



# Migratory Linkages of Burrowing Owls on DoD Installations and Adjacent Lands

Project # 06 to 09-243

## 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 examined connectivity of BUOW populations throughout their range, and quantified how far nesting owls disperse from one year to the next.

## Summary of Approach:

We used stable isotope ratios from BUOW feathers to determine where owls breeding at each sample location came from. We used DNA from blood samples to determine how much genetic interchange exists among populations. We used radio telemetry to determine migration routes and overwintering sites of owls breeding on DoD installations.

## Benefit:

This work provides a landscape-scale view of movements among BUOW populations which will allow conservation managers to direct their efforts appropriately. Our results 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 in the future. 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 still rather common on DoD installations, and document movement patterns of a bird that breeds on many DoD installations in the region.

## Accomplishments:

We have trained 7 personnel from 6 DoD facilities on BUOW field techniques. We have visited and collected samples from >4000 BUOWs at 38 DoD installations and dozens of other locations throughout the bird's breeding distribution in North America. Patterns of genetic differentiation from DNA indicated a connection between Canadian and northern Mexican populations that would be consistent with the hypothesis that BUOWs are becoming less migratory. We also found evidence supporting 1 or 2 unique subspecies in central Mexico. Our analyses of stable isotope ratios of feathers has revealed high levels of connectivity among populations, but owls at the northern edge of the breeding range are "rescued" via very high rates of immigration from elsewhere (including the southwestern U.S.). We radio-collared 118 BUOWs at Kirtland AFB. We have not located any of these owls outside of Kirtland AFB, but have learned about the movements of BUOWs on the base. Preliminary results suggest that a smaller proportion of BUOWs than originally suspected survive to dispersal age.

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