



FRIENDS

OF THE UNIVERSITY
OF MONTANA

HERBARIUM

Spring 2008

MONTU Gets a Helping Hand During the Depression

by Peter Lesica

The UM Herbarium has an excellent representation of montane to alpine plants from western Montana. However, MONTU is not strong on the Great Plains flora of eastern Montana. This is understandable; Missoula is closer to Seattle than to Glendive. Time and again I have seen the same label when looking at Montana collections from the Great Plains in our herbarium. The label says “Biological Project of the National Youth Administration” (or N.Y.A.). I have been grateful for these specimens because on more than one occasion they have been the only Montana representation of a Great Plains species in our herbarium. Finally my curiosity got the best of me, and I had to find out about the N.Y.A.

The National Youth Administration was created in 1935, during the Great Depression and the Administration of Franklin D. Roosevelt. It was similar to the better-known Civilian Conservation Corps but for people in their teens or early twenties. Over two million people including one million women across the country, but especially in rural areas, were paid to perform all manner of work, from constructing public skating rinks to clerical work in public libraries. The “Biological Project” of N.Y.A. hired students ages 16-25 to collect plant and insect specimens for museums and universities. Federal funding was provided to the University of Montana (then known as Montana State University) and to the N.Y.A. district offices. Apparently high school students did the collecting, and university students mounted, cataloged and identified the specimens.

During the spring and summer of 1936 and 1937, approximately 70 high School students, both boys and girls, from Browning, Butte, Columbus, Ekalaka, Havre, Livingston, Miles City, Missoula, Polson, Shelby, Wibaux, and Whitefish were employed to collect and press plants. MONTU has N.Y.A. collections from 31 of our 54 counties, with the most collections coming from Flathead, Carter, Deerlodge, Custer, Silver Bow and Wibaux counties. Most important to the UM Herbarium are those



The first Montana collection of *Lobelia spicata*, a Montana Natural Heritage Program Species of Concern, was made by an N.Y.A. worker in 1937, sixty years before the next collection was made by MTNHP botanists.

coming from Blaine, Carter, Custer, Dawson, Fallon, McCone, Petroleum, Prairie, Richland, and Wibaux counties, where we have few other collections.

University students were hired by the N.Y.A. to curate the specimens starting in the fall of 1936, and continuing at least through the fall of 1937. MONTU has more than 1,300 Montana collections with N.Y.A. labels. One report of the project states that over 9,000 specimens were identified and mounted by N.Y.A. workers during this

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FRIENDS

of the University
of Montana

HERBARIUM



**BIOLOGICAL SCIENCES
UNIVERSITY OF
MONTANA
MISSOULA, MT 59812**

*THE MISSION OF THE
FRIENDS IS TO SECURE
SUPPORT FOR AND TO
ENRICH THE
COLLECTIONS AND
OPERATIONS OF
THE UM HERBARIUM*

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The *Friends* Newsletter
is edited by
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Activities

The Clark Fork Chapter of the Montana Native Plant Society held three meetings in the herbarium during the winter of 2007. In January James Riser told us everything he knows and then some about the orchids of Montana. Peter Lesica led the group in learning the anatomy of, and keying out, Montana's paintbrushes in February. In March a dedicated group of Plant Society members spent an evening organizing the teaching collection, cleaning the tops of the cabinets, and labeling the new yellow folders for the Montana specimens. Ten people can get a lot of work done in just a couple of hours.

Notes from the Board

According to the National Science Foundation, "Our planet is rapidly being modified by human development, and natural history collections are an enormously valuable source of biological information ... Natural history collections contain records of life on earth that are unique and irreplaceable, including specimens of extinct species and temporal information on changes in the ranges of native and introduced species." Therefore, the U.S. government spends about 6 million dollars every year to make information from biological collections across the country more easily available and accessible.

For the past three years, the University of Montana herbarium has had the privilege of spending about \$100,000 of these \$6,000,000 to make our data available on line. (Perhaps that doesn't sound like a very large share, but in fact it is about four or five times larger than the ratio of the Montana population to the U.S. Population, and this is just for the UM herbarium.) And I have had the privilege of helping to coordinate this effort.

Our team is different than most groups who receive funding from the research collections program. Most such teams are led by a university professor whose research is based in systematics or biogeography, so they directly need the collection themselves as part of their work. Our project is co-directed by Dr. Lila Fishman (a professor in the Division of Biological Sciences) and me. Both of us have a history of working with herbarium data, but we focus our research primarily on different aspects of ecology (me) and genetics (Lila).

I believe that our project is only possible because of the dedication of the Friends of the Herbarium. Most obviously, it would never have been funded without the help of Peter Lesica. He is doing the work of a plant taxonomist on the project, checking specimen identifications and using the data to write a Montana flora. Peter was also responsible for contributing the background information on when, and how, and by whom, our collections have contributed to conservation on local, national, and international scales.

But, more than simply compiling statistics, our project must have been funded because of what those statistics revealed. The University of Montana herbarium is used not only by a few academics, but is important for a large number of botanists and conservation planners from state, federal and nongovernmental organizations. Because many of you are actively using, caring for, and contributing to our collections, our collection is valuable enough to merit more than our share of national funding.

In the 20th Century, conservation planning and decision-making were limited by the lack of appropriate data. In the 21st Century, we are faced with the challenge of making sense of output from new technologies for collecting and consolidating data, and evaluating whether these technologies give us the information we need. I am grateful to everyone who has enabled us to contribute our collections to these efforts.

Elizabeth Crone

MONTU People

...Wally Albert

Wally spent most of his life in the Missoula area, but he was born in Wallace, Idaho on February 12, 1928, and so was named for that town. As a railroad fireman and engineer, his father was moved to Missoula just weeks after Wally's birth. There he lived at the family home in the Rattlesnake Valley at the corner of Cherry and Monroe for 57 years. As a child, he fished Rattlesnake Creek, which had plentiful fish at that time. When he was twelve years old, he contracted polio which made it impossible for him to play the sports he loved.

As he grew older, he pursued his outdoor interests of hunting and trapping despite his physical difficulties. However, there came a time when he looked through his rifle scope at a beautiful buck and wondered, "Why would I want to kill that animal?" That ended his hunting days, and a similar experience ended his trapping. Looking for other ways to enjoy the outdoors, he became a serious birder and began wondering about the plants he encountered on his birding excursions. A neighbor worked at the uni-



Wally Albert in a recent photo taken at his home outside Corvallis.

versity and offered to take plant specimens to botanists there for identification. Eventually she recommended that he contact Klaus Lackschewitz for help with his plants. This became a close association including a number of trips together in search of rare plants. At one point, Wally called Klaus about a rare plant he had found in the Skalkaho drainage, and Klaus showed up at his door at 5 o'clock the next morning ready to go look at it.

Peter Stickney, at the U.S. Forestry Sciences Lab, became another important source of help with identification and remained a friend for many years. Although he became proficient at finding and identifying plants, Wally had almost no formal botanical training. (He has a BA degree in psychology from the University of Montana.) He was allowed to take the U of M Flora of Montana class without charge since he could help other students. The primary advantage for him was access to the microscopes and other botany equipment.

As he grew more knowledgeable, he identified and collected plants from many locations. These included: Sapphire Mountains, Bitterroot Mountains, East and West Forks of the Bitterroot River, Rock Creek (near Missoula), Salmon River/Challis areas of Idaho, Drummond, Skalkaho Drainage, the Blackfoot River area, the Swan Valley, and Browns Lake and Georgetown Lake for aquatics. One of his favorites was the Lost Horse drainage in the Bitterroots where, on one trip, he saw 18 moose. As he grew more familiar with places and plants, he was able to take U.S. Forest Service personnel on a number of field trips.

During his many outings, he camped out, sleeping in the back of his truck and never bothering to stop for or eat lunch.

In about 1985, he sold the family home in Missoula and moved to Stevensville where he regularly rode his bike to the Lee Metcalf National Wildlife Refuge. Then manager Margaret Anderson, recognizing his expertise, enlisted his help to record the plants growing on the refuge. For three years, he worked on this project covering much of the refuge in all seasons.

While he lived in Stevensville, he met Judy Hoy and did botany work on her ranch southeast of Stevensville, identifying some plants there that were new to Montana, including the little annual, *Ipomopsis minutiflora*. Part of this land is now the Willoughby Bluff Natural Area, protected by The Nature Conservancy for the unique plants growing there.

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MONT NEWS BRIEFS

New Acquisitions

Scott Mincemoyer: 80 specimens from 13 counties across Montana.

Peter Lesica: 160 specimens from Montana.

Loren Bahls: 300 diatom slides from the Pacific Northwest, for the Montana Diatom Collection.

University of Kansas: 4 specimens from Idaho.

Kansas State University: 2 specimens of *Phlox* from UT and NV.

Bruce McCune: 3 lichen specimens from MT and ID.

Exchange Acquisitions

Snake River Plains Herbarium, Boise State Univ.: 63 specimens.

New York Botanical Garden: 96 specimens from NV.

Loans for Research

Excluding loans for annotation, illustration, teaching, etc.

Robin Scribailo, Purdue University: 92 sheets of Haloragaceae for Flora of North America treatment.

Barry Wendling, Western Washington University: 111 sheets of *Campanula* for phylogeographic study of western North American *Campanula*.

Ron Kelley, Eastern Oregon University: 2 sheets of *Cryptantha*.

James Harris, Utah Valley State College: 58 sheets of *Draba paysonii* for research on high elevation species of *Draba*.

Publications Based on MONTU Specimens

Bahls, L. 2007. *Cymbella janischii* – giant endemic diatom of the Pacific Northwest: morphology, ecology and distribution compared to *Cymbella mexicana*. Northwest Science, Vol.81, No.4, pp.284-292.

Jacobson, A.L. and P.F. Zika. 2007. A new hybrid cherry, *Prunus x pugetensis* (*P. avium* x *emarginata*, Rosaceae), from the Pacific Northwest. Madrono, Vol.54, No.1, pp.74-85.

Several Flora of North America treatments in the Poaceae, Part 1 (Volume 24) including *Poa* by Rob Soreng and *Trisetum* by John H. Rumely.

Examples of Information Requests

Elizabeth Dickson, University of Calgary: records at MONTU of *Pyrus malus* from naturalized settings.

Aaron Wells, Montana State University: label data for *Festuca vivipara*.

Craig Barrett, The Ohio State University: label data for 26 sheets of *Corallorhiza*.

Dr. Catherine Raven, Emigrant, MT: label data for 10 sheets of *Asarum caudatum*.

Several tours of the herbarium, including Marie Moor's family from Michigan and a UM Environmental Studies class.

MONTU Donations

Several hundred MONTU duplicates from the exchange collection were donated to Dr. Linda Lyon at the University of Montana-Western in Dillon. This is a "seed collection" to help get the newest herbarium in Montana off the ground.

Don't Forget to Pay Your Dues!

If you haven't already done so, send in your membership renewal. You won't want to miss a single issue of the newsletter or miss out on what is happening at the herbarium. There is a membership form on page 8. Gift memberships are also available and are a great idea for friends.

2008 FRIENDS OF THE UM HERBARIUM ANNUAL MEETING

The Annual Meeting of the Friends of the UM Herbarium will be held Saturday, October 25 from 10:00 AM to 2 PM. The meeting will be held in Rm. 202 of the Natural Sciences Building on the UM Campus. This is the annual meeting of the Board of Directors and is open to the membership.

...N.Y.A. (Continued from page 1)

time period. Many of these may have been collected by others such as Fred Barkley, and some were probably collected by N.Y.A. workers who travelled with C. L. Hitchcock on a collecting trip to the southwest in the spring of 1937.

Walter Twedt made the first Montana collection of *Lobelia spicata*, a plant still known from fewer than five sites in the state. Severyna Zabroski's collection of *Nigella damascena* from Wibaux County is still our only Montana specimen. Other uncommon plants collected by N.Y.A. students include *Papaver somniferum*, *Vaccaria hispanica*, and *Rumex fueginus*. There are some of us who wish the government would start the program up again.

Visitors to the University of Montana Herbarium in 2007

General Public and Private Consultants

Claire Emery; Abbey Hegl; John Pierce; Lindsey Myers;
Greg Howard, PBS&J; Drake Barton; Kathy Lloyd; H.
Wayne Phillips; Steve Kohler

UM Researchers and Students

Jodi Berg, Eli Loomis, James Habeck, Peter Rice

Out-of-town Academic Researchers

Thomas Mitchell-Olds, Duke University
Ronald Kelley, Eastern Oregon University
Brad Oberle, Missouri Botanical Garden

Federal, State, Tribal, NGO Biologists

Scott Mincemoyer, Montana Natural Heritage Program
James Riser, U.S. Forest Service
Peter Stickney, U.S. Forest Service
Darlene Lavelle, U.S. Forest Service
Carrie Muller, Montana State Crime Lab
Charles Repatl, U.S. Forest Service
John Rider, U.S. Forest Service
Craig Odegard, U.S. Forest Service
Marcus Jackson, U.S. Forest Service

Thanks to new members of the Friends!

Your continued interest and support is what makes us effective. Thanks, and welcome to these members, new since the last newsletter.

Kenton Chambers

Destructive Sampling of Herbarium Specimens

Museum specimens are preserved and curated in a manner designed to preserve them for centuries. Type specimens designated by Linnaeus are more than 250 years old! When researchers ask for pieces of a specimen to use in their study, there can be a lot of hand-wringing. The Friends of the UM Herbarium Board of Directors recently took up this difficult problem. But first, what good are a bunch of old pressed plants to high-powered researchers anyway?

Studies of evolutionary biology and systematics are the most common reason for the destructive sampling of herbarium specimens. One of the older techniques is estimating pollen viability by staining pollen grains taken from flowers pressed at anthesis. Pollen that was viable will take up stain and become plump, while pollen that was not viable will not become stained and will remain shriveled. The proportion of stainable pollen is a measure of the plants ability to reproduce sexually. Plants without stainable pollen often produce seeds without fertilization (agamospermy). John Beaman at the University of Michigan used pollen stainability of MONTU's cut-leaf daisy (*Erigeron compositus*) specimens to determine that plants with short ray flowers are agamospermous, while those with long rays are sexual. The composition of certain chemicals contained in the leaves of plants can also have taxonomic significance. For example, species with more similar suites of pigments can be considered to be more closely related. Dried specimens can be used for such chemotaxonomic studies. The most powerful method in the taxonomists' toolbox is molecular genetic analysis. Some of these methods, such as chloroplast or nuclear DNA sequencing, can be conducted with tissue taken from herbarium specimens.

Ecological studies, especially those involving temporal change, may also use herbarium material. Researchers have used herbarium material to analyze the change in heavy metals pollution between aquatic plants collected 100 years ago and those recently collected from the same locations. The recently developed technique of isotope analysis also offers a powerful method of monitoring change. Most elements can occur as several different isotopes depending on the number of neutrons in the nucleus. Different isotopes may be found in different proportions depending on the source of the molecule. For example, the ratio of carbon isotopes in leaf tissue is related to drought stress, so past climates can be inferred from leaf tissue collected in past centuries. Destructive sampling is also required to accurately measure the size of stomates, which relates to the concentration of CO₂ in the atmosphere.

Our herbarium has had few requests for destructive sampling to date, but the prospect is on the horizon. In response, the Board of Directors of the Friends of the Herbarium discussed and approved a new policy drafted by Dave Dyer on destructive sampling of herbarium specimens. In a nutshell, the policy requires that the researcher request permission, remove only a small amount of material, and document the removal and results with an annotation label. Only specimens with adequate material and never type specimens may be sampled. Individual sheets may not be sampled more than once. The policy assures that our herbarium can accommodate legitimate research without endangering the collections.

Peter Lesica

...Wally (Continued from page 3)

Later he would move to a home in the foothills west of Stevensville and after that to a place on Harvey Lane near Corvallis.

During all this time he continued seriously identifying and collecting plants, bringing some plant specimens not previously known to Montana to Peter Stickney at the U.S. Forest Sciences Lab. He recently donated his private collection of over 100 specimens to the UM Herbarium. Wally had a number of favorite plants, many of which were firsts for the state of Montana. These include:

- | | |
|---------------------------|------------------------------------|
| Azolla mexicana | Mimulus suksdorfii |
| Brasenia schreberi | Monotropa uniflora |
| Carex pallescens | Muhlenbergia minutissima |
| Centaurea solstitialis | Najas guadalupensis |
| Centunculus minimus | Navarretia intertexta |
| Crepis setosa | Oenothera pallida var. lateriflora |
| Cyperus rivularis | Parietaria pensylvanica |
| Dipsacus sylvestrus | Penstemon lemhiensis |
| Drosera anglica | Pimpinella saxifraga |
| Elatine brachysperma | Rotala ramosior |
| Elatine californica | Salicornia rubra |
| Elatine triandra | Schedonnardus paniculatus |
| Floerkea proserpinacoides | Scirpus maritimus |
| Glossopetalum nevadense | Scirpus pendulus |
| Hypochaeris radicata | Sparganium minimum |
| Idahoia scapigera | Stellaria aquatica |
| Ivesia gordonii | Trifolium microcephalum |
| Lomatogonium rotatum | Ventanata dubia |
| Medicago falcato | Wolffia columbiana |
| Microseris troximoides | |

Sheila Morrison



Lauren Stoffel

Meet MONTU ' s Student Employees

Please help us welcome the newest student workers to the herbarium, Lauren Stoffel and Carson Baughman. Both have started this spring semester and are off and running with their herbarium duties. Lauren is our student employee in the work-study program while Carson is working in the herbarium as an intern for the semester.

Lauren is a senior at U.M. majoring in biology with an ecology emphasis. Her journey to U.M. has taken her from coast to coast, and to some great heights! She grew up in San Luis Obispo, California, and after high school moved sight-unseen to Boston for a change of pace. Later, after returning to California, she became acquainted with some plant ecologists in the California State Park system. This sparked her interest in ecology and botany, and led her to move to Montana to pursue her degree at the University of Montana.

Once at U.M. she was accepted into the MILES Program, which provides undergraduates the opportunity to participate in cutting-edge research in biological sciences. She has been working in this program in Dr. Anna Sala's lab for almost a year. Her project is analyzing resource allocation in whitebark pine. Sounds tame enough, right? But her research requires the collection of female cones which are found at the TOP of the trees! So one of her first tasks was to take a 3-day training class with smokejumpers to learn how to safely climb trees. After the course she could be spotted nimbly roaming high atop whitebark pine trees in Montana.

Lauren plans to pursue a graduate degree in the future, possibly in plant physiology. But first she will take a break and travel to Vietnam, and possibly Madagascar!

Carson is a senior and is also studying biology with an ecology emphasis. He wanted herbarium experience to compliment his extensive field experience, so we arranged an internship in the herbarium. Carson hails from Ely, Nevada, and comes to us with great experience working with plants. He worked for two years with the Bureau of Land Management in Nevada doing backcountry vegetation monitoring and creating GIS maps. His team monitored the effects of rehabilitation efforts on BLM-managed wildland fires. He then worked for two years in Nevada for The Nature Conservancy surveying for rare and endemic plant species.

Carson is active in the outdoors and enjoys backpacking, hiking, hunting, fishing, backcountry skiing, and astronomy. He also plans to attend graduate school, and hopefully the lure of abundant outdoor activities in Montana will keep him at U.M.!

Say "Hi" to our great students when you see them in the herbarium!

Dave Dyer

Montana Flora Online Project

The Montana Flora On-line Project is now in its third year, and data from over 36,000 Montana specimens (an estimated 60%) have been entered. Just as exciting is the website that is now on-line. The database can be queried by species, collector, county, and habitat, and most of the label data are available by clicking on a particular specimen. The website produces Google-Earth dot maps that show the approximate location of all the collections, and there are photographs for some of the species. Now we need some help troubleshooting. Please take a few minutes to go on-line to www.umt.edu/herbarium/ and try it out for yourself. By the time you read this all of the dicot specimens except the Aster Family should be available. Try making a species list for your county. If you know someone who has made collections, find out which plants they've collected in your county. If you're interested in a certain species, discover the range of habitats it occurs in across the state. Then give us some feedback. What do you like? What could be better? What didn't work? Send an e-mail to Zia at zia.maumenee@gmail.com. The website can continue to evolve for another year, but when the money runs out, improvements will be harder to make.

The principal work horses of the Flora project are the data enterers. It may sound like no-brainer kind of work, but it's not. The data people must be able to interpret archaic handwriting as well as make informed decisions on locality information. For example, what do you do if the label says "Rock Creek," but no county is given? There must be at least 50 rock creeks in Montana. For the past two years the lion's share of data has been entered by three students in Wildlife Biology, and they're all graduating this spring. Brynn Griffin hails from Billings, Todd Caltrider comes from White Sulphur Springs, and Jonathan Lewis grew up in the Seattle area. Although Brynn worked in the herbarium last summer, this summer all three have jobs in natural resource management. They all agree that the job has its good and bad aspects. They like learning the families, the diversity of places in Montana and the diversity of plants (after all, plants make animal habitat). They don't like the tedium of sitting in front of a computer for 10-20 hours a week or the frustration of trying to interpret bad handwriting. I wonder if there will be a lasting effect from being exposed to all the Linnaean binomials at such a tender age.

Ten first records for Montana made an appearance in the collections this past year. Several are exotics, including *Origanum vulgare* (oregano), *Lonicera morrowii*, and *Centaurea virgata*. The latter is not a new knapweed to the state. It was collected south of Helena more than 60 years ago and has only recently been reported again. Among the natives is *Plagiobothrys stipitatus*, collected in the Flathead 60 years ago and hiding in the collections as a *Cryptantha*. Two new species of monkeyflower turned up: *Mimulus ampliatus* and *M. hymenophyllus*. Both were masquerading as *M. floribundus*. *Mimulus hymenophyllus* was previously known from just a few side canyons of the Snake River in eastern Washington. Other records are *Phlox austromontana*, *Penstemon humilis*, and *Ambrosia tomentosa*.

Peter Lesica

Brynn Griffin



Jonathan Lewis



Todd Caltrider



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

- | | | |
|--------------------------|----------------------------|----------------|
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Dues are for a period of **two** years. All contributions to the Friends are tax deductible to the full extent provided by law. All checks should be made payable to UM Foundation/Friends of the UM Herbarium.

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