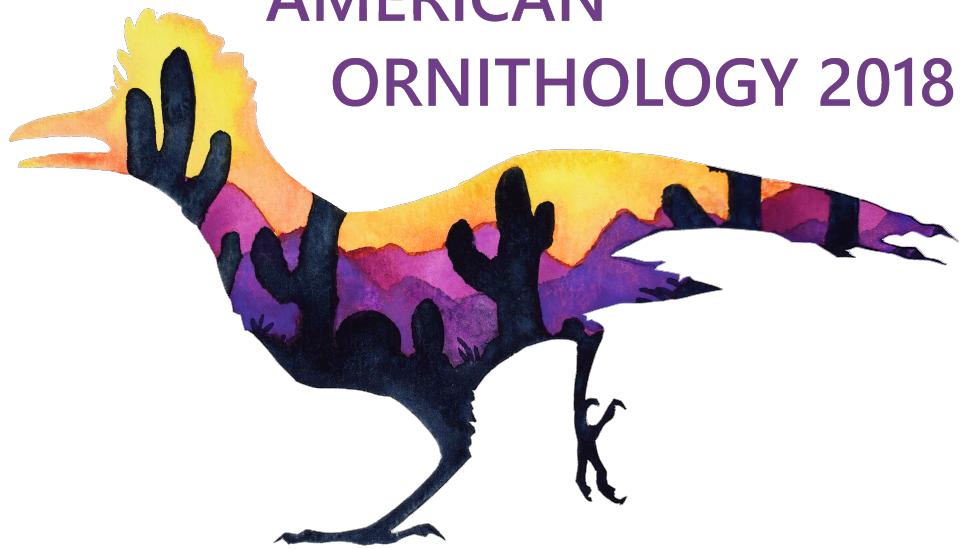


AMERICAN ORNITHOLOGY 2018



ABSTRACT BOOK

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ORAL PRESENTATIONS

Interactive effects of climate, landcover change, and habitat quality on Ferruginous Pygmy-Owl populations in the U.S and Mexico

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Climatic flux and anthropogenic landcover change pose major threats to wildlife especially in arid regions, but information on their combined impacts is limited. Ferruginous Pygmy-owls are iconic Sonoran Desert predators that are of major conservation concern given marked range contractions over the past century. I assessed spatiotemporal variation in territory occupancy across 14 watershed regions in northern Mexico and adjacent Arizona across 16 years (2001-2016), and evaluated hypothesized relationships between occupancy and variation in temperature, precipitation, landcover change, and local habitat quality. There was little evidence of systematic temporal declines in occupancy across this vast bi-national region or for population units in the U.S. or Mexico. Instead, occupancy dynamics varied at smaller scales among watershed regions. Subpopulations in six regions declined or marginally declined including two to extinction, six were stable, and two increased or marginally increased. Although variation in occupancy was associated with changes in temperature, precipitation, landcover, and habitat quality in the predicted directions, evidence for interactions among these factors was much greater than that for additive relationships. Occupancy declined with rising winter temperatures at a much greater rate in disturbed landscapes compared to those with little anthropogenic disturbance. Moreover, occupancy increased with precipitation at increasingly positive rates as local habitat quality increased. Such results suggest a complex set of processes simultaneously drove dynamics likely by influencing food abundance and the quantity, connectivity, and quality of habitat. Management focused on protecting high-quality habitat, creating and enhancing habitat, reducing landcover change, and increasing landscape connectivity will enhance conservation.

Response of nomadic grassland birds to temporal variation in habitat conditions

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Grasslands are dynamic ecosystems and species that use these habitats must respond to changing conditions.

Many species have evolved nomadic behaviors to take advantage of sites these changing conditions. Distribution models are increasingly being used to understand how landscape changes are affecting the spatial and temporal distributions of plants and animals, yet they only describe patterns, not the processes resulting in those patterns. We extended the Bayesian multi-scale occupancy model to estimate extinction and colonization for large-scale occupancy and applied it to data of two grassland bird species, the Chestnut-collared Longspur (CCLO) and Lark Bunting (LARB), collected as part of the Integrated Monitoring in Bird Conservation Regions program. We included covariates for landscape composition and annual vegetation greenness to explain large-scale occupancy, extinction and colonization, and point-level habitat structure to predict small-scale occupancy. Large- and small-scale occupancy of CCLO increased over the period, despite declining regional abundance, and LARB occupancy and abundance remained stable. Both species colonized new sites containing less than ideal habitat and went locally extinct at sites with poor habitat, and the species used local features similar to those chosen at the landscape level. In addition to applications at multiple spatial scales, our model can be used to estimate dynamic parameters influencing temporal habitat use and can be easily extended to accommodate additional scales. Our extension of the multi-scale model allows us to better understand the dynamic processes influencing the distribution of nomadic and is well-suited for addressing ecological questions within the theory of hierarchical habitat selection.

Estimating Population Trends with Dynamic N-mixture Models: When do Repeated Visits Count?

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Population monitoring is important for informing conservation, and N-mixture models increasingly are used to account for variation in detection probability with repeated counts when estimating population size and trends. However, simulations to evaluate efficacy of N-mixture models and inform survey effort (i.e., number of repeated visits) typically do not consider scenarios with systematic trends in detectability. As a result, it is unclear how these models perform when

trends in detectability confound inferences on population trends, and conclusions regarding survey effort may be overly optimistic. Here, we used GPS data from greater sage-grouse (*Centrocercus urophasianus*) to parameterize simulations of the detection process during lek counts, and then we compared estimates of population size (N) and trends (l) from state-space models with either uncorrected peak counts or with N-mixture models that used repeated counts to account for detectability (p). When p varied randomly each year, we found that although peak count models consistently underestimated N by >40%, estimates of l were accurate and similar to estimates from N-mixture models. When p systematically declined across years, N-mixture models estimated l with little bias whereas peak count models strongly underestimated l. However, as the number of sites with repeated visits decreased, absolute bias in estimates of l from N-mixture models increased and resembled estimates from peak count models. We therefore recommend that researchers evaluate population trend models with systematic trends in p to better understand potential biases and inform survey design.

Stress-induced maternal effect links local competitive environment with large-scale changes in population demography

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Adaptive maternal effects allow mothers to fine-tune offspring phenotype to match future ecological challenges. A critical question is how such multi-generational coordination can evolve, as it requires co-evolution of maternal physiology, offspring development and cues that predict future conditions. One possibility is that ecological variation induces variation in maternal physiology through pre-existing stress pathways during offspring development. Western bluebirds provide an opportunity to investigate this possibility as they have a known maternal effect where competition over a limited breeding resource (nest cavities) results in mothers influencing both offspring aggression and dispersal. We combine long-term data with experimental manipulations of resource availability to determine whether resource distribution is sufficient to influence maternal stress and induce the maternal effect. In both an unmanipulated population and a large-scale field experiment, we found that baseline maternal corticosterone levels were lower when females had extra nest cavities on their territories. Moreover, females provided with extra nest cavities produced philopatric sons more often than females without, and this manipulation had

a population-level effect: populations that received extra nest cavities recruited more male offspring relative to populations where resources were not manipulated, even when the extra nest cavities were subsequently removed. These results support the idea that stress pathways are a crucial link between the cue and functional context of adaptive maternal strategies. We suggest that conserved hormonal pathways, such as those underlying stress responses, may facilitate the evolution of maternal effects by enabling species-specific stressors to become linked to adaptive variation in the offspring generation.

Extraordinary genetic similarity between Rufous and Allen's hummingbirds inferred from whole genome sequences

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Rufous and Allen's hummingbird males differ in several traits that are likely to be under sexual selection, including coloration, the shape of tail feathers involved in sound production, and courtship display behavior. The recent discovery of a hybrid zone in southern Oregon and northern California raises the possibility of determining the genetic basis of these traits by admixture mapping. In order to determine the extent of genetic differentiation between the species and how differentiation varies among genomic regions, we sequenced the genomes of 7 Allen's and 9 Rufous hummingbirds collected far from the hybrid zone. Out of 1.6 million SNP markers identified, only 81 were fixed for alternative alleles in the two species. These fixed differences were overwhelmingly (82%) located on the Z chromosome, further supporting the important role of sex chromosomes in speciation. Most of the fixed differences fall outside protein-coding regions, and none cause amino acid substitutions, suggesting that the functional differences between the species are regulatory, not structural. Because fixed differences are limited to a few small regions of the genome, prospects are good for identifying their associations with behavioral and morphological traits by admixture mapping.

Natal dispersal of Aplomado Falcons under drastic habitat loss in the Chihuahuan Desert of Mexico

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The study of natal dispersal (movement of wandering individuals from their birthplaces to their first breeding locations) in endangered species may potentially reveal mechanisms of habitat selection and help to identify critical habitat suitable to protection. In this regard, the Chihuahuan Desert population of the endangered Northern Aplomado Falcon (*Falco femoralis septentrionalis*) is currently threatened by the extensive conversion of breeding habitat from open desert grasslands to irrigated farmland in Chihuahua, Mexico. However, why the species has not been able to occupy apparently-available breeding habitat in the Chihuahuan Desert of Mexico and southwestern United States remains a mystery. In this regard, we tracked the movements two wild Aplomado Falcon (female and male) in Chihuahua from their fledgling stage to demise or first reproduction using Argos 5g-PTT satellite transmitters deployed on May of 2015. Falcons dispersed from their natal territory about 100 days after fledgling. These falcons wandered around breeding territories (delineated by a long-term demographic study), either intact or converted to farmland. However, these falcons occasionally explored areas outside the core breeding areas, only to reveal potential breeding habitat being converted to farmland. The male falcon unsuccessfully nested with an unbanded female in his second year, only 15 km away from its natal territory and in a breeding territory vacant since 2000. Our telemetry data suggest that suitable Aplomado Falcon breeding habitat, in spite of its apparent availability, is actually limited to central Chihuahua and its current loss rate seriously questions the potential recovery of the species in the Chihuahuan Desert

Climate change and management implications for a declining Neotropical migratory songbird breeding in the Great Plains

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Grassland birds comprise the most rapidly declining group of birds in continental North America, and contend with longstanding threats including habitat loss and degradation as well as the emerging threat of accelerating climate change. Although grassland bird responses to habitat management are well-documented, much less is known about how external factors, such as climate, interact with management actions to affect grassland birds. We evaluated how habitat management and climate parameters influenced the abundance of the Grasshopper Sparrow (*Ammodramus savannarum*), a declining Neotropical migrant that breeds in the Great Plains, using mark-recapture data. Specifically, we investigated breeding populations responses to management actions including patch burning, cattle (*Bos taurus*) grazing and haying, and their interactions with varying temperature and precipitation regimes on private conservation land in the Platte River Valley, Nebraska. We found that Grasshopper Sparrow abundance was primarily correlated with prescribed burning and spring precipitation. Total Grasshopper Sparrow abundance peaked around 25-28 months after burning, and declined with greater spring precipitation levels. Grasshopper Sparrows in grazed pastures responded favorably to higher cattle stocking rates, which in this study ranged from 0.75 to 5.3 animal unit months per hectare. Our results indicate that the effects of habitat management practices such as fire, grazing and haying are influenced by precipitation levels. Since the Grasshopper Sparrow population in this study was heavily affected by climate, we may expect ongoing climate change to have a disproportionate effect on Grasshopper Sparrows in the future.

Drivers of molt-migration in intra-tropical migratory birds

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The timing of breeding, molting and migration is still poorly known for many birds that breed in the Neotropics. However, a growing body of knowledge suggests that molt-migration is likely widespread in passerines that migrate within the Neotropics. We studied migration and molt timing of intra-tropical migratory Fork-tailed Flycatchers (*Tyrannus savana*) breeding in Brazil and whether molt overlaps with fall migration, as in congeners breeding in North America. Geolocator data from flycatchers captured in Brasilia and So Paulo indicated that flycatchers stopover in Mato Grosso do Sul

State, Brazil for a prolonged period during fall migration. To investigate further, we captured flycatchers during the period of stopover in Mato Grosso do Sul. Of two adults and two juveniles captured, one adult female was symmetrically molting the first primary feather, suggesting that some Fork-tailed Flycatchers undertake fall molt-migration. Further research on molt dynamics across a wide range of taxa is imperative to appreciating the conditions under which a given molt strategy evolves, the tradeoffs between molt strategies and other life history strategies, and the challenges to survival that birds face throughout the year.

Impact of Nesting Microhabitat and Foraging Habitat on the Nesting Site Selection of the Northern Black Swift (*Cypseloides niger borealis*)

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The Northern Black Swift (*Cypseloides niger borealis*) is an insectivorous bird which nests in small colonies in western North America. Previous research has mostly focused on nesting locations, and foraging habitat is largely unresearched due to the difficulty of detecting foraging black swifts. We conducted surveys for foraging black swifts in the southern Sierra Nevada and collected records from previous surveys in Colorado. We collected data on six aspects of black swift microhabitat from 109 potential nesting sites: water flow, vertical relief, aerial access, shade, nesting niches, and moss cover. Scores for these variables were summed to provide a total microhabitat score. We then used the total area covered by standing water and wetlands within 5 kilometers of each colony as an index of foraging habitat. Standing water and wetlands are major sources of emergent insect prey. These two scores were used as independent variables in a logistic regression to determine their relative effect on the occurrence of black swifts at each potential nesting site. Our results suggest that foraging habitat is not a driver of nesting site selection. However, radio telemetry data from breeding black swifts could clarify the role of foraging habitat in nest site selection.

Growing up in a noisy world: can grassland songbirds nestlings cope with the stress of growing up near oil development?

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In recent decades oil and gas development and the associated infrastructure has increased in central North America; fragmenting the landscape, reducing habitat suitability and introducing anthropogenic noise to the soundscape. The non-lethal effects of human disturbance may be contributing to the rapid decline of grassland songbirds. Physiological mediators, such as corticosterone, are increasingly being used to measure an organisms ability to respond to and cope with environmental and anthropogenic disturbance. Chronic disturbances on the landscape may impact corticosterone levels in altricial nestlings, potentially influencing growth rate, fledgling success, or adult behaviour. To determine how anthropogenic disturbance and chronic noise impact the development of the stress response in chestnut-collared longspur (*Calcarius ornatus*) nestlings, we measured basal and acute plasma corticosterone levels. We isolated noise from the associated infrastructure by broadcasting screwpump recordings on the short- and mixed- grass prairies of southeastern Alberta using solar-powered playback units in addition to sampling nestlings at sites with active screwpump leases. Our results indicate that basal corticosterone is lower in nestlings close to real infrastructure but not active playback sites, suggesting that the physical footprint of oil development and the associated disturbance has a greater impact on nestlings corticosterone levels than noise alone. Surprisingly our results show that nestlings with lower basal corticosterone are heavier indicating that the effect of disturbance might not be negative. Disentangling the effects of noise from anthropogenic disturbances will aid land managers in the difficult task of mediating human impact on declining species during vulnerable stages of their life history.

LIGHTNING TALKS

POSTERS