



Burrowing Owl Research:

Burrowing Owl Occupancy Surveys Within the City of Tucson's Avra Valley Properties

Background

As part of the proposed City of Tucson Habitat Conservation Plan (HCP), the western burrowing owl was identified as a species of concern due to its high risk of take during planned development activities in the Avra Valley planning sub-area. An estimated footprint of approximately 7,500 acres in Avra Valley may be needed to expand public water infrastructure (e.g., recharge basins, evaporation ponds, treatment plants, etc.) and these developments have the potential to disturb existing burrowing owl habitat depending on their location and configuration. The purpose of this project was to provide information regarding the presence and distribution of burrowing owls within the Avra Valley planning sub-area. This information will allow city managers to incorporate burrowing owl conservation into the future development of public water infrastructure projects in Avra Valley, thereby reducing impacts to burrowing owls and their habitat.

In addition, understanding burrowing owl habitat use in Avra Valley and implementing conservation measures may help facilitate the persistence of the local burrowing owl population in the Tucson planning area. As such, summer (i.e., breeding season) occupancy was compared to winter (i.e., non-breeding season) occupancy.

Approach:

The Arizona Game and Fish Department (AGFD) used the following approach to evaluate burrowing owl occupancy on the City of Tucson's Avra Valley Properties:

- **Survey Delineation and Habitat Evaluation** –AGFD biologists conducted an initial evaluation of 35 City of Tucson-owned Avra Valley properties with Tucson water personnel in November 2005. Potential nesting habitat for burrowing was assessed by characterizing each property according to vegetation density, presence of concrete irrigation canals (which often provide burrow opportunities), and availability of usable burrows. This allowed AGFD to direct breeding season surveys towards parcels with high burrowing owl nesting habitat potential.
- **Winter (i.e., Non-Breeding Season) Survey** – All areas that met the vegetation structure characteristics for potential nesting habitat were surveyed during January and February 2006. Within each parcel, a series of transects spaced 50 meters apart were established in a north-south orientation. Surveyors recorded the location of all burrows within 25 meters of each transect. Burrows were categorized by their potential to support burrowing owls. During winter surveys, presence of owls was documented by recording the number of owls at each burrow. The location of all suitable burrows was recorded and mapped. When evidence of burrow use was detected (e.g., whitewash, pellets, feathers, ornamentation, prey remains), we cleaned and removed any owl sign. This allowed us to identify occupied burrows if fresh sign was present during our breeding season survey effort.
- **Summer Breeding Survey** – In June 2006, all burrows that had supported evidence of burrowing owl use and/or where owls had been detected during the winter survey were revisited. Burrows were observed from a distance of >250 meters using binoculars and spotting scopes to determine the presence of owls prior to approaching the burrows. If no owls were observed during an initial five minute observation period, we approached burrows to assess evidence of owl occupancy based on owl sign. Burrows with sign (e.g., whitewash, pellets, feathers, ornamentation) could now be identified as having been used sometime during the interval between our winter and summer survey.

Results:

Burrowing owls were present on nine properties and suitable burrows were detected on 16 properties. Winter surveys detected a total of 1,836 burrows suitable for burrowing owl use based on opening dimensions and burrow depth. Seventy-one burrows exhibited signs of recent use by burrowing owls (e.g., whitewash, pellets, feathers, ornamentation, prey remains), and 214 had evidence of past use (e.g., old pellets, whitewash). The remaining 1,551 burrows had potential to be modified for use by burrowing owls but had no sign indicating recent or past



occupancy. A total of 34 burrowing owls were detected during the winter survey.

A total of 292 burrows where owls or owl sign were detected during winter surveys were revisited during the breeding season. Of these, 117 burrows had collapsed since the previous visit and were unsuitable for burrowing owl use. Four adult owls were detected when revisiting burrows that had supported evidence of burrowing owl use and/or where owls had been detected during the winter survey.

Can the City of Tucson's Avra Valley Properties Contribute to Burrowing Owl Management?

The City of Tucson's Avra Valley properties have high burrowing owl wintering and breeding habitat potential given the abundance of burrows and the predominance of short vegetation across many of the parcels. Close proximity to active or historical farmlands may also increase the potential of these parcels as burrowing owl habitat due to increased prey base.

Our survey results suggest that Avra Valley may be an important wintering habitat, despite lower occupancy during nesting season surveys. Arizona is known to provide winter habitat for burrowing owls that nest in the northern United States and Canada, and loss of this winter habitat has the potential to affect the overall western population of the owl.