model performance. My results show random forest machine learning methods can improve the accuracy of species distribution models, generating the most informative models for T. tao to date in spite of strong spatial sampling bias. I identified optimal methods to reduce the negative effects of spatial bias in presence and absence data on distribution models, and identified areas of persistent difficulty in using citizen science data with these models.

Plasticity of Aggressive Behavior in Bachman's Sparrows

Joseph M Niederhauser, Sabah Ali, Maria P Ziadi, Rindy C Anderson

In changing environments, behavioral plasticity should be favored by selection when the cost of plasticity is low and individuals can match their behavior to current environmental conditions. However, some behaviors may be fixed due to phylogenetic, physiological, or developmental constraints, and may covary in consistent and predictable ways, known as behavioral syndromes or animal "personalities." Some personalities are sensitive to environmental changes with shyer, less aggressive individuals having better fitness in rapidly changing habitats than bolder, more aggressive individuals. However, personality traits have been found to be plastic in some cases, with variation depending on context or experience. This raises the question: are personality traits plastic in frequently disturbed environments? To explore this question, we studied aggressive behavior in the Bachman's Sparrow (Peucaea aestivalis), a Near Threatened songbird that resides in habitats that experience frequent fire every one to three years. We measured aggressiveness over four breeding seasons using simulated territorial intrusions. We found that aggressive behavior varied across years and had a low repeatability. Aggressiveness was related to fire history: sparrows were very aggressive immediately after a fire and became less aggressive as more time passed. These data suggest that Bachman's Sparrows are flexible in their aggressiveness, but what remains to be tested is why they adjust their behavior relative to fire. This is one of the first studies to show plasticity in aggressive behavior across years.

Mexican Hummingbird Nesting

Laura E Nuñez-Rosas, María dC Arizmendi

Nesting is a sensitive period that presents a high mortality rate because of many ecological factors. Hummingbirds are altricial birds which need parental care. Female carries all the nesting process. Although, Trochilidae family is a diverse group in terms of species number (330), the knowledge about their reproductive aspects is scarce. For this study, we made a review based on published data and personal observations. We collected data from nests and eggs measures, incubation and fledging periods, lichen use, site and vegetation where nest was located. For statistical analysis, we used PGLS, which incorporates a phylogenetic correction. We also used simple linear regressions. We found that nest shape is a cup, built at 41.6 12.39 mm of high, 40.21 13.94 mm of diameter and 18.59 5.06 mm of deep. Eggs were 13.19 1.04 mm of length and 8.65 0.67 mm of width. We couldnt find evolutionary relationship in lichen use, however, it shows a tendency of recently clades using more lichens. Additionally, both incubation period (16.17 1.16 day) and fledging period (22.4 2.25 day) were not related with female size or clade. Finally, most of the nest has been found in pine forest (50%). Available information for reproductive aspects in hummingbird is limited, and much work is needed to fully understand the process. Although some data for exist for some species, most of these are not distributed in Mexico.

Unidirectional Introgression Between Rhegmatorhina Hoffmannsi and R. Berlepschi in the Amazon Forest

Glaucia C Del-Rio, Marco A Rego, Bret M Whitney, Fábio Schunck, Luís F Silveira, Brant C Faircloth, Robb T Brumfield

At hybrid zones, different species meet, mate and generate individuals of mixed ancestry. Because hybrid zones are areas where reproductive isolation is not complete, they are natural laboratories for understanding how species boundaries are maintained in the face of hybridization. Here we study a hybrid zone in the most biodiverse area in the planet, the Amazon Basin. At the Sucunduri River headwaters, the distributions of two antbirds (Thamnophilidae), Rhegmatorhina hoffmannsi (with white chest) and R. berlepschi (with brown chest), meet at a hybrid zone containing individuals with recombinant plumage patterns. To investigate the processes involved in the maintenance of the hybrid zone, we used geographic and genomic cline analyses to characterize genetic and morphological transitions across the zone. We sequenced the whole-genome of one individual of R. hoffmannsi, and generated RADseq and

ND2 data for 212 samples spanning the zone. We characterized plumage color of 212 museum specimens using reflectance spectrometry. We found that: (1) the mitochondrial cline is shifted 140 km south of the autosomal cline center, in the direction of hoffmannsi (2); the cline for chest color is shifted 110 km north of the autosomal cline center, in the direction of berlepschi; (3) the majority of hoffmannsi alleles (93%) are found on the genomic background of berlepschi. These results suggest a pattern of unidirectional introgression in which hoffmannsi nuclear genotype and white plumage phenotype are moving towards berlepschi populations.

What Factors Influence Nest Survival of the Endangered Yellow-Headed Amazon?

Fabio L Tarazona-Tubens, Charles R Britt, Fitsum Abadi, Martha J Desmond

Several factors have been identified as driving forces behind the decline of Psittacid populations worldwide. The endangered Yellow-headed parrot (Amazona oratrix) is not an exception to this declining population trend, suffering considerable reduction in abundance and distribution across its historic range. Identifying natural and anthropogenic causes of nest failure is a critical step towards improving our understanding of this species to ultimately develop conservation plans that will increase recruitment of individuals into the population. Our objective was to model nest survival in relation to temporal and environmental factors, and physical properties of nest cavities. We examined survival of Yellow-headed parrot nests across protected areas in Belize during the 2017 and 2018 nesting seasons (n=102). In addition, we used a subset of our data to model natural (i.e. predation, abandonment) and anthropogenic (i.e. poaching), causes of nest failure independently. Preliminary results indicated that mean cumulative nest survival estimate was 0.355 (SE = 0.003), and was positively influenced by properties of the cavity (i.e. cavity depth) but negatively affected by local-scale environmental factors (i.e. frontal visibility and canopy cover). These factors were also ranked as important predictors of survival when only natural causes of failure were modeled independently. However, when anthropogenic causes of failure were modeled independently, cumulative nest survival estimate was 0.259 (SE = 0.006) and was negatively influenced by temporal factors (i.e. nestling stage). Our results suggest that this species has low nest survival and that low annual recruitment may contribute to future population declines of Yellow-headed parrots in Belize.

Timing is of the Essence: Later Breeding Predicts Lower Survival in American Kestrels (Falco Sparverius)

Kathleen R Callery, John A Smallwood, Amber L Eschenbauch, Emilie R Luttmann, Julie A Heath

Organisms have evolved annual cycles of life history stages so that energetically expensive events - like breeding - are timed to coincide with peak food abundance. Breeding asynchronously from this optimal time could have negative fitness consequences, especially if resource scarcity forces breeders to make trade-offs between sustaining their offspring and maintaining their own health. We used breeding season mark-recapture data from long-term monitoring sites of American kestrels (Falco sparverius) to test the hypothesis that the synchrony of nesting and the onset of spring at the nest site would predict adult survival. In addition, we also tested whether the timing of when a bird fledged relative to the onset of spring predicted hatch-year mortality. We modelled apparent survival and capture rates using Cormack-Jolly-Seber mark-recapture survival models. All of the models were run in MARK through the RMARK interface. Preliminary results show that timing did predict apparent survival rates of adult American kestrels, with birds breeding later than the onset of spring having lower survival rates than birds that bred earlier. Climate change has the potential to shift the timing of peak food availability faster than some species are able to change their breeding phenology. Understanding the fitness consequences of the existing variation in breeding phenology for a species will help us predict how that species could be affected by a changing climate.

Landscape Composition Explains High Rates of Dispersal in Translocated Lesser Prairie-Chickens

Liam A Berigan, Carly Aulicky, Daniel Sullins, David Haukos, Kent Fricke, Jonathan Reitz, Liza Rossi, Kraig Schultz

Since 2016, a multi-agency effort has been augmenting lesser prairie-chicken (Tympanuchus pallidicinctus) populations within the Sand Sagebrush Ecoregion of southwestern Kansas and southeastern Colorado. To date, 254 lesser prairie-chickens have been captured in the Short-Grass Prairie/CRP Mosaic Ecoregion of northwestern Kansas, equipped with VHF radio-collars or SAT-PTT GPS transmitters, and translocated to the