BEFORE THE UNITED STATES DEPARTMENT OF INTERIOR AND
THE UNITED STATES FISH AND WILDLIFE SERVICE

In the Matter of the Petition to Delist
the Stephens' kangaroo rat
(*Dipodomys stephensi*) under the
Endangered Species Act

PETITION OF THE RIVERSIDE COUNTY FARM BUREAU AND THE CENTER FOR ENVIRONMENTAL SCIENCE, ACCURACY & RELIABILITY TO DELIST THE STEPHENS' KANGAROO RAT UNDER THE ENDANGERED SPECIES ACT

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TABLE OF CONTENTS

TABLE OF AUTHORITIES

INTRODUCTION

Petitioners Riverside County Farm Bureau and the Center for Environmental Science, Accuracy & Reliability (CESAR) hereby petition the United States Department of Interior and the United States Fish and Wildlife Service, pursuant to Section 4(b)(3), 16 U.S.C. § 1533(b)(3), of the Endangered Species Act (ESA), *id.* §§ 1531-1544, to delist the Stephens' kangaroo rat (*Dipodomys stephensi*).

PETITIONERS

The Riverside County Farm Bureau is an independent, voluntary membership organization that represents the interests of agriculture in Riverside County. The Farm Bureau is one of 53 farm bureaus in California. The Farm Bureau has worked to protect agricultural interests in Riverside County for nearly a century. The Stephens' kangaroo rat resides, among other places, in Riverside County. Therefore, the rat's listing affects many landowners in Riverside County, including members of the Farm Bureau. Because of the stringent land-use restrictions that the rat's listing triggers, property of Farm Bureau members has lost significant value. For the same reason, Farm Bureau members have been unable adequately to protect their property from wildfire.

CESAR is a California nonprofit corporation. Its primary purposes are to bring scientific rigor to regulatory decisions undertaken pursuant to

environmental statutes, and to ensure consistent application of these statutes throughout all industries and sectors. CESAR believes that achieving these goals will generate additional support for environmental statutes, because the results of and bases for regulatory actions will be transparent and supported by science. CESAR believes that these goals will be furthered by withdrawing the rat's listing, which has been based largely on surmise and untested assumptions about rat population dynamics.

BACKGROUND

The Stephens' kangaroo rat is a small, nocturnal mammal, more closely related to squirrels than to other rodents. 75 Fed. Reg. 51,204 (Aug. 19, 2010). It has a "large head, external cheek pouches, elongated rear legs used for jumping, and relatively small front legs." 53 Fed. Reg. 38,465, 38,465 (Sept. 30, 1988). The average size of the adult rat is 11 to 12 inches in length; its average weight is a little more than two ounces. *Id.* The rat digs burrows for sleeping and nesting as well as for the storage of seed, its primary food. 75 Fed. Reg. at 51,206-07.

Historically, the rat's range encompassed the Perris and San Jacinto Valleys of western Riverside County, California, and the San Luis Rey and Temecula Valleys of northern San Diego County, California. 53 Fed. Reg. at 38,465. The rat's preferred habitat is sparse vegetation, generally level land, and soil that is neither too dense nor too sandy. 75 Fed. Reg. at 51,207.

Despite loss of habitat over the recent centuries, the rat continues "to persist in areas throughout [its] native range." 75 Fed. Reg. at 51,206.

In 1988, the Service listed the rat as an endangered species. *See* 53 Fed. Reg. at 38,469. The Service explained that the principal reason for the listing was the rat's loss of habitat, the effects of which were exacerbated by the remaining habitat's fragmentation. *See id.* at 38,468. At that time, only 11 rat populations were known to persist. *See* 75 Fed. Reg. at 51,205-06.

In 1995 and again in 2002, the Farm Bureau petitioned the Service to delist the rat. The primary basis offered for delisting was that the Service's 1988 listing determination had underestimated the rat's population and its available habitat. *See id.* at 51,205. In 2004, the Service determined that the Farm Bureau's petition contained substantial information indicating that delisting may be warranted. Among that information, the Service specifically noted: (1) expansion of the rat's range since its listing; (2) prior overestimation of the negative effects of a variety of land uses on the rat; and (3) habitat preservation since listing. *See* 69 Fed. Reg. 21,567, 21,568-69 (Apr. 21, 2004).

In 2010, the Service issued its tardy 12-month finding on the Farm Bureau's petition, determining that the rat's delisting was not warranted. *See* 75 Fed. Reg. at 51,204. The12-month finding notes that, since the rat's listing, additional rat populations have been discovered and much habitat protected. *See id.* at 51,205-06, 51,209-10. Nevertheless, the 12-month finding concludes

that threats to the rat's continued existence persist and are severe. *See id.* at 51,218. The 12-month finding adds that habitat fragmentation, coupled with the rat's purportedly restricted range, exacerbate these threats because they increase the likelihood of extinction by random ("stochastic") events. *See id.* at 51,221. The 12-month finding concludes that, although conservation efforts have helped the rat's recovery, these advances do not fully remedy the threats from habitat loss and fragmentation. *See id.* at 51,222.

Within a year of this finding, the Service completed a status review of the rat. *See* Exhibit 1 (5-Year Review, Short Form Summary). *Cf.* 16 U.S.C. § 1533(c)(2) (requiring the Service to review the status of listed species every five years). The review acknowledges the Service's 12-month finding that delisting is not warranted, but explains that the Farm Bureau's delisting petition did not request the Service to decide whether downlisting to threatened status would be warranted. *See* Exh. 1 at 1. The review observes that, since the rat's proposed listing, the number of known populations has more than doubled. *See id.* at 2. The additional populations, the review asserts, will help counteract the negative effects of small population size and habitat fragmentation noted in the Service's 12-month finding. *See id.* The review then rehearses the rat's draft recovery criteria, which the Service published in 1997: Criterion 1 requires the establishment of four rat preserves in western Riverside County; Criterion 2 requires the establishment of one rat preserve in western San Diego County. *Id.* at 3. The review concludes that the

existing reserves in Riverside and San Diego Counties are sufficient at least to blunt the threats of habitat destruction and fragmentation. *Id.* at 4. The review therefore recommends, among other actions, that the rat be downlisted to threatened status. *Id.* at 7.

ARGUMENT

I

DELISTING IS WARRANTED BASED ON A CORRECT ANALYSIS OF THE RAT'S DISPERSAL ABILITY

The Service's 12-month finding concludes that delisting is not warranted, notwithstanding that, since the listing, many previously unknown rat populations have been discovered and thousands of acres of rat habitat have been protected. *See* 75 Fed. Reg. at 51,205-06, 51,211-12. The Service's five-year status review nevertheless acknowledges that the additional populations and protected habitat have substantially mitigated the rat's primary threat of habitat destruction and fragmentation. *See* Exh. 1 at 4.

The Service's qualification of all rat threats is significantly overstated, because the Service improperly assumes that the rat cannot disperse far from its home burrows. That error is critical because it leads the Service to overplay the threat of stochastic-event extinction, a threat that fragmented habitat and small population size exacerbate. *Cf.* 75 Fed. Reg. at 51,221. If, however, one correctly assumes a greater rat dispersal ability (and thus a better likelihood

that rats from burrow X can repopulate or simply escape to burrow Y), the rat's habitat is not severely fragmented, and thus the rat is not particularly susceptible to stochastic-event extinction or other threats common to species residing in fragmented habitat (such as inadequate exchange of genetic material).

As set forth below, the best scientific data indicate that the original listing and the 12-month finding overstate the rat's threats, and therefore under-qualify the rat's habitat recovery. Consequently, regardless of whether it merited listing in 1988, the rat should no longer be listed. *Cf.* 50 C.F.R. § 424.11(d)(2)-(3).

A. The Service's Rat Population Analysis in the Listing and 12-Month Finding Is Fundamentally Flawed

Although the Service has relied heavily on the rat's purported small population size and fragmented habitat to justify the rat's continued listing, the agency has never really defined what it means by population or the assumptions it uses in its population analysis. To begin with, neither the original listing decision nor the 12-month finding defines "small population size" or provides a threshold number below which a rat population would be considered "small." Thus, the term "small population size," so critical to the Service's threats analysis, could refer to any population size. Moreover,

neither the original listing nor the 12-month finding defines a rat population spatially, *i.e.*, in a manner explaining how the spatial arrangement of habitat patches might constitute a "population" or "meta-population." The absence of any definition renders nonscientific the evaluation of the threats to small rat populations and leaves the term "small population size" open to any number of varying interpretations by the Service and rat researchers.

An excellent example of the effects of this arbitrary and flawed approach to population analysis is the study of O'Farrell & Uptain (1989), which the 12-month finding relies on for rat population analysis. *See* 75 Fed. Reg. at 51,210, 51,221. The study reports that, by 1989, 51 rat populations had been extirpated, out of a total of 132 known or potential populations. O'Farrell & Uptain (1989) at 5. Yet an examination of the location of these "populations" plotted on the study's maps[1] reveals that the majority are in close proximity to one another (within one kilometer), comfortably within the rat's undisputed dispersal range. Thus, the population loss that the O'Farrell & Uptain study quantifies, and on which the 12-month finding relies, is significantly overestimated because it fails to account adequately for the rat population persistence through dispersal.

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[1] O'Farrell & Uptain (1989), App.1, at 20.

Another reason for the importance of defining "small population size" is that models estimating extinction probability depend on inputs of population density, area, and threshold (*i.e.*, the point below which model deems the population "extinct"). Because it has never defined a rat "population" or "small population size," the Service is incapable of analyzing rat population dynamics with a standard population model.[2] For the same reason, the Service cannot identify small population size as an exacerbating threat to the rat's existence. In fact, the O'Farrell & Uptain study concedes that, "[w]ithin the area surveyed for this report, . . . [the rat] populations were arbitrarily designated based on geographic cohesiveness," and "[s]everal of [the study's] designated populations probably have interchange," notwithstanding the study's assumption that they were isolated. O'Farell & Uptain (1989) at 5.

Relying on the O'Farrell & Uptain study, the Service asserts in its 12-month finding that the "majority of remaining . . . rat populations occur in small, isolated areas (habitat patches) and are fragmented from a wider historical distribution." 75 Fed. Reg. at 51,221. Again, the agency's conclusion rests on what is deemed a rat "population." But as demonstrated above, qualifying the threat of habitat fragmentation (or any other threat

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[2] Although O'Farrell & Uptain (1989) counted 132 rat populations, the study conceded that the count was the result of arbitrary designation based on geographic cohesiveness.

pertinent to population size) depends on how one defines a population size: the smaller the number of rats needed to qualify as a population, the more populations one will have and the greater the likelihood of fragmentation among those populations. Any conservation conclusion drawn from such an analysis, however, is necessarily arbitrary where the key variable—a rat "population"—is not explicitly defined and any implicit definition is left unexplained.

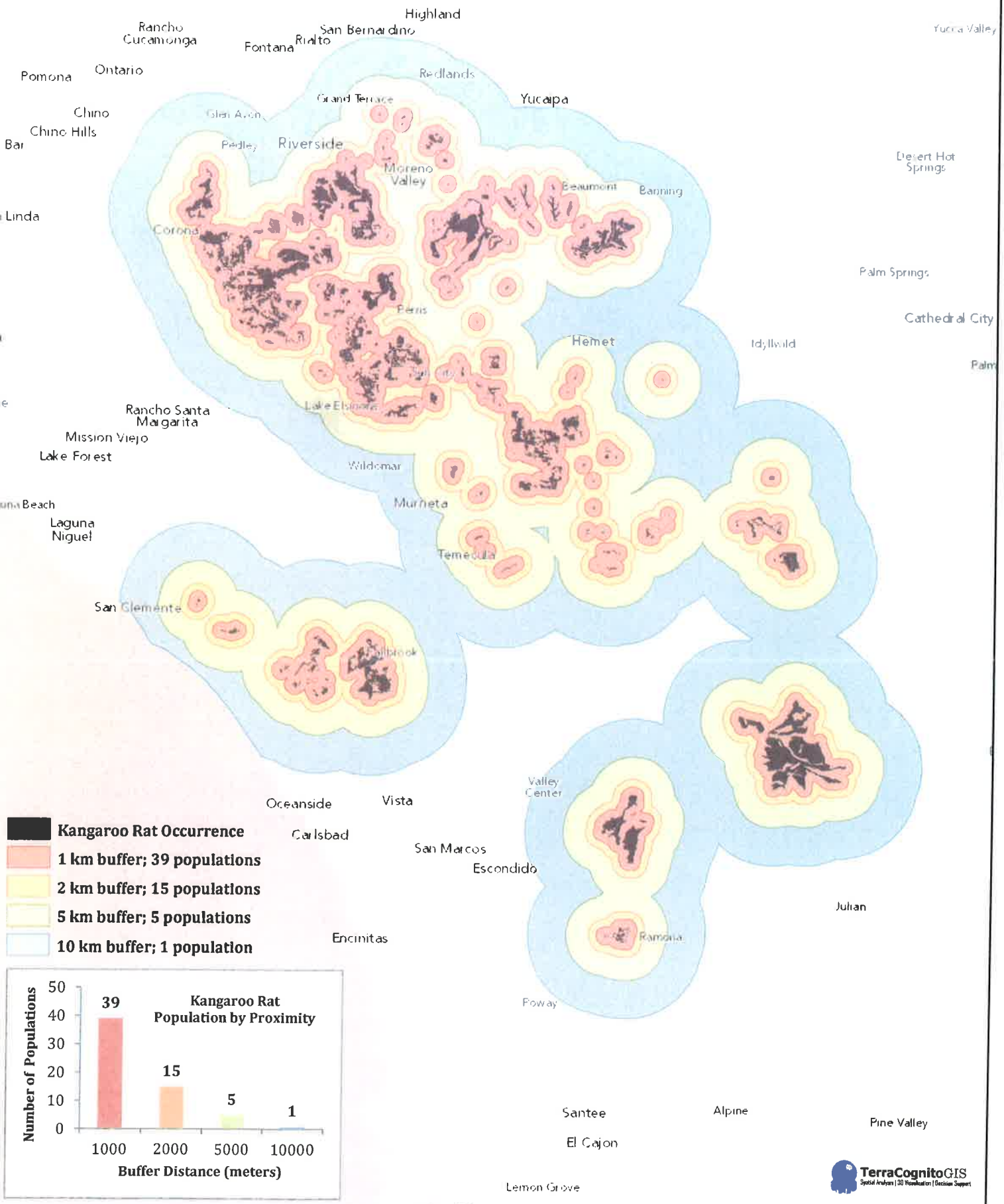
Compounding this analytical error is the Service's failure to account for a downward population bias owing to prior underestimates of the rat's dispersal ability, as well as the inaccurate assumption that dispersal rates are equal throughout the rat's range. For example, the 12-month finding relies on Price, *et al.* (1994), for the proposition that the rat is highly "sedentary" and thus unlikely to disperse across large distances. *See* 75 Fed. Reg. at 51,207. Yet the Price study concedes that the rat *is* capable of longer dispersal. *See* Price, *et al.* (1994) (male rats recorded to have traveled from 400 meters to 1,040 meters). In fact, the study's results "underscore th[e] systematic underestimation of long-distance dispersal."

For these reasons, the Service's rat population analysis is unreliable. The following section confirms that conclusion with a corrected population analysis.

B. The Rat's Population Dispersal Ability Is Much Greater Than the Service Has Asserted, and Thus the Threats of Fragmentation and Inadequate Genetic Exchange Have Been Overstated

To test the hypothesis that the Service has underestimated dispersal rate distances, CESAR scientists performed a new population analysis using the Service's own rat population data and applying various definitions of populations based on different dispersal distances. The analysis illustrated by Figure 1 below compares the number of rat populations in occupied rat habitat (black) as defined by potential dispersal buffers of 1 km (red), 2 km (yellow), 5 km (green), and 10 km (blue). The number of contiguous rat populations within each buffer category is listed.

Kangaroo Rat: Number of Populations by Proximity



The number of populations that the Service's data can support illustrates the importance of defining a "population." If each contiguous polygon of occupied habitat is treated as a separate population, there are 884 separate, small, and isolated rat populations. Yet that scenario is not realistic because even a limited dispersal of one kilometer or less would result in these otherwise small and isolated populations being joined into fewer but larger contiguous populations.

The CESAR analysis demonstrates: 39 rat populations based on a one-kilometer buffer; fifteen larger populations based on a two-kilometer buffer; five very large populations based on a five-kilometer buffer; and one extremely large population based on a ten-kilometer buffer. The summary statistics for each of these categories (in hectares) are presented in Table 1.

Buffer Distance (km)	*Number of Populations*	*Mean Area (ha)*	*Min. Area (ha)*	*Max. Area (ha)*	*Range*	*Standard Deviation*
0	884	25	0	3,296	3,296	142
1	39	3,558	384	33,525	3,3142	6544
2	15	15,293	1,393	152,696	151,303	38371
5	5	89,561	8,188	318,505	310,316	128871
10	1	754,660	754,660	754,660	0	0

Table 1. Number and size of Stephens' kangaroo rat populations when occupied habitat patches are connected by dispersal buffers of zero, one, two, five, and ten kilometers. Occupied habitat data provided by the U.S. Fish & Wildlife Service.

These results support two significant conclusions. First, even with a limited dispersal of one or two kilometers (the most probable range of rat dispersal ability), there would be fewer but far larger rat populations than

previously reported by O'Farrell & Uptain (1989). That fact undercuts the Service's conclusion that the rat is peculiarly susceptible to threats associated with habitat fragmentation and small populations, such as stochastic catastrophic events and inadequate genetic exchange. Second, the analysis provides a quantifiable basis for the recognition of rat population extent and size (an analysis that the Service has not undertaken). Consequently, the 12-month finding's conclusion that threats from habitat fragmentation and small population size persist and thereby undercut any gains made in habitat preservation, *see* 75 Fed. Reg. at 51,222, is no longer accurate. Delisting is warranted.

CONCLUSION

For the foregoing reasons, the Farm Bureau and CESAR petition for the delisting of the Stephens' kangaroo rat.

DATED: November 7, 2014.

Respectfully submitted,

DAMIEN M. SCHIFF
PAUL J. BEARD II

By _____
DAMIEN M. SCHIFF

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EXHIBIT 1

5-YEAR REVIEW

Short Form Summary

Species Reviewed: Stephens' kangaroo rat
(*Dipodomys stephensi)*

Current Classification: Endangered

FR Notice announcing initiation of this review: 69 FR 21567.

Endangered and threatened wildlife and plants; 90-day finding on petition to delist the Stephens' kangaroo rat and initiation of a 5-year review

Lead Regional Office:

Larry Rabin, Deputy Division Chief for Listing, Recovery, and Environmental Contaminants, Region 8; 916–414–6464.

Lead Field Office:

Jim Bartel, Carlsbad Fish and Wildlife Office; 760–431–9440.

Name of Reviewer(s):

Susie Tharratt, Carlsbad Fish and Wildlife Office; 760–431–9440.

Methodology used to complete this 5-year review:

On April 21, 2004, we announced a 90-day finding that a 1995 delisting petition presented substantial information to indicate the petitioned action may be warranted and initiated a status review under section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (Act). In the same Federal Register notice, we initiated this 5-year review (Service 2004, pp. 21567–21569). The 12-month finding, in response to the 1995 petition, published in the Federal Register on August 19, 2010 (Service 2010, pp. 51204–51223) and found that the species should not be delisted at this time. We compiled the best scientific and commercial information available regarding past, present, and future threats faced by the species, and used that information to assess the status of the Stephens' kangaroo rat in our 12-month finding. Our determination included an analysis of the information provided in the delisting petition as well as other available information on the current status of and threats to Stephens' kangaroo rat compared to when it was listed as endangered on September 30, 1988 (Service 1988, p. 38465). Although that 12-month finding concluded that the species should not be delisted at this time, it does not address the question as to whether or not the species warrants downlisting. Included here is a brief summary of the information in the 12-month finding; for a complete analysis, please refer to the 12-month finding.

Application of the 1996 Distinct Population Segment (DPS) Policy:

The Act defines "species" as including any subspecies of fish or wildlife or plants, and any distinct population segment (DPS) of any species of vertebrate wildlife. This definition of species under the Act limits listing as DPS to species of vertebrate fish or wildlife. The 1996 policy regarding the recognition of distinct vertebrate population segments under the Endangered Species Act (Service 1996, pp. 4722–4725) clarifies the interpretation of the phrase "distinct

population segment" for the purposes of listing, delisting, and reclassifying species under the Act. Stephens' kangaroo rat was listed as endangered in 1988. Stephens' kangaroo rat is not listed as a DPS, and no new information exists to suggest that this species should be listed as a DPS.

Review Analysis:

Please refer to the 12-month finding published in the Federal Register on August 19, 2010, for a complete discussion of the species status (including biology and habitat), five-factor analysis, and an evaluation of ongoing management efforts (Service 2010, pp. 51204–51223).

The Stephens' kangaroo rat was listed as endangered on September 30, 1988. Based on the best available information at that time, we determined that the Stephens' kangaroo rat was threatened by the following factors: habitat loss resulting from widespread, rapid urbanization and agricultural development; fragmented and isolated populations; reduction of habitat suitability (from anthropogenic activities including grazing, off-highway vehicle use, disking, plowing, introduction of nonnative vegetation, and rodent control programs); predation by domestic cats; and the lack of existing regulatory protections.

In the 12-month finding and in this 5-year review, we find that the threats to Stephens' kangaroo rat remain similar today to those identified at listing in 1988, with additional impacts from nonnative plant species and climate change. However, the primary and imminent threat at the time of listing, habitat destruction from urban and agricultural development resulting in isolated habitat patches, has been largely ameliorated through the implementation and design of the core reserve system in western Riverside County (through the Stephens' Kangaroo Rat Habitat Conservation Plan), through ongoing land acquisitions and easements, and with other conservation plans and efforts (Multiple Species Habitat Conservation Plan (MSHCP) and Integrated Natural Resource Management Plans (INRMPs)). The Stephens' kangaroo rat population at Camp Pendleton and Detachment Fallbrook in San Diego County is covered by active INRMPs that include actions to provide for the long-term conservation of the Stephens' kangaroo rat on Federal military lands. Significant areas of habitat have been conserved and managed in Riverside and San Diego Counties since the species was listed.

Data collected since 1988 show that the species continues to be restricted to a relatively small geographic area where it is dependent on sparsely vegetated, forb-dominated grasslands. New areas not known at listing have since been identified as a result of more focused research efforts and consultations. In the proposed listing rule, we identified eight general areas where the species was recorded (Service 1987, p. 44454). At least 15 geographical areas are currently known to be occupied by Stephen's kangaroo rat (Service 2010, p. 51205). The documentation of additional occupied areas, as well as some of the largest remaining populations (e.g., Rancho Guejito in San Diego County) of the species in Riverside and San Diego Counties, expands the known range of the species. These populations can potentially contribute to genetic diversity and the amelioration of effects from small population size and risks associated with reduced genetic variability and inbreeding.

Recovery Criteria:

We published a draft recovery plan for the Stephens' kangaroo rat on June 23, 1997 (Service 1997, pp. 1–71), but it has not been finalized. The draft recovery plan provides recovery guidance and a benchmark for delisting or downlisting the species. Criteria in the draft recovery plan to reclassify the Stephens' kangaroo rat do not reflect the most current information. The recovery criteria were developed using information available in 1997, and additional occurrences occupied by Stephens' kangaroo rat have since been identified. While recovery plans are intended to guide actions to recover listed species and to provide measurable objectives against which to measure progress towards recovery, precise attainment of the recovery criteria is not a prerequisite for downlisting or delisting.

The draft recovery plan for Stephens' kangaroo rat outlined a twofold strategy (consistent with direction established at listing in 1988) to recover the species and established the following criteria for downlisting the species from endangered to threatened:

1. Establishment of four reserves, which encompass at least 6,070 hectares (15,000 acres) of occupied habitat that are permanently protected, funded, and managed and are located in western Riverside County; and

2. establishment of one ecosystem-based reserve in either western or central San Diego County that is permanently protected, funded, and managed.

Our review of the recovery criteria in the draft recovery plan for Stephens' kangaroo rat indicates both small, isolated reserves and larger ecosystem-based reserves have been established that help to ameliorate the threat of urban development. The Riverside County Habitat Conservation Agency's Habitat Conservation Plan for the Stephens' Kangaroo Rat in Western Riverside County (the HCP) (see *Western Riverside County - Stephens' Kangaroo Rat Habitat Conservation Plan (HCP)* of the 12-month finding) has resulted in the conservation of eight reserves. The established eight reserves (including Potrero Valley) exceed the four reserves required by criterion 1 (see Table 3 of the 12-month finding). In San Diego County, active INRMPs at Marine Corps Base Camp Pendleton (Camp Pendleton) and Naval Weapons Station Seal Beach Detachment Fallbrook (Detachment Fallbrook) include actions to provide for the long-term conservation of Stephens' kangaroo rat on Federal military lands. The INRMPs are based, to the maximum extent practicable, on ecosystem management principles and provide for the management of Stephens' kangaroo rat and its habitat while sustaining necessary military land uses. Despite the fact that INRMPs may be superseded by the military's obligation to ensure readiness of the Armed Forces and are subject to discretionary funds and planning, the occurrence of the species and its habitat on Federal land, the existing INRMPs, and the continued consultation provisions of the Act provide some of the best assurances for long-term conservation of the species and its habitat. For the aforementioned reasons, Stephens' kangaroo rat occupied habitat and surrounding natural lands encompassed at Camp Pendleton and Detachment Fallbrook meet the intent of downlisting of Criterion 2 in the draft recovery plan for an ecosystem-based reserve in western San Diego County.

While the criteria in the draft recovery plan appropriately indicate the need for habitat protection and management of reserves, the criteria do not reflect the current conservation status and no longer adequately address the threats to the species. Our review of the strategy and objectives outlined in the draft recovery plan indicates that both types of reserves remain important for the long-term persistence of Stephen's kangaroo rat throughout its range. Recovery criteria should be modified and updated to incorporate new information regarding current threats to the species and the quality and maintenance of remaining habitat (Service 2010, p. 51204).

Synthesis:

In our 12-month finding, we determined that delisting was not warranted. For this review, we evaluated recovery progress based on the recovery criteria for downlisting in the draft recovery plan and considered the current threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act (please refer to the 12-month finding for the five-factor analysis). As discussed above, our review of the recovery criteria from the draft recovery plan for Stephens' kangaroo rat indicates that reserves in western Riverside and San Diego counties effectively have been established that address the primary and imminent threat at the time of listing, habitat destruction from urban and agricultural development. Substantial progress clearly has been made since listing in protecting and conserving habitat for Stephens' kangaroo rat. Nevertheless, additional management effort and alternative approaches likely will be needed over time to maintain this conserved habitat to ensure the species' long-term survival.

In conclusion, we carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. Based on this review of the factors affecting the species and an evaluation of the recovery progress to date, we conclude threats have been removed or their imminence, intensity, or magnitude reduced to the extent that the species is no longer in danger of extinction throughout all or a significant portion of it range. Despite this significant reduction in threats, non-conserved Stephens' kangaroo rat habitat continues to be impacted by urban and agricultural development, while nonnative species, off-highway vehicles, and the potential impacts associated with climate change continue to pose a threat to the species over the long term. As a result, Stephens' kangaroo rat best fits the definition of a threatened species, a species likely to become endangered within the foreseeable future, throughout all or a significant portion of its range. Therefore, we recommend a change in status from endangered to threatened at this time.

In making this determination to reclassify Stephens' kangaroo rat from endangered to threatened, we followed the procedures set forth in section 4(a)(1) of the Act and regulations implementing the listing provisions of the Act (50 CFR 424).

Recommendations for Future Actions:

1. Secure and conserve remaining large contiguous blocks of habitat and Stephens' kangaroo rat populations in southern portions of this species' range (i.e., San Diego County) that will lower the extirpation risks associated with lower genetic variability and smaller, fragmented populations.

2. Develop and adopt a systematic survey program for monitoring species status and trends across the range of Stephens' kangaroo rat. This objective will include standardization of habitat assessment methodologies across reserves and will require rigorous, detailed, and consistent surveys at appropriate regularity necessary to reliably determine an accurate population status and trend for the species.

3. Develop and adopt a centrally organized management plan which employs appropriate management techniques for maintaining suitable habitat quality for Stephens' kangaroo rat. The management plan will prevent habitat loss and degradation and restore degraded habitats through practices directed at increasing occupied habitat, including reduction of nonnative grass density and thatch buildup that inhibits species movement.

4. Revise the draft recovery plan to include threats-based and demographic criteria that objectively address current threats. Recovery criteria should be modified and updated to incorporate new information regarding current threats to the species and the quality and maintenance of remaining habitat (Service 2010, p. 51204).

5. Increase funding and support for investigations, which support translocation activities. Encourage hypothesis-driven studies that investigate effects of grazing, controlled burns, vegetation mowing, tilling and scraping as habitat management tools and which test their efficacy in site-specific locations.

6. Conduct genetic studies to examine gene flow over a more recent period that will help to clarify impacts of recent habitat fragmentation on Stephens' kangaroo rat genetics, and provide information on the frequency with which genetic exchange occurs between existing populations.

Literature Cited:

[Service] U.S. Fish and Wildlife Service. 1987. Endangered and threatened wildlife and plants; Determination of endangered status for Stephens' kangaroo rat. *Federal Register* 52:44453–44456.

[Service] U.S. Fish and Wildlife Service. 1988. Endangered and threatened wildlife and plants; Final rule to determine endangered or threatened status for the Stephens' kangaroo rat. *Federal Register* 53:38465–38470.

[Service] U.S. Fish and Wildlife Service. 1996. The 1996 policy regarding the recognition of distinct vertebrate population segments under the Endangered Species Act. *Federal Register* 61:4722–4725.

[Service] U.S. Fish and Wildlife Service. 1997. Draft recovery plan for the Stephens' kangaroo rat (*Dipodomys stephensi*). U.S. Fish and Wildlife Service, Region 1, Portland, Oregon. April 1997. 71 pp.

[Service] U.S. Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants; 90-day finding on petition to delist the Stephens' kangaroo rat and initiation of a 5-year review. *Federal Register* 69:21567–21569.

[Service] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; 12-month finding on a petition to remove the Stephens' kangaroo rat from the Federal list of endangered and threatened wildlife. *Federal Register* 75:51204–51223.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW

Stephens' kangaroo rat (*Dipodomys stephensi*)

Current Classification: Endangered

Recommendation Resulting from the 5-Year Review:

X Downlist to Threatened
Uplist to Endangered
Delist
No change needed

Review Conducted By: Carlsbad Fish and Wildlife Office

New Recovery Priority Number and Brief Rationale: 11

We recommend a change in the recovery priority number for Stephens' kangaroo rat from 2C to 11. The primary threat at listing was habitat destruction from urban and agricultural development. Impacts from these activities largely have been ameliorated through the implementation and the SKR HCP and Western Riverside County MSHCP, such that Stephens' kangaroo rat faces a moderate degree of threat. Though threats have been reduced, Stephens' kangaroo rat still faces a low recovery potential; continued management of conserved habitat is needed to further reduce current threats, and additional research and monitoring is needed to better understand biological and ecological limiting factors. Therefore, we recommend the recovery priority number be changed to 11.

FIELD OFFICE APPROVAL:

Lead Field Supervisor, U.S. Fish and Wildlife Service

Approve _____ Date July 19, 2011

Lead Assistant Regional Director, Ecological Services, U.S. Fish and Wildlife Service, Region 8

Approve _____ Date July 22, 11