



# MORONGO BASIN ALTERNATIVE FUTURES

## Pacific Kangaroo Rat *Lynx rufus*

### About the Species:

The Pacific kangaroo rat is one of several nocturnal kangaroo rat species in the Morongo Basin area, including the Merriam's kangaroo rat and the Desert kangaroo rat. All are sensitive to barriers, artificial light, noises, and large stands of non-native grasses. They live in burrows in sandy soils or rocky flats, and will often defend territory around their burrows. Much of the Morongo Basin area contains suitable habitat for the species. The Pacific kangaroo rat is known to be somewhat more mobile than other rodents of its size, and they may be opportunistic when it comes to finding new habitat, possibly moving between adjacent mountain ranges over multiple generations.



### Threats:

Urban development and road infrastructure may contribute to fragmentation and habitat loss that impacts the Pacific kangaroo rat. Wide roads and barriers in roads prevent crossing and exacerbate road kill for these small rodents. The nocturnal nature of the rat is impacted by bright lighting. Dense vegetation, especially non-native grasses, can affect the ability of the rats to move through areas. Domestic pets are also a major mortality factor near development. Education of pet owners can be used to raise awareness of the impacts on this small, but important species of wildlife.

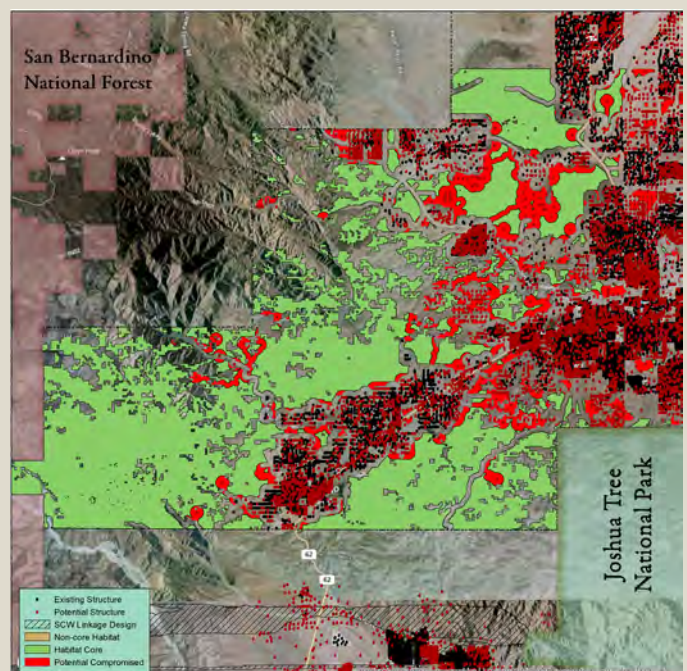
### Habitat:

The Pacific kangaroo rat is a habitat generalist, but needs soils that will allow them to burrow, which occur in a number of open habitats including desert scrub and pinon-juniper woodlands. Vegetation openings that commonly follow fires have been shown to enhance the abundance of the species.

### Potential Development Impacts:

The SC Wildlands habitat analysis for Pacific kangaroo rat only covers the west half of the Morongo Basin study area, so our habitat analysis is limited to that area. Because Pacific kangaroo rats have small home ranges (0.5 ha), nearly all habitat patches are sufficiently sized to qualify as cores. Twenty-four percent of core habitat is vulnerable to development under a full build out scenario which could result in substantial reductions in available habitat.

Connectivity analysis indicates there may already be significant impacts from current development on Pacific kangaroo rat movement



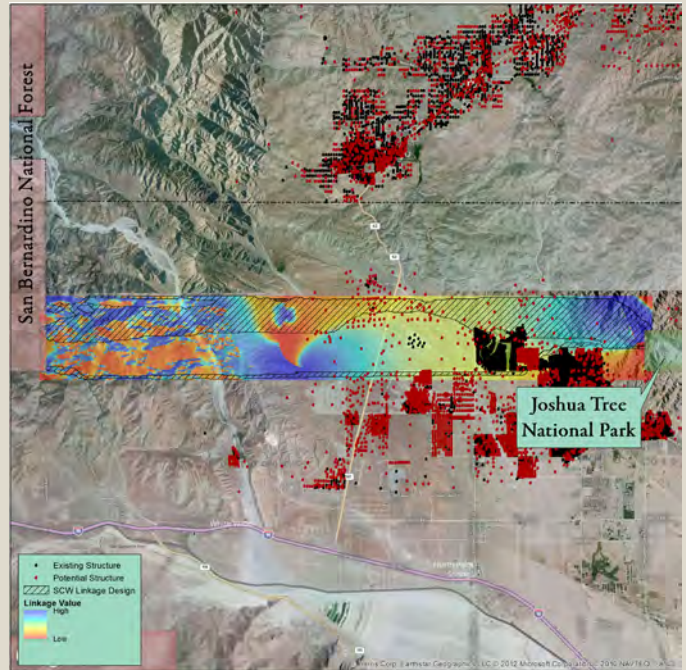
Potential Compromised Pacific Kangaroo Rat Habitat with Full Build out in the Morongo Basin.

along the SC Wildlands linkage design. Because the SC Wildlands linkage design is outside the boundary of the study area, none of the planned development scenarios are predicted to have any impact on Pacific kangaroo rat connectivity between Joshua Tree National Park and the San Bernardino Mountains. However, analysis shows that full build out around Desert Hot Springs could seriously impact kangaroo rat habitat connectivity.

### Strategies for Protection:

The Pacific kangaroo rat might benefit by widening the effective linkage to the north to provide opportunities to avoid impacts of current development. This could significantly improve connectivity, particularly around development associated with Desert Hot Springs. In addition, a potential restriction to movement is indicated due to a small cluster of structures north of the SC Wildlands linkage design and west of the Twentynine Palms Highway plus an additional lone structure directly south and in the middle of the linkage area. An education program for residents of those structures to communicate the importance of controlling their pets to eliminate harassment and predation from cats and dogs could greatly reduce the impact of those structures and serve to restore unrestricted movement for kangaroo rats.

In the map at right, colors represent relative value of current density. Areas of high current density indicate where animal movement is likely to be concentrated. Results indicate that expansion of the linkage area to the north combined with strict confinement of domestic pets in the area circled could improve connectivity for this species. Because the linkage area is outside the Morongo Basin study area, planned development scenarios would not impact connectivity. However, development of existing parcels around Desert Hot Springs may degrade connectivity between Joshua Tree National Park and the San Bernardino Mountains.



### References:

- Penrod, K., C.R. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2005. South Coast missing linkages project: A linkage design for the San Bernardino-Little San Bernardino connection. *Idyllwild: SC Wildlands*.
- Penrod, K., C.R. Cabañero, P. Beier, C. Luke, W. Spencer, E. Rubin, and C. Paulman. 2008. South Coast missing linkages project: A linkage design for the Joshua Tree-Twentynine Palms connection. *Idyllwild: SC Wildlands*.
- Weigel, S., Ellis C. and B. Brock. 2013. Integrating Scenario Planning Tools with Wildlife Planning Tools: Informing Land Use Planning in a Rural Desert Landscape via the Morongo Basin Alternative Futures Project. Lincoln Institute of Land Policy Working Paper.

Photo Credit: USFWS.

Map Credit: Brent Brock, Craighead Institute.

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