

Abstract Book



Symposia Presentation Abstracts



**BIRDS OF MANY
FEATHERS**
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Listed alphabetically by last name of first author

of expiring CRP grasslands to sustainable grazing operations, other conservation programs, and alternative post-CRP land uses that make financial sense for producers and provide enduring benefits for grassland bird conservation.

Thermal niche breadth and diet explain variation in elevational migration in Himalayan birds

Sahas Barve, Tarun Menon, and Vijay Ramesh

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Elevational migration is a globally ubiquitous avian behavior and is seen in over 12% of all species. Understanding the mechanisms that drive variation in elevational movement across an avifaunal assemblage can help explain the evolution of this widespread animal behavior and its role in shaping a montane life history in birds. We used the citizen-science dataset eBird to acquire checklist-based observation data of Himalayan birds. We used comprehensive data cleaning procedures and randomization tests to produce robust estimates of the extent of elevational migration for 239 species of terrestrial birds. We then examined the role of thermal niche breadth, body size, dispersal ability and diet in explaining the extent of elevational migration in Himalayan birds using a multi-model information theoretic framework, separately for the eastern and western Himalayan regions. The extent of elevational movement was best supported by the thermal niche breadth and diet of a species in both regions. High-elevation species had broad thermal niches and showed greater elevational migration, exploiting wintering elevations that were warmer in the winter than their summer elevations in the summer. The effect of thermal niche breadth was however also influenced by the species' diet. Seed-eating birds migrated downslope less than other diet categories. A broad thermal niche may have been key in facilitating some species to colonize the high Himalayas seasonally, during the breeding season.

track2KBA: An R package for identifying important sites for biodiversity from tracking data

Martin Beal, Steffen Opiel, Jonathan Handley, Elizabeth J. Pearmain, Virginia Morera-Pujol, Ana P. B. Carneiro, Tammy E. Davies, Richard A. Phillips, Philip R. Taylor, Mark G. R. Miller, Aldina M. A. Franco, Inês Catry, Ana R. Patrício, Aissa Regalla, Iain Staniland, Charlotte Boyd, Paulo Catry, and Maria P. Dias

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Identifying important sites for biodiversity is vital for conservation and management. However, there is a lack of accessible, easily-applied tools that enable practitioners to delineate important sites for highly mobile species using established criteria. We developed the R package 'track2KBA' as a tool to identify important sites using tracking data from individual animals. The method is based on three key steps: (1) identifying individual core areas, (2) assessing population-level representativeness of the sample, and (3) quantifying spatial overlap among individuals and scaling up to the population. We show examples of how the package can be useful for diverse taxa, from both marine and terrestrial systems.

Putting it all together: Ornithometrics — a task view for ornithology

Marc-Olivier Beausoleil

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With the increase in utilization of R in ornithological research and an ever-increasing list of R packages to choose from, challenges are growing to find the package related to a specific field of study and verify which package might be more appropriate to conduct a research. Therefore, to facilitate package discovery, I share a task view or package collection in an "annotated bibliography" format which describes, by topic, the various packages that can be used to analyze ornithological data. Not only are the packages listed in a structured manner, they are also described including key functions. As a bonus, I included websites where ornithological data and data aggregators (such as weather data or bioclimatic variables) could be downloaded by researchers. For some of these websites, data-gathering R packages are added. I will show how to get started with the collection in order to download and install the packages listed.

warbler and Raven: Bioacoustics in R

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The R package warbleR aims to simplify the analysis of the structure of acoustic signals in R, and Raven connects R and the commonly used Raven Sound Analysis software. warbleR was developed by Marcelo Araya-Salas and Grace Smith-Vidaurre; and Raven was written by Marcelo Araya-Salas. warbleR includes a wide range of functions for acoustic structure analysis. This package has a clear workflow that streamlines visualization of spectrograms and measurement of acoustic parameters. The Raven package eases the exchange of data between R and Raven, and includes functions to effortlessly import and relabel Raven selection tables that can be input into multiple warbleR functions for analysis. In addition, selection tables can be exported from R to Raven. This talk will provide examples of warbleR specific tools such as downloading avian vocalizations from the online repository Xeno-Canto, and creating maps of recording locations. Other useful functions for exploring and comparing spectrograms will also be included.

Experimental exposure to noise alters gut microbiota in a songbird

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Noise pollution is an unprecedented evolutionary pressure on wild animals that can lead to alteration of stress hormone levels and changes in foraging behavior. Both corticosterone and feeding behavior can have direct effects on gut bacteria, as well as indirect effects through changes in gut physiology. Therefore, we hypothesized that exposure to noise will alter gut microbial communities via indirect effects on stress hormones and foraging behaviors. We exposed captive White-crowned Sparrows to city-like noise and measured each individual's corticosterone level, food intake and gut microbial diversity at the end of four treatments (acclimation, noise, recovery, and control) using a balanced repeated-measures design. We found evidence to support our prediction for a causal, positive relationship between noise exposure and gut microbiota. We also found evidence that noise acts to increase corticosterone and decrease food intake. However, noise appeared to act directly on the gut microbiome or, more likely, through an unmeasured variable, rather than through indirect effects via corticosterone and food intake. Our results help to explain previous findings that urban, free-living White-crowned Sparrows have higher bacterial richness than rural sparrows. Our findings also add to a growing body of research indicating noise exposure affects stress hormone levels and foraging behaviors. Altogether, our study indicates that noise affects plasma corticosterone, feeding behavior, and the gut microbiome in a songbird and raises new questions as to the mechanism linking noise exposure to gut microbial diversity.

Prairie ponds fuel aerial insectivores: Tales of Tree Swallows in agro-ecosystems

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In the Canadian prairies, agricultural practises have intensified to increase crop production which has led to the loss and degradation of ponds (i.e., flooded wetland basins). Losses of ponds in the prairies may negatively affect aerial insectivores, such as Tree Swallows (*Tachycineta bicolor*), by reducing the quantity or quality of their aquatic food supply during breeding. Analyses of long-term data (28 years) show that pond abundance affects nearly every aspect of reproduction: female swallows lay more eggs, and produce more fledglings and recruits in their lifetime when they experience abundant ponds when breeding. Additionally, nestlings were heavier prior to fledging and were more likely to recruit when raised in years with abundant ponds. A field study conducted in intensively cropped agricultural areas with varying pond abundance (low to high density) further showed that nest box occupancy was lower, and more variable, at sites with low pond abundance. Additionally, adult swallows breeding at sites with low pond abundance produced smaller, lighter nestlings. Nestling body mass prior to fledging is strongly related to food supply, suggesting that sites with low pond abundance may lack high-quality aquatic food resources for rapidly growing nestlings. Overall, because Tree Swallows are more likely to breed, have greater reproductive success, and produce higher-quality nestlings in agricultural landscapes with abundant ponds, this highlights the importance of conserving and restoring ponds to support aerial insectivore populations, and biodiversity more generally.

Estimating dietary niche width in a Neotropical highland endemic bird with multi-tissue stable isotope analysis