

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Improving our understanding of the elevational biodiversity gradient of Rocky Mountain National Park: arthropod diversity and conservation

Discipline: Natural Resources
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: University of Colorado at Boulder
Effective Dates: 7/1/2014 - 4/30/2019
Funding Amount: \$90,000

Investigators and Agency Representative:

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Project Abstract: The need to document and understand the mechanisms producing biodiversity patterns is urgent because biodiversity is being lost at unprecedented rates due to global habitat destruction, overexploitation, and climate change. To discern the most effective methods to preserve, protect and regenerate biodiversity, we need a better comprehension of the mechanisms creating and maintaining biodiversity. This is one reason why the question "What determines patterns of species diversity?" was among the 25 key research themes for the future identified in the 125th Anniversary issue of *Science* (2005). Biodiversity patterns have been addressed scientifically since the seminal works of Darwin and Wallace. While potential factors underlying patterns have been the emphasis of research efforts for decades, no accepted, general explanation for the distribution of biodiversity has been determined (Brown 2001; Gaston 2000; Lomolino 2001; MacArthur 1972; Rosenzweig 1995; Willig et al. 2003).

Three approaches have dominated research into diversity patterns: large-scale correlations between species richness and environmental factors; simulation modeling based on theoretical processes and diversity; and single site monitoring and experimentation. Each of these approaches is fruitful, necessary, and informative. But none is comprehensive enough to test how local-scale relationships change across multiple species' ranges to drive diversity and distributional patterns. These approaches need to be combined across environmental gradients to get both a landscape and a local scale test of how climate, habitat, and biotic interactions influence where species occur, how their populations are distributed across their range and how these patterns may shift with anthropogenic changes.

The objective of this proposal is to use the ground-dwelling arthropod diversity and distributions on two contrasting montane gradients in the northern Front Range to (1) examine the biodiversity trends in these lesser studied taxonomic groups, (2) to test factors driving current diversity patterns, and (3) to evaluate the protection of the National Park in comparison to sites at similar elevations outside the park.

Outcomes with Completion Dates:

Database/Species Lists provided to the NPS ATR or Technical Expert - December 31, 2016
Draft Final Report/Biodiversity Products -December 31, 2015
Final Report/Biodiversity Products - March 31, 2016
Workshop Products- due within 6 months after the scheduled workshop

Keywords: arthropods, diversity, conservation, Rocky Mountain National Park, University of Colorado at Boulder