

PETITION TO LIST THE  
Peñasco Least Chipmunk (*Tamias minimus atristriatus*)  
UNDER THE U.S. ENDANGERED SPECIES ACT



Specimen of *Tamias minimus atristriatus* collected by W. W. Brown in Cloudcroft, New Mexico in 1928.  
Photograph © Jennifer Frey (used with permission)

**Petition Submitted to the U.S. Secretary of Interior  
Acting through the U.S. Fish and Wildlife Service**

Petitioner:

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September 30, 2011



## EXECUTIVE SUMMARY

The Peñasco least chipmunk (*Tamias minimus atristriatus*) is an endangered subspecies of least chipmunk (*Tamias minimus*) and occurs in two populations in the White and Sacramento mountains in southern New Mexico within the Lincoln National Forest and the Mescalero Apache Indian Reservation. The Peñasco least chipmunk is a disjunct, geographically isolated, and genetically distinct population of *T. minimus* and occupies the southernmost edge of the species' range.

Peñasco least chipmunk populations are declining rapidly toward extinction, mainly due to habitat loss and degradation. Logging, livestock grazing, and fire suppression, among other factors, have radically altered the structure of one of the Peñasco least chipmunk's preferred habitats: ponderosa pine forest. Large areas of ponderosa pine have been eliminated or have shifted from stands of mature trees with open understory of abundant and diverse herbaceous vegetation to dense stands of younger trees. These changes in forest structure makes the Peñasco least chipmunk more vulnerable to competition from the larger, more arboreal gray-footed chipmunk (*Tamias canipes*) with which it shares its range. The Peñasco least chipmunk is further threatened by climate change, livestock grazing, biological vulnerability due to its limited range and small population size, and the cumulative effects of these myriad threats.

New Mexico recognized the decline and imperiled status of the Peñasco least chipmunk in 1983 by listing it as "endangered" in the state. Listing under the Endangered Species Act (ESA) would afford the Chipmunk with critical habitat designation, a recovery plan, and stringent federal protection it needs to survive. Designating the Peñasco least chipmunk as "endangered" or "threatened" would also benefit its unique homerange in the Sacramento Mountains, an area that is home to many other rare and endemic species.

## **INTRODUCTION**

This petition requests that the U.S. Fish and Wildlife Service (FWS) list the Peñasco least chipmunk as “endangered” or “threatened” throughout its entire range under the U.S. Endangered Species Act (ESA). The chipmunk has a narrow range and small population size—it is known from only two populations in the White and Sacramento mountain ranges in Otero and Lincoln counties in New Mexico. The Sacramento Mountains population was last verified as extant in 1966 and has not been found since despite intensive sampling efforts. The White Mountains population remains extant as of 2000. The chipmunk is classified by scientists as critically imperiled and is thought to be rapidly declining in both distribution and abundance. The chipmunk has two preferred habitats: ponderosa pine forest and alpine talus imbedded in a subalpine grassland matrix (Frey and Boykin 2007). The most serious threat facing the chipmunk is loss of one of its preferred habitats: mature ponderosa pine forest. This threat is exacerbated by habitat alteration due to livestock grazing and fire suppression, competition with the sympatric gray-footed chipmunk (*Tamias canipes*), and potential effects of climate change. The chipmunk was verified extant in 2000 in alpine talus habitat in the White Mountains (Hope & Frey 2000), and likely still persists in this relatively stable environment. However, its association with ponderosa pine forest was not well understood until 2007 (J. Frey, pers. comm., Aug. 30, 2011). This new information can now be acted upon to preserve the species in ponderosa pine habitat as well as alpine talus habitat (Id.). Though the chipmunk is listed as “endangered” by the state of New Mexico, this designation provides no habitat protection. This subspecies is on the brink of extinction and needs federal protection in order to survive.

A recovery effort should seek to preserve and restore the chipmunk and its preferred ponderosa pine forest habitat, both occupied and unoccupied. Surveys and monitoring are urgently needed to locate and track any existing chipmunk populations. Ponderosa pine forest restoration, reduced grazing, and maintenance of downed, coarse woody debris structures in mature ponderosa pine forests will be key components of chipmunk habitat restoration (Frey & Boykin 2007). These recovery actions would result in collateral benefits to other plants and animals that rely on the unique ecosystem of the Sacramento Mountains (and the contiguous White Mountains), some of which are already listed under the ESA and found nowhere else on earth.

## **PETITIONER**

WildEarth Guardians is a nonprofit environmental advocacy organization that works to protect wildlife, wild places and wild waters. The organization has more than 12,000 members and supporters and maintains offices in New Mexico, Colorado and Arizona. WildEarth Guardians maintains an active endangered species protection program. As part of this program, Guardians works to obtain ESA protection for a wide variety of imperiled wildlife and plants and the ecosystems on which they depend.

## **THE ENDANGERED SPECIES ACT AND IMPLEMENTING REGULATIONS**

The Endangered Species Act of 1973 protects plants and animals that are listed by the federal government as “endangered” or “threatened” (16 U.S.C. § 1531 et seq.). Any interested person may submit a written petition to the Secretary of the Interior requesting him to list a species as

“endangered” or “threatened” under the ESA (50 C.F.R. § 424.14(a)). An “endangered species” is “any species that is in danger of extinction throughout all or a significant portion of its range” (16 U.S.C. § 1532(6)). A “threatened species” is defined as “any species which 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)). “Species” includes subspecies and distinct population segments of sensitive taxa (16 U.S.C § 1532(16)).

ESA Section 4 (16 U.S.C. § 1533(a)(1)) sets forth listing factors under which a species can qualify for ESA protection (*see also* 50 C.F.R. § 424.11(c)):

- 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. The inadequacy of existing regulatory mechanisms; and
- E. Other natural or manmade factors affecting its continued existence.

A taxon need only meet one of the listing criteria outlined in the ESA to qualify for federal listing.

#### CLASSIFICATION AND NOMENCLATURE

**Common name.** The common name for *Tamias minimus atristriatus* (Bailey 1913) is the “Peñasco least chipmunk.” We refer to this species as the “Peñasco least chipmunk” or “chipmunk” throughout this petition.

**Taxonomy.** The chipmunk was originally described as a distinct species (*Eutamias atristriatus*) by Bailey (1913), based on 10 specimens collected by Bailey and Hollister in 1902 on the eastern slope of the Sacramento Mountains in Otero County, New Mexico (Bailey 1913, *cited in* Frey and Boykin 2007). In a subsequent revision of the North American chipmunks, Howell (1929, *cited in* Frey and Boykin 2007) referred *atristriatus* to a subspecies of least chipmunk (*i.e.*, *Tamias minimus atristriatus*) (Table 1). *Tamias minimus atristriatus* is genetically distinct from other subspecies of *Tamias minimus* (Sullivan and Peterson 1988).

**Table 1.** Taxonomic classification for *Tamias minimus atristriatus*.

Order	Rodentia
Suborder	Sciuromorpha
Family	Sciuridae
Subfamily	Sciurinae
Tribe	Tamiini
Genus	<i>Tamias</i>
Species	<i>Tamias minimus</i>
Subspecies	<i>Tamias minimus atristriatus</i>

## SPECIES DESCRIPTION

Specimens of the Peñasco least chipmunk from the Sacramento Mountains had a mean body length of 113.7 mm, a mean tail length of 92.7 mm, a mean ear length of 13.6 mm, and a mean hindfoot length of 30.5 mm (Frey 2010). The chipmunk has pale yellowish orange hindfeet, a light beige, yellowish, or orange belly, and dark underfur (Frey 2010). “The outer pair of dorsal stripes tends to be black in *T. m. atristriatus* and brown in *T. canipes*, although there is considerable variation in this character and it is not reliable alone. Differences also exist for the median pair of dark dorsal stripes (i.e., these are the two dark stripes immediately lateral to the middle dark stripe). In *T. m. atristriatus* these stripes tend to be thin, blackish, and remain distinct lines over the rump, while in *T. canipes* these stripes tend to be thick, brownish, and fade over the rump. The post-auricular patches (i.e., light spots behind ears) tend to be obscure (i.e., small and dark) in *T. m. atristriatus*, but large and prominent (i.e., white) in *T. canipes*. Finally, the color of the face below the lowest dark facial stripe tends to be dingy or yellowish in *T. m. atristriatus*, but whitish or clean pale gray in *T. canipes*” (Frey 2010).

*T. m. atristriatus* is a subspecies of least chipmunk (*Tamias minimus*). *T. minimus* is a wide-ranging species that occurs in a variety of habitats from the boreal coniferous forest zone of Canada and eastern Alaska south through the Rocky Mountain region (Verts and Carraway 2001). The southernmost extent of its distribution is isolated populations in the Chuska and White mountains of Arizona and the Sandia, White, and Sacramento mountains in New Mexico (Findley et al. 1975; Hoffmeister 1986). Though *T. minimus* is considered a generalist species, distinct population segments and subspecies may evolve unique adaptations to their local environment (Frey and Boykin 2007).

**Least chipmunk biology.** The average life span of the least chipmunk is 0.7 years (Erlien and Tester 1984, cited in Verts and Carraway 2001). In spring, females typically produce one litter of 4-5 pups (Skryja 1974, cited in Verts and Carraway 2001). Least chipmunks dig burrows for nesting, often under large rocks, but may also use tree cavities or other natural structures. They rely on cached food for survival over the winter (Verts and Carraway 2001), and overwinter survival rates are less than one-third (Bergstrom and Hoffman 1991).

The seeds of shrubs and forbs are their main food source, though they also feed on arthropods, leaves, fruits, flowers, and fungi (Vaughn 1974, cited in Verts and Carraway 2001). They forage mainly on the ground or in shrubs (Hoffmeister 1986).

**Distinctive traits.** The Peñasco least chipmunk is a disjunct population of *T. minimus* and occupies the southernmost edge of the species’ range. The chipmunk is geographically isolated; the only known extant population is restricted to a rocky areas on Sierra Blanca Peak in the White Mountains of New Mexico (Sullivan and Nagorsen 1998), and the status of the Sacramento Mountains population, last verified in 1966, is unknown (Frey and Boykin 2007). The chipmunk likely represents a Pleistocene relict population (Sullivan and Nagorsen 1998).

## HABITAT REQUIREMENTS

Competitive exclusion by other chipmunk species and ground squirrels is thought to have strong effects on local distribution and habitat use of least chipmunks (Heller 1971; Carey 1978;

Chappell 1978). The least chipmunk is one of the smallest chipmunks, and tends to be more terrestrial than other species of chipmunk, which tend to be more arboreal in behavior (Hall 1981; Verts and Carraway 2001). The effect is that in most cases the least chipmunk is excluded from woodlands and forest habitats more favorable to the larger, arboreal species; these habitats are characterized by trees with branches close to the ground and a denser understory (piñon pine, fir, spruce). Instead, the least chipmunk tends to occupy non-forested habitats such as those dominated by shrubs, rocks, or dense herbaceous vegetation, or forested habitats dominated by trees that do not have limbs close to the ground (quaking aspen, ponderosa pine) (Heller 1971; Heller and Poulson 1971; States 1976; Feldhamer 1979; Bergstrom and Hoffman 1991; Frey and Boykin 2007). They prefer habitats where ground cover <15 cm from the ground is sparse, allowing concealment from predators and clear escape routes (Feldhamer 1979). The Peñasco least chipmunk is sympatric and potentially competitive with the larger, more arboreal gray-footed chipmunk (*Tamias canipes*) (Frey and Boykin 2007).

### **GEOGRAPHIC DISTRIBUTION: HISTORIC AND CURRENT**

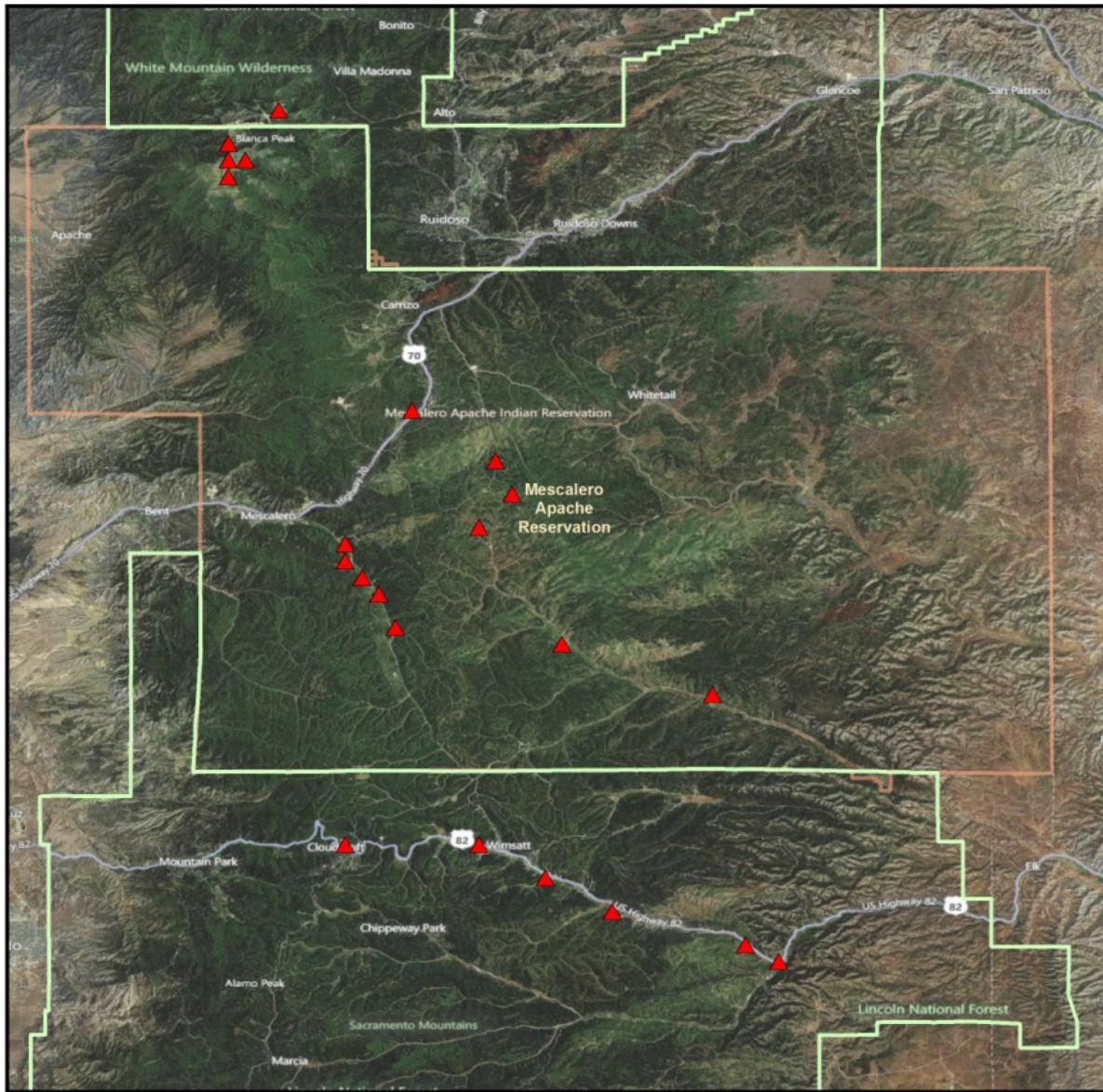
The Peñasco least chipmunk is found only in the Sacramento and White mountains, contiguous mountain ranges in southern New Mexico (*see* Figure 1). One population is found in the White Mountains and one in the Sacramento Mountains. These populations have differentiated and have unique ecological associations, and each contributes uniquely to diversity (Frey and Boykin 2007). Regardless, both populations are considered *T. m. atristriatus* as per Sullivan and Petersen (1988).

The distribution of the Peñasco least chipmunk has declined dramatically since the early 20<sup>th</sup> century (Frey and Boykin 2007). Specimen records and observations indicate that it was widespread throughout the ponderosa pine zone of the Sacramento Mountains until at least the early 1930s (Frey and Boykin 2007). The Sacramento Mountains population of Peñasco least chipmunk was last verified as extant in 1966 despite subsequent intensive field surveys. It is unknown whether this population persists. In the Sacramento Mountains, the preferred habitat of the chipmunk – large, open stands of mature ponderosa pine with abundant groundcover of grasses, forbs, and fruiting shrubs – is found only as isolated stringers along drainages within Lincoln National Forest, especially in the Elk and Tularosa valleys (Frey and Boykin 2007).

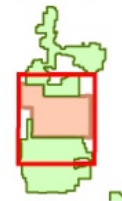
The status of the White Mountains population is also precarious. This population was last verified in 2000—it is probably structured as a source-sink metapopulation, with the core source population inhabiting a rocky area imbedded in subalpine grassland habitat on Sierra Blanca Peak (Frey and Boykin 2007). Specimen records indicate a possible shift in the mammal community on Sierra Blanca Peak from exclusively *T. m. atristriatus* in the 1930s to the 1960s to a mix of *T. m. atristriatus* and *T. canipes* in the 1980s (Frey and Boykin 2007).



# Penasco Least Chipmunk Occurrences



- ▲ Penasco Least Chipmunk
- Lincoln National Forest
- Mescalero Apache Reservation



Cartography: Kurt Menke, GISP  
Bird's Eye View  
[www.BirdsEyeViewGIS.com](http://www.BirdsEyeViewGIS.com)  
Date: September 20, 2011

**Figure 1.** All recorded occurrences of the Peñasco least chipmunk. Data: J. Frey and K. Boykin, used with permission. Map: Kurt Menke, Bird's Eye View GIS.

## POPULATION STATUS: HISTORIC AND CURRENT

Population size of the Peñasco least chipmunk is unknown but considered declining. When Bailey collected the type series in 1902, he made note of its abundance, and later wrote that it was “abundant in the open forests... Dozens were seen on the roadside fences, often three or four at a time... and while many were shot for specimens many more escaped into holes in the ground or under logs, or among the weeds and bush... Their chipper of alarm was constantly heard along the roadside” (Bailey 1931).

In contrast, surveys in 1965 and 1966 revealed the Sacramento Mountains population to be “greatly depressed” (Conley 1970). Over two years, 26 specimens were collected from Sierra Blanca Peak in the White Mountains and only 4 from James Canyon in the Sacramento Mountains (Id.). Subsequent surveys in the 1970s failed to discover any chipmunks in the Sacramento Mountains study site (Sullivan et al. undated, *cited in* Frey and Boykin 2007). Surveys in the early 1980s confirmed the Sierra Blanca Peak population in the White Mountains, but a concurrent survey effort using eighteen times as many trap nights failed to confirm the persistence of the Sacramento Mountains population (Sullivan et al. undated, *cited in* Frey and Boykin 2007). The White Mountains population of *T. m. atristriatus* was estimated at 15–20 individuals in 1981–1982 (Sullivan and Nagorsen 1998). The White Mountains population was most recently confirmed as extant in 2000 (Hope and Frey 2000). The chipmunk was first listed as “endangered” in New Mexico in 1983, and the New Mexico Department of Game and Fish has recommended further research on the species to better define its distribution, population size, and habitats (NMDGF 2006).

## IDENTIFIED THREATS TO THE PETITIONED SPECIES: CRITERIA FOR LISTING

The Peñasco least chipmunk meets at least three criteria for listing under ESA Section 4 (16 U.S.C. § 1533(a)(1)) (bolded):

- 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. The inadequacy of existing regulatory mechanisms; and**
- E. Other natural or manmade factors affecting its continued existence.**

### (Factor A) Present and Threatened Destruction, Modification, or Curtailment of Habitat or Range

***Loss of Mature Ponderosa Pine Forest.*** The single greatest threat to the Peñasco least chipmunk is the loss of mature ponderosa pine forest habitat (Frey and Boykin 2007). Ponderosa pine forest once occupied large areas at mid-elevation in the White and Sacramento mountains (Alexander et al. 1984). Original uncut ponderosa pine forest formed open, park-like stands – a mosaic of large trees scattered or clumped in groups and including small patches of dense young ponderosa – within a grassland matrix. Stands of mature ponderosa pine lack low branches, making these



areas ideal habitat for the chipmunk (Frey and Boykin 2007). With the exception of some small, inaccessible areas, all ponderosa pine forest in the White and Sacramento mountains has been logged (Moline 1992, *cited in* Frey and Boykin 2007; Kaufmann et al. 1998). Survey efforts prior to 2007 may not have discovered populations of chipmunks persisting in ponderosa pine habitat (J. Frey, pers. comm., Aug. 30, 2011), but any such populations need the protection of the ESA.

***Changes in Forest Structure.*** Recruitment after logging, along with other factors described below, has radically altered the structure of regenerating stands of ponderosa pine (Kaufmann et al. 1998. *See also* Stade and Salvo 2009). As opposed to the open, park-like stands formed by mature trees, younger ponderosa pine forms dense stands that are most likely unsuitable for the Peñasco least chipmunk, but are suitable for *T. canipes* (Frey and Boykin 2007). This makes it more likely that *T. canipes* will out-compete *T. m. atristriatus* where their ranges overlap (Frey and Boykin 2007).

*Fire Suppression.* “Fire suppression has led to an ingrowth of Douglas fir and white fir within ponderosa pine, which further alters the habitat in favor of *T. canipes* (Covington & Moore 1992, Kaufmann et al. 1998)... [A]s a consequence of the densely stocked forests, insect infestations and especially stand-replacing fires have eliminated most of the former ponderosa pine forest areas on Lincoln National Forest” (Frey and Boykin 2007).

*Livestock Grazing.* By altering the plant species composition and reducing the availability of food, livestock grazing may present a threat to the Peñasco least chipmunk (Frey and Boykin 2007). Livestock grazing reduces or alters suitable groundcover of herbaceous plants, which the chipmunk uses for cover from predators and for food resources, particularly seeds. In addition, intensive grazing can cause trees to invade subalpine and montane grasslands, creating habitat that favors *T. canipes* over the Peñasco least chipmunk (Frey and Boykin 2007).

#### (Factor B) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Collection is not known to constitute a threat to the Peñasco least chipmunk. Regulation of collection is recommended, including those taken for scientific purposes (Sullivan and Nagorsen 1998). However, much information may be gained about the life history and conservation status of this species through collecting. FWS should investigate the extent of collection and the potential consequences to the chipmunk as part of its status review of the species.

#### (Factor C) Disease or Predation

Neither disease nor predation is known to constitute a threat to the Peñasco least chipmunk. They are likely prey for the suite of predators known to feed on *T. minimus*, including raptors, weasels, coyotes, foxes, and bobcats. Zoonotic disease is not known to be a threat to this species, but climate change may cause shifts in the range of disease-carrying insects, parasites, or other pathogens, potentially exposing animal populations to novel disease threat (Harvell et al. 2002;

Rodenhouse et al. 2009). FWS should investigate the potential consequences of predation and disease to the chipmunk as part of its status review of the species.

#### (Factor D) Inadequacy of Existing Regulatory Mechanisms

The Peñasco least chipmunk is listed as “Critically Endangered” by the International Union for the Conservation of Nature (Sullivan and Nagorsen 1998). Despite this designation, existing state and federal regulations have failed to prevent severe declines in this species’ distribution and abundance.

**Federal Regulations.** The Peñasco least chipmunk does not enjoy any federal protection. The U. S. Forest Service (Southwestern Region) lists it as a Species of Concern.<sup>1</sup> “Species of Concern” is defined as a category “for planning purposes only”<sup>2</sup> and does not offer any particular protection to species so designated.

**State Regulations.** The Peñasco least chipmunk has been listed as “endangered” in New Mexico since 1983 (NMDGF 2008). The New Mexico Wildlife Conservation Act provides a modicum of protection to state-listed species, as follows:

NM ST §§ 17-2-39(A) “Species of wildlife indigenous to the state that may be found to be threatened or endangered should be managed to maintain and, to the extent possible, enhance their numbers within the carrying capacity of the habitat

NM ST §§ 17-2-40.1(A) To the extent practicable, a recovery plan shall be developed... for any species listed as threatened or endangered

NM ST §§ 17-2-41 (C) Except as otherwise provided in the Wildlife Conservation Act [17-2-37 to 17-2-46 NMSA 1978], it is unlawful for any person to take, possess, transport, export, process, sell or offer for sale or ship any species of wildlife appearing on... the list of wildlife indigenous to the state determined to be endangered within the state...”

Though the subspecies is protected from unlawful take in New Mexico, the primary threat facing the chipmunk is habitat destruction. The state statute does not protect habitat for listed taxon, nor designate critical habitat or require development of a recovery plan, as would be provided under the ESA.

**Lincoln National Forest.** As discussed under Factor A, changes in forest structure due in some part to fire suppression and livestock grazing are threats to the chipmunk. The Lincoln National Forest Plan does not adequately protect the species or its habitat from fire suppression and grazing and associated negative effects. It also does not adequately protect the chipmunk’s habitat against logging.

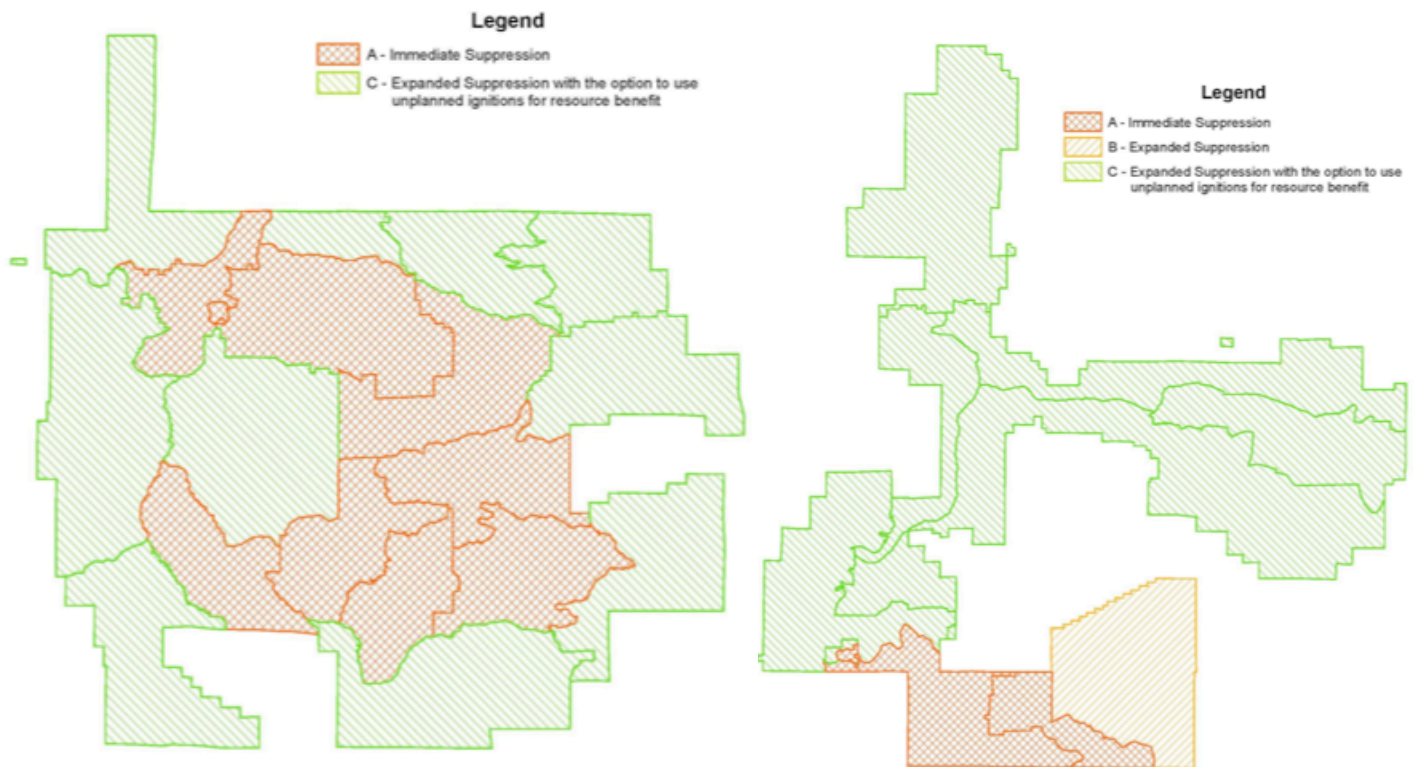
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<sup>1</sup> See the New Mexico Ecological Services Field Office website at [www.fws.gov/southwest/es/newmexico/SBC\\_view\\_all.cfm](http://www.fws.gov/southwest/es/newmexico/SBC_view_all.cfm) (viewed October 2010).

<sup>2</sup> Id.

*Fire.* In the Lincoln National Forest Plan, “[f]ire suppression objectives are established for four fire suppression zones which cover the Lincoln National Forest” (LNF 1986). In both the Sacramento and Smokey Bear ranger district, large tracts of land overlapping documented occurrences of the chipmunk are designated Zone A or B. Zone A “applies to the suppression of wildland fires that pose a threat to life or property in developed areas. Planned ignitions will be used to accomplish fuel treatment and resource management objectives in these areas. Suppression tactics will be selected as an AMR that prioritize firefighter and public safety, and have the least impact on the land while still meeting the suppression objective” (*Id.*). In Zone B, decisions about fire suppression are made “based on fuels, weather, and knowledge of the terrain where the wildland fire occurs. Suppression tactics will be selected as an AMR that prioritize firefighter and public safety, have least impact on the land, and are most cost effective. Planned ignitions will be used to accomplish fuel treatment and resource management objectives. Suppression action will give protection to private in-holdings and other land ownership whenever possible” (*Id.*).

Prioritization of fire suppression in areas overlapping or close to the chipmunk’s habitat may make it more difficult to manage for chipmunk habitat.



**Figure 2.** Lincoln National Forest fire management zones in the chipmunk’s range in the Sacramento Ranger District (left) and the Smokey Bear Ranger District (*compare to* Figure 3). (LNF 1986: 50-51).

*Logging.* The Lincoln National Forest Plan contains the following guidelines for thinning spruce-fir, mixed conifer and ponderosa pine: “(a) In the mixed conifer and ponderosa pine types, thin to 200-300 well-spaced acceptable trees per acre using one pre-commercial entry. In the spruce-fir type, thin to 500-600 trees per acre. (b) Non-commercial species will be retained if needed for wildlife or other resource purposes, and if not in conflict with timber management objectives; otherwise, non-commercial species over 4" dbh will be cut during pre-commercial thinning” (LNF 1986).

Logging, no matter how it is managed, can have detrimental impacts on the chipmunk, not only because of the impacts of logging itself but through associated impacts such as road-building, soil compaction and erosion, and disturbance.

*Grazing.* “Forage use by grazing ungulates will be maintained at or above a condition which assures recovery and continued existence of threatened and endangered species. Guidelines: Identify key ungulate forage monitoring areas. These key areas will normally be 1/4 to 1 mile from water, located on productive soils on level to intermediate slopes, and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres... Within key forage monitoring areas, select appropriate key species to monitor average allowable use. In consultation with US Fish and Wildlife Service, develop site-specific forage use levels” (LNF 1986). Though the Forest Plan mandates maintaining conditions that are optimal for “endangered” or “threatened” species, this does not benefit the chipmunk because a) it is not listed as “threatened” or “endangered” and b) grazing is often poorly regulated and poorly monitored. The Candidate Assessment Form for the New Mexico meadow jumping mouse reveals that “the Santa Fe and Lincoln National Forests have not regularly monitored forage utilization (grazing intensity) of grazing allotments within the range of the jumping mouse under current grazing guidelines.” In addition, “it is likely that current utilization guidelines, as well as the timing of grazing, would still result in the destruction, modification, or curtailment of jumping mouse habitat. Similarly, some historic localities had evidence of being fenced from livestock in the past, but the fences were left open, cut, or not maintained and fallen down. The Santa Fe, Carson, and Lincoln National Forests presently are not planning any new management measures (e.g., construction of new grazing exclosures)... Moreover, it appears that some of the livestock exclosures within extant localities are not regularly inspected or maintained... We have no information that indicates that future livestock grazing on the National Forests is likely to be reduced in the future” (FWS 2010). Since the Forest Service is failing to prevent grazing damage to the habitat of a candidate species, it is unlikely that the habitat of the chipmunk, which is not yet recognized as warranting listing, is faring any better under the current grazing regimen.

To the south of the Mescalero Apache Reservation, most recorded occurrences of the chipmunk are within an ungrazed forest fragment (Figure 3). Considering that grazing probably changes forest composition to be less favorable to the chipmunk (see above), the chipmunk population in the Sacramento Ranger District are likely to be fragmented and isolated in ungrazed areas. A similar situation likely exists for chipmunks persisting in the Smokey Bear Ranger District, but occurrence data is sparse for this area (Figure 3).

**Mescalero Apache Reservation.** The reservation is approximately 720 square miles and home to about 4000 Native Americans ([www.mescaleroapache.com](http://www.mescaleroapache.com), viewed Sept. 22, 2011). The summit of Sierra Blanca Peak, home to one population of chipmunk, is part of the Reservation and requires a permit for access (Id.). “Approximately 85 percent of the reservation is forested with 150,000 acres considered commercial forest. The commercial forest is managed on a 20-year cutting cycle with about 7,500 acres receiving treatment each year at an average harvest volume of 2,240 bdf/acre” (Hornsby 2001). We are not aware of any laws or regulations that would offer specific protection to the chipmunk or its habitat on the Reservation.

#### (Factor E) Other Natural or Manmade Factors

**Climate Change.** The EPA (1998) and the IPCC (2001) predict that, due to anthropogenic climate change, the average temperature in the Southwest will increase by 3° to 5° C by 2100, and that both temperature and precipitation will be more variable. A consequence of this warming could be a reduction of coniferous forest habitat in the Southwest (EPA 1998; IPCC 2001).

A 2008 report from the Nature Conservancy and Wildlife Conservation Society indicates that the effects of climate change are already apparent in the chipmunk’s habitat. “Most of New Mexico has already experienced mean temperature increases of varying magnitude... Most of New Mexico’s mid- to high-elevation forests and woodlands have experienced consistently warmer and drier conditions or greater variability in temperature and precipitation from 1991 to 2005. Should this continue, as future climate projections suggest, these habitats may be most susceptible or vulnerable to ongoing climate change” (Enquist and Gori 2008). The Sacramento Mountains (which are contiguous with the White Mountains) are identified in the report as one of eleven high-elevation conservation areas that are potentially most vulnerable to climate change due to their high number of drought-sensitive species and “*the magnitude of their recent climate exposure (i.e., warmer-drier conditions or greater variability in temperature and precipitation)*” (Enquist and Gori 2008, emphasis in original). Continued climate change will likely adversely affect the chipmunk. Any further reduction in the area of ponderosa pine forest poses a threat to the Sacramento Mountains population of Peñasco least chipmunk, and any climate change that would reduce subalpine grassland threatens the White Mountains population (Frey and Boykin 2007).

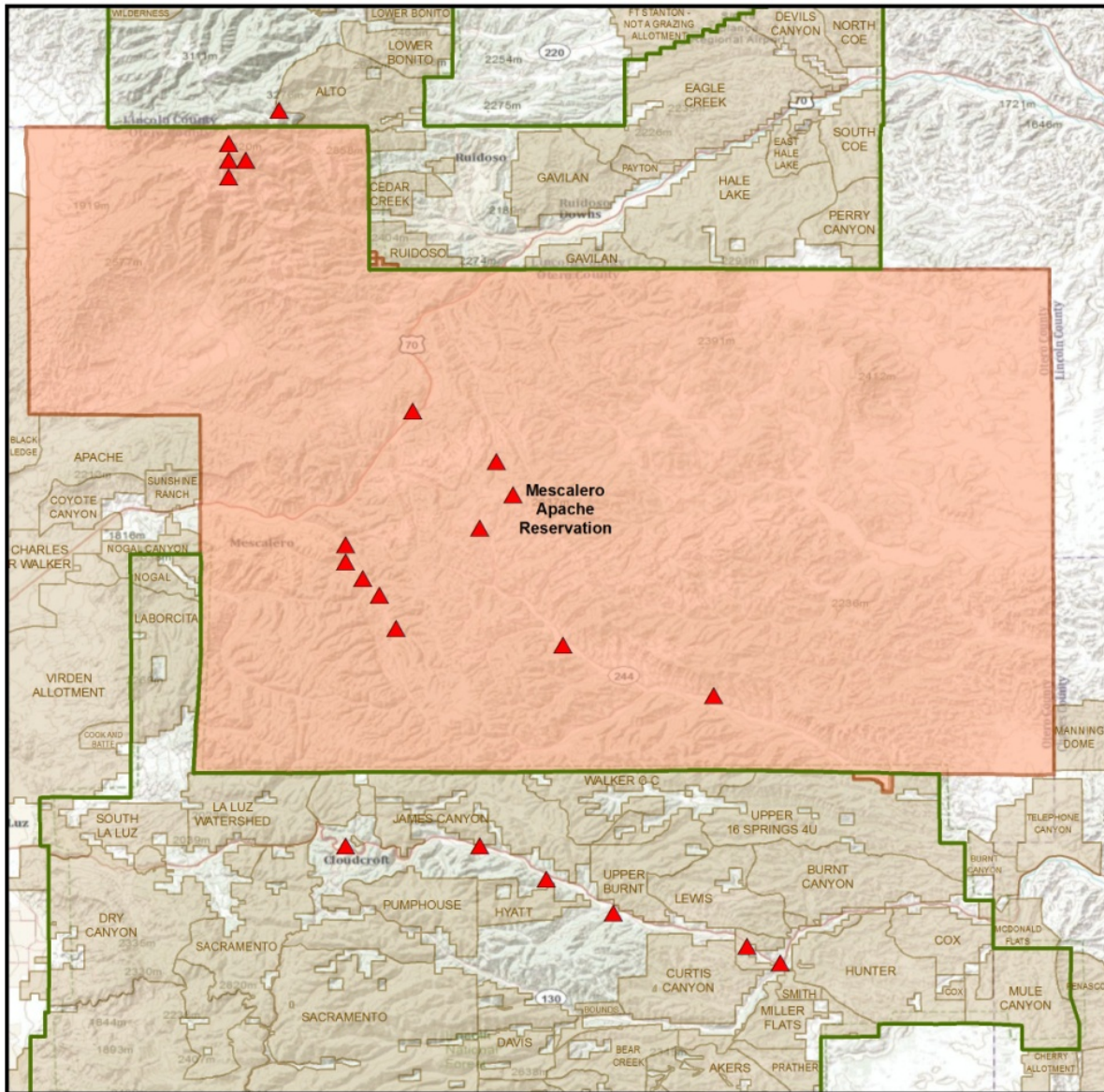
**Biological Vulnerability.** FWS has routinely recognized that small population size increases the likelihood of extinction.<sup>3</sup> Populations of *T. minimus* can fluctuate dramatically – local extinctions or near-extinctions have been documented even in large patches of suitable habitat (Bergstrom and Hoffman 1991). These types of stochastic fluctuations in population size could pose problems for the metapopulation in the White Mountains, and are an even greater threat to any isolated relict populations in the Sacramento Mountains (Frey and Boykin 2007). Because the Peñasco least chipmunk likely produces only one litter a year, population growth and recovery following extirpation or near-extirpation is expected to be slow (Frey and Boykin 2007).

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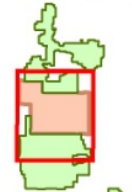
<sup>3</sup> See, for examples, candidate assessment forms for *Porzana tabuensis* (spotless crane, April 2010), *Eumops floridanus* (Florida bonneted bat, March 2010), *Vagrans egistina* (Mariana wandering butterfly, April 2010), *Gallicolumba stairi* (friendly ground-dove, March 2010), *Eremophila alpestris strigata* (streaked horned lark, April 2010), and *Hyla wrightorum* (Arizona treefrog, April 2010) (Available at [http://ecos.fws.gov/tess\\_public/pub/SpeciesReport.do?listingType=C&mapstatus=1](http://ecos.fws.gov/tess_public/pub/SpeciesReport.do?listingType=C&mapstatus=1)).



# Penasco Least Chipmunk Federal Grazing Allotments



- ▲ Penasco Least Chipmunk
- Lincoln National Forest
- Mescalero Apache Reservation
- Federal Grazing Allotments



**BIRD'S EYE VIEW GIS**  
 Cartography: Kurt Menke, GISP  
 Bird's Eye View  
[www.BirdsEyeViewGIS.com](http://www.BirdsEyeViewGIS.com)  
 Date: September 20, 2011

**Figure 3.** Occurrences of the Peñasco least chipmunk in relation to federal grazing allotments. Chipmunk data: J. Frey and K. Boykin, used with permission. Map: Kurt Menke, Bird's Eye View GIS.

**Cumulative Threats.** FWS should consider whether the array of aforementioned threats intersect and act synergistically, therefore increasing the likelihood of extinction or endangerment of the Peñasco least chipmunk in the foreseeable future. For example, habitat loss and degradation due to logging, livestock grazing, and fire suppression is exacerbated by the threats of increased temperatures and more extreme weather caused by climate change, which may also restrict or shift the chipmunk’s coniferous habitat. These threats are further exacerbated by competition with the gray-footed chipmunk, which tends to out-compete the Peñasco least chipmunk in the types of ecosystems generally created by habitat loss and modification through human activity or climate change. These are just examples of intersecting threats facing the chipmunk.

Traits such as ecological specialization and low population density act synergistically to elevate extinction risk above that expected from their additive contributions, because rarity itself imparts higher risk and specialization reduces the capacity of a species to adapt to habitat loss by shifting range or changing diet. Similarly, interactions between environmental factors and intrinsic characteristics make large-bodied, long-generation and low-fecundity species particularly predisposed to anthropogenic threats given their lower replacement rates.

(Brook et al. 2008: 455, internal citations omitted).

[O]nly by treating extinction as a synergistic process will predictions of risk for most species approximate reality, and conservation efforts therefore be effective. However challenging it is, policy to mitigate biodiversity loss must accept the need to manage multiple threatening processes simultaneously over longer terms. Habitat preservation, restoring degraded landscapes, maintaining or creating connectivity, avoiding overharvest, reducing fire risk and cutting carbon emissions have to be planned in unison. Otherwise, conservation actions which only tackle individual threats risk becoming half-measures which end in failure, due to uncontrolled cascading effects.

(Brook et al. 2008 at 459, internal citations omitted).

## **REQUESTED DESIGNATION**

WildEarth Guardians hereby petitions the U.S. Fish and Wildlife Service under the Department of Interior to list the Peñasco least chipmunk (*Tamias minimus atristriatus*) as an “endangered” or “threatened” species under the Endangered Species Act. Listing is warranted, given the rarity of this species and its apparent precipitous decline in population size and distribution since the 1930s. The Peñasco least chipmunk is threatened by at least three of the five listing factors under the ESA: present and threatened destruction, modification and curtailment of habitat and range; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence.

WildEarth Guardians also requests that critical habitat be designated for the Peñasco least chipmunk in occupied and unoccupied suitable habitat as appropriate concurrent with final ESA listing. Designating critical habitat for this species would not only support its recovery and allow for recolonization of its former range, but would also aid in the protection of the Sacramento Mountains ecosystem. The Sacramento Mountains are home to a unique array of rare and

endemic plants and animals, including the Sacramento Mountains checkerspot butterfly (*Euphydryas chalcedona cloudcrofti*, petitioned for listing under the ESA), the Sacramento Mountains thistle (*Cirsium vinaceum*, listed as “threatened” under the ESA), and the Sacramento Mountains prickly poppy (*Argemone pleiacantha pinnatisecta*, listed as “endangered” under the ESA). The Sacramento Mountains also provide habitat for the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), which is a candidate for listing under the ESA, and the Mexican spotted owl (*Strix occidentalis lucida*), listed as “threatened” under the ESA.

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