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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Gunnison's Prairie Dog as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to list the Gunnison's prairie dog (*Cynomys gunnisoni*) as threatened or endangered under the Endangered Species Act of 1973, as amended (Act). We find that the petition does not present substantial scientific and commercial data indicating that listing the Gunnison's prairie dog may be warranted. Therefore, we will not be initiating a formal status review to determine if listing this species is warranted. We will work with the States where information is currently unavailable to develop information that will assist in determining and monitoring the status of Gunnison's prairie dog. Once those results are available we will reevaluate the status of Gunnison's prairie dog.

DATES: The finding announced in this document was made on January 30, 2006.

ADDRESSES: The petition, supporting data, and comments will be available for public inspection, by appointment, during normal business hours at the South Dakota Ecological Services Office, 420 South Garfield Avenue, Suite 400, Pierre, South Dakota, 57501. Submit new information, materials, comments or questions concerning this taxon to the Field Supervisor at the above address.

FOR FURTHER INFORMATION CONTACT: Pete Gober, Field Supervisor, South Dakota Ecological Services Office at the above address (telephone 605-224-8693; facsimile 605-224-9974).

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Act (16 U.S.C. 1531 *et seq.*), requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or

commercial information indicating that the petitioned action may be warranted. We are to base this finding on information provided in the petition and other information that is readily available to us (*e.g.*, in our files). To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition, and publish our notice of this finding promptly in the **Federal Register**.

Our standard for substantial scientific information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial scientific information was presented, we are required to commence a review of the status of the species.

In making this finding, we relied on information provided by the petitioners and information in our files, and evaluated that information in accordance with 50 CFR 424.14(b). Our process of coming to a 90-day finding under section 4(b)(3)(A) of the Act and § 424.14(b) of our regulations is limited to a determination of whether the information in the petition meets the "substantial scientific information" threshold.

We do not conduct additional research to make a 90-day finding, nor do we subject the petition to rigorous critical review. Rather, as the Act and regulations contemplate, in coming to a 90-day finding, we acknowledge the petitioner's sources and characterizations of the information unless we have specific information to the contrary.

Our 90-day findings consider whether the petition states a reasonable case for listing on its face. Thus, our finding expresses no view as to the ultimate issue of whether the species should be listed. We reach a conclusion on that issue only after a more thorough review of the species' status.

Petition

On February 23, 2004, the Service received a petition of the same date, from Forest Guardians and 73 other organizations and individuals (Forest Guardians *et al.* 2004). This petition requested that the Gunnison's prairie dog (*Cynomys gunnisoni*), found in Arizona, Colorado, New Mexico, and Utah, be listed as threatened or endangered and that critical habitat be designated for the species.

Action on this petition was precluded by court orders and settlement agreements for other listing actions that

required nearly all of our listing funds for fiscal year 2004. On July 29, 2004, we received a 60-day notice of intent to sue (Forest Guardians *et al.* 2004) for failure to complete a finding. On December 7, 2004, an amended complaint for failure to complete a finding for this and other species was filed (Biodiversity Conservation Alliance *et al.* 2004). We reached a settlement agreement with the plaintiffs for submittal to the **Federal Register** of a 90-day finding for the Gunnison's prairie dog by January 26, 2006. This notice constitutes our 90-day finding for the petition to list the Gunnison's prairie dog.

Species Information

The Gunnison's prairie dog is a member of the Sciuridae family, which includes squirrels, chipmunks, marmots, and prairie dogs. Prairie dogs constitute the genus *Cynomys*. Taxonomists currently recognize 5 species of prairie dogs belonging to 2 subgenera, all in North America (Goodwin 1995). The white-tailed subgenus, *Leucocrossuromys*, includes Utah (*C. parvidens*), white-tailed (*C. leucurus*), and Gunnison's prairie dogs (Goodwin 1995). The black-tailed subgenus, *Cynomys*, consists of Mexican (*C. mexicanus*) and black-tailed (*C. ludovicianus*) prairie dogs (Goodwin 1995). The number of chromosomes for the Gunnison's prairie dog ($2n = 40$) is different from all other prairie dog species ($2n = 50$), suggesting the species' uniqueness and its early evolutionary divergence from other prairie dog species (Goodwin 1995; Pizzimenti 1975).

The Gunnison's prairie dog has sometimes been divided into 2 subspecies: *C. g. gunnisoni* and *C. g. zuniensis* (Hollister 1916). The petition addressed the species, with no subspecies consideration. However, the petitioners later requested that the petition be considered to apply to both the full species and either of the subspecies (Rosmarino *in litt.* 2005). The most recent published analyses do not support subspecies designation (Goodwin 1995, Pizzimenti 1975), and this is position we currently hold. Research on the issue of subspeciation is ongoing (Hafner 2004; Hafner *et al.* 2005).

Gunnison's prairie dog adults vary in length from 309–373 millimeters (mm) (12–15 inches (in)) and weigh 650–1200 grams (gm) (23–42 ounces (oz)), with males averaging slightly larger than females (Hall 1981; Pizzimenti and Hoffman 1973). The dorsal color is yellowish buff intermixed with blackish hairs. The top of the head, sides of

cheeks, and “eyebrows” are noticeably darker than the dorsum (Hall 1981; Pizzimenti and Hoffman 1973). The species differs from black-tailed prairie dogs in having a much shorter and lighter colored tail and from other white-tailed species in having grayish-white hairs in the distal half of the tail rather than pure white (Hoogland 1995; Pizzimenti and Hoffman 1973).

The onset of reproduction in Gunnison’s prairie dogs is somewhat variable depending upon latitude, elevation, and seasonal variation, but most typically is April and May (Hoogland 1998, 2001). Females will breed as yearlings when resources are abundant (Goodwin 1995; Hall 1981; Haynie *et al.* 2003; Hoogland 1998; Hoogland 2001; Pizzimenti and Hoffman 1973). A maximum of one litter is produced per year with a mean litter size of 3.77 (Hoogland 2001). Individuals live in family groups called clans; and adjacent clans constitute a colony (Fitzgerald and Lechleitner 1974). Clan members defend a home territory of approximately 2.5 acres (1 hectare), but commonly forage outside of home territory in the weakly defended peripheral sections of territories belonging to other clans (Hoogland 1998, 1999).

Gunnison’s prairie dog potential habitat includes level to gently sloping grasslands and semi-desert and montane shrublands, at elevations from 6,000–12,000 feet (ft) (1,830–3,660 meters (m)) (Bailey 1932; Findley *et al.* 1975; Fitzgerald *et al.* 1994; Pizzimenti and Hoffman 1973; Wagner and Drickamer 2002). Grasses are the most important food item, with forbs, sedges, and shrubs also occasionally utilized (Pizzimenti and Hoffman 1973; Shalaway and Slobodchikoff 1988). Individuals hibernate for as long as 7 months (Ecke and Johnson 1952; Fitzgerald and Lechleitner 1974).

The current distribution of the species is generally centered on the “Four Corners” region of northern Arizona, southwestern Colorado, northwestern New Mexico, and southeastern Utah (Anderson *et al.* 1986; Bailey 1932; Hall 1981; Knowles 2002; Pizzimenti and Hoffman 1973). There is some very limited overlap between ranges for Gunnison’s prairie dogs and black-tailed prairie dogs in New Mexico (Goodwin 1995; Sager 1996), and between Gunnison’s prairie dog and white-tailed prairie dog in Colorado (Knowles 2002), but we have no evidence that interbreeding is occurring. Using Geographic Information Systems (GIS) datasets and known habitat requirements, Seglund *et al.* (2005) estimate that 27 percent of potential

Gunnison’s prairie dog habitat occurs in Arizona, 25 percent in Colorado, 45 percent in New Mexico, and 3 percent in Utah. Rangelwide, approximately 73 percent of potential habitat occurs on tribal and private lands (Seglund *et al.* 2005). Significant portions of potential habitat occur on tribal lands, especially in Arizona and New Mexico. We contacted 29 Tribes and Pueblos within the Gunnison’s prairie dog range to attain post-1961 status information. We did not receive any formal responses from the tribes; no information is available regarding the status of the species on tribal lands.

Of the documented range contractions, the most significant has occurred in Arizona. Gunnison’s prairie dog was recorded in parts of 8 Arizona counties in the early 20th century (Wagner and Drickamer 2002). In 1961, the species was documented in 5 counties (Bureau of Sport Fisheries and Wildlife 1961). More recent studies have observed occupied habitat in only the four northernmost counties (Roemer 1997; Wagner and Drickamer 2002). We are unable to determine what if any contraction is attributable to more recent population changes which would assist us in determining whether the species may be threatened.

The best available information indicates that population densities of Gunnison’s prairie dog colonies are variable, depending on environmental influences (including habitat, season, disease, and precipitation), as well as anthropogenic influences (such as chemical control and recreational shooting). Densities typically range from 2–23 individuals per acre (ac) (5–57 per hectare (ha)) (Fitzgerald *et al.* 1994), and are similar to densities in black-tailed prairie dog colonies (Cully 1993), which typically range from 2–18 individuals per ac (5–45 per ha) (Fagerstone and Ramey 1996; Hoogland 1995; King 1955; Koford 1958). Knowles (2002) notes historic densities for Gunnison’s prairie dogs as high as 63 individuals per ac (156 per ha), but concludes that overall, they generally occur at lower densities than black-tailed prairie dog. In the available literature, prairie dog population abundance is most often discussed in terms of acres or hectares of occupied habitat rather than in numbers of individuals because of the wide range of observed population densities for the species, wide natural population fluctuations (due to drought, etc.) and the limited number of studies that have determined actual numbers of individuals in a population due to the significant additional cost and effort associated with doing so.

We have several estimates of historic and more recent Gunnison’s prairie dog occupied habitat are available from the four States within the species’ range (Tables 1–3). These estimates span a time period from 1916 to the present. Different methodologies were used at different times and in different locales to derive the various estimates. However, these estimates represent the best available information and are comparable for the purpose of determining general population trends on the scale of order-of-magnitude changes. Methodologies have improved in recent years, with the advent of tools such as aerial survey, satellite imagery, and GIS. Consequently, estimates that utilize these tools can be expected to be more accurate.

Only limited information is available regarding State-wide and range-wide historic estimates of occupied habitat. More accurate information is available regarding several smaller (more easily delineated) sites that have been monitored in recent years. All available estimates of occupied habitat are presented in the following paragraphs.

State-Wide Estimates

Information available regarding historic estimates of Gunnison’s prairie dog occupied habitat is based largely on federal records from early poisoning efforts. Oakes (2000) used field survey and poisoning records from the Bureau of Biological Survey (a predecessor of the Service) to derive early estimates for occupied habitat in Arizona and New Mexico. Oakes (2000) estimated that in 1916, approximately 6.6 million ac (2.7 million ha) of Gunnison’s prairie dog occupied habitat occurred in Arizona and 11 million ac (4.4 million ha) in New Mexico. Oakes (2000) postulated that following poisoning efforts, there were approximately 6 million ac (2.4 million ha) of occupied habitat in Arizona and 9 million ac (3.6 million ha) of occupied habitat in New Mexico in 1921 (Table 1). No estimate of density or population associated with the habitat is available, due to the previously-mentioned difficulty associated with determining population densities.

We are not aware of any literature regarding historic estimates of occupied Gunnison’s prairie dog habitat for Colorado or Utah. We derived approximate estimates in order to gain some perspective on the extent of historic decline. As noted previously, the estimates of historically (i.e., 1916) occupied habitat from Oakes (2000) were based on federally-directed state inventories and poisoning records. Seglund *et al.* (2005) used GIS datasets

that considered known habitat requirements regarding elevation, slope, and land cover to predict the potential habitat available in each state. Using the estimates of historically-occupied habitat from Oakes (2000) for Arizona and New Mexico and the relative percentages of potential habitat presented in Seglund *et al.* (2005), we derived estimates of historically-occupied (circa 1916) habitat for Colorado (6 million ac / 2.4 million ha) and Utah (700,000 ac / 284,000 ha). Accordingly, the range-wide estimate for historic (circa 1916) Gunnison's prairie dog occupied habitat would be approximately 24 million ac (9.7 million ha) (Table 1).

We believe that these historic estimates are reasonable but also recognize that they are based on assumptions which could greatly influence the outcome of the estimate. Historic declines which occurred over the past 100 years do not provide an appropriate context for evaluating current threats to the species. These historic estimates are of limited value in determining the likely persistence of this species at present. The evaluation of whether or not a specific threat rises to the level of threatening a species should be based on ongoing and likely future impacts.

In 1961, the Bureau of Sport Fisheries and Wildlife (also a predecessor of the Service) tabulated habitat estimates on a county-by-county basis throughout the range of all prairie dog species in the western United States. This survey was in response to concerns from within the agency regarding possible adverse impacts to prairie dogs from poisoning (Oakes 2000). In State-wide summaries, the agency estimated approximately 445,000 ac (180,000 ha) of Gunnison's prairie dog occupied habitat in Arizona, 116,000 ac (47,000 ha) in Colorado, 355,000 ac (144,000 ha) in New Mexico, and 100,000 ac (41,000 ha) in Utah (Bureau of Sport Fisheries and Wildlife 1961). The total range-wide estimate for Gunnison's prairie dog occupied habitat in 1961 was approximately 1 million ac (405,000 ha) (Table 1).

The estimates of historic habitat compared to the 1961 data suggest that, from 1916 to 1961, Gunnison's prairie dog habitat and thus populations decreased by approximately 93 percent in Arizona, 98 percent in Colorado, 97 percent in New Mexico, and 86 percent in Utah, or by approximately 95 percent range-wide. While the magnitude of the habitat losses require a conclusion that

overall populations declined as well, this decline does not necessarily lead to a conclusion that current populations continue to decline.

All four States within the range of the Gunnison's prairie dog assert in their Comprehensive Wildlife Conservation Strategies that the species is at risk, declining, and deserving of special management consideration (Seglund *et al.* 2005). These Strategies were developed by the States in response to Congressional funding and provide guidance for future conservation efforts between Federal, tribal, State, local, and private entities. The strategies focus on species in greatest need of conservation. However, since less than one year has elapsed since they were completed, an evaluation of their effectiveness cannot yet be made. Based upon the information available in our files, Colorado is the only state with a Gunnison's prairie dog population estimate derived from a recent, State-wide field effort (Skiba, *in litt.* 2005). Other recent State-wide estimates appear to be based on extrapolations (e.g., Bodenchuck (1981) for New Mexico and Colorado Department of Agriculture (1990) for Colorado), or are minimum estimates obtained from summing known, site-specific data (e.g., Knowles (2002) for New Mexico and Utah, Seglund *et al.* (2005) for New Mexico and Utah, and Van Pelt *in litt.* (2005) for Arizona).

In Arizona, it is estimated that occupied habitat on non-tribal lands was approximately 100,000 ac (40,500 ha) in 2005 (Van Pelt *in litt.* 2005) (Table 1). Approximately 50 percent of potential habitat is on tribal lands in Arizona; consequently, a current state-wide estimate in Arizona is likely substantially more than the 100,000 ac (40,500 ha) reported by Van Pelt (*in litt.* 2005), although no comprehensive data from tribal lands are available. Occupied habitat on non-tribal lands State-wide appears to have increased from 10,000 ac (4,000 ha) in 1961 (Bureau of Sport Fisheries and Wildlife 1961) to 100,000 ac (40,500 ha) in 2005 (Van Pelt *in litt.* 2005). We have no data regarding, recent population trends on tribal lands State-wide. However, we are unaware of any disproportionate adverse effects to the species on tribal lands during this interval. Thus, we have assumed that the amount of habitat on tribal lands remained constant from 1961 to 2005 (Table 1). This assumption seems reasonable, particularly in light of

the fact that occupied lands have increased ten-fold on non-tribal lands.

The Colorado Department of Agriculture (CDA 1990) solicited questionnaire responses from farmers and ranchers and thereafter extrapolated an estimate of 1,553,000 ac of occupied habitat for all 3 species of prairie dogs found in Colorado. Based upon species occurrence by county, Seglund *et al.* (2005) derived a state-wide estimate from the CDA (1990) data of 439,000 ac (178,000 ha) of Gunnison's prairie dog occupied habitat in 1990 (Table 1). However, other, more recent estimates based on field work may provide the best evidence of occupied habitat (population) trends for this species in recent years in Colorado. In 2005, the Colorado Division of Wildlife estimated 174,000 ac (70,000 ha) of Gunnison's prairie dog occupied habitat State-wide, based upon their own field surveys and reports from field personnel from other agencies (Skiba, *in litt.* 2005) (Table 1). State-wide occupied habitat since 1961 appears to have remained stable or increased somewhat, from 116,000 ac (55,000 ha) in 1961 to 174,000 ac (70,000 ha) in 2005.

In New Mexico, Bodenchuck (1981) solicited questionnaire responses from agricultural producers. Respondents reported 107,574 ac (43,567 ha) of Gunnison's prairie dog occupied habitat. Bodenchuck (1981) extrapolated a State-wide total of 348,000 ac (141,000 ha) of occupied habitat for the species (Table 1). Oakes (2000) questioned this extrapolation because of possibly faulty assumptions used to derive it. Knowles (2002) estimated that 75,000 ac (30,000 ha) of occupied habitat existed in 1982 (Table 1). Seglund *et al.* (2005) reported that New Mexico Game and Fish utilized Digital Orthophoto Quarter Quadrangles to estimate a minimum of 9,108 ac (3,689 ha) of occupied habitat state-wide in 2004 (Table 1). State-wide occupied habitat may have been in a decreasing trend, from 355,000 ac (144,000 ha) in 1961 to a minimum of 9,000 ac (4,000 ha) in 2004.

In Utah, Seglund *et al.* (2005) reported that the Utah Division of Wildlife estimated that the State had 22,007 ac (8,906 ha) of occupied Gunnison's prairie dog habitat in 1968 (Table 1). Knowles (2002) estimated a minimum of 3,678 ac (1,490 ha) of occupied habitat State-wide (Table 1). The state-wide trend in occupied habitat since 1961 appears to have been decreasing, from 100,000 ac (40,500 ha) in 1961 to 4,000 ac (2,000 ha) in 2002.

TABLE 1.—STATE-WIDE OCCUPIED HABITAT ESTIMATES (IN ACRES) FOR GUNNISON’S PRAIRIE DOG

State	1961	Recent	Trend, 1961 to present
Arizona	445,000	~535,000	Increasing.
Colorado	115,650	439,000 (CO DOA 1990) 174,224 (CO DOW 2005)	Increasing.
New Mexico	354,905	348,000 (Bodenchuk 1981) 75,000 in 1982 (Knowles 2002) >9,108 (Seglund et al. 2005).	Decreasing?
Utah	100,000	22,007 in 1968 (Seglund et al. 2005) >3,678 (Knowles 2002)	Decreasing?
Total	1,015,945	~722,000 (assuming no change in the amount of occupied habitat on AZ tribal lands since 1961).	

Range-Wide Estimates

Gunnison’s prairie dog populations in all states within the species’ range have declined significantly in a historic sense, but may have been relatively more stable in some States in recent decades. Regardless of the absolute accuracy of historic estimates of occupied habitat for the individual States, it is apparent that Gunnison’s prairie dog occupied habitat has declined range-wide (Table 1). Differing survey and analytical methods, along with unknown confidence intervals prevents us from being able to compare estimates through time and among localities. Point estimates (Table 1) for New Mexico (Seglund *et al.* 2005) and for Utah (Knowles 2002) are estimated minimums.

Site-Specific Estimates

In addition to State-wide and range-wide estimates, we also evaluated site-specific estimates of occupied habitat, and considered this information in our

conclusions regarding current population trends. Site-specific estimates of occupied habitat are typically derived from field surveys related to monitoring and/or research, rather than extrapolation. The smaller size of a study site versus a state-wide also lends itself to more precise assessment. Consequently site-specific estimates are often more accurate than state-wide estimates. Site-specific estimates are also often more recent and therefore provide additional insight into current trends. However, an inherent bias in evaluating prairie dog population trends may exist because dramatic declines or increases in existing colonies may be more likely to be reported than the establishment of new populations in previously uninhabited areas. In addition, monitoring programs tend to focus more on established sites than on identifying new occupied sites.

All site-specific estimates that we are aware of are listed in Table 2. As noted in the following text, all site-specific

estimates, with the exception of Aubrey Valley in Arizona, indicate declines in occupied habitat due to plague epizootics. In addition to State-wide and site-specific estimates, there are several sites that have been studied and described in terms of numbers of colonies. While these sites do not provide precise data in terms of acres of occupied habitat, they provide additional insight into the likely extent of impact from sylvatic plague throughout the range of the Gunnison’s prairie dog (Table 3). It should be noted that for most sites described in Tables 2 and 3, estimates are not available from the past year, so the current status of these sites is not known. In addition, the basis of the estimates vary, the relative rigor of the estimates vary from published papers to verbal estimates. Notwithstanding the variance in methodology and level of rigor it is apparent that plague can result in devastating population effects to individual populations and colonies.

TABLE 2.—SITE-SPECIFIC OCCUPIED HABITAT ESTIMATES (IN ACRES) FOR GUNNISON’S PRAIRIE DOG

Site	Estimate	Estimate	Estimate	Estimate	Status
Aubrey Valley, AZ .....	.....	19,368 in 1990 (Seglund et al. 2005).	29,653 in 1997 (Winstead in litt 2002).	42,000 in 2005 (Van Pelt, pers.comm. 2005).	Increasing.
Dilkon, AZ .....	.....	.....	8,650 in 1994 (Wagner 2002).	43 in 2001 (Wagner 2002).	Decreasing.
Currecanti Natl. Rec. Area, CO.	.....	148 in 1980 (Rayor 1985).	100% mortality by 1981 (Rayor 1985).	.....	Decreasing.
Gunnison, Saguache, Montrose Co., CO.	.....	.....	15,569 in 1980 (Capodice & Harrell 2003).	770 in 2002 (Capodice & Harrell 2003).	Decreasing.
South Park, CO	915,000 in 1945 (Ecke & Johnson 1952).	74,000 in 1948 (Fitzgerald 1993).	None known in 1977 (Fitzgerald 1993).	42 in 2002 (CO DOW 2002).	Decreasing.
Catron & Socorro Co., NM.	2,458,650 in 1916 (Oakes 2000).	.....	>12,000 in 1984 (Luce 2005).	>6,000 in 2005 (Luce 2005).	Decreasing.
Moreno Valley, NM .....	.....	11,000 in 1984 (Cully et al. 1997).	>99% mortality by 1987 (Cully et al. 1997).	.....	Decreasing.

TABLE 3.—SITE-SPECIFIC ESTIMATES OF COLONY NUMBERS FOR GUNNISON’S PRAIRIE DOG

Site	Estimate	Estimate	Status
Flagstaff, AZ	75 colonies in 2000 (Wagner & Drickamer 2002).	14 colonies in 2001 (Wagner & Drickamer 2002).	Decreasing.
Petrified Forest NP, AZ	8 colonies in 1994 (Turner 2001)	3 colonies in 1996 (Turner 2001)	Decreasing.

TABLE 3.—SITE-SPECIFIC ESTIMATES OF COLONY NUMBERS FOR GUNNISON'S PRAIRIE DOG—Continued

Site	Estimate	Estimate	Status
Seligman, AZ	47 colonies in 1990 (Wagner & Drickamer 2002).	11 colonies in 2001 (Wagner & Drickamer 2002).	Decreasing.
Chubbs Park, CO	1 colony in Aug., 1958 (Lechleitner et al. 1962).	100% mortality in Sept., 1959 (Lechleitner et al. 1962).	Decreasing.
Navajo Nation in NM	625 colonies in 1966 (Fitzgerald 1970) ...	233 colonies in 1969 (Fitzgerald 1970) ...	Decreasing.
Garfield Co., UT	1 colony in 1980 (Barnes 1993)	100% mortality in 1981 (Barnes 1993)	Decreasing.

The Dilkon area on the Navajo Reservation in Arizona had 8,650 ac (3,500 ha) of occupied habitat in 1994 and apparently decreased to 43 ac (17 ha) in 2001 (Wagner 2002) following a plague epizootic (Table 2). Other sites in Arizona, where only the number of colonies were noted (Table 3) include: 8 colonies in Petrified Forest National Park in 1994, with 5 colonies extirpated following a plague epizootic in 1995 and 1996 (Turner 2001); 75 active colonies in the Flagstaff area in 2000, reduced to 14 active colonies in 2001 following a plague epizootic (Wagner and Drickamer 2002); and 47 active colonies in the Seligman area, covering approximately 9,000 ac (3,500 ha) were reduced to 11 active colonies in 2001 following a plague epizootic (Wagner and Drickamer 2002).

In Colorado, a 148-ac (60-ha) colony in Curecanti National Recreation Area experienced 100 percent mortality following a plague epizootic in 1981 (Rayor 1985) (Table 2). In South Park, Colorado, there were an estimated 915,000 ac (371,000 ha) of occupied habitat in 1945 (Ecke and Johnson 1952) and 74,000 ac (30,000 ha) in 1948 (Fitzgerald 1993). Fitzgerald (1993) could not locate any colonies in South Park in 1977, but 42 ac (17 ha) of occupied habitat were located in 2002 (Colorado Division of Wildlife 2002) (Table 2). South Park experienced a remarkable decrease in occupied habitat from 1945 to 2002, due predominantly to plague. Another site in Colorado where only the number of colonies was noted (Table 3), is a colony in Chubbs Park, Chaffee County, which experienced 100 percent mortality in 1959 following a plague epizootic (Kartman *et al.* 1962 and Lechleitner *et al.* 1962).

In Moreno Valley, New Mexico, Cully (1991) estimated that there were 11,000 ac (4,500 ha) of occupied habitat in 1984; and in 1987, after two plague epizootics, there was a significant decrease, with greater than 99.5 percent mortality (Cully *et al.* 1997) (Table 2). Another site in New Mexico where only the number of colonies was noted, is the New Mexico portion of the Navajo Nation (Table 3), where the number of

known colonies dropped from 625 in 1966 to 233 in 1969 following repeated epizootics (Fitzgerald 1970).

In Utah, a colony in Garfield County experienced 100 percent mortality following a plague epizootic in 1981 (Barnes 1993) (Table 3).

Threats Analysis

In the following narrative, we discuss each of the major assertions made in the petition, organized by the five listing factors found in section 4(a)(1) of the Act. A species may be determined to be endangered or threatened if it meets the definition specified in the Act pursuant to an evaluation of the following five threat factors: (A) the present or threatened destruction, modification, or curtailment of habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. In making this finding, we evaluated whether impacts to the Gunnison's prairie dog presented in the petition and other information readily available in our files present substantial information that listing may be warranted. Our evaluation of these factors is presented below.

A. Present of Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Information Provided in the Petition

The petition asserts that habitat loss and fragmentation has imperiled the Gunnison's prairie dog. The petitioner has documented, through personal observation, the loss of 745 ac (302 ha) of occupied habitat due to municipal development in Santa Fe, Albuquerque, Taos, and Flagstaff. The petition documents that poor rangeland management (primarily via overgrazing) has resulted in the proliferation of noxious weeds, especially cheatgrass (*Bromus tectorum*), that has in turn affected native vegetation. The petition asserts that loss of native vegetation may diminish habitat suitability for Gunnison's prairie dog. The petition notes that the proliferation of cheatgrass

has resulted in the alteration of fire ecology, and asserts that it has in turn degraded prairie dog habitat. The petition asserts that the transfer of public lands (privatization) threatens the species. The petition presents an inventory of land parcels leased for oil and gas exploration and development and asserts that this activity threatens the species. The petition asserts that road mortality threatens the species. The petition asserts that all factors affecting the Gunnison's prairie dog result in isolation and fragmentation of remnant colonies, and that these smaller, isolated colonies are more susceptible to local extirpation by other factors such as poisoning and plague.

Evaluation of Information in the Petition

Although municipal development may have adverse impacts on some Gunnison's prairie dog populations at a local scale, we do not have substantial information that it causes range-wide population declines. Seglund *et al.* (2005) determined that urbanization affects 577,438 ac (233,681 ha) within the range of the species. This is less than 2 percent of the potential habitat within the range of the species. Wagner (2002) noted that in Arizona, human development undoubtedly impacts local populations of Gunnison's prairie dogs near the few cities and agricultural areas in northern Arizona, but the impact on overall populations is probably quite small. The petition did not present substantial scientific information that habitat loss and fragmentation is threatening the species.

We are aware of reports that noxious weeds increase in the presence of overgrazing. However, based upon the information in our files, the impact of overgrazing on prairie dog populations is contradictory. Some reports have noted that species density is positively correlated with the number of native plants (Shalaway and Slobdchikoff 1988; Slobdchikoff *et al.* 1988). Other reports have concluded that prairie dog density is positively correlated with an increase in grazing, which simulates the shortgrass environment preferred by prairie dogs (Fagerstone and Ramey 1996; Marsh 1984, Slobdchikoff *et al.*

1988). The petition did not present substantial scientific information that poor rangeland management is threatening the species.

We are aware that a relationship exists between overgrazing, cheatgrass proliferation, and fire frequency and intensity. However, we have no information in our files that addresses any correlation between fire and Gunnison's prairie dog populations. The petition does not present substantial scientific information that fire is threatening the Gunnison Prairie Dog.

We have no information in our files that indicates that the transfer of public lands (privatization) has any significant influence on Gunnison's prairie dog populations and the petition does not present substantial scientific information that privatization is threatening the Gunnison Prairie Dog.

We acknowledge that there are numerous land parcels within the Gunnison's prairie dog range that are leased for oil and gas development (Seglund *et al.* 2005). However, no information is available that quantifies the amount of occupied habitat that is affected. Menkens and Anderson (1985) concluded in a study of white-tailed prairie dogs that any impact from seismic testing is negligible. The petition does not present substantial scientific information that oil and gas development is threatening the Gunnison Prairie Dog.

We acknowledge that roads are related to some Gunnison's prairie dog mortality. However, there is no information that indicates range-wide impacts to the species from this factor and the petition does not provide substantial scientific information to support this assertion.

We have significant information available in our files indicating that generally smaller, more isolated populations are more vulnerable to extirpation. In addition, isolation of colonies may also reduce the chance of recolonization after extirpation (Wagner and Drickamer 2002). The literature on prairie dogs and the effects of isolation is inconclusive. Lomolino *et al.* (2003) found that persistence of black-tailed prairie dog towns increased significantly with larger town size and decreased isolation. However, Lomolino *et al.* (2003) and other recent reports (Cully and Williams 2001; Miller *et al.* 1993; Roach *et al.* 2001; Vosburgh 1996) also indicate that isolation and fragmentation may provide some protection to prairie dogs from sylvatic plague by lessening the likelihood of disease transmission. Conversely, large intercolony distances may not protect towns if agents of plague transmission

include highly mobile species such as coyotes and raptors (Barnes 1982, 1993). Because we do understand the mechanics of plague transmission well, we are unable to find that isolation and fragmentation is wholly detrimental to the species as it may contribute to avoidance of plague transmission. The petition does not provide substantial scientific information to support an assertion that small colony size in and of itself in the absence of disease is currently threatening the Gunnison prairie dog.

Summary of Factor A

We have determined that information in the petition and readily available in our files does not constitute substantial scientific information that any present or threatened destruction, modification, or curtailment of habitat is a threat to Gunnison's prairie dog such that listing under the Act may be warranted. However, more information on the impacts of fragmentation and isolation with regard to persistence of prairie dog populations is needed.

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

Information Provided in the Petition

The petition asserts that recreational shooting of Gunnison's prairie dogs threatens the species through population reduction, alteration of behavior, and potential extirpation of entire colonies. Citations are provided regarding the impact of shooting on prairie dogs, particularly black-tailed prairie dogs.

Evaluation of Information in the Petition

We are aware that recreational shooting can reduce prairie dog population density at specific sites (Cully 1986; Knowles 2002; Miller *et al.* 1993; Vosburgh 1996; Vosburgh and Irby 1998; Wagner 2002; Wagner and Drickamer 2002), and acknowledge the possibility that local extirpation may have occurred in isolated circumstances (Knowles 1988). However, no information is available in the petition or our files to support a correlation between a range-wide decline of Gunnison's prairie dogs and recreational shooting. Prairie dog colonies typically experience increased population growth rates following shooting and can recover from very low numbers (Knowles 1988; Reeve and Vosburgh, In press).

Summary of Factor B

We have determined that information in the petition and readily available in our files does not constitute substantial scientific information that

overutilization is a threat to Gunnison's prairie dog such that listing under the Act may be warranted.

C. Disease or Predation

Information Provided in the Petition

The petition asserts that sylvatic plague threatens the Gunnison's prairie dog. The petition cites sources that report that plague is a non-native disease that was first reported in the species in 1932. It further cites sources that report that the species has almost a total lack of natural immunity, with mortality rates at infected colonies typically reaching 99 to 100 percent. The petition states that plague occurs throughout the range of the species and cites reports of epizootics in each of the states within the species' range. Some of the more significant epizootics cited by the petition include: The Dilkon region and Seligman region in Arizona; Saguache County and the South Park region in Colorado; Catron County and Moreno Valley in New Mexico; and Lisbon Valley and Tank Mesa in Utah.

The petition describes declines in black-tailed prairie dog populations at Rocky Mountain Arsenal National Wildlife Refuge due to sylvatic plague. Following a plague epizootic in 1988, prairie dog populations declined by at least 90 percent. During the next few years, populations rebounded to approximately half of the original number before experiencing another epizootic. After the epizootic, populations again declined by at least 90 percent. This pattern has repeated itself at this site through three epizootics. Each time the maximum population attained has only been approximately half of the previous maximum population. The petitioner asserts that a similar pattern of decline is likely for Gunnison's prairie dog colonies exposed to plague.

Evaluation of Information in the Petition

Information in our files supports the assertions made in the petition regarding sylvatic plague (Barnes 1982; Barnes 1993; Biggins and Kosoy 2001; Center for Disease Control 1998; Cully 1989; Eskey and Hass 1940; Gage and Kosoy 2005; Girard *et al.* 2004; Kartman *et al.* 1966; Navajo Natural Heritage Program 1996; Olsen 1981; Seglund *et al.* 2005; Stapp *et al.* 2004; Witmer 2004). Quantitative data indicate that plague has caused population declines in recent years at many well-studied sites throughout the range of Gunnison's prairie dog (Cully 1986; Cully 1989; Cully 1997; Cully *et al.* 1997; Ecke and Johnson 1952; Fitzgerald 1970; Fitzgerald 1993; Fitzgerald and

Lechleitner 1974; Girard *et al.* 2004; Kartman *et al.* 1962; Lechleitner *et al.* 1962; Lechleitner *et al.* 1968; Rayer 1985; Turner 2001; Wagner 2002; Wagner and Drickamer 2002). All of the declines noted in Tables 2 and 3 are due to plague epizootics. However, range-wide population trends may or may not follow this pattern (Table 1). Beyond absolute numbers, an additional consideration when evaluating Gunnison's prairie dog populations is the temporal fluctuation of occupied versus unoccupied habitat caused by periodic plague epizootics. We are unaware of any information at the landscape level that definitively suggests range-wide population declines caused by plague, although some reports indicate significant amounts of recently unoccupied habitat (Skiba, *in litt.* 2005 and Utah Division of Wildlife Resources, *in litt.* 2005), and many specific sites have experienced at least temporary reductions to extirpation or near extirpation (Tables 2 and 3).

Plague is an exotic disease foreign to the evolutionary history of North American species (Barnes 1982; Barnes 1993; Biggins and Kosoy 2001). Plague was first detected in Gunnison's prairie dogs in the 1930s (Eskey and Hass 1940) and has subsequently spread throughout the range of the species (Center for Disease Control 1998; Cully 1989; Girard *et al.* 2004). Therefore, it has been present within the species' range for only approximately 70 years, allowing very little time for any resistance to evolve (Biggins and Kosoy 2001). Once established in an area, plague becomes persistent and periodically erupts, with the potential to eventually extirpate or nearly extirpate entire colonies (Barnes 1982; Barnes 1993; Cully 1989; Cully 1993; Cully *et al.* 1997; Fitzgerald 1993).

Studies indicate that Gunnison's prairie dog populations are more susceptible to decline from sylvatic plague than white-tailed prairie dog populations, and are at least as, if not more, susceptible than black-tailed prairie dog populations (Antolin *et al.* 2002; Cully 1989; Cully and Williams 2001; Hubbard and Schmitt 1984; Knowles 2002; Ruffner 1980; Torres 1973; Turner 2001). Gunnison's prairie dogs commonly forage outside of their home territory, a characteristic that may play a significant role in the susceptibility of the species to plague. The Gunnison's prairie dog may be more susceptible to plague than the black-tailed prairie dog because of the Gunnison's less exclusive territorial behavior, where relatively many prairie dogs mix relatively freely throughout adjacent territories and thereby

contribute to the communicability of plague. Additionally, plague is only present throughout approximately 66 percent of the black-tailed prairie dog's range (US Fish and Wildlife Service 2000) in comparison to 100 percent of the Gunnison's prairie dog's range (Center for Disease Control 1998; Cully 1989, Girard *et al.* 2004). The Gunnison's prairie dog is likely more susceptible to plague than the white-tailed prairie dog because the Gunnison's typically occurs at higher densities and is less widely dispersed on the landscape, allowing for more frequent transmission of the disease from one individual to another (Antolin *et al.* 2002, Cully 1989; Cully and Williams 2001; Turner 2001).

Many populations of Gunnison's prairie dogs have never been studied, and for those we have no information on their current population status or recent trends. In addition, for some previously studied sites we have no recent information regarding the status of the population. Tables 2 and 3 note declines due to plague at numerous sites throughout the range of the species. For example, occupied habitat in South Park, Colorado was estimated at 915,000 ac (371,000 ha) in 1945, 74,000 ac (30,000 ha) in 1948, and 42 ac (17 ha) in 2002. This decline was largely due to plague and affected a substantial portion of the species' extant occupied habitat in Colorado (at least 15 percent). Partial or complete recovery following population reductions due to plague has been reported at various sites for both white-tailed and black-tailed prairie dogs (Biggins and Kosoy 2001). In the few sites where Gunnison's prairie dog populations have been monitored after plague, only one population may have increased after the plague outbreak, but it is a very small fraction of pre-plague abundance.

Summary of Factor C

We have determined that information in the petition and readily available in our files does not constitute substantial scientific information that disease or predation are threats to Gunnison's prairie dog such that listing under the Act may be warranted. We recognize that sylvatic plague has been and continues to be the major mortality factor for Gunnison's prairie dog at specific sites, but the impact that this disease has had on the overall status of the species, even at the State level, remains unclear. More information on the impacts of disease, specifically sylvatic plague, with regard to persistence of Gunnison's prairie dog populations is needed.

D. Inadequacy of Existing Regulatory Mechanisms

Information Provided in the Petition

The petition documents the State and federal regulatory status of the Gunnison's prairie dog and asserts that those regulations are inadequate and constitute a threat to the species. Most concerns relate to a lack of restrictions with regard to chemical control and recreational shooting. However, information in our files indicates most of the Western Association of Fish and Wildlife Agencies (WAFWA) states have already established shooting restrictions on prairie dogs via state hunting regulations, however such regulations do not apply to tribal lands. The petition notes that in Arizona and Utah there is only a seasonal closure on public lands; and in Colorado and New Mexico, there is no season. The petition also notes that none of the state management plans developed in response to a petition on the black-tailed prairie dog include any conservation measures for Gunnison's prairie dogs. The petition further claims that federal policies of various agencies and departments allow chemical control of the species.

Evaluation of Information in the Petition

The current regulatory status with regard to Gunnison's prairie dogs is well documented in various State and federal statutes. However, the impacts resulting from these regulations or lack thereof are difficult to quantify. The petition notes that none of the State management plans developed in response to a petition on the black-tailed prairie dog (Colorado Division of Wildlife 2003; New Mexico Black-tailed Prairie Dog Working Group 2001; Van Pelt 1999) include any conservation measures for Gunnison's prairie dogs. However, this would be expected since these plans address a different species and/or habitat type. All four States discuss the Gunnison's prairie dog in their Comprehensive Wildlife Conservation Strategies (Seglund *et al.* 2005), and found the species deserving of special management consideration.

WAFWA has completed a conservation assessment for the species (Seglund *et al.* 2005) that describes regulatory status, occupied habitat estimates, limiting factors, and conservation needs for the species. After consideration of the contents of the assessment, the WAFWA and its Prairie Dog Conservation Team and White-tailed and Gunnison's Prairie Dog Working Group concluded that just active management and development of a comprehensive conservation strategy

for the species and its habitat are needed to conserve the species. Conservation planning efforts are underway among state and federal agencies for the Gunnison prairie dog with a strategy due to be completed by 2006.

The range-wide assessment indicates that BLM has incorporated Gunnison prairie dog conservation into most land use plans.

Summary of Factor D

Gaps in the regulatory mechanisms applicable to threats discussed in the analysis of the five factors are not determinative, as we do not have substantial scientific information that the species may warrant listing due to any of these potential threats, either together or in isolation.

E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

Information Provided in the Petition

The petition cites sources that document early chemical control (poisoning) efforts directed toward the Gunnison's prairie dog. These early efforts were generally broad-scale and federally directed. Competition with livestock for forage was the most common impetus for chemical control of prairie dogs. The petition cites sources that report that in Arizona, a minimum of 2.3 million ac (935,000 ha) of Gunnison's prairie dog occupied habitat were poisoned from 1915–1964. In Colorado, New Mexico, and Utah, the petition notes that control efforts were not quantified by species. However, for all prairie dog species from 1915 to 1964, the petition cites sources that report 23.2 million ac (9.4 million ha) poisoned in Colorado, 20.5 million ac (8.3 million ha) poisoned in New Mexico, and 2.7 million ac (1.1 million ha) poisoned in Utah.

The petition asserts that drought may have affected Gunnison's prairie dogs. It acknowledges that the effects of drought on the species have not been examined in the published scientific literature, but

speculates that chemical control may be more likely during periods of drought.

Evaluation of Information in the Petition

Information in our files supports the assertions made in the petition regarding dramatic declines in Gunnison's prairie dog occupied habitat associated with early chemical control efforts (Bailey 1932; Bell 1921; Ecke and Johnson 1952; Hubbard and Schmitt 1984; Forrest 2002; Knowles 2002; Longhurst 1944; Oakes 2000; Seglund *et al.* 2005; Shriver 1965; Wagner 2002). In the early 1900s, strychnine treated grain was primarily used. In 1947, strychnine began to be replaced with compound 1080, which was used until it was rescinded in 1972 by Presidential Executive Order No. 11643 (Hubbard and Schmitt 1984). Since 1972, zinc phosphide has most often been used. Fewer chemical control efforts for the species have been federally directed in recent years and we are not aware of any recent large-scale chemical control programs. Consequently, the extent of impacts to the species likely has not continued to the same degree as in earlier years. We have no information to indicate that large scale poisoning is ongoing on the federal land management agencies. Information provided by the BLM indicates that no authorized poisoning is occurring on BLM lands. Other than a recitation of the effects of early chemical control activities, the petition does not provide substantial scientific information that chemical control is a current threat to the species, nor do we have information in our files that supports such a conclusion.

Drought may affect some Gunnison's prairie dog populations in some circumstances, but no information regarding a direct relationship between drought and range-wide populations is available.

Summary of Factor E

Substantial information is not presented by the petition or available in our files to indicate that other natural or manmade factors, in particular chemical control and drought, currently threaten

the Gunnison's prairie dog such that listing under the Act may be warranted.

Finding

We have reviewed the information presented in the petition, and have evaluated that information in relation to information readily available in our files. On the basis of our review, we find that the petition does not present substantial scientific information indicating that listing the Gunnison's prairie dog species may be warranted due to any of the five threat factors. As noted previously under our discussion of factor C, we recognize that sylvatic plague has been and continues to be the primary mortality factor for Gunnison's prairie dog, especially at specific sites, but the impact that this disease has had on the overall status of the species is unclear. More information on the impacts of disease, specifically sylvatic plague, and on population status and trends is needed. The Service had already engaged the States in an effort to collect status information on the species, especially in areas where the current status of Gunnison's prairie dog is not well known. Results from these cooperative efforts should be available within a year. Once those results are available we will reevaluate the status of Gunnison's prairie dog.

References Cited

A complete list of all references cited herein is available upon request from the Field supervisor (see **ADDRESSES** section).

Author

The primary authors of this document are staff at the South Dakota Ecological Services Office (see **ADDRESSES** section).

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

Dated: January 30, 2006.

Marshall P. Jones, Jr.,

Acting Director, U.S. Fish and Wildlife Service.

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