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ABSTRACT BOOK

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studied their habitat selection, breeding biology, survival, and space use in the Arkansas Ozarks. Ceruleans demonstrated selection of various habitat features at all scales. Most saliently, they preferred areas with relatively large-diameter trees at all scales, which is largely consistent with studies from other areas. Inconsistent with previous studies, ceruleans in our area appeared to avoid white oaks at the territory scale, but this may have been confounded by selection of riparian habitat. We located 25 active nests and estimated entire-period nest survival at 32%. We also estimated apparent within-season weekly survival at 0.95, return rate at 29%, and mean territory size at 1.14 ha. Our results will help guide regional/local habitat management and provide parameter estimates for use in integrative full-annual-cycle population models.

Examining the Effects of Settlement and Habitat Preferences on Eastern Bluebirds Breeding Biology

Melissa L Bailey, Joanna Hubbard

The environmental conditions present early in an organism's life can greatly impact development of behavioral, morphological, and physiological traits, which can then affect overall quality and survival potential. Thus, understanding the factors that determine settlement and habitat preference aids in the greater understanding of offspring quality within a species. Eastern bluebirds (*Sialia sialis*) are a multi-brooded, secondary cavity nesting species, making them an excellent study system to observe the effects of habitat choice. Their inability to excavate their own nesting cavities paired with their aggressive territoriality causes there to be a natural limit on the number of high quality sites available to a population. In addition, previous research has found that nestlings exhibit variation in UV-blue plumage coloration and overall quality in response to developmental conditions. One condition which has received less attention is the effect of cavity age on settlement patterns and nestling development. To study this, three sites in Northeastern, Missouri were studied, two of which contained all newly made nest boxes while one contained a mix of old and new boxes. Preliminary results show variation in settlement patterns with greater levels of settlement in the sites that have a mixture of new and old boxes. Further analyses will examine variation in habitat preference between sites with predominantly old or new boxes as well as variation in reproductive output, reproductive initiation date, nestling body condition, and nestling ornamentation production between new and old boxes.

Chickadees Increase Provisioning Effort to Compensate for Poor Prey Quality During the Nestling Period

Sarah Sénécal, Julie-Camille Riva, Ryan S O'Connor, Christian Nozais, François Vézina

The early acquisition of nutrition can significantly impact nestling fitness by increasing chances of survival and recruitment after fledging. The effort invested by parents towards the provisioning of nestlings is therefore crucially important and represents a key link between habitat resources and reproductive success. Recent observations suggest that provisioning rate (i.e., provisioning effort) has little effect on nestling growth rate. However, these studies did not include measurements of prey quality, despite the fact that parents could adjust their provisioning effort to account for diets of differing nutritional value. Here, we hypothesized that provisioning rates would negatively correlate with prey quality. We monitored breeding effort in black-capped (*Poecile atricapillus*) and boreal chickadees (*Poecile hudsonicus*) in the Forêt d'enseignement et de recherche Macps, near Rimouski, Québec, Canada. Provisioning rates were quantified using RFID systems fitted to nest boxes. Prey quality was determined through bomb calorimetry of nestling stomach contents obtained non-invasively. Mean daily growth rate was consistent across 8 years in both species. However, provisioning rate and prey quality differed by as much as 57% among years. Consequently, parents brought 47% more food to the nest in years of low prey quality. Thus, provisioning rate was higher in years of poor prey quality, and this likely explains the lack of a relationship between provisioning rate and growth rate often reported in this and other studies. These data support our hypothesis that parents increase provisioning effort to compensate for poor prey quality, thereby maintaining nestling growth rate.

Food Abundance as an Environmental Cue for the Start of Reproduction of *Elaenia Albiceps*

Cristian A Gorosito, Diego T Tuero, Víctor R Cueto

The time of the year when birds reproduce has a great impact on their reproductive success. That is, if they reproduce when food availability for their nestlings is low, their survival could be reduced. Therefore, birds should synchronize the maturation of their gonads with

the most favorable environmental conditions for reproduction. Photoperiod length is the main cue that birds use to achieve this synchronization. However, using other cues, such as food abundance, is necessary to refine the most suitable moment for reproduction. The aim of this work was to study the synchronization between the food types consumed by the long-distance migratory bird *Elaenia albiceps* and its reproduction. The effects of ripe fruit, arthropods and caterpillar abundances on the breeding intensity of this species were evaluated. Ripe fruit and caterpillar abundances were the food resources that had the greatest effects on the number of nests with eggs. These items could constitute important food sources for the preparation of reproduction in adults, providing protein and calcium for egg formation. Ripe fruit abundance also had a great effect on the number of nests with nestlings. It was observed a synchronization between the moment of maximum abundance of this food resource and the maximum abundance of nests with nestlings. Ripe fruits have a high antioxidant and calcium content, thereby they would be beneficial for nestling growth. Hence, ripe fruit abundance would be the main cue to refine the start of reproduction of *E. albiceps* in Patagonian forests.

Scarlet Macaw Nesting Ecology and Behavior in a Pristine Forest

Gabriela Vigo Trauco, Donald Brightsmith

Documenting parental care by wild birds is important for understanding reproductive success and promoting conservation. However, little is known about how wild parrots care for their offspring in the nest and how to use this knowledge to inform conservation actions. We documented wild Scarlet Macaw parental behavior in the lowland forests of southeastern Peru during 19 breeding seasons. In the > 1900 hours of video analyzed, I found that females provide most feedings to chicks (%%) but feedings by the male increase significantly as the chicks age. I found that (1) chicks are fed on average 3.6 times per hour throughout the nesting period, (2) there are major diurnal and nocturnal chick feeding peaks, and (3) macaw parents store food in their crops for over 7 hours and use this to feed their chicks at night. We analyzed chick starvation due to brood reduction and found that chick starvation is the leading cause of chick mortality, 27% of all second hatched chicks starve, and nearly all third and fourth hatched chicks starve. We found no evidence that death by starvation was caused by (1) sibling rivalry, (2) food availability, or (3) hatch

weight. I did find that (1) direct control of food distribution within the brood favors first hatch chicks but specifically disfavors second hatch chicks that starve and (2) the larger the age difference between brood members the more likely the second chick would starve. This research has great potential to inform macaw population management and conservation.

Breeding Biology and Interspecific Interactions of Cypseloidinae Swifts in Central Brazil

Renata N Biancalana

Swifts are long-lived, highly aerial insectivore birds. They are still a particularly overlooked group of birds in the Neotropics, with limited data on their biology and distribution. Although some species are considered common, there are few studies regarding their conservation status or acknowledging the threats that they may face in South America, especially in Brazil. Four Cypseloidine species are breeding residents in the Cerrado, which is considered the most threatened biome in Brazil. Here I present new data on the breeding biology and interspecific interactions of swifts in Central Brazil. Field work was conducted between September 2015 and March 2017 in three states to monitor colonies of Sooty, Great Dusky and White-collared Swifts. Birds were banded, measured, and had blood samples and ectoparasites taken. Recaptured individuals in different years of the survey showed strong nest site fidelity, which is characteristic of this group. Great Dusky and White-collared Swifts were frequently seen foraging, nesting and preening together, whereas Sooty Swifts were rarely seen on their nests during daylight. Great Dusky Swifts nests were made of moss and rootlets, and many were exposed to dripping water making them damp. Sooty and Great Dusky Swifts had one egg clutches, however they differed in breeding timing, with the latter laying the eggs earlier in the rainy season and not having a second breeding attempt as the former. Nestlings from all species had their bodies covered by dark gray semiplumes before feathers erupted. Nestling mortality was observed, and the main cause was falling from nests.

Direct and Indirect Factors on Bird Nestling Growth: a Case Study of the Red-Crested Cardinal using Structural Equation Models

Facundo X Palacio, Luciano N Segura