

FINAL REPORT ON FRIENDS RESEARCH FUND 2023

Tayla Moore

Methods

My research objective was to map the geographic distribution and study the natural history of the Siskiyou slant-faced grasshopper (*Chloealtis aspasma*) within the Cascade-Siskiyou National Monument (CSNM). To do this, we visited four core sites: the Hobart Bluff Trailhead, Shale City Vista, Shale City Meadow, and Surveyor Mountain. We used a preliminary species distribution map that was created beforehand to predict where this grasshopper was likely to be found. We did weekly surveying to determine when *C. aspasma* first emerged and during the grasshoppers active season in August, we aimed to locate more populations of this species and understand their natural history.

Figure 1. Photograph of the Siskiyou slant-faced grasshopper (*Chloealtis aspasma*).
Project Outcomes & Findings

From the preliminary species distribution model, we wanted to accurately predict additional populations of this endemic grasshopper. Once we first detected the species' emergence from known locations, we were able to explore 26 sites within the Cascade-Siskiyou National Monument. Once we found them, we were able to conduct field observations to better understand their reproductive behaviors, feeding habits, and thermoregulation patterns. The research had a significant outcome regarding the geographic distribution of the Siskiyou slant-faced grasshopper. Because of this grant and the preliminary species distribution model, we were able to locate five additional populations that have never been documented. Additionally, through these field observations, we were able to record this first-ever video of this species stridulating, which is when the male grasshopper makes a noise to attract females.

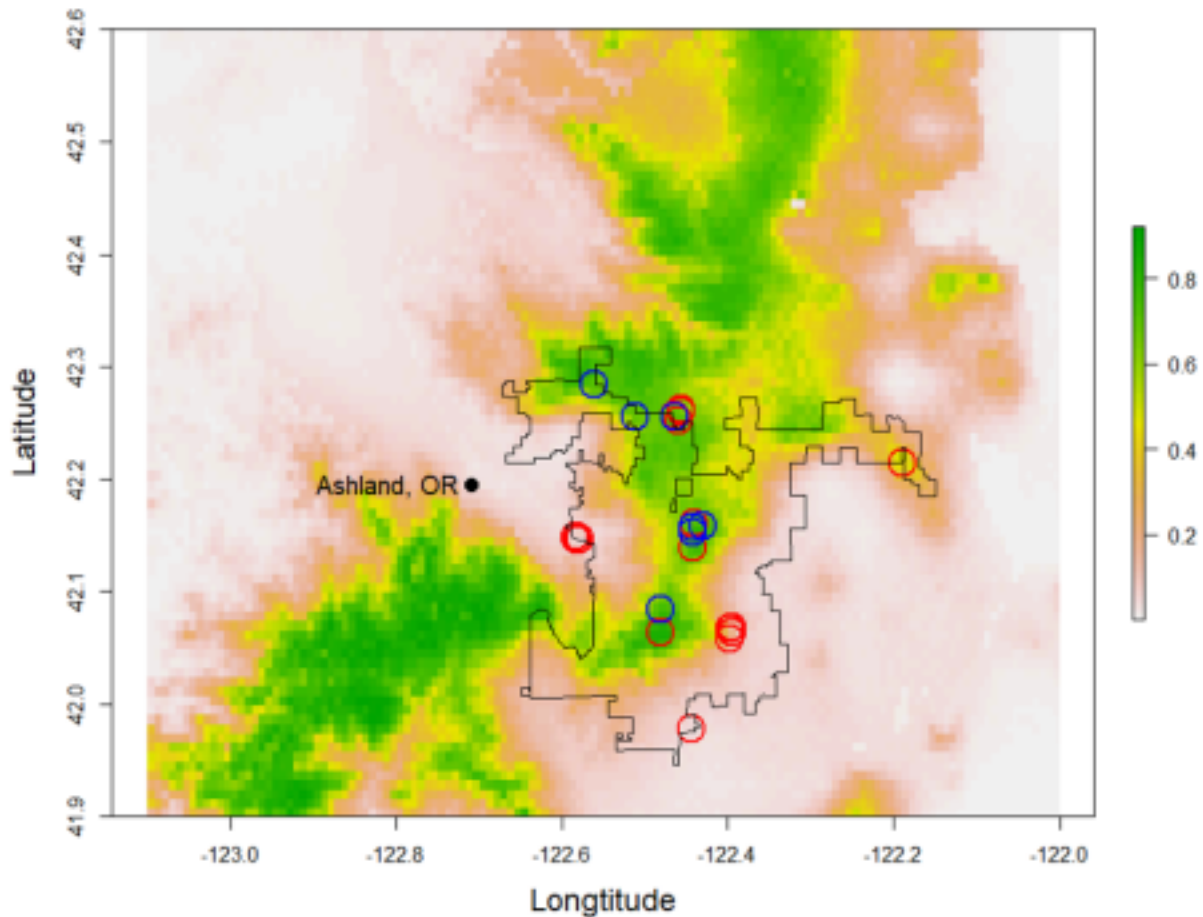


Figure 2. A species distribution model enabled us to find five new populations of *C. aspasma* within the monument. The map is color coded so that green areas are where the grasshopper is more likely to occur and yellow and pink areas are where the grasshopper is less likely to occur. Red and blue circles indicate the absence and presence of *C. aspasma*, respectively.

Promoting the Understanding, Appreciation, Preservation and Protection of the Monument

The Cascade-Siskiyou National Monument was founded, in part, to protect the wide variety of animals found within the park boundaries. One of these animals is the Siskiyou slant-faced grasshopper, a rare grasshopper that is endemic to Southern Oregon and listed as species of special status by the Bureau of Land Management and the United States Forest Service. This grasshopper has only been found in 14 locations throughout Southern Oregon, and five of these populations are located within the boundaries of Cascade-Siskiyou National

Monument. However, scientists know very little about the distribution and natural history of this rare and sensitive species, making this project important.

This research was also important to support FCSNM's missions by also promoting an understanding and appreciation of the Cascade-Siskiyou National Monument by mapping the geographic distribution and trying to study the natural history of the Siskiyou slant-faced grasshopper, *Chloealtis aspasma*. The Cascade-Siskiyou Monument is an important region that provides a unique and incomparable biodiversity, making it one of the most ecologically crucial areas in North America. The monument provides a habitat for a variety of species, some found nowhere else on earth, and the Monument also plays a significant role in cultural and historical value and must be preserved for future generations. By continuing to monitor the Siskiyou slant-faced grasshopper and other endemic species in the Monument, we can quickly respond to population threats and ensure that they are in the Monument for generations to come.

C. aspasma specimens, alongside other grasshoppers collected, will be pinned and stored in the SOU Insect Museum. These grasshoppers will be cataloged in the Southern Oregon University Natural History or Digital Archive (SODA) collections. Each specimen will be preserved in entomological storage cabinets and the specimen ID, sex, common name, genus, species, date collected, and location will be recorded for each grasshopper. By pinning these specimens, researchers and students can study the diversity of these grasshoppers found in this region. This not only fosters a deeper appreciation of the Monument's biodiversity but also supports ongoing conservation efforts by providing important data and promoting public awareness about the ecological significance and the need to preserve the Cascade-Siskiyou National Monument.

DETAILED ACCOUNT OF FUNDS SPENT ON PROJECT

MATERIALS AND SUPPLIES				
Item	Quantity	Cost per Unit	Matching Funds (if available)	FRF Funds Spent
Gemplers Sweep Nets	1	\$99.99/net	\$0.00	\$99.99
Replacement Nets	5	\$32.99/unit	\$22.75	\$142.20
Student Stipend	1	\$750.00	\$0.00	\$750.00
Thermochron iButton	9	\$88.99/unit	\$0.00	\$800.91
Hiking boots	1	\$159.95/pair	\$0.00	\$159.95
Rite in the Rain Notebook	1	\$13.95/unit	\$0.00	\$13.95
Total: Materials and Supplies			\$22.75	\$1967.00
Gemplers Sweep Nets: These nets were used for collecting grasshoppers at all field sites. This specific net and handle are sturdy enough to withstand a field season of intensive sampling in diverse terrain. Replacement nets: Replacement nets were necessary because sweep netting through thickets of thorns and occasional barb wire pierced the nets. Multiple replacement nets ensure that we never have to miss a day in the field because of a ripped net. Student stipend: I relied on part-time work during the summer, so anytime spent volunteering for field work was lost income. This stipend enabled me to complete this project during the summer without experiencing any financial difficulty. Thermochron iButton: iButtons were deployed at three sites to document the range of environmental temperatures available to the grasshoppers and to determine the relationship between temperature and behaviors such as feeding, thermoregulating, and mating. Nine iButtons were necessary because three iButtons were deployed at each site: one in full sun on the ground, one in full shade on the ground, and one in full shade two meters off the ground to estimate air temperature.				

	Hiking boots: The terrain in the Monument was rocky and diverse, so high-quality hiking boots were essential for safety while doing field work in the Monument. Rite in the Rain Notebook: This waterproof, high-quality notebook ensured that our field notes were recorded							
	LODGING AND PER DIEM							
	Proposed Travel		No. of People	No. of Days	Cost Per Person (per day or trip)	Matching Funds (if available)	FRF Funds	Total Funding
From:	To:	Southern Oregon University Cascade-Siskiyou National Monument	1	12	\$20.00	\$0.00	\$240.00	\$240.00
	Total: Lodging & Per Diem					\$0.00	\$240.00	\$240.00
	project required us to travel to the Monument once per week for twelve weeks to scout sites, deploy temperature loggers, collect grasshoppers, and conduct focal observations (see timeline). During this time, we were in the field from 9:00 AM to approximately 7:00 PM, so we requested per diem to cover the costs of meals during day field work.							
	and preserved regardless of the weather or local conditions.							

MILEAGE							
Proposed Travel		No. of Miles	No. of Trips	Cost Per Mile	Matching Funds (if available)	FRF Funds	Total Funding
To:	Cascade-Siskiyou National Monument	25	12	\$0.655	\$0	\$196.5	\$196.5
From:	Southern Oregon University						

To:	Southern Oregon University	25	12	\$0.655	\$0	\$196.5	\$196.5
From:	Cascade-Siskiyou National Monument						
Total: Mileage					\$ 0	\$393	\$393
Our project required us to travel to the Monument once per week for twelve weeks to scout sites, deploy temperature loggers, collect grasshoppers, and conduct focal observations (see timeline). We used a personal vehicle for this trip, so we requested reimbursement for the mileage and costs of gas.							