COLORADO STATE UNIVERSITY EXTENSION

CSU WESTERN COLORADO EXTENSION ENTOMOLOGY INTERNSHIP

CATE COLLINS

Mentor Team:

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Check out the 2,305 specimens that were databased this summer from the CSU Extension Tri River Area office collection by scanning this QR code.

PROJECT INTRODUCTION

I worked under the guidance of Melissa Schreiner, CSU Extension Entomologist for the Tri River Area, and Tristan Kubik, Entomologist with the Colorado Natural Heritage Program (CNHP). My primary project was digitizing specimens in the CSU Extension Tri River Area insect collection using iNaturalist. The collection was founded by retired CSU Extension entomologist Bob Hammon and is home to thousands of insect specimens, some over 50 years old. I focused on pollinators within the collection and as a result, database-archived 2,305 specimens, while also contributing to insect surveys across Colorado supporting CNHP's mission. CNHP provides statewide expertise on conserving rare and lesser-known species and is currently leading rare invertebrate surveys, to which my work in both databasing and insect surveys contributed.

Figure 1. Cate Collins photographs pink aphids on the rare wild hollyhock at Owl Creek Pass. This data, along with other photos and collected specimens, support CNHP's statewide invertebrate survey. Insect photography and ethical collection were among the many skills I gained during my internship.

WHAT IS iNATURALIST?

iNaturalist is a community science platform that lets users upload, identify, and share biodiversity observations worldwide. By making species data publicly accessible, it connects scientists, land managers, and the public to track species distributions and monitor biodiversity changes.

ANYONE CAN BE A NATURALIST

Figure 2. *Eleodes obscura dispersa (Obscure Darkling Beetle) photographed at Southwest Seed Inc. in Montezuma County, CO.*

A naturalist is someone who values the natural world and makes meaningful observations about species. iNaturalist makes participating as a naturalist accessible by turning individual observations into data that support biodiversity research and conservation, while fostering ecological awareness.

DATABASING THE INSECT ARCHIVES

Figure 3. Pictured above are digitalized specimens from the CSU Extension collection. From top to bottom, *Euphydryas anicia wecoeut* (Anicia Checkerspot), *Melissodes sp.* (Long Horned Bee).

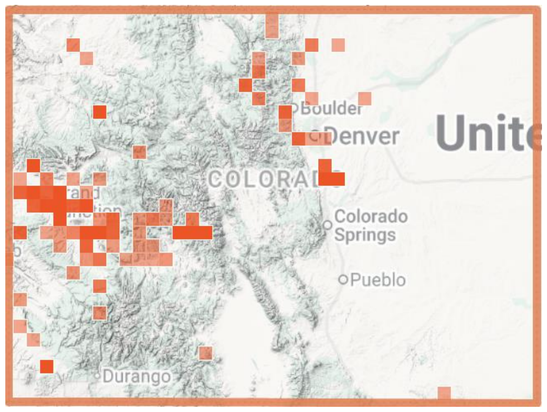

Figure 4. Map generated by iNaturalist highlighting where the databased specimens were collected in Colorado. The collection is extensive and features insects from (but not limited to) Mesa, Gunnison, Larimer, Rio Blanco, Grand, Garfield, and Routt counties.

The databasing process involved photographing each specimen from multiple angles using a Dino-Lite microscope. The images and data were then uploaded to iNaturalist, and the specimen was returned to the collection to continue serving as an educational resource. This allowed the iNaturalist community to help with species identification, determining conservation status, and identifying whether the specimen is native or introduced to its collection region.

INSECT SURVEYS ACROSS WESTERN CO

In addition to digitizing specimens, I participated in insect biodiversity surveys across multiple Colorado counties, including Mesa, Ouray, Dolores, Rio Blanco, and Gunnison. Field days were long and immersive in which I explored diverse habitats across the state. Through this work I developed hands-on entomological and field biology skills, including ethical specimen collection, insect identification, sweep net use, macro photography, and how to document my observations. Photo data was uploaded to iNaturalist to contribute to CNHP statewide biodiversity records while select specimens were collected and added to the CSU Extension Tri River Area insect collection, where they serve as educational resources and enable species-level identifications.

Figure 5. *Ochlodes sylvanoides* (Woodland Skipper) photographed in White River National Forest, CO. (left) and *Polygonia satyrus* (Satyr Comma) photographed in Dolores County, CO. (right).

The insects we collected during surveys were carefully curated to improve insect biodiversity data. I learned and practiced a variety of entomological curation techniques, including using a spreading board for moths and butterflies, creating accurate specimen labels, and determining proper pinning/pointing locations. The specimens I curated meet museum-quality standards and through this process I gained experience with the proper techniques for collecting, preserving, and documenting insects. I began my own insect collection this summer, which allows me to continue developing these skills and contribute to the growing body of insect records in Colorado.

Figure 6. Lakyn Barkley (left), Cate Collins (middle), and Melissa Schreiner (right) completing an insect survey outside of Telluride, CO. for CNHP's statewide insect survey.

Figure 7. Sweep netting at Upper Colorado Environmental Plant Materials Center in Meeker, CO.