PETITION TO LIST THE WHITE-SIDED JACKRABBIT *(Lepus callotis)* UNDER THE U.S. ENDANGERED SPECIES ACT

White-sided Jackrabbit photo, courtesy of Cesar Mendez.

In the Office of Endangered Species
U.S. Fish and Wildlife Service
United States Department of Interior

Petitioner:

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WILDEARTH GUARDIANS
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EXECUTIVE SUMMARY

In the United States the white-sided jackrabbit is found in an extremely restricted area of New Mexico, where it is known only from within 20 miles of the international border with Mexico in southern Hidalgo County. The white-sided jackrabbit's historical distribution in Hidalgo County consisted of 46.3 square miles. This jackrabbit was found in the southern portion of two valleys in Hidalgo County: the Animas Valley and the Playas Valley, which are separated by the Animas and San Luis mountains. Current surveys indicate that the population in the Playas Valley is extirpated. Populations in the Animas Valley have declined dramatically since the first comprehensive surveys conducted in 1976. In 1976 the estimated population of white-sided jackrabbits in both the Animas and Playas Valleys totaled 340 individuals. In 1976, a 63 km survey route resulted in the observation of 100 individuals. In 1981, this same route was surveyed and 45 individuals were observed. Surveys from 1990-1995 counted less than five white-sided jackrabbits per year. In 1995 only one individual was observed in the Animas Valley, and none were found in the Playas Valley. New Mexico Department of Game and Fish conducted surveys for white-sided jackrabbits in 1997 and 2002. These data are still in raw form and may indicate that the white-sided jackrabbit population during those years was not as low as during the 1995 survey, but survey results have not been analyzed.

The white-sided jackrabbit is an obligate of pure Chihuahua desert grasslands. Declines in grassland health, which are indicated by increases in shrub and forb cover, cause populations of the white-sided jackrabbit to decrease and populations of black-tailed jackrabbits to increase. Causes of decline in grassland health include grazing, climate change effects such as decreased precipitation and drought, and suppression of wildfire. While direct measurement of changes in grassland health within the range of the white-sided jackrabbit has not been conducted, researchers have observed that areas where the white-sided jackrabbit previously occurred have become more dominated by shrubs and forbs. This change in vegetation is especially apparent in the Playas Valley, where the white-sided jackrabbit is likely extirpated. Surveys between 1976 and 1981 indicated a decrease in white-sided jackrabbit populations of greater than 50%, but also indicated a doubling of black-tailed jackrabbits. Black-tailed jackrabbits are indicative of grasslands in fair to poor health, and the species is not usually abundant in grasslands considered to be in good health.

While the majority of the distribution of the white-sided jackrabbit is in Mexico, it appears that a decreasing population trend has occurred in that country as well. Bird surveys conducted throughout Mexico within the range of the white-sided jackrabbit documented incidental observations of jackrabbit species. There were no observations of white-sided jackrabbits. A study on white-sided jackrabbits in Chihuahua found that the average density of white-sided jackrabbits was 0.03/hectare in 1998 and 0.04/hectare in 1999, which is similar to the lowest and most recent densities in New Mexico (0.03/hectare) calculated in 1995.

The white-sided jackrabbit is an indicator of grassland health throughout the Chihuahuan Desert region. Its distribution and abundance in the United States has steeply declined, indicating that the species and its habitat are in danger of extinction within the United States. Similarly, there is evidence that populations may be decreasing dramatically in the fragmented populations of Mexico.

INTRODUCTION

The white-sided jackrabbit is an elusive animal. Although it is wide-ranging with a distribution from southern New Mexico south to northern Durango, Mexico, there is little documentation of its occurrence in New Mexico and even less in Mexico. Mearns first described this jackrabbit in 1896 as *Lepus gaillardi*. In 1962, *Lepus gaillardi* was recognized as a subspecies of *Lepus callotis* (i.e., *Lepus callotis gaillardi*) (Anderson and Gaunt 1962). In New Mexico comprehensive surveys for the white-sided jackrabbit did not begin until 1976, and were followed by surveys in 1981, 1990-1995, 1997 and 2002. Previous to 1976 documentation of this jackrabbit in New Mexico consisted of semi-incidental observations.

The white-sided jackrabbit is an obligate of grasslands in the Chihuahuan Desert region. The jackrabbit requires pure stands of grass at high elevations. Greater than 97% of observations of the white-sided jackrabbit have been in pure grasslands. Observations also indicate that the jackrabbit prefers flat topography with few shrubs or forbs. Population densities are highest in grassland composed of greater than 65% grass, less than 25% forbs, and less than 1% of shrubs. Some species of grass in which white-sided jackrabbits have been found include blue and black grama, tobosa grass, and buffalo grass. These pure grasslands are important for sufficient food and shelter for this species. Greater than 90% of the white-sided jackrabbit diet consists of grass, and tall grasses appear necessary for concealment during the day and for nesting sites.

The white-sided jackrabbit is similar in general appearance to other species of jackrabbits, but it is characterized by unique differences. The white-sided jackrabbit is almost exclusively nocturnal. Surveys conducted during the day by flushing jackrabbits from resting places are not highly successful. The white-sided jackrabbit has three types of vocalizations, which are used to communicate fear or alarm, when a male protects a female from an invading male, and during sexual chase. One characteristic peculiar to the white-sided jackrabbit is that most observations are of paired animals. It is believed that the pair does not readily separate and pairs are observed at all times of the year. The white-sided jackrabbit is also the only jackrabbit known to use it forepaws to excavate bulbous tubers of nutgrass.

The black-tailed jackrabbit is a congener of the white-sided jackrabbit and is found in the shrublands surrounding white-sided jackrabbit habitat. The black-tailed jackrabbit probably is not a direct competitor of the white-sided jackrabbit. However, the abundance of black-tailed and white-sided jackrabbits is negatively correlated depending on the health of the grassland. As pure grassland changes to shrubland, black-tailed

jackrabbit abundance increases, while white-sided jackrabbit abundance decreases. In pure grasslands white-sided jackrabbit abundance is higher than black-tailed jackrabbit abundance.

ENDANGERED SPECIES ACT IMPLEMENTING REGULATIONS

Section 424 of the regulations implementing the Endangered Species Act (50 C.F.R. § 424) is applicable to this petition. Subsections that concern the formal listing of the white-sided jackrabbit as an Endangered or Threatened species are:

> 424.02 (d) "Critical habitat" means "(1) the specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection..."
>
> 424.02 (e) "Endangered species" means a species that is in danger of extinction throughout all or a significant portion of its range."
>
> "Threatened species" means a species that "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C § 1532(20)).
>
> 424.11(c) "A species shall be listed…because of any one or a combination of the following factors:
>
> 1. The present or threatened destruction, modification, or curtailment of habitat or range;
> 2. Overutilization for commercial, recreational, scientific, or educational purposes;
> 3. Disease or predation;
> 4. The inadequacy of existing regulatory mechanisms; and
> 5. Other natural or manmade factors affecting its continued existence."

Multiple factors set forth in 424.11(c) and in ESA Section 4 (16 U.S.C. § 1533(a)(1)) have resulted in the continued decline of the white-sided jackrabbit and are causing the species to face endangerment and extinction. While the white-sided jackrabbit meets all five criteria for listing, the primary factor threatening the white-sided jackrabbit is the "present or threatened destruction, modification, or curtailment of habitat or range."

THE SPIRIT OF THE ENDANGERED SPECIES ACT

The purposes of the ESA are two-fold, to conserve threatened and endangered species *and* the ecosystems on which they depend. The Act's Section 2 reads:

> The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species…

See 16 U.S.C.A. § 1531(b). This is set forth as the very purpose of the ESA and our petition therefore goes to the very heart of this visionary law, as protection for this jackrabbit could provide protection for endangered Chihuahuan Desert grasslands.

CLASSIFICATION AND NOMENCLATURE

Common Name

The common name for *Lepus callotis* (Wagler 1830) and its two subspecies, *L. c. gaillardi* and *L. c. callotis*, is the "white-sided jackrabbit." The species has also been referred to as the beautiful-eared jackrabbit and snow sides jackrabbit. The subspecies *Lepus callotis gaillardi* is referred to as Gaillard's white-sided jackrabbit.

Taxonomy

Jackrabbits are lagomorphs within the family Leporidae. Leporidae consists of 11 genera and 54 species. The genus *Lepus*, common hares and jackrabbits, consists of approximately 29 species (Lorenzo et al. 2003). There are seven recognized species of *Lepus* in North America (NHM 2007)

- *Lepus alleni* (Antelope Jackrabbit)
- *Lepus americanus* (Snowshoe Hare)
- *Lepus arcticus* (Arctic Hare)
- *Lepus californicus* (Black-tailed Jackrabbit)
- *Lepus callotis* (White-sided Jackrabbit)
- *Lepus othus* (Alaskan Hare)
- *Lepus townsendii* (White-tailed Jackrabbit)

Synonyms for *L. callotis* (Wagler 1830) include: *L. mexicanus* (Lichtenstein, 1830), *L. nigricaudatus* (Bennett, 1833), *L. gaillardi* (Mearns, 1896), and *L. battyi* (J. Allen, 1903).

Lepus gaillardi was recognized as a subspecies of *Lepus callotis* and thus synonymized as *L. c. gaillardi* in 1962 (Anderson and Gaunt 1962). In general, the two subspecies of *L. callotis* can be distinguished by color and bone structure. *L. c. gaillardi* differs from *L. c. callotis* in having a pale-buff hue, a brown rather than black nape, and large supraorbital processes causing a greater frontal depression of the skull (Best and Henry 1993). Geographic variation exists for most characteristics (Anderson and Gaunt 1962). Morphometric data reveal overlap between certain characteristics of the two subspecies of white-sided jackrabbits, *L. c. gailladri* and *L. c. callotis*. These characteristics include instances of clinal variation within the subspecies *L. c. callotis*, with an end of the cline not significantly different from the condition of the subspecies *L. c. gaillardi* (InfoNatura:

2004). There is weak geographic concordance in the pattern of variation in several characters (InfoNatura: 2004). The lack of a strong geographic pattern in the morphological data and an absence of genetic data has caused some questions regarding the evolutionary uniqueness of the named subspecies *L. c. gaillardi* (InfoNatura: 2004). Despite these questions, mammalian specialists continue to regard *L. c. callotis* and *L. c. gaillardi* as separate subspecies of *L. callotis* (Hall 1981; Best and Henry 1993; Natureserve 2006a; Natureserve 2006b). While questions may exist regarding subspecies status of *L. c. gaillardi* and *L. c. callotis*, *L. c. gaillardi* is the only white-sided jackrabbit found in the United States.

Petitioners request the designation of the full species, the white-sided jackrabbit (*Lepus callotis*), as Endangered or Threatened under the ESA. USFWS should also consider this a petition to list each of the recognized subspecies (*L. c. callotis* and *L. c. gaillardi*) if they are found to be taxonomically valid. Petitioners also request that northern populations currently recognized as the subspecies *L. c. gaillardi* be considered for listing as a distinct population segment (DPS). Northern populations of *L. callotis*, which are currently regarded as *L. c. gaillardi*, could be regarded as a DPS based on the geographic isolation of these populations and because evidence indicates a steep decline in New Mexico populations, low population densities in northern Mexico, and similar threats throughout the region.

DESCRIPTION

Pelage color

In general, the coloration of the white-sided jackrabbit is light, grizzled brown on the upperparts, becoming darker on the nape and back. The sides, flanks, and underparts are white, with the flanks variously overlain with brownish. The tail is black above and white below. The eyes are light brown to golden-yellow (Best and Henry 1993).

The following description of differences in pelage coloration between *L. c. gaillardi* and *L. c. callotis* are taken from Mearns (1896), Nelson (1909) and Best and Henry (1993). Also see brief discussion of differences between the two subspecies in Taxonomy section of this petition.

L. c. gaillardi compared to *L. c. callotis*

Upperparts:

- *L. c. gaillardi*: Top and sides of head and back are deep dull vinaceous buff approaching a fawn color.
- *L. c. callotis*: Top and sides of head and back are dark pinkish-buff heavily overlaid with black.

Head:

- *L. c. gaillardi*: Underside is dull buff becoming whitish in the middle and underside of the neck is dark dull buff.
- *L. c. callotis*: Underside of neck is dull dark-grayish buff, varying to buff drab.

Nape:

- *L. c. gaillardi*: Black and sometimes grizzled on the surface with gray.
- *L. c. callotis*: Same but brighter.

Ears:

- *L. c. gaillardi*: Front one-half of the ear is dull buff, posterior one-half is white, no trace of black at the tip. Insides of the ears are buff becoming ochraceous buff on the fringe along the front border and buff white on the posterior edge. A narrow dusky line present on the membrane inside the ear along the posterior border, widening to form a broad black patch (1 inch wide) underlying the short buff hairs at the tip.
- *L. c. callotis*: Front one-half of ear is dark buff or grayish buff, posterior one-half is black on the basal one-third and white on the terminal two-thirds with no trace of black at the tip. Front borders are fringed with buff or ochraceous-buff hairs, posterior border and entire tip are velvety white. A well-marked dusky line present on the membrane inside the ear along the posterior border, broadening to form a broad blackish patch underlying the buff hairs at the tip.

Legs and feet:

- *L. c. gaillardi*: Front of hind legs and tops of feet are white. Front of forelegs and tops of feet are gray, palest on the feet.
- *L. c. callotis*: Front of hind legs and tops of feet are white. Front of forelegs and tops of forefeet vary from pale gray to dull iron-tray, but are palest on the feet.

Rump:

- *L. c. gaillardi*: Outside of rump and back of hind legs are pale iron-gray sometimes becoming whitish from loss of black hairs. Rump divided by a median line of dusky extending down and becoming black over the upper surface of tail.
- *L. c. callotis*: Rump, back and outside of hind legs are iron gray. Median line on rump is black and not strongly marked, does not extend much above the base of the tail.

Tail:

- *L. c. gaillardi*: Underside of the tail is white to tip.
- *L. c. callotis*: Entire top, sides and tip of tail are black. Basal two-thirds of the underside of tail is white and the terminal one-third is black.

Underparts:

- *L. c. gaillardi*: Underparts, including flanks, are white.
- *L. c. callotis*: Underparts, including flanks, are white. On the flanks, white extends high on the sides and abruptly ends posteriorly against the iron gray of the rump patch. A few scattered long black hairs occur throughout the white of the underparts and flanks.

Morphometrics

The white-sided jackrabbit has a body length that ranges from 18 – 21 inches (450 -536 mm) long. The tail is from 2.5 – 3 inches (59-80 mm) in length. Length of the front leg is 4 – 6 inches (102 – 152 mm), while length of the back leg is 6 – 12 inches (152 – 305 mm). The length of the hind foot is 4.9 – 5.2 inches (124-133 mm). Similar to other species of jackrabbits, the white-sided jackrabbit's ears are long, measuring 4.3 – 4.4 inches (110-112 mm) (Hall 1981). Anderson and Gaunt (1962) published average and range measurement differences between *L. c. gaillardi* and *L. c. callotis* for total length, length of tail, length of hind foot, length of ear from notch, basilar length of cranium, breadth of braincase, breadth of bullae, basioccipital constriction, and frontal depression.

Dimorphism

Females are larger than males. In New Mexico comparative measurements for females versus males were: mass 6.5 vs. 4.0 pounds (2.95 vs. 1.82 kg); total length 22 vs. 21 inches (558 vs. 529 mm); hindfoot length 5.0 vs. 4.8 inches (126 vs. 121 mm); ear length 5.6 vs. 5.3 inches (142 vs. 135 mm) (Bednarz and Cook 1984).

Distinctive traits

The only species of hare (family Leporidae) that overlaps in range of the white-sided jackrabbit is the black-tailed jackrabbit (*Lepus californicus*) (Hall 1981; Hubbard et al. 1985). In general, the white-sided jackrabbit can be distinguished from the abundant black-tailed jack rabbit by their extensive white sides and inconspicuous or absent black ear tips (Findley et al. 1975; Cook 1986; Best and Henry 1993). The most reliable way of distinguishing the two is by the patterning of black and white on the ears. In the white-sided jackrabbit the black tipping is on the anterior part of the ears, while the white edging is on the posterior part of the ears. This pattern is reversed in the black-tailed jackrabbit. Both species have varying amounts of whitish fur on their sides and flanks. However, the white pelage is more extensive and strikingly visible in the white-sided jackrabbit. The white-sided jackrabbit is also somewhat more stocky in build, and it differs as well in habitat selection and behavior (Hall 1981).

Range distinctions

The two subspecies of white-sided jackrabbit, *L. c. gaillardi* and *L. c. callotis,* are separated geographically at the prominent valley of the Rio Nazas. The Rio Nazas also is the dividing line for several other mammalian species (Baker and Greer 1962; Peterson

1976). Discussion of the distinctiveness of these subspecies is presented in the sections on taxonomy and description. The range of *L. c. gaillardi* is disjunct due to its association with relict areas of relatively mesic high elevation pure grasslands (Hall 1981). In the United States, the only place where the white-sided jackrabbit occurs is southern Hidalgo County, New Mexico (NMDGF 1996a) (Figures 1 & 2). *Lepus callotis callotis* is confined to Mexico and occurs from southern Durango through the Mexican Plateau region (Figure 1).

GEOGRAPHIC DISTRIBUTION: HISTORICAL AND CURRENT

Figure 1. Geographic distribution of the white-sided jackrabbit, *Lepus callotis*. Northern populations in New Mexico, Chihuahua, and northern Durango are *L. c. gaillardi*; southern populations from southern Durango to Oaxaca are *L. c. callotis*. Source for Image: NatureServe 2004.

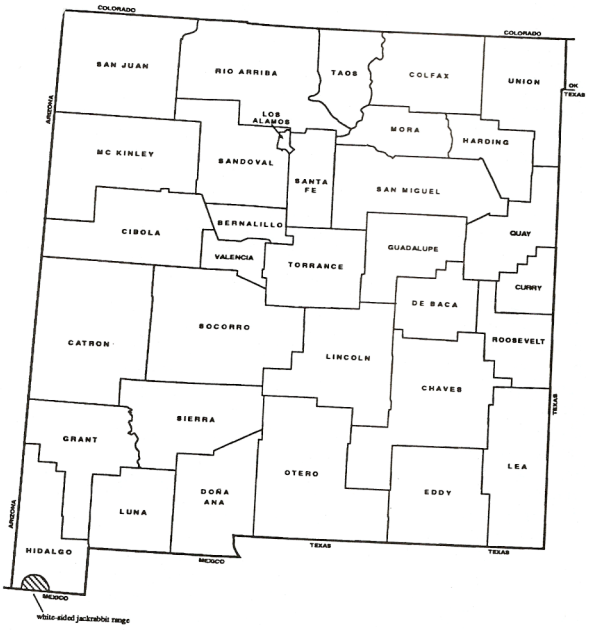

Figure 2. Geographic distribution of the white-sided jackrabbit in New Mexico. Source: NMDGF 1996b.

The historical range of the northern subspecies of white-sided jackrabbit, *L. c. gaillardi*, was high elevation grasslands along the eastern flank of the Sierra Madre Occidental from southwestern New Mexico, through Chihuahua, and into northern Durango, Mexico (Figure 1) (Anderson and Gaunt 1962). *L. c. gaillardi* has not been verified in Sonora, although Caire suspected that it could occur in northeastern Sonora (Caire 1997). Leopold stated that *L. callotis* occurred in western Sonora, although it is likely this was a misstatement and that he was referring to another species, *L. alleni* (Leopold 1959, Jennifer Frey, pers. comm.). In the United States, it has only been documented from southern Hidalgo County, New Mexico (Figure 2) (Bednarz and Cook 1984). The historical range of the southern subspecies of white-sided jackrabbit, *L. c. callotis*, extends across the Mexican Plateau from southern Durango to central Oaxaca (Hall 1991).

In 1950 two mammal specialists observed white-sided jackrabbits in a pure grassland plain along the west side of the Huachuca Mountains in Cochise County, Arizona (Hoffmeister and Goodpaster 1954). These grasslands are the same type as those used by white-sided jackrabbits in New Mexico and Chihuahua and are broadly distributed in vicinity of the Huachuca Mountains, both in Arizona and adjacent Sonora (Brown 1994). There has been no verification of white-sided jackrabbits in Arizona, although Hoffmeister continued to consider the species as one of possible occurrence in the state (Hoffmeister 1986).

The historical distribution of the white-sided jackrabbit in New Mexico is not known because intensive surveys for the species only occurred in more recent times (1970s to

present). In New Mexico the species has a very localized distribution. Historically it was found in two valleys in Hidalgo County near the Mexican border: the southern Animas Valley and a very limited portion of the southern Playas Valley (Figure 3). The Animas Valley distribution is bounded to the east by the Animas and San Luis mountains and to the west by the Peloncillo and Guadalupe mountains (Bednarz and Cook 1984). The northward distribution appears to be limited approximately 13 miles north of the international border by broken terrain and a change of habitat from nearly pure grasslands to communities dominated by shrubs and forbs (Bednarz 1977). The Playas Valley extends northward into New Mexico from Mexico, for four to five miles and lies between the Whitewater and San Luis mountains (Moore-Craig 1992). Records of the white-sided jackrabbit in the Playas Valley are limited to the northern tip of the west fork of the Playas Valley. The Animas and Playas valleys are key habitat areas for the white-sided jackrabbit in New Mexico (Hubbard et al. 1985). The known inhabited area in New Mexico is restricted to 46.3 square miles (120 km^2) of high grasslands between 4,920 – 5,248 feet (1,500 – 1,600 m) in elevation (Bednarz and Cook 1984; IUCN 1996). Those parts of the Animas and Playas valleys that do not support the white-sided jackrabbit are at elevations below 4,805 feet (1,465 m) and are drier, supporting amore xeric grass-shrub association where the white-sided jackrabbit apparently cannot survive (Moore-Craig 1992).

The last observation of a white-sided jackrabbit in the Playas Valley was in 1990 (Mehlhop 1995) (Figure 5). Currently, the Playas Valley population may be extirpated due to increase shrub cover (NMDGF 2006, Pers. comm. NMDGF 2007). While the general geographic distribution of the white-sided jackrabbit in the Animas Valley has not changed, it appears that populations have decreased in response to deterioration of the grasslands on which these jackrabbits rely (Bednarz and Cook 1984; Mehlhop 1995; Traphagen 2002) (Figures 4 and 5).

In 2005 a statistical computer model predicted potential habitat for the white-sided jackrabbit in Grant and Luna counties, New Mexico (Boykin 2005). While potentially suitable habitat may be present, there is no evidence that the white-sided jackrabbit occurs or historically occurred in those counties, and its distribution is considered restricted to southern Hidalgo County in New Mexico (Pers. comm. NMDGF 2007). Both the Bureau of Land Management (BLM) and US Fish and Wildlife Service (USFWS) included the white-sided jackrabbit on lists of species occurring in three New Mexico counties: Hidalgo, Grant, and Luna (BLM 1999; USFWS 2006). These lists are misleading because there is no evidence that the species has been observed in any county other than the southern tip of Hidalgo County.

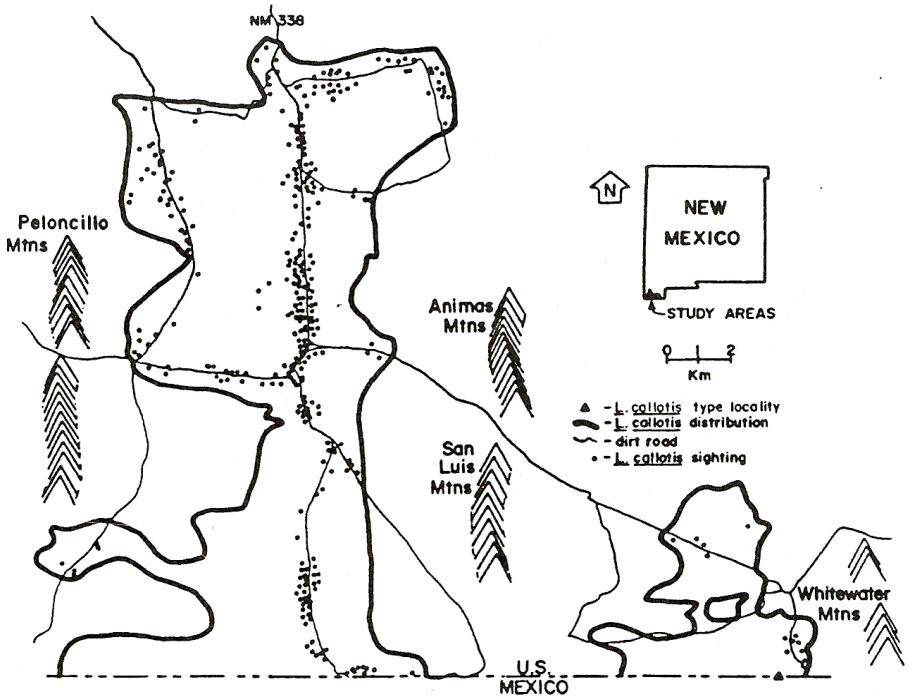

FIG. 1.—Distribution of white-sided jackrabbits in Hidalgo Co., New Mexico.

Figure 3. Distribution of the white-sided jackrabbit in southern New Mexico Source: Bednarz and Cook 1984. Dots represent locations of observations of the species in 1977 and 1981 and the solid line indicates the presumed range limits in New Mexico.

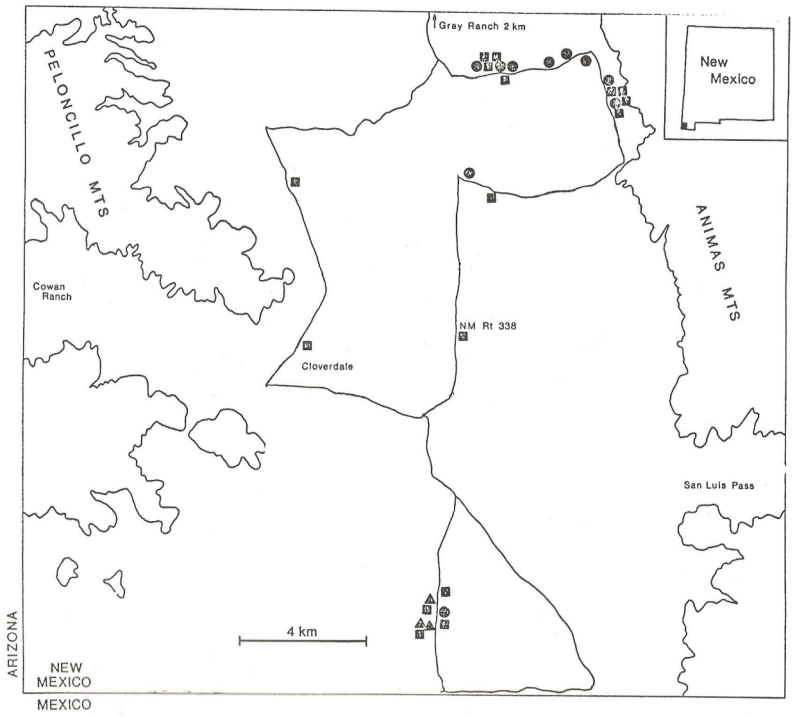

Figure 4. Results of surveys for the white-sided jackrabbit in the Animas Valley, Hidalgo County, New Mexico during 1981. Source: Cook 1981a.

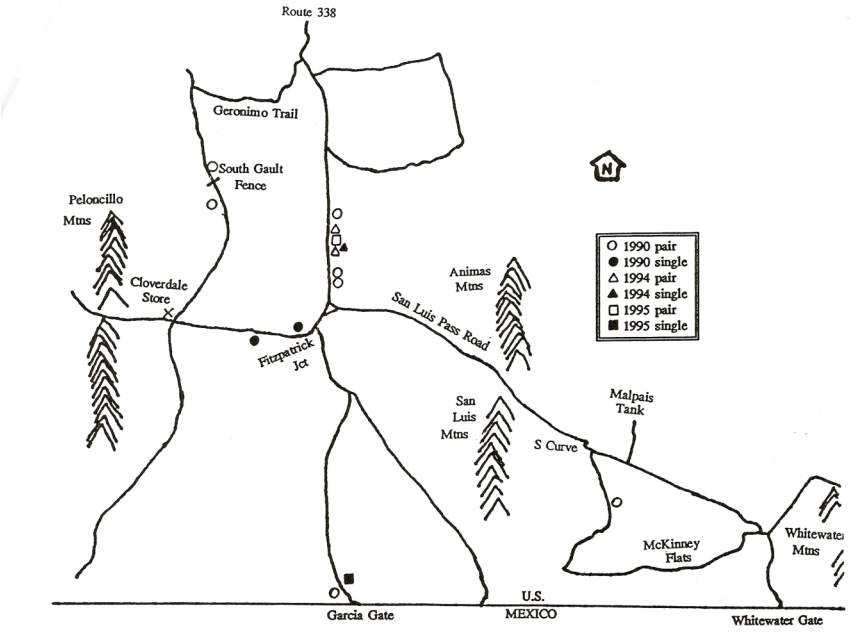

Figure 5. Results of surveys for the white-sided jackrabbit in the Animas and Playas Valleys, Hidalgo County, New Mexico, during 1990-1995. Source: Mehlhop 1995.

LIFE HISTORY

Habitat requirements

L. c. gaillardi is primarily associated with the "plains grassland" biotic community, which is a cold temperate grassland dominated by sod-forming grasses such as blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), side oats grama (*B. curtipendula*), and hairy grama (*B. hirsute*) (Brown 1994; Desmond 2004). In the Chihuahuan Desert region, these grasslands are relict and primarily found in disjunct areas on relatively level plateaus, plains, and valleys at high elevations of 5,000 – 5,300 feet (1,525 –1,620 m), which generally corresponds to the distribution of *L. c. gaillardi* (Brown 1994, J. Frey pers. comm.). In New Mexico, stands of buffalograss (*Buchloe dactyloides*), which is a typical plains grassland species, was an indicator of white-sided jackrabbit presence (Traphagen 2002, J. Frey pers. comm.). At lower elevations, the plains grassland transitions to a different biotic community, the "semi-desert grassland". Semi-desert grassland is a warm-temperate grassland that is broadly distributed at lower elevations of 3,600 – 4,600 feet (1,100-1,400 m) and dominated by perennial bunchgrasses such as black grama (*B. eripoda*) and tobosa (*Pleuraphis=Hilaria mutica*). *L. c. gaillardi* occurs in some semi-desert grasslands at lower densities in comparison with plains grassland, but it is unknown if they historically utilized semi-desert grassland at low densities or if current low densities reflect recent habitat degradation (Desmond 2004).

The white-sided jackrabbit appears to be a virtual obligate of grasslands,(Conway 1975; Bednarz 1977; Conley and Brown 1977; Bednarz and Cook 1984). *Lepus callotis gaillardi* is dependent on well-developed grasslands that are characterized by flat topography, few shrubs and forbs and a higher elevation than nearby grasslands (Moore-Craig 1992). Population densities are greatest in habitats composed of > 65% grasses, < 25% forbs and < 1% shrubs (Dunn et al. 1982). In Chihuahua during 1998 and 1999, white-sided jackrabbits were found in areas with the highest grass cover (Desmond 2004). The best predictors of white-sided jackrabbit occurrence were plains grassland type, high grass cover, and low grazing pressure. *Id*.

Typical plants found within the range of *L. c. gaillardi* in the Animas and Playa valleys include blue grama (*Bouteloua gracilis*), black grama (*B. eriopoda*), tobosa grass, buffalograss (*Buchole dactyloides*), wolftail (*Lycurus pheloides*), flatsedge (*Cyperus spp*.), snakeweed (*Gutierrizia sarothae*), soap-tree yucca (*Yucca elata*), and honey mesquite (*Prosopis glandulosa*) (Bednarz and Cook 1984). Greater than 97% of observations of this species have been recorded in pure grasslands, and less than 3% have been recorded in grasslands with varying amounts of forbs and shrubs. *Id*. All of the observations in grasslands with varying amounts of forbs and shrubs were immediately adjacent to large expanses of grasslands. *Id*.

A tall grass species like tobosa grass appears to be essential for concealment during the day (Moore-Craig 1992). During 1975 surveys in New Mexico, *L. c. gaillardi* was only found in tobosa grass and when flushed fled to other stands of the same grass (Findley et

al. 1975). Foot-wide depressions in tobosa grass indicate that the white-sided jackrabbit uses this grass as a shelter. *Id*.

Relatively little is known about specific habitat associations of the southern subspecies, *L. c. callotis*, but it appears to be similar to *L. c. gaillardi*. In Durango it "preferred grassy areas where grazing by domestic animals was not severe" (Baker and Greer 1962). In Durango its association with high elevation grassland was indicated by observations of it in "open grasslands interspersed with pine-oak forests as high in elevation as 8,350 feet on the eastern slopes of the Sierra Madre Occidental" (Baker and Greer 1962: page 78). Near the Guadiana Lava Field in Durango, *L. c. callotis* was less common than black-tailed jackrabbits and "was in the more grassy, less heavily grazed areas" (Baker1960: page 310). "In Zacatecas the white-sided jackrabbit "formerly lived in open grassland plains habitat in much of Zacatecas but is confined now mostly to lightly and moderately grazed elevated grasslands, foothills, and glades in the forested uplands in the southwestern part of the state" (Matson and Baker 1986: page 41). Its association with high elevation grasslands in Zacatecas was also indicated by observation of the species at oak woodland edges in the upper foothills (Matson and Baker 1986).

Although the white-sided jackrabbit shares its range with the black-tailed jackrabbit (*L. californicus*), the two generally occupy different habitats (Conway 1975; Bednarz 1977; Bednarz and Cook 1984; Cook 1986; Desmond 2004). White-sided jackrabbits are most common in high elevation plains grasslands, while black-tailed jackrabbits are most common in lower elevation semi-desert grasslands, which have been extensively degraded through shrub encroachment (Desmond 2004). In New Mexico, areas where grassland is invaded by shrubs and forbs black-tailed jackrabbits outnumber white-sided jackrabbits proportional to the extent of invasion (Cook 1986). In Durango, black-tailed jackrabbits had replaced white-sided jackrabbits in a place where white-sided jackrabbits were formerly abundant at the turn of the 20th century (Baker and Greer 1962). In Chihuahua, black-tailed jackrabbits utilized areas with an average shrub density of 75.3 per hectare, while white-sided jackrabbits utilized areas with an average shrub density of 4.9 per hectare (Desmond 2004). In comparison with white-sided jackrabbits, black-tailed jackrabbits also used areas with lower vegetation cover, lower grass cover, lower grass height, and higher forb cover (Desmond 2004). In New Mexico, black-tailed jackrabbits occupied broken terrain and along the periphery of the large pastures that were occupied by white-sided jackrabbits (Cook 1986).

Behavior

The white-sided jackrabbit is active at dusk and at night (from 2200 – 0500 h) (Dunn et al. 1982). Its activity may be limited by cloud cover, precipitation and wind (Best and Henry 1993). Temperature has little effect on the activity level for this species. *Id*. The white-sided jackrabbit spends the daylight hours hiding in grass (Findley et al. 1975). Almost all observation of the species during the day are of animals flushed from cover (Findley et al. 1975; Bednarz 1977). In its resting position, the white-sided jackrabbit is camouflaged with its surroundings.

As are all jackrabbits, the white-sided jackrabbit is well-developed for escape. The long hind legs and feet are adapted for speed, giving the jackrabbit lift and an ability to run in a zig-zag fashion that surpasses its pursuers. The eyes, like those of most mammals adapted for open habitats, are laterally arranged, giving them a complete field of vision (360 degrees). As a result, approaching danger can be perceived in advance. When startled or alarmed by a predator, the white-sided jackrabbit leaps straight upwards (1-4 feet) while extending the hind legs and flashing the white sides (Best and Henry 1993).

White-sided jackrabbits are usually found in pairs consisting of one male and one female (Bednarz and Cook 1984, Desmond 2004). Pairing is a conspicuous trait of the white-sided jackrabbit. The pair runs together when approached by intruders (Bogan and Jones 1975).

Unlike rabbits, hares do not dig or occupy burrows. The white-sided jackrabbit constructs and utilizes shelter forms averaging 14.5 inches (37 cm) in length, 7 inches (18.3 cm) in width, and 2.5 inches (6.3 cm) in depth (Best and Henry 1993). In New Mexico, the shelter form is usually located in clumps of grass and surrounded by dense stands of tobosa grass. White-sided jackrabbits also might occupy underground shelters, but this behavior is rare (Best and Henry 1993).

White-sided jackrabbits have three types of vocalizations (Dunn et al. 1982). The alarm or fear reaction consists of a high-pitched scream (Bednarz 1977). A male emits another sound when an outside intruding male approaches the pair. This call is a series of harsh grunts and is repeated until the intruder leaves or is chased away. *Id*. A third vocalization, consisting of a trilling grunt, can be heard during sexual chase, however, it is not known which member of the pair makes this sound (Bednarz 1977; Dunn et al. 1982).

Food Habits

In New Mexico, the diet of the white-sided jackrabbit consists of > 99% grass (Best and Henry 1993). The primary forage of the white-sided jackrabbit is buffalograss, tobosa grass, fiddle neck, wolftail, blue grama, vine mesquite, ring muhly, woolly Indian wheat and Wright buckwheat and other shortgrass plains species (Bednarz 1977; Dunn et al. 1982). The only non-grass food item is sedge nutgrass (Dunn et al. 1982). When the rainy season begins, the white-sided jackrabbit stops feeding on nutgrass and exclusively feed on grasses, which become succulent and palatable (Bednarz 1977).

The white-sided jackrabbit forages by chewing and pulling grass blades near the ground until they are either uprooted or broken off (Best and Henry 1993). White feeding, the head is raised and the body is sitting in a crouched position; grass is held in the mouth (usually sticking out of the mouth) and chewed. The forepaws are not used in feeding except to brace against the ground as the grass is bitten or uprooted. When eating nutgrass the forepaws are used to excavate the bulbous tubers, leaving behind oval foraging depressions in which fecal pellets are often deposited (Bednarz 1977; Best and Henry 1993). This feeding technique is unknown in other hares (Bednarz 1977).

Population density

White-sided jackrabbit population densities are difficult to measure. Flush transects are not a reliable census method, because this jackrabbit occurs at extremely low densities (Best and Henry 1993). During one survey an observer spent > 100 hours walking an estimated 130 km and only flushed three white-sided jackrabbits (Bednarz and Cook 1984). Night spotlighting is considered a more reliable method for determining population densities. In New Mexico during 1977 density was estimated at 0.11 – 0.18 white-sided jackrabbits/hectare (Bednarz 1977). In 1984, the population had declined by 50% (Bednarz and Cook 1984). Most recent surveys conducted in New Mexico did not determine population density (Mehlhop 1995). Data collected during surveys in the Animas and Playas valleys during 1997 and 2002 were not analyzed. In a study conducted in Chihuahua during 1998 and 1999, white-sided jackrabbit densities were 0.01 jackrabbit per hectare in semi-desert grassland, and 0.06 and 0.08 jackrabbits per hectare in plains grassland during 1998 and 1999, respectively (Desmond 2004).

Demography and Reproduction

The white-sided jackrabbit usually is found in pairs and the pair bond is most evident during the breeding season (Best and Henry 1993). However, in Chihuahua most winter observations of white-sided jackrabbits also were in pairs (Desmond 2004). After establishment of the pair bond, the male defends the pair from other intruding males (Best and Henry 1993). The purpose of such pair bonds may be to keep the sexes together in areas of low density. The pair bond does not appear to be broken during pregnancy (Bednarz 1977).

Several litters likely are produced each year and the litter size averages 2.2 young (Bednarz 1977). The minimum breeding season is 18 weeks, occurring from mid-April to mid August. *Id*. The earliest breeding record in New Mexico was of a near-term female collected in March 1982 (Cook 1986). Young tend to have a soft, wooly coat in early life and attain sexual maturity at a rapid rate, although breeding in the white-sided jackrabbit does not begin within the first calendar year following birth (Moore-Craig 1992). Nesting sites appear to be constructed in depression or scrapes. Observations of such nesting sites have been in tobosa grass and may occur in other grasses and forbs. *Id.*

Hares and rabbits can breed prolifically. A collected white-sided jackrabbit was lactating and pregnant indicating that female white-sided jackrabbits can go into heat immediately after giving birth, mate again and become pregnant while still lactating (Findley et al. 1975; Moore-Craig 1992). However, if conditions including weather, population density, and stress become unfavorable, female hares can absorb unborn embryos (Moore-Craig 1992).

Mortality

Predation

Predators in the southern Animas Valley include coyotes, gray fox, kit fox, American badger, striped skunk, spotted skunk, and large hawks and owls (Moore-Craig 1992). It is likely that only a coyote can successfully capture an adult white-sided jackrabbit (Bednarz 1977). It is also possible that rattlesnakes can take young hares (Moore-Craig 1992).

Hunting

White-sided jackrabbits are hunted for sport and food by humans (Bogan and Jones 1975, Leopold 1959, Matson and Baker 1986). Historically, white-sided jackrabbits were hunted for commercial markets in Mexico (Leopold 1959). White-sided jackrabbits are also killed by gunners and trappers (NMDGF 1988).

Food Poisoning

Several dead white-sided jackrabbits were found while a rancher was eradicating mustard plants (Bednarz 1977). Mustard plants cause nitrate poisoning in cattle and may cause similar effects in the white-sided jackrabbit. *Id.* Accumulation of nitrates occurs in plants growing on nitrogen-rich soils, under drought conditions (Herbel 1974). The rancher found several carcasses each day and all were associated with mustard plants. *Id.*

Infection/Disease

Only one instance has been observed of a pneumatic infection (Bednarz 1977). Several ticks and fleas have been collected from white-sided jackrabbit specimens but no serious diseases have been reported. *Id.*

Roadkill

There was an observation of two white-sided jackrabbits found killed by vehicles on a roadway (Brown 2000).

Wildfire

Concerns were raised by Sam Smith of Grassland Management in a letter to NMDGF about the impacts to the white-sided jackrabbit from an approximately 2,500-acre wildfire on the Diamond Ranch (one of the only known locations of this species in the U.S.) (Smith 1999).

Habitat degradation and loss

The loss and degradation of habitat is the primary threat to the persistence of the white-sided jackrabbit (NMDGF 1988). Conditions resulting from grazing regimes that foster annual forb and shrub invasion degrade white-sided jackrabbit habitat. Acceptable habitat consists of vegetation with at least 65% grass composition and no more than 25% forb composition, with preferred grasses including blue grama, buffalo grass, black grama, vine mesquite, wolftail and ring muhly1988 (Bednarz 1977). The high density of grass is required for forage and protection.

Black-tailed jackrabbits replace white-sided jackrabbits when habitat changes from pure grassland to degraded grasslands having a strong shrub component (Bednarz and Cook 1984, Desmond 2004). Formerly widespread areas of grassland in the Chihuahuan Desert region have been converted from grass to shrub-dominated ecosystems (Brown 1994, Desmond 2004). Currently, there are few large patches of intact semi-desert grassland remaining (Dinerstein et al. 2000). Reason for the degradation and loss of these grasslands is primarily livestock grazing (Brown 1994). Black-tailed jackrabbit numbers increase as livestock grazing increased (Taylor et al. 1935).

Other threats that could affect habitat suitability include oil, gas, and mineral exploitation, conversion to agriculture and development, and perhaps pollution from copper smelters to the west.

HISTORICAL AND CURRENT POPULATION STATUS & TRENDS

The white-sided jackrabbit is found in a limited portion of North America, from southern New Mexico to Oaxaca, Mexico. In the United States its range is confined to an area of 46.3 square miles (120 km^2) in two valleys in southern Hidalgo County, New Mexico. The white-sided jackrabbit is listed as threatened in New Mexico with numbers in decline from the 1970s to the mid 1990s (Figure 6) (Bednarz 1977; Bednarz and Cook 1984; Mehlhop 1995). New Mexico Department of Game and Fish data collected in 1997 and 2002 have been used to suggest that the decline is not as dramatic as indicated by the 1995 survey, yet the data is still in its raw form and has not been fully analyzed (NMDGF 2006; NMDGF 2007). Regardless, available evidence documents declines in abundance from throughout the species range, including New Mexico.

In 1976, the maximum population in the U.S. was estimated at only 340 animals (Bednarz 1977). Results of surveys conducted in 1976 and 1981 showed a decline of greater than 50%, with the average number of white-sided jackrabbit observed on a 63 km survey route equal to 15.1 in 1976, but 7.6 in 1981 (Bednarz and Cook 1984). The total number of white-sided jackrabbits observed in 1976 was 100, but dropped to 45 in 1981 (Cook 1981a). A 1996 summary of 4 years of spotlight surveys from 1977 – 1995 showed a downward population trend: in 1977, 240; 1981, 61; 1990, 16; and 1994-95, 8 (Figures 5 and 6) (Mehlhop 1995; NMDGF 1996a). Surveys in 1997 suggested that numbers of white-sided jackrabbits might be greater than observed by Mehlhop in the early-to-mid 1990s (NMDGF 2002).

It is believed that the population of white-sided jackrabbits in the Playas Valley is likely extirpated (Mehlhop 1995; Traphagen 2002). Surveys from 1997 and 2002 have not located the white-sided jackrabbit in the Playas Valley (Mehlhop 1995; NMDGF 2002; NMDGF 2005; NMDGF 2006). Habitat has changed in the Playas Valley from a pure grassland to having more shrubs (Traphagen 2002; NMDGF 2007).

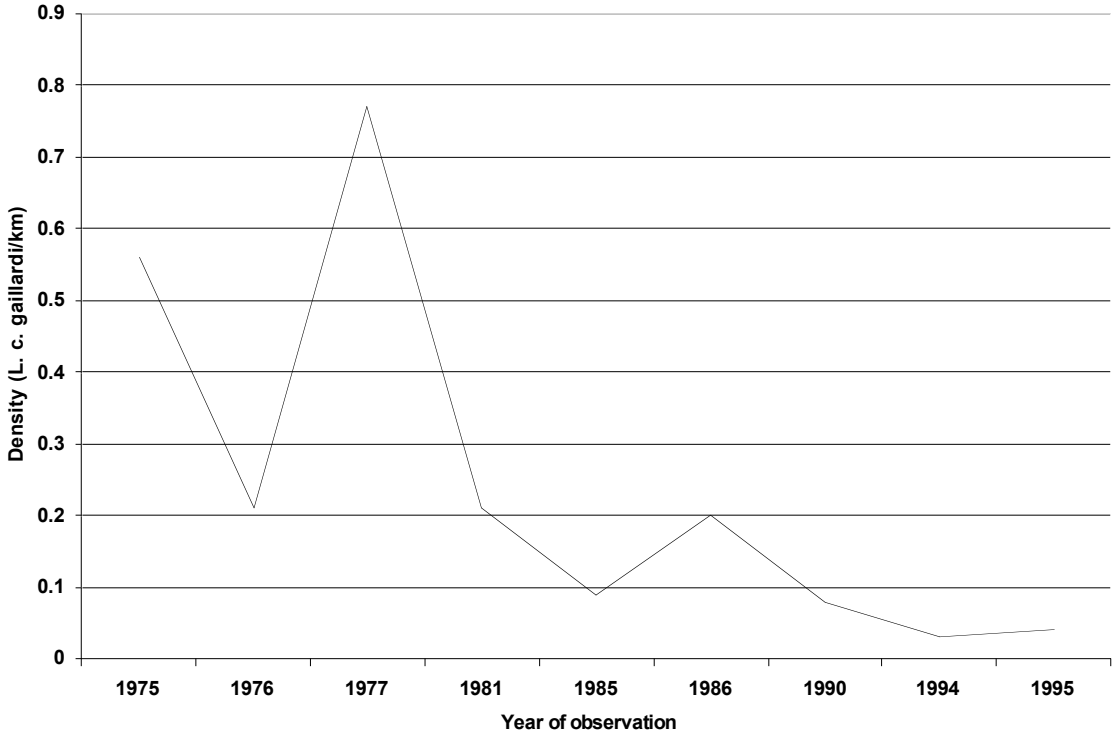

Figure 6. Density of white-sided jackrabbits in the Animas Valley. Source: New Mexico Department of Fish and Game.

Baker considered white-sided jackrabbits endangered throughout its range, and implicated livestock grazing and subsequent replacement by black-tailed jackrabbits as the culprit (Baker 1977). Populations in Mexico are considered to be decreasing as a result of increasing threats caused by the overgrazing of grasslands (Baker and Greer 1962; Baker 1977; Matson and Baker 1986; Findley 1987; Desmond 2004). In Durango, Baker and Greer stated in 1962 that white-sided jackrabbits (apparently referring to both subspecies) had "been diminishing for many years" and that the species "had been much more numerous and widely distributed than today" (Baker and Greer 1962: page 78). Further, at a ranch where white-sided jackrabbits had been abundant at the turn of the 20th century, they were rare in 1962 and had been replaced by black-tailed jackrabbits. *Id*. In north-central Durango *L. c. gaillardi* has not been observed since 1903 (Baker and Greer 1962). In the northern and eastern part of Zacatecas, black-tailed jackrabbits had expanded in distribution to the detriment of *L. c. callotis* as a result of overgrazing and encroachment of shrubs (Matson and Baker 1986). Similar declines have been documented in Chihuahua. During bird surveys during 1997-1998 conducted from

northern Chihuahua through southern Durango, jackrabbit occurrences were recorded, but no white-sided jackrabbits were seen (Najera-Meyer 1999; Najera-Meyer 2007). Densities of white-sided jackrabbits in central and northwestern Chihuahua were 0.03 and 0.04 per hectare during 1998 and 1999, respectively (Desmond 2004). These densities are similar to those for the white-sided jackrabbit in the Animas Valley between 1994 and 1995, which are the lowest on record.

LAND OWNERSHIP

The only known populations of the white-sided jackrabbit in the U.S. are found on private property owned by Diamond A Ranch/Animas Foundation (formerly Gray's Ranch/The Nature Conservancy), Cloverdale Ranch, and Pendleton Ranch (Moore-Craig 1992). Land ownership of populations in Mexico is unknown.

In 1990, The Nature Conservancy purchased the 322,000-acre Gray Ranch in order to protect its abundance of biological diversity (TNC 2007). In 1994, the Gray Ranch was transferred to the Diamond A Ranch/Animas Foundation, an organization dedicated to protecting the natural values of the Gray Ranch while maintaining the cultural and economic heritage of southern Hidalgo County (TNC 2007). The Animas Foundation is also a partner to the larger Malpais Borderlands Group, a non-profit, community-based, volunteer organization founded by ranchers in southern New Mexico and Arizona dedicated to improving the quality of their ranches and preserving their ranching way of life (Audubon 2007).

IDENTIFIED THREATS TO THE PETITIONED SPECIES: CRITERIA FOR LISTING

The white-sided jackrabbit meets all five criteria for listing under the ESA. It needs to meet only one of these criteria to qualify for federal listed:

1. Present and threatened destruction, modification, and curtailment of habitat and range;
2. Overutilization of habitat for commercial and recreational purposes;
3. Disease;
4. The inadequacy of existing regulatory mechanisms; and
5. Other natural or manmade factors affecting its continued existence.

Petitioners demonstrate in this section that multiple threats exist for the perpetuation of this species. The largest and continual threat to this species is habitat loss due to grazing on grassland and the resulting shrub encroachment that supports black-tailed jackrabbits. Studies have documented the declines in distribution and profound declines in abundance of the white-sided jackrabbit within its historical range. No regulatory mechanisms exist to protect the white-sided jackrabbit. No survey programs have been established to continue to monitor the population status of the species. The species is not given much attention in New Mexico; programs such as the New Mexico Species of Greatest

Conservation Need in the Chihuahua Desert Ecoregion do not mention the white-sided jackrabbit as a species of concern.

I. Present and Threatened Destruction, Modification, or Curtailment of Habitat or Range

Habitat loss has been implicated as a significant cause of imperilment for 85% of the species listed under the ESA and the single greatest threat to biodiversity in the United States (Wilcove et al. 1993; Wilcove et al. 1998). Habitat loss, through degradation of suitable habitat, is the primary threat to the persistence of the white-sided jackrabbit. The main cause of the loss of white-sided jackrabbit habitat is grazing practices, which is a primary cause of shrub encroachment into grasslands (Buffington and Herbel 1965). Areas where white-sided jackrabbits historically or currently occur have been continuously grazed for over a century (Traphagen 2002). Other factors such as inter-specific species competition, road mortality, and climate change cumulatively increase the threats to precarious existence of this species.

As early as 1960 in Mexico and 1975 in the U.S., it was observed that overgrazing and the resulting deterioration in grassland vegetation favored the black-tailed jackrabbit at the expense of the white-sided jackrabbit (Baker 1960; Conway 1975). In 1976 the white-sided jackrabbit was commonly found in its range in New Mexico (Bednarz 1977). By 1981 the population had noticeably decreased (Bednarz and Cook 1984). Researches suggested that white-sided jackrabbit numbers decreased as the density and vigor of grass plants declined, while black-tailed jackrabbit populations increased in response to a concurrent increase in forb and shrub cover (Bednarz and Cook 1984).

The Diamond A Ranch/Animas Foundation, formerly Gray's Ranch of the Nature Conservancy owns the land in the northern portion of the white-sided jackrabbit's range in New Mexico (Moore-Craig 1992). In the transfer from The Nature Conservancy, the Animas Foundation agreed to establish a vegetation monitoring program (Animas 1993). The 1993 survey indicated plot coverage of 51.9% threeawn grass (*Aristida* spp.), 38.6% blue grama, 20.1% black grama, and 12.0% forbs; there was no indication that tobosoa was on any of the plots (Animas 1993). White-sided jackrabbits require more than 65% grass cover and grasslands dominated by blue and black grama, ring muhly, buffalograss, wolftail, and bottlebrush squirrel tail (Bednarz and Cook 1984). Further, threeawn was only found at low density (20% coverage) on one of four plots associated with white-sided jackrabbit (Mehlhop 1995).

In 1977, 1,425 ha (3,520 acres) of suitable white-sided jackrabbit habitat was estimated to be present on McKinney Flats, located on the Diamond A Ranch/Animas Foundation (Bednarz 1977). In 2002, a study found a direct positive relationship between the presence of buffalograss and the presence of white-sided jackrabbit in New Mexico (Traphagen 2002). That study also documented the absence of buffalograss and the resulting absence of white-sided jackrabbits on McKinney Flats, which historically supported white-sided jackrabbits (Traphagen 2002). The vegetation plots monitored by

the Diamond A Ranch/Animas Foundation in 1993 did not indicate the presence of any buffalograss (Animas 1993).

Traphagen's (2002) study also indicated that in 2001 habitat suitability had declined within the 46.3 square mile area range of the white-sided jackrabbit documented in 1976 and 1981 by Bednarz and Cook. The area between Foster Draw and Cloverdale, which formerly yielded greater than 30 sightings between 1976 and 1981, produced only four sightings from 1981 to 2001; shrub cover had increased in this area which likely contributed to the decline in white-sided jackrabbit sightings (Figures 4-5) (Mehlhop 1995; Traphagen 2002).

Black-tailed jackrabbit presence indicates grasslands that have been degraded (Best 1996). Studies in New Mexico have shown that black-tailed jackrabbits are found in greater abundance in grassland considered fair in comparison to grassland that is considered in good condition (Daniel et al. 1993). While there are few data on changes in grassland conditions in the Animas and Playas valleys, there are data on changes in black-tailed jackrabbit abundance. From 1977 to 1981 numbers of black-tailed jackrabbit observed on white-sided jackrabbit census routes more than doubled from an average of 14.0 in 1977 to an average of 34.1 in 1981 (Bednarz and Cook 1984). In Mexico the same relationship is seen between a reduction in quality grassland habitat, with a decrease in white-sided jackrabbit density and increase in black-tailed jackrabbit density (Desmond 2004).

The distribution of the white-sided jackrabbit in New Mexico and Mexico corresponds directly to Chihuahuan Desert grasslands of high biodiversity and in need of conservation, as identified by the World Wildlife Fund, Comisión Nacional para el Conocimiento y Uso de la Universidad, The Nature Conservancy, PRONATURA Noreste, Instituto Tecologica y de Estudios Superiores de Universida (Dinerstein et al. 2000).

In 1990, The Nature Conservancy purchased the 322,000-acre Gray Ranch in order to protect its abundance of biological diversity (TNC 2007). The ranch spans more than 50 natural communities, containing more than 700 species of plants, 75 mammals, 50 reptiles and amphibians and more than 170 species of breeding birds and is considered by some as one of the most significant sites in the nation (Audubon 2007). Ultimately, The Nature Conservancy decided to sell the Gray Ranch back to a rancher. In 1994, the Gray Ranch was transferred to the Animas Foundation, an organization whose stated mission is to protect the natural values of the Gray Ranch while maintaining the cultural and economic heritage of southern Hidalgo County. The ranch was also given back its original name, Diamond A Ranch (TNC 2007).

As noted earlier, the Animas Foundation is also a partner of the larger Malpais Borderlands Group. The stated goal of the Malpais Borderlands Group is "to restore and maintain the natural processes that create and protect a healthy, unfragmented landscape to support a diverse, flourishing community of human, plant and animal life in our borderlands region," which will be accomplished through "working to encourage

profitable ranching and other traditional livelihoods which will sustain the open space nature of our land for generations to come" (McDonald 2007: page 3).

The entirety of the white-sided jackrabbit's range in New Mexico is on privately owned ranches, Diamond A, Cloverdale and Pendleton Ranches (Moore-Craig 1992). While the stated goals of the Animas Foundation and the Malpais Borderlands Group include stewardship of the land, their main goals are to ranch the land and make a profit from cattle grazing.

In 2001, a permit was reissued for the Gillespie Mountain Allotment, which is located in the Playas Valley near white-sided jackrabbits historical locations (BLM 2001). The grazing allotment consists of 35,130 acres with 2,782 Animal Unit Months. The environmental assessment analyzed the effects this grazing allotment would have on the white-sided jackrabbit. The analysis determined that the "Reissuance of the grazing permit would not affect this species because there is (was) very little pure grassland on the allotment that is suitable habitat." *Id*. The lack of pure grassland was likely due to previous grazing pressures. The environmental assessment described the affected environment as being poor in 1987 and fair in 1992 as determined by two established trend plots (BLM 2001).

In 2006, 5,402 acres were up for an oil and gas lease in the Playas Valley, north of historical locations of the white-sided jackrabbit (BLM 2006a). The environmental assessment determined that the white-sided jackrabbit does not likely occur in the lease parcels and potential impacts would be through loss of grassland habitat and mortality associated with vehicles and poaching (BLM 2006b). The assessment determined that impacts of the sale would be "limited to individuals and not approach a magnitude of the local populations or species level." *Id*.

In 2008 the USFWS may issue an incidental take permit to the Malpais Borderland Group, which included the incidental take of white-sided jackrabbits (USFWS 2007; USFWS pers. comm. February 8, 2008).

Based on observed declines in grassland health and declines in distribution and abundance of white-sided jackrabbits in Hidalgo County, current grazing practices on private lands, including the Diamond A Ranch, appear to be detrimental to white-sided jackrabbits. Consequently, the Animas Foundation is not fulfilling its stated mission to protect the natural values of the Diamond A Ranch. Likewise, the Malpais Borderlands Group is not fulfilling its stated mission to restore and maintain natural processes that create healthy landscapes and that support a diverse and flourishing animal life. Most importantly, USFWS cannot rely on this Habitat Conservation Plan to argue that adequate regulatory mechanisms exist to protect the white-sided jackrabbit.

II. Overutilization for commercial, recreational, scientific, or educational purposes.

While hunting may not be a great threat in New Mexico, hunting may play a role in the decline of the white-sided jackrabbit in most of its Mexican range because both white-sided and black-tailed jackrabbits are considered "highly edible" (Matson and Baker 1986). Most hunting for white-sided jackrabbits in Mexico is for home use, although commercial hunting occurred historically, but is now illegal (Leopold 1959). Jackrabbits are considered non-game animals in New Mexico and are not protected by state game laws (Knight 1988). Some white-sided jackrabbits are known to have been killed by gunners and trappers (NMDGF 1988).

III. Disease

A pneumatic infection has been observed in white-sided jackrabbits (Bednarz 1977). Several ticks and fleas have been collected from white-sided jackrabbit specimens but no serious diseases were noticed (Bednarz 1977). Studies of helminthes in a congener of white-sided jackrabbit showed that four species of parasitic tapeworms of the genus *Eucestoda* were present in populations of black-tailed jackrabbit in southeastern New Mexico (Pfaffenberger and Vallencia 1988).

IV. Inadequacy of Existing Regulatory Mechanisms

NatureServe Rankings

NatureServe presents information that has been developed by biologists in state and provincial natural heritage programs and conservation data centers and by staff of The Nature Conservancy and NatureServe. These programs rely on collaboration with, and contributions of data from, scientists at universities, conservation organizations, natural history museums, botanical gardens, and state and federal agencies (NatureServe 2007). FWS regards NatureServe as an authoritative source for conservation ranks for species in the U.S. See discussion in Rosmarino and Tutchton (2007).

The conservation status of a species or community is designated by a number from 1 (Critically imperiled) to 5 (Demonstrably widespread, abundant, and secure), preceded by a letter reflecting the appropriate geographic scale of the assessment (G = Global, N = National, and S = Subnational).

We hereby incorporate all analysis, references, and documentation provided by NatureServe in its on-line database at: http://www.natureserve.org/explorer into this Petition by reference, including all data and analysis underlying its conservation status classification scheme.

Global Status: G3T3 – (last reviewed 2000)

G3 Vulnerable - At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
T3 Vulnerable - At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.

National Status: N1- (last reviewed 2000)
Critically Imperiled - in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

New Mexico Heritage Program: S1 – (last updated 2006, unchanged since 1989)
Critically Imperiled - in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

While signifying biological imperilment, NatureServe rankings do not provide any regulatory or policy mechanisms to protect the species *Lepus callotis*.

International Union for the Conservation of Nature and Natural Resources (IUCN)

IUCN Red List Category: NT – (last reviewed in 2000, pertains to species *Lepus callotis*)
Near Threatened - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

This status does not provide any regulatory or policy mechanisms to protect the species *Lepus callotis*.

United States Federal Agency Rankings

USFWS: Species of Concern – (reclassified from Category 2 in 1996)
Taxa that are at-risk or potentially at-risk due to rarity, restricted distribution, habitat loss, and/or other factors.

This status requires that the species be considered in biological and environmental evaluations but does not require any protection or mitigation for populations or its habitat.

> **USFS/BLM:** Sensitive –(corrected 2000, although lists *L. callotis* as G5T4T3, which is not accurate in comparison to Natureserve documentation)
>
> > Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:
> > a. Significant current or predicted downward trends in population numbers or density.
> > b. Significant current or predicted downward trends in habitat capability that would reduce a species existing distribution.

This status requires that the species be considered in biological and environmental evaluations but does not require any protection or mitigation for populations or its habitat.

New Mexico State Listing

> **New Mexico State listed:** Threatened (last reviewed in 2006, unchanged since 1975)
>
> > As defined in the Wildlife Conservation Act [17-2-37 to 17-2-46 NMSA (New Mexico Statutes Annotated) 1978]: "Threatened Species" "formerly called `Group 2' means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range in New Mexico; the term may also include any species of fish and wildlife appearing on the United States list of endangered native and foreign fish and wildlife as set forth in Section 4 of the Endangered Species Act of 1973 as threatened species, provided that the commission adopts the list in whole or in part.

This status does not provide any significant regulatory or policy mechanisms to protect the species *Lepus callotis*.

V. Other Natural or Man-made Factors Affecting the White-sided Jackrabbit's Continued Existence

Non-point source habitat change

Specific factors resulting in the encroachment of shrubs into grasslands in the American Southwest may vary, and no single factor has been identified as the culprit (Grover and Musick 1990). Whether the forces driving woody shrub invasion in the Southwest are grazing (Bahre 1995), fire suppression (McPherson 1995), shifting rainfall patterns, or increased atmospheric carbon dioxide levels favoring cool season C3 shrubs over warm season C4 grasses (Van Devender 1995), they can only be agents of a widespread

phenomenon best described as "non-point source" habitat change (Traphagen 2002). However, most sources agree that livestock grazing has been a primary cause of shrub invasion and deterioration of grasslands (Buffington and Herbel 1965, Brown 1994).

Drought and Climate Change

Climate change impacts in the southwest included extended droughts, which may facilitate shrub encroachment into the white-sided jackrabbit's Chihuahuan Desert grassland habitat. "The likely synergistic impacts of climate change and land-use change on endemic species have been widely confirmed" (Fischlin et al. 2007: page 241). During the past 45 years the Southwest has been drier and had more droughts than any other region in the United States (NSC 2000). The Environmental Protection Agency estimates average temperature in New Mexico could rise about 4 degrees Fahrenheit by 2100 (NWF 2007). Drought and climate change has been implicated as influencing shrub encroachment into grasslands (Buffington and Herbel 1965, Van Devender 1995).

Many species respond to warming by shifting their ranges to the north or to higher elevations (Field *et al*. 2007, p.622). However, this adaptation is not possible for all species. For some species, human development and other habitat changes have cut off natural migration routes, while others will become extinct if they cannot move to suitable habitat (NSC 2000). This would likely be the case for the white-sided jackrabbit, which now exists in habitat that has been increasingly fragmented due to habitat degradation. Further, the white-sided jackrabbit is associated with cold-temperate grasslands, which exist in the Chihuahuan Desert region as Ice Age relicts in disjunct areas of suitable topography and elevation. These suitable areas are bounded by the steep terrains of the adjacent mountains at higher elevations and inhospitable desertscrub habitats at lower elevations. Deterioration of grassland habitats through shrub encroachment within the range of white-sided jackrabbits is likely most intense in eastern and lower elevation areas that are drier (Brown 1994). Thus, it will be challenging for the white-sided jackrabbit to adapt to climate change. Global warming can only make this jackrabbit's current range more unsuitable as temperatures increase and conditions shift further away from those amenable to development of the plains grassland biotic community.

Food Poisoning

Several dead white-sided jackrabbits were found while a rancher was eradicating mustard plants. Mustard plants cause nitrate poisoning in cattle and may cause similar effects in the white-sided jackrabbit (Bednarz 1977). Accumulation of nitrates occurs in plants growing on nitrogen-rich soils, under drought conditions (Herbel 1974). The rancher found several carcasses each day, and all were associated with mustard plants (Bednarz 1977).

Roadkill

Observations have been made of white-sided jackrabbits that were found on roadways, killed by vehicles (Brown 2000).

SUMMARY

The white-sided jackrabbit merits listing as Endangered or Threatened under the Endangered Species Act. This species has a very limited range in the United States and is an obligate of pure grasslands at high elevations in the Chihuahuan Desert region. In the United States, the grasslands on which the white-sided jackrabbit is found are owned by private entities, which use the land for ranching and grazing cattle. While owners of these ranches have indicated a desire to manage their land in a sustainable manner, the white-sided jackrabbit is only found in grassland of good health that have not been encroached by forbs and shrubs. While the goals of sustainable rangeland management are valid, they focus on maintaining cattle grazing rather than grassland habitat required by wildlife, such as the white-sided jackrabbit. In addition to grazing, change in climatic conditions and wildfire suppression have decreased the health of grasslands promoting a change from grass to shrub-dominated land. No long-term monitoring programs, management plans, or mechanisms for protection or conservation exist for this species or habitats in which it is found, either in the U.S. or Mexico. Surveys conducted in New Mexico during the 1990s indicate that white-sided jackrabbit populations may have decreased to single digits from a population of 340 in the 1970s. The State of New Mexico has population data from the late 1990s and early 2000s that need to be analyzed, but may indicate that the white-sided jackrabbit needs to be uplisted to Endangered in the state. This petition is submitted with the hope that federal agencies will take similar steps as has the New Mexico State government in acknowledging the vulnerability of this species to extinction and move to ensure the survival and recovery of the white-sided jackrabbit. We believe federal ESA listing is vital to motivate a conservation program for this species and its habitat.

NEED FOR ECOSYSTEM MANAGEMENT

Petitioners believe that classification of the white-sided jackrabbit as an Endangered or Threatened species under the ESA will insure that state and federal agencies develop an effective form of ecosystem protection. The white-sided jackrabbit is an indicator of grassland health. Grasslands in the Chihuahuan Desert region support a high diversity of animals and it is an ecosystem that needs to be managed because both the United States and Mexico use a majority of this ecosystem as grazing pastures. In addition, this ecosystem is sensitive to environmental and climate changes, as such, closer attention must be paid to its management. The protection of ecosystems is stated as the very purpose of the ESA. The white-sided jackrabbit is an indicator of grassland ecosystem health and as such its decline has indicated a decline in the health of grassland ecosystems in the Chihuahuan Desert region. As an imperiled mammal species, *Lepus callotis* listing as Endangered or Threatened species should be among the USFWS's highest priorities.

REQUESTED DESIGNATION

WildEarth Guardians hereby petitions the U.S. Fish and Wildlife Service under the Department of Interior to list the full species, the white-sided jackrabbit (*Lepus callotis*),

as an Endangered or Threatened species pursuant to the Endangered Species Act. USFWS should also consider this a petition to list each of the recognized subspecies (*L. c. callotis* and *L. c. gaillardi*) if they are found to be taxonomically valid. Petitioners also request that northern populations currently recognized as the subspecies *L. c. gaillardi* be considered for listing as a distinct population segment (DPS). Northern populations of *L. callotis*, which are currently regarded as *L. c. gaillardi*, could be regarded as a DPS based on the geographic isolation of these populations and because evidence indicates a steep decline in New Mexico populations, low population densities in northern Mexico, and similar threats throughout the region. This listing action is warranted, given the declines in distribution and drastic declines in abundance of the white-sided jackrabbit in Mexico and the United States. The white-sided jackrabbit is threatened by the "present and threatened destruction, modification and curtailment of habitat and range", by the "overutilization of habitat for commercial and recreational purposes", and by "other natural or manmade factors affecting its continued existence". Regulatory mechanisms do not exist to protect this species from further population declines.

CRITICAL HABITAT

Habitat degradation and loss is a leading threat to the Petitioned species. This petition therefore requests that critical habitat be designated for *Lepus callotis*, its subspecies, and the northern DPS concurrent with ESA listing.

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