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Wildlife Field Notes

Dispersal Patterns of Burrowing Owls in the Tucson Basin

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Introduction

Recent decades have witnessed remarkable changes to the landscapes of Southern Arizona. Human population has exploded, cities have expanded their footprints, and an increasing network of roadways continues to fragment fragile desert habitats, placing added pressures on native wildlife.

One species that has suffered from these rapid changes is the burrowing owl (*Athene cunicularia*). Like the roadrunner or saguaro cactus, the image of this small owl standing sentinel next to its burrow is familiar to anyone who has explored the Sonoran Desert landscape.

As growth and progress continues in Southern Arizona, the burrowing owl is experiencing population declines. The species is dependent on abandoned burrows created by small mammals such as ground squirrels. However, adequate breeding habitat in the area has declined more than 80% and continuing land use practices threaten to reduce local burrowing owl habitat even more.

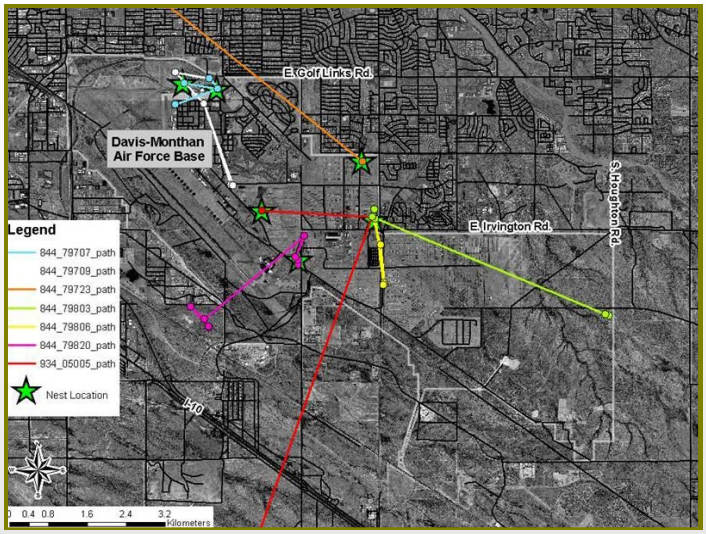
One of the few remaining contiguous patches of land offering suitable burrowing owl nesting habitat is found at the Davis-Monthan Air Force Base southeast of Tucson. Because of the availability of preferred habitats and reduced human disturbance, the expansive tract of land at the base acts as a population source for juvenile burrowing owls to disperse into the Tucson Basin.

Recently, researchers with the Arizona Game and Fish Department's Wildlife Contracts Branch set out to determine dispersal habits of young burrowing owls within the Tucson Basin. During this time period, researchers with the Wildlife Contracts Branch performed burrowing owl surveys at four sites: the Davis-Monthan AFB, Tucson Electric Park, the Santa Cruz River Channel, and within the Town of Marana to identify occupied habitats for this species. This study would help define the species' preferred habitats and also identify remaining suitable tracts of land within Tucson's urban matrix. Their findings would help inform various development practices that could minimize impacts to burrowing owls and their habitats.

With habitat fragmentation continuing throughout the Tucson area, young burrowing owls are under increased pressure to find suitable habitats and prey sources.

Study Methods

At Davis Monthan AFB, researchers walked transects through areas identified as potential burrowing owl habitat and recorded all burrows within 25m of the transect. Researchers then collected data on burrow activity, habitat use by owls, and the landscape characteristics found at each burrow.



Telemetry data collected during this study suggested that juvenile burrowing owls will disperse anywhere in the Tucson Basin where suitable habitat is found.

To identify juvenile dispersal habitats, researchers captured and radio-collared 18 juvenile burrowing owls. The young owls were then tracked on a weekly basis using radio telemetry. Dispersal of juveniles was defined as any movement outside of a 600m radius from the natal burrow without evidence of returning to their home burrow. Researchers also estimated juvenile survival rates using a staggered entry Kaplan-Meier estimator.

Results

Although Wildlife Contracts Branch researchers located active burrowing owl burrows in a variety of habitats, most burrows were identified on the flight line and near buildings on the Davis-Monthan AFB. Habitat characteristics preferred by burrowing owls included areas with moderate levels of bare ground, low vegetation height, and low shrub densities. Active nest sites included burrows made by mammals or human structures such as cement culverts and drain pipes.

Radio-telemetry data suggested that, like the adults, juvenile burrowing owls also preferred to disperse into scrub habitats with moderate barren space, as would be expected with a species adapted to the short grass prairie environment. However, these data also suggested that young owls preferred areas where this scrub habitat was surrounded by low-intensity development

Management Implications

Data collected through this study suggested that the Davis-Monthan AFB is a population source for juvenile burrowing owls to disperse throughout the Tucson Basin. Wildlife Contracts Branch researchers also learned that the Santa Cruz River acts as a vital dispersal corridor for young owls leaving the base to seek out their own territory.

Researchers found a 70% survival rate among the radio-collared dispersing juveniles. This high rate of survivorship suggests that even in a fragmented urban environment, juveniles will survive if patches of undeveloped land are still available.

While some data from this study reaffirmed the classic species' preference for habitat types, researchers found that these habitats are oftentimes embedded in a mosaic of developed and undeveloped areas throughout an urban complex. These findings suggest that the remaining undeveloped patches of land will have greater importance to owl population as development continues and suitable dispersal habitat becomes more rare. Increased human-owl conflicts, a decrease in the amount of preferred habitats, a rise in predation, and a reduction of prey base, will add pressure to owl populations and threaten the future of burrowing owls throughout the Tucson Basin.

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For more information on this and other projects, visit www.azgfd.gov/contracts