

50 CFR Part 17**Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Stephens' Kangaroo Rat****AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: The Fish and Wildlife Service (Service) determines the Stephens' kangaroo rat (*Dipodomys stephensi*), a small mammal found in southern California, to be an endangered species. The species has suffered widespread habitat loss and degradation, resulting in small isolated populations. This rule implements the protection provided by the Endangered Species Act of 1973, as amended (Act), for the Stephens' kangaroo rat.

DATE: The effective date of this rule is October 31, 1988.**ADDRESS:** The complete file for this rule is available for inspection, by appointment, during normal business hours at U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, California 92656.**FOR FURTHER INFORMATION CONTACT:** Ms. Nancy M. Kaufman, field supervisor,

at the above address (714/643-4270 or FTS 796-4270).

SUPPLEMENTARY INFORMATION:**Background**

The Stephens' kangaroo rat (*Dipodomys stephensi*) is a small mammal of the rodent family Heteromyidae. Like other kangaroo rats, it has a large head, external cheek pouches, elongated rear legs used for jumping, and relatively small front legs. The front feet are frequently used to hold seeds that the animal eats. There are five toes on the hind foot and the tail is 1.45 times the length of the head and body. The Stephens' kangaroo rat is distinguished from the sympatric agile kangaroo rat (*Dipodomys agilis*) by a lateral white tail band that is one half or less (rather than one half or more) times the width of the dorsal tail stripe, dusky (rather than dark) soles on the hind feet, a more grizzled appearance to the dorsal tail stripe due to many white hairs, a darker tail tuft due to fewer white hairs, a smaller ear (averaging 0.5 inch [15 millimeters] in length), and a relatively broad head. The average adult Stephens' kangaroo rat is 11 to 12 inches (277 to 300 millimeters) in length and weighs 2.3 ounces (67 grams) (Bleich 1977).

The Stephens' kangaroo rat was first described by Merriam (1907) as *Perodipus stephensi*. The type locality is the San Jacinto Valley, a little west of the town of Winchester, Riverside County. Grinnell (1921) placed the species in the genus *Dipodomys*. Huey (1962) described a kangaroo rat from the

San Luis Rey River valley as *Dipodomys cascus*. However, Lackey later (1967a) determined *D. cascus* to be a synonym of *D. stephensi*.

The Stephens' kangaroo rat is endemic to the Perris and San Jacinto Valleys in western Riverside County and the San Luis Rey and Temecula Valleys in northern San Diego County (Grinnell 1922, Lackey 1967a, O'Farrell and Uptain 1986, Thomas 1973). Occupied habitats are usually described as sparse, slightly disturbed coastal sage scrub or annual grassland. The actual distribution of suitable habitat is normally mixed with other habitat types in a natural mosaic. The populations with the highest densities have been found in areas where the herbaceous layer still contains California native annuals, and where perennial cover is less than 30 percent (Hogan 1981). The Stephens' kangaroo rat is most commonly associated with *Artemisia californica* and *Eriogonum fasciculatum* because these shrubs are often the most obvious elements of the habitat. The animal is actually using the herbaceous layer which is often dominated by filaree (*Erodium cicutarium*). Many areas supporting the species are shrubless (O'Farrell, 1988 pers. comm.). The Stephens' kangaroo rat occurs on level or low rolling terrain; it is not found on extremely hard or sandy soils (Lackey 1967a). Bleich (1977) noted that gravel is a common component of soils where the animal is found.

All of the occupied sites found by Thomas (1973) had been previously disturbed, usually by plowing. Remnant

populations that survived at the natural edges had reinvaded after the fields had been left fallow. At that time most populations were considered isolated from one another and were found predominantly in the western portions of the range. Rapid urbanization has reinforced this pattern.

Like all kangaroo rats, *D. stephensi* is nocturnal, spending the day in underground burrows and foraging on the surface at night. Pregnant and lactating females have been caught in the spring and summer months (Lackey 1967b). To date, few population density studies have been completed and none have covered an entire year. Relatively high densities (over 20 per acre or 50 per hectare) have been found during the summer months when the young are out of the nest (Thomas 1975). Hogan (1981) reported fall-winter densities of about 2.5 to 6 per acre (6 to 15 per hectare). According to Dr. Michael J. O'Farrell (private consultant, Santa Ynez, California), high density areas contain over 4 animals per acre (10 per hectare), moderate density areas support about 2 to 4 animals per acre (5 to 10 per hectare), and low density areas contain less than 2 per acre (5 per hectare). Most of the occupied range probably has low to moderate density populations.

Most remaining habitat for the Stephens' kangaroo rat is in private ownership. Federal agencies or installations with land holdings supporting this species include March Air Force Base, Fallbrook Naval Weapons Annex, Camp Pendleton Marine Corps Base, and the Bureau of Land Management. The Vista Irrigation District, Metropolitan Water District, and State of California also own comparatively large blocks of suitable habitat.

In its original Review of Vertebrate Wildlife, published in the **Federal Register** of December 30, 1982 (47 FR 58454-58460), the Service included *D. stephensi* in category 2, meaning that information then available indicated that a proposal to determine endangered or threatened status was possibly appropriate, but was not yet sufficiently substantial to support such a proposal. Subsequently, many new data on the species became available, and in its revised Vertebrate Review of September 18, 1985 (50 FR 37958-37967), the Service included *D. stephensi* in category 1, meaning that substantial information was on hand to support the biological appropriateness of proposing to list as endangered or threatened. The Service published the proposed rule for this species on November 19, 1987 (53 FR 44453-44456).

Summary of Comments and Recommendations

In the November 19, 1987, proposed rule (52 FR 44453-44456) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. The public comment period was extended twice, until April 19, 1988, to accommodate a requested public hearing held on March 11, 1988 (53 FR 5022), and again until June 20, 1988, to allow for the receipt of additional comments (53 FR 17964). Hence, the total comment period was 7 months. A newspaper notice was published in the *Los Angeles Times* on December 5, 1987, the *Riverside Press Enterprise* on December 17, 1987, and the *San Diego Union* on December 15, 1987, announcing the proposed rule and requesting comments. Announcements for the public hearing were published in the above newspapers on March 9, 1988. A total of 11 individuals and organizations submitted written comments. Two people provided oral testimony at the public hearing.

The only opposing statement was received from the U.S. Air Force, which was the only Federal agency to submit comments. The California Department of Fish and Game submitted supporting comments, and provided a copy of a recent status update. The cities of Moreno Valley and Riverside provided neutral comments and submitted information on the status of the species within their boundaries. One utility company and a water district also submitted neutral comments. One conservation organization, and two researchers also submitted supporting comments. Twelve individuals submitted signed photocopies of the same supporting letter, which were treated as one comment. Of the 11 comments received, 7 supported listing, 1 opposed, and 3 were neutral. The written and oral comments received are grouped under issues and discussed below:

Issue 1: The Stephens' kangaroo rat should not be listed as endangered until its range is more accurately delineated. The species may be more widespread than previously thought.

Service Response: The total range of the Stephens' kangaroo rat has been well documented (Bleich 1977, Lackey 1967a, Price and Endo 1988, Thomas 1973, Thomas 1975, O'Farrell and Uptain 1986). It is unlikely that this small mammal occurs outside of this range. The presence or absence of the Stephens' kangaroo rat at specific locations within this range is sometimes uncertain. Furthermore, the population

densities of this species fluctuate greatly from one year to the next (Price and Endo 1988), hence, suitable habitat may not always be occupied. The discussions under Factor A regarding habitat loss and Factor E regarding habitat fragmentation indicate that the threats facing the kangaroo rat are occurring range-wide. To wait until the species' occurrence is more precisely known would allow the present rate of habitat loss to continue unabated, making extinction of the species more likely.

Issue 2: Once the kangaroo rat is listed, the Federal and other public lands containing the species will become defacto reserves for this species. The Service may have "written-off" privately owned parcels for purposes of establishing Stephens' kangaroo rat reserves. All land owners should share in the burden of Stephens' kangaroo rat protection.

Service Response: The lands now held in public ownership are not sufficient to ensure the maintenance of the species in perpetuity. Consequently, the preservation of many presently privately owned parcels likely will be necessary. The Canyon Lake Property Owners Association has expressed interest in actions intended to preserve Stephens' kangaroo rat habitat. The County of Riverside has formed a committee to begin the development of a Habitat Conservation Plan for the kangaroo rat. A key feature of this program is to identify the best Stephens' kangaroo rat habitat in Riverside County for the establishment of viable reserves and develop the means to provide permanent protection and management for these sites. Many of the public parcels contain the species because the major public purpose of the land is at least partially compatible with preservation of the Stephens' kangaroo rat.

Issue 3: Many land uses appear to be compatible with the preservation of Stephens' kangaroo rats. For example, the species occurs along power line corridors, in grazed areas, at a solar facility, near napalm storage grounds on military lands, and in areas where off-road vehicle travel has occurred.

Service Response: The habitat requirements of the Stephens' kangaroo rat are not well defined. The species does appear to need some bare ground, and the habitat is usually described as being open or sparsely vegetated. Consequently, land uses that cause artificial disturbance and perpetuate the sparse nature of the habitat may be compatible with the preservation of the species. However, further study is needed to determine which kinds of

disturbances under what circumstances truly are compatible. During a recent 1-year study (O'Farrell 1988, pers. comm.) noted a population increase of Stephens' kangaroo rats following development of a solar facility. The population change was attributed to increased protection from predators and increased herbaceous growth. Given that populations of this species fluctuate greatly from year to year (Price and Endo 1988), conclusions based on this short time period should be drawn conservatively. Thus, further careful study is needed to confidently assess the long-term impacts of various land uses on this species. Nevertheless, despite the fact that some land uses may be compatible, the primary threat to this species is permanent loss and fragmentation of habitat resulting from urbanization and other land uses.

Issue 4: In the proposed rule, it was suggested that some small land areas lacked viable populations; however, apparently this is not the case.

Service Response: The areas referred to were fairly small, approximately 40 acres (100 hectares) in size. As discussed below under Factor E, such small areas would support the species indefinitely. Although the population size that would be needed for viability is not known, it may contain 500 or more individuals. Additionally, on most lands supporting the species, not all habitat is suitable or occupied by Stephens' kangaroo rats; consequently, a viable population would more likely require several square miles. However, further study is needed to determine how many animals are needed for a viable population, and how much land they require.

In summary, no information was received indicating that the species is more widespread or under a lesser degree of threat than was originally thought.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Stephens' kangaroo rat should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in Section 4(a)(1). These factors and their application to the Stephens' kangaroo rat (*Dipodomys stephensi*) are as follows:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. The habitat and range of the Stephens' kangaroo rat have been greatly reduced. The species probably once occurred through annual grassland or sparse coastal sage scrub communities of the Perris and San Jacinto Valleys and up adjoining washes in southern California. As the flatter plains were developed by people, however, the kangaroo rat became confined to isolated bases of low rolling hills and level ridge tops.

Price and Endo (1988) have completed a mapping effort focusing on suitable soil types and relatively flat topography to compare the amount of estimated habitat available to the Stephens' kangaroo rat prior to Twentieth-century agriculture and again in 1984 in Riverside County. Price and Endo (1988) estimated that approximately 308,195 acres (124,775 hectares) of potential habitat originally existed for this species. In 1984, 124,779 acres (50,518 hectares) remained. Habitat had been lost due to urban and agricultural developments. Moreover, of the remaining habitat patches, 84 percent were less than 1 square kilometer (384 acres) in size. Only 21,212 acres (8,588 hectares) remained in patches larger than one square kilometer (Price and Endo 1988). cursory observations indicate that since 1984, the situation has worsened. Most recent habitat loss is the result of urban development and is permanent; losses from agricultural development are less severe because Stephens' kangaroo rats can invade plowed fields following abandonment (Thomas 1973, 1975).

Some areas in public ownership contain substantial habitat for *D. stephensi*. O'Farrell and Uptain (1986) indicated that approximately 12,600 acres (5,100 hectares) of suitable habitat remain at Lake Henshaw and that another 4,940 acres (2,000 hectares) appear suitable on the Fallbrook Naval Weapons Annex. The species, however, probably has been extirpated between the latter facility and the San Luis Rey River. The Metropolitan Water District owns some habitat surrounding Lake Mathews where, including contiguous private parcels, an area of about 17,000 acres (6,800 hectares) remains, although not all of this habitat is suitable. Many proposed projects, however, threaten the land surrounding Lake Mathews.

No attempt to trap the species has been made at Lake Perris since 1973. On the east side of the San Jacinto Valley, it is now restricted mainly to insular patches at the edges of plowed fields. It is similarly restricted in the Lakeview Mountains, where only a few thousand

non-contiguous acres are now thought to contain adequate habitat. The species has been reported on the Beaumont-Banning Plain; however, this area is also undergoing rapid urbanization. The U.S. Bureau of Land Management (Bureau) owns some parcels near Lake Elsinore, but survival of the kangaroo rat there is tenuous because of rapid urbanization and an expected increase in casual human use (off-road vehicles already have been noted). Land exchanges are being pursued to consolidate these Bureau parcels to provide a viable preserve for the Stephens' kangaroo rat.

Further compounding the fragmented nature of the current distribution is the fact that the Stephens' kangaroo rat does not occupy all apparently suitable habitat (Friesen 1985a). Relatively large areas may include only a small percentage of occupied habitat. Grazing, off-road vehicle activity (common in southern California), and rodent control programs all potentially reduce habitat suitability.

These habitat losses are likely to continue. An examination of Riverside County's General Plan guidelines revealed that 78 percent of the sites where the kangaroo rat has been trapped are zoned for use incompatible with preservation of the species. Only 3 percent of the sites were zoned for vegetation or wildlife protection, and much of this land is not suitable for the kangaroo rat. Within the overall range of the Stephens' kangaroo rat, only 6 percent of the land is zoned for uses compatible with the preservation of the species. Because not all of the habitat in this 6 percent is suitable, much less is available for the kangaroo rat. Although biological consultants have sometimes located the species and informed appropriate land owners or project proponents, some of the sites, nonetheless, have been disked or plowed.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Not now known to be applicable.

C. Disease or Predation. Not now known to be applicable. However, many areas of occurrence are adjacent to urban neighborhoods and increased predation from domestic and feral cats can be expected (Friesen 1985b).

D. The inadequacy of existing regulatory mechanisms. The California State Fish and Game Commission has listed the Stephens' kangaroo rat as threatened. Recently, the Department of Fish and Game recommended that the kangaroo rat's status be upgraded to endangered. The California Endangered Species Act (State Act) of 1985 provides

protection from take, and contains provisions that call for a consultation process, similar to Section 7 of the Federal Act, when a State lead agency's project may affect a State-listed species. The regulations implementing the consultation process under the State Act were not completed until June of 1986, and it is still unclear how effective the State Act will be. Few State agencies are expected to propose State projects as defined under the State Act. Under the California Environmental Quality Act, an attempt is made to "mitigate" for losses of occupied Stephens' kangaroo rat habitat. This procedure has been inadequate because the usual suggested "mitigation" measures presented in most proposed projects consist of preserving habitat in another location. There is thus a constant, ongoing habitat loss. Additionally, because the species does not occupy all suitable habitat, losses of unoccupied habitat remain uncompensated.

County zoning restrictions do not now provide adequate protection for the kangaroo rat and its habitat. Although "open space" designations are sometimes made, these can be altered to allow subdivision and development. Only a small fraction of the involved land is currently zoned for uses compatible with the preservation of the kangaroo rat (see "Factor A" above).

Federal lands form only a small part (approximately 15 percent) of the range of the species. Although a significant population of *D. stephensi* may occur on the Fallbrook Naval Weapons Annex, the Navy has no established policy regarding the protection of sensitive species. The involved Bureau of Land Management-administered lands are small and also lack specific protective policies, however, the Bureau does intend to consolidate some of its holdings through land exchanges and provide a reserve for the Stephens' kangaroo rat.

E. Other natural or manmade factors affecting its continued existence. Coastal sage scrub plant communities may become less sparse through time. As plant density and ground cover increase, patches of habitat would become unsuitable for Stephens' kangaroo rat.

The State recreation areas have rodent control programs that probably adversely affect the Stephens' kangaroo rat populations. Consultants also have noted the disappearance of kangaroo rat sign due to unknown causes. A hypothesis concerning such unexplained disappearances is that rodenticides have been used.

Further compounding the habitat loss and degradation referred to under

Factor A is the fragmented nature of the remaining habitat. Price and Endo (1988) have provided an estimate of original habitat and that available in 1984 based upon mapping of soil types. This effort has revealed approximately 84 percent of the remaining habitat patches are less than 1 square kilometer in extent. The size of a reserve that would be needed to support the Stephens' kangaroo rat in perpetuity is currently unknown; however, preliminary estimates indicate that it may be close to 6 square miles (1,536 hectares). Thus, most remaining habitat patches cannot be expected to support the species indefinitely.

Populations occupying fragments can be more easily extirpated from unpredictable natural catastrophes such as floods, fires, or disease outbreaks. Many of the habitat patches supporting the species are less than 10 acres (4 hectares) in size. Areas this small support such low numbers of Stephens' kangaroo rats that fluctuations in birth and death rates, unequal sex ratios, and loss of genetic diversity can be expected to adversely affect the survival of these populations.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based upon this evaluation, the preferred action is to list the Stephens' kangaroo rat as endangered. Threatened status would not adequately reflect the drastic habitat decline that already has occurred and the continued rapid habitat loss that is likely to occur in association with human activity. Although certain sites supporting the species receive some protection, these areas have management problems that could adversely affect the kangaroo rat. For the reasons given below, a critical habitat designation is not included in this rule.

Critical Habitat

Section 4(a) of the Endangered Species Act, as amended, requires that "critical habitat" be designated "to the maximum extent prudent and determinable," at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent or determinable for *D. stephensi* at this time. For example, as discussed after factor "A" in the "Summary of Factors Affecting the Species," some landowners or project developers have disked or plowed their lands upon the discovery of this species. Populations in other areas have mysteriously disappeared following discovery, possibly from rodenticide use.

Prevention of take, as described in Section 9 of the Act, would be difficult to enforce under these circumstances. Publication of critical habitat descriptions and maps would likely make the species more vulnerable and increase enforcement problems. Affected parties and landowners will be notified of the location and importance of protecting this species' habitat. Protection of the species' habitat will be addressed through the recovery process and through the Section 7 jeopardy clause as described below.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, County, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or to destroy or adversely modify its critical habitat. If a proposed Federal action may affect a listed species, the responsible Federal agency must enter into formal consultation with the Service.

Several Federal actions may involve *D. stephensi*. The Bureau of Land Management owns several isolated parcels supporting the species (Hicks and Cooperrider 1975). The Bureau is interested in consolidating its land holdings within this area and has proposed that this effort could result in the formation of all or part of a reserve for this species. The Veterans Administration or Federal Housing Administration may finance housing loans in areas where the species now

occurs. The U.S. Army Corps of Engineers may permit or carry out flood control projects in sandy washes where the species has been found. The U.S. Air Force has proposed activities such as a housing development project on March Air Force Base which may involve the Stephens' kangaroo rat. The U.S. Marine Corps and U.S. Navy also own land that supports this species. To facilitate survival of the kangaroo rate on public lands, it would be necessary to carry out conducive management activities, such as preserving natural habitat where it now exists, conducting controlled burns to keep vegetation at the low densities favored by the species, and other activities.

The Act and implementing regulations found at 50 CFR 17.21, set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import, or export, ship in interstate or foreign commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared

in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

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Author

The primary author of this rule is Karla Kramer, U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, CA 92656 (714) 643-4270 or FTS 796-4270.

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Regulation Promulgation

Part 17—[AMENDED]

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*); Pub. L. 99-625, 100 Stat. 3500 (1986), unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under "Mammals," to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

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(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
Rat, Stephens' Kangaroo.....	<i>Dipodomys stephensi</i>	U.S.A. (CA).....	Entire.....	E	338	NA	NA

Dated: September 22, 1988.

Susan Recce,

*Acting Assistant Secretary for Fish and
Wildlife and Parks.*

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