

## Managing Exotic Species and Conserving Declining Species

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Dr. Germano presented nine years of results of an ongoing study. The purpose of the research is to examine various protected species in the San Joaquin Valley to determine if grazing by livestock can keep population numbers from crashing during wet years when herbaceous plant cover makes impenetrable thickets for small cursorial vertebrates. The study site is about 80 km west of Bakersfield at the Lokern Natural Area. The study design consists of four replicates grazing sites located within a fenced section enclosure, with a control randomly placed in one corner of each replicate where cattle were excluded. The site is grazed when there is sufficient grass available for cattle. Various sampling schemes were employed depending on the species being evaluated. Preliminary conclusions drawn from this research indicate that all species studied benefit from dry weather that decreases herbaceous biomass. Additionally, grazing benefited most species: blunt-nosed leopard lizards (*Gambelia sila*) were consistently more abundant on treatment plots than on controls; San Joaquin antelope squirrels (*Ammospermophilus nelsoni*) were found to be more abundant on treatment plots than controls during years of average or above average rainfall when controls were grassy and grazing occurred; too few giant kangaroo rats (*Dipodomys ingens*) were caught to determine any meaningful pattern, although there were always more found on treatment than control plots; and there was no consistent pattern observed with short-nosed kangaroo rats (*D. nitratoides brevinasus*), although more were reported on treatment plots during wet years when controls were much grassier. Heermann's kangaroo rats (*D. heermanni*) were the only species that was more abundant on controls, due in large part to one control that was reinvaded by saltbush.

In summary, most small vertebrates that are protected in the San Joaquin Valley benefit or are not harmed by livestock grazing. Furthermore, although a species may persist during grassy years without livestock grazing, populations may be vulnerable to extinction on small-sized habitats surrounded by agriculture; areas typical of reserves in the valley established to protect these very species.