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Title: Genetic connectivity of a Rocky Mountain hummingbird in threatened sky-island habitats

Amount Awarded: \$4,291.11. Funds were used for graduate student summer stipend, and laboratory supplies for extraction and preparation of DNA samples for next-generation sequencing. Current remaining funds will be used to pay for genomic sequencing.

Project Summary: Sky islands are systems of mountains and valleys with limited dispersal among high-elevation habitats, forming biological “islands.” High-elevation bird species are sensitive to climate change because phenology of plants shift and habitats shrink. Broad-tailed Hummingbirds (*Selasphorus platycercus*) breed in montane habitats in the Rocky Mountains. Banding studies show *S. platycercus* exhibits high fidelity to breeding sites. The health of Wyoming populations depends on the health of surrounding populations as well. I will estimate genetic connectivity of sky-island *S. platycercus* populations from Jackson, WY to southern Colorado to assess potential to maintain genetic diversity and population health in changing habitats.

Progress: During the summer of 2017 we visited 12 sites to collect samples from Broad-tailed Hummingbirds. We banded and collected blood and feather samples for DNA from 221 Broad-tailed Hummingbirds throughout Wyoming and Colorado. During our banding, we interacted with approximately 40 people and educated them about hummingbirds and ecology and conservation. The summer banding season was a success and we collected the samples needed to conclude the field work portion of the project.



Figure 1. Brady Godwin releasing a banded and sampled male Broad-tailed Hummingbird

I have extracted the DNA from approximately 100 of those samples, and am currently awaiting that job to be completed. Once sequenced, the genomic data can be analyzed for genetic connectivity, population structure, and genetic diversity, and the remaining samples can be sequenced. The project is on schedule to be completed in 2018.

Thank you to the Meg and Bert Raynes Wildlife Foundation for all of your support and help!

Picture taken by Laura Hagar, a banding site volunteer, 2017

Special thanks to many people and groups that helped us organize and execute the field work: Wyoming Game and Fish Department, Colorado Parks and Wildlife, Colorado Audubon Society, wyobird online group, cobird online group, professors and students at the University of Wyoming and the Wyoming State Veterinary Laboratory