COMPARING DETECTION METHODS TO QUANTIFY MASS AVIAN MORTALITY ON THE WHITE SANDS MISSILE RANGE

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Migrating birds passing through New Mexico in 2020 suffered mass mortality—hundreds of carcasses were collected at White Sands Missile Range (WSMR) alone. Recent studies highlight the combined effects of artificial light at night (ALAN) and extreme weather on mortalities during migration. Thus, several factors likely led to the 2020 mortality event, including ALAN and extreme weather, plus broader impacts from wildfires and drought. However, as there was no standardized data collection during the 2020 mortality, we were unable to evaluate the impact of ALAN. This project created standardized carcass surveys on WSMR to (1) identify primary factors influencing avian mortality during migration; and (2) compare effectiveness of human and scent detection dogs as carcass surveyors. Carcass surveys were performed by students and dogs on 25 sites on WSMR during fall migration 2021 and 2022. Student surveys involved three students walking along a 20m-wide transect, visually scanning for bird carcasses. Dog surveys involved a professional handler monitoring the free-ranging dog. Surveyor detection rates were measured by placing carcasses on surveys without surveyor knowledge. No substantial mortalities were detected during either season (n = 11 in 2021 and n = 4 in 2022). Preliminary analyses show student detection rates are highly variable with an average around 50% while dog detection rates are around 80%. Even though humans have lower detection, these data may still be able to accurately estimate mortalities, a goal of this research. This study aims to assist local researchers and managers in making decisions on the best carcass survey approach.

INFLUENCES OF PASSIVE RELOCATION ON BURROWING OWL SURVIVAL IN SOUTH CENTRAL ARIZONA

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Expansion of anthropogenic environments negatively impacts native wildlife through habitat loss, fragmentation and competition with exotic species. The Western Burrowing Owl (*Athene cunicularia hypugaea*, BUOW) has been declining throughout parts of its North American range due in part to the cumulative impacts of human activities. Our research took place in Phoenix, Arizona, where large numbers of owls come in conflict with development. The focus of this research is to assess the impacts of passive relocation as a mitigative response to development on the survival of BUOW. To evaluate passive relocation, we used telemetry data and estimated survival probabilities using the known-fate model. Based on our preliminary analyses, the top ranked model included the effect of status (i.e., passively relocated or wild resident owl) on survival probability. From this model, the mean annual survival for wild resident owls was 0.69 (95% CI, 0.41-0.97) and passively relocated owls was 0.41 (95% CI, 0.08-0.74). This effort examines passive relocation as a mitigation tool to advance appropriate management decisions for BUOW populations in the face of rapid human development.

SPECIES LIMITS IN THE CURVE-BILLED THRASHER

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The Curve-billed Thrasher (*Toxostoma curvirostre*) is an iconic bird of the North American desert southwest. Two taxonomic groups are recognized based on differences in plumage, vocalizations, and geography: *T. c. curvirostre* in the Chihuahuan Desert and *T. c. palmeri* in the Sonoran Desert. Previous work has documented a mismatch between taxonomy and mitochondrial DNA where both groups come into contact in New Mexico. In 2010, the American Ornithological Society's (formerly AOU) Classification and Nomenclature Committee rejected a proposal to split *T. curvirostre* into two species, citing the possibility of gene flow, the need for bioacoustic analysis, and more genetic sampling in the contact zone. In this talk, I will discuss ongoing collecting efforts in the contact zone to better assess species limits in the *T. curivrostre* complex using an integrative taxonomic approach of genes, plumage characters, and bioacoustic data.

COMPOSITION AND DRIVERS OF DIVERSITY OF SANDHILL CRANES LUNG MYCOBIOMES AND THEIR IMPLICATIONS FOR PATHOGEN STRESS ON MIGRATORY BIRDS

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Growing concerns about bird population declines, large mortality events, and emergent/resurgent pathogens have placed an emphasis on understanding bird microbial community diversity and mechanisms of community assembly. This has led to an increase in the description of bird microbiomes with a focus on bacteria and viruses within gastrointestinal tracts; however, very few studies acknowledge either the **lung** microbiome or the **fungal** component of the microbiome (mycobiome). Beyond gaps in organ-specific and taxonomic understanding of microbiomes, little is known about the influence of subspecies variation, demography, and geography on microbial community assembly. Here, I describe our multipronged project and present preliminary data. This research will characterize the first wild bird lung mycobiome with a focus on pathogens and will assess within-species variation, demography, and migratory paths as drivers of mycobiome diversity. To address these objectives, we are leveraging hunter-salvaged Sandhill Crane (*Antigone canadensis*) lung tissues from their Middle Rio Grande Valley wintering grounds. This population contains two phenotypically distinct subspecies that breed at dramatically different latitudes and exhibit substantial within-species size dimorphism. Preliminary data hint at the diversity of the lung mycobiome and identify potentially pathogenic taxa. After higher resolution sequencing, we will refine our community description, allowing us to compare communities across multiple axes (subspecies, geography, and age) to test predictions about the drivers of lung mycobiome composition. This research will open opportunities to evaluate the role of fungal microbes in the increasing array of stressors migratory birds face.

INFLUENCE OF ARTHROPOD AND HABITAT CHARACTERISTICS ON FORAGING SITE SELECTION OF PINYON JAYS IN SOUTHERN NEW MEXICO

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Pinyon Jays (*Gymnorhinus cyanocephalus*) are a main disperser of pinyon pine (*Pinus edulis*) seeds in New Mexico. According to recent data, their populations have declined by 83.5% since 1967. The reasons for declines are not completely understood, and research has focused on breeding habitat with little emphasis on foraging, roosting, and caching. Our study focused on factors that may influence Pinyon Jay foraging habitat selection. Three Pinyon Jay flocks in southern NM were observed at 126 locations in 2021 and 2022. Arthropod data were collected via sweep- and beat-netting at these and 126 random locations. Habitat data were collected using line-point intercept and Robel pole methods. Preliminary analyses were conducted using conditional logistic regression at both site and landscape scales and models were compared using Akaike's information criterion. A top site-scale model included large prey abundance, elevation, and distance to forest edge. Prey abundance and distance to edge had positive effects on foraging site selection (ORs = 1.344 (95% CI = [1.0730, 1.6841]) and 1.002 (95% CI = [1.0000, 1.0032]), respectively), while elevation had a negative effect (odds ratio = 0.9599, 95% CI = [0.9434, 0.9767]). The top landscape-scale model showed a positive effect of herbaceous cover on foraging site selection (OR = 1.09795 (95% CI = [1.029, 1.171]). Our study suggests that Pinyon Jays may select foraging sites with more herbaceous cover and large prey items at lower elevations and further from forest edges. This research can be used to inform management decisions to protect habitat for pinyon jays.

AVIAN MIGRATION AND SMALL-SCALE ARTIFICIAL LIGHT AT NIGHT: RYAN BEAULIEU RESEARCH GRANT UPDATE

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During migration, birds are exposed to stressors that amplify the physiological demands that migration entails and increase their vulnerability to mortality. Artificial light at night (ALAN) is an anthropogenic stressor that interferes with avian navigation and orientation systems. In recent decades, studies have documented avian attraction to ALAN at citywide scales. Given the findings of these studies, "Lights Out" campaigns have focused on large cities. However, rural regions, ALAN may exist as a single building illuminated in an otherwise dark environment. If these individual buildings are impacting avian migration, then it is possible that we are overlooking a large contributor to the decline of migratory birds. Using acoustic analysis and weather radar data, we are examining the potential impact of ALAN on migrants across the White Sands Missile Range. Over the last two fall migrations, we collected ~70,000 hours of acoustic recordings. Nocturnal flight call (NFC) counts are being generated from these recordings as a metric of migration activity and compared between lighted and dark sites to determine if small scale ALAN attracts birds. To allow for the training of an NFC detecting/classifying machine learning algorithm, we have manually counted NFC's for ~500 hours of recordings. Here, we will present preliminary results from NFC counts and radar data and provide an outline for next steps in algorithm implementation for the remaining NFC data set. Our research serves to inform lighting management (i.e., recommendations for "bird friendly" lighting strategies), and guidance for "Lights Out" campaigns in rural areas.

CONSERVING BIRDS IN THE PYROCENE: THE BURNING ISSUE OF SPOTTED OWLS IN THE SOUTHWESTERN UNITED STATES

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Fire regimes are rapidly changing around the world, and we've seen these changes first-hand in New Mexico. How can we conserve the birds we love in this new age of 'megafires'? In this talk, Dr. Gavin Jones provides a broad overview of research by he and his colleagues on how spotted owls respond to wildfires – as well as the forest management actions intended to reduce fire risk.