Researcher Builds Cutting-Edge Legacy While at McGraw

By Shane McKenzie/McGraw Research
McGraw photo

With a few months remaining before graduation, McGraw's doctoral wildlife research student, Katie Robertson, has much to be proud of – not the least of which is the cutting-edge research she and the McGraw research team has conducted under the Urban Coyote Project.

"Having grown up in a small town in North Carolina, I never in million years would have dreamed of living and working so close to a city as large as Chicago," says Katie, whose doctorate will be awarded by The Ohio State University.

Katie's research began in 2013 and focuses on coyote boldness and chronic stress, seeking to whether urbanization and related stress influence coyote personality. This is a crucial step towards understanding wildlife activity and ultimately, better wildlife management.

It is of particular importance when trying to manage conflicts between humans and animals in an increasingly urban landscape, such as the Chicago suburbs.

Katie's work is the first to examine the factors influencing chronic stress in free-ranging coyotes using hair cortisol analysis. She has collected 200 hair samples from the local urban coyote population, and examined them for cortisol stress hormones. The concentration level is used to assess chronic stress levels.

Past studies measured only short-term stress.

Based on preliminary results, coyotes experience stress due to a combination of biological, social, and environmental factors. A coyote's overall body condition correlates strongly with cortisol concentration. For example, coyotes infected with sarcoptic mange had the highest level of cortisol. Understanding how diseases such as mange create stress and influence animal behavior could help moderate human-wildlife conflicts.

Katie believes that social factors also play a role in stress levels. Lone or transient coyotes, ones without a stable home range, are much more stressed than resident coyotes living within packs. Even coyotes living within a pack differ in their stress levels.

"Alpha animals are actually more stressed than subordinate individuals, likely because they must constantly defend their territory and their high ranking within the pack,"

Katie says. “Additionally, while all individuals within a pack will assist with pup rearing, the alphas are typically the only individuals that have offspring of their own and this increased responsibility could lead to increased stress levels.”

Environmental factors related to landscape gradients also affect stress levels, but at levels below an individual coyote’s body condition and social status. Coyotes living within the suburbs such as Schaumburg tended to be more stressed than coyotes found in forest preserves or within the city limits of Chicago.

“The coyotes living in the City of Chicago have adjusted their behavior to avoid people,” Katie explained. “They stick to areas of low human activity, and are used to human disturbance, so they may not be as stressed as people tend to assume.”

Each individual coyote has a unique background and lifestyle that can generate major changes in cortisol production. One example is coyote #743, a male living on Chicago’s North Sie.

Coyote #743 had the lowest cortisol concentrations out of the 200 samples. Based on radio-telemetry tracking and observations, the coyote appears to live entirely within a grassy cemetery and is regularly fed by people. This likely affected coyote #743’s stress levels – but without tracking and observations, his data likely would be dismissed as an outlier..

Katie expects to graduate in December, ending her five-year academic journey based here at McGraw. She plans to continue working in the field of wildlife research after graduation, hoping to pursue a post-doc or full-time teaching position as a future career goal.

“The skills I have developed over the last five years will help me move forward in my career and hopefully inspire others along the way,” she said. “But it isn’t just the learning aspect that I’ve loved about my time at McGraw; the people I’ve had the pleasure to meet and work with at the Foundation have become my close friends and have made the Chicagoland area truly feel like home.”