

FIVE-YEAR STATUS REPORT

I. COMMON NAME: Stephens' Kangaroo Rat
SCIENTIFIC NAME: Dipodomys stephensi
CURRENT CLASSIFICATION: Threatened

II. RECOMMENDED ACTION:

Change Threatened classification to Endangered

III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

The Threatened classification of the Stephens' Kangaroo Rat (SKR) was based on the knowledge of the status of the species when it was originally classified in 1971. Since that time, information including that assembled by the U.S. Fish and Wildlife Service (FWS) in support of a federal listing package indicates that the SKR is in danger of extinction. Thus, the Department of Fish and Game (DFG) recommends that the classification be changed to Endangered.

IV. NATURE AND DEGREE OF THREAT:

The greatest single threat to the continued existence of the SKR continues to be the destruction or degradation of its grassland or sparsely vegetated shrubland habitat. This habitat is being lost at an alarming rate, particularly in Riverside County. "The extensive habitat loss throughout the range of D. stephensi...has resulted in only isolated populations of the animal. These populations occupy small areas and are vulnerable to habitat loss" (Thomas 1975). "Agricultural development of the low-lying lands of the San Jacinto Valley and vicinity has destroyed much of the preferred habitat of stephensi" (Bleich 1977). The SKR is found in annual grasslands and "the narrow ecotonal area formed at the transition between annual grassland and sage scrub habitat. This latter usually occurs at the base of hills. Much of the existing grassland has been disked for pasture for livestock, which effectively removes Stephens' kangaroo habitat. Thus, the species has been pushed into marginal ecotonal areas that are becoming disjunct in distribution due to various agricultural practices and other forms of human disturbances. The resulting situation has produced a patchy dispersion with little or no movement corridors between isolated patches. These islands of habitat are, in many cases, extremely small (less than 4 acres) and the threat of extirpation or critical inbreeding is great" (O'Farrell et al. 1985).

Although most of the early habitat loss was due to agricultural development (and that development continues today), the more recent loss is due largely to urban and suburban development. The SKR seems to prefer relatively flat areas, either in the valleys or on tops of hills or on saddles between hills. These flat areas are particularly desirable for the building of single family homes.

The question of the impact on the SKR of the use of rodenticides has been raised. It is not known whether the SKR is being impacted by such use.

V. HISTORIC AND CURRENT DISTRIBUTION:

Grinnell (1922) reported the distribution of the SKR as "San Jacinto Valley and vicinity, western Riverside County and extreme southern San Bernardino County." Lackey (1967) found that the SKR was also present in the Bonsall area of northern San Diego County. Thomas (1973) found additional populations in the San Luis Rey River area of San Diego County, west of the Bonsall location. Bleich and Schwartz (1974) reported the SKR from the Fallbrook Annex of the Seal Beach Naval Weapons Station, which is west of locations established by Thomas (1973). Bleich (1977) thus summarized the known distribution of the SKR as "the San Jacinto Valley and adjacent areas of western Riverside, southwestern San Bernardino, and northwestern San Diego counties." In a survey of U.S. Bureau of Land Management lands, Hicks and Cooperrider (1977) found the SKR at nine sites not previously reported. These sites did not appreciably change the limits of the known range.

O'Farrell *et al.* (1986) have reported an addition to the known range of the SKR in an unnamed valley near Lake Henshaw in San Diego County. This population is approximately 42 km from the nearest point of the previously known range.

Several significant populations of the SKR are located in the central portions of Camp Pendleton Marine Corps Base and are currently under study.

The discovery of previously unknown sites does not balance the loss of known sites. Ongoing habitat destruction for residential, agricultural, and other purposes has resulted in smaller and disjunct populations which have a greater probability of extinction than did populations in the once large and interconnected habitats.

The FWS (1987) has stated that sites from which the SKR has been recorded can be grouped into eight general areas. "From north to south, these areas are: (1) March Air Force Base to the Moreno Valley, (2) Lake Perris to the eastern side of the San Jacinto Valley, (3) Lake Mathews to Estelle Mountain, (4) the Lakeview Mountains, (5) the vicinity of Lake Elsinore, (6) Lake Skinner to Temecula, (7) Fallbrook Naval Weapons Annex to the San Luis Rey River, and (8) the vicinity of Lake Henshaw. The first six areas are in Riverside County and the last two in San Diego County" (FWS 1987).

"Only three of these areas still contain substantial habitat for D. stephensi. O'Farrell (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, has probably been extirpated between the latter facility and the San Luis Rey River. Another area of about 17,000 acres (6,800 hectares), between Lake Mathews and Estelle Mountain, still contains some suitable habitat, though much of this acreage has been lost to agriculture and urban development and some of it has too great a vegetation cover to support the kangaroo rat. The species is likely to be extirpated from this entire area because of several planned housing and agricultural developments, except for 2,500 acres of habitat within a State ecological reserve" (FWS 1987).

"Of the remaining five areas, two, March Air Force Base to Moreno Valley and Lake Skinner to Temecula, evidently no longer support viable populations of D. stephensi. The species also has not been recorded at Lake Perris since 1973, and, 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 acres are now thought to contain adequate habitat. The last area, in the vicinity of Lake Elsinore, contains some U.S. Bureau of Land Management parcels, but survival of the kangaroo rat there is tenuous because of rapid surrounding urbanization and an expected increase in casual human use (off-road-vehicles already have been noted). Outside of these parcels, the species will be unlikely to survive extensive housing developments. The Devers-Serrano Power line right-of-way passes through this area, but is probably not wide enough to accommodate a viable kangaroo rat population" (FWS 1987).

"Further compounding the fragmented nature of the current distribution is the fact that Stephens' kangaroo rat does not occupy all apparently suitable habitat. Grazing, off-road-vehicle activity (common in southern California), and rodent control programs all reduce habitat suitability" (FWS 1987).

VI. HISTORIC AND CURRENT ABUNDANCE:

There is no estimate of historic abundance. As with most small mammals, the numbers of the SKR probably change significantly over time as climatic factors vary. Few population data are available. Thomas (1973) reported summer densities no higher than 12.5 SKR per ha. Bleich and Schwartz (1974) reported summer population density in annual grassland as 7.5 SKR per ha and in the Haplopappus association of the coastal sage scrub community as 33.8 per ha. O'Farrell and Clark (1985) estimated 3.88 to 9.71 SKR per ha on six sites in western Riverside County during the summer. However, techniques for determining abundance and density values have varied, and it is difficult to compare the results of any study to others. In addition, trappability of the SKR is highly variable, depending on behavior and season of year.

VII. SPECIES DESCRIPTION AND BIOLOGY:

The SKR is a member of the mammalian Family Heteromyidae, which includes kangaroo rats, kangaroo mice, and pocket mice.

The SKR, like all kangaroo rats, has extremely long hind legs, small front legs and feet, and a white belly. The SKR has 5 toes on each rear foot. It is difficult to separate in the hand from the very similar Pacific Kangaroo Rat (D. agilis).

As with all kangaroo rats, the SKR burrows into the ground for living sites and is nocturnal. It eats seeds and probably fruits, leaves, stems, buds, and insects.

VIII. HABITAT REQUIREMENTS:

"The close association between [the SKR] and sparsely vegetated habitats has been well documented (Grinnell, 1933; Lackey, [1967]; Bleich, 1973; Bontrager, 1973; Thomas, 1973; Bleich and Schwartz, 1974; Thomas, 1975). [The SKR has been found] in a mixture of sagebrush and annual grasslands in the Santa Ana Mountains. Bleich (1973) captured stephensi in the Annual Grassland Community, and in the Haplopappus Association of the Coastal Sage Scrub Community; these habitats are characterized by sparse perennial vegetation. Bontrager (1973) reported stephensi from the annual grassland plant formation on the Santa Rosa Plateau, Riverside County. Lackey [1967] found stephensi in open types of habitat, taking only a few specimens in light chaparral immediately adjacent to a field in which that species was abundant" (Bleich 1977).

"Stephens' kangaroo rat is restricted to gravelly soils in the Santa Ana Mountains.... Near Fallbrook, stephensi was found on soils containing high percentages of granule gravel (Bleich 1973). Lackey [1967] reported stephensi from habits having soils neither extremely dense nor largely sand. Bontrager (1973) found stephensi most abundantly in areas having extremely sandy soil. Bleich (1973) and Thomas (1975) hypothesized that soil types or vegetation density, or a combination of the two, may be ecological factors limiting the distribution of stephensi" (Bleich 1977).

In their San Diego County study, O'Farrell et al. (1986) stated that "[p]reliminary results indicate D. stephensi avoids soils high in clay content. Abundance appears to be inversely related to vegetative ground cover and standing litter height, and appears to be greater when there is a greater contribution of Erodium and Eremocarpus as opposed to annual grasses."

"Thomas (1975) noted that the stephensi commonly inhabited previously disturbed areas, and offered explanations for this observation. He also speculated that stephensi utilizes old pocket gopher (Thomomys bottae burrows" (Bleich 1977).

"There are two primary plant species found in the stephensi habitat type, Eriogonum fasciculatum and Artemisia californica. Coincidentally these species, especially E. fasciculatum, are prime invaders where

secondary succession is occurring. This gives an idea of the past status of the habitats where stephensi is found to occur today" (Thomas 1973).

O'Farrell et al. (1986) state that the SKR "is restricted to annual grasslands (Bleich, 1977) and the narrow ecotonal area formed at the transition between annual grassland and sage scrub habitat." They go on to say that "[i]t is evident that D. stephensi is only patchily distributed within the relatively narrow geographic confines in areas where it occurs. Part of this is due to the patchy distribution of suitable habitat and part is due to habitat alteration or destruction. The former possible connections between these disjunct populations are currently occupied with urban and agricultural development. Although new locations may be found, the number of extirpations due to human encroachment speaks eloquently for the need to protect the remaining populations of this species."

IX. CURRENT AND RECOMMENDED MANAGEMENT:

The chief management need in conservation of the SKR is protection of habitat in as many sites of meaningful size as possible. The most critical need is in the San Jacinto Valley of western Riverside County.

Since 1985 the DFG has participated with the Sierra Club, FWS, and private individuals in an effort to convince the County of Riverside to begin habitat conservation planning for the SKR. The concept which the parties would like to see the county embrace is one of protected areas. These areas might initially be those already protected in public ownership, and which might be added to through the use of mitigation purchases. In other words, the county might allow project proponents to develop in certain SKR habitats if the proponents agreed to mitigate for the loss of these habitats by purchasing land adjacent to the core areas. These protected areas would grow in size over time. A working list of areas in public ownership within Riverside County includes Lake Mathews Ecological Reserve and the San Jacinto Wildlife Area/Lake Perris State Recreation Area complex. Thus, protection of the SKR habitat on these state-owned or state-managed areas is of utmost importance. Habitat on lands in public ownership must be managed to achieve and maintain optimal habitat characteristics.

In 1986 the Laguna Niguel office of the FWS submitted a listing package for the SKR, proposing the animal as Endangered, to the Portland and Washington D.C. offices. In preparing the proposal, the FWS evaluated all available information, including that found in a number of Environmental Impact Reports (EIR's), and made field checks of previously known sites occupied by the SKR. The FWS's conclusion, from analysis of all data, was that the species is deserving of federal protection. The Service found that the SKR, as a state-listed species, is virtually ignored in EIR's.

In the analysis, the FWS determined that many, possibly more than half, of the historic sites for the SKR have been destroyed. Most of the remaining sites have no protection, i.e., they are not in public ownership and the present zoning is adverse. Because of the present

situation, the publicly-owned areas assume much greater importance to the survival of the SKR than might have been previously thought. Even if private sites could be protected, through zoning, fee purchase, or conservation easement, many of these sites may not be suitable due to small size. The average size of existing sites which currently have the SKR may be too small to support a self-sustaining population. In addition, there is a question about the impact of rodenticide use on the SKR, particularly in Riverside County.

"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 Stephens' kangaroo rat, only 8 percent of the land is zoned for uses compatible with the preservation of the species. Because not all of the habitat in the 6 percent is suitable, much less is really protected for the kangaroo rat. Although biological consultants have sometimes located the species and informed appropriate land owners or project proponents, the sites have nonetheless been disked or plowed" (FWS 1987).

The advantage of a federal classification of Endangered or Threatened for the SKR is that federal agencies which permit, finance, or undertake projects would be required to avoid or compensate for impacts to the SKR and its habitat. In addition, the habitat on non-federal lands would have a measure of protection under the federal Endangered Species Act, if an action to destroy or alter SKR habitat on these lands required federal approval, funding, or a permit. No such habitat protection is available under the California Endangered Species Act.

The FWS recently has published (19 November 1987) in the Federal Register a proposed rule to determine Endangered status for the SKR (FWS 1987). After a 60-day comment period, the FWS will have until 19 November 1988 in which to take final action on the proposed rule.

Surveys are necessary to determine the current status of the SKR within its range, in terms of numbers and distribution of occupied sites, extent and quality of habitat at each site, abundance of the SKR, and threats to the occupied areas. In addition, to more completely understand the biology of the species, specific studies are required to determine various aspects of life history, such as food habits, periods of activity, and dispersal.

Another subject of needed investigation is the restoration of degraded or former habitat (i.e., old fields), especially that adjacent to occupied areas. Experimental plots could be established to determine whether the SKR moves more readily into old fields under natural succession or into old fields which are seeded or planted to native vegetation.

The DFG has attempted to obtain federal Endangered Species Act grant-in-aid funds (popularly known as Section 6 funds) for surveys and studies of the SKR as described above. Because the SKR is not yet classified as a federal Endangered or Threatened species, the priority for funds is

low within the FWS. The state endangered species tax check-off program is a possible source of funds for some of the needed SKR work. Indeed, funds from this program are available for studies in FY 87-88.

A recovery plan which would incorporate elements of the management needs discussed herein should be prepared.

In summary, the management needs of the SKR in priority area as follows:

1. Protection and management of habitat on public lands, including degraded habitat and former habitat recently in agriculture.
2. Protection and management of habitat not currently in public ownership through establishment of a series of preserves, particularly in Riverside County.
3. Classification of the SKR as an Endangered species by the federal government.
4. Determination of the current status of the SKR, in terms of distribution, numbers, quality and extent of habitat at all sites, and threats to the sites; and periodic surveys (at least every five years) to repeat the status determination.
5. Preparation of a recovery plan which would incorporate the elements of protection and restoration of habitat, the establishment of core preserves, and surveys and studies.
6. Restoration of degraded or suitable former habitat.
7. Studies to determine various aspects of the life history of the SKR.
8. Investigation of the impacts of rodenticides on the SKR.
9. Reclassification of the SKR by the Fish and Game Commission to Endangered from Threatened.

X. SOURCES OF INFORMATION:

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