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Project Perch's BuOw Blog 6

Friday, July 19, 2013

Behaviors, Activity Patterns and Time Budgets of Burrowing Owls

When we first started watching the owls in April, their behavior seemed “normal” to us and what we expected. By mid-May, we could not believe the amount of food the male was bringing back to the burrow. As the darkness lifted in the morning each day, we would wait to see what new surprise the male had left there for the female and the owlets. There was a lot to watch, the burrow was always busy with activity and we were really having trouble keeping up. Then in early June the burrow flooded during Tropical Storm Andrea, and in a few days, the hunting efforts diminished and their behaviors went back to “normal”.

So many people have commented to us on how enjoyable it is to watch this pair of burrowing owls. They seem to always be around and hanging out together. More recently, we were watching them in the morning, from 8 to 9 am, and the female was out and she seemed to be enjoying some time in the sun, stretching, fluffing and working on her feathers. She seemed to be relaxing or “loafing”, a behavior we had not really seen before. Then came the Cooper's hawk and the owls did nothing but stay in the burrow and scan the sky. So we were wondering and talking about how Burrowing owls really spend most of their time.

Movements and Activity Patterns of Saskatchewan Burrowing Owls in Breeding Season

In 1990, Haug and Oliphant published the first study of both diurnal and nocturnal movements and activity patterns of Burrowing owls. They classified the owls' behaviors into the following categories: foraging, roosting, loafing, nesting, and raising young. “Diurnal observations showed that male owls foraged at all hours of the day but spent most of the day roosting or loafing within 50m of the burrow. They were occasionally seen foraging for insects farther than 50m, but they were never seen to travel farther than 250m. Adult owls were never seen hunting or carrying small mammals during the day.”¹

“Peak activity hours, as determined by flights >50m from nest burrows, occurred between 2030 and 0630 hours. Males became more active, frequently engaging in long-distance flights and hovering, suggestive of foraging for small mammals. Most of this activity began within 1 hour of sunset and ended at sunrise. The results of the study indicated that male owls were predominantly nocturnal and flew long distances to find food during darkness. From the time the young hatched until their independence, the adults were also observed foraging for insects within 250m of the nest burrow during daylight hours.”¹

All of this corresponded perfectly with what we saw in May. We had always told students that the owls were “crepuscular”, active at dawn and dusk and that they mostly ate insects (80-90% of diet) with an occasional small mammal. When we describe them going forward, we will make the distinction that we are describing the non-breeding season. During the breeding season, the male owl is working hard all night and bringing back all sorts of small mammals.

Behaviors Common to Florida Burrowing Owls

In 2000, Bowen was the first to describe the behaviors common to Florida Burrowing owls and included the following categories: territory defense, hunting, preening, roosting, feeding young and burrow maintenance.

Behavior of Adult and Juvenile Florida Burrowing Owls in a Rural Environment in Breeding Season

Part of Robert Mrykalo’s thesis in 2005 was a behavioral study on Florida burrowing owls in a rural environment. Mrykalo included the following categories for adults: scanning, hunting, preening, thermoregulation, feeding self/young, digging and vocalizing.³ He included the following categories for owlets: scanning, dozing, wing stretching, being fed, digging, vocalizing, flying practice and running into the burrow.³ Behavioral observations ranged from 1-4 hours, were done at 5 minute intervals using a spotting scope from 100m away.³ Mrykalo’s work was the first to include the behaviors of juvenile owls.

Scanning was the most frequently observed behavior for both females and males with or without young and the second most observed behavior was thermoregulation.³ For females with young and for males with or without young, the third most observed behavior was hunting.³ For females without young, the third most observed behavior was preening. Mrykalo also determined there was no relationship between sex and behavior or sex and location.³ Scanning was also the most frequently observed behavior in owlets and the second most frequent behavior was practice flying and the third was running into the burrow.³

We had posted about the owls warming themselves in the morning by tucking one leg up underneath them, an adaptation called “rete mirabile”. Now that we were in the middle of a Florida summer, we had seen the owls doing all sorts of things to cool themselves. We had posted pictures and information about their “gular flutter”, their droopy wings and all sorts of pictures of them shading themselves, the burrow, and each other. For Florida burrowing owls, staying cool in the summer takes some work.

Effects of Translocation on the Behavior of Florida Burrowing Owls

Anders Nixon studied two populations of Florida burrowing owls in 2006. The first owls were in their natural habitat. The second group had been relocated to a new area with an artificial burrow system and support fed water, 20 crickets and 2 mice per day for 18 days and then released. Observations were conducted on randomly chosen owls from both groups and they were watched for 30 minutes in the morning or the afternoon. Observations occurred 2 days a week for 6 hours. “Times, events and approximate location (i.e. at burrow/on perch, at burrow/on ground, away from burrow/on ground and away from burrow/on perch) were recorded.”⁴ Nixon studied the second group of owls before and after their relocation.

Behaviors were reduced to behavioral events and in Nixon’s study the following events were included: scanning, gular flutter (cooling), scanning and cooling, hunting, preening, resting, comfort movements (stretching, yawning, fluffing feathers), pellet regurgitation, burrow maintenance, aggression, interspecies interaction, burrow decoration, and flight practice (juveniles), cannot be ascertained (either in burrow versus out of burrow).⁴

The top three day time behaviors observed for the owl populations were as follows:

Control Population	Scanning (47%)	In Burrow (34%)	Resting (7%)	Scanning/Cooling (5%)
Pre-translocation Population	Scanning (47%)	In Burrow (37%)	Resting (7%)	Scanning/Cooling (2%)
Post-translocation Population	Scanning (59%)	In Burrow (21%)	Resting (2%)	Scanning/Cooling (7%) ⁴

There were significant differences in scanning and resting time between the control and treatment group. Even though differences in behavior were present in the relocated group, before and after relocation, there were no statistically significant differences.⁴

Recently, when we started seeing the Cooper's hawk, we were reminded that the owl's main focus all of the time is to stay safe. The owls spent almost all of their time scanning skyward and retreating into their burrow. They must stay vigilant if they are to keep ahead of their predators, especially aerial ones.

The First Diurnal Time Budget of Florida Burrowing Owls in the Non-Breeding Season

In 2008, the first study was published that looked at the non-breeding season time budget of burrowing owls. LaFever, LaFever, Catlin and Rosenberg (2008) used the following list to categorize the owls behaviors: agonistic, alert, comfort movements (preening, yawning, or defecating), feeding, locomotive (flying or running), out of sight (either in burrow or away from burrow based on radio transmitters) and resting.⁵

"The major finding of the study was the high percentage of time owls spent within the nest burrow during the non-breeding season, contrary to the previous understanding of the owls' ecology from which management guidelines are based." In this study, the males spent most of their time alert, 58% for males and 43% for females and the females spent most of their time in the burrow during early afternoon, 19% for males and 46% for females. Some inter gender differences remained into the non-breeding season. The study suggested two explanations for this. The first was that the female was conserving energy to be in prime condition to breed. The second was that the male was protecting the female from predation and mate guarding or protecting the female from unmated males.⁵

The official breeding season has just ended. Once the young have fledged, some owls disperse. Both juveniles and adults can become more nocturnal and arboreal. Mealey reported that this coincided with the onset of the summer rains which floods some burrows.⁶ Come August and September, the hawks migrate through Florida and some biologists have correlated that to the dispersion of the owls; others say it is how the owls have adapted to the fire-dependent ecosystem they have historically relied upon. When these owls lost their young in Tropical Storm Andrea, we immediately wondered if they would disperse, but they haven't.

Some owls, especially urban school yard owls, have been reported to be year round residents, sometimes breeding multiple times a year. The parents of these owls have been observed doing just that. These young owls did not disperse last year and so we are hoping that they might stay put again this summer, only time will tell. This last study only proves how important the burrow is to the owls year round. The hawk visits reminded us how happy we were that these owls have stuck close to their burrow. We are also happy they know where all of the other burrows are in the area and can find them quickly if they need to.



June 26 5:57pm – A Hard Day at Work, Scanning for the Cooper’s Hawk

Sources:

¹ Haug, Elizabeth A. and Lynn W. Oliphant. 1990. Movements, Activity Patterns, and Habitat Use of Burrowing Owls in Saskatchewan. *The Journal of Wildlife Management*, Volume 54, No. 1, Jan 1990, pp. 27-35.

² Bowen, Pamela. 2000. Demographic, distribution, and metapopulation analyses of the burrowing owl (*Athene cunicularia*) in Florida. Thesis, University of Central Florida, Orlando, Florida.

³ 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.

⁴ Nixon, Anders. 2006. Effects of Translocation on the Florida Burrowing Owl, *Athene cunicularia floridana*. University of South Florida, <http://scholarcommons.usf.edu/etd/2648/>

⁵ LaFever, David H., LaFever, Kristin F., Daniel H. Catlin, and Daniel K. Rosenberg. 2008. Diurnal Time Budget of Burrowing Owls in a Resident Population During the Non-Breeding Season. *The Southwestern Naturalist*, Mar 2008, pp. 29-33. <http://people.oregonstate.edu/~rosenbed/articles/Lafever%20et%20al%20SWNAT%20in%20press.pdf>

⁶ 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>