Friends of the University of Montana Herbarium

2026 2026

As of October 2025 there has been a Field Station Exhibit at the Montana Natural History Center focused on the University of Montana Herbarium

MONTU Herbarium Joins the UM Biodiversity Research Collections

Nathalie Wolfram

In July 2025, the MONTU Herbarium joined together with the University of Montana Paleontology Center and the Philip L. Wright Zoological Museum to form the UM Biodiversity Research Collections (UMBRC). With this change, the Herbarium moved organizationally from the Division of Biological Sciences into the Broader Impacts Group, an office within UM's Research and Creative Scholarship sector. Here's what Friends of the Herbarium should know about these changes.

As a collective, UMBRC is poised to raise our collections' public profile, collaborate in ways that leverage each collection's unique strengths, and tackle resource limitations strategically. The Herbarium's curator and faculty partners played an instrumental role in creating UMBRC and are vital stakeholders in its success.

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Notes from the Board

By Amandra Hendrix

Why Herbaria Matter in Montana Montana's sweeping landscapes — from alpine tundra and subalpine forests to expansive prairie and sagebrush steppe — support some of the most diverse and ecologically important plant communities in the Northern Rockies. Herbaria help us document and understand that diversity in a way nothing else can.

Each specimen collected in Montana preserves a snapshot of our changing ecosystems: the exact place a plant grew, the conditions it experienced, and how species' ranges shift across elevation, climate gradients, and time. These records are especially valuable as our state faces increasingly complex pressures from climate change, wildfire, invasive species, and evolving land use patterns.

A cornerstone of this work is the University of Montana Herbarium (MONTU), one of the most comprehensive botanical collections in the region. MONTU provides rigorously curated specimens that support accurate species identification, rare plant surveys, restoration planning, and long-term ecological research. Its historical collections offer vital context for understanding shifts in plant distributions, changes in flowering times, and broader patterns of biodiversity across Montana.

Visitors to MONTU

General Public & Private Consultants
Scott Mincemoyer, Gary Laursen, Tim Thomas, Nancy Seiler, Rosella Mosteller, Peter Husby, Thayne Tuason

UM Researchers & Students
Lisa Kouroupis, Rebekah Fields, Zettlemoyer Lab *Phlox* sequencing, using a few old herbarium specimens

Other Academic Researchers
Loren Bahls, Marquerite Trost (RM)

Federal, State, Tribal and NGO Biologists
William Schlegel (USFS), Kat Thomas (USFS), Dave Hanna (TNC), Andrea Pipp (MTNHP), Gunner Davies (CSKT)

Group Tours
Scouts of America
Montana Natural History Center Master Naturalists
UM MOLLI Class
9 UM Rocky Mountain Flora classes
UM Introduction to Drawing class
UM Museum Collections Course

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HERBARIUM
Biodiversity Research Collections
University Of Montana
Missoula. MT 59812

New Acquisitions

Gunner Davies (CSKT): 1 *Eleocharis bella*
Joe Elliott (& Giovanna Bishop): ca. 120 bryophytes
Camillo Florez: 1 Lichen, *Xanthomendoza hasseana*
Scott Freeman :40+ vascular aquatics
Nic Gravley: 1 MT lichen specimen
Karen Gray: ca. 160 MT, PNW non-vascular plants
Dave Hanna (TNC): 20+ MT vascular plants
Kurt Hansen (USFS): ca. 50 vascular plants
Bonnie Heidel: *2* WY *Physaria pachyphylla*
Matt Lavin: 2 MONT vascular duplicates
Peter Lesica: 66 Montana vascular plants
Bruce McCune: (OSC): 9 lichens (4 types)
Tim Meikle: few *Penstemon strictus*
Sage Niles: 50+ alpine MT vasculars
Andrea Pipp (MNHP): 2 vasculars, 1 lichen
Richard Prodgers: ca. 100 MT specimens for teaching

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In the six months since UMBRC was formed, our collective efforts have yielded:

(1) A successful crowdfunding campaign through the UM Foundation that raised nearly $3,000, enough to support one UM student intern in each collection this spring. (A heartfelt thank you to all who donated!)
(2) An UMBRC exhibit case to be installed inside the Missoula Public Library. The case will feature a rotating selection of specimens and interpretive signage from the three collections, engaging the library's visitors.
(3) Coordinated outreach programming, such as joint Family Weekend tours in September 2025 that brought UM students and their families in to explore the collections. MONTU accommodated 300+ visitors with biodiversity education and research.

The Herbarium's fundamental mission, vision, and activities will not change. Its goals remain focused on preserving and sharing botanical knowledge from Montana and the greater region. UMBRC provides strategic and administrative support to facilitate the Herbarium's mission-driven work.

The Herbarium's current strategic plan is scheduled to be reviewed and updated for 2026. This fall, Herbarium curator Giovanna Bishop and Broader Impacts Group director Nathalie Wolfram participated together in iDigBio's Strategic Planning for Biodiversity Collections course, which provided space for the Herbarium and UMBRC to develop coordinated, mutually supportive strategy while networking with peers from natural history collections around the world.

The Herbarium continues to partner closely with DBS. Faculty members Drs. Meredith Zettlemoyer and Jedediah Brodie stepped in as co-directors of the Herbarium, following Dr. Lila Fishman's term in that role. The faculty co-directors maintain a direct line of communication and collaboration between the Herbarium and DBS and have been instrumental in advocating for the Herbarium with stakeholders, advising the curator on operations, and promoting experiential learning opportunities for students.

Moving into the Broader Impacts Group strengthens the Herbarium's connections with UM's Research and Creative Scholarship sector. BIG is home to several other UM programs that bridge research and community, including spectrUM Discovery Area, the Office of Undergraduate Research, and We Are Montana in the Classroom, a STEM role model program. Joining this constellation of programs creates new opportunities to cross-pollinate ideas and resources. The MONTU curator continues to be funded by UM.

Charitable contributions to the Herbarium remain under the stewardship of the UM Foundation. Looking ahead, the Broader Impacts Group has a strong track record for securing grant funding to support efforts that amplify the benefits of research to society. BIG, the Herbarium, and our UMBRC partners are actively pursuing funding opportunities to strengthen the position of UM's natural history collections as vital hubs for research, teaching, and outreach.

Publications Using MONTU Specimens

Ivanovich, C., Weber, L., Palice, Z., Hollinger, J., Otte, V., Sohrabi, M., Sheehy, S., and Printzen, C. 2025. A Taxonomic Revision of the lichen genus *Lecanoropsis* (Lecanoraceae). Phytotaxa 695(1): 1-56.

Created by Herbarium intern , Kadence Johnson

The Milton Ranch is Home to the Newly Described Nearactic Rim Lichen

Andrea Pipp, Montana Natural Heritage Program

In 2016, Bill and Dana Milton invited a group of nine lichenologists, bryologists, and botanists to stay at their ranch. Our goal was to survey the land for lichens, mosses, and liverworts. In preparing for this trip we discovered, to our astonishment, that no mosses or liverworts and only one lichen had been documented in Mussellshell County. Over the course of 3 days, our group spread out across the landscape searching the trees, fence posts, soil, rock, and ground cover - on land and in water. We made over 480 collections, documenting about 93 lichen, 27 moss, and 3 free-living cyanobacteria species, but found no liverworts. Some collections were sent to other experts, one of which was a collection of a crustose lichen that took on new significance in 2025.

An international team of lichenologists led by a German researcher, Dr. Cristóbal Ivanovich, used newer technologies and two centuries of foundational studies to better understand the *Lecanora saligna* group. They published their research findings in 2025, which revived the old genus name of *Lecanoropsis*. Of relevance to us in Montana was the recognition and description of *Lecanoropsis iapyx* as a species new to science. Furthermore, the authors chose to have Bruce McCune's 2016 collection from the Milton Ranch be the type specimen, which is a specific collection used to define and describe the characteristics of a newly named species. Where the type specimen was found becomes the type locality and duplicate collections are considered isotypes. One isotype of *L. iapyx* resides at MONTU.

Though recently recognized as a new species, *L.iapyx* (Nearrctic Rim Lichen) - is a common crustose lichen in the western U.S. It is found on wood, such as tree branches that lack bark, aged fenceposts, or old porch stoops in arid places with plenty of light. What we see on the wood is a scattering of apothecia – round, reddish-brown discs unevenly outlined in the color of ochre. Apothecia are the reproductive structures that produce spores. It is the lichen's cellular structure and chemistry that defines *L. iapyx*. More about its distribution, ecology, and identification can be found on the Montana Field Guide (https://fieldguide.mt.gov/speciesDetail.aspx?elcode=NLLEC9V010).

Lecanoropsis iapyx Photo by Bruce McCune

Additional reading

Ivanovich, C., Weber, L., Palice, Z., Hollinger, J., Otte, V., Sohrabi, M., Sheehy, S., and Printzen, C. 2025. A Taxonomic Revision of the Lichen Genus *Lecanoropsis* (Lecanoraceae). Phytotaxa 695(1): 1-56.

Botanists at the Milton Ranch

2026 FOH Annual Members Meeting

The annual business meeting of the Friends of the UM Herbarium will be Friday, October 30th from 10 AM to 2:00 PM on the UM Campus (location to be announced). Open to the membership.

Herbaria and Genomics Team Up to Study Viruses

By Peter Lesica

Plants can have a lot of trouble with insects and diseases. Botanical specimens preserved in herbaria are considered a type of host tissue repository. Herbarium specimens have been used to determine how insect pests are reacting to increased temperature and the lengthening growing seasons. For the most part, the density of insect damage can be pretty easily seen on dried specimens. To a lesser extent, the presence of molds (fungi) and bacteria can also be detected, although sometimes a microscope is needed. However, some of the most common plant diseases are caused by viruses, and they cause nearly 50% of emerging plant diseases. Unfortunately, viruses are so small that they can be difficult to detect and identify on herbarium specimens, even with a microscope. This is where genomics comes in.

Crop pests and diseases have plagued farmers since the dawn of agriculture. With technological advances in the use of genomics for older samples, it is now possible to sequence viral genomes from herbarium specimens to provide a better understanding of viral plant disease viruses. RNA (ribonucleic acid) is currently the preferred molecule for sequencing and is a promising approach for detection of historical infections. The most common, widespread and accessible source of whole plant host samples are herbaria. The use of tissue from whole-plant specimens allows virus biodiversity to be considered across biological scales and with environmental context. Pressed botanical specimens are currently the best, most equitably accessible resources we have for studying plant viruses across time and space. The use of historical natural history collections can aid with detection of emergent pathogens, including detrimental viruses.

The majority of native perennial grasslands in California have been replaced by introduced annuals such as cheat grass (*Bromus tectorum*). Evidence from herbarium specimens collected in the early 1900s suggests that this invasion was facilitated by viruses carried by the invaders and widely dispersed by numerous aphid species. Although introduced annual grasses are susceptible to these same viral infections too, their life-history strategies appear to better buffer their populations against virus-induced losses. Historical herbarium specimens, particularly those collected from localities in which crops are prevalent, may also help agricultural researchers predict and prevent spillover and crop loss due to generalist viruses.

Further reading

Lombardi, E.M. & H.E. Marx. 2024. Herbaria as critical resources for studying plant-virus biodiversity and epidemiology. American Journal of Botany 112:e16463.

Malmstrom, C.M. et al. 2007. Barley yellow dwarf viruses (BYDVs) preserved in herbarium specimens illuminate historical disease ecology of invasive and native grasses. Journal of Ecology 95:1153–1166.

Hey! Let's Remember

It's Time to Pay Our Dues

Please see the back page for details

MONTU Activities and People

Employees and students had many opportunities to work in the Herbarium over the course of 2025. Paid, non-student employees included Nic Gravley, Kian McDonough, Dorothea Kast, and Max Mace. Nic finished taxonomic updates for the Forest Service-donated MRC collections before embarking on a trip to South America. Hellgate High School student Max Mace was hired over the summer to continue with pest management. He also got the teaching collection catalogued and organized and created a new lichen and moss teaching collection with donations from Kootenai National Forest that did not have enough data for the main collection. Dorothea helped to mount new vascular plant collections as well doing some databasing and imaging. She was rehired November 1st again for the winter and will be with MONTU through March.

FOH interns were Audrey Gustafson and Morgan Kelly during the spring. Audrey integrated over 200 moss specimens collected by local botanist Frank Rose back in the 1930s into MONTU. Morgan mainly worked on typing up old Forest Service labels and mounted some specimens for the MRC as well as the teaching collection. This autumn the FOH interns were Kadence Johnson and Olivia Cornwall. Kadence was a monumental help, fully updating all of the fern names for MONTU using the Pteridophyte Portal which has the most up-to-date taxonomy of ferns and allies. Olivia helped with vascular plant imaging as well as updating some backlog in the database, connecting old specimen data to new updated images and fully databasing non-Montana vascular plants.

Over the summer, MONTU not only hired Max, but also hired students Trey Good and Asher Ackerman to work in the collections. Trey filed recently imaged specimens that were backlogged when Giovanna arrived. He also helped to integrate new and backlogged mosses into the collection. Asher databased the lichens as well as vascular plants. Another worker was Jax Rigler who earned his Experiential Learning credits for his Wildlife Biology degree this past summer in the herbarium. Jax has a passion for photography and has a lot of experience editing images, so he imaged over 1,000 specimens for MONTU.

In the fall semester, both Keith Delaney and Trey Good signed up for BIO 390 to earn credits for their work in the herbarium. Keith started updating the Fabaceae nomenclature based on Lesica (2022) and the Flora of North America. Trey continued to help integrate new moss collections and help with vascular plant filing. Asher Ackerman was re-hired and the Lichen collection is now fully databased in the lichen Portal as of December 2025.

Asher Ackerman

Marty Skinner was MONTU's most dedicated volunteer in 2025. He helped to database the MONTU liverworts, MRC bryophytes, MRC lichens, and MONTU algae. MONTU had several student volunteers this past year. Poetry graduate student, Lisa Kouroupis, volunteered in the collection over the summer and helped re-file Montana vascular species alphabetically by county within folders, helping to make the collection easier to access for future visitors. Morgan Frazer has been working to revive MONTUs fungal collection from what remained after the majority of specimens were deaccessioned and sent to Denver. She has been typing labels, sorting specimens for quality, and creating a fungal teaching collection. Kyie Salerno has a photography background and helped image MONTU vascular plants

last year. Harper Tipps and Tristan Shamlin were both volunteers in the for Spring of 2025. Harper helped start a catalogue for MONTU exchange specimens, and Tristan helped curate and type up labels for liverwort collections taken in New Zealand in the 1960s. Cole Romano volunteered in the fall and helped do some imaging as well as alphabetizing Montana vascular specimens by county within folders.

Keith Deleny

Workers databased 7,087 MONTU and MRC moss and liverwort collections into the Bryophyte Portal and 3,159 lichens into the Lichen Portal. Giovanna started updating nomenclature and barcoding non-Montana specimens in preparation for imaging. As of Dec. 2025, two full cabinets have been imaged and two more have been prepped for imaging in 2026. With the help of students, volunteers, and employees, MONTU has been able to get over 7,000 new images uploaded to the Consortium of Pacific Northwest Herbaria (CPNWH).

Herbarium Nights were a big hit! The moss and lichen and the *Senecio* classes were full with students, land managers, Native Plant Society members, and community members. More will be held in 2026. MONTU is currently the Field Station Exhibit at the Montana Natural History Center. It was installed in October 2025 and will be up for the following 6 months or more. Opening night for the exhibit was a big hit with over 50 visitors. This exhibit will help the public learn more about herbaria and their importance.

Loren Bahls, western North American diatom guru, visited the herbarium and donated a cabinet to house his extensive collections. That summer a MONTU crew drove to Dillon and received ca. 1,000 vascular plant specimens from long-time FOH member Richard Prodgers. These were put into the MONTU teaching collection. Richard also donated $1,000 and some floristic books to the herbarium. The best part of the trip was hearing Joe Elliott and Richard tell some old stories about field work back in the day with Klaus Lackschewitz. During the summer of 2025 Joe and Giovanna went on several moss-collecting trips. Herbarium workers, Trey and Max joined them on one trip where they found several state record mosses. In December Joe and Giovanna were invited to join the Northwest Regions Bryophyte Conservation Alliance to help with future bryophyte conservation and research.

Trey, Max and Giovanna in the field

Loans

2 *Psoralidium tenuiflorum* to U. Nebraska: Due 09/2026
15 *Salix* to Stanford U.;:Due 05/2026
4 *Taraxacum lyratum* to RM: Due 09/2026
12 sheets of *Tofieldia (Triantha)* to UBC: Due 12/26

Overdue loans

5 *Polemonium viscosum* to COLO: Extension until September 2026
14 *Potentilla* 1 *Abronia* to SRP: Due: 3/2025, no response
13 Brassicaceae specimens to DUKE: LOST

Leaf samples

3+ *Artemisia* leaf specimens to Scott Mincemoyer
3 MT *Asclepias* leaf samples to DAV
2 *Chenopodium fremontii* leaf samples to BYU

Yes! I want to help protect the irreplaceable collections and enhance the facilities of the University of Montana Herbarium

Name:_____
Address:_____
City, State & Zip:_____
Email:_____
I prefer a digital copy of the FOH newsletter:___

Regular Member $30
Sustaining Member $50
Organization $50
Life Membership $500

Additional Donation (chose one of the following and note on check or electronic form)
$_____Endowment Fund: accrues annual interest, part of which can be used for hiring workers.
$_____FOH Account: funds are used for student internships after Board approval.
$_____Operational Account: funds are used for day-to-day supplies, mailing etc.

FRIENDS
of the
University of Montana
HERBARIUM
University Of Montana
Missoula, MT 59812

After 30 years of no change, membership dues have increased. We hope you will understand.

Dues are for a period of **two years.** Dues for current members are payable in even-num-bered years. New memberships are accepted at any time. All contributions to the Friends are tax deductible to the full extent provided by law. All checks should be made payable to: Friends of the UM Herbarium/UMF. Join or renew online: www.hs.umt.edu/herbarium/support.php or send checks to: Herbarium, Natural Sciences Bldg., University of Montana, Missoula, MT 59812.

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