UW College of Agriculture and Natural Resources

Global Perspectives Grant Program

Project Report Instructions

Trip Date: June 2025-May 2026/March 2026

Principle Investigator(s): Corey Tarwater

Department: Zoology and Physiology

Email: corey.tarwater@uwyo.edu

Project Title from Application: Wings of Change: monitoring how bird and bat populations respond to global change and subsequent impacts on ecosystem function

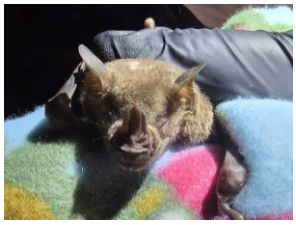
Non-technical summary:

Tropical forests are home to more than two-thirds of the world's species, and yet many of the species that play vital roles in these habitats are declining. Birds and bats are vital for forests – they pollinate plants, spread seeds, and reduce the number of insects. Without them, large losses of species and shifts in communities are expected. This grant supported a new international collaboration between institutions in the UK, Germany, Panama, and the USA working together to track how birds and bats are faring in Panamanian tropical forests. With support from this grant, we acquired new equipment that would allow us to monitor birds and bats in the rainforests, collected field data in the dry season, exchanged ideas while bat and bird researchers captured animals with each other, and started our first annual Long Bird-Bat Symposium at the Smithsonian Tropical Research Institute in Panama. At the Symposium, researchers shared their findings, discussed ways to improve data collection, and mapped out plans for future research, grants, and publications. What makes this project unique is that the bird monitoring program has been running for 50 years. By launching a matching bat program at the exact same sites, scientists can now compare day-active and night-active wildlife side by side — giving a fuller picture of how tropical forest communities are changing over time and what that means for the future of these critical ecosystems.

1. Main Results of Year 1 Activities

Partnership Development - Funds were used to establish a new international research collaboration — a primary objective of this proposal. Initial meetings were held with partner institutions that study bats in Panama and are based in the UK, Germany, and at the Smithsonian Tropical Research Institute (STRI). These meetings aligned research goals, confirmed shared field protocols, and identified early opportunities for joint publications and grant applications.

Field Data Collection – With the funds from this project, we were able to buy new equipment that allows us to monitor more of the bird and bat community. Previous bird methods used only mist-nets, which capture birds that fly into nets <2.5 m off the ground. With these funds, we bought game cameras and acoustic recorders. These additional monitoring methods are key expansions: whereas mist-nets capture only understory species, recorders and cameras will document the full bird and bat community, including ground-walking and canopy species.



We went to Panama during the dry season and captured hundreds of birds, while at the same time, the bat team captured bats. Data on survival, recruitment, abundance, disease, and body condition were collected for both programs — LIMBO (bird monitoring, now in its 50th year) and the newly launched LongBAT (bat monitoring) — using consistent protocols at the same locations to ensure the datasets are directly comparable. While in Panama, the bird team also spent one night in the field with the bat team to aid in protocol development and ensure data collection methods are similar.

Long Bird-Bat Symposium - A two-day symposium was hosted at STRI in Panama, bringing all research teams together for the first time. There were 25 people in attendance. On Day 1, Tarwater presented long-term bird monitoring results and two graduate students and one postdoctoral researcher from Tarwater's bird team gave research talks. The bat team, led by Rachel Page at STRI, presented their findings. We went through methods and discussed protocols to ensure all data will be comparable. We were also joined by other

researchers interested in joining our collaboration and they presented their results. Day 2 was focused on collaborative planning, including identifying joint publication opportunities and scoping future grant proposals.

2.Future Plans

Building on Year 1, the team will continue mist-netting in both the dry and wet seasons and continue to deploy wildlife acoustic recorders and game cameras at study sites. The team will also advance work on the first collaborative publications comparing three decades of change in tropical bird and bat populations. Additional joint grant applications are planned with all partners to secure long-term funding for the collaboration. One grant was already submitted to NSF this past month based on our initial data collection.

Further, our symposium generated a lot of interest from other researchers conducting work in Panama. We have already added Cornell University as another partner. Researchers from Cornell study the insect community and want to collaborate on examining how the insects that are consumed by birds and bats are changing. We have also had STRI researchers who study fruit and flowers, other key prey items of the birds and bats, express interest in joining our collaboration.

3.Potential Impacts

a) College of Agriculture, Life Sciences, and Natural Resources

This project enhances the College's research profile in tropical ecology, wildlife conservation, and bioacoustics. It provides graduate students with hands-on international field experience in Panama, training in cutting-edge acoustic monitoring methods, and exposure to large-scale cross-taxon research. These experiences directly strengthen student preparation for careers in conservation and ecological research.

b) University of Wyoming

This project advances UW's Global Perspectives priorities by launching a new long-term international collaboration with institutions in Germany, the UK, and Panama. It expands UW's expertise in bioacoustics and ecological modeling, strengthens UW's international research presence, and opens new funding streams through partner-country grant mechanisms. Although Tarwater has worked in Panama since 2003, this project marks the first collaboration with STRI staff scientists and with the European partner universities, representing a meaningful expansion of UW's global research network.

c) State of Wyoming

By positioning UW as a key partner in a high-profile international research program, this project raises the state's profile in global conservation science. The work addresses pressing questions about biodiversity loss and ecosystem function under global change — issues with broad relevance to land managers, policymakers, and conservation practitioners in Wyoming and beyond. Student training supported by this project will develop the next generation of Wyoming-based conservation scientists with international experience and skills.