

Current Findings on Grazing Impacts

California's special status species benefit from grazing

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Periodically, the United States Fish and Wildlife Service (Service) reviews and revises listed species information, including conducting five-year reviews, as required under the Endangered Species Act (ESA). These reviews include new research findings and impacts of recovery efforts for species of special concern.

The following is a summary of current reviews by the Service of listed species occurring on California rangelands. Interestingly, in every case where grazing was originally considered to be a threat to the listed species, it has been found that managed grazing may be beneficial. In addition, for several species, managed livestock grazing has been determined to be essential to prevent further loss or decline in the species.

These findings, as reported by the Service, overwhelmingly point to the

need to sustain grazing regimes and rancher stewardship for the successful conservation and recovery of special status species occurring on California's rangelands.

Grazing Benefits Wildlife

In the five-year review in 2010 on the San Joaquin kit fox (*Vulpes macrotis mutica*), the Service stated that additional threats to kit fox habitat had been identified. These threats include changes to vegetation structure due to non-native species and altered grazing regimes. Kit fox are vulnerable to coyotes in dense vegetation.

Optimal habitat for the kit fox is considered to have low vegetation structure, common patches of bare ground and abundant prey. It has been demonstrated that a reduction or cessation of grazing on sites where

precipitation and soil conditions allow the growth of dense vegetation results in conditions unsuitable for kit fox. Cattle grazing is thought to be to be the most reasonable and economical method for landscape-scale management of kit fox habitat.

Although overgrazing was recognized as a threat to the California red-legged frog (*Rana draytonii*); findings since the listing, reported in the 2006 review of the species, concluded that managed livestock grazing at low to moderate levels has a neutral or beneficial effect on frog habitat. Managed livestock grazing around ponds can maintain a mix of open water habitat and emergent vegetation.

In some cases, without managed grazing, stock ponds would quickly fill with emergent vegetation resulting in habitat loss. In some locations fencing,



which had excluded livestock from ponds, is being removed to improve habitat for red-legged frogs.

Much like the California red-legged frog, the California tiger salamander (*Ambystoma californiense*) is thought to be compatible with managed livestock grazing by cattle, horses and sheep. It has been recognized that grazing can maintain a low vegetation structure, which makes areas more suitable for California ground squirrels whose burrows are essential to the tiger salamanders.

In 2004, the Service decided that the long-term effect of ranching is either neutral or beneficial, as long as burrowing rodents are not completely eradicated.

The Service noted that the California tiger salamander would have been eliminated from many areas if stock ponds had not been built and maintained for livestock production. The Service's data from 2003 showed that less vegetation on rangelands may also facilitate the movement of tiger salamanders from upland areas to breeding ponds.

In addition, in 2004, the Service published findings noting sustainable grazing around natural ephemeral pools, including vernal pools, may also benefit the California tiger salamander by extending the wet period so amphibian larvae can complete their life cycle.

Overgrazing has previously been identified as a threat to the bay checkerspot butterfly (*Euphydryas editha bayensis*). Current scientific findings from the Service released in 2009, state that a lack of grazing or undergrazing is a more common threat to the butterfly. Grazing reduces standing biomass of non-native vegetation, which if uncontrolled, crowd outs forbs, including those essential to the butterfly.

Since maintaining an appropriate grazing regime is essential to the butterfly's habitat, the Service has also recognized that protecting habitat from development alone is not sufficient. For example, state and county parks are considered

"protected" and not subject to development, but without appropriate grazing regimes, the butterfly has disappeared from historical areas within "protected" lands.

The five-year review released in 2010 of the San Bruno elfin butterfly (*Callophrys mossii bayensis*) and mission blue butterfly (*Icaricia icarioides missionensis*), recognized that coastal scrub succession continues unchecked and without a comprehensive grazing and/or controlled burning program, habitat for these two butterflies will continue to slowly decline on San Bruno Mountain. It has been documented that in the absence of grazing and fire, coastal prairie grassland habitats are being lost to shrub and tree encroachment.

The 1987 Service recovery plan included livestock grazing as a threat to the survival of the mission blue butterfly, due to encouraging the growth of weedy annuals and other exotic plants in the grasslands and reducing the amount of chaparral. Current studies, as reported in the review, have shown that managed grazing may increase the density of native plants that support butterfly populations.

A stewardship grazing plan was developed for San Bruno Mountain, the northernmost part of the Santa Cruz Mountains, in 2002. Due, in part, to lack of funding, the plan has not been implemented. The Service recognizes that preventing the continued loss of habitat will require sustainable funding sources and/or manpower and/or the reintroduction of San Bruno elfin butterfly.

Although overgrazing was previously indicated as a threat to the blunt-nosed leopard lizard (*Gambelia sila*), current findings as reported by the Service in its 2010 five-year review suggest that the cessation of grazing is likely to be even more detrimental.

Long-term studies of blunt-nosed leopard lizard population trends on the Elkhorn Plain and Pixley National Wildlife Refuge, located in the San Joaquin Valley between Tulare and

Bakersfield, have shown dramatic declines in numbers following consecutive wet years and dense vegetation growth. Annual grazing studies in the Lokern Preserve area, about 30 miles west of Bakersfield, from 1997 to 2005 have demonstrated the benefits of livestock grazing in reducing exotic grasses and increasing blunt-nosed leopard lizard numbers. Decisions to severely restrict or eliminate livestock grazing from conservation lands may negatively affect blunt-nosed leopard lizards.

Fire as an alternative vegetation management tool has also been studied in recent years. It was found to be less effective than grazing at controlling annual vegetation because the positive effects lasted less than one year.

Although studies in the 1970s identified grazing as a threat to Fresno kangaroo rats (*Dipodomys nitratoides exilis*), recent studies highlighted by the 2010 five-year reviews of the Service with giant kangaroo rats (*Dipodomys ingens*) suggest that both overgrazing and complete lack of grazing are detrimental for populations of kangaroo rats. Sites which develop thatch from non-native grasses not only impede the activities of the kangaroo rats and but also competitively exclude the native forbs that are the preferred food source for the kangaroo rats.

Early studies reported the negative effects of overgrazing on habitat quality through competition for food between cattle and the giant kangaroo rat and the potential collapse of burrows by livestock. Recently, long-term grazing studies included in the 2010 Service's five-year review, have reported declines in the number of kangaroo rats (including the giant kangaroo rat) on ungrazed plots relative to grazed plots during wet years.

The actual cause of decline in kangaroo rats during wet years is unknown, but a possible factor is dense grass growth, which inhibits foraging; increases the risk of

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predation by providing cover for hunting animals; and increases soil moisture which may lead to fatal respiratory problems, or the infestation of kangaroo rat seed caches with toxic molds. Livestock grazing can control the dense growth of non-native grasses that threaten giant kangaroo rats during wet years.

The Service concluded in the species review that while overgrazing may disturb individual giant kangaroo rat precincts, the cessation of grazing may lead to a significant decline in giant kangaroo rat numbers particularly during wet years.

When grazing was removed by California Department of Fish and Game (DFG) from the Alkali Sink Ecological Reserve and the Kerman Ecological Reserve (both in Fresno County) population numbers of kangaroo rats began to decline. Heavy thatch buildup was observed at the Kerman Ecological Reserve as recently as 2008.

DFG is currently working on a contract to begin grazing in the Kerman Ecological Reserve. They are also contracting with California Department of Forestry and Fire Protection to conduct a prescription burn in the Alkali Sink Ecological Reserve to reduce vegetation cover and thatch buildup and thereby benefit San Joaquin kit fox and Fresno kangaroo rat.

The 2010 Service five-year review of the Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) recognizes that while there are some monitoring studies underway, the biology of the subspecies and keys to effective habitat management essentially remain poorly known. Livestock grazing has been identified as a potential habitat management tool to reduce thatch.

Positive Grazing Impacts on Plants

In 1986, cattle grazing was identified as a major factor in the decline of palmate-bracted bird's beak (*Cordylanthus palmatus* or

Chloropyron palmatum), an annual plant belonging to the snapdragon family, when the species was listed under the ESA.

In the 2009 five-year review on the plant, the Service recognized that cattle grazing may be beneficial and, in some cases, can have harmful effects. Grazing can enhance habitat for the flower through the removal of invasive non-native plants. But, unmanaged grazing can negatively-impact habitat through physical destruction, like soil compaction or wallowing in seasonal ponds.

Many areas occupied by palmate-bracted bird's-beak have been grazed by cattle over the years with mixed results. At Springtown Alkali Sink, near Livermore, an end to intensive cattle grazing in the 1980s allowed the Native Alkali Sacaton (*Sporobolus airoides*), Pickleweed (*Salicornia subterminalis*), and Iodine Bush (*Allenrolfea occidentalis*) to recover.

This action also promoted the partial recovery of the bird's beak flower. However, without grazing weed cover increased significantly and Palmate-Bracted Bird's Beak numbers have been declining over time.

These results suggest that the short-term results may differ from long-term results of grazing. In the plant's five-year review in 2009, the Service concluded that controlled and properly managed, grazing may be helpful for management of palmate-bracted bird's beak.

When the large-flowered fiddleneck (*Amsinckia grandiflora*), a wildflower endemic to California, was listed under the ESA, it was thought that grazing may have been responsible for the destruction of some populations. In the five-year review released by the Service in 2009, it was recognized that a combination of either the change in the intensity of grazing (possibly a decline in cattle grazing) or the change from cattle grazing to sheep grazing may have destroyed the natural population located at Carnegie



Canyon, in Western San Joaquin County. When the site at Carnegie Canyon was surveyed in 2003 after the removal of grazing, no plants were seen.

In the 2010 five-year review, the Service stated that the consistent pattern of heavy growth of non-native grasses when not controlled by grazing or other management can "smother" native plants such as Calistoga popcorn flower (*Plagiobothrys strictus* Calistoga *allocarya*) and Napa bluegrass (*Poa napensis*). The lack of management of grasslands results in the subsequent crowding out, outcompeting or overshadowing of the previously mentioned native annuals.

The case examples above clearly illustrate the recognition of the important role of managed grazing in California's expansive rangelands. The research that has been conducted and continues to be reported illustrating the positive impacts of herbivores will play a role in future public land management decision, regulatory policies and public perception of grazing.

For a complete list of the Service's five-year reviews on these species of plants and animals that have previously been listed under ESA, visit <https://ecos.fws.gov/doc>.

You can also find research illustrating the myriad benefits grazing plays for plants, wildlife and rural communities on the California Rangeland Conservation Coalition Web site at www.CaRangeland.org.