

FIVE-YEAR STATUS REPORT

I. COMMON NAME: San Joaquin Antelope Squirrel
SCIENTIFIC NAME: Ammospermophilus nelsoni
CURRENT CLASSIFICATION: Threatened

II. RECOMMENDED ACTION:

Retain Threatened classification

III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

Cultivation of the San Joaquin Antelope Squirrel's (SJAS) habitat continues to be the single most important factor threatening this species. Currently no known habitat exists that is considered prime, and much of the habitat rated marginal to fair is under current threat of cultivation. There are virtually no public lands in the San Joaquin Valley which can serve as reserves for the SJAS. The only relatively large block of public land which might be of sufficient size to preserve the genetic diversity and sustain a population indefinitely is on the Department of Energy's (DOE) Elk Hills Naval Petroleum Reserve. This area is undergoing intense oil development now, and although this alone may not jeopardize all SJAS on the reserve, jeopardy is possible if the area becomes as heavily developed as the oil fields on nearby lands. There is a conflict between the oil development goals on the DOE properties and the goal of protecting Endangered and Threatened species. It is clear that long-term viability of SJAS populations in the face of intensive oil development cannot be guaranteed.

Proposed water delivery systems which would transport northern California water to the southern San Joaquin Valley will encourage even greater conversion of SJAS habitat and could eventually cause extirpation of the species from all but public lands.

IV. NATURE AND DEGREE OF THREAT:

The greatest threat to the SJAS is loss of its native habitat to cultivation for a variety of crops. Cultivation of native grassland and shrubland habitat has resulted in loss of more than 80% of its historical range in the state and of the remaining 20% only about 15% can be considered fair to good habitat (Williams 1980). The species has been extirpated from large portions of its former range and may be nearly gone in most of the eastern San Joaquin Valley. Habitat in the northwestern portion of the range is also severely threatened.

During investigations of the SJAS for the Department of Fish and Game (DFG) in 1979, Williams (1980) witnessed thousands of acres of former

habitat converted to irrigated and dry land crops. This process has been accelerating in the eight years since and with new sources of irrigation waters available in the near future, even lands that are marginally suitable for cultivation may be lost. When all private lands within SJAS range are managed for intensive agriculture the species will be restricted to scattered public lands and private sanctuaries (such as the Nature Conservancy's Paine Wildflower Preserve, Kern County). There has been little documented use of cultivated cropland by SJAS for foraging or any other phase of their life cycle (Grinnell and Dixon 1918, Hawbecker 1953, Williams 1980). Virtually all parcels of private land on the San Joaquin Valley floor are small and support only sparse populations of the SJAS. These parcels are probably too small to support populations indefinitely. Property such as the Paine Wildflower Preserve is in this category. It is subjected to periodic seasonal flooding from the Kern River or the Pozo Creek watershed. Recent flooding may have extirpated populations from most of the parcels south and east of the Kern National Wildlife Refuge (which was also completely flooded, including the dikes).

Although habitat loss is the most important factor affecting the SJAS, a significant threat to the species may also exist in the form of rodenticides such as 1080 (Williams 1980). Poison baits are applied to many thousands of acres of farm and ranchland within the range of the SJAS. These poisons, targeted for elimination of California Ground Squirrels (Spermophilus beecheyi), pose an immediate threat of direct mortality to SJAS. This threat exists on certain public as well as private lands.

Certain non-agricultural development activities prevalent in the southern San Joaquin Valley also threaten the SJAS and its habitat. Residential and oil and gas development remove habitat as effectively as does agricultural development. Housing and industrial development is accelerating in certain portions of SJAS range.

Cattle grazing occurs on many acres of private and public land within SJAS range. At present, its effects on the SJAS are unknown (Williams 1980) but should be investigated to determine if overgrazing poses an additional threat to the species.

In those areas where residential development encroaches upon SJAS habitat, domestic dogs and cats may pose a predation threat to the species. The SJAS has evolved with a wide variety of natural predators such as the San Joaquin Kit Fox (Vulpes macrotis mutica), Coyote (Canis latrans) and various raptors. These natural predators however, probably did not threaten populations of the SJAS the way current cumulative threats do today.

V. HISTORIC AND CURRENT DISTRIBUTION:

Historic:

The SJAS was restricted to the Tulare Basin in the southern San Joaquin Valley, the Carrizo Basin, and the Cuyama and Panoche valleys (Williams 1980). This is a distribution that coincided with the area's marine-

sediment soils and low annual precipitation. Within this range SJAS inhabited annual grasslands of loam and sandy-loam soils on the gently sloping terrain of the valley margins (Hawbecker 1953, Williams 1980). This distribution covered about 3,456,000 acres (Williams 1980).

Current

The SJAS has suffered extensive loss of habitat throughout its former range. Eight years ago Williams (1980) reported that only 680,000 acres of former range remained, and this figure included land with many human developments. Today, considerably less than 20% of SJAS habitat remains. Of the extant habitat Williams (1980) estimated that only 15% (102,000 acres) could be considered fair to good, supporting moderate populations of the SJAS. The remaining habitat is poor to marginal, supporting only a few animals per acre. Much of the former range is cultivated with a variety of crops and there has been very little evidence of use of these areas by the SJAS. In the early twentieth century, cultivation already was considered responsible for much local extirpation of the SJAS, including at the type locality near Tipton (Williams 1980). Some remnant habitats are rather small (30 acres) and several areas of SJAS habitat involving hundreds of acres were lost to cultivation during Williams' (1980) investigation into the status of the species eight years ago. It is expected that this trend of loss, which has continued virtually unchecked to the present, will continue at an even greater rate into the future, especially if new sources of irrigation water become available.

Williams (1980) believed that the best remaining publicly administered block of SJAS habitat was located in the oil field of Elk Hills Naval Petroleum Reserve and surrounding areas. Maintenance of this area in as natural a state as possible may be essential to preserving a viable SJAS population. The Elkhorn Plain in eastern San Luis Obispo County is the largest area with good habitat. The Carrizo Plain, also in eastern San Luis Obispo County, has areas with good habitat. Since the 1979 survey (Williams 1980) large areas have come under dry-land cultivation, destroying thousands of acres of SJAS habitat, and there are no large blocks of public land which can be maintained in an uncultivated state. The Cuyama Valley of San Luis Obispo and Santa Barbara counties probably has little land with substantial populations; virtually all of it is privately owned (public lands there do not support populations of the SJAS), with perhaps the exception of a few hundred acres in the mouth of Ballinger Canyon, where off-highway vehicle recreation is a major threat to this and other species.

Scattered remnant intact habitats exist in a few other locales with some on public land. However, most of these are rather small parcels of land amounting to a few hundred acres. Further survey on some lands that appear at least somewhat promising may reveal additional remnant populations of SJAS especially on certain public lands. However, as Williams (1980) stated, none of what remains can be considered prime habitat for the SJAS and most lands are poor to marginal for the species.

VI. HISTORIC AND CURRENT ABUNDANCE:

The historic and current population numbers of the SJAS are not known. However, based on the past and present range of the species, some inferences can be drawn. Certainly, as habitat of the SJAS was lost to cultivation and other forms of development, the population declined from its historic level before the arrival of European man. Since no prime habitat exists it is assumed that the densities on extant habitat are considerably lower than during historic times. The fact that only 108,000 acres of habitat can even be considered good to fair illustrates the magnitude of potential decline of populations. The population clearly has plummeted since historic times and may be considerably less than 10% of its original figure. If current trends of habitat loss continue the current remnant population will be further reduced.

VII. SPECIES DESCRIPTION AND BIOLOGY:

The SJAS, like other ground squirrels, is a diurnal mammal active during daylight hours. The animal is about 9 inches long, grayish brown with one white stripe on each side and no dark colored body stripes (Ingels 1965). The tail is about 2 3/4 inches long and typically held closely over the back while running exposing a white underside. The SJAS employs a combination of thermoregulation adaptations that allow it to thrive in its arid environment. Its thermoneutral zone is higher than any other nonsweating mammal (90-107° F) (Ingels 1965).

The SJAS and all other ground squirrels are fossorial, making tunnels and burrows underground (Hall and Kelson 1959). All ground squirrels have inside cheek pouches which are used to store and transport foods such as seeds and fruits. The SJAS has a diet consisting primarily of seeds, nuts, and fruits. Insects and carrion are taken when available.

The species inhabits arid, sparsely-vegetated plains and lower mountain slopes. Females produce one litter of 6-11 (mean = 8.9) young annually. Gestation is about 26 days. Average life span in the wild is often short but a maximum of four years is possible for captive individuals (Hawbecker 1975).

VIII. HABITAT REQUIREMENTS:

The SJAS requires minimally disturbed natural grass and shrub communities for habitat. Much of the native California grass communities (Stipa pulchra and S. cernua) may have been replaced with Bromus spp., Erodium spp. and other exotics through overgrazing by livestock since the arrival of European man in the state (Williams 1980). The precise impact of grazing on the SJAS is not known but it is clear that livestock have had a profound impact on most grassland communities of the state through overgrazing and accelerated erosion.

The SJAS often locates its burrows at the base of a shrub, typically desert salt brush (Atriplex polycarpa) or iodine bush (Allenrolfea occidentalis). California ephedra (Ephedra californica) is an important shrub species for the SJAS on the Elkhorn and Carrizo plains, in the

Panoche and Tumey hills, and probably elsewhere. This may be partly because more palatable shrubs such as Atriplex sp. have been extirpated from many areas by heavy browsing by cattle. It is clear that ephedra bushes are both a source of food (seeds) and a preferred site for placing burrows. Burrows are dug in the sandy and sandy-loam soils that are prevalent throughout the species' range along the western side of the southern San Joaquin Valley from southern Merced to Kern Counties. The burrow systems are the primary cover and shelter for the species for protection from predators and to escape the extremes of temperature common to the SJAS's semi-desert environment.

Weather has an important influence on the distribution of the SJAS. Hawbecker (1953) reported that foggy conditions and low temperatures prevented above-ground activity and restricted the distribution of the species to areas of the southern San Joaquin where such conditions were not excessive. Flooding of river systems also played a role in establishing the limits of the SJAS range on the eastern portion of the southern San Joaquin Valley (Williams 1980).

Most of what was considered prime agricultural land was eventually cultivated. These same broad, flat, sparsely-vegetated grassy plains also once constituted prime SJAS habitat. Since no examples of this habitat remain, our concept of typical SJAS habitat in pristine times has to be equated to the very few tracts of good habitat that remain on certain public lands and private sanctuaries today.

IX. CURRENT AND RECOMMENDED MANAGEMENT:

Since the SJAS has Threatened status in the state, state lead agencies must consider its needs in the granting of construction permits and the authorizing of other activities that might adversely affect the species and its habitat. Consultation regarding Threatened and Endangered species under the provisions established in the California Environmental Quality Act (CEQA) must be entered into between state lead agencies and the DFG whenever projects with potential to harm SJAS and other listed species are proposed. These provisions, though not binding on all development interests within the range of the SJAS, do allow for some measure of protection from direct, indirect, and cumulative impacts to the affected species and their habitat. The best solution to development-caused habitat loss is compensation (money or land) for the lost acreage. When losses are compensated on a greater than one-to-one ratio, some progress is made in the effort to actually recover the affected species. Preservation of natural habitat is often the cornerstone of mitigation or compensation efforts with regard to the CEQA and the Endangered Species Act consultation process. Some of the more promising recent efforts in this regard concern the California Energy Commission and its authority to permit the siting of cogeneration plants in the oil fields of eastern Kern County and mitigation agreements that have been worked out.

There is a continuing need to inventory the remaining natural habitats of the southern San Joaquin Valley and other important ecosystems such as the Carrizo Plain in eastern San Luis Obispo County. An effort lead by the California Energy Commission and several interested and concerned

agencies and organizations is under way to map, catalog, and develop priorities for acquiring the best remaining natural habitats of the southern San Joaquin Valley. Once completed, the inventory will become the focus for mitigation and compensation efforts evolving out of continued development within the oil fields and wherever else there are conflicts with SJAS and other species.

An effort to develop a macropreserve in the Carrizo Plain area is being led by the U.S. Bureau of Land Management (BLM) with assistance from the DFG and other interested parties. The best areas are being inventoried and priorities for sensitive species management will be developed to ensure the continued survival of the SJAS and other animals and plants within the boundaries of the macropreserve.

According to Dr. Dan Williams (pers. com.) there is an immediate need to develop adequate and efficient inventory techniques for survey of the SJAS. Even though the range of the species is much reduced there are still areas of habitat that need to be surveyed to establish presence or absence of the species, in order to facilitate the compensation and mitigation process and for the acquisition of properties and establishment of preserves. Since funds available for acquisition of lands to establish preserves for the SJAS and other Threatened and Endangered species are limited, it will be essential to have reliable census techniques to gather data to support such land purchases.

Aside from the critical need to identify lands for purchase it will become increasingly important to ensure proper management of those public lands that have populations of SJAS. Grazing and use of the rodenticide 1080 must be closely scrutinized to ensure that major detrimental impacts on SJAS are not occurring. Monitoring programs need to be established to assess these impacts and corrective measures need to be applied in problem areas. The DFG, BLM, and California Department of Food and Agriculture need to work closely to resolve the rodenticide problem. The use of 1080 in SJAS range has the potential to do great harm. The extent of the potential for 1080-caused mortality within SJAS range on both public and private lands needs to be assessed. Some guidelines have been established by the U.S. Fish and Wildlife Service and the Environmental Protection Agency with the cooperation of the Department of Food and Agriculture and local county Agricultural Commissions for the prudent use of 1080 within the range of sensitive species such as the San Joaquin Kit Fox, the Giant Kangaroo Rat (Dipodomys ingens), and the SJAS. Close monitoring will be necessary to assess the impact and effectiveness of these guidelines.

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

In summary, it will be important to focus management attention on acquisition of suitable SJAS habitat on private lands either through compensation for project-caused habitat loss or for the expressed purpose of establishing a preserve in which the SJAS is among the featured species. In addition, those public lands known to support healthy populations of the SJAS need focused management attention sensitive to the needs of this species. The DFG and other concerned agencies need to assess the impact of rodenticides, especially compound

1080, on the SJAS. Finally, research is needed to provide information for management programs that involve acquisition, habitat enhancement, rodent control, livestock grazing, and mitigation for development-caused habitat loss.

X. SOURCES OF INFORMATION:

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8 May 1987 (revised 16 November 1987)

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