

**Project Perch's mission is to protect and nurture the Burrowing Owl in SE Florida.  
A real life HOOT, join now!**



**Project Perch's BuOw Blog 15**

**Friday, April 11, 2014**

### **Re-Nesting, Double-Brooding, Nesting Success and Fledgling Rates**

#### **Re-nesting versus Double-brooding**

When an initial nesting attempt fails, several species re-nest.<sup>1</sup> Re-nesting has been documented in numerous birds, including Western and Florida burrowing owls.<sup>2,3</sup> Two successful nests during the same breeding season is called "double-brooding" and was defined by Marti in 1969.<sup>4</sup> Double-brooding is rare in raptors and is thought to be uncommon because of the length of the breeding cycle.<sup>4</sup> The definition used by Millsap and Bear in 1990 was slightly different; raising two broods in the same calendar year versus the same breeding season.<sup>2</sup>

#### **Double-Brooding in Western Burrowing Owls**

Western burrowing owls are migratory and live in climates that make multiple breeding attempts more difficult.<sup>2</sup> Studies of non-migratory Western burrowing owls revealed re-nesting attempts following the destruction of their burrow, the loss of eggs or hatchlings.<sup>2</sup> The true frequency of re-nesting and second nesting attempts is likely underestimated because the female has to be individually marked and observed at both nests.<sup>3</sup> Distances moved between first and second breeding attempts within a nesting season are frequently not available and are likely underestimated for most, if not all species.<sup>3</sup>

In California Gervais and Rosenberg documented a pair that produced a second brood of chicks in 1999.<sup>5</sup> In 2004 Caitlin documented two pairs that produced three and four clutches after their eggs were experimentally removed.<sup>6</sup> In Texcoco, Mexico, A.M. Romero and M. Olivas documented a banded pair of burrowing owls that raised two broods with three young each in March and December of 2006.<sup>3</sup> There were also two instances at a Tucson study site where females left young nestlings and moved to initiate second nests with new mates.<sup>3</sup>

In May of 2003, at the Tucson study site they also documented a female burrowing owl that hatched a nestling that she left behind with the male owl.<sup>3</sup> By July she had migrated to Saskatchewan and had a second clutch of seven young.<sup>3</sup> In two and a half months she had migrated 1,860km north and crossed between two migration corridors, the one east of the Rocky Mountains through the Great Plains and the second for British Columbia along the West coast of North America.<sup>3</sup> She arrived in Saskatchewan fit enough to breed and brood seven young.<sup>3</sup> This is the first time a second brood has been documented following a long distance migration by a burrowing owl.<sup>3</sup> These long distance dispersals have important implications for population genetics, especially in colonies that have become genetically isolated.<sup>3</sup>

## Double-Brooding in Florida Burrowing Owls

In 1986 Wesemann suggested that the stable prey densities and sub-tropical climates in Southern Florida might allow for double-brooding, but he noticed no instances of it in his study.<sup>7</sup> Millsap and Bear studied the same population from 1987-1991 and were the first to document double-brooding in Florida burrowing owls.<sup>2</sup> They defined double-brooding as the raising of two broods in the same calendar year and documented five instances of it.<sup>2</sup> The approximate interval between fledgling of first broods and initiation of second clutches was 29 days at nests A and D, 26 days at nest B, 16 days at nest C and approximately 150 days at Nest E.<sup>2</sup> The pairs at nest A and C remained paired and raised two broods successfully.<sup>2</sup> The father owls at nest B, D and E took up with new females and had second clutches.<sup>2</sup> Although it appeared to be a rare event, 1% of the occupied nests in their study population were able to successfully brood two clutches in one year.<sup>2</sup>

## The Prolific Pair

In May of 2009, the school had just one family of owls. There was an adult pair and 4 owlets or an adult pair, 3 owlets and 1 juvenile from the previous batch of young. They had produced young in the previous breeding season and also right after Thanksgiving and that is why it was so hard to tell if the largest juvenile was from the current or previous batch of young. They were so successful they were nicknamed the Prolific Pair. They were successful double-brooders using Millsap and Bear's definition because the two nests were within the same calendar year.<sup>2</sup> Their nests were at least 150 days apart and was similar to what Millsap and Bear documented at Nest E.<sup>2</sup>

## The Cam Owls

The Cam Owls were new parents during the 2013 breeding season. They had laid their eggs later than the other owls at the school. By May, they were on eggs and by June they had at least one owlet. On June 7, 2013, Tropical Storm Andrea hit and the burrow was flooded and the owls lost all of their owlets. We would only be able to confirm one, but there is no reason to believe they didn't have 3-5 more babies down there. Millsap and Bear's study of owls in Cape Coral had flooding as the third most prevalent cause of nesting failure.<sup>8</sup> In Mealey's study of Florida burrowing owls in Broward and Dade counties, the primary cause of the known nesting failures was flooding or 63% of the failed nests had flooded.<sup>9</sup>

By December, the Cam Owls had re-nested and were on eggs again. Their nests were also about 150 days apart. By mid-February 2014, owlets would emerge from the burrow. We were thrilled when we confirmed 5 owlets in total but their success wouldn't last. The Cooper's hawk got two of the owlets while at the same time the two littlest ones were outcompeted for food. The middle owlet would grow up and fledge and so the Cam Owl's second nesting would be considered a success. A territory is successful if one or more young fledge from it.<sup>9</sup> Millsap and Bear wrote the young needed to survive to fledge or 40 days of age.<sup>8</sup> The percentage of successful nests from residential areas in Mealey's study ranged from 38% - 58% in 1988-1990.<sup>9</sup> So far 50% of the Cam Owl's nests had been successful.



**The Cam Owl's Four Babies – February 10, 2014**

## Fledgling Rates

Millsap and Mealey reported fledgling rates per breeding pair of 1.59-2.75 for the Florida burrowing owl.<sup>8,9</sup> These rates were much lower than those previously reported for Western burrowing owls.<sup>9</sup> In Millsap and Bear's study brood size ranged from 0 to 6 and 30% of nests failed, 11% of the nests fledged 1 young, 18% fledged 2, 18% fledged 3, 15% fledged 4, 6% fledged 5 and 2% fledged 6.<sup>8</sup> The mean number of young fledged per breeding attempt per occupied nest site was 2 and 2.9 per successful nest site.<sup>8</sup> The fledgling rate for the Cam Owls is 1 and that is low, but they are young parents and this was their first nesting season. The Prolific Pair have had several nests with a fledgling rate of 3 and at least one with 4, but that is high, and they are very experienced parents. In April of 2014 the Prolific Pair's six owlets starting showing themselves. They were very large and already able to flap their wings and hop. The dad always sits guard on the nearby tree or fence and sends the owlets into the burrow whenever anybody comes near, making it difficult to get a good picture of the babies even from outside of the fence. We hope they will be able to fledge all of their young and continue to raise the colony's fledgling rates up.



**The Cam Owl's Fledge - February 26, 2014**

## Mate Fidelity

Five weeks after the owlets were born, the mother owl from the Cam Pair moved next door to the natural burrow. We thought at first she was excavating and cleaning up that burrow, so she and dad could move next door, but soon she had a new mate. The Cam Pair divorced. Millsap and Bear's study from 1987 to 1990 looked at mate fidelity in burrowing owls. For instances where both pair members were known to have survived into the next breeding season, 92% of the pairs remained together and 9% of the pairs divorced.<sup>10</sup> There were no consistent patterns that preceded territory shifts in instances where the first territory was still intact.<sup>10</sup> More territory moves followed successful breeding attempts (58%) than unsuccessful breeding attempts (42%).<sup>10</sup> Why mother owl left and moved next door is unknown, but we wonder if she will be nesting in that burrow in the near future and able to produce a third brood within the same calendar year.

## Sources:

- <sup>1</sup> Newton, I. 1979. Population Ecology of Raptors. T. & A.D. Poyser Ltd., London, United Kingdom.
- <sup>2</sup> Millsap, Brian and Cindy Bear. June, 1990. Double-Brooding by Florida Burrowing Owls. The Wilson Bulletin, Vol 102, No 2, pp. 313-317.
- <sup>3</sup> Holroyd, Geoffrey L., Conway, Courtney J. and Helen E. Trefry. June 1, 2011. Breeding Dispersal of a Burrowing owl from Arizona to Saskatchewan. The Wilson Journal of Ornithology.  
<http://www.thefreelibrary.com/Breeding+dispersal+of+a+Burrowing+Owl+from+Arizona+to+Saskatchewan.-a0259154991>
- <sup>4</sup> Marti, C.D. 1969. Renesting by Barn and Great Horned Owls. Wilson Bulletin Vol 111, pp. 273-276.
- <sup>5</sup> Gervais, J.A. and D.K. Rosenberg. 1999. Western Burrowing Owls in California produce a second brood of chicks. Wilson Bulletin Vol 111, pp. 569-571.
- <sup>6</sup> Catlin, D.H. 2004. Factors affecting within-season and between-season breeding dispersal of Burrowing Owls in California. Thesis. Oregon State University, Corvallis, USA.
- <sup>7</sup> Wesemann, T. 1986. Factors influencing the distribution and abundance of Burrowing Owls (*Athene cunicularia*) in Cape Coral, Florida. M.S. thesis, Appalachian State University, Boone, North Carolina.
- <sup>8</sup> Millsap, Brian and Cindy Bear. January, 2000. Density and Reproduction of Burrowing Owls along an Urban Development Gradient. The Journal of Wildlife Management, Vol 64, No 1, pp. 33-41.
- <sup>9</sup> 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>
- <sup>10</sup> Millsap, Brian and Cindy Bear. May, 1997. Territory Fidelity, Mate Fidelity, and Dispersal in an Urban-Nesting Population of Florida Burrowing Owls. Journal Raptor Research Report 9, pp. 91-98.