FINAL REPORT
Faculty Research Grant Fall 2016

In October 2016 I received a Faculty Research Grant for audio recording equipment that would be used to record bird song. The objective of this research is to test the hypothesis that a bird's use of feeders affects characteristics of their vocalizations. I received the equipment and am thus far extremely happy with its performance. Across the spring I began using this equipment and fine-tuned my methods to ensure the recordings were of publication quality. We recorded and analyzed the songs of approximately 15 House Finches that we had previously banded (see below). This number remains too low for statistical analyses of the relationship between song and food usage, though we are actively catching additional birds and expect through the 2018 breeding season to collect enough recordings of vocalizations to properly test our hypothesis and conclude this portion of the study. I then intend to prepare and publish the results of this study in a national or international journal such as *Ecology*, *The Auk*, or *Animal Behaviour*.

This aspect that focuses on bird song is part of a larger project aimed to understand the effects of bird food on songbird attractiveness. Both the focused song project and the broader research questions require certain research objectives be met, as outlined in my proposal. Below is a summary of the related tasks I have completed since receiving this grant:

- I established five additional bird feeders on campus. These feeders are used extensively by local birds and must be filled every 1-2 days due to high seed consumption.
- I attached automated radio-frequency identification (RFID) readers to each feeder that record the identity of individual birds, along with the date and time that each bird visited the feeder.
- I captured approximately 60 birds by May 2017. Each bird received a passive integrated transponder (PIT) tag that can be read by the dataloggers attached to my feeders. I also recorded data on the plumage color and morphological characteristics of each bird.
- Upon each feeding visit the dataloggers record the identity of each individual bird along with the date and time of the visit. At present I have already recorded more than 20,000 feeding visits.

One of the students working on the project, Stetson Collard, presented preliminary findings of this study as first author on a poster presentation at the Arkansas Academy of Science conference at UCA April 8, 2017. This was Stetson's first professional presentation. Impressively, he received the "Best Undergraduate Poster, Biology, 2nd place" award. Below is the reference to the presentation. Attached is a copy of the poster he presented, which is now displayed in McEver Hall.

> Collard, S. R. and D. G. Barron. 2017. Evaluating the effects of bird feeders on songbird plumage coloration. Arkansas Academy of Science, Conway, AR. Poster presentation.

I have also integrated this research into my classroom and those of my colleagues. I have used these bird feeders to conduct hands-on demonstrations for more than 60 students teaching how to capture, handle, and band songbirds. Specifically, I have had two students complete undergraduate research credit, one student carry-out research funded through the ATU undergraduate research grant, six students work as paid research assistants, and involved larger student audiences through my Ecology course and Dr. Jorista Van der Merwe's Wildlife Techniques courses. The on-campus nature of this research is ideal for continued integration into the classroom.

In summation, the recording equipment purchased with this Faculty Research Grant has been integral to testing the hypothesis that bird food influences song characteristics. I and the many students working with me have been working diligently to establish feeders and dataloggers, to capture birds on campus, and to record and analyze the song of banded birds. I am excited about continuing this research and am optimistic that it will produce additional scholarly products and facilitate further hands-on classroom experiences across upcoming years.