Progress Report

CNHA Discovery Pool Grant #25-02-USFS: *Surveying for the rare stonefly, Gaufinia cristata, to inform management*

Project Overview:

In summer 2024, with support from the CNHA, we initiated a project in collaboration with the Manti-La Sal National Forest to establish contemporary understanding of the distribution of the rare stonefly, *Gaufinia cristata* in the La Sal and Abajo Mountains. In addition, we planned to perform genetic work to better understand population relatedness (i.e., genetic structure) and, hopefully, to link the winged terrestrial adults of the species to the larval nymphs. Finally, during our field surveys, we planned to collect environmental data to better understand the conditions associated with healthy *G. cristata* and to potentially inform management decisions (e.g., fencing of headwater springs that contain *G. cristata* to limit impacts from grazing).

Progress:

We have made considerable progress toward our goal. With support from the CNHA, we were permitted to spread our project over two summer seasons (2024 and 2025). This was critical as the high alpine streams where G. cristata may reside are only accessible for a narrow window of time each year and since we specifically needed to collect adults of the species—which have a poorly known emergence window—we wanted to maximize our chances. This has proved to be incredibly important to the project's success. Since our 2025 work is ongoing, we focus here on our 2024 efforts.

Field surveys:

In Summer 2024, we made two visits to the area (mid-June and mid-July) and spent 7 total days surveying. We focused on previous sites where G. cristata had been collected as well as new habitat. Notably, while *G. cristata* likely exist in the La Sals, it has never been confirmed from the range. One previous record that was originally described as *G. cristata* from the La Salshas since been revised to a related species *G. wasatchensis*.

Genetics:

We collected many promising specimens and submitted them for DNA barcoding in January 2025. We are still waiting for these results.

Preliminary Results:

Field surveys:

While we found many nymphs in 2024 that were from the right family (Chloroperlidae) that were good candidates to be *G. cristata*, the species was described based on adult morphological characters so we needed to find adults. Specifically male adults as the defining characters for the genus mostly relate to the adult male genitalia. This was a major struggle and we were

ultimately unable to locate a single male *Gaufinia* in 2024. Note: We were able to collect a number of males in 2025 to fill this gap in our data set.

Genetics:
Despite not finding a male, we were still able to make significant progress on the genetics for *G. cristata*. Namely, we submitted 96 specimens for barcoding. Once we *do* find a male and generate sequence data for it, we will be able to then use that specimen's genetics to confirm if any other specimen that we sequenced is also *G. cristata*.

Plans for Summer 2025:
We will make additional visits to the area to continue our surveys for *G. cristata*. We will specifically try to collect males as they are key to confirming the species is still in the area *and* connecting various life stages with our barcoding analyses. As part of this, we anticipate submitting another round of specimens for DNA sequencing. We expect to have a complete picture of what we found in late 2025. We will also publish 1-2 additional YouTube videos.

Outreach and Education:
Presentations:

- Moab Information Center (June 19, 2025): "The Future of Utah's Mountains"
- Moab Information Center (June 13, 2024): "Climate Change in Utah's Mountains"

Podcasts:

- Science Moab Podcast (September 3, 2024): "Rock Glaciers and Water Sustainability" -- https://sciencemoab.org/rock-glaciers-and-water-sustainability/

YouTube videos:
My lab has a YouTube channel (@MountainFutures) where we publish videos about our work. So far, we've published two videos about our CNHA funded work with another in progress.

- "Ice in the Desert: Stream Ecology in Utah's Alpine Zone" (180 views): https://youtu.be/VCRVBVi9nHU

- "Researchers Collecting Stoneflies in a Mountain Stream" (105 views): https://youtu.be/5dEbz4qyTYM

Photos:
All are available at higher resolution if needed!

A male *Gaufinia* stonefly in the moss next to an Oowah Lake inlet spring. July 2025. Photograph by Scott Hotaling

A mating pair of *Gaufinia* stoneflies in the moss next to an Oowah Lake inlet spring. July 2025. Photograph by Scott Hotaling

Scott Hotaling collecting a stonefly from a mountain stream in the Abajo Mountains (July 2024). Photograph by Scott Hotaling

A small stream fed by a rock glacier in the La Sal Mountains (July 2024). Photograph by Scott Hotaling