

Reproductive ecology and phenology of the Rufous-winged Sparrow at the Santa Rita Experimental Range

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Introduction

•The Rufous-winged Sparrow (*Peucaea carpalis*; RWSP) is a sedentary songbird that breeds in south-central Arizona (Lowther et. al 1999).

•Little is known about the breeding behavior and nest microhabitat selection of RWSP, and regarding the extent to which RWSP nests are parasitized by Brown-headed Cowbirds, *Molothrus ater*.

•Previous investigations on the timing of RWSP reproduction did not include actual observations of breeding behavior.



Fig. 1. Rufous-winged sparrow female incubating.

Methods

•Rufous-winged sparrows build small, cup-shaped nests and lay oval white eggs. RWSP incubate for 11 days.

•We studied nesting RWSP nesting on and around the Santa Rita Experimental Range (SRER) in 2011 from July 11th until August 1st, and in 2012, from July 11th until August 7th. Lay dates were calculated from hatch date or estimated as the average of the earliest and latest possible lay date.

•Nests were counted if RWSP sang or were sighted around the nest or if RWSP hatchlings were present. Nest that were clearly abandoned or predated when found were not marked.

•All nests counted were found with eggs or chicks under three days old. No nests with very large chicks were found until late in the nest-search period, and they were not counted because initial clutch size could not be determined.



Fig. 2. Locations of nests on and around the SRER

Nest microhabitat selection

- In 2011, average nest height was 1.16 m (st.dev=0.41 m, n=15). In 2012, average nest height was 1.20 m (st.dev=0.45 m, n=49)
- Nests were built in Hackberry, *Celtis pallida*; Palo Verde, *Parkinsonia florida*; Chain-fruit Cholla, *Cylindropuntia fulgida*; Catclaw Acacia, *Acacia greggii*; and Velvet Mesquite, *Prosopis velutina*.

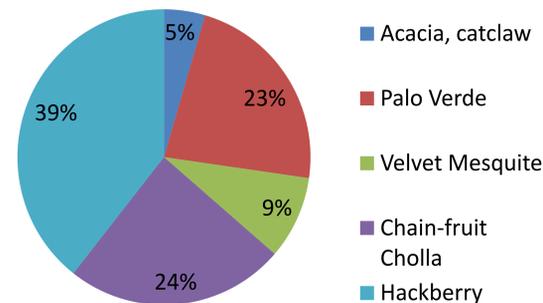


Fig. 3. Nest location in summer 2011 and 2012

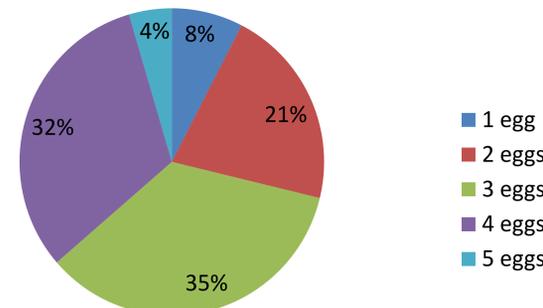


Fig. 4. Clutch size in summer 2011 and 2012

Reproductive measures

- Summer 2011: Average number of eggs laid per nest was 3.82 (st.dev= 0.81). From five hatched nests, 14 chicks were produced. 11.8% were parasitized by cowbirds.
- In summer 2012, the average number of eggs laid was 2.77 (st.dev= 0.94). From 22 hatched nests (data missing for seven nests), 49 chicks hatched. 22.4% were parasitized by cowbirds.
- Nests in both years contained no more than one cowbird egg.

Clutch survived to hatch	5
Predated or abandoned	12

Table 1. 2011 nest fates

Clutch survived to hatch	29
Predated or abandoned	18
Female incubating on damaged eggs	1

Table 2. 2012 nest fates

Timing of reproduction

- In 2011, the average estimated lay date was 7/12/2012 (range 7/10/2011-7/17/2011). The average estimated hatch date was 7/27/2011 (range 7/26/2011- 7/30/2011).
- In 2012, the average estimated lay date was also 7/12/2012 (range 6/28/2012-7/25/2012). The average estimated hatch date was 7/26/2012 (range 7/12/2012- 8/2/2012).
- Precipitation data was collected from the Santa Rita Mesquite Savanna (SR) weather station, from the Daily Rain Report put out by Dr. Russell L. Scott. The SR station was near the middle of our nest distribution.
- The earliest clutch in 2011 was not laid until 58.16 mm of rain had fallen. By the time the first young hatched, 107.44 mm of rain had fallen.
- The first clutch in 2012 was laid when only 12.96 mm of rain had fallen, but by the average lay date, 50.8 mm of rain had fallen. By the last clutch laid, 112.51 mm of rain had fallen. When the first young hatched, 112.26 mm of rain had fallen.

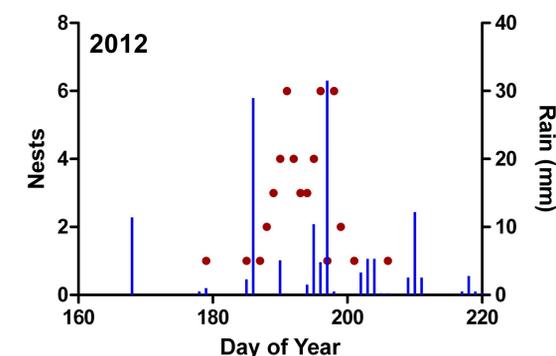
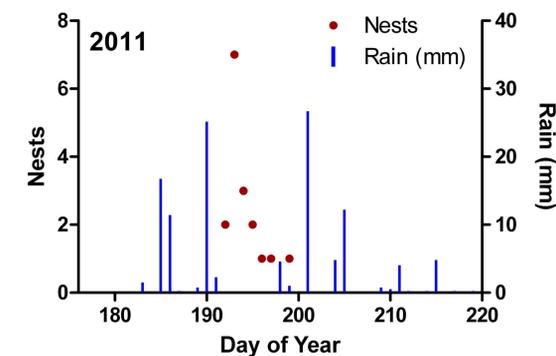


Fig. 5. Estimated lay date and daily precipitation

Parental behavior

- At six nests in summer 2012, we recorded videos of the parental care behavior of RWSP three days after hatch.
- Parents were observed to remove fecal sacs from the nest.
- Parents brought food items, including small green caterpillars and moths. Caterpillars were the most common item brought.



Fig. 6. Rufous-winged sparrow feeding chicks.

Conclusions

The present data corresponds fairly well to data collected in the 1970's on clutch size and microhabitat selection for nest-building (Lowther 1999). The data provide some of the first solid information on cowbird parasitism occurrence in RWSP. Although cowbirds are present, they do not appear to have a great impact on RWSP.

The Rufous-winged Sparrow may time its reproduction to rainfall itself, or it may time its reproduction to the emergence of vegetation or insect life. Further investigation is required to determine which cues this species uses to time reproduction.

Literature cited

Lowther, P. E., K. D. Groschupf and S. M. Russell. 1999. Rufous-winged Sparrow (*Peucaea carpalis*). The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: doi:10.2173/bna.422

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