Volume 34 No. 1 | **Fall 2020**

Kelseya

Newsletter of the Montana Native Plant Society

Kelseya uniflora
ill. by Bonnie Heidel

COVID-19 Summer
A Trip to Cliff Lake

By Paul Buck, Clark Fork Chapter

Photo by Paul Buck

Above: Masked Clark Fork Chapter members, from left: Paul Buck, Anne Garde, Janet Simms, Julie Duggan, Michael Krebs, Mari Laxi von Hoffman, and Peter Lesica (kneeling).

AUGUST 8 DAWNED A BEAUTIFUL, CLEAR SUMMER DAY IN MISSOULA, and it only got better from there. In the midst of the Covid-19 pandemic, seven Clark Fork Chapter members enjoyed a field trip to the Montana-Idaho border. Carpooling with masks on and windows lowered provided a safe, albeit noisy, trip to the trailhead. But the 90 minute drive and mile and a half hike were well worth it.

Trip leader Peter Lesica chose the most idyllic location of Cliff Lake for our outing. Located at about 6,500 feet, the lake is surrounded by sub-alpine forest, vertical cliffs, and avalanche-created meadows. The basin held a tremendous display of wildflowers. At a minimum, 40 species were in flower and we identified plants from 26 families.

Plants of note were the American saw-wort *(Saussurea americana)*, which Peter said he has only seen in Montana in this mountain range, and false hellebore (*Veratrum viride)* and western coneflower *(Rudbeckia occidentalis)* standing sentinel over the surrounding forbs, the latter with their strange-looking rayless flower heads.

The most prolific area of flowering plants was a very moist avalanche chute bordered by a melting snowfield. Several shooting stars *(Dodecatheon pulchellum)* with white petals were found. We had a discussion about the origin of the white petals and made the decision to come

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back to the area next year to see if they returned. The red stemmed saxifrage *(Micranthes lyallii)* presented a beautiful contrast of white flowers and red stems against surrounding lush green mosses, leaves and trickling clear water.

Many thanks to Peter for his most informative and rejuvenating botanical adventure. Amid the uncertainties of present-day global disorder, the comfort of knowing, appreciating, and immersing oneself in the natural environment gave us joy and peace.

Left: A view of Cliff Lake, sparkling in the summer sunshine.

Photo by Paul Buck

Chapter Events

Calypso Chapter
Info: Catherine Cain at 498-6198, nativeplants@montana.com.

Clark Fork Chapter
Info: Anne Garde at 721-7627, anniegarde@yahoo.com

Eastern At-Large
Info: Jennifer Lyman at 860-0223, jenclyman@gmail.com.

Flathead Chapter
Info: Tara Carolin at 260-7533, mnps.flathead@gmail.com.

While most field trips were cancelled this year, we sponsored at least one socially distanced field trip that went well. We also would like to extend a huge thank you to Teagan Hayes for coordinating the Glacier Wildflower Trivia Challenge on Facebook over the summer. The Trivia challenge provided fun education and offered promo codes for the newly released Glacier Wildflower app.

We have not yet formally scheduled any events for the winter, but we anticipate using Zoom to host a few virtual presentations. Watch for our electronic newsletters for details on upcoming events. Send us an email if you would like to be added to our mailing list, and make sure that mnps.flathead@gmail.com is on your safe senders list so you don't miss our e-newsletters and updates.

Kelsey Chapter
Info: Bob Person at 443-4678, thepersons@mcn.net.

Maka Flora Chapter
Info: Bob Srygley at 488-6086, robert.srygley@usda.gov.

Valley of Flowers Chapter
Info: Beth Madden, 224-1012, bethmadden64@gmail.com.

Local fall and winter events are uncertain at this point. Any plans will be emailed to members and posted on our chapter Facebook page: https://www.facebook.com/MNPSValleyofFlowers/ so keep a lookout.

Western At-Large
Info: Kris Boyd at 295-9414, boyd.kristina@yahoo.com.

Plant Fans!

Given the uncertainties and constraints of coronavirus on gatherings this fall, please make sure to stay in touch with your Chapter and the MNPS through the website, Facebook, or email to stay abreast of late-breaking news and activities.

2021 Annual Membership Meeting planners scout a possible location in the Yaak.

Photo by Tara Carolin

Looking Forward

Summer 2021 MNPS Annual Meeting

Flathead Chapter and Western At-Large members are excited to host next year's meeting in the beautiful Yaak region of northwest Montana, most likely the weekend of June 25-27. The venue will be rustic camping with no frills, but other lodging options are in the area. There are numerous opportunities for interesting field trips near the venue. Further details will be shared in the Spring edition of Kelseya. As with everything else during the coronavirus pandemic, all plans are tentative and subject to whatever safety guidelines may be in place next June.

2020 Raffle-By-Mail Prizewinners

By Beth Madden, VoF Chapter

It was very disappointing that the 2020 MNPS Annual Membership Meeting, which had been slated for July 3-5 in the Centennial Valley, had to be cancelled. We were, however, still able to hold a very successful Raffle-by-Mail fundraiser, thanks to many generous donations from local businesses and members. A big shout out to Xanterra Travel, Doug Smith, Oboz Footwear (a Bozeman-based company), Duckworth (a Dillon-based company), Tizer Botanic Garden and Arboretum in Jefferson City, and REI Co-op. Thanks to them, the entire $3,440 in raffle proceeds go to benefit our Society.

We sold 200 tickets for the raffle and drew the names of winners at our summer MNPS board meeting, held via Zoom on June 30. The lucky folks were:

Xanterra Frosty Fun YNP winter package: Matt Lavin

Doug Smith's Willow Basket of goodies: Tad Weaver

Photo by Beth Madden

Oboz hiking shoes and Duckworth wool jacket: Beth MacFawn

Oboz hiking shoes and Duckworth wool tee shirt: Cathie Jean

Tizer Botanic Garden cabin stay: Anna Jacobs

In case you were wondering, prizewinners bought at least six tickets each! Congratulations to them, and thanks to everyone who supported this fundraiser.

WELCOME ABOARD!

The Montana Native Plant Society welcomes the following new members:

Calypso Chapter
Dorothy DeHart, Kimberly Giannone

Clark Fork Chapter
Sue Furey, Lila Fishman, Molly Galusha, Michael Painter, Sarah Siebach Dennis Sullivan

Eastern At-Large
Brian & Teresa Henderson, Susan Kimmet, Thomas Rogoff, and Douglas Reynolds renewing as a lifetime member

Flathead Chapter
Lavonne Blunt, Pam Dietz, Barb Etchieson, Deborah Eunpu, Ann Halter, Nancy Kaumeyer, Melissa Kelly, Lynda Saul

Kelsey Chapter
Sunny Hill

Valley of Flowers Chapter
Talitha Bennett, Milla Cummins, Meghan Durney, and Sally Owen-Still & Tom Still joining as lifetime members

MNPS News

SMALL GRANTS PROGRAM

Something New in 2021

By Betty Kuropat, Flathead Chapter

Each of the last 25 years MNPS has awarded one or more Small Grants for projects or studies that help foster an appreciation for and conservation of Montana's native plants and plant communities through a better understanding of our native flora. That objective favors education and almost all the projects have had a strong educational component.

In 2021 we want to focus even more on education, specifically with projects geared toward children. We don't yet have full details for the Call for Proposals, but if you have ideas about education projects, now is the time to start developing them. Examples of proposal topics or themes you could focus on include plant identification and taxonomy, Native American connection to and use of local plants, plant ecology, plant communities, native plant gardening, or plant communities' connections to wildlife and pollinators. Curriculum delivery methods could include educational trunks, short video presentations, podcasts, e-books, classroom or online games, or age-specific scripts for in-person presentations.

The 2021 Small Grants proposals will be due January 31. Proposals must address specific criteria and meet formatting requirements. All proposals that meet the criteria will be considered. We prefer proposals that demonstrate initiative and cooperation with others. Proposals must be emailed by January 31, 2021. Grant recipients will be required to submit final project accomplishments by January 2022. That final project will either become property of MNPS or include MNPS as a partner.

Complete eligibility criteria, application instructions, and grant award limits will be posted by November 1, 2020 under Call for Proposals on the MNPS website at https://www.mtnativeplants.org/small-grants-program. Or contact Betty Kuropat, Small Grants Committee Chair, at blueirismt@gmail.com.

President's Platform

Thank you for taking the survey! The MNPS online summer survey, that is.

The MNPS board had two purposes in asking for your input. First, we wanted to learn about your interaction with the organization – your favorite activities, how you prefer to learn about what's going on, which aspects of our charter you especially favor, and what new things we should consider. In addition, we wanted to identify folks who have not been super-active in MNPS so far but who are willing to step forward and do more. Our all-volunteer society relies on member energy for everything from plant expertise to book-keeping, event organizing, and IT support. In anticipation of an active 2021, new volunteer energy will be crucial.

As I write, the survey has just closed and the board is beginning to digest your responses. I cannot share many specific findings at this time, but the general trends are interesting. We heard from 378 people, of whom 80 percent are members and the others "friends" of MNPS. About two-thirds of respondents were over 50 years old.

There was a wide spread in responses to "the principal way that you relate to plants and plant communities," with a quarter being plant or land management professionals, and another quarter calling yourselves amateur naturalists/citizen scientists. Twenty percent of you are most interested in gardening with native plants, and there was good representation from folks who are principally conservationists, and a respectable number of landscapers or landscape designers.

Just about all of you said that you're interested in plant identification and the conservation of native plant communities. You expressed enthusiasm about several aspects of our organization, particularly field trips/garden tours and evening programs or workshops. A number of folks raised their hands as potential future volunteers, with a wonderful range of useful knowledge and skills they can bring to bear. And finally, you made many, many suggestions responding to the open-ended questions. These range from the highly practical – ways to stay active during our Covid-19 semi-quarantine – to the near-philosophical, such as finding the right balance among the different aspects of our mission.

This fall and winter the MNPS board will be engaged in a mini strategic-planning exercise. What will we be doing two years from now? In ten? How will we communicate? Who will be leading our various activities and what support will they need? Our deliberations on these and other vital questions will be deeply informed by the results of the online survey. Thank you so much for sharing your ideas and observations, and have a great (safe, socially-distanced) fall!

— Gretchen Rupp

We Remember Virginia Vincent

MORE THAN THIRTY YEARS AGO VIRGINIA VINCENT was one of the three people who put their noses to the grindstone and made the Montana Native Plant Society happen. She was instrumental in sending out the first two mass mailings to botany people all over the state, enticing them to join the brand new organization. After that, she produced the first three issues of the MNPS newsletter with a little help from a friend who worked for the local newspaper. Virginia would have nothing to do with a computer and typed them all out on an electric typewriter. In 1996 and 1997 she was the Clark Fork Chapter secretary, typing her notes on the same typewriter. This mother of the Montana Native Plant Society passed away on August 10 at the age of 89.

Virginia grew up in New Jersey and graduated from the University of Vermont with a degree in zoology. She moved to Montana in 1956 and is best known locally for her 39 years as a U.S. Forest Service fire lookout on Stark Mountain northwest of Missoula. Her expertise in fire spotting was highlighted in a Montana PBS Back Roads of Montana program and in the July 2001 issue of National Geographic. Virginia volunteered in the University of Montana Herbarium from 1985 through 2014. For much of that time she was in charge of the two or three work-study students that came and went every year. Virginia was a kind person ready to do whatever needed to be done. She will be missed by many.

— By Peter Lesica, Clark Fork Chapter

Photo courtesy of Peter Lesica

Virginia Vincent with one of her pals on Stark Mountain Lookout in 1989.

[Along with her family and friends, the Montana conservation and nature education community mourns the loss of Virginia Vincent this summer. Below is an essay she contributed in 1996 to the Montana Natural History Center for "Field Notes" on Montana Public Radio — Ed.]

Fire Lookout on Stark Mountain

By Virginia Vincent

Have you ever wondered what birds and flowers are doing on the high points around Missoula after that first snow whitens the peaks? I can tell you. Some summer birds are still there, some continue to migrate through, and a few hardy plants continue to bloom.

As a fire watcher, it is a thrill to man Stark Mountain Lookout through October. I recorded observations one year when temperatures and winds were moderate and there were only a few snow flurries, thus I was able to observe the goings-on during a dry autumn….

The habitat of Stark Mountain is considered lower subalpine forest. There were white bark pines and subalpine fir right to the top before they were cut for better visibility. Now beargrass is common and the rocky summit is a garden of wildflowers.

During late August and early September, small flocks of water pipits and horned larks migrated past. Most years I've recorded a Say's phoebe late in August. Northern harriers are quite prevalent in late summer as they begin migrating along high ridges.

Bluebirds and robins moved through in flocks of varying size. Mountain bluebirds nested at this elevation, as did one pair of robins, but in autumn those seen were migrants. Hairy woodpecker males contested year-long territories. Ravens engaged in aerial cavorting right to the end of October.

It pays to scrutinize each individual in a flock of birds: this particular year, the pipit flocks had a longspur with them on two occasions!

And then October 10 through 12 the rosy finches came, both forms — gray-headed and gray-crowned. They flew differently than pipits, in a loose flock of 10 to 15, and whirled and banked like sandpipers. This species nests in the alpine, such as in the Mission Mountains and Glacier National Park. At times, only a single bird appeared.

Two new records for my Stark Mountain list included four western bluebirds on September 30. And those you do have to scrutinize. They are a darker blue and have no blue on the front. On October 17, four snow buntings flew in. Winter was soon to come.

Every so often, a lone hawk or golden eagle would soar by. A single Clark's nutcracker seen since August was around, as were three gray jays. Few, if any, Cassin's finches, juncos, or kestrels were seen in October.

To me, the most surprising visitors were the thirty-some bohemian waxwings that settled into some prostrate junipers on the headwall. No mountain ash up there, but I'm sure the Townsend's solitaires had left a few juniper berries….

Oh yes! The one plant blooming on October 17, after a one-inch snowfall, was the harebell, *Campanula rotundifolia.*

The Future of Montana Grasslands

A Stable Isotope Analysis of Herbarium Specimens

By Matt Lavin, Plant Sciences and Plant Pathology, Montana State University

Two recent studies demonstrate the use of herbarium specimens in the study of ecosystem-level changes in plant productivity. Both studies accomplished this by a time series analysis of the ratios of stable (non-radioactive) isotopes for each of carbon and nitrogen sampled from herbarium specimens.

McLauchlan et al. (2010) sampled 545 herbarium specimens representing 24 species of grasses, forbs, and woody plants common to Kansas grasslands. Herbarium specimens came from the Kansas State University Herbarium (Manhattan). Dates of collection ranged 132 years, from 1876 to 2008. They analyzed herbarium specimens mainly from the Flint Hills because they best represented this period.

Brookshire et al. (2020) sampled 397 herbarium specimens representing four species that are abundant throughout Montana. The four species included big sagebrush (mountain and Wyoming big sagebrush), Idaho fescue, prairie junegrass, and bluebunch wheatgrass. Herbarium specimens came from the Montana State University Herbarium (Bozeman). Dates of collection ranged 135 years, from 1881 to 2016. The most recent dates came from resampling 68 herbarium collection sites during the summer of 2016.

Both studies accomplished their objective by sampling from herbarium specimens while maintaining archival integrity. Judicious sampling from specimens with ample leaf material involved removal of only a few milligrams of leaf tissue per specimen.

The upshot of both studies is that, even with human impact causing large-scale inputs of carbon and nitrogen into the environment, nitrogen is becoming a limited resource for North American rangeland plants. This has been the trend especially since about 1930. This finding agrees with analyses of tree ring data

…nitrogen is becoming a limited resource for North American rangeland plants.

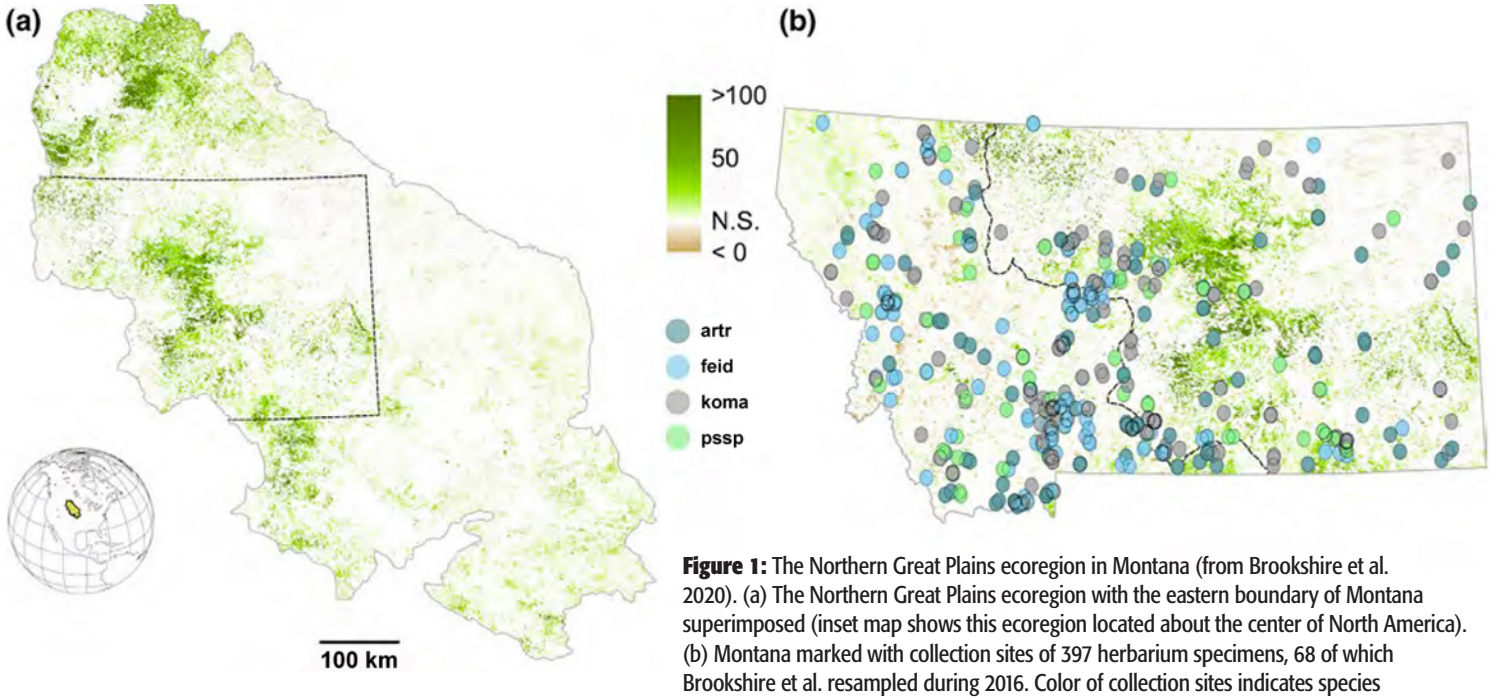


Figure 1: The Northern Great Plains ecoregion in Montana (from Brookshire et al. 2020). (a) The Northern Great Plains ecoregion with the eastern boundary of Montana superimposed (inset map shows this ecoregion located about the center of North America). (b) Montana marked with collection sites of 397 herbarium specimens, 68 of which Brookshire et al. resampled during 2016. Color of collection sites indicates species at collection site: artr = mountain or Wyoming big sagebrush, feid = Idaho fescue, koma = prairie junegrass, and pssp = bluebunch wheatgrass. Boundary line divides the Northern Rocky Mountain and Northern Great Plains ecoregions. Background color on both maps (a and b) varies mostly from white to green and represents a change in the maximum annual values of the "normalized difference vegetation index" or NDVI. This index is a measure of vegetation greenness detected via satellite imagery and factors in both the spatial and temporal extent of vegetation greening within and among years from 2000-2018.

Map credit

and experimental inputs of CO2, which point to lower nitrogen availability. The implications are that limited nitrogen availability could compromise increases in rangeland plant productivity due to increasing CO2 levels.

The analyses by McLauchlan et al. (2010) and Brookshire et al. (2020) are complex and involve an understanding that plant, fungal, and microbial communities sometimes exclude heavier isotopes in favor of lighter isotopes. In general, when nitrogen is plentiful in soils, microbes leave behind isotopically enriched nitrogen and they do so less when nitrogen is scarce. Regardless, analyses of nitrogen-stable isotopes in leaf tissue reveal that nitrogen in North American rangelands is less available because it is becoming more tied up in the production of plant carbon, and this the result of increasing levels of human-generated atmospheric CO2.

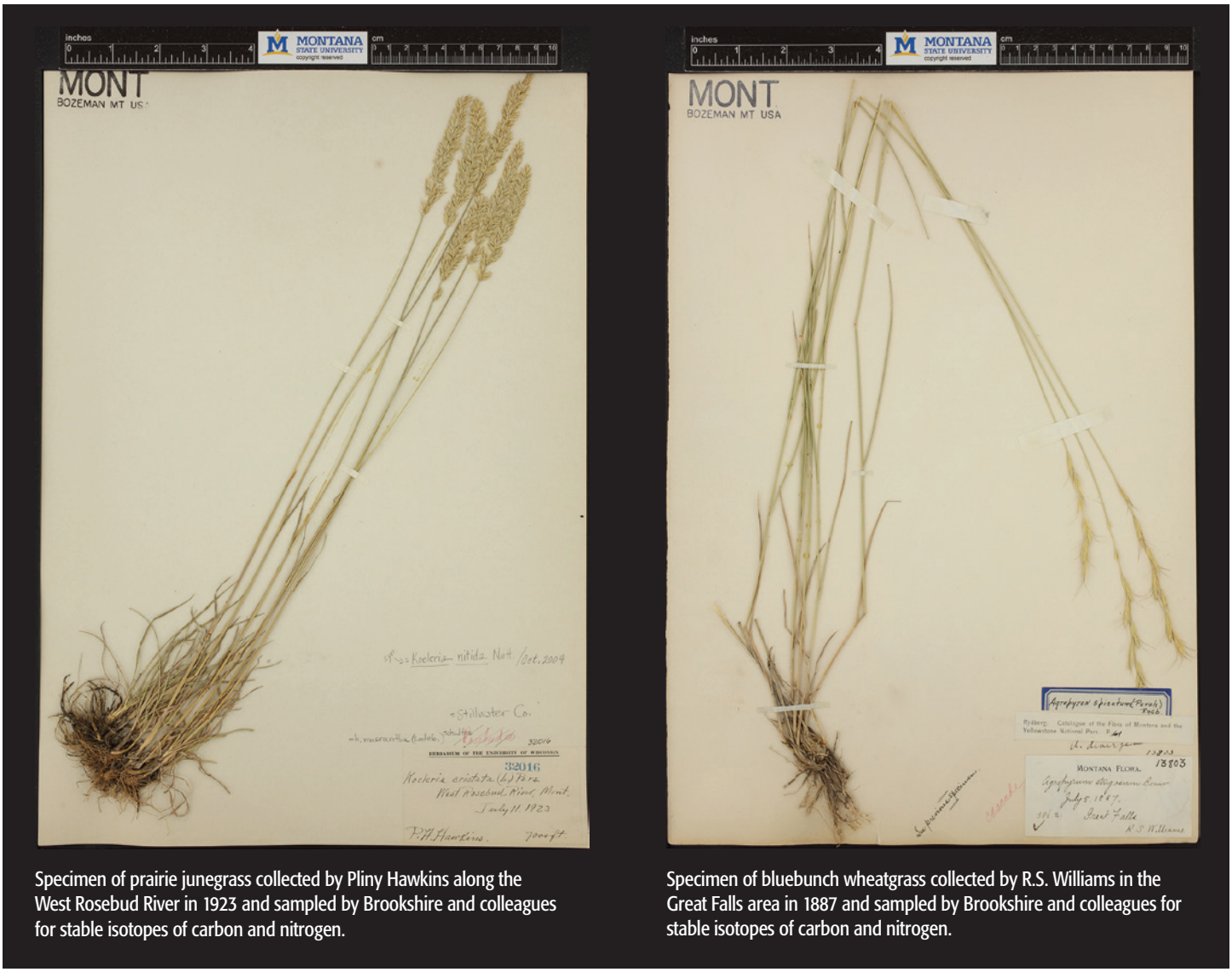
Brookshire et al. underscore the primary role of rising CO2 levels in reducing nitrogen availability to plants by ruling out the role of climate variation. Their detected trends in leaf tissue isotopes composition held constant across variable climate regimes, from the Northern Rocky Mountain to the Northern Great Plains ecoregions. In addition, leaf samples from Montana sites where climate is changing vegetation most show the same levels of nitrogen limitation and carbon excess as leaf samples from sites where climate is changing vegetation less (Figure 1b; mostly in the Northern Rocky Mountain ecoregion).

As Montana grasslands become increasingly carbon rich and nitrogen poor, and thus poorer in forage quality, predicting the impact of climate change on long-term plant productivity is possible only with an understanding of the physiological effects of increasing CO2 levels on the photosynthetic tissues of plants. Herbarium specimens are providing some of the knowledge needed by ecologists and land managers to begin to manage the future vegetation of the Northern Great Plains ecoregion.

Literature cited:

Brookshire, E.N.J., P.C. Stoy, B. Currey, and B. Finney. 2020. The greening of the Northern Great Plains and its biogeochemical precursors. Global Change Biology 00: 1–10. https://doi.org/10.1111/gcb.15115

McLauchlan, K.K., C.J. Ferguson, I.E. Wilson, T.W. Ocheltree, and J.M. Craine. 2010. Thirteen decades of foliar isotopes indicate declining nitrogen availability in central North American grasslands. New Phytologist 187(4): 1135–1145. https://doi.org/10.1111/j.1469-8137.2010.03322.x



Specimen of prairie junegrass collected by Pliny Hawkins along the West Rosebud River in 1923 and sampled by Brookshire and colleagues for stable isotopes of carbon and nitrogen.

Specimen of bluebunch wheatgrass collected by R.S. Williams in the Great Falls area in 1887 and sampled by Brookshire and colleagues for stable isotopes of carbon and nitrogen.

Photos: Montana State University?

Taxonomical Meanderings
Western Wheatgrass

By Robert L. Wooley, Calypso Chapter

Western wheatgrass, *Pascopyrum smithi*, is one of my favorite plants, likely because it often is the same color as one of my other favorite plants — big sagebrush, or *Artemesia tridentata tridentata*.

Western wheatgrass has never let me down. When I have needed a plant to revegetate harshly disturbed sites, western wheatgrass works. It grows not only on extremely arid sites with compacted soils, but also in waterlogged places. It grows on exposed sites baking in the sun, but also in shaded locales. It is easy to harvest seeds from when they are ripe (in Montana, usually in August). One can plant the seeds on bare ground, or oftentimes just scatter them on snow, and the plant works its magic in revegetating just about any site.

Taxonomic classification of living things is ever-changing, as reflected in these pages from historical texts.

But the hardy attributes of western wheatgrass are not really what I want to talk about here. Before I get to that, though, I want to complain that when I originally learned of this plant it was called western wheatgrass *Agropyron smithii*. Then the taxonomists came up with *Pascopyrum smithii*. Giving species binomial Latin names goes back to Carolus Linneaus and his 1837 publication Species Plantorum, for plants, and 1859 Systemae Naturae, for everything else. Ever since then, people such as myself who claim to be professional biologists, or botanists, or entomologists, or — the list of titles would take the rest of this publication to name — have considered knowing the common and latin names of species we are working with to be a mark of professional competence. I have no complaint with using the binomial system of nomenclature to let others know as closely as possible what species of plant or other organism I am talking about. When I title an article "Western Wheatgrass," most of my readers know I am not talking about blue grama grass or eastern white pine. But what am I really talking about?

Well, let me digress even further a moment. Mentioning eastern white pine brought up a mental conflagration. When I was young (many moons ago) I lived near a stand of very large trees. At different times of year I would go visit them. If there was a slight breeze, or wind, or even a gale, the trees made sounds. I became very fond of the sounds. When I advanced to the sixth grade I had the fortune — at the time I thought it miserable luck — to have a teacher who loved the English language. She made her sixth graders read such things as "Evangeline" by Henry Wadsworth Longfellow. In the poem I came across the passage that reads "This is the forest primeval/The murmuring pines and the hemlocks…" Holy cow! I knew what the poet was talking about. The big trees were pines because they were murmuring. Soon I acquired a small book on evergreens of America. I have since lost the little tome, and can't recall its title, but it had these beautiful pictures of cones. It also described how to tell the different trees apart. After a few errors, I identified my murmuring trees as eastern white pines, *Pinus strobus*. The binomial system became a part of my thinking at that point.

Some time later on a trip through the Southwest I came across another love — southwestern big sagebrush, the same thing as the basin big sagebrush, *Artemesia tridentata tridentata.* Now, there is no such thing in the literature as southwestern big sagebrush but under the First Amendment of the U.S. Constitution I still refer to it as that.

Now to get to my point. I think it is fine to use the binomial system of nomenclature to call something western wheatgrass or basin big sagebrush or eastern white pine, and even give it a binomial latin epitaph. So long as we as biologists remember there is really no such thing as a single entity that makes up a plant or an animal. In reality all of the so-called higher species are a consortium of organisms from different domains of life.

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Gardener's Notebook

Using Native Plants in Backyard Landscaping

Rubber Rabbitbrush

Ericameria nauseosa (Asteraceae)

By Caroline Kruckeberg Clemans

Photos: Caroline Clemens

How often have we marveled at this late summer/fall-blooming beauty? With its silver foliage and golden yellow flowers, rubber rabbitbrush *(Ericameria nauseosa)* lights up the landscape as it ushers in the change of seasons.

The genus name *Ericameria* is from the Greek, "erica" meaning "heath" and "meris" or "meros" meaning division or part, referencing the long, slender heath-like leaves. *Nauseosa* is Italian from the Latin *nauseosus,* for "heavy scented." The flowers emit a very sweet, citrusy fragrance some people might find a bit "nauseating." The "rubber" of rubber rabbitbrush refers to a natural rubber compound found in the plant's tissues that, in fact, was studied during WWll as an alternative source for latex.

Rubber Rabbitbrush is a common plant found in sagebrush steppe lands. You can find it on hills, slopes, and flats in western, central and eastern Montana. According to Ronald Taylor in "Sagebrush Country Wildflowers," "It may have pure communities but may be confined to more moist, sandier soils than its sagebrush co-inhabitants."

In the absence of flowers, rabbitbrush at first glance may seem similar to sagebrush but it lacks the pungent odor and lobed leaves. At three or four feet tall by four to five feet wide, *Ericameria* is a good sized shrubby plant that is adapted to hot, dry summer conditions and can withstand winter temperatures to -45 F.

Insects, like native bees, honeybees, butterflies, moths, and others search out its nectar and pollen for food, and it is a food plant for some moth larvae as well. It's browsed by rabbits and the dry, chaffy seeds are eaten by birds and small rodents. All the above animals use it to find protective cover from weather or predators.

Rubber rabbitbrush makes a wonderful contrast plant with foliage that stays silvery green for most of the year. However, it is what I call a "Right Plant for the Right Place" because of its size and particular soil requirements. If it is planted in rich garden soil it will most likely become leggy and be short lived. For the garden —and better yet, shrub border — lean soil will do, somewhere well-drained and dry. Water deeply only two or three times the first summer.

In short, *Ericameria nauseosa* is a unique contrast plant, with silvery green foliage and persistent winter leaves, white or blue tinged stems, and late summer yellow-gold blooms. It's an important pollinator plant with a tolerance for drought and cold.

—An At-Large member of MNPS, Caroline Kruckeberg is retired from Grouse Springs Nursery, Polson, MT.

Rubber rabbitbrush is an excellent pollinator plant that needs space in a garden setting.

Height: Grows between 2-4 feet.

Width: Grows between 3-5 feet.

Light: Prefers sun to part shade.

Soil: Requires well drained, dry, non-amended soils.

Water Requirements: Very low, less than 10 inches/year in natural habitat. First summer in the garden, deep soak 2 or 3 times.

Planting: Fall in the northern half of its range, spring for southern half. Space 8 to 12 feet apart.

Germination: Seed is non-dormant with approximately 65% viability. Container sown in peat media with low nutrition results in well-rooted seedlings.

SOURCES:

Currans, Hannah Rugged Country Plants

Dorn, Robert Vascular Plants of Montana

Malaby, Sarah USDA Forest Service Plant of the Week Rubber Rabbitbrush

Lesica, Peter Manual of Montana Vascular Plants

Kruckeberg, A.R. Gardening with Native Plants of the Pacific Northwest

Taylor, Ronald J. Sagebrush Country Wildflowers 2

Tweit, Susan Plant Rubber Rabbitbrush for Its Brilliant Blaze of Gold in Fall

Native Plant Conservation Campaign News

Immune Systems, Public Health Benefit from Diverse Native Plant Communities

Research from Finland and Australia has found more evidence that living among diverse native plants helps protect human populations from diseases associated with weakened immune systems, such as asthma, auto immune disease, and allergies.

Native plants may accomplish this by supporting more diverse populations of bacteria and other microorganisms, which in turn strengthen human immune system health.

In a 2012 Finnish study, researchers collected plant species data across a range of plant communities and compared it to the diversity of skin microorganisms in adolescents. The study concluded that the presence of diverse native plant species in the vicinity supported healthier and more diverse microbial communities around and on humans. A 2020 Australian study documented a similar effect of native plants on the diversity of soil microorganisms. Microbial diversity was greater in native dominated areas versus lawns or vacant lots.

This is important because, as both the Finnish and Australian articles state, exposure to diverse communities of bacteria and other microorganisms may help "train" human immune systems to respond to threats such as asthma, allergies, and chronic autoimmune disease. This idea is captured in the Biodiversity Hypothesis, which proposes that "contact with natural environments enriches the human microbiome [microorganisms on your skin and in your gut], promotes immune balance, and protects from allergy and inflammatory disorders."

In fact, the Finnish researchers found that subjects living among more diverse native-dominated plant communities, and thus among more diverse microorganisms, showed lower susceptibility to allergic reactions.

These findings support the results of a New Zealand study summarized in a 2018 NPCC News. That research examined nearly 50,000 children in New Zealand. It found that those who grew up in greener neighborhoods were less likely to develop asthma. However, not all greenness is a good thing—children living in areas with nonnative plant species or low plant diversity were actually at greater risk of developing the disease.

Photo: Emily B. Roberson

A child supercharging her immune system with native plants

Worldwide, the incidence of chronic inflammatory diseases has doubled every two decades since 1950, especially in wealthier countries. In the U.S., allergies have increased by 50 percent and asthma by one-third over the past 20 years.

Read more about the Finnish study and the Biodiversity Hypothesis in the article "Can Yards Without Native Plants Make Us Sick?"

Read more about the Australian study in "Microbiome rewilding: Biodiverse urban green spaces strengthen human immune systems."

This item appeared in the June 2, 2020 issue of NPCC News. *For more information and additional examples of the health and other benefits of diverse native plant communities, see the NPCC Ecosystem Services/Nature Based Solutions web pages. Click on "Health, Well Being and Medicine."*

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The strict definition of consortium is an association of parts. The word "consortium" comes from business, where the output of one mine, farm, or factory is used by another factory to produce an intermediate product, until eventually a finished product like a tomato or a pickup truck results and is of some use for a while in commerce. A plant has eukaryotic cells and prokaryotic cells in its makeup. Chloroplasts are derived from prokaryotes (likely blue green algae) and, of course, all land plants have mycorrhizae (eukaryotic cells of the Kingdom Fungi) as integral components. The mitochondria and ribosomes of animal and plant cells are prokaryotic in origin.

So when I praise western wheatgrass I am not talking about a single thing, I am talking about a consortium of organisms and it is that consortium that "evolves" or changes and adapts to any new local environments or conditions. How can taxonomy ever account for this?

—Robert Wooley is a retired U.S. Forest Service Botanist/ Ecologist. He has lived and worked in eight different states with the longest stretch being in Montana. He remains active in counting birds for the Cornell Lab of Ornithology and enjoying the native flora and insect life of Montana. He resides with his wife, Barbara, in Dillon, MT.

MONTANA NATIVE PLANT SOCIETY MEMBERSHIP

Name (please print)_____ Phone_____

Address_____ City/State/Zip_____

E-mail_____ Chapter Affiliation (optional) _____

Newsletter delivery preference _____ paper by USPS _____ digital by email

**Additional donations to our general fund are greatly appreciated!*

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or mail application to:
Montana Native Plant Society
P.O. Box 8783
Missoula, MT 59807-8783

Membership Level	Dues with affiliation	I am paying for _____ years	Donation*	Total amount enclosed
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MNPS Chapters and the Areas They Serve

Members are welcome to affiliate with any chapter. Please select the chapter with which you wish to be affiliated:

☐ **CALYPSO CHAPTER** - Beaverhead, Madison, Deer Lodge, and Silver Bow Counties; southwestern Montana

☐ **CLARK FORK CHAPTER** - Lake, Mineral, Missoula, Powell, and Ravalli Counties

☐ **FLATHEAD CHAPTER** - Flathead and Lake Counties plus Glacier National Park

☐ **KELSEY CHAPTER** - Lewis & Clark, Jefferson, and Broadwater Counties

☐ **MAKA FLORA CHAPTER** - Richland, Roosevelt, McCone, Sheridan, and Daniels Counties

☐ **VALLEY OF FLOWERS CHAPTER** - Gallatin, Park, and Sweet Grass Counties plus Yellowstone National Park

☐ **EASTERN-AT-LARGE**

☐ **WESTERN-AT-LARGE**

All MNPS chapters welcome members from areas other than those indicated. Alternatively, you may choose to be a member At-Large. We've listed counties just to give you some idea of what part of the state is served by each chapter. Watch for meeting announcements in your local newspaper. Ten paid members are required for a chapter to be eligible for acceptance in MNPS.

YOUR MEMBERSHIP EXPIRES on the date displayed on your newsletter mailing label.

Membership in the MNPS runs March 1 through February 28th of the following year. Memberships processed before the end of October each year will expire the following February 28th; those processed after October 31, expire February 28th of the year after. Memberships are processed on a quarterly basis so you may experience a slight delay in membership recognition and benefits. We appreciate your patience with our all volunteer organization. ***THANK YOU!***

PLEASE NOTIFY US PROMPTLY of physical and email address changes at mtnativeplantmembership@gmail.com or mail to:
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About Montana Native Plant Society

The Montana Native Plant Society (MNPS) is a 501(c)(3) not-for-profit corporation chartered for the purpose of preserving, conserving, and studying the native plants and plant communities of Montana, and educating the public about the value of our native flora. Contributions to MNPS are tax deductible, and may be designated for a specific project or chapter, for the Small Grants fund, or the general operating fund.

Your yearly membership fee includes a subscription to *Kelseya*, the quarterly newsletter of MNPS. We welcome your articles, field trip reports, book review, or anything that relates to native plants or the Society. Please include a line or two of "bio" information with each article. Drawings should be in black ink or a good quality photocopy. All items should be emailed to: carokurtz@gmail.com or mailed to *Kelseya* Editor, 645 Beverly Avenue, Missoula, MT, 59801.

Changes of address and inquiries about membership should be sent to MNPS Membership, P.O. Box 8783, Missoula, MT 59807-8783. Advertising space is available in each issue at $5/column inch. Ads must be camera-ready and must meet the guidelines set by the Board of Directors for suitable subject matter; that is, be related in some way to native plants or the interests of MNPS members.

The deadline for each issue is Fall–September 10; Winter–December 10; Spring–March 10; Field Trip Guide–April 10; Summer–June 10. Please send web items to our webmaster concurrent with these dates.

If you want extra copies of *Kelseya* for friends or family, call the Newsletter Editor or email: carokurtz@gmail.com. No part of this publication may be reprinted without the consent of MNPS. Reprint requests should be directed to the Newsletter Editor.

Visit our website at: www.mtnativeplants.org
or contact our webmaster Bob Person at: thepersons@mcn.net

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