Abstract Book

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Table of Contents

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parent as well as the nestlings. House Wrens (*Troglodytes aedon aedon*) are small, cavity-nesting songbirds that defend against multiple species of nest predators including rodents, birds of prey, and snakes. Here, we used two different predator decoys, an eastern chipmunk (*Tamias striatus*) and a black rat snake (*Pantherophis alleghaniensis*), to elicit nest defense behavior and test whether females are consistent in their anti-predator response and whether that response predicts fitness. We found that anti-predator behaviors were not significantly different between the two predatory species. However, there was a significant weak negative correlation between time spent within five meters of the decoy and the number of offspring produced, which contradicted our prediction. The two simulated predators likely posed similar threats to the females as neither species frequently captures adult wrens, which may explain the consistent response. Measuring anti-predator responses to a higher threat such as a bird of prey is critical to assess whether females adjust their nest defense according to risk level.

Decline of North American avian populations as a function of land use, land cover and migration period

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Avian populations have decreased at an alarming rate over the past 50 years, but the causes of these declines, particularly for migratory birds, are debated. Evidence from temperate regions in the Palearctic suggests that bird populations are most severely decreasing in their wintering grounds, especially when those wintering grounds have been converted to agricultural use. However, the details of population declines for migratory birds in North American temperate regions are less well understood. This study explores two guiding questions: 1) How are bird population declines related to agricultural land use and 2) during which stage of the migratory cycle are bird populations declining the most? Our analyses address these questions by comparing avian population trends at regional and local spatial scales based on migratory status and land cover, respectively. We expected that migratory species in North America suffer the greatest population losses in their wintering grounds and in areas with the most agricultural land use. A preliminary analysis of population trends in Western Meadowlarks revealed that their numbers have decreased more severely in areas with high proportions of agriculture. We intend to delve deeper into these trends by comparing population trends of at least 10 common agricultural species across the annual cycle. This will help to discern at which stage of the migratory cycle Western Meadowlarks' and other species' population trends have the strongest relationship with agriculture. This study will be valuable to determine which bird species are most severely impacted by modern agricultural landscapes and help to pinpoint the differential declines during different stages of the annual migratory cycle.

Tail shape classification of *Tyrannus* species based on geometric morphometrics

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Tail morphologies of birds are driven by natural and sexual selection affecting flight performance, foraging strategies and even communication. These evolutionary processes fueled tail diversity but, until now, no study proposed a sound criterion to quantify and interpret such phenotypical variation. *Tyrannus* (Tyrannidae) is a New World group which includes 13 species with a wide range of tail morphologies, classically categorized into five shapes (round, square, notch, shallow fork and deep fork) based on the rectrices' length proportions. Although descriptive, we think this linear (and arbitrary) approach may not be enough to grasp forms and their conformational aspects. Our aim was to describe and quantify tail shapes of all the species in *Tyrannus* – via geometric morphometrics – in order to assess the clustering structure of the sample and the correspondence to their traditional categorizations. Tail shape of non-deep forked species (i.e., previously grouped with round, square, notch or shallow-fork tail) failed to display any clustering structure matching the traditional categorization, while deep-forked species were subdivided into two (morpho)groups. When model-based clustering was applied to the entire specimens' distribution, eight different groups were detected, while combining and disengaging traditional tail categories. Our results showed that classic categories cannot be retrieved as consistent morphogroups. This lack of descriptive resolution indicates that the whole variability of *Tyrannus'* tail phenotypes could be not only underestimated but misinterpreted if preset categorizations are forcefully applied.
