998, to list the black-tailed prairie dog as threatened throughout its range. On August 26, 1998, we received another petition to list the black-tailed prairie dog as threatened throughout its range from the Biodiversity Legal Foundation, Predator Project, and Jon C. Sharps. We accepted this second request as supplemental information to the National Wildlife Federation petition. On February 4, 2000, we announced a 12-month finding that issuing a proposed rule to list the black-tailed prairie dog was warranted but precluded by other higher priority actions (65 FR 5476), and the species was included in the list of candidate species. Two candidate assessments and resubmitted petition findings for the black-tailed prairie dog were completed on October 30, 2001 (66 FR 54303), and June 13, 2002 (67 FR 40657). On August 18, 2004, we completed a resubmitted petition finding for the black-tailed prairie dog (69 FR 51217) concluding that listing the species was not warranted, and the species was removed from the candidate list. This removal was the result of new information regarding the amount of occupied habitat present throughout the species' range and a reevaluation of potential threats. Estimates from the 2004 finding were more accurate than those available during the earlier assessments and indicated nearly 3 times more occupied habitat was present than we originally believed. We concluded that the trends in the amount of occupied habitat did not support listing the species.

On February 7, 2007, Forest Guardians and others filed a complaint challenging the decision to remove the black-tailed prairie dog from the candidate list. On August 6, 2007, we received a formal petition dated August

1, 2007, from Forest Guardians (now WildEarth Guardians), Biodiversity Conservation Alliance, Center for Native Ecosystems, and Rocky Mountain Animal Defense, requesting that we list the black-tailed prairie dog throughout its historical range in Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming and in Canada and Mexico. The petitioners requested that, if the Service believes that *Cynomys ludovicianus arizonensis* is a distinct subspecies or population segment, we list it as threatened or endangered throughout its historical range. The petitioners also requested that the Service designate critical habitat for the species.

The petition clearly identified itself as a petition and included the requisite identification information as required in 50 CFR 424.14(a). We acknowledged receipt of the petition in a letter on August 24, 2007, and indicated that emergency listing of the black-tailed prairie dog was not warranted. We also explained that we would not be able to address their petition until fiscal year 2009, due to existing court orders and settlement agreements for other listing actions. However, in fiscal year 2008, funding became available, and we began work on this petition finding. The plaintiffs withdrew their February 7, 2007, complaint on October 9, 2007.

On March 13, 2008, WildEarth Guardians filed a complaint for failure to complete a 90-day finding on their August 1, 2007, petition. On July 1, 2008, a stipulated settlement and order was signed, in which we agreed to submit a 90-day finding to the **Federal Register** by November 30, 2008, and deliver a 12-month finding to the **Federal Register** by November 30, 2009. We published a 90-day finding for the black-tailed prairie dog in the **Federal Register** on December 2, 2008 (73 FR 73211). Today's notice constitutes the 12-month finding on the August 1, 2007, petition to list the black-tailed prairie dog as threatened or endangered.

Species Information

The black-tailed prairie dog is a member of the *Sciuridae* family, which includes squirrels, chipmunks, marmots, and several species of prairie dogs. Prairie dogs constitute the genus *Cynomys*. Taxonomists currently recognize five species of prairie dogs belonging to two subgenera, all in North America (Hoogland 2006a, pp. 8-9). The white-tailed subgenus, *Leucocrossuromys*, includes Utah (*C. parvidens*), white-tailed (*C. leucurus*), and Gunnison's prairie dogs (*C. gunnisoni*) (Hoogland 2006a, pp. 8-9).

The black-tailed subgenus, *Cynomys*, consists of Mexican (*C. mexicanus*) and black-tailed prairie dogs (Hoogland 2006a, pp. 8-9). Generally, the black-tailed prairie dog occurs east of the other four species in less xeric (dry) habitat (Hall and Kelson 1959, p. 365).

The Utah and Mexican prairie dogs are currently listed as threatened (49 FR 22330, May 29, 1984) and endangered (35 FR 8491, June 2, 1970), respectively. The Gunnison's prairie dog is currently a candidate species within the montane portion of its range (73 FR 6660, February 5, 2008). The Service is considering whether listing is warranted for the white-tailed prairie dog through a formal status review which is due to be submitted to the **Federal Register** by June 1, 2010, under a court-approved settlement agreement.

Research on the evolutionary divergence of the various taxa and populations of *Cynomys* indicates that the black-tailed prairie dog should be considered a monotypic species (a taxonomic group without lower level subdivisions) (Pizzimenti 1975, p. 64). Based on this information, we determined that the black-tailed prairie dog is a valid taxonomic species and a listable entity under the Act.

We also investigated the petitioners' request that we list the subspecies *Cynomys ludovicianus arizonensis* if we found it to be a distinct subspecies. The best available information indicates that *C. l. arizonensis* is not a distinct subspecies (Pizzimenti 1975, p. 64). Pizzimenti (1975, p. 64) researched the evolutionary divergence of the various taxa and populations of *Cynomys* and concluded that the black-tailed prairie dog should be considered a single monotypic species and that further subspecific differentiation was not supported due to the similarity of characteristics between purported subspecies. Later research on the genetic variability within and among populations of black-tailed prairie dogs in New Mexico also concluded that subspecies classification could not be supported (Chesser 1983, p. 326). Therefore, based on currently available information, we conclude that there are no distinct subspecies of black-tailed prairie dog.

The black-tailed prairie dog is a burrowing, colonial mammal that is brown in color (Hoogland 2006a, pp. 8-9). Black-tailed prairie dogs are approximately 12 inches (in) (30 centimeters (cm)) in length and weigh 1 to 3 pounds (lbs) (500 to 1,500 grams (g)) (Hoogland 2006a, pp. 8-9). Key characteristics distinguish the black-tailed prairie dog from other prairie dog species:

(1) It has a longer (2 to 3 in (7-10 cm)) tail that is black-tipped;

(2) It is generally non-hibernating, except possibly in the northern and southern extremes of its range (Tuckwell and Everest 2009, p. 1; Truett *et al.* 2007, p. 10); and

(3) It lives at lower elevations (2,300-7,200 feet (ft) (700-2,200 meters (m))) (Hoogland 2006a, pp. 8-9). Overlap of the geographic ranges of the five species is minimal; consequently, species usually can be identified by locality (Hall and Kelson 1959, p. 365; Hoogland 2006a, pp. 8-9).

The black-tailed prairie dog is typically found in level or gently sloping short- and mixed-grass rangeland, primarily east of the Rocky Mountains (Koford 1958, p. 8). The species is an herbivore, consuming short-grasses such as buffalograss (*Buchloe dactyloides*) and blue grama (*Bouteloua gracilis*) as well as several forb species (Koford 1958, p. 6). Prairie dogs also clip taller forage, without consuming it, to enhance their detection of predators (Hoogland 2006a, p. 15). Numerous species prey on the prairie dog including badger (*Taxidea taxus*), coyote (*Canis latrans*), black-footed ferret (*Mustela nigripes*), golden eagle (*Aquila chrysaetos*), and many other species of raptor (Hoogland 1995, pp. 14-15).

Several biological factors determine the reproductive potential of the black-tailed prairie dog. Females live 4 to 5 years, usually do not breed until their second year, and produce a single litter with an average of three pups annually (Hoogland 2001, p. 917; Hoogland 2006b, p. 29). Therefore, one female may produce zero to 15 young in its lifetime. While the species is not prolific in comparison to many other rodents, it is capable of rapid population increases after population reductions (Collins *et al.* 1984, p. 360; Pauli 2005, p. 17; Reeve and Vosburgh 2006, p. 144).

The colonial nature of prairie dogs, especially the black-tailed prairie dog, is a noteworthy characteristic of the species (Miller *et al.* 1996, p. 20). Historically, black-tailed prairie dogs generally occurred in large complexes, containing multiple colonies that often contained thousands of individuals. These complexes covered hundreds or thousands of acres (ac), and extended for miles (Lantz 1903, p. 2671; Bailey 1905, p. 90; Bailey 1932, p. 122; Ceballos *et al.* 1993, p. 109). Currently, most colonies and complexes are much smaller.

Colonial behavior offers an advantageous defense mechanism by aiding in the detection of predators and

by deterring predators through mobbing behavior (Hoogland 1995, pp. 3-6). Colonial behavior also increases reproductive success through cooperative rearing of juveniles and aids parasite removal via shared grooming (Hoogland 1995, pp. 3-6). However, colonial behavior can increase the disadvantageous transmission of disease (Olsen 1981, p. 236; Biggins and Kosoy 2001, p. 911; Antolin *et al.* 2002, p. 122). Plague is a disease that was introduced to North America and can spread from prairie dog to prairie dog through social behaviors such as grooming that transfers fleas carrying the disease. The disease can also be transmitted by pneumonic (airborne) or septicemic (blood) routes (see Threats Analysis, Factor C).

An estimated 2.4 million ac (1 million hectares (ha)) of occupied habitat exists in a constantly shifting mosaic throughout an estimated 283 million ac (115 million ha) of suitable habitat that occurs across a range of approximately 440 million ac (178 million ha). Historically, unsuitable habitat included wetlands, lands with steep slopes, lands with shallow or sandy soils, and wooded areas. More recently, tilled croplands and urban areas have also been considered to be only marginally suitable. Black-tailed prairie dog colonies may expand or contract from year to year (Koford 1958, p. 12). Whether a colony expands or contracts depends on a combination of several factors such as climate, poisoning, disease, and shooting. Prairie dogs may also disperse over considerably long distances and establish new colonies. Dispersal distances up to 6 miles (mi) (10 kilometers (km)) over a period of a few weeks have been documented (Knowles 1985, p. 37). Dispersal can maintain genetic diversity or restore it following plague epizootics (Trudeau *et al.* 2004, p. 206).

The black-tailed prairie dog is considered a keystone species; that is, it is an indicator of diverse species composition within an ecosystem, and key to the persistence of that ecosystem (Kotliar *et al.* 1999, pp. 183, 185). The black-footed ferret, swift fox (*Vulpes velox*), golden eagle, and ferruginous hawk (*Buteo regalis*) use prairie dogs as a food source. The mountain plover (*Charadrius montanus*) and burrowing owl (*Athene cunicularia*) use habitat (burrows) created by prairie dogs (Kotliar *et al.* 1999, pp. 181-182). The most obligatory species of this group is the black-footed ferret, which has a clearly documented dependence on the prairie dog (Linder *et al.* 1972, pp. 23-24; Kotliar *et al.* 2006, pp. 55-57). Numerous other species share habitat

with prairie dogs, and rely on them to varying degrees (Kotliar *et al.* 2006, pp. 54-55).

Species Range

The historical range of the black-tailed prairie dog included portions of 11 States (Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming), Canada, and Mexico (Hall and Kelson 1959, p. 365). This corresponds approximately with the Great Plains Physiographic Province, a zone of about 400 miles wide extending eastward from the Rocky Mountains. Approximately 395 million ac (160 million ha) of potential habitat are estimated to have existed across a range of approximately 440 million ac (178 million ha) (Black-footed Ferret Recovery Foundation (BFFRF) 1999, p. 4; Ernst 2008, p. 2). The species currently exists in the same 11 States, Canada, and Mexico, from extreme south-central Canada to northeastern Mexico and from approximately the 98th meridian west to the Rocky Mountains. This very roughly corresponds to the western halves of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas and the eastern halves of Montana, Wyoming, Colorado, and New Mexico. The species was largely extirpated from Arizona before 1940 (Arizona Game and Fish Department 1988, p. 22), and later described as extinct in that State (Cockrum 1960, p. 76). However, in 2008, the species was reintroduced into a small portion of its historical range in Arizona via translocations from wild populations in New Mexico (Van Pelt 2009, p. 41). Range contractions have occurred in the southwestern portion of the species' range in Arizona, New Mexico, and Texas through conversion of grasslands to desert shrub (Weltzin *et al.* 1997, pp. 758-760; Pidgeon *et al.* 2001, p. 1773). In the eastern portion of the species' range in Kansas, Nebraska, Oklahoma, South Dakota, and Texas, range contractions are largely due to habitat destruction as a result of cropland development (BFFRF 1999, p. 1).

Population Estimates

Most estimates of black-tailed prairie dog populations are based on estimates of the amount of occupied habitat (Facka *et al.* 2008, p. 360), not numbers of individual animals. Biggins *et al.* (2006 p. 94) evaluated several methodologies for estimating prairie dog populations and concluded that counting actual numbers of prairie dogs is feasible only for small areas. Determining the actual population of a colony requires marking all colony residents. This method is reasonable for only a small number (less than five) of small colonies (each with less than 200 residents) because of the difficulty and impracticality of catching and marking all residents (Biggins *et al.* 2006, p. 102). Estimates of occupied habitat remain the best measure of estimating prairie dog abundance over a larger area. The actual number of prairie dogs present depends upon the density of animals in that locality. Density of prairie dogs varies depending on the season, ecological region, and climatic conditions, but typically ranges from 2 to 18 individuals per ac (5 to 45 per ha) in early spring, before the emergence of young-of-the year (King 1955, p. 46; Koford 1958, pp. 10-11; Hoogland 1995, p. 98; Fagerstone and Ramey 1996, p. 85). Prairie dog occupied habitat may expand locally during drought, with a concurrent decline in density, due to the extended foraging area needed to obtain food. Density can also vary spatially and temporally due to poisoning, plague, and recreational shooting as discussed in later sections.

A more accurate large-scale estimate of occupied habitat can be derived by applying a correction factor for percent occupancy (the percent of habitat with burrows currently occupied by black-tailed prairie dogs) to an initial estimate. We can estimate percent occupancy via an on-site inspection of a portion of a survey area to confirm the presence of prairie dogs. This is particularly important in colonies that have been impacted by plague or poisoning. In these instances burrows remain but

prairie dogs are absent. This unoccupied habitat should not be included in estimations of occupied habitat. We believe that occupied habitat is a reasonable measure to use in evaluating the persistence of the species inasmuch as comparisons involve millions of acres (hectares) and several-fold more millions of individual prairie dogs, whose numbers may fluctuate between and within years.

We have relied on the best available estimates of occupied habitat from States, land managers, researchers, or other sources to evaluate distribution, abundance, and trends of prairie dog populations. Recent trends of prairie dog populations are an appropriate surrogate for evaluating the status of the species.

Numerous estimates of black-tailed prairie dog occupied habitat are available, spanning a time period from 1903 to the present. In Table 1, we summarize historical estimates, estimates from a 1961 range wide survey, and the most recent available estimates. The 1961 estimates came from a Bureau of Sport Fisheries and Wildlife (BSFW) range wide survey that followed large-scale poisoning efforts and represent a low point in occupied habitat. Other estimates are from a variety of agencies and individuals as cited in Table 1. Additional estimates derived between 1961 and the most recent available estimates are also available in the Service's 2000 12-month finding and in the 2004 species assessment that removed the black-tailed prairie dog from the candidate list (Service 2000, p. 98; Service 2004, p. 7).

Some of these intermediate estimates are derived from field efforts, others are based on censuses by phone or mail, and the remainder are a result of desktop extrapolations. Desktop extrapolations used known estimates of occupied habitat that existed for portions of a state to derive a Statewide estimate for occupied habitat. These studies provide intermediate estimates of occupied habitat and additional information regarding trends.

TABLE 1. OCCUPIED HABITAT ESTIMATES FOR THE BLACK-TAILED PRAIRIE DOG

State or Country	Historical c (ha) ^A	1961 (BSFW) ac (ha) ^A	Most Recent ac (ha)	Year of Most Recent Survey
Arizona	650,000 (263,000) ¹ 1,396,000 (565,000) ²	0	8 (3) ³	2008
Colorado	3,000,000 (1,214,000) ⁴ 5,445,000 (2,204,000) ² 7,000,000 (2,833,000) ⁵	96,000 (39,000)	788,657 (319,158) ⁶	2006

TABLE 1. OCCUPIED HABITAT ESTIMATES FOR THE BLACK-TAILED PRAIRIE DOG—Continued

State or Country	Historical c (ha) ^A	1961 (BSFW) ac (ha) ^A	Most Recent ac (ha)	Year of Most Recent Survey
Kansas	2,000,000 (809,000) ⁷ 2,500,000 (1,012,000) ⁵ 7,503,000 (3,036,000) ²	50,000 (20,000)	173,593 (70,251) ³	2006
Montana	1,471,000 (595,000) ⁸ 6,000,000 (2,428,000) ⁵ 10,667,000 (4,317,000) ²	28,000 (11,000)	193,862 (78,453) ⁹	2008
Nebraska	6,000,000 (2,428,000) ⁵ 9,021,000 (3,651,000) ²	30,000 (12,000)	136,991 (55,438) ¹⁰	2003
New Mexico	6,640,000 (2,687,000) ¹¹ 8,950,000 (3,622,000) ²	17,000 (7,000)	40,000 (16,187) ¹²	2003
North Dakota	2,000,000 (809,000) ⁵ 2,201,000 (891,000) ²	20,000 (8,000)	22,597 (9,145) ¹³	2006
Oklahoma	950,000 (384,000) ⁵ 4,625,000 (1,872,000) ²	15,000 (6,000)	57,677 (23,341) ³	2002
South Dakota	1,757,000 (711,000) ¹⁴ 6,411,000 (2,594,000) ²	33,000 (13,000)	630,849 (255,296) ¹⁵	2006
Texas	16,703,000 (6,759,000) ² 57,600,000 (23,310,000) ¹⁶	26,000 (11,000)	115,000 (46,539) ³	2006
Wyoming	5,786,000 (2,342,000) ² 16,000,000 (6,475,000) ⁵	49,000 (20,000)	229,607 (92,919) ¹⁷	2006
U.S. Total	78,708,000 (31,852,000)² 102,583,000 (41,514,000) (non-BFFRF citations)^B	364,000 (147,000)	2,388,841 (966,730)	
Canada	2,000 (1,000) ⁵		4,485 (1,815) ³	2007
Mexico	1,384,000 (560,000) ¹⁸		36,561 (14,796) ³	2006
Range wide Total	80,094,000-103,969,000 (32,413,000-42,075,000)		2,429,887 (983,340)¹	

^A Estimates rounded to the nearest thousand.

^B Low U.S. total estimate derived from the total of all BFFRF² estimates (a single methodology described below) for each State. High total estimates were derived by adding all other estimates; in States with more than one other historical estimate (CO, KS, MT) the average was used.

¹ Van Pelt 1998

² BFFRF 1999

³ Koch 2009

⁴ Clark 1989

⁵ Knowles 1998

⁶ Odell et al. 2008

⁷ Lantz 1903

⁸ Flath and Ibach 2009

⁹ Hanauska-Brown 2009

¹⁰ Amack and Ibach 2009

¹¹ Bailey 1932

¹² Johnson et al. 2004

¹³ Knowles 2007

¹⁴ Linder et al. 1972

¹⁵ Vonk 2009

¹⁶ Bailey 1905

¹⁷ Grenier et al. 2007a

¹⁸ Ceballos et al. 1993

Historical estimates of black-tailed prairie dog occupied habitat for a particular State are often quite variable. This is likely due to the imprecise survey methodologies used to derive early estimates. Additionally, some historical estimates were made after land conversion and poisoning had been initiated. If the average historical estimates (not including estimates from

BFFRF 1999) in Table 1 for each State, Canada, and Mexico are summed, the range wide historical estimate of occupied habitat is approximately 104 million ac (42 million ha).

The Black-footed Ferret Recovery Foundation (BFFRF) (1999, p. 4) addressed this variability in historical estimates by evaluating U.S. Geological Survey land use and land cover data

throughout the range of the black-tailed prairie dog. The BFFRF assumed that suitable land cover types such as grassland and agricultural land were potential habitat for the species historically. Other land cover types such as forests, rocky areas, wetlands, and lands with excessive slopes were not considered. Whicker and Detling (1988, p. 778) estimated that black-tailed

prairie dogs occupied at least 20 percent of short- and mixed-grass prairies historically. BFFRF applied this 20 percent historical occupancy rate to its estimate of potential habitat to derive an estimate of approximately 79 million ac (32 million ha) of historically occupied habitat in the United States.

A reasonable range wide estimate of historically occupied habitat for the black-tailed prairie dog that considers all historical estimates from Table 1 is approximately 80 to 104 million ac (32 to 42 million ha).

In 1961, the BSWF, a predecessor agency of the Service, tabulated habitat estimates on a county-by-county basis throughout the range of all prairie dog species in the United States (BSFW 1961, p. 1). These estimates were completed by District Agents for BSWF who were familiar with remaining extant prairie dog populations. The survey was completed in response to concerns from within the agency regarding possible adverse impacts to prairie dogs following large-scale poisoning (Oakes 2000, p. 167). These data provide an estimate for a single point in time when prairie dogs were reduced to very low numbers following a half century of intensive, coordinated government poisoning efforts.

The petitioners questioned the use of the BSWF (1961) survey due to its brevity and the fact that it represented an extreme low point in black-tailed prairie dog occupied habitat. However, this survey has been cited in other seminal documents, including Leopold (1964, p. 38) and Cain *et al.* (1972, Appendix VIII). These latter two documents resulted in substantial changes in predator and rodent control policies in the United States, including a ban of Compound 1080, a highly toxic poison once widely used to control prairie dogs and other mammalian species. We agree that the early 1960s likely represented an extreme low in occupied habitat, but believe that the BSWF (1961) estimates of occupied habitat for the species are useful for trend analyses and represent the best available information for that time period.

The most recent Statewide estimates vary in survey date from 2002 to 2008 and include all black-tailed prairie dog occupied habitat known in a given State. The most current range wide estimate is approximately 2.4 million ac (1 million ha) including Canada and Mexico. Trends for occupied habitat in the United States appear to be increasing from the low point of 364,000 ac (147,000 ha) in 1961. Statewide trends for the same period (1961 – present) range from nearly stable in

North Dakota to an approximately 19-fold increase in South Dakota. The status in Arizona is currently indeterminate due to the recent reintroduction.

We recognize that different methodologies were used at different times and in different locales for the various occupied habitat estimates. However, we believe that these estimates are the best available information and are comparable for the purpose of determining general population trends. Methods for determining occupied habitat have improved in recent years with the advent of tools such as aerial survey, satellite imagery, and Geographic Information Systems (GIS). Consequently, estimates that use these tools can be expected to be more accurate. Ground-truthing a percentage of the land surveyed to determine the percent of habitat occupied adds additional confidence to any large-scale estimate. States continue to refine their methodologies. A workshop is being planned in 2010 by the Western Association of Fish and Wildlife Agencies to further evaluate current survey methodologies for accuracy, statistical validity, cost, and other considerations. More detailed information regarding survey methodology, distribution, abundance, and trends for each State is provided as follows.

Arizona

Survey methodology – The most recent survey by the Arizona Game and Fish Department in 2008 consisted of ground mapping, including ground-truthing (Van Pelt 2009, p. 41). The small amount of occupied habitat enabled a detailed survey effort with ground-truthing throughout and a high degree of confidence in the estimate.

Distribution – Historically, black-tailed prairie dog occupied habitat existed in extreme southeastern Arizona (Hall and Kelson 1959, p. 365). The species was extirpated from the State by approximately 1940 (Arizona Game and Fish Dept. 1988, p. 22). In October 2008, the species was reintroduced on Las Cienegas National Conservation Area (Voyles 2009, pp. 1-2).

Abundance – Historically approximately 650,000 ac (263,000 ha) (Van Pelt 1998, p. 1) to 1,396,000 ac (565,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Arizona. The most recent survey was conducted in 2008 (Van Pelt 2009, p. 41) and percent occupancy was 100 percent. The most recent estimate is 8 ac (3 ha) of occupied habitat, following an October 2008

reintroduction on Las Cienegas National Conservation Area (Koch 2009, p. 7). The next survey is scheduled for 2009 (Van Pelt 2009, p. 41).

Trends – Arizona contains approximately 1 percent of the potential habitat (Ernst 2008, p. 2) and less than 1 percent of currently occupied habitat in the United States. In 1961, no black-tailed prairie dog occupied habitat was found in Arizona (BSFW 1961, p. 1). Currently 8 ac (3 ha) are estimated to occur (Koch 2009, p. 7). The recent date of reintroduction does not allow for any interpretation of trends. However, reintroduction of the species after approximately 70 years of absence in the State is notable.

Colorado

Survey methodology – The most recent survey by the Colorado Division of Wildlife (CDOW) in 2006 consisted of aerial line-intercept surveys. The observers in airplanes fly line-intercepts and record the flight path and length of lines flown above black-tailed prairie dog colonies, then estimate the cumulative area of colonies from the percentage of the flight path intercepted by prairie dog colonies. CDOW attempted to ground-truth 10 percent of recorded colony intercepts (dependent upon landowner permission) (Odell *et al.* 2008, p. 1312). Improvements were made in previous survey methods, and results were published in the Journal of Wildlife Management (Odell *et al.* 2008, p. 1312). However, petitioners and other parties expressed concerns that this study overestimated the amount of occupied habitat in Colorado (Knowles 2009, pp. 1-2; McCain 2009, p. 2; Miller 2009, pp. 1-3; Proctor 2009, p. 2; Reading 2009, pp. 1-9; Sidle 2009a, p. 1). Specific concerns included the method of designating active and inactive colonies, the absence of density evaluation in determination of occupancy, differences in occupancy levels compared to surrounding states, and the likelihood of this methodology being adopted by other states without further refinement.

Estimates derived from large-scale surveys, such as those conducted at a Statewide level, are not as accurate as smaller-scale, more intensive surveys that can include ground-truthing of 100 percent of the habitat. This level of effort is not feasible in large surveys. Nearly all States, including Colorado, dedicate considerable resources to conducting surveys and refining their methodologies, which contribute to improved estimates in future surveys. The CDOW added ground-truthing to their most recent survey, which further refined their estimate of black-tailed

prairie dog occupied habitat. We consider the estimate provided by Odell *et al.* (2008, p. 1311) to constitute the best available information for Colorado.

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the eastern half of Colorado, east of the Front Range mountains (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations throughout at least 75 percent of the historical range (Van Pelt 2009, p. 14).

Abundance – Historically, approximately 3,000,000 ac (1,214,000 ha) (Clark 1989, p. 17) to 7,000,000 ac (2,833,000 ha) (Knowles 1998, p. 12) of black-tailed prairie dog occupied habitat existed in Colorado. CDOW completed the most recent survey in 2006 (Van Pelt 2009, p.14). Percent occupancy was 88 percent (Odell *et al.* 2008, p. 1311). Adjusted to account for 88 percent occupancy, the most recent estimate of occupied habitat is 788,657 ac (319,158 ha) (Odell *et al.* 2008, p. 1311). The next survey is scheduled for 2011 (Van Pelt 2009, p. 14).

Trends – Colorado contains approximately 8 percent of the potential habitat (Ernst 2008, p. 2) and approximately 33 percent of currently occupied habitat in the United States. In 1961, Colorado contained an estimated 96,000 ac (39,000 ha) of black-tailed prairie dog occupied habitat (BSFW 1961, p. 1). Currently, 788,657 ac (319,158 ha) of occupied habitat are estimated to occur in the state (Odell *et al.* 2008, p. 1311). This amount represents an apparent eight-fold increase in occupied habitat since 1961.

Kansas

Survey methodology – The Kansas Department of Wildlife and Parks conducted the most recent survey in 2006. It consisted of a combination of line transect (a survey along a straight path of standard width where the presence of appropriate habitat is recorded when observed) and interpretation of National Agriculture Imagery Program photographs (Van Pelt 2009, p. 15). No record of ground-truthing information was available. Because the State did not determine percent of habitat occupied, the estimate is less accurate than if they had ground-truthed a percentage of the lands surveyed and addressed percent occupancy. Nevertheless, the estimate is the most recent and best available information regarding the amount of black-tailed prairie dog habitat within the State.

Estimates of percent occupancy provided in 10 recent Statewide surveys range from 73-89 percent, with an

average of 81 percent (EDAW 2000, p. 20; Sidle *et al.* 2001, p. 930; Bischof *et al.* 2004, p. 2; Johnson *et al.* 2004, p. 11; Knowles 2007, p. 2; Odell *et al.* 2008, p. 1311; Emmerich 2009, p. 2; Hanauska-Brown 2009, p. 1). If the current Kansas estimate of 173,593 ac (70,251 ha) of occupied habitat were assumed to have 81 percent occupancy, this would equate to 140,610 ac (56,903 ha).

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the western two-thirds of Kansas (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations throughout at least 75 percent of the historical range (Van Pelt 2009, p. 16).

Abundance – Historically, approximately 2,000,000 ac (809,000 ha) (Lantz 1903, p. 150) to 7,503,000 ac (3,036,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Kansas. The Kansas Department of Wildlife and Parks completed the most recent survey in 2006 (Van Pelt 2009); it did not note percent occupancy. The most recent estimate is 173,593 ac (70,251 ha) (Van Pelt 2009, p. 15). The next survey is scheduled for 2009 (Van Pelt 2009, p. 15).

Trends – Kansas contains approximately 10 percent of the potential habitat (Ernst 2008, p. 2) and approximately 7 percent of currently occupied habitat in the United States. In 1961, 50,000 ac (20,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in Kansas (BSFW 1961, p. 1). Currently 173,593 ac (70,251 ha) of occupied habitat are estimated to occur (Koch 2009, p. 7). This area represents an apparent three-fold increase since 1961.

Montana

Survey methodology – The most recent survey conducted by the Montana Department of Fish, Wildlife and Parks in 2008 consisted of an aerial line intercept survey, patterned after Sidle *et al.* (2001, pp. 929-931), White *et al.* (2005, pp. 266-268), and Odell *et al.* (2008, pp. 1312-1313). No information was provided by the Montana Department of Fish, Wildlife and Parks regarding ground-truthing efforts in their preliminary report, although estimates for active and inactive colonies were provided, and percent occupancy was addressed (Hanauska-Brown 2009, p. 1).

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the eastern two-thirds of Montana, with the exception of the northeastern corner of the State (Hall

and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations throughout over 90 percent of the historical range (Van Pelt 2009, p. 20).

Abundance – Historically, approximately 1,471,000 ac (595,000 ha) (Flath and Clark 1986, p. 67) to 10,667,000 ac (4,317,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Montana. The most recent survey was completed by the Montana Department of Fish, Wildlife and Parks in 2008 (Van Pelt 2009, p. 19). The percent of habitat occupied was 85 percent (Hanauska-Brown 2009, p. 1). Adjusted to account for 85 percent occupancy, the most recent estimate of occupied habitat is 193,862 ac (78,453 ha) (Hanauska-Brown 2009, p. 1). The next survey is scheduled for 2011.

Trends – Montana contains approximately 12 percent of the potential habitat (Ernst 2008, p. 2) and approximately 8 percent of currently occupied habitat in the United States. In 1961, an estimated 28,000 ac (11,000 ha) of black-tailed prairie dog occupied habitat occurred in Montana (BSFW 1961, p. 1). Currently, 193,862 ac (78,453 ha) of occupied habitat are estimated to occur (Hanauska-Brown 2009, p. 1). This area represents nearly a seven-fold increase since 1961.

Nebraska

Survey methodology – The Nebraska Game and Parks Commission conducted the most recent survey in 2003, consisting of an aerial line intercept survey by county using variably spaced transects based on the estimated number of occupied acres in each county, with more transects in the more densely populated counties (Bischof *et al.* 2004, pp. 3-6). Methodology was patterned after Sidle *et al.* (2001, pp. 929-931). Based on the information provided regarding methodology, ground-truthing was not conducted; however, habitat was only classified as active (occupied) if black-tailed prairie dogs were seen (Bischof *et al.* 2004, pp. 3-6). Additional habitat was classified as “possibly active” if no prairie dogs were visible but evidence of recent activity was present.

Distribution – Historically, black-tailed prairie dog occupied habitat existed throughout most of Nebraska west of the 97th meridian, with the exception of most of the Sandhills region in the north-central portion of the State (Hall and Kelson 1959, p. 365). The current distribution is unknown, but the species occurs in less than 75 percent of counties with historical records (Luce 2003, p. 17).

Abundance – Historically, approximately 6,000,000 ac (2,428,000 ha) (Knowles 1998, p. 12) to 9,021,000 ac (3,651,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Nebraska. The most recent survey was completed by the Nebraska Game and Parks Commission in 2003 (Amack and Ibach 2009, p. 1). The percent of habitat occupied was 74 percent (Bischoff *et al.* 2004, p. 6). Adjusted to account for 74 percent occupancy, the most recent estimate of occupied habitat is 136,991 ac (55,438 ha) (Amack and Ibach 2009, p. 1). An additional 102,828 ac (41,613 ha) were not verified and were classified as possibly active. No future surveys are scheduled at this time (Amack and Ibach 2009, p. 2).

Trends – Nebraska contains approximately 11 percent of the potential habitat (Ernst 2008, p. 2) and approximately 6 percent of currently occupied habitat in the United States. In 1961, 30,000 ac (12,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in Nebraska (BSFW 1961, p. 1). Currently, 136,991 ac (55,438 ha) of occupied habitat are estimated to occur (Amack and Ibach 2009, p. 1). This area represents nearly a five-fold increase since 1961.

New Mexico

Survey methodology – New Mexico Department of Game and Fish conducted the most recent survey in 2003, which consisted of examination of digital orthophoto quadrangle imagery, followed by an effort to ground-truth 15 percent of recorded colonies (dependent upon landowner permission) (Johnson *et al.* 2004, pp. 3-4). Due to lack of permission in some cases, the actual amount of habitat ground-truthed was slightly less than 15 percent.

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the eastern and southwestern two-thirds of the State (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations in 54 percent of the counties that had historical records (Van Pelt 2009, p. 28).

Abundance – Historically, approximately 6,640,000 ac (2,687,000 ha) (Bailey 1932, pp. 14 and 16) to 8,950,000 ac (3,622,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in New Mexico. The most recent survey was completed by the New Mexico Department of Game and Fish in 2003 (Johnson *et al.* 2004, p. 11). The percent of habitat occupied was 81 percent (Johnson *et al.* 2004, p. 11). Adjusted to account for 81 percent occupancy, the

most recent estimate of occupied habitat is 40,000 ac (16,187 ha) (Johnson *et al.* 2004, p. 11). The next survey is underway and scheduled to be completed in 2009 (Van Pelt 2009, p. 27).

Trends – New Mexico contains approximately 12 percent of the potential habitat (Ernst 2008, p. 2) and approximately 2 percent of currently occupied habitat in the United States. In 1961, 17,000 ac (7,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in New Mexico (BSFW 1961, p. 1). Currently, 40,000 ac (16,187 ha) of occupied habitat are estimated to occur (Johnson *et al.* 2004, p. 11). This area represents an apparent two-fold increase since 1961.

North Dakota

Survey methodology – The most recent survey conducted by the North Dakota Game and Fish Department in 2006 consisted of aerial surveys, followed by an effort to ground-truth all active colonies that they were able to get landowner permission to visit and then map colonies using GPS (Knowles 2007, p. 3).

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the southwestern third of North Dakota, west of the Missouri River (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations in 79 percent of counties that historically contained prairie dogs (Van Pelt 2009, p. 24).

Abundance – Historically, approximately 2,000,000 ac (809,000 ha) (Knowles 1998, p. 12) to 2,201,000 ac (891,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in North Dakota. The most recent survey was completed by the North Dakota Game and Fish Department in 2006 (Knowles 2007, p. 1). 89 percent of acres were occupied (Knowles 2007, p. 2). Adjusted to account for 89 percent occupancy, the most recent estimate of occupied habitat is 22,597 ac (9,145 ha) (Knowles 2007, p. 1). The next survey is scheduled for 2010 (Van Pelt 2009, p. 24).

Trends – North Dakota contains approximately 3 percent of the potential habitat (Ernst 2008, p. 2) and approximately 1 percent of currently occupied habitat in the United States. In 1961, 20,000 ac (8,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in North Dakota (BSFW 1961, p. 1). Currently, 22,597 ac (9,145 ha) of occupied habitat are estimated to occur (Knowles 2007, p. 7). Occupied habitat has apparently remained relatively stable since 1961.

Oklahoma

Survey methodology – The Oklahoma Department of Wildlife Conservation conducted the most recent survey in 2002, which consisted of interpretation of aerial maps and on-site ground-truthing with input from county game wardens (Van Pelt 2009, p. 30).

Distribution – Historically, black-tailed prairie dog occupied habitat existed throughout approximately the western two-thirds of Oklahoma west of the 97th meridian (Hall and Kelson 1959, p. 365). Currently, distribution is largely limited to the panhandle, although scattered remnant populations occur elsewhere throughout 87 percent of the historical range (Van Pelt 2009, p. 30).

Abundance – Historically, approximately 950,000 ac (384,000 ha) (Knowles 1998, p. 12) to 4,625,000 ac (1,872,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Oklahoma. Ground-truthing was conducted in the most recent survey completed by the Oklahoma Department of Wildlife Conservation in 2002 (Van Pelt 2009, p. 30), however the percent of habitat occupied was not noted (Van Pelt 2009). The most recent estimate of occupied habitat is 57,677 ac (23,341 ha) (Koch 2009, p. 7) based upon the 2002 survey (Van Pelt 2009, p. 30). The next survey is scheduled for 2008 through 2009 (Van Pelt 2009, p. 30). We have not yet received any survey results.

Trends – Oklahoma contains approximately 6 percent of the potential habitat (Ernst 2008, p. 2) and approximately 2 percent of currently occupied habitat in the United States. In 1961, 15,000 ac (6,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in Oklahoma (BSFW 1961, p. 1). Currently, 57,677 ac (23,341 ha) of occupied habitat are estimated to occur (Koch 2009, p. 7). This area represents a nearly four-fold increase since 1961.

South Dakota

Survey methodology – The South Dakota Department of Game, Fish, and Parks conducted the most recent survey conducted in 2009 which consisted of interpretation of aerial photographs (Kempema *et al.* 2009, p. 2; Vonk 2009, p. 1). Ground-truthing was conducted on 25 percent of the surveyed area (Kempema *et al.* 2009, pp. 3, 5).

Distribution – Historically, black-tailed prairie dog occupied habitat existed throughout the western three-fourths of the State (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant

populations throughout 78 percent of the counties within the historical range (Van Pelt 2009, p. 34).

Abundance – Historically, approximately 1,757,000 ac (711,000 ha) (Linder *et al.* 1972, p. 29) to 6,411,000 ac (2,594,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in South Dakota. The most recent survey was completed by the South Dakota Department of Game, Fish, and Parks in 2009. Percent occupancy was 93 percent (Kempema *et al.* p. 5). Adjusted to account for 93 percent occupancy, the most recent estimate of occupied habitat is 630,849 ac (255,296 ha). The next survey is scheduled for 2011 (Van Pelt 2009, p. 32).

Trends – South Dakota contains approximately 9 percent of the potential habitat (Ernst 2008, p. 2) and approximately 26 percent of currently occupied habitat in the United States. In 1961, 33,000 ac (13,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in South Dakota (BSFW 1961, p. 1). Currently, 630,849 ac (255,296 ha) of occupied habitat are estimated to occur (Kempema *et al.* 2009, p. 4; Vonk 2009, p. 1). This represents an apparent 19-fold increase since 1961.

Texas

Survey methodology – The Texas Parks and Wildlife Department in 2006 conducted the most recent survey which consisted of interpretation of Digital Orthoimagery Quarter Quadrangles (DOQQs) and ground-truthing (Van Pelt 2009, p. 37). The proportion of habitat that was ground-truthed was not noted.

Distribution – Historically, black-tailed prairie dog occupied habitat existed throughout approximately the northwestern one-third of Texas (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations throughout 75 percent of the historical range (Van Pelt 2009, p. 38).

Abundance – Historically, approximately 57,600,000 ac (23,310,000 ha) (Bailey 1905, p. 90) to 16,703,000 ac (6,759,000 ha) (BFFRF 1999, p. 4) of black-tailed prairie dog occupied habitat existed in Texas. The Texas Parks and Wildlife Department completed the most recent survey in 2006 (Van Pelt 2009, p. 37). Percent occupancy was not noted. The most recent estimate of occupied habitat is 115,000 ac (46,539 ha) based upon the 2006 survey (Koch 2009, p. 7). The next survey is scheduled for 2010 (Van Pelt 2009, p. 37).

Trends – Texas contains approximately 21 percent of the

potential habitat (Ernst 2008, p. 2) and approximately 5 percent of currently occupied habitat in the United States. In 1961, 26,000 ac (11,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in Texas (BSFW 1961, p. 1). Currently, 115,000 ac (46,539 ha) of occupied habitat are estimated to occur (Koch 2009, p. 7). This area represents an apparent four-fold increase since 1961.

Wyoming

Survey methodology – The Wyoming Game and Fish Department conducted the most recent survey in 2006 which consisted of delineation of colony boundaries from interpretation of DOQQs, followed by aerial survey to confirm status (Grenier *et al.* 2007b, pp. 115-116).

Distribution – Historically, black-tailed prairie dog occupied habitat existed in the eastern half of Wyoming, east of the Rocky Mountains (Hall and Kelson 1959, p. 365). Currently, distribution appears to be scattered in remnant populations throughout at least 75 percent of the historical range (Van Pelt 2009, p. 40).

Abundance – Historically, approximately 5,786,000 ac (2,342,000 ha) (BFFRF 1999, p. 4) to 16,000,000 ac (6,475,000 ha) (Knowles 1998, p. 12) of black-tailed prairie dog occupied habitat existed in Wyoming. The most recent survey was completed by the Wyoming Game and Fish Department in 2006 (Emmerich 2009, p. 2). Occupied habitat was categorized as healthy (87 percent) or impacted (13 percent) (Grenier *et al.* 2007a, p. 125). Adjusted to account for 87 percent occupancy, the most recent estimate of occupied habitat is 229,607 ac (92,919 ha) (Grenier *et al.* 2007a, p. 125). The next survey is scheduled for 2009 (Van Pelt 2009, p. 39).

Trends – Wyoming contains approximately 6 percent of the potential habitat (Ernst 2008, p. 2) and nearly 10 percent of currently occupied habitat in the United States. In 1961, 49,000 ac (20,000 ha) of black-tailed prairie dog occupied habitat were estimated to occur in Wyoming (BSFW 1961, p. 1). Currently, 229,607 ac (92,919 ha) of occupied habitat are estimated to occur (Grenier *et al.* 2007a, p. 125). This area represents an apparent nearly five-fold increase since 1961.

Canada

Survey methodology – The most recent survey was described as mapping with GPS (Koch 2009, p. 7). We do not have more detailed information concerning the methods used, including whether data was ground-truthed or corrected for occupancy.

Distribution – Historically, black-tailed prairie dog occupied habitat existed in southernmost Saskatchewan (Hall and Kelson 1959, p. 365). Currently, distribution is limited to remnant populations within the same range, primarily in Grasslands National Park (Tuckwell and Everest 2009, p. 2).

Abundance – Historically, approximately 2,000 ac (809 ha) of black-tailed prairie dog occupied habitat existed in Canada (Knowles 1998, p. 12). Surveys are conducted every other year (Tuckwell and Everest 2009, p. 16). The most recent survey was completed in 2007 (Van Pelt 2009, p. 64). Percent occupancy was not noted. The most recent estimate of occupied habitat is 4,485 ac (1,815 ha) based upon the 2007 survey (Koch 2009, p. 3).

Trends – Canada represents the periphery of the black-tailed prairie dog's range and habitat has always been limited, but the amount of occupied habitat appears stable (Tuckwell and Everest 2009, p. 2).

Mexico

Survey methodology – Recent survey techniques and extent of ground-truthing efforts was not reported.

Distribution – Historically, black-tailed prairie dog occupied habitat existed throughout the northern portion of the Mexican States of Chihuahua and Sonora (Hall and Kelson 1959, p. 365). Currently, distribution appears limited to remnant populations in a small area of northern Chihuahua (List 1997, p. 141).

Abundance – Historically, approximately 1,384,000 ac (560,000 ha) of black-tailed prairie dog occupied habitat existed in Mexico (Ceballos *et al.* 1993, p. 109). The most recent survey was completed in 2006 (Koch 2009, p. 3). Percent occupancy was not noted. The most recent estimate is 36,561 ac (14,796 ha) of occupied habitat (Koch 2009, p. 3). The year of the next survey is not known.

Trends – Mexico experienced a prolonged drought in recent years, which resulted in dramatic loss of vegetation, followed by a reduction in black-tailed prairie dog occupied habitat (Larson 2008, p. 87). The most recent estimate is 36,561 ac (14,796 ha) of occupied habitat in 2006 (Koch 2009, p. 3). Occupied habitat appears to be declining in recent years.

Summary of Factors Affecting the Species

We have considered all scientific and commercial information available in our files, including pertinent information received during this status review. We relied primarily on published, peer-

reviewed literature; information provided by affected state wildlife agencies; and information provided by the Western Association of Fish and Wildlife Agencies. We received more than 18,000 comment letters from individuals, agencies, organizations, and companies. Most were form letters that expressed support or opposition to listing the black-tailed prairie dog. However, we cite several submissions that provided useful information in this finding. Much of the data refers to the 98 percent of occupied habitat that occurs in the United States, but we include data on Canada and Mexico where available.

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations (50 CFR 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be endangered or threatened based on any of the following five factors: (A) present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or education purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

We addressed the potential threats discussed in the petition under the most appropriate factor; however, we recognize that several potential threats might be considered under more than one factor. For example, poisoning can affect habitat (Factor A), and can be affected by state and Federal regulatory mechanisms (Factor D), but is primarily addressed in this finding under other factors (Factor E). In making this finding, information pertaining to the black-tailed prairie dog, in relation to the five factors provided in section 4(a)(1) of the Act is discussed below.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Some black-tailed prairie dog habitat has been destroyed, modified, or curtailed by:

- (1) conversion of native prairie habitat to cropland;
- (2) urbanization;
- (3) oil, gas, and mineral extraction;
- (4) habitat loss caused by loss of prairie dogs; and
- (5) livestock grazing, fire suppression, and weeds.

In some instances, black-tailed prairie dog habitat continues to be impacted by

these same stressors. The Black-tailed Prairie Dog Conservation Team developed conservation plans that address issues of habitat loss. Each is discussed below.

Conversion of native prairie habitat to cropland

The present or threatened destruction of habitat due to cropland development affects portions of the black-tailed prairie dog's range. Regular cultivation precludes burrow development by the species. This practice is the most substantial cause of habitat destruction that we are able to quantify. Conversion of native prairie to cropland has largely progressed across the species' range from east to west. The most intensive agricultural use is in the eastern portion of the black-tailed prairie dog's range, in portions of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas, where higher rainfall amounts and generally better soils result in greater agricultural production. Land with the highest potential for traditional farming uses was converted many years ago. Consequently, the present and future destruction of habitat through cropland conversion is likely much less than in the early days of agricultural development in the Great Plains.

A detailed assessment using the National Land Cover Dataset determined that there are approximately 110 million ac (45 million ha) of cropland and 283 million ac (115 million ha) of rangeland within the species' range at present (Ernst 2008, pp. 10-19). When the 2.4 million ac (1 million ha) of currently occupied habitat is contrasted with the 283 million ac (115 million ha) of rangeland, it appears that sufficient potential habitat still occurs within the range of the species in the United States to accommodate large expansions of prairie dog populations. These areas could be colonized over time by expansion of existing colonies if the landowners and public sentiment allows.

In recent years, ethanol production from corn has expanded in the United States (Westcott 2007, p. 1). However, most corn is cultivated east of the range of the black-tailed prairie dog (Westcott 2007, p. 3). Additionally, the increase in corn production largely occurs by adjusting crop rotations between corn and soybeans (Westcott 2007, p. 7). We do not anticipate that increased ethanol production will result in a substantial loss in the species' occupied or potential habitat.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, suggests that the

present or threatened destruction of habitat due to cropland development is not a limiting factor for the species.

Urbanization

The present or threatened destruction of habitat due to urbanization affects portions of the black-tailed prairie dog's range, particularly east of the Front Range in Colorado. However, in a Statewide or range wide context, loss of habitat due to urbanization is not substantial. In Colorado, approximately 502,000 ac (203,000 ha) of urban lands and 21.6 million ac (8.8 million ha) of rangeland occur within the species' range (Ernst 2008, pp. 10-11). This equates to approximately 2 percent of potential habitat lost to urbanization in Colorado. Throughout the United States, approximately 2.4 million ac (1 million ha) of urban lands occur within the species' historic range (Ernst 2008, pp. 10-18), while approximately 283 million ac (115 million ha) of rangeland exist within the species' range. This equates to less than 1 percent of potential habitat lost to urbanization in the United States. A very small percentage of potential prairie dog habitat has been lost to urbanization. As a consequence, it appears that sufficient potential habitat still occurs within the range of the species, including Colorado, to accommodate existing or large expansions of prairie dog populations, even if some local prairie dog populations may be lost to urbanization in the future.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that the present or threatened destruction of habitat due to urbanization is not a limiting factor for the species.

Oil, gas, and mineral extraction

The present or threatened curtailment of habitat due to oil, gas, and mineral extraction may affect portions of black-tailed prairie dog occupied habitat; however, we have no information that quantifies these impacts. Qualitative information was submitted on behalf of the Petroleum Association of Wyoming, the Public Lands Advocacy, the Montana Petroleum Association, the New Mexico Oil and Gas Association, the Oklahoma Independent Petroleum Association, and the Independent Petroleum Association of Mountain States. Mapping in colonies within oil and gas development areas in Wyoming indicates increased prairie dog occupancy in these areas (Sorensen *et al.* 2009, pp. 5-6). Although we have not confirmed this conclusion, the current status of the black-tailed prairie dog, as

indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that the present or threatened curtailment of habitat due to energy development is not a limiting factor for the species in Wyoming or elsewhere throughout its range.

Habitat loss caused by loss of prairie dogs

The present or threatened modification of habitat due to the extirpation of black-tailed prairie dogs may affect portions of the species' range. The petitioners theorized that the loss of prairie dogs from their habitats may create a negative feedback loop, resulting in their habitat becoming less suitable. Documentation of the species' effects on habitat is mixed. In some instances, prairie dogs may have a positive effect on habitat (Koford 1958, pp. 43–62; Kotliar *et al.* 1999, p. 178; Johnson-Nistler *et al.* 2004, p. 641; Lantz *et al.* 2006, p. 2671). Positive effects have been particularly notable in the southwestern portion of the species' range where the foraging and clipping habits of prairie dogs destroy seedlings of undesirable shrub and tree species that might otherwise invade and eventually convert grasslands to scrublands. The aeration of soil from burrow construction may increase the growth of grasses (Koford 1958, pp. 43–62; Davis 1974, p. 156; Fagerstone and Ramey 1996, p. 89; List 1997, p. 150; Weltzin *et al.* 1997, pp. 758–760). Prairie dogs may also have a negative habitat effect by reducing grass species and causing conversion to less desirable forb species (Koford 1958, pp. 43–62; Bonham and Lerwick 1976, p. 225; Klatt and Hein 1978, p. 316; Fagerstone and Ramey 1996, p. 88; Johnson-Nistler *et al.* 2004, p. 641). However, the current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that the present or threatened modification of habitat due to the presence or absence of prairie dogs on their habitat is not a limiting factor for the species.

Livestock grazing, fire suppression, and weeds

The present or threatened modification of habitat due to livestock grazing, fire suppression, and weeds may affect portions of the black-tailed prairie dog's range. Nonnative plant species may increase as a result of overgrazing and in the absence of fire, may modify the habitat. However, the impact of plant composition on habitat suitability for prairie dogs is contradictory. Some studies suggest that prairie dogs cause deterioration in

forage quality, while others contend that livestock grazing causes a deterioration in forage quality (Koford 1958, pp. 43–62; Uresk *et al.* 1981, p. 200; Cerovski 2004, p. 101; Vermeire *et al.* 2004, p. 691; Detling 2006, p. 115). Available information indicates that livestock grazing typically encourages black-tailed prairie dog expansion by maintaining vegetation at a lower height that improves visibility for prairie dogs (Osborn and Allan 1949, p. 330; Koford 1958, p. 68; Snell and Hlavachick 1980, p. 240; Uresk *et al.* 1981, p. 200; Hubbard and Schmitt 1983, p. 30; Marsh 1984, p. 203; Snell 1985, p. 30; Groombridge 1992, p. 290; U.S. Forest Service 1995, p. 5; Fagerstone and Ramey 1996, p. 88; Wuertner 1997, pp. 460–461; U.S. Forest Service 1998, p. 4; Forest 2005, p. 528; Andelt 2006, p. 131).

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that the present or threatened modification of habitat due to livestock grazing, fire suppression, or weeds is not a limiting factor for the species.

The Black-tailed Prairie Dog Conservation Assessment and Strategy

Following the 1998 petitions to list the black-tailed prairie dog, a group of representatives from each State within the historical range of the species formed the Black-tailed Prairie Dog Conservation Team. The team intended to reduce threats to the species and increase the amount of habitat occupied by the species. The Team developed "The Black-tailed Prairie Dog Conservation Assessment and Strategy" (Van Pelt 1999), which initiated development of "A Multi-State Conservation Plan for the Black-tailed Prairie Dog, *Cynomys ludovicianus*, in the United States" (Multi-State Plan) (Luce 2002).

The purpose of the Multi-State Plan was to provide adaptive management goals for future prairie dog management within the 11 States. The Multi-State Plan identified the following minimum 10-year target objectives:

(1) maintain at least the currently occupied acreage of black-tailed prairie dog habitat in the United States;

(2) increase occupied habitat to at least 1,693,695 ac (685,414 ha) in the United States by 2011;

(3) maintain at least the current occupied acreage in the two complexes greater than 5,000 ac (2,023 ha) that then occurred on and adjacent to Conata Basin–Buffalo Gap National Grassland, South Dakota, and Thunder Basin National Grassland, Wyoming;

(4) develop and maintain a minimum of 9 additional complexes greater than 5,000 ac (2,023 ha), with each State managing or contributing to at least one complex greater than 5,000 ac (2,023 ha) by 2011;

(5) maintain at least 10 percent of total occupied acreage in colonies or complexes greater than 1,000 ac (405 ha) by 2011; and

(6) maintain distribution over at least 75 percent of the counties in the historical range, or at least 75 percent of the historical geographic distribution.

Objectives 1, 2, and 3 have been achieved. Objectives 4, 5, and 6 have not yet been demonstrated in all States. The progress of individual states in achieving these objectives is described in more detail under Factor D.

The States also agreed to draft Statewide management plans for the black-tailed prairie dog. The States approve their own Statewide management plans. Colorado and Wyoming have finalized grassland conservation plans that support and meet the objectives of the Multi-State Plan. South Dakota has a finalized management plan that supports and meets the Multi-State Plan's objectives, but reserves the right to preserve its own management authority and identify its own goals and objectives. Kansas, Oklahoma, and Texas have finalized management plans that support the Multi-State Plan objectives, but have not yet met all of those objectives. Montana, New Mexico, and North Dakota have finalized management plans that do not support or meet all of the objectives of the Multi-State Plan. Arizona has a draft plan that supports the Multi-State Plan's objectives, but their Wildlife Commission did not approve it. Nevertheless, Arizona continues to work toward the Multi-State Plan's objectives. Nebraska has a draft plan that supports the Multi-State Plan objectives, but it its Wildlife Commission did not approve it. In Nebraska, work toward the Multi-State Plan's objectives has been halted.

As a result of the development of the Multi-State and Statewide management plans, state wildlife agencies are surveying and monitoring black-tailed prairie dogs on a more regular basis. These efforts will enable the States to monitor the status of the black-tailed prairie dog and the progress of the conservation programs.

Summary of Factor A

Cropland conversion, urbanization, energy development, conversion to scrubland in the absence of prairie dogs, and invasion of non-native species all occur within the historical range of the black-tailed prairie dog, and will likely

continue to occur in the future. However, when the approximately 2.4 million ac (1 million ha) of currently occupied habitat is contrasted with the extant 283 million ac (115 million ha) of rangeland, it appears that sufficient potential habitat still occurs within the range of the species in the United States to accommodate prairie dog expansions over time despite some habitat loss from these stressors. Since the early 1960s, occupied habitat has increased in every State. The species' occupied habitat in the United States is estimated to have increased by over 600 percent from 1961 until the present time. This increase has occurred despite continued impacts to the species' habitat and impacts from other factors. The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that the present or threatened destruction, modification, or curtailment of habitat or range is not a limiting factor for the species. The most significant impact to the species' habitat that we are able to quantify is habitat loss due to cropland conversion, and the rate of conversion is likely much less than in the early days of agricultural development in the Great Plains. Consequently, we do not anticipate that impacts from habitat loss are likely to negatively impact the status of the species in the foreseeable future.

We conclude that the best scientific and commercial information available indicates that the black-tailed prairie dog is not now, or in the foreseeable future, threatened by the present or threatened destruction, modification, or curtailment of its habitat or range to the extent that listing under the Act as a threatened or endangered species is warranted at this time. Abundant suitable habitat in the form of rangeland exists and is not a limiting factor for the species. The present or threatened modification of prairie dog habitat presented by sylvatic plague is addressed under Factor C, and the present or threatened curtailment of prairie dog habitat presented by poisoning is addressed under Factor E.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Recreational shooting of black-tailed prairie dogs can reduce population densities, cause behavioral changes, diminish reproduction and body condition, increase emigration, and cause extirpation in isolated circumstances (Stockrahm 1979, pp. 80–84; Knowles 1988, p. 54; Vosburgh 1996, pp. 13, 15, 16, and 18; Vosburgh and Irby 1998, pp. 366–371; Pauli 2005,

p. 1; Reeve and Vosburgh 2006, p. 144). This may be due to the colonial nature of prairie dogs, their sensitivity to social disruption, and the intense nature of some recreational shooting. However, available information from several of the same studies indicates that populations can also often recover from very low numbers following intensive shooting (Knowles 1988, p. 54; Vosburgh 1996, pp. 16, 31; Dullum *et al.* 2005, p. 843; Pauli 2005, p. 17; Cully and Johnson 2006, pp. 6–7). Based on the research cited above, it appears that a typical scenario is either: (1) once populations have been reduced, shooters go elsewhere and populations recover; or (2) continued shooting maintains reduced population size at specific sites. Some landowners maintain prairie dog populations and derive income from charging people for recreational shooting. Monetary gain from shooting fees may motivate landowners to preserve prairie dog colonies for future shooting opportunities. This is currently an alternative to eradicating them by poisoning (Vosburgh and Irby 1998, pp. 366–371; Reeve and Vosburgh 2006, pp. 154–155).

Pauli (2005) studied five colonies not exposed to shooting and compared population effects with five colonies where shooting occurred. He found that in the colonies with shooting, reproductive output decreased by 76 percent from 2003–2004 on the shot colonies (Pauli 2005, p. 29). However, all colonies but one expanded from 2003–2004, although expansion was greater in control colonies (49.6 percent) than in colonies where shooting occurred (25.0 percent) (Pauli 2005, p. 17). The colony that did not expand was a control colony that experienced plague (Pauli *et al.* 2006, p. 77). A second paper on the same research project noted a decline in reproductive output in colonies with shooting, of 82 percent from 2003–2004, but did not discuss colony expansion (Pauli and Buskirk 2007a, p. 1228).

Recreational shooting may increase the potential for lead poisoning in predators and scavengers consuming shot prairie dogs (Reeve and Vosburgh 2006, p. 154). This risk may extend to prairie dogs, which have occasionally been observed to cannibalize carcasses (Hoogland 1995, p. 14). Recreational shooters primarily use bullets designed to expand on impact and rarely remove carcasses. In one study, expanding bullets left an average of 3.426 grains (228.4 milligrams (mg)) of lead in a prairie dog carcass, while non-expanding bullets averaged 0.297 grains (19.8 mg) of lead (Pauli and Buskirk 2007b, p.103). The authors noted that

the amount of lead in a single prairie dog carcass shot with an expanding bullet is potentially sufficient to acutely poison scavengers or predators, and may provide an important portal for lead entering wildlife food chains. A wide range of sublethal toxic effects are also possible from smaller quantities of lead (Pauli and Buskirk 2007, p.103).

Black-tailed prairie dogs are occasionally collected for the pet trade, plague research, and zoo displays. However, we have no information indicating any adverse effects resulting from possible overutilization for commercial (pet trade), scientific (plague research), or educational (zoo displays) purposes.

Summary of Factor B

Recreational shooting of prairie dogs can cause localized effects on a population. However, literature documenting effects from shooting of prairie dogs also frequently describes subsequent rebounds in local populations. Extirpations due to recreational shooting, while documented, are rare and therefore not considered a significant threat overall to the species. Recent Statewide estimates of occupied habitat further reinforce this observation by documenting population increases in States that allow shooting. There is no information available to indicate that the type of bullet used to shoot prairie dogs poses a substantial risk of lead poisoning to surviving prairie dogs due to scavenging carcasses. However, the risk to other species that may scavenge prairie dog carcasses should be a management consideration if intensive recreational shooting occurs. Since the early 1960s, occupied habitat has increased in every State. Throughout the United States, occupied habitat is estimated to have increased by over 600 percent from 1961 until the present time. This increase has occurred despite recreational shooting and impacts from other factors.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that recreational shooting is not a limiting factor for the species. Consequently, we do not anticipate that impacts from recreational shooting are likely to negatively impact the status of the species in the foreseeable future.

We conclude that the best scientific and commercial information available indicates that the black-tailed prairie dog is not now, or in the foreseeable future, threatened by overutilization for commercial, recreational, scientific, or educational purposes to the extent that listing under the Act as a threatened or

endangered species is warranted at this time. Regulations specific to shooting are described under Factor D.

C. Disease and Predation

Plague is an exotic disease foreign to the evolutionary history of North American prairie dogs. It is caused by the bacterium *Yersinia pestis*, which fleas acquire by biting infected animals and subsequently transmit via a bite to other animals (Gage and Kosoy 2005, pp. 516-517). The disease can also be transmitted through pneumonic (airborne) or septicemic (blood) pathways from infected to disease-free animals (Barnes 1993, p. 28; Ray and Collinge 2005, p. 203; Cully *et al.* 2006, p. 158; Rocke *et al.* 2006, p. 243; Webb *et al.* 2006, p. 6236). Plague was first observed in wild rodents in North America near San Francisco, California, in 1903 (Eskey and Haas 1940, p. 1), and was first documented in black-tailed prairie dogs in Texas in 1946 (Miles *et al.* 1952, p. 41). Plague spread approximately 1,400 mi (2,250 km) eastward from its initial introduction in San Francisco into the species' habitat in approximately 40 years, but eastward expansion has since slowed (Adjemian *et al.* 2007, p. 365). Plague has only spread a few hundred miles in the past 50-60 years.

Plague is maintained in nature through fleas and certain rodent hosts that have sufficient resistance to maintain the disease at a low level of

transmission with little evident mortality in animals carrying plague (enzootic cycle). Occasionally, the disease spreads from enzootic hosts to more susceptible animals, resulting in a rapidly spreading die-off affecting a large number of animals (epizootic cycle) (Barnes 1993, p. 29; Biggins and Kosoy 2001, p. 909; Cully and Williams 2001, p. 900; Gage and Kosoy 2005, pp. 506-508). The factors that cause a change from an enzootic to epizootic cycle are still being researched, but may include host density, flea density, and climatic conditions (Cully 1989, p. 49; Parmenter *et al.* 1999, p. 814; Cully and Williams 2001, pp. 899-903; Enscoe *et al.* 2002, p. 186; Lomolino *et al.* 2003, pp. 118-119; Stapp *et al.* 2004, p. 237; Gage and Kosoy 2005, p. 509; Ray and Collinge 2005, p. 204; Stenseth *et al.* 2006, p. 13110; Adjemian *et al.* 2007, p. 372; Snäll *et al.* 2008, p. 246).

Black-tailed prairie dogs are very sensitive to plague, and mortality frequently reaches 100 percent (Barnes 1993, p. 28). Two patterns of die-offs are typically described for black-tailed prairie dogs: (1) A rapid and nearly 100 percent die-off with incomplete recovery, such as has occurred at the Rocky Mountain Arsenal and the Comanche National Grassland in Colorado (Cully and Williams 2001, pp. 899-903); and (2) a partial die-off resulting in smaller, but stable, populations and smaller, more dispersed colonies, such as has occurred

at the Cimarron National Grassland in Kansas (Cully and Williams 2001, pp. 899-903) and Pawnee National Grassland in Colorado (Derner *et al.* 2006, p. 459).

Several reports have suggested that the response of black-tailed prairie dogs to plague may vary based on population density or degree of colony isolation (Cully 1989, p. 49; Cully and Williams 2001, pp. 899-903; Lomolino *et al.* 2003, pp. 118-119). Colony complexes with a history of recurring plague are typically composed of smaller colonies with greater intercolony distances. A frequent assumption of metapopulation conservation is that larger and closer populations are preferable to smaller and more isolated populations; however, this may not be the case when populations are exposed to a highly virulent pathogen such as plague that can be transferred from patch to patch by species movement (Johnson 2005, pp. 73-74).

Table 2 illustrates die-offs and extent of recovery for several well-studied sites that have experienced plague epizootics (outbreak), although some of these sites may have also been influenced by poisoning. Any conclusions as to decreasing or increasing trends in black-tailed prairie dog populations described in Table 2 are temporal in nature and site-specific. Long-term, large-scale population trends appear to be increasing.

TABLE 2. SITE-SPECIFIC POPULATION ESTIMATES OF OCCUPIED BLACK-TAILED PRAIRIE DOG HABITAT PRE- AND POST-PLAGUE (PP = POST-PLAGUE)

Site	1 st Estimate	2 nd Estimate	3 rd Estimate	4 th Estimate	5 th Estimate	6 th Estimate
Comanche NG, CO	5,000 (2,023), 1995 ¹	1,600 (647), 1999 ¹ (PP)	10,700 (4,330), 2005 ¹	3,000 (1,214), 2006 ¹ (PP)		
Meadow Springs Ranch, CO	3,336 (1,351), 2006 ²	1,393 (564), 2007 ² (PP)	360 (146), 2008 ² (PP)			
Pawnee NG, CO	731 (296), 1998 ³	744 (301), 1999 ⁴	983 (398), 2000 ⁴	3,300 (1,337), 2005 ⁵	2,398 (971), 2008 ⁵ (PP)	
Pueblo Chemical Depot, CO	4,333 (1,753), 1998 ⁶	67 (27), 2000 ⁶ (PP)	3,423 (1,385), 2005 ⁶	2,712 (1,097), 2006 ⁶ (PP)		
Rocky Mt. Arsenal, CO	4,574 (1,851), 1988 ⁷	247 (99), 1989 ⁷ (PP)	2,429 (982), 1994 ⁷	22 (8), 1995 ⁷ (PP)	1,646 (666), 2000 ⁷	314 (127), 2002 ⁸ (PP)
Cimarron NG, KS	1,716 (695), 1988 ³	1,287 (521), 1998 ³	1,688 (684), 1999 ⁴	2,639 (1,069), 2001 ⁴	3,321 (1,345), 2002 ⁹	1,337 (541), 2008 (PP) ⁵
CMR NWR, MT	4,859 (1,968), 2004 ¹⁰	2,064 (836), 2007 ¹⁰ (PP)	1,729 (700), 2008 ¹⁰ (PP)			
Ft. Belknap Res., MT	24,000 (9,720), 1990 ¹¹	11,000 (4,455), 1996 ¹¹ (PP)	13,475 (5,457), 1998 ¹¹	14,230 (5,763), 1999 ¹²	12,987 (5,260), 2000 ¹²	12,989 (5,261), 2002 ¹²
N Cheyenne Res., MT	10,720 (4,338), 1990 ¹³	378 (152), 1995 ¹⁴ (PP)	3,300 (1,335), 2002 ¹⁵	3,913 (1,585), 2003 ¹⁵	5,683 (2,299), 2006 ¹³	

TABLE 2. SITE-SPECIFIC POPULATION ESTIMATES OF OCCUPIED BLACK-TAILED PRAIRIE DOG HABITAT PRE- AND POST-PLAGUE (PP = POST-PLAGUE)—Continued

Site	1 st Estimate	2 nd Estimate	3 rd Estimate	4 th Estimate	5 th Estimate	6 th Estimate
Kiowa/Rita Blanca NG, TX, OK, NM	1,600 (647), 1999 ⁹	6,800 (2,751), 2003 ⁹	4,500 (1,821), 2004 ⁹ (PP)	3,000 (1,214), 2005 ⁹ (PP)		
Cimarron County, OK	1,837 (744), 1967 ¹⁶	5,500 (2,228), 1972 ¹⁷	10,406 (4,214), 1989 ¹⁸	2,370 (960), 1991 ¹⁹ (PP)	1,975 (800), 1999 ²⁰	13,523 (5,477), 2002 ²¹
Buffalo Gap NG, SD	42,600 (17,253), 1980 ⁴	13,270 (5,374), 1998 ³	18,105 (7,333), 2002 ⁴	~38,000 (15,400), 2007 ⁵	28,993 (11,742), 2008 ⁵ (PP)	
Thunder Basin NG, WY	6,301 (2,552), 1980 ⁴	18,340 (7,428), 1997 ⁴	18,239 (7,387), 1998 ³	15,864 (6,425), 2001 ⁴ (PP)	9,000 (3,642), 2003 ²² (PP)	3,700 (1,500), 2008 ⁵ (PP)

¹ Augustine *et al.* 2008

² Bachland 2008

³ Sidle 1999

⁴ Thompson 2002

⁵ Sidle 2009b

⁶ Young 2008

⁷ Seery 2001

⁸ Seery 2002

⁹ Cully and Johnson 2006

¹⁰ Dullum 2009

¹¹ FaunaWest 1998

¹² Vosburg 2002

¹³ Larson 2008

¹⁴ Fourstar 1998

¹⁵ Vosburg 2003

¹⁶ Tyler 1968

¹⁷ Lewis and Hassien 1973

¹⁸ Shackford *et al.* 1990

¹⁹ Shaw *et al.* 1993

²⁰ Lomolino 1999

²¹ Luce 2002

²² Byer 2003

Some studies have documented the development of antibodies in black-tailed prairie dogs surviving a plague epizootic. Over 50 percent of survivors developed antibodies at one Colorado site (Pauli 2005, pp. 1, 71). The degree of evolved resistance, assuming little or no resistance initially, is not known. However, a preliminary assessment of natural resistance to plague found that prairie dogs collected from South Dakota (minimal plague), Texas (historical plague outbreaks), and Colorado (ongoing plague outbreaks) had differing levels of resistance. When challenged with the same doses of plague inoculum, nearly all South Dakota animals died, but 60 percent and 50 percent of animals from Texas and Colorado respectively survived over all doses (Rocke 2009, p. 1). Laboratory research indicates that at low levels of exposure a small percentage of black-tailed prairie dogs show some immune response and consequently some resistance to plague, indicating that development of a plague vaccine may be feasible (Creekmore *et al.* 2002, pp. 32, 38). Research on development of a plague vaccine has demonstrated significantly higher antibody levels and survival rates in vaccinated black-tailed

prairie dogs that were challenged with the plague bacterium (Mencher *et al.* 2004, pp. 5, 8–9; Rocke *et al.* 2008, p. 930). Oral vaccination may be effective for managing plague epizootics in select free-ranging prairie dog populations by reducing mortality in exposed individuals (Mencher *et al.* 2004, pp. 8–9). However, we need to conduct field tests before using it as a management tool.

Since our last evaluation of the status of the black-tailed prairie dog in 2004, when it was removed from the candidate list, plague has expanded its range into South Dakota, previously the only State where plague had not been documented in prairie dogs (U.S. Fish & Wildlife Service 2005a, p. 1). The disease reached Conata Basin in 2008, despite 3 years of treating prairie dog burrows in portions of the affected area with insecticide in an effort to kill fleas and thereby limit plague transmission (a process referred to as “dusting”).

Conata Basin is one of the largest remaining black-tailed prairie dog complexes and is the most successful recovery site in North America for the endangered black-footed ferret. Approximately 10,505 ac (4,251 ha) have been affected by plague through May 2009 in Conata Basin (Griebel

2009, p. 1). Within the plague zone, there are typically scattered individuals or small pockets of 1 to 2 ac (0.4 to 0.8 ha) where prairie dogs either have natural immunity or escaped exposure by chance (Griebel 2008, p. 4).

Plague has also been documented on Pine Ridge and Cheyenne River Reservations in South Dakota (Mann-Klager 2008, pp. 1-2). Creekmore *et al.* (2002, p. 38) noted that the establishment of sylvatic plague in South Dakota could have a substantial impact on population dynamics of both the black-tailed prairie dog and the black-footed ferret in South Dakota. However, at this time less than 2 percent of occupied habitat in the State has been affected by plague and occupied habitat continues to increase Statewide. Occupied habitat also continues to increase in States that have had plague present for more than 50 years.

Sylvatic plague remains a significant population stressor and the spread and effects of plague on the species could be exacerbated by climate change in the future. The extent to which the spread of plague may expand or contract in the future is not clear. Regardless of how plague is affected by climate change, the black-tailed prairie dog has proven to be

a resilient species. In spite of the past and current effects of plague and climate change and resulting impacts acting on the species, occupied habitat (a surrogate measure for population trends and status) in the United States has increased by more than 600 percent since the early 1960s. Although the effects of plague could be exacerbated by climate change in the future, the current status of the black-tailed prairie dog does not suggest that plague, or the combined effects of plague and climate change, are a limiting factors for the species in the foreseeable future, and we do not believe these will result in significant population-level impacts. The present or threatened curtailment of prairie dog habitat presented by climate change is addressed further under Factor E.

Tularemia and monkey pox are diseases that have had impacts on captive black-tailed prairie dogs associated with the pet trade; however, we have no information to indicate that either of these diseases are a concern for wild prairie dogs.

Many species prey upon the black-tailed prairie dog; however, we have no information to indicate that predation is a concern.

Summary of Factor C

Plague has expanded its range to all States within the range of the black-tailed prairie dog in recent years and has caused local population declines at several sites. These declines are typically followed by partial or complete recovery. Development of a vaccine to protect prairie dog populations has begun, and resistance to plague has been observed in some individuals. Since the early 1960s, occupied habitat has increased in every State, even in those States where plague has been present for over 50 years. Throughout the United States, occupied habitat is estimated to have increased by over 600 percent from 1961 until the present time. This increase has occurred despite continued impacts from plague and other factors.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that plague is not a limiting factor for the species. Although Sylvatic plague remains a population stressor and the spread and effects of plague on the species could be exacerbated by climate change in the long term future, the black-tailed prairie dog has proven to be a resilient species. In spite of the past and current effects of plague and climate change and resulting impacts on the species, black-tailed prairie dog

occupied habitat (a surrogate measure for population trends and status) in the U.S. has increased by more than 600 percent since the early 1960s. Although the effects of plague could be exacerbated by climate change in the future, the current status of the black-tailed prairie dog does not suggest that the combined effects of climate change and plague, are a limiting factor for the species in the foreseeable future, and we do not believe these will result in significant population-level impacts. Consequently, we do not anticipate that impacts from the disease are likely to negatively impact the status of the species in the foreseeable future. Therefore, we have no reason to suspect that plague poses a significant threat to the species.

We conclude that the best scientific and commercial information available indicates that the black-tailed prairie dog is not now, or in the foreseeable future, threatened by disease or predation to the extent that listing under the Act as a threatened or endangered species is warranted at this time.

D. The Inadequacy of Existing Regulatory Mechanisms

Traditionally, resident species that are not federally threatened or endangered are usually managed by States or Tribes. Federal land management agencies may have additional management policies on their lands. The three primary means by which agencies can effectively influence black-tailed prairie dog populations are via shooting regulations, poisoning regulations, and proactive management. Detailed information regarding existing regulatory and management measures affecting the species is provided below.

Arizona

Classification – The species is classified as nongame (animals that are not traditionally hunted, fished, or trapped) (Voyles 2009, p. 2).

Shooting – A hunting license is required to shoot prairie dogs. The hunting season for black-tailed prairie dogs has been closed since 1999 (Voyles 2009, p. 2).

Poisoning – Toxicants are permitted for use on prairie dogs in Arizona, typically in conjunction with human health related to plague or safety concerns; however, plague has not been identified within the range of the black-tailed prairie dog in Arizona since its reintroduction in 2008, and no poisoning has occurred (Voyles 2009, p. 2).

Management Plans – Arizona is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan

(Van Pelt *et al.* 2001) for Arizona supports, but does not meet, the objectives described in the Multi-State Plan. The Statewide management plan for Arizona has not been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Arizona Game and Fish Dept. 2006, pp. 443-445). However, this designation does not result in any protection for the species.

Colorado

Classification – The black-tailed prairie dog is classified as small game (CDOW 2009, p. 2).

Shooting – In 2006, the State removed the ban on hunting black-tailed prairie dogs on public land (Nesler 2009, p. 5). The hunting season is year-round on private land and June 15 through the end of February on public land. A small game license is required. There is no bag limit (CDOW 2009, p. 2).

Poisoning – Chemical control is jointly regulated by the Colorado Department of Agriculture, and the CDOW and is limited to those pesticides legally permitted for use on black-tailed prairie dogs. Prairie dogs may also be taken by use of explosive gases where necessary to control damage on private lands (CDOW 2009, p. 4).

Management Plans – Colorado is not a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (CDOW 2003) for Colorado supports and meets all of the objectives described in the Multi-State Plan. The Statewide management plan for Colorado has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (CDOW 2006, p. 98). However, this designation does not result in any protection for the species.

Kansas

Classification – The Kansas Department of Wildlife and Parks classifies the species as wildlife (Kansas Department of Wildlife and Parks 2009, p. 1).

Shooting – The hunting season is year-round on private and public lands. A hunting license is required for residents and nonresidents. There is no bag limit (Kansas Department of Wildlife and Parks 2009, p. 2).

Poisoning – The most recent information available to us indicates that a permit is required to use any poisonous gas or smoke, but is not required to use above ground toxicants (Mitchener 2003, p. 2). According to Kansas Statutes 80-1201, 1202, and

1203, control may be legislated at a local level. For example, several townships have imposed mandatory control requirements. In some cases, landowners are instructed to control prairie dogs on their land; if they fail to do so, it is done by the county at the landowner's expense (Kansas Legislature 2009, pp. 1-8).

Management Plans – Kansas is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (Kansas Department of Wildlife and Parks 2002) for Kansas supports, but does not meet, all of the objectives described in the Multi-State Plan. Kansas does not meet the objective of maintaining at least 10 percent of total occupied area in complexes greater than 1,000 ac (405 ha) (Van Pelt 2009, p. 16). The Statewide management plan for Kansas has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Wasson *et al.* 2005, Appendix 1). However, this designation does not result in any protection for the species.

Montana

Classification – The species is classified as a vertebrate pest under the Montana Department of Agriculture (Bamber 2009, pp. 1-2). The State legislature allowed the dual status of “nongame wildlife in need of management” and “vertebrate pest” to expire in 2007 (Bamber 2009, pp. 1-2). A bill to resume dual classification and management of the black-tailed prairie dog failed to pass in the 2009 Montana legislative session (Hanuska-Brown 2009, p. 2).

Shooting – The hunting season is year-round on private and public lands. No hunting license is required for residents or nonresidents (Van Pelt 2009, p. 21). There is no bag limit.

Poisoning – Chemical control is regulated by the Montana Department of Agriculture. The Department employs a vertebrate pest specialist to assist Federal, State, and County agencies and private landowners with training and certification of pesticide applicators. There is no funding or personnel for the Montana Department of Agriculture to conduct prairie dog control programs. No control is currently occurring on Federal or tribal lands, and the level of control on private and State lands has remained stable in recent years (Bamber 2009, pp. 1-2).

Management Plans – Montana is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (Montana Department of Fish, Wildlife

and Parks 2002) for Montana does not support or meet the occupied area objective. The Statewide management plan for Montana has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Montana Fish, Wildlife and Parks 2005, pp. 375-378). However, this designation does not result in any protection for the species.

Nebraska

Classification – The species is classified as unprotected nongame (Amack and Ibach 2009, p. 2).

Shooting – The hunting season is year-round on private and public lands. No hunting license is required for residents. Nonresidents must have a small game hunting license. There is no bag limit (Amack and Ibach 2009, p. 2).

Poisoning – Chemical control is regulated by the Nebraska Department of Agriculture and is limited to those pesticides legally permitted for use on black-tailed prairie dogs. The U. S. Animal and Plant Health Inspection Service and landowners conduct control work (Amack and Ibach 2009, p. 3).

Management Plans – Nebraska is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (Nebraska Game and Parks Commission 2001) for Nebraska supports, but does not meet, all of the objectives described in the Multi-State Plan. Nebraska does not meet the objective of managing or contributing to at least one complex greater than 5,000 ac (2,023 ha) and does not meet the objective of maintaining distribution throughout at least 75 percent of the historic range in the State (Van Pelt 2009, p. 26). The Statewide management plan for Nebraska has not been approved. The Statewide comprehensive wildlife strategy does not recognize the black-tailed prairie dog as a species of concern (Schneider *et al.* 2005, pp. 203, 236).

New Mexico

Classification – The species is not classified as having any status by the State other than that described by the Statewide comprehensive wildlife strategy (Van Pelt 2009, p. 28).

Shooting – The hunting season is year-round on private and public lands. No hunting license is required for residents. Nonresidents must have a hunting license (Van Pelt 2009, p. 28). There is no bag limit.

Poisoning – Chemical control is limited to pesticides legally permitted for use on black-tailed prairie dogs.

Management Plans – New Mexico is a signatory to the interstate

Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (New Mexico Black-tailed Prairie Dog Working Group 2001) for New Mexico does not support or meet all of the objectives described in the Multi-State Plan. New Mexico does not support the objective of managing or contributing to at least one complex greater than 5,000 ac (2,023 ha), although it does meet that objective (Van Pelt 2009, p. 28). It does not meet the occupied area objective or the objective of maintaining distribution throughout at least 75 percent of the historic range in the State (Van Pelt 2009, p. 28). The Statewide management plan for New Mexico has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (New Mexico Department of Game and Fish 2006, pp. 55, 577). However, this designation does not result in any protection for the species.

North Dakota

Classification – The species is classified as a pest species by the North Dakota Department of Agriculture (McKenna 2009, p. 1).

Shooting – The hunting season is year-round on private and public lands. No hunting license is required for residents. Nonresidents must have a nongame or furbearers license (McKenna 2009, p. 2). There is no bag limit.

Poisoning – Current regulations allow landowners to poison black-tailed prairie dogs if they are certified applicators (McKenna 2009, p. 2).

Management Plans – North Dakota is not a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (North Dakota Game and Fish Department 2001) for North Dakota does not support or meet all of the objectives described in the Multi-State Plan. North Dakota does not support any of the objectives and does not meet any objectives except distribution over at least 75 percent of the historical range (Van Pelt 2009, p. 24). The Statewide management plan for North Dakota has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Hagen *et al.* 2005, pp. 27, 305-307). However, this designation does not result in any protection for the species.

Oklahoma

Classification – The species is classified as wildlife-nongame (Van Pelt 2009, p. 30).

Shooting – The hunting season is year-round on private and public lands. Residents and nonresidents must have a valid State hunting license. There is no bag limit (Van Pelt 2009, p. 30).

Poisoning – A permit from the Oklahoma Department of Wildlife Conservation is required. No permit will be issued in a county with less than 100 ac (40 ha) of black-tailed prairie dog occupied habitat (Van Pelt 2009, p. 30).

Management Plans – Oklahoma is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 71). The Statewide management plan (Hoagland 2001) for Oklahoma supports, but does not meet all of the objectives described in the Multi-State Plan. Oklahoma does not meet the occupied area objective (Van Pelt 2009, p. 30). The Statewide management plan for Oklahoma has not been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Oklahoma Department of Wildlife Conservation 2005, pp. 358, 360). However, this designation does not result in any protection for the species.

South Dakota

Classification – The State of South Dakota modified the designation of “species of management concern” for the black-tailed prairie dog by designating it as a pest if plague is reported east of the Rocky Mountains, the Statewide population is greater than approximately 145,000 ac (59,000 ha), or the species is colonizing within a 1 mi (1.6 km) buffer around concerned landowners (South Dakota State Legislature 2005, pp. 3-4). Currently, all of these criteria are being met; therefore, the species is considered a pest in South Dakota.

Shooting – The hunting season is year-round on private lands and open from June 15 through February 28 on public lands, except for a year-round closure in Conata Basin. Residents and nonresidents must have a valid South Dakota hunting license. There is no bag limit (Van Pelt 2009, p. 34).

Poisoning – Chemical control is limited to pesticides legally permitted for use on black-tailed prairie dogs.

Management Plans – South Dakota is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 72). The Statewide management plan (Cooper and Gabriel 2005) for South Dakota supports and meets all of the objectives described in the Multi-State Plan (Vonk and Even 2009, pp. 3-4). South Dakota’s management plan also notes that the state has identified its own goals and objectives, specific to South Dakota, and reserves the right to

preserve their own management authority. The Statewide management plan for South Dakota has been approved. The Statewide comprehensive wildlife strategy does not recognize the black-tailed prairie dog as a species of concern (South Dakota Department of Game, Fish, and Parks 2006, pp. 65-69).

Texas

Classification – The species is classified as nongame (Van Pelt 2009, p. 38).

Shooting – The hunting season is year-round on private and public lands. Residents and nonresidents must have a valid State hunting license. There is no bag limit for shooting. A nongame commercial dealer’s permit is required for capture and selling of more than 25 individuals (Van Pelt 2009, p. 38).

Poisoning – Chemical control is limited to pesticides legally permitted for use on black-tailed prairie dogs.

Management Plans – Texas is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 72). The Statewide management plan (Texas Black-tailed Prairie Dog Working Group 2004) for Texas supports, but does not meet all of the objectives described in the Multi-State Plan. Texas does not meet the occupied area objective (Van Pelt 2009, p. 37). The Statewide management plan for Texas has been approved. The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Texas Parks and Wildlife Department 2005, p. 744). However, this designation does not result in any protection for the species.

Wyoming

Classification – The species is classified as a nongame mammal by the Wyoming Game and Fish Department and as a pest by the Wyoming Department of Agriculture. A Memorandum of Understanding exists to coordinate management of the species between the two Departments if survey results indicate that occupied habitat for the species is less than the Wyoming Game and Fish Department objectives (Emmerich 2009, p. 3).

Shooting – The hunting season is year-round on private and public lands. Residents and nonresidents are not required to have a State hunting license. There is no bag limit for shooting (Van Pelt 2009, p. 40). Unlike most States, the Wyoming Game and Fish Commission has the authority to implement a shooting closure if it deems it necessary (Emmerich 2009, p. 3).

Poisoning – Chemical control is limited to pesticides legally permitted for use on black-tailed prairie dogs.

Management Plans – Wyoming is a signatory to the interstate Conservation Assessment and Strategy (Van Pelt 1999, p. 72). The Statewide management plan (Kruckenberg *et al.* 2001) for Wyoming supports and meets all of the objectives described in the Multi-State Plan. The Statewide management plan for Wyoming has not been approved. However, a grasslands conservation plan (Wyoming Game and Fish Department 2006, pp. 23-29, 94-130) addresses the species and has specific management objectives consistent with the Multi-State Plan (Emmerich 2009, pp. 3-4). The Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern (Wyoming Game and Fish Department 2005, pp. 10, 141-143). However, this designation does not result in any protection for the species.

Tribes

There are several Indian Reservations within the range of the black-tailed prairie dog in Montana, New Mexico, North Dakota, and South Dakota. However, we are only aware of nine Tribes that have black-tailed prairie dog occupied habitat within their Reservations (Cheyenne River Sioux Indian Reservation, SD; Crow Indian Reservation, MT; Crow Creek Indian Reservation, SD; Fort Belknap Indian Reservation, MT; Lower Brule Indian Reservation, SD; Northern Cheyenne Indian Reservation, MT; Pine Ridge Indian Reservation, SD; Rosebud Indian Reservation, SD; and Standing Rock Indian Reservation in ND and SD). Tribes did not provide any new information. It is our understanding that hunting black-tailed prairie dogs on tribal lands requires a permit. The season is typically year-round, and there are no bag limits. Poisoning is prohibited or requires a permit. Tribes generally meet or exceed their proportional requirements for occupied habitat, as described in the Multi-State Plan.

Federal Agencies

There are numerous Federal laws, acts, and policies in addition to the Act that encourage coordination of activities that may impact wildlife and promote conservation of wildlife. Some of the most frequently encountered that may influence black-tailed prairie dog management are described. The Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*) requires consultation between the Service and other Federal agencies and equal consideration of

wildlife conservation with water resource development programs. The Fish and Wildlife Conservation Act (16 U.S.C. 2901 *et seq.*) authorizes financial and technical assistance to States for the development of conservation plans and programs for nongame fish and wildlife. The National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Specific information for affected Federal agencies is provided as follows.

U.S. Air Force – The most recent available information indicates that no recreational shooting is allowed on Ellsworth Air Force Base and Badlands Bombing Range in South Dakota; however, some chemical control has been conducted (Morgenstern 2003, pp. 3-4). Similarly, at Buckley Air Force Base in Colorado there is no recreational shooting, but some chemical control (Friese 2003, pp. 2, 4). We have no information on black-tailed prairie dog management policies from other bases.

Department of Agriculture, U.S. Animal and Plant Health Inspection Service (APHIS) – APHIS, Wildlife Services (WS) does not manage any Federal lands. However, it supports prairie dog control programs in several States. In 2008, 129 projects were conducted regarding the control of black-tailed prairie dogs (primarily personal consultations) in Colorado, Nebraska, New Mexico, North Dakota, Oklahoma, Texas, and Wyoming (APHIS 2009, pp. 1-7). At a black-footed ferret reintroduction site in Kansas, the Service has an agreement with APHIS-WS to provide a staff person to control prairie dogs if neighboring landowners request control (LeValley 2009, pp. 1-2). APHIS-WS also has supported several research efforts in recent years regarding disease, control, non-target impacts that can be accessed on their website.

U.S. Army – The most recent available information indicates that the U.S. Army manages approximately 8,800 ac (3,600 ha) of black-tailed prairie dog occupied habitat (Hoefert 2002, pp. 2-6). The majority of occupied habitat (approximately 7,000 ac/2,800 ha) occurs on Fort Carson Garrison in Colorado (Larson 2008, p. 73).

U.S. Bureau of Indian Affairs – The U.S. Bureau of Indian Affairs' involvement in black-tailed prairie dog management has been principally through management of funding for prairie dog control programs on tribal lands in Montana, North Dakota, and South Dakota. The last large-scale

chemical control effort for the species was directed by U.S. Bureau of Indian Affairs on the Pine Ridge/Oglala Sioux Reservation in South Dakota in the 1980s (Roemer and Forrest 1996, p. 353).

U.S. Bureau of Land Management – The most recent available information indicates that the U.S. Bureau of Land Management (BLM) manages approximately 39,000 ac (16,000 ha) of black-tailed prairie dog occupied habitat in Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, and Wyoming (Lawton 2003, p. 14). The BLM manages prairie dogs to meet multiple-use resource objectives including production of livestock forage and prevention of prairie dog encroachment onto adjacent lands. The BLM generally adheres to State regulations regarding shooting, although some additional closures exist at black-footed ferret recovery sites.

U.S. Environmental Protection Agency – The U.S. Environmental Protection Agency (EPA) influences regulatory mechanisms through its pesticide labeling programs that determine which pesticides can be legally used to poison prairie dogs, who can apply them, and what other label restrictions apply. The EPA has approved several chemicals for control of black-tailed prairie dogs. The impacts of poisoning by these chemicals are described in greater detail under "Poisoning" in Factor E below. Here, we describe the regulatory process employed by the EPA.

The EPA approved zinc phosphide as a legal prairie dog control chemical in 1973 (Forrest and Luchsinger 2006, p. 124). The EPA has not responded to our request to provide information on the amount of area poisoned with zinc phosphide or the amount of chemical sold. This information would enable us to better monitor the extent and effects of poisoning with zinc phosphide on black-tailed prairie dogs.

The EPA recently permitted the use of chlorophacinone and diphacinone (both anticoagulants) to poison prairie dogs. Use of these two chemicals to control prairie dogs constitutes new uses for these poisons. Since 2004, State agricultural departments have issued Special Local Needs permits under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136 *et seq.*) Section 24(c) authorizing the use of chlorophacinone for poisoning prairie dogs in Colorado, Kansas, Nebraska, Oklahoma, Texas, and Wyoming and authorizing the use of diphacinone for poisoning prairie dogs in Colorado, Kansas, Nebraska, Texas, and Wyoming. In 2009, the EPA further broadened the

potential scope of chlorophacinone by registering it under FIFRA section 3, which allows its use throughout the 11 States within the range of the black-tailed prairie dog. Prairie dogs are highly susceptible to both chlorophacinone and diphacinone, which is why the chemicals are popular as a control mechanism. Unlike zinc phosphide, secondary poisoning of several species is documented from chlorophacinone and diphacinone (Erickson and Urban 2004, pp. 48, 51; Lydick 2006, pp. 1-2; Klataske 2009, pp. 1-6; Service 2007, pp. 1-10).

We have limited information regarding the number of prairie dogs that are killed by anticoagulants or the amount of habitat treated. We are concerned about the impacts to both the black-tailed prairie dog and the secondary poisoning of other species, such as black-footed ferrets, other mammals, eagles, and other raptors. Despite this concern, the amount of habitat occupied by the black-tailed prairie dog throughout the United States increased by over 600 percent from 1961 until the present time.

U.S. Fish and Wildlife Service – The Service manages over 500 National Wildlife Refuges and their satellites, but only about 15 refuges, satellites, or Waterfowl Production Areas have black-tailed prairie dogs. Three refuges have a majority of occupied habitat on Service lands (approximately 6,000 ac/2,400 ha). On Charles M. Russell and UL Bend National Wildlife Refuges in Montana, black-tailed prairie dog habitat is managed to enhance its value as a black-footed ferret reintroduction site. The Rocky Mountain Arsenal National Wildlife Refuge in Colorado is managed to support black-tailed prairie dogs and a diversity of wildlife. Current Service management policy allows managers on Service lands to:

- (1) control the species as needed for public health and safety,
- (2) translocate up to 30 percent of the population annually with proper coordination with State wildlife agencies, and
- (3) control the species to accommodate wildlife and habitat objectives after completion of a prairie dog management plan and evaluation by a Service review committee (Service 2005b, pp. 1-2).

Managers of Service lands are also encouraged to work cooperatively with neighboring landowners and local governments through the use of agreements and technical and financial assistance.

Department of Agriculture, U.S. Forest Service – The U.S. Forest Service (USFS) reduced their restrictions on

poisoning by rescinding a 2000 policy letter regarding control of black-tailed prairie dogs and allowing expanded poisoning on their lands (Manning 2004, pp. 2-4). The USFS manages an estimated 57,606 ac (23,312 ha) of black-tailed prairie dog occupied habitat (Sidle 2009b, p. 3). The USFS manages prairie dogs to meet multiple-use resource objectives including production of livestock forage and prevention of prairie dog encroachment onto adjacent lands. Recreational shooting is typically regulated by the State and is allowed on most National Grasslands, although some additional closures exist at black-footed ferret recovery sites. In 2008, the USFS poisoned 3,679 ac (1,489 ha) of black-tailed prairie dog occupied habitat (Sidle 2009b, p. 3). This control addressed encroachment of prairie dogs onto adjacent private lands. Most of this (2,489 ac/1,008 ha) was on Buffalo Gap National Grassland. Nevertheless, lands poisoned on Buffalo Gap constitute less than 0.4 percent of occupied habitat in South Dakota.

U.S. National Park Service – The U.S. National Park Service manages approximately 13,777 ac (5,575 ha) of black-tailed prairie dog occupied habitat (Van Pelt 2009, p. 71). A majority of occupied habitat (8,993 ac/3,642 ha) occurs on Badlands National Park in South Dakota (Van Pelt 2009, p. 71). Some poisoning with zinc phosphide and shooting by National Park Service rangers occurs in boundary areas for “good neighbor” purposes (Davila 2009, p. 1). The most recent National Park Service guidance notes that black-tailed prairie dogs are managed under policies for conserving native species, but that some control may be necessary for “good neighbor” and human health reasons. The use of anticoagulants is not approved due to impacts on non-target species (Davila 2009, pp. 3-4).

Canada – The black-tailed prairie dog is designated as vulnerable by the Committee on the Status of Endangered Wildlife in Canada. The management plan for the black-tailed prairie dog in Canada notes that the species will be allowed to naturally fluctuate on land managed by the Province of Saskatchewan, but if colonies expand beyond their 2007 boundaries, the affected land manager may implement control measures under authority of a permit issued by Saskatchewan Environment, with nonlethal control measures encouraged (Tuckwell and Everest 2009, p. 15).

Mexico – The most recent available information indicates that there is no shooting of black-tailed prairie dogs and little chemical control in Mexico (List

2001, p. 1). The species is listed as threatened by the Lista de las Especies Amerzadas, the official endangered and threatened species list of the Mexican government (SEMARNAP 1994).

Summary of Factor D

The affected State and Federal agencies are engaged in black-tailed prairie dog management and monitoring to a much greater extent than they were 10 years ago, before creation of the Prairie Dog Conservation Team. Nevertheless, agencies continue to have conflicting policies regarding prairie dog management. For example, Kansas has an approved management plan that supports all of the objectives described in the Multi-State Plan, and their Statewide comprehensive wildlife strategy recognizes the black-tailed prairie dog as a species of concern. However, the State’s only complex greater than 5,000 ac (2,023 ha), which satisfies an objective from the Multi-State Plan and is also a black-footed ferret recovery site, potentially could be reduced or eliminated by the Logan County Commission, which under state law has authority to control prairie dogs, against the landowners’ wishes and at the landowners’ expense (Haverfield and Haverfield 2009, pp. 1-6).

In some cases, Statewide occupied habitat is increasing in spite of, rather than because of, agency actions, which indicates that the species has been persistent despite state management contradictions. However, there is no evident correlation between the magnitude of increase in the species’ population in a particular State and the extent to which a State is engaged in proactive management. Since the early 1960s, occupied habitat has increased in every State. Throughout the United States, occupied habitat is estimated to have increased by over 600 percent from 1961 until the present time. This increase has occurred despite regulatory mechanisms that favor control of the species and other factors.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species’ occupied habitat since the early 1960s, indicates that inadequate regulatory mechanisms are not a limiting factor for the species. Consequently, we do not anticipate that impacts from inadequate regulatory mechanisms are likely to negatively impact the status of the species in the foreseeable future.

We conclude that the best scientific and commercial information available indicates that the black-tailed prairie dog is not now, or in the foreseeable future, threatened by inadequate

regulatory mechanisms to the extent that listing under the Act as an endangered or threatened species is warranted at this time.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Under this factor we evaluate poisoning, drought, and climate change.

Poisoning

Early poisoning of prairie dogs typically was conducted with strychnine and carbon bisulphide, with Compound-1080 becoming popular after World War II (Forrest and Luchsinger 2006, p. 122). Early poisoning efforts led to extirpation of the black-tailed prairie dog in Arizona by approximately 1940 (Arizona Game and Fish Dept. 1988, p. 26). Both Compound-1080 and strychnine can cause secondary poisoning of non-target predators and scavengers that prey on poisoned prairie dogs. Concern over secondary poisoning from strychnine and Compound-1080 led to a report by Cain *et al.* (1972, p. 6). The Council on Environmental Quality and the Department of the Interior requested this report and instructed the authors to evaluate existing animal control programs and provide recommendations. One of the recommendations was to remove from registration all toxicants used for predator control and those toxicants used for rodent control that resulted in secondary poisoning of non-target animals, because such methods were likely to be inhumane (Cain *et al.* 1972, pp. 5-6).

These recommendations led to Executive Order 11643, which in 1972 banned the use of toxicants that might cause secondary poisoning on public lands or via Federal programs. In 1982, this order was revoked by Executive Order 12342. However, poisoning prairie dogs with strychnine and Compound-1080 did not resume. The total area throughout the range of the species that was poisoned from 1915-1965 was likely more than 37 million ac (15 million ha) (Forrest and Luchsinger 2006, p. 120). The broad-scale, government sponsored poisoning that occurred during the first half of the twentieth century likely contributed to the species reaching a low point of 364,000 ac (147,000 ha) of occupied habitat in the early 1960s. Since then, poisoning has generally occurred on a more local scale and been conducted by individual landowners.

Since 1973, the two most commonly used toxicants have been zinc phosphide (administered via oats or other grain) and fumigants (administered via insertion into

burrows) (Forrest and Luchsinger 2006, p. 124). Both toxicants can pose a risk to non-target wildlife from primary exposure. In recent years anticoagulants such as chlorophacinone (trade name Rozol) and diphacinone (trade name Kaput) have become popular, as described under Factor D. In addition to risks of primary toxicity to non-target wildlife, these products pose a risk of secondary poisoning to non-target wildlife that is not a concern with zinc phosphide. These risks from secondary poisoning are similar to those raised 37 years ago by Cain *et al.* (1972, p. 6). Secondary poisoning has been documented in badgers (Lydick 2006, pp. 1-2; Klataske 2009, pp. 1-6) and a bald eagle (Service 2007, pp. 1-10) as a result of legal application of chlorophacinone for control of black-tailed prairie dogs.

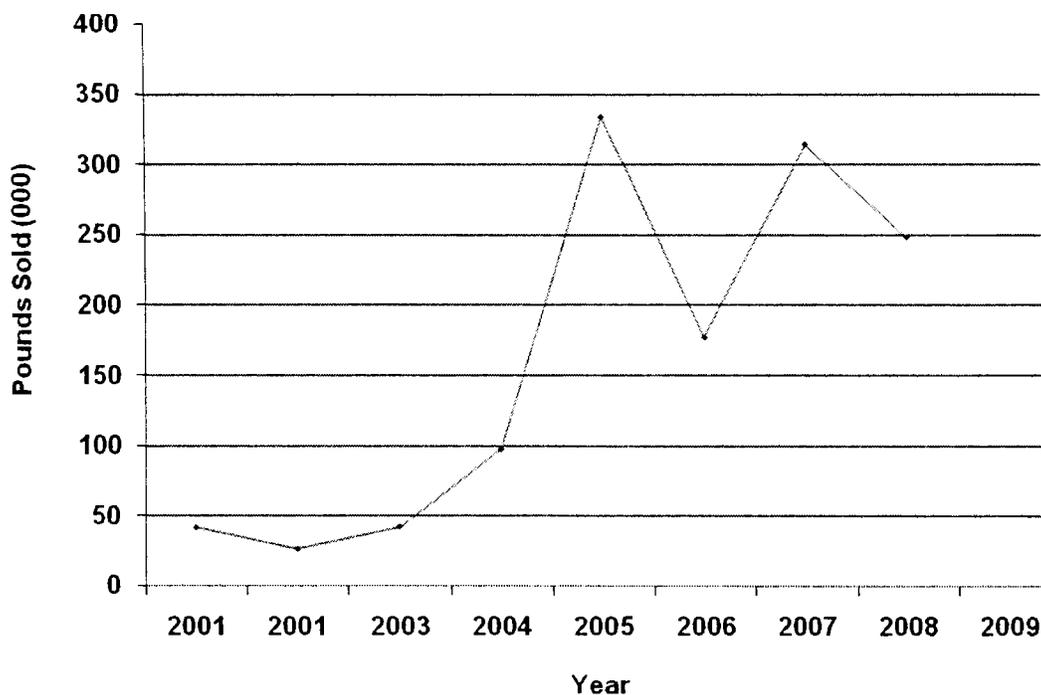
Anticoagulants such as chlorophacinone and diphacinone cause a more prolonged period of distress for

the black-tailed prairie dog prior to mortality than zinc phosphide. Anticoagulants act as blood thinners, with poisoned animals losing blood through various orifices, including eventually the skin membranes, over a period of weeks (Erickson and Urban 2004, p. 3). For example, two weeks after an illegal application of chlorophacinone on 160 ac (65 ha) in South Dakota in 2005, we found dying prairie dogs. In contrast, zinc phosphide causes mortality in a matter of hours. We do not have any information on the amount of anticoagulants sold for prairie dog control or the amount of land treated.

The most complete information that we have regarding the amount of black-tailed prairie dog habitat poisoned or the amount of poison sold is from the South Dakota Department of Agriculture, which jointly manages prairie dog control with the South Dakota Department of Game, Fish and

Parks. South Dakota is the only State that has been permitted by EPA to manufacture and sell zinc phosphide. Sales from the South Dakota bait station are largely limited to South Dakota, Wyoming, and Nebraska. The available information indicates that sales from the South Dakota bait station fluctuate, but in general have increased since we removed the black-tailed prairie dog from the candidate list in 2004 (Cеровski 2004, p. 101; Kempema 2007, p. 8). Figure 1 includes the total sales of zinc phosphide bait by the South Dakota bait station in the 4 years prior to candidate removal and the 4 years following candidate removal.

Figure 1. Sales of Zinc Phosphide Bait Prior (Fridley 2003, p. 2) and Subsequent to (Josten 2009, p. 3) our 2004 Removal of the Black-tailed Prairie Dog from the Federal Candidate List. Total sales for 2009 not yet tabulated.



Zinc phosphide sales do not necessarily reflect effective application. For example, individuals may stockpile poison, re-treat previously poisoned land, or apply it at rates different than the recommended rate of 1/3 pound per acre (Hygnstrom and Virchow 1994, p. B89). Additionally, the South Dakota bait station is only one of several suppliers of prairie dog poison. However, to provide some perspective, if all of the zinc phosphide bait were applied at the recommended rate of 1/3 pound per acre, enough poison has

been sold by this one facility since removal of the black-tailed prairie dog from the candidate list in 2004 to theoretically poison over 3.5 million ac (1.4 million ha). This equates to more than all estimated occupied habitat in the United States with enough remaining to poison an additional one million ac (400,000 ha).

Some additional information regarding the extent of poisoning is available for other States within the range of the black-tailed prairie dog. In Kansas, an estimated 40,000 ac (16,200

ha) of private land have been poisoned recently (Van Pelt 2009, p. 16). There has been no indication of an increase in poisoning in Montana in recent years (Bamber 2009, p. 2). The most recent survey in North Dakota noted that approximately 43 percent of colonies on private land (approximately 9,700 ac/ 3,900 ha) had some indication of poisoning, although total occupied habitat increased (Knowles 2007, p. 2). An estimated 900 ac (400 ha) have been poisoned recently in Oklahoma (Van Pelt 2009, p. 30). The Texas Wildlife

Damage Management Service estimated 3,500 ac (1,420 ha) were poisoned in 2008 (Van Pelt 2009, p. 38). As described under Factor D, the USFS estimated 3,679 ac (1,490 ha) were poisoned on their lands in 2008; the majority was 2,489 ac (1,008 ha) in Buffalo Gap National Grassland, South Dakota, and 670 ac (271 ha) in Pawnee National Grassland, Colorado (Sidle 2009b, p. 3). No other recent estimates regarding poisoning were available.

If we total poison estimates for 2008 from the South Dakota Bait Station, Kansas, North Dakota, Oklahoma, Texas, and Pawnee National Grasslands, the amount of black-tailed prairie dog occupied habitat poisoned in 2008 was approximately 801,000 ac (324,000 ha), or 33 percent of estimated range wide occupied habitat. This figure does not include estimates for Montana or New Mexico, and only partial estimates are available for Colorado, Nebraska, and Wyoming.

In a review of available research, Adelt (2006, p. 135) concluded that colony size increases by about 30 percent annually for several consecutive years following poisoning; after intense but not total elimination, colony size can initially increase by as much as 71 percent annually. Colonies usually require 3 to 5 years to attain pre-treatment size. The author further notes that complete eradication with 100 percent mortality is "formidably elusive." Earlier, government sponsored poisoning efforts such as those that led to the eradication of the black-tailed prairie dog in Arizona were likely more effective due to a synchronized effort by the Federal government over a large landscape. In recent years poisoning has typically been conducted over a smaller landscape such as the property of a single landowner. Despite the long-term and widespread poisoning of the black-tailed prairie dog, increasing population trends both range wide and Statewide indicate that localized poisoning is not adversely impacting the species' status and long-term conservation.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that poisoning is not a threat to the species. There is no evidence that poisoning poses a significant threat to the species now or into the future.

Drought

Drought is a natural and cyclical occurrence within the range of the black-tailed prairie dog to which the animal has adapted (Forrest 2005, p. 528). In at least some instances, occupied habitat tends to increase

during periods of drought and densities decrease, because animals spread out in search of food (Young 2008, p. 5). However, we are aware of no information that quantifies the effect of drought, singly or in conjunction with other threats, on the species range wide.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, suggests that drought is not a limiting factor for the species. Therefore, we have no reason to suspect this poses a significant threat to the species.

Climate Change

No information on the direct relationship between climate change and black-tailed prairie dog population trends is available. However, climate change could potentially impact the species. According to the Intergovernmental Panel on Climate Change (IPCC 2007, p. 6), "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." Average Northern Hemisphere temperatures during the second half of the 20th century were very likely higher than during any other 50-year period in the last 500 years and likely the highest in at least the past 1,300 years (IPCC 2007, p. 6). It is very likely that over the past 50 years cold days, cold nights, and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent (IPCC 2007, p. 6). It is likely that heat waves have become more frequent over most land areas, and the frequency of heavy precipitation events has increased over most areas (IPCC 2007, p. 6).

Changes in the global climate system during the 21st century are likely to be larger than those observed during the 20th century (IPCC 2007, p. 19). For the next 2 decades, a warming of about 0.2 °C (0.4 °F) per decade is projected (IPCC 2007, p. 19). Afterward, temperature projections increasingly depend on specific emission scenarios (IPCC 2007, p. 19). Various emissions scenarios suggest that by the end of the 21st century, average global temperatures are expected to increase 0.6-4.0 °C (1.1-7.2 °F), with the greatest warming expected over land (IPCC 2007, p. 20).

The IPCC (2007, pp. 22, 27) report outlines several scenarios that are virtually certain or very likely to occur in the 21st century including:

(1) over most land, there will be warmer and fewer cold days and nights,

and warmer and more frequent hot days and nights;

(2) areas affected by drought will increase; and

(3) the frequency of warm spells and heat waves over most land areas will likely increase.

The IPCC predicts that the resiliency of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change associated disturbances (e.g., flooding, drought, wildfire, and insects), and other global drivers. With medium confidence, IPCC predicts that approximately 20 to 30 percent of plant and animal species assessed so far are likely to be at an increased risk of extinction if increases in global average temperature exceed 1.5 – 2.5 °C (3 – 5 °F).

The black-tailed prairie dog, along with its habitat, will likely be affected in some manner by climate change. A shift in the species' geographic range may occur due to an increase in temperature and drought, although climate change would likely not pose as great a risk to prairie dog habitat as it would to species in polar, coastal, or montane ecosystems. Additionally, a strong relationship between plague outbreaks and climatic variables has been established (Parmenter *et al.* 1999, p. 814; Enscoe *et al.* 2002, p. 186; Stapp *et al.* 2004, p. 237; Gage and Kosoy 2005, p. 509; Ray and Collinge 2005, p. 204; Stenseth *et al.* 2006, p. 13110; Adjemian *et al.* 2007, p. 372; Snäll *et al.* 2008, p. 246). The key climatic variables influencing plague appear to be maximum daily summer temperature (plague is enhanced by cooler summer temperatures) and late winter precipitation (plague is enhanced by increased precipitation). Modeling efforts indicate that shifts in plague distribution may be a result of shifts of pathogen, vector, or host distribution due to climate change scenarios (Nakazawa *et al.* 2007, p. 537). The distribution of plague may expand north and east (Nakazawa *et al.* 2007, p. 537). The recent expansion of plague into South Dakota supports this. However, variables associated with climate change and increased plague activity conflict. Plague is enhanced by cooler summer temperatures and by increased precipitation. Consequently, the extent to which plague may shift due to climate change versus expand or contract is supposition. Although the black-tailed prairie dog will likely be affected by climate change, it is not apparent that a net loss in occupied habitat or a significant impact to the status of the species will result. The species is adaptable to a wide array of

climates, as evidenced by a geographic range that includes 11 States, Canada, and Mexico. Unlike vulnerable species in polar, coastal, and montane ecosystems, a shift in range could be possible.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, indicates that climate change is not a threat to the species.

Summary of Factor E

Poisoning has impacted black-tailed prairie dogs from the early 1900s until the present time. Efforts to obtain more detailed information regarding the extent of poisoning, as well as efforts to interpret the additional recent impacts of anticoagulants, have been unsuccessful. Drought is a natural phenomenon throughout the range of the black-tailed prairie dog to which we believe the species has adapted. Continued climate change will likely cause shifts in the species' range, as well as changes in occurrence of plague. Additional information, particularly regarding impacts from poisoning and climate change, would improve our understanding of the effects on the species.

The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat since the early 1960s, shows that poisoning, drought, climate change, or other factors are not threats to the species. Consequently, we do not anticipate that impacts from these stressors are likely to negatively impact the status of the species in the foreseeable future.

We conclude that the best scientific and commercial information available indicates that the black-tailed prairie dog is not now, or in the foreseeable future, threatened by poisoning, drought, or climate change to the extent that listing under the Act as an endangered or threatened species is warranted at this time.

Finding

As required by the Act, we considered the five factors in assessing whether the black-tailed prairie dog is threatened or endangered throughout all or a significant portion of its range. We have carefully examined the best scientific and commercial information available regarding the status and the past, present, and future threats faced by the black-tailed prairie dog. We reviewed information provided by the petitioners, information in our files, other available published and unpublished information, and information provided

by other interested parties during the status review. We also consulted with Federal and State land managers. On the basis of the best scientific and commercial information available, we find that the magnitude and imminence of threats do not indicate that the black-tailed prairie dog is in danger of extinction (endangered), or likely to become endangered within the foreseeable future (threatened), throughout its entire range.

There have been several impacts to the black-tailed prairie dog, in particular habitat loss due to conversion to cropland, sylvatic plague, and poisoning. Sylvatic plague and poisoning remain significant population stressors and are exacerbated by conflicting Federal and state management policies. Additionally, climate change may potentially impact the species in future decades. The effects of plague could be exacerbated by climate change in the future. However, the current status of the black-tailed prairie dog does not suggest that plague, or the combined effects of plague and climate change, are limiting factors for the species in the foreseeable future, and we do not believe these will result in significant population-level impacts. In spite of these stressors and resulting impacts on the species, occupied habitat (a surrogate measure for population trends and status) in the United States has increased by more than 600 percent since the early 1960s. The species has proven to be quite resilient and is not expected to be significantly affected by these stressors in the future.

Improved management and continued research regarding plague and climate change could further improve the status of the black-tailed prairie dog. Continuing research will help increase our understanding of how plague, climate change, and the combined effects of these stressors will affect the species in the future. This will allow for informed management decisions related to these stressors that could further improve the status of the species. It could also improve the status of the many species that depend upon the prairie dog as a food source or upon prairie dog burrows for shelter. The smaller, more scattered prairie dog complexes that are typical today cannot support the diversity of wildlife that historically depended upon the prairie dog. For example, the black-footed ferret requires large, healthy prairie dog complexes for its survival.

Our review of the information pertaining to the five factors does not support the assertion that there are threats of sufficient imminence,

intensity, or magnitude to cause substantial losses of population distribution or viability of the black-tailed prairie dog. Therefore, we do not find that the black-tailed prairie dog is in danger of extinction (endangered), nor is it likely to become endangered within the foreseeable future (threatened) throughout its entire range. Therefore, listing the species as threatened or endangered under the Act is not warranted at this time.

Distinct Vertebrate Population Segments and Significant Portion of the Range

After assessing whether the species is threatened or endangered throughout its range, we next consider whether a distinct vertebrate population segment (DPS) exists or whether any significant portion of the black-tailed prairie dog's range meets the definition of endangered or is likely to become endangered in the foreseeable future (threatened).

Distinct Vertebrate Population Segments

To interpret and implement the distinct vertebrate population segment (DPS) provisions of the Act, the Service and the National Oceanic and Atmospheric Administration published the *Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act* in the **Federal Register** on February 7, 1996 (61 FR 4722). Under the DPS Policy, three elements are considered in the decision regarding the establishment and classification of a population of a vertebrate species as a possible DPS:

(1) The discreteness of a population in relation to the remainder of the species to which it belongs;

(2) the significance of the population segment to the species to which it belongs; and

(3) the population segment's conservation status in relation to the Act's standards for listing, delisting, or reclassification.

Both discreteness and significance are required for a species population to meet our criteria for classification as a DPS. If any portion of a species population is considered a valid DPS, we may list, delist, or reclassify that DPS under the Act. We address these elements with respect to the black-tailed prairie dog.

Discreteness

Under the DPS policy, a population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions.

(1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.

(2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

We do not consider any population segment of black-tailed prairie dog to be markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. As a colonial species, black-tailed prairie dogs are naturally distributed across the landscape in a discontinuous fashion. Black-tailed prairie dog occupied habitat exists in a constantly shifting mosaic throughout an estimated 283 million ac (115 million ha) of suitable habitat that occurs across a range of approximately 440 million ac (178 million ha). Because this discontinuous distribution is the "baseline" condition for the species, for us to consider any geographic discontinuity as being evidence of marked separation (i.e., discreteness) under the DPS policy, we would need the best available information to indicate that the amount of discontinuity is over and above what is considered to be normal for the species.

We do not have detailed mapping of occupied habitat throughout the range of the species. We recognize the likely occurrence of some small, isolated black-tailed prairie dog colonies, but have very limited information available that identifies their locations. Therefore, we looked for other measures of discontinuity, such as measures of genetic or morphological differences as guided by the DPS policy, to determine whether any populations showed evidence of marked separation. There is minimal information available to us to indicate that any population segments express any genetic or morphological discontinuity due to separation from other prairie dog populations. We are aware of one study that found measurable genetic divergence in certain populations in Texas (Biggs 2007, p. 51). However, other studies have concluded that genetic differences are often as great among individuals from local populations as those from vastly different parts of their range (Chesser 1983, p. 329; Trudeau *et al.* 2004, p. 205). Therefore, we do not believe that genetic or morphological

discontinuity provides evidence of discrete prairie dog populations.

The black-tailed prairie dog spans international boundaries between the United States, Canada, and Mexico, with approximately 98 percent of occupied habitat occurring in the United States. However, there are no substantial differences in exploitation, habitat management, or regulatory mechanisms between the three countries. Additionally, the relative distribution of prairie dogs between the three countries has remained constant in recent years. Therefore, we do not believe that international boundaries provide evidence of discrete prairie dog populations.

We determine, based on a review of the best available information, that no black-tailed prairie dog population segments meet the discreteness conditions of the 1996 DPS policy. Therefore, no black-tailed prairie dog population segment qualifies as a DPS under our policy and is not a listable entity under the Act. The DPS policy is clear that significance is analyzed only when a population segment has been identified as discrete. Because no discrete populations of black-tailed prairie dogs exist, we did not further analyze whether any populations meet the criteria in the DPS policy for significance.

Significant Portion of the Range (SPR)

Having determined that the black-tailed prairie dog does not meet the definition of a threatened or endangered species range wide or in a DPS, we must next consider whether there are any significant portions of the range where the black-tailed prairie dog is in danger of extinction or is likely to become endangered in the foreseeable future.

On March 16, 2007, a formal opinion was issued by the Office of the Solicitor of the Department of the Interior, "The meaning of 'In Danger of Extinction Throughout All or a Significant Portion of Its Range'" (USDI 2007c). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a species' range is significant if it is part of the current range of the species and it contributes substantially to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species.

In determining whether a species is threatened or endangered in a significant portion of its range, we first identify any portions of the range of the species that warrant further consideration. The range of a species

can theoretically be divided into portions an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be significant and threatened or endangered. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) the portions may be significant, and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the species' range that are not significant, such portions will not warrant further consideration.

If we identify portions that warrant further consideration, we then determine whether the species is threatened or endangered in these portions of its range. Depending on the biology of the species, its range, and the threats it faces, the Service may address either the significance question or the status question first. Thus, if the Service considers significance first and determines that a portion of the range is not significant, the Service need not determine whether the species is threatened or endangered there. Likewise, if the Service considers status first and determines that the species is not threatened or endangered in a portion of its range, the Service need not determine if that portion is significant. However, if the Service determines that both a portion of the range of a species is significant and the species is threatened or endangered there, the Service will specify that portion of the range as threatened or endangered under section 4(c)(1) of the Act.

The terms "resiliency," "redundancy," and "representation" are intended to be indicators of the conservation value of portions of the range. Resiliency of a species allows the species to recover from periodic disturbance. A species will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the species in such a way as to capture the environmental variability found within the range of the species. A portion of the range of a species may make a meaningful contribution to the resiliency of the species if the area is relatively large and contains particularly high-quality habitat, or if its location or characteristics make it less susceptible

to certain threats than other portions of the range. When evaluating whether or how a portion of the range contributes to resiliency of the species, we evaluate the historical value of the portion and how frequently the portion is used by the species, if possible. In addition, the portion may contribute to resiliency for other reasons—for instance, it may contain an important concentration of certain types of habitat that are necessary for the species to carry out its life-history functions, such as breeding, feeding, migration, dispersal, or wintering.

Redundancy of populations may be needed to provide a margin of safety for the species to withstand catastrophic events. This does not mean that any portion that provides redundancy is necessarily a significant portion of the range of a species. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. Therefore, each area must be examined based on whether that area provides an increment of redundancy that is important to the conservation of the species.

Adequate representation ensures that the species' adaptive capabilities are conserved. Specifically, the portion should be evaluated to see how it contributes to the genetic diversity of the species. The loss of genetically based diversity may substantially reduce the ability of the species to respond and adapt to future environmental changes. A peripheral population may contribute meaningfully to representation if there is evidence that it provides genetic diversity due to its location on the margin of the species' habitat requirements.

SPR Evaluation for black-tailed prairie dog

We evaluated the black-tailed prairie dog's current range in the context of the primary stressors affecting the species (plague, inadequate regulatory mechanisms, and poisoning) to determine if there is any apparent geographic concentration of these stressors. If effects to the species from all of these stressors are not disproportionate in any portion of the species' range, no portion is likely to warrant further consideration; and a determination of significance based upon resiliency, redundancy, or representation is not necessary.

Plague – We regard sylvatic plague as the most substantial impact on the black-tailed prairie dog at the present. However, with the spread of plague into South Dakota, the disease now is present in portions of every State within

the species' range, and the effects of plague are presumably no longer geographically concentrated in the western portion of the range. The current status of the black-tailed prairie dog, as indicated by increasing trends in the species' occupied habitat in every State, since the early 1960s, indicates that plague is not a limiting factor for the species in any State. These increasing trends are evident even in States with a long history of plague. Plague does not appear to result in disproportionate impacts to the black-tailed prairie dog in any portion of its range. Therefore, a determination of significance based upon resiliency, redundancy, or representation is not necessary.

Inadequate regulatory mechanisms – We evaluated the differences in management between States. All States within the historical range of the black-tailed prairie dog demonstrate both positive and negative management practices with regard to the species. Some States are more engaged than others; however, all have had stable to increasing black-tailed prairie dog populations since 1961. Additionally, there is no evident correlation between the status of the species' population in a particular State and the extent to which a State is engaged in proactive management. Differences in management and the adequacy of regulatory mechanisms do not appear to result in disproportionate impacts to the black-tailed prairie dog in any portion of its range. Therefore, a determination of significance based upon resiliency, redundancy, or representation is not necessary.

Poisoning – The most complete information with regard to the extent of poisoning is probably available for Arizona, South Dakota, Kansas, North Dakota, Oklahoma, and Texas. Only partial estimates are available for Colorado, Nebraska, and Wyoming. Little or no information is available for Montana and New Mexico. However, black-tailed prairie dog populations have been stable to increasing in all States. Some of the most intensive poisoning we are aware of has occurred in South Dakota, which is also the State with the largest percentage increase in the species' population. Poisoning does not appear to result in disproportionate impacts to the black-tailed prairie dog in any portion of its range. Therefore, a determination of significance based upon resiliency, redundancy, or representation is not necessary.

We do not find that the black-tailed prairie dog is in danger of extinction now, nor is it likely to become endangered within the foreseeable

future throughout all or a significant portion of its range. Therefore, listing the black-tailed prairie dog as threatened or endangered under the Act is not warranted at this time.

We request that you submit any new information concerning the status of, or threats to, this species to our South Dakota Ecological Services Office (see **ADDRESSES** section) whenever it becomes available. New information will help us monitor this species and encourage its conservation. If an emergency situation develops for this species or any other species, we will act to provide immediate protection.

References Cited

A complete list of all cited references is available on the Internet at <http://www.regulations.gov> and on request from the South Dakota Ecological Services Office (see **ADDRESSES** section).

Author

The primary authors of this document are the staff members of the U.S. Fish and Wildlife Service, South Dakota Ecological Services Office (see **ADDRESSES**).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: November 18, 2009.

Sam D. Hamilton,

Director, U.S. Fish and Wildlife Service.

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

FWS-R4-ES-2009-0079 92210–1117–0000–B4

[RIN 1018-AW52]

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Vermilion Darter

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service, propose to designate critical habitat for the vermilion darter (*Etheostoma chermocki*) under the Endangered Species Act of 1973, as amended. We propose to designate as critical habitat approximately 21.0 kilometers (13.0 stream miles) in 5 units. The proposed critical habitat is