

**Project Perch's mission is to protect and nurture the Burrowing Owl in SE Florida.
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Project Perch's BuOw Blog 8

August 12, 2013

Where do the owls go?

Even before Tropical Storm Andrea, the burrowing owls had started to disappear. We were not at all surprised; they were always scarce in August. We knew the owls dispersed after nesting. We had been telling the students that owls dispersed once their young were fledged, because they could. The young could fly and they were no longer reliant on the burrow. Their dispersal also coincided with the hawk migration which takes place from mid-August through November and so the owls become a bit more secretive and seldom seen.

Then we had Tropical Storm Andrea and the burrow in front of the camera flooded. As we wrote about that storm, we had several references that hypothesized that burrow flooding during the rainy season could be a dispersal mechanism for Florida burrowing owls.^{1, 2} Here is a description from Dr. Mealey's work:

"Numbers peaked in late May and early June. During the following months, the sightings decreased as adults shifted to a more crepuscular and nocturnal behavior and the young dispersed to new areas. The onset of summer and the rainy season probably play major roles in the shift in behavior and in fledgling dispersal due to the flooding of burrows."¹

Even the very earliest observations of Florida burrowing owls indicated they dispersed after breeding, but there was no understanding as to why they dispersed or where they dispersed to.

"Bendire (1892) says that "after the breeding season is over, the Florida Burrowing Owl is said to disappear for a time from its usual haunts, but where it goes is not positively known."³

Nomadic Colonies

The observations of Florida burrowing owls from the 1800's indicate that small nomadic colonies were common.³ Periodic fires and flooding, coupled with natural firebreaks such as rivers and wetlands may have created a continuously shifting mosaic of short grass habitat suitable for the owls. Millsap theorized that Florida burrowing owls were nomadic and followed these short-term disturbances that created new breeding habitat.² Most lightning strikes and fires historically occurred during June to September and also coincided with the flooding of burrows.²

Adult Dispersal

Breeding dispersal is defined as the movement of adults between breeding attempts.⁴ It has also been defined as movements of greater than 100m from the previous nest site between breeding seasons.⁵ Dr. Mealey describes the adults as more crepuscular and nocturnal.¹ As early as 1889, Hoxie described the adults as becoming more crepuscular and nocturnal, but also arboreal.³

Adult Post-Breeding Dispersal in Non-Migratory Burrowing Owls

Non-migratory populations of burrowing owls often do not display breeding dispersal, but nest again in the same burrow or move to or build another burrow nearby. In an urban environment in Florida, few adult owls dispersed greater than 400m between breeding seasons.⁶ In this study and others that had similar results, the density of burrowing owls was comparatively very high.⁶

Another study looked at a population of non-migratory Western burrowing owls, where the owls were at low densities in an extensive habitat. The hypothesis was that dispersal distance would be greater and that is what they found with a mean dispersal distance of 3.1km.⁴ Results from the study showed that owls from successful nests did not disperse but about half of the owls from the unsuccessful nests did disperse.⁴ Dispersal was strongly influenced by nest success.⁴

Dr. Mealey reported that during his research, the adults, in most cases, stay on the territory but not in the burrow. The adults are usually close by in trees, sheds and barns, since most of the burrows flood during summer.⁷ The owls in Rolling Oaks, a residential area, were visually seen off season in the barns or open sheds.⁷ The Burrowing owls at the Miami and Ft. Lauderdale International Airports moved into the airplane hangars.⁷ Some school owls may use the burrow sporadically when they are not flooded or because they are built in non-flooding areas.⁷

Nesting Success, Mate Loss, Divorce and its Affect on Dispersal Probability and Distance

Further research on non-migratory Western burrowing owls focused on dispersal and investigated the hypothesis that dispersal probability and distance is affected by nesting success and mate fidelity. They banded the owls so that they could be re-sighted. The following results were found:

- a. Most owls (66%) remained near their initial nest.
- b. Owls that moved >100m, were treated as dispersing and dispersed an average distance of 472m.
- c. Both female and male owls whose nests failed were more likely to disperse and go longer distances.
- d. Nest failure was associated with an increased chance of divorce.
- e. Divorce and mate loss was related to increased dispersal probabilities and distances.
- f. Even after controlling for the effects of mate loss, nesting success was the most important factor.⁵

The study concluded that nest failure was the primary factor associated with dispersal probability and distance.⁵

Divorce

The owls we are watching in the camera suffered nest failure, so will they divorce? Divorce rates in Burrowing owls are very low. In the study cited above, high mate fidelity was observed with only 8% of pairs divorcing.⁵ Millsap also reported high mate fidelity in the central Florida population of Burrowing owls where 9% of pairs were divorced.⁶ However, divorce is related to nesting failure and owls are both more likely to change mates and disperse following reproductive failure.⁵ So it is possible that this pair of owls could still divorce and disperse. We hope not.

Juvenile or Natal Dispersal in Florida Burrowing Owls

In a study on Florida burrowing owls in a rural environment, dispersal was studied. This study used radio transmitters but the adult owls never adjusted to the transmitters, so the study only tracked juveniles. Dispersal was defined as a young owl moving from its breeding habitat to any other habitat and dispersal distance was calculated by measuring the distance to the nearest meter.⁷

During the day, juveniles were consistently relocated near their burrows. The home range estimates of owlets indicated they were extremely dependent upon their burrows.⁷ Myrkalo's findings were consistent with what Mealey had reported; that young owls were dependent upon their burrows for up to 60 days after the young were able to fly.¹

Also like Mealey, Myrkalo found that the juvenile burrowing owls in his study dispersed from their breeding habitat when it was flooded.^{1,7} He described the young owls activity as shifting from colonial to solitary and they changed habitats, from an improved pasture to saw palmetto and scrub oak.⁷ Once the owlets dispersed from their burrow, they were never again relocated in the breeding habitat during the study, even after the water had receded and the breeding habitat had dried.⁷ Dr. Mealey also reported that while doing his research, the young owls in most cases dispersed to new areas.⁸ He banded young that established 5 miles from their natal site.⁸

Also, during Myrkalo's study, juvenile burrowing owls were not observed with other juveniles or adults during the dispersal and post-breeding period.⁷ Therefore, the colonial behavior of burrowing owls may only occur during the nesting season.⁷ The different habitat preference for juvenile burrowing owls during the breeding and post-breeding period raises concerns about current management practices, which only protects the breeding habitat and even then, only while it is being used. Understanding and describing the factors that affect burrowing owl breeding dispersal is critical for modeling population dynamics and designing conservation strategies.

The Owls in Front of the Camera

After the owls' nest failed during Tropical Storm Andrea, we worried they would disperse like the rest of the colony, but we also knew they had never dispersed as juveniles. In the prior summer, when they were owlets, their parents stayed around all summer with them. Initially, the parents moved next door, to a natural satellite burrow they had dug and added to their main burrow. Then the parents moved across the street and built a new burrow to nest in. This left the juveniles their natal burrow with a satellite burrow nearby and they stayed. We are hoping they do not divorce or disperse and just stay put. We are also hoping the rest of the colony returns soon. In the past, owls typically start to return in late fall and by mid winter, they are taking up residence and fixing up burrows in time for breeding season.



**January 2013 – The juveniles on the left are the adults in the camera now. Their parents stayed with them and did not disperse last year. The young have also not dispersed from their natal burrow, even though their nest failed.
– Picture Donated by a Student**

Sources:

¹ Mealey, Brian. 1997. Reproductive Ecology of the Burrowing Owls, *Speotyto Cunicularia Floridana*, in Dade and Broward Counties, Florida. Falcon Batchelor Bird of Prey Bird of Prey Center, Miami Museum of Science, Florida. <http://www.instwildlifesciences.org/Mealey.BUOW1997.pdf>.

² Millsap, Brian A. 1997. Florida Burrowing Owl. Pp. 579-587 in J.A. Rodgers Jr., H.W. Kale II, and H.T. Smith, eds., Rare and Endangered Biota of Florida: Volume V. Birds. University Press of Florida, Gainesville, FL.

³ Bent Life History of the Florida Burrowing Owl, http://www.birdzilla.com/birds/Burrowing-Owl/bent_life_history.html

⁴ Rosier, Jeff R., Noelle A Ronan and Daniel K. Rosenberg. 2005. Post-Breeding Dispersal of Burrowing Owls in an Extensive California Grassland. *The American Midland Naturalist*, 155:162-167.

⁵ Catlin, D.H., D.K. Rosenberg and K.L. Haley. 2004. The Effects of Nesting Success and Mate Fidelity on Breeding Dispersal in Burrowing Owls. Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR.

⁶ Millsap, Brian A. and Cindy Bear. 1988. Cape Coral Burrowing Owl Population Monitoring: Annual Performance Report. Florida Game and Fresh Water Fish Commission, Tallahassee, FL, pp. 1-16.

⁷ Mrykalo, Robert. 2005. The Florida Burrowing Owl in a Rural Environment: Breeding Habitat, Dispersal, Post-Breeding Habitat, Behavior and Diet. Master's Thesis, University of South Florida.

⁸ Mealey, Brian. 2013. Personal Communication.