

2023

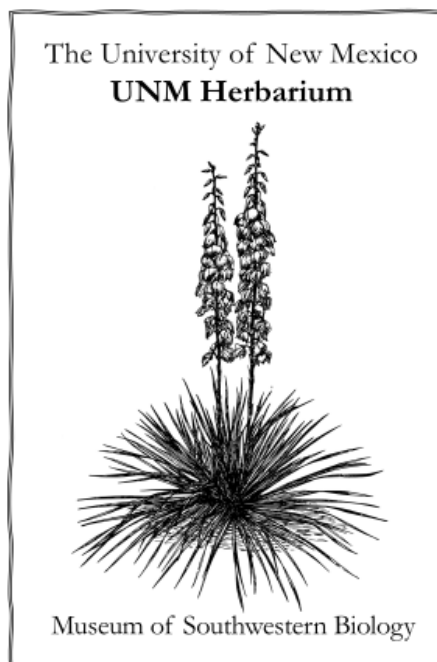
UNM HERBARIUM  
MUSEUM OF SOUTHWESTERN BIOLOGY

# ANNUAL REPORT



# Table of Contents

Numbers and Highlights .....	3
Collection Development: Inaugural Foray .....	4
Collection Development: Genetic Samples .....	5
Collection Based Research Highlight .....	6
Specimen Based Education .....	7
Field Work.....	8
Outreach and Community Engagement .....	9
The People at the UNM Herbarium .....	10
Support the UNM Herbarium .....	11



# Numbers & highlights from 2023



## Visited by over **638** guests

We hosted one public museum wide open house that saw around 350 visitors and a private open house that saw around 200 visitors. In addition to these two tours we hosted school tours, visiting researchers, and botanists from all over!



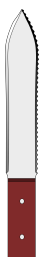
## Added **4,720** new specimens

Over 4,000 new specimens were accessioned into the UNM Herbarium and are available on SEINet, our online data repository ([swbiodiversity.org](http://swbiodiversity.org)).



## Volunteers worked **748** hours

We host a special crew of rotating and long term volunteers at the herbarium who aid in specimen processing from mounting to imaging to filing and even cataloguing our reference book library.



## Students & Staff collected **2,208** specimens

Herbarium graduate students and herbarium staff alone collected over 2,000 specimens across New Mexico and Colorado, all deposited in the collection.



# Collection Development: Inaugural Foray

*For 3 beautiful days in early June 2023, 24 socially inclined botanists of New Mexico, gathered for the inaugural UNM Herbarium Collecting Foray. The first Foray was held in the Zuni Mountains, about 2 hours east of Albuquerque. The Zuni's have seen a decent amount of collecting, especially by Foray attendees, Arch McCallum and Jim McGrath, but deserved more attention, especially with an early phenological focus. We were able to find a few new county records as well as a handful of new records for the range, which we continue to work through during our ID Nights. All this effort amounted in **317** specimens, and a lot of fun. Thanks to all who came!*



From Left to Right: Hannah Marx, Sharon Miles, Erika Rowe, Lee Regan and Marty Purdy pressing wetland plants from Shush Kin Fen, and Bob Sivinski, posed as the botanical Marlboro Man at the campground.

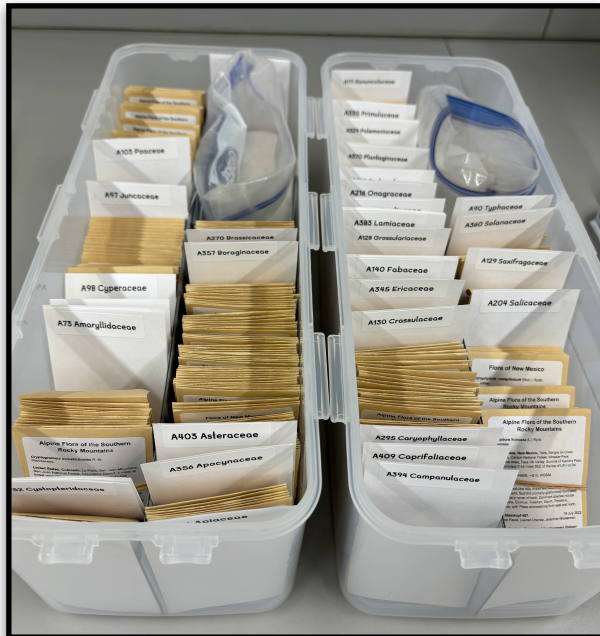


From Left to Right: Don and Wendy Graves in Little Water Canyon, Genevieve Harman and Arch McCullum pressing an aquatic plant, and Melanie Gisler, Steve Gisler, Hannah Marx and Lizzie Lombardi pressing plants at the campground.



# Collection Development: Genetic Samples

*In 2023 the ground work began for two major connections to genetic sampling at the herbarium, a leaf tissue silica library as well as a connection to the Division of Genomic (DGR) resources. These projects were spear headed by two of our graduate students.*



Leaf tissue samples organized by family in air tight boxes.

## Leaf Tissue Silica Library

The foundation of a leaf tissue silica library has begun at UNM, led by graduate student Joseph Kleinkopf. During collecting, a small piece of leaf tissue is put into a tea bag and then stored in silica desiccant for later usage, as opposed to destructively sampling mounted specimens. High-quality genomic DNA extracted from these tissues facilitates systematics, population genetics, and genomics research. Over **3,000** new tissue samples collected by students, faculty, and associates in the last two years have necessitated the physical and digital curation of these tissues to make them accessible to researchers at UNM and globally.

## Genomic Connection

While the tissue samples we can store and track in our herbarium, genomic samples need to be stored in nitrogen at  $-80^{\circ}$ . Recently graduated, Diana Macias PhD, has been studying Piñon Pine genomics, and with the help of DGR Collections Manager, Mariel Campbell, we have begun to connect her specimens to the genomic samples stored in the DGR, tracked both on SEINET as well as on Arctos databases. The herbarium samples and the deposited tissue samples will make it possible to connect phenotypes with genotype or with expression patterns and make them valuable “extended specimens” in the global network of natural history collections.

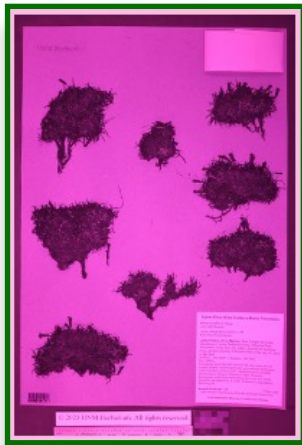


Brenda Ramos Villanueva, being taught by Diana Macias, how to extract DNA from Piñon Pine needles.



# Collection Based Research Highlight

Our Curator advises multiple students in collections based research. Below are a few research projects that have more recently come to a close. Keep an eye out for publications coming out of the UNM Herbarium!



## Alpine Pollinator Syndromes

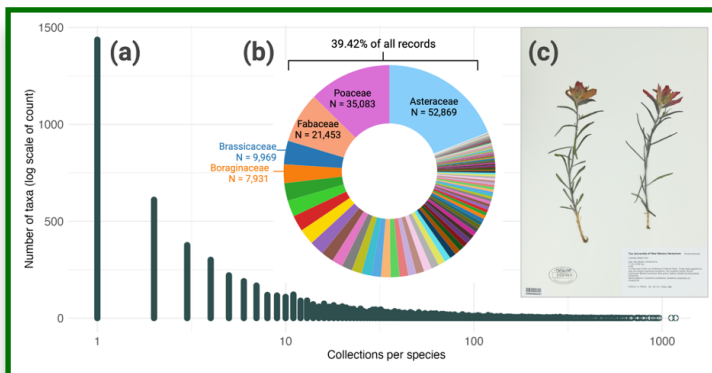
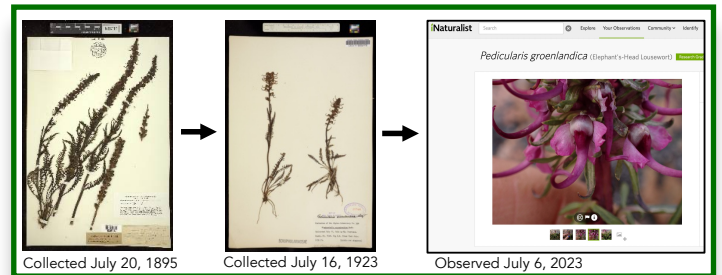
Jeremiah Westerman

Using herbarium specimens from recent alpine efforts, UV images of alpine plant specimens, alongside measurements of floral traits, helped to determine pollinators for major flowering plants of the southern Rocky Mountain alpine. The pollinators along with the phylogenies of the sampled alpine plant communities, was used to determine the effects of these pollinators on alpine plant diversity across the sampled summits.

## Alpine Plant Phenology

Erin Berkowitz

This work centers around using over 150 years of historical herbarium specimen data to study the impacts of climate change on alpine plant phenology in the South Rocky Mountains. It was found that flowering time has generally been advancing by 2 weeks over the two sampled peaks.



## State Collection Analysis

Lizzie Lombardi, Harpo Faust, Hannah Marx

In 2023, we synthesized and analyzed data from all digitized collections that have ever been made from the contemporary state of New Mexico, and described common trends and possible gaps in what we know about the state flora. All data and analyses for this project will be publicly available (soon, hopefully!) and can be helpful for planning future collection trips.



# Specimen Based Education

*In 2023 both Curator, Hannah Marx, and Collections Manager, Harpo Faust, taught specimen based courses, that got students out in the field, and required students to deposit specimens into the collection. Both courses hosted a botanical lectures series and we are grateful to all the New Mexico Botanists who shared their knowledge with our students.*



## Flora of New Mexico

Taught by Hannah Marx, Fall 2023, this course was well received by its students, who deposited over a hundred specimens, alongside silica preserved leaf tissue, into the collection. This is the only course at UNM that offers students skills in plant identification and classification, and therefore it is of interest for undergraduate and graduate students in the Biology department and beyond (e.g., Landscape Architecture, Art). We are excited this course has returned!

Flora students learning from Dr. Marx on a field trip in the Sandias.

## Botanical Diversity & Preservation

Taught by Harpo Faust, Spring 2023, this course was a special one time offering to 8 conservation biology undergraduates. In order to manage teaching and managing the collection full-time, this course was hosted, designed around and facilitated entirely by the herbarium. In this course students learned the background of herbaria, curation and collection standards, research applications and facilitated a weekly lab learning different steps of the specimen processing queue. The students final project was a collections based research project that they all presented at the UNM Biology Department Research Day.



Khadijah Burke & Botanical Diversity students pressing specimens on a field trip in the Quebradas.



# Field Work

In addition to the foray, we also hosted multiple collecting activities around the state. Below are just some of the field and research projects being conducted at the UNM Herbarium. In 2023, we hosted six graduate students and one postdoctoral researcher, who hosted a NSF REU undergraduate student.

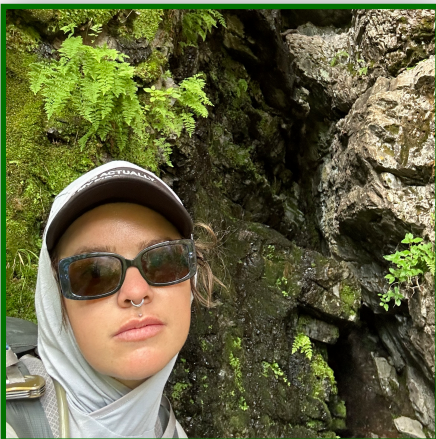


## Alpine plants

One floristic focus of the UNM Herbarium is southern Rocky Mountain alpine. PhD student Joseph Kleinkopf is currently working on uncovering the community phylogenetics of alpine plants to understand their ecology and evolution, with a special focus on *Erigeron*. Left, Joseph Kleinkopf and field technician Brianna Addison taking a snack break at 8am after summiting Sheepshead Peak. Joseph collected **603** specimens in his 2023 field season!

## Chihuahuan Desert

Bryana Olmeda is a Masters student interested in the floristic diversity of the Chihuahuan Desert in New Mexico. In 2023 they began their floristic inventory of the Brokeoff Mountains, Otero County, New Mexico. Right, Bryana Olmeda pressing *Bletia nitida* in the Brokeoffs, only the second collection in the state. Bryana made **1019** collections in their 2023 field season!



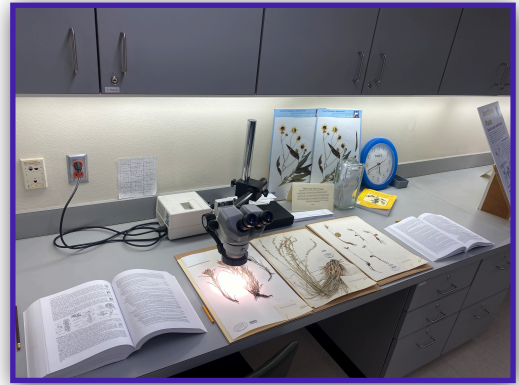
## Ferns

Collection Manager, Harpo Faust, has undertaken a multi-year project updating the checklist of ferns and fern allies for the state of New Mexico. Left, Harpo Faust is awakened by a fervor for ferns after unknowingly collecting a state record and a new county record amidst a healthy *Cystopteris fragilis* ssp. *tenuifolia* population in the Trampas Lakes region. Harpo made **426** specimen collections in 2023.





# Outreach & Community Engagement



Plant ID Station from our Museum wide open house.



From Left to Right: Shelby Haney doing a live specimen prep for an audience of a few hundred during a public Open House, and Diana Macias, with her Piñon Pine display during one of our open house, showing her work, as well as the specimens connection across the herbarium, the entomology division and the genomic division.



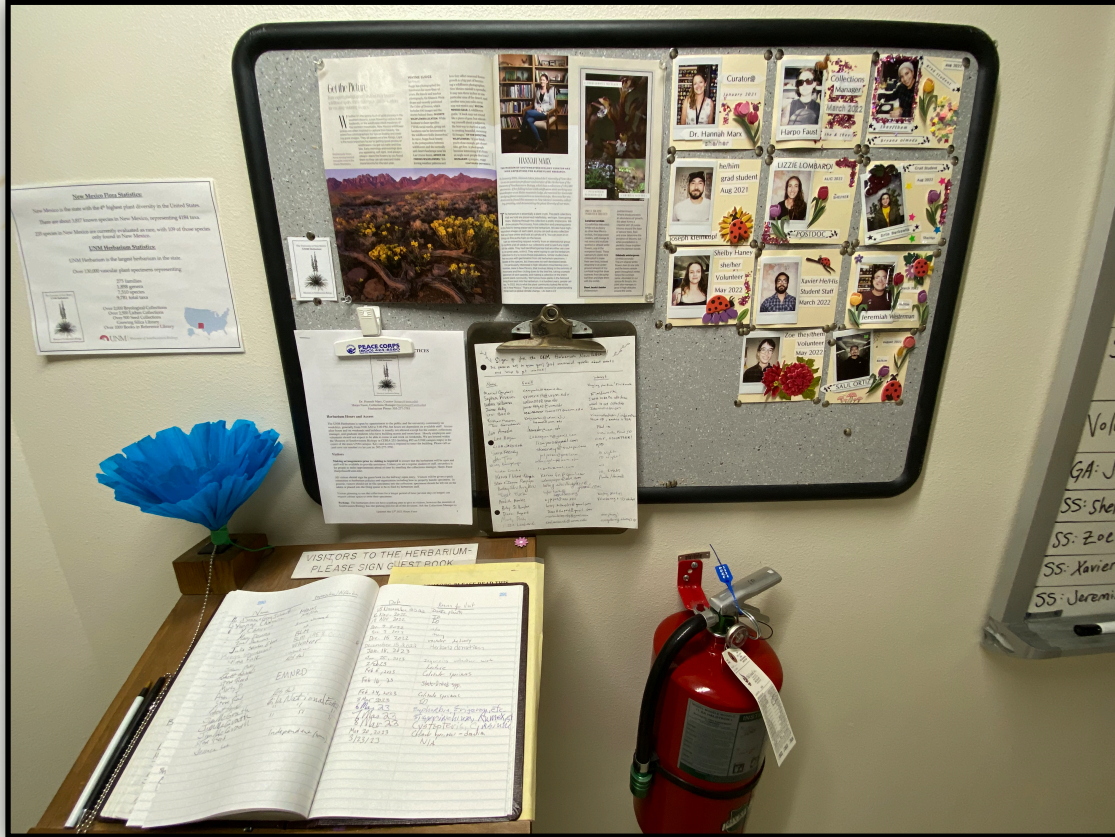
From Left to Right: Bryana Olmeda, Erin Berkowitz, Wendy Graves, Don Graves and Tom Stewart at our November 30th ID Night.

We continued our Plant ID Series this year with **4 more events in 2023**, totaling in **59 attendees total**, picture bottom left. We were able to get through a third of our foray specimens!

We also were able to host **10 tours** of the collection, 6 of which were for UNM based groups, 2 for local K-12 groups and 2 were for larger museum wide open houses, pictured above.



# Herbarium Personnel 2023



Curator .....	Hannah Marx
Collections Manager .....	Harpo Faust
Graduate Assistant (Spring) .....	Joseph Kleinkopf
Graduate Assistant (Fall) .....	Erin Berkowitz
Postdoctoral Associate .....	Lizzie Lombardi
Undergraduate Student Staff .....	Zee Vermette
	Xavier Cardona
	Jeremiah Westerman
	Shelby Haney

# Support the UNM Herbarium

As the largest herbarium in the state, the UNM Herbarium takes the responsibility to maintain and actively curate the collection seriously. On top of this we are devoted to growing the collection and training aspiring botanists.

This work could not be done without the support of the botanical community here in New Mexico. We want to extend gratitude to the many students, volunteers, associates and botanists who have helped maintain this herbarium.

Lastly, a special thank you to those who donated to our herbarium in 2023. Your support helps us continue to maintain this incredibly important collection.



Please consider donating!



## More Information

<http://www.msb.unm.edu/divisions/herbarium/index.html>

## Contact Us

Email Dr. Marx: [hmarx@unm.edu](mailto:hmarx@unm.edu)

Email Harpo Faust: [harpofaust@unm.edu](mailto:harpofaust@unm.edu)

Call the Herbarium: (505)-277-1360

*“We unlock the wonders of the largest preserved plant collection in New Mexico to **enhance botanical education, promote impactful research products, and encourage safe and ethical practices.**”*

*UNM Herbarium Mission Statement*

