



# Migratory linkages of Burrowing Owls on DoD installations and adjacent lands

## Background:



Burrowing owl (BUOW) (*Athene cunicularia*) populations have declined throughout the Western U.S. and Canada, and they have been extirpated from the periphery of their breeding range. Despite these declines, BUOWs appear to be increasing in other areas. One possible explanation for this paradox is that

BUOWs are becoming less migratory. That is, breeding populations might be redistributing themselves rather than declining. This hypothesis has implications for the validity of BUOW listing petitions and for the effectiveness of conservation and management efforts. The status of the BUOW impacts the military mission because BUOWs are common on many DoD installations in the western U.S.

## Objective:

The overall objective of this project is to determine whether BUOWs are redistributing their populations and becoming less migratory. To this end, we will determine connectivity of BUOW populations on DoD installations in the western U.S., and determine how far BUOWs nesting on DoD installations and adjacent lands disperse from one year to the next.

## Summary of Approach:

We will use stable isotope ratios from BUOW feathers to determine where owls breeding on DoD installations disperse. We will use DNA from blood samples to determine how much genetic interchange exists among populations breeding on DoD installations. We will use radio telemetry to determine migration routes and overwintering sites of owls breeding on DoD installations.

## Benefit:

This work will provide a landscape level view of movements among BUOW populations which will allow conservation managers to direct their efforts appropriately. This study also will provide insight into how the rapid land-use changes occurring in arid areas of the southwestern U.S. and northern Mexico are likely to influence the distribution of BUOWs. This information is vital to supporting the military mission because it will help identify the management role of DoD for conserving BUOWs in the U.S., potentially help prevent further listing efforts for a species that is common on DoD installations, and document movement patterns of a breeding bird common on DoD installations in the region. Additionally, this project will provide information and

training to resource managers at DoD installations that want to manage their BUOW populations.

## Accomplishments:

We have trained 7 personnel from 6 DoD facilities on BUOW field techniques. We have visited and collected samples from 3,022 BUOWs at 35 DoD installations.

Patterns of genetic differentiation from DNA indicated a possible connection between Canadian and Mexican populations that would be consistent with the hypothesis that



BUOWs are becoming less migratory. However, we need to increase the power of the analysis by looking at BUOW genetic differentiation on a finer scale than has previously been available. Therefore, we have identified and developed 13 new genetic markers from which we have obtained polymerase chain reaction (PCR) products. We will continue determining the genotypes of BUOWs from DoD bases with this new microsatellite library.

We have also conducted a preliminary stable isotope analysis on feathers to try to determine whether BUOWs from the U.S. were dispersing to Mexico. From a small subset of feathers collected, the distribution of stable isotopes has revealed high breeding site fidelity in all Mexican populations inconsistent with the hypothesis that BUOWs are becoming less migratory. We are just beginning to analyze the large number of blood and feather samples that we have collected.

We have radio-collared 118 BUOWs at Kirtland AFB. We have not located any of these owls outside of Kirtland, but have learned a great deal about the movements of BUOWs on the base. Preliminary results suggest that a smaller proportion of BUOWs than originally suspected survive to disperse from their breeding grounds. We are still radio-tracking BUOWs.



## Contact Information:

Ms. Carol A. Finley  
Natural Resource Manager  
Kirtland AFB  
Natural Resources Office  
2050 Wyoming Blvd. SE  
Kirtland AFB, NM 87117  
505-846-0053  
carol.finley@kirtland.af.mil

Dr. Courtney J. Conway  
Assistant Unit Leader  
USGS Arizona Coop. Research  
Unit  
University of Arizona  
Tucson, AZ 85721  
520-626-8535  
cconway@usgs.gov