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NESTING PHENOLOGY AND BURROW OCCUPANCY OF THE FLORIDA BURROWING OWL (*Athene cunicularia floridana*) IN SOUTH FLORIDA

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Abstract.— Incidental take permits by the Florida Fish and Wildlife Conservation Commission (FWC) are required when a Burrowing Owl burrow will be impacted by clearing or construction. These permits are issued only for burrows that are inactive. The typical breeding season for Burrowing Owls is 15 February–10 July. This project had 4 chronology-related objectives: 1) estimate the percentage of burrows in south Florida that became active prior to 15 February, 2) identify the range of dates when nesting was initiated, 3) estimate the percentage of burrows occupied by adult owls prior to 15 February, and 4) estimate the percentage of decorated burrows that were active. A fifth objective was to determine if the burrow lengths of Burrowing Owls in south Florida are comparable to those in the published literature. We scoped 89 burrows at four sites from 30 November 2007 to 14 February 2008. Only 4.4% ($n = 4$) of the burrows were active (contained eggs or flightless chicks). Burrow lengths ranged from 0.3 m to 3.2 m with a mean length of 2.05 m. This study found less than a 5% probability of a burrow being active between the 30 November and 14 February so the risk of encountering an active burrow while executing an FWC incidental take permit during this period is low.

Key words: breeding status, Burrowing Owl, burrow length, nesting phenology

INTRODUCTION

Historically, the Florida Burrowing Owl was found primarily in Florida's central prairies. However, clearing for development, draining and filling of wetlands, and construction of numerous parks, schools, and airports have created suitable habitat for Burrowing Owls in urban areas throughout most of peninsular Florida (Millsap and Bear 2000). Due to native habitat loss and the owl's dependence on human-maintained habitat, the Florida Fish and Wildlife

Conservation Commission (FWC) classified the Florida Burrowing Owl as a Threatened species in 2016 (FWC 2016). An incidental take permit from FWC is now necessary to proceed with clearing or constructing on properties when Burrowing Owls and their burrows will be affected. Currently, FWC issues incidental take permits only for inactive Burrowing Owl burrows. Inactive burrows are defined as not containing eggs or flightless young. Generally, most burrows are considered inactive outside the period from 15 February through 10 July, the breeding season officially designated by FWC in its *Florida Burrowing Owl Species Conservation Measures and Permitting Guidelines* (hereafter referred to as Permitting Guidelines; FWC 2018). However, chicks have been found as early as October at Cape Coral, Lee County, and Florida Atlantic University, Palm Beach County (Millsap and Bear 1990, McKie 2003). Permitting Guidelines also recommend a minimum buffer of 3 m (10 ft) around Burrowing Owl burrows during the non-breeding season to prevent harm to burrows by construction or other human activities (FWC 2018). The buffer is based on burrow lengths found by Millsap (1996) at Cape Coral, Florida, but there are little to no published data for other regions of Florida.

Unfortunately, it is not possible to determine burrow or nest status of urban Florida Burrowing Owls by examining only the exterior, and it is difficult to estimate when egg laying occurs because pair formation is not always evident and owls sometimes occupy their burrows year-round (Millsap 1996). The presence of one or two adult owls at a burrow indicates that the burrow is occupied but not whether it is active or inactive. Occupied burrows may be decorated by the Burrowing Owls with materials such as paper, fecal matter, trash, and animal parts, but it is unclear if decorations indicate an active burrow (Mealy 1997). The use of burrow video scopes, miniature video cameras mounted at the end of a feed line and viewed through a small monitor, are commonly used in determining burrow status. However, if there are sharp bends or obstructions in the burrow, the scope may not be able to reach the egg chamber. Therefore, the status of the burrow may not be determined unless completely excavated. Excavation entails gently digging from the entrance of the burrow by hand or trowel, a small section at a time, until reaching the end (FWC 2018). If eggs or flightless chicks are encountered in the process of excavation, the permittee is required to stop digging. Unfortunately, at that point it may not be possible to reconstruct the burrow, requiring the eggs or chicks to be transported to a wildlife rehabilitator.

This project had four chronology-related objectives: 1) to estimate the percentage of burrows in South Florida that became active before 15 February, 2) to identify the range of dates when nesting was initiated,

3) to estimate the percentage of burrows occupied by adult owls (when burrows are active vs. inactive) before 15 February, and 4) to estimate the percentage of decorated burrows that were active during the study period. The final objective of the project was to determine if the burrow lengths of Burrowing Owls in South Florida are similar to those in the published literature.

METHODS

We selected three study sites on the Florida Atlantic Coast: Florida Atlantic University in Boca Raton; Brian Piccolo Park in Cooper City, Broward County; and Central Broward Regional Park in Lauderhill, Broward County. The fourth study site was Marco Island in Collier County on Florida's Gulf Coast (Fig. 1). We included all known Burrowing Owl burrows found at each site in the survey and gave each a unique identification number. The FWC staff conducted the surveys in Palm Beach and Broward counties. The environmental scientist for the City of Marco Island conducted the scoping and surveys on Marco Island. Observers conducted surveys at intervals of 14 days or less, from 30 November 2007 to 14 February 2008. At each burrow, the observer recorded the location and behavior of adult owls present at the entrance and the condition of the burrow. Observers used a burrow scope to determine if adults, eggs, or chicks were present within the burrow. We considered burrows with adults present at the entrance to the burrow prior to our approach or inside the burrow to be occupied, regardless of whether the burrow was active. We scoped all burrows at the project sites at least once. We recorded the presence of burrow decorations around the entrance hole at each visit. The FWC buffer zone guidelines for the protection of burrows are in feet so we measured burrow lengths to the nearest six inches (15.24 cm) by marking the scope's feed line in six-inch increments.

RESULTS

We scoped a total of 89 burrows across all four sites. Of those burrows, 4.4% ($n = 4$) were active as defined by FWC during the study period (Table 1). Brian Piccolo Park contained two active burrows. One burrow contained five eggs on 3 January 2008 and two chicks on 1 February 2008. The second burrow contained three eggs and one chick on 25 January 2008. We recorded two other active burrows at Central Broward Regional Park. One burrow contained two eggs on 19 December 2007 and one chick on 1 February 2008. The second burrow contained two chicks on 11 January 2008, which means eggs were laid in December 2007. Florida Atlantic University and Marco Island did not have any active burrows during the study period. Forty-eight percent ($n = 43$) of the burrows surveyed were occupied; however, 90% of occupied burrows were inactive prior to 15 February (Table 1). Nineteen burrows had decorations at the entrance hole; however, only 5% ($n = 1$) of those burrows were active before 15 February. Decorations included foil, animal remains, animal scat, feathers, food wrappers, and assorted plastic debris. Burrow lengths

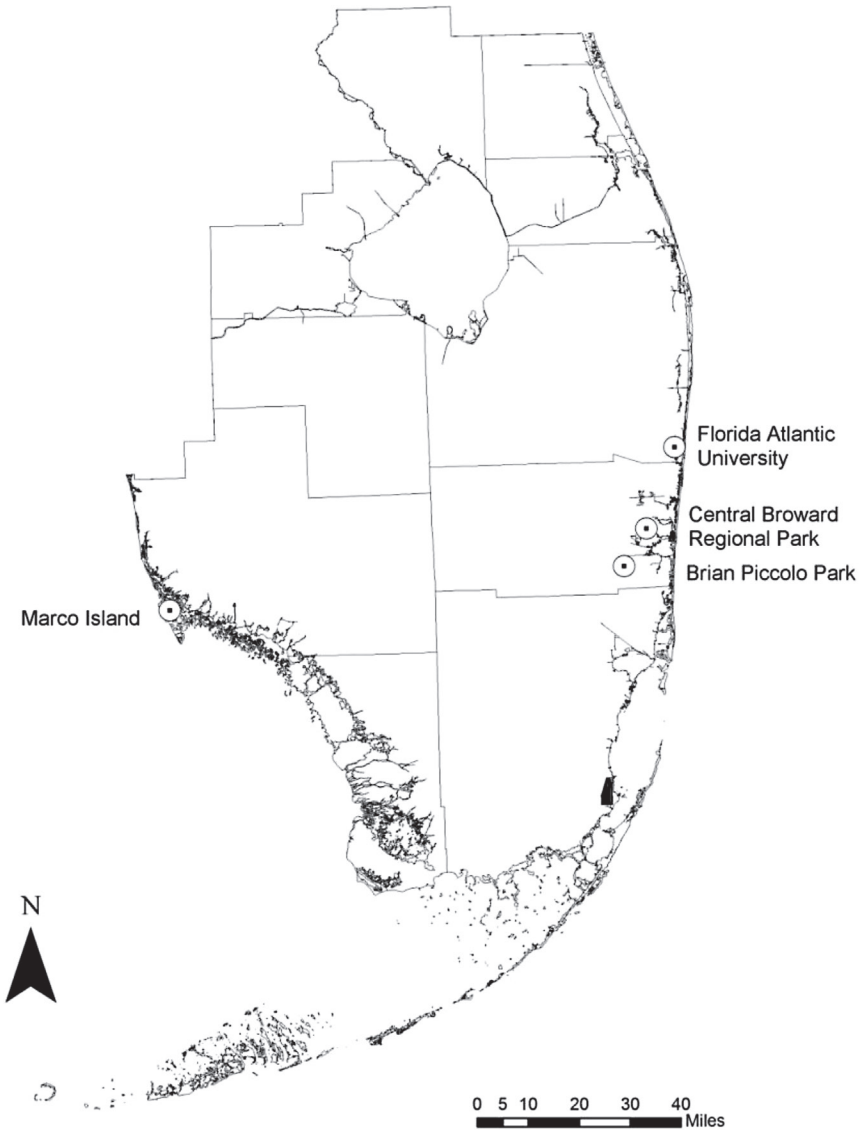


Figure 1. Burrowing Owl nesting phenology and occupancy study sites in South Florida, 2008–2009.

ranged from 0.3 m to 3.2 m with a mean length of 2.05 m for all sites combined (Table 1).

DISCUSSION

Table 1. Number of occupied burrows, decorated burrows, active burrows, and length of Burrowing Owl burrows scoped at four sites in South Florida 30 November 2007 to 14 February 2008.

Site	<i>n</i>	Decorated	Occupied	Active	Mean length (m)	Range of lengths (m)
Florida Atlantic University	26	3	16	0	1.99	0.30–3.04
Brian Piccolo Park	16	9	16	2	1.98	1.52–3.20
Central Broward Regional Park	13	4	11	2	2.11	1.37–3.04
Marco Island	34	3	nd ^a	0	2.11	1.21–3.20
Total	89	19	43	4	2.05	0.30–3.20

^aNo data.

This study found less than a 5% probability of a burrow being active between 30 November and 14 February. Therefore, the risk of encountering an active burrow while conducting activities authorized by an FWC incidental take permit during this period is low. Results showed that occupancy and decorations are not good indicators of the status of a burrow.

Determining burrow status by using the presence of adults outside the entrance hole is not always a reliable method even if surveys are conducted for several days or multiple weeks. Similarly, the use of burrow decorations to assess burrow status is not always a reliable method. Although McKie (2003) found that owls at Florida Atlantic University decorated the entrance holes of burrows prior to egg-laying and incubation, there was no mention of how much time had elapsed between decoration and egg-laying. More research on the relationship between burrow decorations and nesting phenology is necessary before it should be used as a predictor of burrow status. Using a burrow scope to determine burrow status is also not foolproof. Burrowing Owls repeatedly retreated into the burrow when approached or were already inside the burrow before the scoping began. Further, the adults did not always flush out of the hole when the scopes were inserted, making it impossible to verify the contents of the burrow with the scope when the tunnel was blocked by one or more adults. At times, the scopes could not turn a corner inside the tunnel or the scope was blocked by rocks or other debris, making it difficult to reach the end to confirm burrow status. The most reliable method of determining burrow status when excavating a Burrowing Owl burrow for the purposes of clearing or construction is to use a combination of scoping and excavating a burrow, carefully starting from the entrance hole and working toward the end. These recommendations are consistent with FWC permitting guidelines. Finally, the average and maximum Burrowing Owl burrow lengths at these sites were consistent with the 2–3-m lengths found in other regions of Florida (Poulin et al. 2011) and the recommended buffer zones in the FWC permitting guidelines.

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LITERATURE CITED

FWC [FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION]. 2016. Florida's Imperiled Species Management Plan. Tallahassee.

- FWC [FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION]. 2018. Florida Burrowing Owl Species Conservation Measures and Permitting Guidelines. Tallahassee.
- MEALY, B. 1997. Reproductive ecology of the Burrowing Owls, *Speotyto cunicularia floridana*, in Dade and Broward Counties, Florida. *Journal of Raptor Research* 9:74–79.
- MILLSAP, B. A. 1996. Florida Burrowing Owl. Pages 579–587 in *Rare and Endangered Biota of Florida, Volume V: Birds* (J. A. Rogers and H. W. Kale II, Eds.). University Presses Florida, Gainesville.
- MILLSAP, B. A., AND C. BEAR. 1990. Double-brooding by Florida Burrowing Owls. *Wilson Bulletin* 102:313–317.
- MILLSAP, B. A., AND C. BEAR. 2000. Density and reproduction of Burrowing Owls along an urban development gradient. *Journal of Wildlife Management* 64:33–41.
- McKIE, A. C. 2003. Population trends and breeding ecology of the Florida Burrowing Owl (*Athene cunicularia floridana*) on the Florida Atlantic University Campus, 1990–2003. M.S. thesis, Florida Atlantic University, Boca Raton.
- POULIN, R. G., L. D. TODD, E. A. HAUG, B. A. MILLSAP, AND M. S. MARTELL. 2011. Burrowing Owl (*Athene cunicularia*). Account 61 in *The Birds of North America Online* (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York.