



FRIENDS

OF THE UNIVERSITY
OF MONTANA

HERBARIUM

Spring 2013

Montana's Special Status Plants: Thirty Years of Tracking Rare and Threatened Plants in the Treasure State

By Scott Mincemoyer, Montana Natural Heritage Program

In 1980, the Montana Rare Plant Project, based at the University of Montana, was formed with the intent of developing the first, comprehensive listing of rare and threatened plants for the state (Lesica et al. 1984). Previous efforts, focused on developing a list of rare plants had a regional or national scope, including one for the Northern Region of the U.S. Forest Service (Inman, Hendzel, and Schmautz 1971) and several iterations of lists of plants under consideration for listing as threatened or endangered after passage of the Federal Endangered Species Act (ESA) in 1973. The Montana Rare Plant Project assembled information on the state's plant species from several herbaria, including the University of Montana, Montana State University, and University of Washington, published and unpublished literature, and the knowledge of numerous individuals. This work resulted in the compilation of a couple preliminary lists of rare plants and culminated with the publication of "Vascular Plants of Limited Distribution in Montana" in 1984 (Lesica et al. 1984), a publication which is often referred to as the "Blue Book" in reference to the blue cover of the publication. Plants listed in the Blue Book were categorized under one of the following status values: threatened, endangered, extinct, rare, undetermined, and rejected. They were also distinguished by form of rarity: disjunct, peripheral, sparse, regional endemic, state endemic. Out of over 1,000 taxa reviewed, 254 vascular plants were listed as rare, threatened or endangered; one species was thought to be extinct, and the status of 141 taxa were left as undetermined.

Soon after publication of the Blue Book, the Montana Natural Heritage Program (MTNHP) was created by the Montana Legislature as part of the Montana State Library's Natural Resource Information System. MTNHP assumed the responsibility for developing lists of rare and threatened plants and animals in the state and in 1991, MTNHP published "Sensitive, Threatened and Endangered Vascular Plants of Montana" (Lesica and Shelly). This comprehensive publication on the status of Mon-

tana's plants built upon the previous work and helped to clarify the conservation status of many other plants based upon additional information accumulated from field surveys and herbaria specimens over the previous seven years.

As early as 1987, MTNHP applied the term "Species of Conservation Concern" to species that previously were categorized in one of the various status categories (e.g. threatened, endangered, rare) used in the preceding publications. This was later abbreviated to Species of Concern (SOC), terminology that is still used today for those species that meet specific criteria of rarity and/or threats to their viability (MTNHP 2013). A second category called



Silene spaldingii, a threatened plant in MT (Continued on page 4)

Notes from the Board

This note is a follow up to the Notes from the Board written by Andrea Pipp for the Spring 2012 newsletter. The two main herbaria in Montana, The University of Montana herbarium (MONTU) and the Montana State University herbarium (MONT), house bryophyte and lichen collections for which specimen information is now being digitized as part of a national herbarium project. During July 2011, the U.S. National Science Foundation awarded support to a collaboration of herbaria for a project involving the data basing of about 2.3 million North American lichen and bryophyte specimens. The project is expected to be completed no later than 2015, and involves a web portal that offers access to over 85% of the North American (Canada, Mexico, U.S.A.) bryophyte and lichen records held by U.S. herbaria. The project is headed up by Dr. Thomas Nash and the data basing of Montana specimens is occurring at the Wisconsin State Herbarium (University of Wisconsin Madison).

The Consortium of North American Bryophyte Herbaria (CNABH; bryophyteportal.org/portal/) and The Consortium of North American Lichen Herbaria (CNALH; lichenportal.org/portal/) were created to serve as a gateway to distribute data resources to interested members of the taxonomic and environmental research community in North America. Through a common web interface, these sites offer tools to locate, access, and work with a variety of data, including keying out species and searching image data bases.

So far, all approximately 2,000 bryophyte and half of the approximately 8,000 lichens specimens housed at MONT have been data based. This project involves the shipment of about 1,000 specimens at a time from Montana to Wisconsin. After specimen information is entered into the national data base, specimens are returned and a new round of specimens is then shipped from Montana back to Wisconsin. All of this is progressing smoothly and with minimal specimen damage.

With Montana vascular plant information derived from specimens at MONT and MONTU now available on the Consortium for Pacific Northwest Herbaria Online Portal (www.pnwherbaria.org), the impending completion of the bryophyte and lichen portals will ensure that plant and lichen biodiversity information from Montana is widely accessible to all interested parties. Some concern has been expressed that these national portals will reduce the utility of herbaria or perhaps replace them. My suspicion is that they will only serve to advertise the specimen holdings of each and every herbarium. A few loan requests from MONT since completion of the vascular plant image data base now ask for specific specimens in addition to the general holdings of particular species or genera. This suggests to me that these national biodiversity web portals will likely result in increased use of herbaria, especially in somewhat remote places like Montana.

Matt Lavin

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MONTU NEWS BRIEFS

New Acquisitions

Peter Lesica: 143 specimens from Montana.

Neil Snow: 28 specimens from Montana.

Montana Natural Heritage Program: 98 vouchers from E.P.A. sponsored program "National Wetland Condition Assessment".

Cheryl Beyer: 3 specimens from Montana.

Peter Stickney: 1 *Cirsium* with taproot growth and 1 *Taraxacum* with root regrowth.

Andrea Pipp: 7 lichens from Montana.

University of Waterloo, Ontario: 15 specimens from J. Semple Collection.

Yelena Kosovich-Anderson: 30 bryophytes from MT and WY.

Roger Rosentreter: 19 lichens from western Canada and AK.

Celestine Duncan: 3 specimens of *Myriophyllum* from Montana.

Exchange Acquisitions

University of Washington: 106 specimens from MT, WA, OR.

Loans for Research

University of Washington, Peter Zika: 8 sheets of *Luzula*.

Kansas State University, Carolyn Ferguson: 145 sheets of *Phlox*.

Examples of Information Requests

Colorado State University: Records of *Ulmus* at MONTU.

San Diego State University, graduate student: localities for *Fritillaria* at MONTU.

University of Alberta: data for liverwort specimens from MT.

Publications

Lesica, P. 2012. Manual of Montana Vascular Plants. Botanical Research Institute of Texas, Fort Worth.

Lesica, P. 2012. New combinations for the Montana flora. Journal of the Botanical Research Institute of Texas 6: 25-27.

Odegard, C. 2012. Noteworthy collections, Montana. Madrono 59: 166.

Zika, P.F. 2012. *Juncus trilocularis* (Juncaceae), a new rush species from western North America. Rhodora, 114:309-329.

Visitors to the University of Montana Herbarium in 2012

General Public and Private Consultants

Ben Crawford, John Csoka, Stephen Cooper (Westech Consulting), Andrea Pipp (Atkins Consulting)

UM Researchers and Students

Donna McCrea (UM archives), Scott Mincemoyer (MT Natural Heritage Program), Neil Snow (MT Natural Heritage Program), Stephanie Lubrecht, Annalisa Ingegno, Nicole Hupp, Clea Klagstad (MT Natural Heritage Program), Mandy Slate

Federal, State, Tribal, NGO Biologists

Susan Rinehart (USFS), Jess Brewer (USFS), Michelle Disney (USFS), Sheena Dorak (USFS), David Kemp (USFS)

Other Academic Researchers

Martha Apple, Montana Tech

Activities

The Clark Fork Chapter of the Montana Native Plant Society held three meetings in the herbarium during the winter of 2012. In January Peter Lesica gave an overview of Montana ferns. Scott Mincemoyer came over from Helena and provided a primer on Montana's clovers in February. In March MNPS members had a work night, helping to make new folders where they were needed.

The University of Montana Wilderness and Civilization Class visited the herbarium in mid-September.

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.

Jennifer Hintz, Whitefish

Clea Klagstad, Columbus, Ohio

Lisa Larsen, Helena

LEAW Family Foundation, Missoula

Karen Peterson, Missoula

Time to Vote!

It's time to elect your Board of Directors for the Friends of the UM Herbarium. A ballot is enclosed with this newsletter. Please take a moment to vote for your choices and send us your ballot.

2013 FRIENDS OF THE HERBARIUM ANNUAL MEETING

The Annual Meeting of the Friends of the UM Herbarium will be held Saturday, November 2 from 10 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.

...Special Status (Continued from page 1)

Potential Species of Concern (PSOC) is also used for those taxa that either do not meet the rarity or threat guidelines for SOC designation or for which available data may be slightly ambiguous in regards to the species' conservation status, but for which there is still some concern about the species' viability in the state. The number of plant taxa categorized as Species of Concern has fluctuated over the years, as is to be expected, with some taxa dropping off the list as more information about their distribution and abundance becomes available and other taxa being added, typically as they are discovered within the state, are described as new species, or as new information about threats or trends is obtained. For over a decade, the number of taxa included on the SOC list has fluctuated between 320-350 species and as this article is written the exact number is 329 with an additional 59 taxa categorized as Potential Species of Concern (MTNHP 2013). Included within this tally are three species listed as threatened under the U.S. Endangered Species Act (*Howellia aquatilis*, *Silene spaldingii*, and *Spiranthes diluvialis*) and one recently designated as a Candidate for listing under the ESA (*Pinus albicaulis*).

Given that thirty years has passed since publication of the Blue Book and much more is known today about the distribution and abundance of the state's plants, it seems like a good time to review what progress and change has occurred during this timeframe. Let's specifically look at the statuses of those plants originally listed or considered for listing in the Blue Book, what their corresponding statuses are today, how many species are now listed by MTNHP as SOC that were not listed in the Blue Book, and what some of the reasons are for those differences. This relatively short article won't be able to provide a detailed answer to every question for every species, but we can look at some summaries and examples that help explain what has happened and why those changes occurred.

One of the first things someone will notice when comparing the Blue Book list to the current SOC list is that many plant names used thirty years ago do not correspond to those used today. In fact, 20% of the 254 species listed in the Blue Book as having Rare, Threatened, or Endangered status have a different name in use today due to various nomenclatural and taxonomic changes (Lesica 2012). After sorting through the confusion surrounding plant names, we can move on to comparing and contrasting the two lists. Table 1 provides an overview of status changes and we'll examine a few of the changes in more detail. *Trisetum orthochaetum*, the sole species listed as extinct in the Blue Book, is documented from recent collections in Missoula and Glacier Counties but it is not given any formal conservation status as it is thought to be a hybrid between *T. canescens* and *T. wolfii* (Lesica 2012). Of the remaining 254 taxa given status in the Blue Book, 169 (67%) are still listed as a SOC or PSOC by MTNHP including the four originally listed as endangered and 17 of the 24 listed as threatened. For the taxa that were listed as threatened but since dropped from any status: four are now considered not rare enough and/or not significantly at risk

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Table 1. Breakdown of plant species in the Blue Book by category and number of taxa with the current status of those same taxa under the U.S. Endangered Species Act (ESA) or as listed by the Montana Natural Heritage Program.

Blue Book Status	Total	Current Montana Status				
		ESA - Threatened	SOC	PSOC	Review/Undetermined [^]	No Status
Endangered	4	1 (<i>Howellia aquatilis</i>)	3	-	-	-
Threatened	24	1 (<i>Silene spaldingii</i>)	14	2	1	6
Extinct	1	-	-	-	1	-
Disjunct	25	-	15	4	3	3
Peripheral	118	-	57	15	18	28
Sparse	48	-	26	2	13	7
State Endemic*	16	-	10	4	1	1
Regional Endemic	35	-	26	4	3	2
Undetermined	141	-	40	11	37	53
Rejected	626	-	17	6	123	480

*Includes taxa which are also placed in other status categories.

[^]Review/Undetermined Status includes those plants that are in need of review to determine their rank under the Natural Heritage System (S1-S5) or whose status is uncertain due to either a lack of information or conflicting information about the species status and does not necessarily reflect that the species are rare or likely to be added to SOC status in the future.

...*Special Status* (Continued from page 4)

in the state (*Allium fibrillum*, *Astragalus plattensis*, *Claytonia lanceolata* var. *flava* [syn: *C. rosea*], and *Halenia deflexa*); one is not being recognized as a distinct taxonomic entity (*Tiarella trifoliata* var. *trifoliata*) and the other has not been conclusively documented in Montana (*Euphorbia geyeri*). For the most part, those taxa that are no longer given any conservation status were removed as new surveys, information, and collections showed they were more abundant than previously determined. Species that fall into this category include *Botrychium minganense*, *Carex livida*, *Carex paupercula*, *Eriophorum viridicarinatum*, and *Sphaeromeria capitata*. Others were removed as they were lumped or considered to be conspecific with more common taxa (*Cirsium subniveum* with *C. canovirens*, *Stellaria simcoei* with *S. calycantha*, *Taraxacum eriophorum* with *T. ceratophorum*, and *Triglochin concinnum* with *T. maritima*) and a few were removed as it was determined reports were based on mis-identifications (*Penstemon attenuatus* var. *militaris*) or they were not conclusively known from the state (*Euphorbia geyeri*). Many additional taxa given rare status in the Blue Book require additional review to determine their current status. Examples of species that are listed as requiring additional review of their conservation status include *Cirsium brevistylum*, *Erigeron flagellaris*, *Lycopodium alpinum*, and *Pinguicula vulgaris*. The former two species, though rare, likely benefit from disturbance and thus may not be at risk, while the latter two are rare, limited in distribution, and require specific, undisturbed habitat thus potentially placing them at greater conservation risk. However, additional review and input is needed before a status assignment, or lack thereof, can be made.

The other side of the story concerns those species now recognized as SOC that either were not considered, were of undetermined status, or were rejected for status in the Blue Book. Twenty-three taxa that were rejected for listing in 1984 are now given status as either a SOC or PSOC, including three species of *Botrychium*, *Brickellia oblongifolia*, *Eleocharis rostellata*, and *Primula incana*. These species were typically rejected because they were considered too widespread (occurrences in three or more counties) or occurred in a habitat that was not considered to be restricted, but have been listed as SOC since then due to small population levels and/or threats to their habitat. Of the 141 taxa with undetermined status in 1984, 51 of these are currently on the SOC/PSOC list. The species in this group are taxonomically diverse and occur in habitats ranging from valley grasslands to the alpine but have since been determined to be sufficiently rare in the state to warrant special status.

127 species not considered or referenced in the Blue Book are now SOC, including one species listed as Threatened under the ESA (*Spiranthes diluvialis*) and one species (*Pinus albicaulis*) that is a Candidate for federal listing due to severe declines and continued threats to its viability. Most of the species added to the SOC list since 1984 are either new discoveries for the state or species newly described to science. For instance, *Spiranthes diluvialis* was described as a new species in 1984 (Sheviak) but wasn't documented in

Montana until ten years later. At least 17 taxa on the current SOC list have been formally published as new species or varieties since the Blue Book was published. Eight of these are in the genus *Botrychium* and six belong to *Physaria*; the remaining taxa include *Douglasia conservatorum*, *Eriogonum soliceps*, and the previously mentioned *Spiranthes diluvialis*. Several other taxa have been described as new species with limited distributions during this timeframe but not recognized as valid taxa by Lesica (2012) or given any formal status by MTNHP (eg: *Physaria eriocarpa*, *Senecio sribillei*).

State endemics are the remaining category of special status plants to consider. The Blue Book listed 16 species as being endemic to Montana. However, at least one of these species (*Aquilegia jonesii*) was known to extend into Alberta and Wyoming and it is likely that a few others were also known not to be strictly endemic to Montana. Of the remaining taxa, *Cardamine rupicola*, *Cirsium longistylum*, *Draba daviesiae*, *Saxifraga tempestiva*, *Phlox kelseyi* var. *missouliensis*, and *Synthyris canbyi* are still believed to be endemic to Montana. *Botrychium montanum* and *B. paradoxum* are currently both known to occur in several states and provinces, *Cymopterus* sp. nov. (*C. hendersonii*) extends into Idaho, *Erigeron lackschewitzii* is known from southern Alberta, *Eriogonum pauciflorum* var. *canum* (*E. brevicaulis* var. *canum*) is known from adjacent Wyoming, *Ligusticum verticillatum* is primarily distributed in north Idaho and adjacent British Columbia, *Oxytropis lagopus* var. *conjugans* is also known from Alberta, *Papaver pygmaeum* occurs in southern Alberta, and *Penstemon flavescens* occurs in central Idaho. Taxa newly described since that time and are believed to be endemic include: *Astragalus lackschewitzii*, *Boechera fecunda*, *Delphinium bicolor* ssp. *calcicola*, *Douglasia conservatorum*, *Physaria humilis*, *Physaria klausii*, *Physaria lesicii*, *Physaria pachyphylla*, *Physaria pulchella*, and *Physaria saximontana* var. *dentata*. Technically, the single, known occurrence of *D. conservatorum* is situated atop a ridgeline right at the Montana/Idaho border and the distributions of several of the other plants extend close to the state border and it seems likely that additional survey work will show they are not strictly endemic to Montana either. However, strictly endemic to Montana or not, their distribution is almost entirely within Montana, which means land management within the state that is favorable to their long-term viability will be critical.

Although a lot of progress has been made in our knowledge and understanding of plant distribution and abundance during these past thirty years, much remains to be done. Collection and accession of specimens from under-botanized areas into one of our state or regional herbaria, such as MONTU, will continue to be critically important during the status review process. Targeted surveys for rare plant species, monitoring programs, and identifying potential threats to plant species will also be needed to help qualify and quantify the status of Montana's plants over the next thirty years. If the botanical community across the state continues to collect specimens, report rare plant observations, and provide

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MONTU People

...David Ramsden

Many students obtained undergraduate degrees in Botany between 1960 and 1990, but only a few went on to make significant contributions to the UM Herbarium (MONTU). David Ramsden was one of those few. David was raised in Plano, Illinois on the far southwest outskirts of Chicago. He enrolled in the University of Montana in 1974 and majored in Botany. He began his collecting in the summer of 1977, perhaps in preparation for taking a course in plant taxonomy. In that year his collections are from the Missoula area but also the Salish Mountains northwest of Whitefish and the Lower Clark Fork area along the Bull River, near St. Regis and Fish Creek. He made the fourth collection of *Carex magellanica* (= *C. paupercula*) at Sheep Mountain Bog in September, presumably on a weekend trip.

David graduated UM in June of 1978. Ramsden's family in Illinois was in the construction business. After graduation David worked as a carpenter in Missoula but continued to collect plants in western Montana for the herbarium. In July of 1978, he spent his time in the Swan Valley, the Mission Range, and in Gold Creek, a tributary of the Blackfoot River. In August he went back to the Lower Clark Fork area and made Montana's only collection of *Carex amplifolia* along a small tributary of the Vermillion River. This

population has not been relocated in the 35 years since. Two weeks later he made the first collection of *Juncus covillei* var. *covillei* along the St. Regis River just west of its confluence with the Clark Fork. This is the only collection of this sensitive species from Mineral County and one of only three collections from the state. This plant has not been collected in Montana for over 30 years. In September and October David collected mainly around Missoula

and in the Sapphire Range south of town, and in October he went to the Bitterroot on his first collecting trip with Klaus Lackschewitz, western Montana's premier botanist.

The following year Klaus Lackschewitz was contracted by the U.S. Fish and Wildlife Service to develop a vascular plant species list for the Charles M. Russell National Wildlife Refuge (CMR) in north-central Montana. David Ramsden accompanied him on his field work in May and June. They collected many hundreds of specimens with duplicates going to the newly-formed CMR herbarium. On the way

home in June they collected in the Highwood and Little Belt Mountains and made the second collection of *Physaria klausii* (= *Lesquerella klausii*), a Montana endemic that was undescribed at that time.

In August of 1980, Ramsden was hired by Richard Producers, a biological consultant, who was preparing a baseline study for a proposed lignite mine in McCone County, about 20 miles northwest of Circle. David was charged with searching for *Rorippa calycina*, at that time a candidate for listing under the Federal Endangered Species Act. He visited numerous stock ponds and ephemeral pools without success; however, he did collect dozens of plant specimens from this little-visited region. When he returned from eastern Montana he collected in the Mission and Elkhorn mountains. It appears David moved to Helena that fall because he made collections in the area in December and May. Otherwise there are few other Ramsden collections from 1981.

David joined up with Klaus Lackschewitz again in July of 1982. Together they explored the Front Range of the Rocky Mountains west of Augusta and Choteau. They collected the local endemics, *Astragalus lackschewitzii* and *Erigeron lackschewitzii* on Mount Wright, as well as the rare alpine species *Oxytropis podocarpa*, *Physaria saximontana*, and *Saussurea nuda*. They made collections in and around Pine Butte and on the way home collected what would become the holotype of the yet-to-be-described *Physaria klausii* on Rogers Pass. He returned to Mount Wright the following year with Klaus and also collected in the Beartooth and Big

Belt mountains in September.

More than five years after graduating from the University of Montana, David Ramsden told his friends that there was no future in being a botanist in Montana, and he returned to Illinois to work with his father in the construction business. He returned to Montana in 1987 and collected plants in southeast Montana where he found the rare *Carex torreyi* near Otter Creek. He collected in the Beartooth Range with Gerry Moore that July and near Helena and the Swan Valley soon after. He returned again

in late August of 1993 to explore and collect plants with Klaus Lackschewitz in the Anaconda-Pintlar Range. These were the last collections that David contributed to MONTU.

In all, Ramsden collected over 1,600 specimens for the UM Herbarium. The genus *Carex* was clearly one emphasis for him; he collected specimens of approximately 80 of Montana's 120 species. He and his wife, Robin, moved from Illinois to southern Minnesota. It is not known if he still collects plants.



David in the Bitterroot Range in 1982

Peter Lesica

MONTU Work-Study Students

Often an exposure to a certain subject in one's youth will provide direction for a lifetime of interest. This is true for Grace Johnson, our senior work-study student in the herbarium. She always had an innate interest in natural history; however a 6th grade project in botany piqued her interest and led her on a route that landed her in the U. M. Herbarium. Grace is a senior at U.M. and is majoring in Broadfield Science and Secondary Education. Grace has a gift for working well with people, especially



Grace Johnson at work in the MONTU Herbarium.

children, so she plans to share her enthusiasm about nature by teaching middle school biology.

Grace started out with a strong interest in veterinary medicine. She earned an Associate's Degree in Veterinary Technology in 2006. She then got a great internship at the Montana Veterinary Diagnostic Laboratories in Bozeman. She was able to assist in all types of diagnostic techniques including histopathology, hematology, endocrinology, and necropsy. So how do you go from animal necropsy to the herbarium!? Well, Grace continued her experiences with natural history, from observing the lush plant life in Costa Rica (not to mention finding an iguana under her bed in the local Bed & Breakfast!), to whale-watching in the Pacific Ocean, to a tour of Europe. She then came to U.M. to continue her education and worked in research labs in the Division of Biological Sciences. We are lucky that she has come to work in our herbarium. Who knows, maybe her contagious enthusiasm will inspire the next well-known Montana botanist!

The herbarium is basically a museum: a museum of preserved plant specimens. We don't often find undergraduate students who have a background in any type of museum work, so we were pleasantly surprised when Ashley Hanna applied to the herbarium last fall. Ashley is a U.M. student and is also the Director of the Jefferson County Museum in Clancy, Montana. She attends classes, works in the herbarium, and also spends many long weekends back home operating the museum. Ashley does everything at her museum, including collections management, exhibits, public relations, special events, and outreach programs. This keeps her pretty busy, but we're leaning on her to create one or more new exhibits for our cases in the library! Ashley has a strong interest in botany, gardening, herbology, spinning with plant and animal fibers, and other "lost arts". Her diverse skills and interests are a real plus to the herbarium!

As always, please stop and say "Hi" to our awesome herbarium students!

Dave Dyer

Special Status (Continued from page 5)

input into the status review process, hopefully we can make as much progress in the next three decades as we did over the previous three.

Literature Cited:

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