

Western Ecological Research Center

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Common Raven Juvenile Survival in a Human-Augmented Landscape

Anthropogenic resource subsidies have contributed to a dramatic increase in common raven numbers during the past 30 years in the western Mojave Desert, a concern to resource managers because raven prey includes the federally threatened desert tortoise. The demographic mechanism by which ravens benefit from anthropogenic resources had not previously been well explored, but it was thought that subsidies affected populations by increasing reproductive success, immigration, or survival or by decreasing emigration. In this study, published in *The Condor*, USGS scientist Dr. William I. Boarman, along with University of California, Riverside (UCR) graduate student William C. Webb, and UCR professor Dr. John T. Rotenberry, investigated whether one demographic factor—increased juvenile survival—is enhanced by the proximity of nests to human developments.

During the spring of 1999 and 2000, juvenile ravens in and around Edwards Air Force Base in the western Mojave Desert were marked at the fledgling stage with wing tags and radio transmitters. Juveniles were monitored until they died or departed from their natal territories, and survivors were tracked for 33 additional months. Statistical models were then used to assess the effects of environmental parameters on juvenile survival.

The study found that juvenile survival was influenced by nest distance to human subsidies and fledging date. Ravens nesting closer to human subsidies and earlier in the season had higher survival rates. Ravens nesting within 1.0 km of a point subsidy experienced survival rates to departure from their natal territory of nearly

Management Implications:

- In areas such as the western Mojave Desert where resource levels are naturally low, the impacts of artificial resources can be dramatic and influence increased raven abundance.
- Land managers should expect raven numbers to grow as human presence increases, unless access to anthropogenic resources is controlled.
- Management practices should attempt to eliminate raven access to anthropogenic resources to reduce raven population density and its impacts on biodiversity in the western Mojave.

60%, while those nesting farther than 1.5 km survived to departure only 10–30% of the time. Furthermore, the benefits of nest proximity to human subsidies improved survival for at least 9 months after fledging, as revealed by radio-tracking. Results suggest that proximity of nests to point subsidies contributes to increasing raven numbers via increased juvenile survival to departure as well as post-departure survival. Nesting closer to anthropogenic resources probably reduces the physiological costs of foraging, and it may allow for increased food delivery rates and increased adult vigilance against predators.

Webb, W. C., W. I. Boarman, and J. T. Rotenberry. 2004. Common raven juvenile survival in a human-augmented landscape. *Condor* 106:517–528.