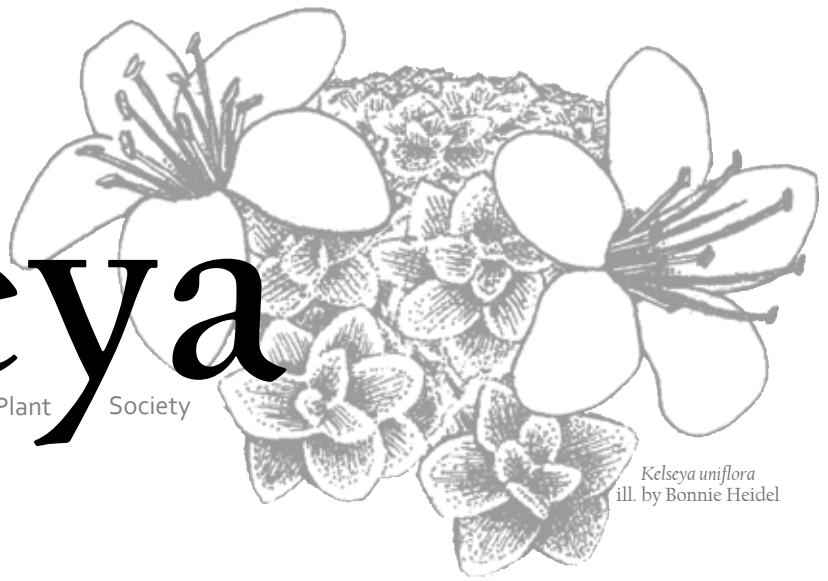


Kelseya

Newsletter of the Montana Native Plant Society



Kelseya uniflora
ill. by Bonnie Heidel

Halting an Invader

Russian Olive Finally is Regulated in Montana

By Peter Lesica and Kathy Lloyd

Finally! After more than two years of ups and downs and ons and offs, the Montana Native Plant Society and Montana Audubon's efforts to list Russian olive as a Priority 3 regulated plant in Montana were successful. As of September 10, 2010, Russian olive can no longer be sold or transported legally into the state. Priority 3 is a new tier of the Montana Noxious Weed list maintained by the Montana Department of Agriculture that stipulates species so designated may not be sold or transported into the state, but does not require that areas already containing the regulated species be treated or the plant, in this case the tree, be removed. In the case of Russian olive, the state recommends research, education and prevention to minimize the spread of this exotic tree.

The impacts associated with Russian olive are many. Negative impacts are a consequence of Russian olive displacing native herbaceous and woody species on active floodplains, but more clearly along regulated rivers. Invasion also is occurring in low and intermittent-flow riparian zones and gullies, and there is a potential for interference with agricultural water conveyance. Once established, Russian olive may hinder recruitment of native cottonwood and willow on some sites. The native pioneer species (primarily *Populus* and *Salix* spp.) rely



Elaeagnus angustifolia. Photo by J.S. Peterson @ USDA-NRCS PLANTS Database

on physical disturbance to create bare, moist patches for seedling establishment. These pioneering natives

form temporary woody communities that are succeeded by non-forested communities, such as prairie or sagebrush steppe. Some ecologists interpret the issue of cottonwood decline as one that has more to do with such factors as water flow rates and the resulting scarification and seedbed creation, as well as herbivory from beavers, rather than competition with Russian olive. Nonetheless it is apparent that Russian olive stands form a self-

perpetuating climax state.

Russian olive is shade tolerant and capable of reproducing beneath a cottonwood canopy or in other shaded sites. In Montana, Russian olive is found on high

continued, page 5

MNPS is Going Digital!

Starting in February, you can renew your membership online at www.mtnativeplants.org/Becoming_a_Member. You will also be able choose to receive Kelseya as a PDF email attachment instead of a hard copy. Visit soon to let us know your preference!

Chapter Events

Calypso Chapter

Again, thanks to everyone who participated in the Annual Meeting last summer. Special thanks to all the volunteers who made it possible and to those who donated or bought silent auction items.

February and March, dates and time TBA. Saturday presentations. Info: Catherine Cain at nativeplants@montana.com or 498-6198.

Saturday, April 2, 9:30 am - 2:00 pm. The fourth annual "Gardening With Natives" workshop will be held at the Divide Grange Hall. This workshop is open to all MNPS members and the general public.

June, date and time TBA. Paul Sawyer will be leading another field trip to Rochester Basin, so anyone who missed his great trip last July will have another chance to visit this little-travelled area of Southwestern Montana.

Saturday, July 16. All MNPS members are invited for a weekend of botany and canoeing with Thomas J. Elpel, author of *Botany in a Day* and founder of the Jefferson River Canoe Trail. JRCT is sponsoring a public canoe float on the Jefferson River on Saturday, followed by a potluck and optional overnight campout. You can join or continue downriver with Tom on Sunday, July 17th for additional paddling, botanizing and foraging. Bring your own canoe if you can. Otherwise, Tom may have extra canoes to loan at no charge. Info: Tom at thomasjelpel@gmail.com

Jessie Salix announced that the Beaverhead-Deerlodge USFS has been awarded a grant to establish a "Pollinator Garden" at the UMW Birch Creek Center, where Calypso hosted the Annual Meeting last July. Chapter members will be volunteering their assistance on this project. Info: Jessie at jsalix@us.fed.us.

July and August, dates and time TBA. Field trips. Info: Catherine Cain at nativeplants@montana.com or 498-6198.

Clark Fork Chapter

Meetings are held in Room Log, Gallagher Business Building, University of Montana campus unless otherwise noted. Herbarium Night presentations are held in Room 303, Botany Building, UM campus.

Monday, January 10, 7:30 pm. Take a trip to the Sonoran Desert with ornithologist Paul Hendricks as he presents "Home is Where You Make It: Woodpeckers and Giant Columnar Cacti." Rm 123, Gallagher Business Bldg, UM Campus. This will be a joint meeting with Montana Audubon (note different day and place).

Tuesday, January 25, 7:30 pm. Herbarium Night. Join retired Forest Service botanist Peter Stickney for a look at some woody plants in Montana's Honeysuckle Family (Caprifoliaceae).

Thursday February 10, 7:30 pm. Providing seeds of native plants for restoration is becoming a big business. Bryce Christiaens and Rebecca Shoemaker talk about "The Successes and Challenges of Establishing a Xeric Forb Seed Increase Farm."

Tuesday, February 22, 7:30 pm. Herbarium Night. Join Natural Heritage Program Botanist Scott Mincemoyer to learn about asters and how to identify them when he presents "Montana's Assortment of Asters."

Thursday, March 10, 7:30 pm. MNPS Small Grant recipient Eva Masin will present results from her research project, "Can Sheep Control Leafy Spurge without Compromising Efforts to Restore Native Plants?"

Tuesday March 29, 7:30 pm. Herbarium Night. Find out some tips for "Learning the Common Plant Families" from botanist Peter Lesica.

Thursday April 14, 7:30 pm. Can you remember the names of wildflowers you haven't seen for nearly a year? Get an early-season refresher from Chapter photographers during a slide presentation of "Western Montana's Grassland Wildflowers."

Flathead Chapter

Monthly meetings are held the third Wednesday of the month at 540 Nucleus Ave., Columbia Falls. Programs start at 7:00 pm unless otherwise noted. Members are invited to attend the 5:30 general meetings beforehand to discuss and plan chapter activities and business. Feel free to bring a sack supper.

January 19 Work Meeting to Revise and Update the Flathead Native Plant Landscaping Packet. We'll start with our regular business meeting at 5:30 and finish up with revising the landscape packet. Bring your editing and writing skills, laptop (if you have one) and a sack supper. Info: Jen Hintz at jhintz2004@yahoo.com or 270-7028.

February 19 "Conservation Gardening: Landscaping with Montana Native Plants for Montana Native Wildlife in Your Own Backyard." David Schmetterling shows us how to use Montana native plants to create habitat for native wildlife and to create a sustainable garden for people to enjoy. David chronicles his Missoula home garden at montanawildlifegardener.blogspot.com. Info: Terry Divoky at tdivoky@centurytel.net or 387-5527.

March 16 "Celebrating Glacier's Centennial: A Backcountry Botanical Journey." Glacier Park Magazine editor Chris Peterson's stunning photographs illustrate Glacier's diverse and spectacular flora, along with scenery, birds and bears. See also Chris' "100 days in Glacier" blog at www.glacierparkmagazine.com. Info: Rachel Potter at jrepotter@centurytel.net or 892-2446.

April 20 "Global Observation Research Initiative in Alpine Environments (GLORIA) in Glacier National Park." Lindsey



Bengtson, a biological research technician for the USGS's Northern Rocky Mountain Science Center in West Glacier, will discuss this effort to establish and maintain a world-wide network of long-term observation sites documenting alpine vegetation. The data will be used to assess and predict losses in biodiversity and other threats to fragile alpine ecosystems, which are under accelerating climate change pressures. Info: Jen Asebrook at jasebrook@centurytel.net or 863-9630.

Kelsey Chapter

For information about Kelsey Chapter programs and events call Kathy at 449-6586.

Tuesday, January 25, 7:00 pm. Matt Lavin from MSU will present "Plant Diversity in the Sagebrush Steppe: An Overlooked Aspect of this Important Western North American Biome." The program will focus on plant biodiversity in sagebrush steppe when it's protected from all but moderate ungulate grazing and occasional fire. Free, Lewis and Clark Library in Helena.

Thursday, February 17, 7:00 p.m. Dean Pearson from the Rocky Mountain Research Station will present "Birds, Spiders and the Natural History of Exotic Plant Invasions." Free, Lewis and Clark Library in Helena.

Maka Flora Chapter

The Maka Flora Chapter will host next year's Annual Meeting June 17-19, 2011 at Camp Needmore near Ekalaka in the Custer National Forest.

For information about upcoming Chapter events, call Beth Madden at 789-7266.

Valley of Flowers Chapter

For information about upcoming Chapter events, call Joanne Jennings at 586-9585

January 11 "White Bark Pine in the Greater Yellowstone," presented by Cathie Jean, National Park Service management assistant and vegetation project leader.

February 8 "Wildflowers of the Northern Mojave," presented by Tom Forwood, park naturalist at Lewis & Clark Caverns State Park.

March 8 "Phytoremediation in Montana," presented by Robert Dunn and Laura Smith, Westscape Nursery in Belgrade.

April 12 "Native Grasses, Forbs and Shrubs for Conservation on the Northern Plains," presented by Susan Winslow, agronomist at Bridger Plant Materials Center.

Welcome New Members

The Montana Native Plant Society welcomes the following new members:

Clark Fork Chapter:
Great Bear Restoration/Great Bear Natives

Valley of Flowers Chapter: April M. Hale

Calypso Chapter: Kelly Urresti and Kenda Herman

President's Platform



Sometimes, in the midst of the ongoing hustle of life, I wish I could be more like one of our native plants and spend the winter in dormancy. But alas, as a warm-blooded mammal that never learned to hibernate, I must maintain a near steady-state of ongoing physiological activity and any respites are comparatively short. But I suppose the dormancy of plants is not as simple as I might imagine, since even in winter plants must monitor conditions around them in order to learn when it might be safe to begin active growth again. Seeds in exposed soil experience frequent temperature shocks, as well as the heaving and churning of the soil from cycles of frost and warmth. While roots buried deep in soil or under a snow blanket experience more buffered conditions, buds on trees and shrubs above the snow must bear the brunt of winter's cold and temperature variations from day to night and week to week. The ability of our native plants to endure and thrive through the winter is part of their magic, and not as effortless as we who are in constant motion realize. There is much to admire in their perseverance and promise of rebirth.

~ Dave Hanna





Sheep grazing on the hills around Missoula. Photo by Suzi Taylor

Can Sheep Control Leafy Spurge without Compromising Efforts to Restore Native Plants?

By Eva Masin

Intermountain grasslands rapidly are being invaded by increasing numbers of non-native plants. Leafy spurge (*Euphorbia esula*) is one of the most damaging invasive species in the region, infesting approximately 800,000 hectares in Montana, North Dakota, South Dakota and Wyoming (Dewey and Anderson 2004). Primary adverse impacts of invasion by leafy spurge include loss of biodiversity, livestock forage and soil stability. One increasingly popular method being used to control leafy spurge is grazing by domestic sheep, which can be effective when used as part of an integrated, long-term management strategy.

Although sheep will consume grasses, they prefer forbs (Cook 1984) and regularly consume leafy spurge. When sheep graze early in the plants' life cycle, the plants produce fewer flowers and seeds and therefore contribute fewer seeds to the soil seed bank. Sheep will not eradicate this noxious weed, but can minimize its spread, reduce large infestations over time and reduce the extensive ecological damage caused by this plant. However, surprisingly little is known about the impacts of this practice on native plant communities, particularly on impacts to native plants growing in leafy-spurge infested areas.

The object of my research is to understand the consequences of sheep grazing for population dynamics of native plants, particularly perennial native forbs. One of my research questions was whether in leafy-spurge-infested grasslands sheep preferentially graze native or non-native plants, and are particular plants favored over others?

I addressed this question through a field investigation done in collaboration with Missoula Parks and Recreation, which manages approximately 3,000 acres of public lands, with generous support from the Montana Native Plant Society and the Montana Weed Control Association. The field site is located on the east side of Mount Jumbo, at the southern end of the Rattlesnake Mountains, on Missoula Conservation Land. Slopes in the study area range from 35-45%, the site has a southeastern aspect and the vegetation is dominated by native bunchgrasses, including bluebunch wheatgrass (*Agropyron spicatum*), Sandberg bluegrass (*Poa secunda*) and junegrass (*Koeleria macrantha*). The study site is infested with leafy spurge and is grazed annually by domestic sheep. Approximately 30 perennial forbs, both native and introduced, occur at the study site, including heath aster (*Aster ericoides*), silky lupine (*Lupinus serecius*), yarrow (*Achillea millifolium*) and blanket flower (*Gaillardia aristata*). Heath aster is commonly considered to increase with grazing by domestic animals (Weaver, 1968) and yarrow has been shown to increase with grazing by bighorn sheep (www.fs.fed.us/database/feis/plants). Both blanket flower and lupine were part of the sheep's summer diet in 2008 on Mt. Jumbo (Hirschenberger, 2008). Commonly occurring non-natives include leafy spurge, sulfur cinquefoil (*Potentilla recta*) and salsify (*Tragopogan dubius*).

In order to better understand sheep foraging choices in areas where native plants grow intermixed with leafy spurge, I measured changes in plant abundance (density) before and after sheep grazing in 60, two-meter radius circular plots with frequently occurring native perennial



Spurge, cont'd

forbs and low-to-moderate levels of leafy spurge infestation. Fifty of the 60 plots were exposed to sheep grazing over approximately six weeks during June and July 2010. We monitored the plots frequently during this time to insure that they were grazed and to observe grazing choices. Ten plots served as controls and were protected from sheep grazing (but likely not by deer) by a low-tension electric fence.

Overall, 70% of the perennial forb stems I measured at my study site were non-native (predominately leafy spurge, sulfur cinquefoil and salsify) while 30% were native (primarily hairy golden aster, heath aster, silky lupin, yarrow, blanket flower, milk vetch and elk thistle). After sheep left the study site, 89% of non-native stems were grazed and 28% of native stems were grazed. In order of preference, sheep primarily grazed leafy spurge, sulfur cinquefoil, heath aster, salsify, elk thistle, blanket flower, milk vetch, yarrow and lupine. Sheep did not graze hairy golden aster. **These results indicate that sheep preferred to graze non-native plants (which may be due in part to their greater abundance) and that when native plants were grazed, certain native species were preferred.**

There is growing excitement about the potential for using sheep as part of an integrated weed control program. However, the efficacy of sheep grazing as a restoration tool depends both on its potential for controlling undesirable plants and its ability to promote native species that provide key ecosystem goods and services.

Eva Masin is an M.S. Candidate in Resource Conservation at the University of Montana and was a lucky recipient of a 2010 MNPS Small Grant.

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Dewey, S.A., K.A. Anderson. 2004. Strategies for early detection-using the wildfire model. *Weed Technology* 18: 1396-1399.

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Hickman, K, S.A., K.A. Anderson. 2004. Strategies for early detection-using the wildfire model. *Weed Technology* 18: 1396-1399.

Popay, I., R. Field. 1996. Grazing animals as weed control agents. *Weed Technology* 10: 217-231

Weaver J.E. 1968. *Prairie plants and their environment: a fifty-year study in the Mid-west.* University of Nebraska Press, Lincoln, NE.

Invader, cont'd

river terraces as well as moister, low terraces (Lesica and Miles 2001). It commonly invades the banks of irrigation ditches and subirrigated pastures in south-central Montana (Lesica and Miles observations). Russian olive rarely is eaten or used by beavers (Lesica and Miles 1999a, 2001; Pearce and Smith 2001), thus providing a competitive advantage over cottonwood and willow.

In Montana, undisturbed colonizing and established cottonwood communities support as many as 114 and 58 plant species, respectively, compared to only 29 species in Russian-olive stands (Hansen et al. 1995, Pearce and Smith 2001). Russian olive may preclude cottonwood recruitment by shading seedlings along streams where flooding does not occur or merely deposits alluvium on top of existing vegetation rather than creating new channels or broad point bars (Lesica and Miles 2001). Russian olive is ecologically similar to native green ash and could replace it where both occur because it grows three times faster in girth than green ash (Lesica and Miles 2001).

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Olson T.E.; Knopf F.L. 1986. Naturalization of Russian olive in the Western United States. *Western Journal of Applied Forestry* . 1: 65-69.

Pearce, Cheryl M.; Smith, Derald G. 2001. Plains cottonwood's last stand: Can it survive invasion of Russian olive onto the Milk River, Montana, floodplain? *Environmental Management*. 28(5): 623-637.



Russian Olive stand on Howser Island before treatment (above), and after removal (left).
Photos by Peter Lesica.

News & Notes

Needmore Prairie: 2011 Montana Native Plant Society Annual Meeting

By Beth Madden



The Maka Flora Chapter will host the 2011 Annual Meeting of the Montana Native Plant Society, June 17-19 at Camp Needmore on the Custer National Forest, Ekalaka, Montana. The theme is Needmore Prairie and the weekend will focus on the diverse prairie and ponderosa pine ecosystems of southeast Montana. Field trips will include Forest Service and private lands around Capitol Rock, Belltower Rock and Chalk Buttes as well as to nearby Medicine Rocks State Park and area BLM lands.

On Saturday night, rancher and conservation writer Linda Hasselstrom will share insights about ranch life and her advocacy for the preservation of prairies and their ecosystems.

The setting will be rustic, with dormitory-style cabins,

tent and RV camping on site (www.campneedmore.org), and limited motel accommodations in Ekalaka (eight miles away). Meals will include catered dinners on Friday and Saturday night, and continental breakfasts on Saturday and Sunday.

Because of the remoteness of Ekalaka, we are encouraging local chapters to explore possibilities for shared travel to the meeting. We also need silent auction or raffle items for the annual fundraiser, so let us know what you can bring! Registration materials will be available in April. Info: Beth Madden at bethmadden64@gmail.com or 789-7266, or Doug Smith at dsmith@co.sheridan.mt.us or 483-5431.

MNPS Award Nominations Due

By Patrick Plantenberg

The Montana Native Plant Society periodically offers awards for service to MNPS and for careers dedicated to Montana's native plants. The MNPS Outstanding Service Award is given to an MNPS member for outstanding service to MNPS and its mission. The MNPS Special Achievement Award is given to someone whose work has contributed to the mission and goals of MNPS. Nominees for the Special Achievement Award do not necessarily have to be MNPS members.

Nominations are due by April 1 (no joke!) and should include a brief statement about the nominee's contribution to MNPS, or to native plants and their conservation in general, and relate why the nominee should receive the award. What a great way to say thank you for a job well done! Awards will be presented during the 2011 Annual Meeting in Ekalaka, June 17-19. To submit a nomination, contact Patrick Plantenberg, 431-4615, or Joanne Jennings, 586-9585.

Calypso Chapter Member Honored

Submitted by Debbie Mueller

Delena Norris Tull, one of the cheerful folk staffing the registration table at the MNPS Annual Meeting last July, has been named 2010 Montana Professor of the Year. Delena received the Carnegie Foundation award November 18 in Washington D.C.

Before coming to UM-Western in 2004 as an education professor, Delena worked as a professor at the University of Alaska-Fairbanks for 11 years. She has a doctorate in life- and environmental sciences. As a botanist, Delena has authored two field guides to native plants of Texas. Delena works with her education students to "have their children involved in science inquiry and hands-on experiential learning." To read more about Delena's career accomplishments, visit www.mtstandard.com and type "Delena Norris-Tull" in the search box.





Erwin Evert at home in the field. Photo courtesy of Rocky Mountain Herbarium blog.

A Tribute to Erwin Evert, 1940-2010

By Walter Fertig

[This tribute and the following interview originally appeared in the December 2010 issue of *Castilleja* (Vol. 29, No. 4), the newsletter of the Wyoming Native Plant Society. Used with permission.]

This past June, Erwin Evert's long-anticipated book "Vascular Plants of the Greater Yellowstone Area: Annotated Catalog and Atlas" was finally published. It seemed that Erwin had been working on his tome for at least 20 years, or nearly as long as I had known him. I well remember visiting with Erwin and his wife, Yolanda, on their visits to the Rocky Mountain Herbarium, where the Everts would spend several days poring over specimens from northwest Wyoming, Idaho and Montana. As a botanist with my own interest in the flora of Yellowstone and vicinity, I always anticipated these visits as an opportunity to learn of Erwin's latest finds and to catch up on botanical gossip.

Erwin Evert was a native Chicagoan, born on the northwest side in February, 1940. From an early age he had a keen interest in nature and botany, fostered by a great uncle who took him on jaunts to the zoo and park, and a grandmother who let him create his own garden at the age of four. As a youngster, he and his family would visit a relative's summer

home in the North Woods of Wisconsin, where they would catch fish and pack them with fern fronds for the trip home. Perhaps gathering these ferns instilled a lifelong interest in collecting plants.

Erwin graduated from Roosevelt University in Chicago with degrees in Zoology/Chemistry and Education. He taught high school science, biology and chemistry in the Chicago public schools, and studied painting and drawing at the Art Institute of Chicago. Erwin also was interested in music, and studied voice at the American Music Conservatory with thoughts of becoming an opera singer. He could speak German and Italian and sing in these languages while playing the piano to entertain family and friends.

Botany remained Erwin's primary love throughout his career. He and Yolanda maintained a native plant garden at their home in Park Ridge, Illinois, that was famous in the Chicago area and frequently featured in gardening magazines and on tours.

Erwin Evert's life trajectory changed in the 1960s, when he visited Yellowstone National Park and the mountains of northwestern Wyoming on a family vacation. Although the flora of the greater Yellowstone area had been surveyed by several prominent botanists for nearly a century, Erwin must have been surprised to find so many areas that were still unexplored and species not yet catalogued. On a trip in 1974, he collected a short, bright-blue penstemon from the Absarokas that did not match any species descriptions or fit any keys. It turned out to be a new species and one he would name a decade later as *Penstemon absarokensis*. In 1983, he found a peculiar umbel on volcanic rubble in the Absarokas that didn't match anything, either, and which he named *Lomatium attenuatum*. Erwin clearly had found his niche.

The Everts purchased a summer cabin along Kitty Creek in the midst of the Absaroka Range in the mid 1970s and used it as a base camp for western explorations for the next four decades. Erwin began documenting the flora of the North Fork drainage of the Shoshone River. At the time, the Absarokas had received surprisingly little attention from botanists, perhaps due to the rugged, slippery volcanic peaks, dense forests, sparse road and trail network (much of the area is designated wilderness) and density of grizzly bears. Erwin produced an annotated checklist of the flora of the drainage in 1991 and re-issued it every few years. This document was the foundation on which he would build his comprehensive catalog of the greater Yellowstone flora.

Erwin also made several important collecting trips in the Black Hills, where he discovered the first Wyoming population of trailplant (*Adenocaulon bicolor*) and several other species. In the Bighorns, he was the first botanist to explore the boggy swamp forest at Preacher Rock, where he discovered the state's first population of woodland horsetail (*Equisetum sylvaticum*) – just one day before Bob Dorn discovered it independently in the Black Hills. Erwin also made important botanical discoveries at the Story Fish Hatchery and in the Cloud Peak Wilderness Area.

Erwin Evert was one of the 23 charter members of the Wyoming Native Plant Society, founded in early 1981, and later served as President for the 1983-84 term. During the 1980s he was a frequent contributor



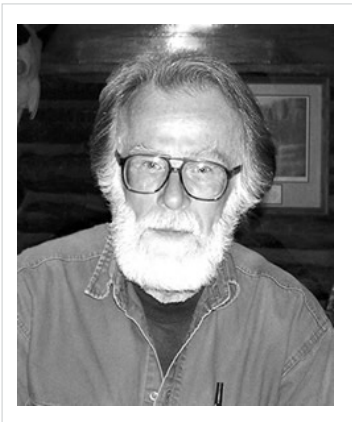


Photo courtesy of Rocky Mountain Herbarium blog.

to the Wyoming Native Plant Society Newsletter (the original name of the *Castilleja*). He maintained a strong interest in plant conservation and in a series of articles in 1983 and 1984 proposed that Wyoming develop a system of protected natural areas analogous to the Illinois Nature Preserve System. Along with Bob Lichvar and Ellen Collins, he proposed Preacher Rock Bog and Sawtooth Palsa (the only domed peatland underlain by permafrost in the lower 48 states, found on the Beartooth Plateau) as initial components of such a system. Erwin's idea for a natural areas system was adopted by The Nature Conservancy and several federal and state agencies in November, 1984 at the first Natural Area Needs Workshop, held in Riverton.

Perhaps Erwin's greatest botanical discovery came in June, 1984, while he was scouting out areas to visit for the upcoming WNPS annual field trip to the Beartooths. Always interested in sedges and peatlands, Erwin stopped off the highway leading to Cooke City and Red Lodge to explore a large lake at the base of the Cathedral Cliffs, known today as Swamp Lake. This remarkable area contained eight new state records and some 25 rare plant species associated with the white spruce muskeg forest, marl wetlands and floating

mat vegetation. Most of the species were widely disjunct from their primary range in boreal Canada and Alaska. Red manzanita (*Arctous rubra*) had never before been found in the contiguous United States. To this day, Swamp Lake remains one of the five Wyoming sites with the highest concentration of rare plant species (along with Dugout Gulch/Sand Creek of the Black Hills, Medicine Bow Peak, Beartooth Pass and the vicinity of Jenny Lake in the Tetons). Needless to say, the stop at Swamp Lake was the highlight of the 1984 meeting!

Since the mid 1970s, Erwin collected more than 40,000 vascular plant specimens from Wyoming, Idaho and Montana while researching his catalog of the greater Yellowstone flora. Most of these collections are at the University of Wyoming's Rocky Mountain Herbarium or the Morton Arboretum in Chicago, where Erwin was a long-time research affiliate. Remarkably, he didn't seem to keep a field book and hand wrote copious label information on each set of newspapers containing his prized specimens. These collections included dozens of first records for each state and four new species to science. In addition to the previously mentioned Absaroka biscuitroot (*Lomatium attenuatum*) and Absaroka beardtongue (*Penstemon absarokensis*), Erwin named aromatic pussytoes (*Antennaria aromatica*) and Shoshonea (*Shoshonea pulvinata*). The latter species, co-named by umbel expert Lincoln Constance, also represented a previously unknown genus and was named to honor its limited range in the Shoshone drainage of northwestern Wyoming and southern Montana. Another new umbel species from the Owl Creek and southeastern Absaroka ranges was named *Cymopterus evertii* (Evert's spring-parsley) in Erwin's honor by Ron Hartman and Rob Kirkpatrick in 1986.

Erwin's lasting legacy will be his massive (751 page) Catalog. The book begins with an outstanding overview of the greater Yellowstone area, including a summary of its vegetation, climate and geology. Other sections review the flora of each mountain range within the study area and the history of botanical exploration in the region. The bulk of the book details the 2,082 vascular plant taxa known from the greater Yellowstone area, including descriptions of range, habitat, conservation status and comments on taxonomic problems, as well as a dot map. The book captures Erwin's four decades of field experience and knowledge of the Yellowstone area, and is a critical update to the classic (but long out of print) floristic studies of Frank Tweedy, Per Axel Rydberg and Aven Nelson.

I was preparing to leave for 10 days of my own fieldwork in southwestern Wyoming and the Black Hills this past June when I learned of publication of Erwin's book. I planned to write him and order my own copy as soon as I returned. Sadly, in that short span of time, Erwin died, at age 70, not far from his beloved Kitty Creek Cabin on his daily sojourn of botanical discovery. I'm sad for the loss of a colleague and friend, and for the sorrow of his wife and daughter. I'll miss being able to catch up on botanical news and gossip, and giving Erwin in person the credit he so richly deserved for his book. I am thankful that he did finally publish the book after so many years – it would have been an even greater loss if the work had remained unfinished. But I'm grateful, too, for all of his contributions to science and his unflagging enthusiasm for Wyoming botany. I'm grateful that he was able to get in that one last hike, despite the consequences – to be once more out of doors in the wild Absarokas that he loved so well.

Vascular Plants of the Greater Yellowstone Area: Annotated Catalog and Atlas, by Erwin F. Evert.

To order a copy of the Catalog, contact Yolanda Evert at yolandaevert@yahoo.com or (847) 823-1501. Cost is \$45.00, payable by check to Yolanda Evert, 1476 Tyrell Ave., Park Ridge, IL 60068.

[For further memories of Erwin Evert, see "Memories of Erwin Evert," an interview of Bob Lichvar by Phil White, on the MNPS website at www.mtnativeplants.org]



What Good Are Awns?

By Peter Lesica

It's the middle of winter, and I'm still picking grass seeds out of my favorite wool socks. I'll bet they're cheat grass (*Bromus tectorum*) which has those long, needle-like awns that project out from the grass flowers. Cheat grass is an introduced weed, but many of our native grasses also have those annoying awns. These include needle grasses (*Stipa* spp.) bromes (*Bromus* spp.), three-awn (*Aristida purpurea*), wheat grasses (*Agropyron* spp., *Elymus* spp.) and fescues (*Festuca* spp.) among others. Ranchers really have a problem with all these grasses. Although they are palatable early in the season, the awned seeds get lodged in the mouths and noses of their livestock. They get into dogs too. It's hard to imagine that grass awns evolved in so many species just to annoy us.

It is believed that awns evolved as a mechanism to disperse seeds, and they do this in three ways. The first way is obvious to a guy with grass seeds in his socks. The awns get attached to the fur of animals, bird feathers or your clothes. If the wind is strong enough, awns may also help seeds become airborne and travel from the parent plant. Finally, awns have been shown to allow the grass seed to move along the ground and find a suitable place to germinate. This can happen because grass awns are hygroscopic, they twist and untwist in response to changes in the humidity of the air.

During the day it's hot and dry, and the awn curls up and becomes shorter. At night when the temperature drops and relative humidity increases, the awn expands, and the seed is pushed forward. Many grass seeds have backward-pointing hairs, allowing them to move forward with ease but preventing backward movement. The cells that make up an awn are constructed of two types of material. Most of the cell expands when it absorbs water and contracts when it dries. However, little fibers inside the cell are stiff and do not change with humidity. These fibers cause the awn to twist and bend when it dries. The grass seed is harnessing energy from the sun to move along the ground. Although awns have been shown to cause grass seed to move along the ground, researchers have been unable to show that a longer awn is associated with greater dispersal distance. So why do some plants have really long awns?

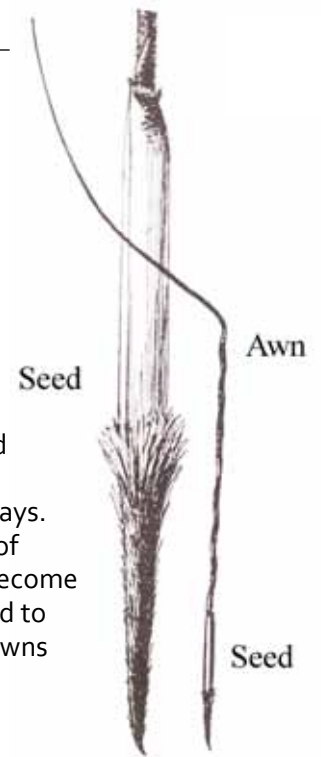
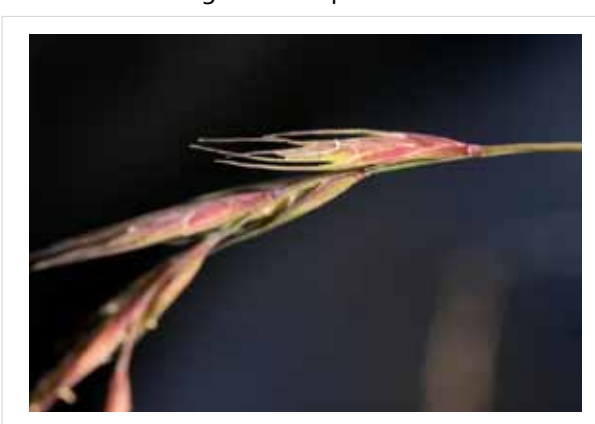


Illustration by A.S Hitchcock, Manual of Grasses of the United States.



Agropyron spicatum. Patrick J. Alexander @ USDA-NRCS PLANTS Database

Dispersal is not the only service an awn provides. As the grass seed moves along the ground it may eventually happen upon a depression, a safe site for germination. The seed becomes stuck in the depression, so now the expanding and contracting of the awn literally drills the seed into the hole. No help from gardeners needed. At least two studies have shown that seeds with longer awns become buried deeper and are more likely to germinate. Furthermore, some grasses, like *Aristida*, have seeds with three awns, and removing even one of the awns makes it less likely that the seed will bury itself (by the way, a self-burying seed is termed trypanospermic). So awned grass seeds are just like worms, they can crawl along the ground and dig into a good spot.

Understanding trypanospermic behavior is important as well as being a great natural history story. Many of our native grasses with awns are important for restoring degraded grasslands. These include bluebunch wheatgrass (*Agropyron spicatum*), green needlegrass (*Stipa viridula*), mountain brome (*Bromus carinatus*) and needle-and-thread

(*Stipa comata*). Unfortunately, awned seeds get tangled up with each other, making it more difficult to broadcast them evenly across a restoration site. Some restorationists remove grass awns before broadcasting the seed. However, these studies have shown that this practice may reduce the germination and survival of awned grass species.

Further reading:

Elbaum, R., S. Gorb and P. Fratzl. 2008. Structures in the cell wall that enable hygroscopic movement of wheat awns. *Journal of Structural Biology* 164: 101-107.

Molano-Flores, B., C. A. Danderson, and K. Patel. 2010. Seed self-burial, germination, and seedling survival for a species with hygroscopic awns (Illinois). *Ecological Restoration* 28: 126-129.

Pearl, M. H. 1979. Experiments on the biological significance of the morphology of seed dispersal units in grasses. *Journal of Ecology* 67: 843-863.



Montana Plants Need Citizen Scientists

By Peter Lesica

Citizen science is catching on! As humans transform the earth at an ever-increasing rate, there just aren't enough professional scientists to keep track of all the changes that are happening. As a result, organizations like the National Park Service and the Audubon Society are enlisting interested amateurs to help monitor animal populations. The Montana Native Plant Society has its own citizen scientist program that members need to know about; it's called the Plant Species of Concern Threats Assessment. The Montana Natural Heritage Program and plant conservationists have a good deal of information about which species are rare, but much less knowledge about what threats these populations are facing.

The Montana Interagency Plant Threats Assessment Committee was formed in 2006 at the Montana Plant Conservation Conference in Helena to assess threats and assign threat rankings to species of concern. The Committee has received information on many species and used it to assess the severity, scope and immediacy of the threats and assign an overall rank of highly threatened, threatened, little threatened or unknown. Much of this information was contributed by professional botanists, but even so there are many species that are unranked because even the best botanists can't go everywhere. It's really the people who live in an area who know what the threats are. For example, Columbia onion (*Allium columbianum*) occurs in only two places in Montana. One of these is between Perma and Hot Springs in rural Sanders County. Part of this population was destroyed by a gravel pit. Who knew a gravel pit was going in? Local people probably knew, but professional botanists did not. That's why MNPS needs the help of citizen scientists.



If you want to help, here's how to find the plant species of concern that are in your county. First, you must have Internet Explorer as your web browser. Enter www.mtnhp.org/Tracker/ in the address bar. Click on "Reports" on the left side of the screen. Then click on "Generalized Observations." Now click on "Filter by Plants," select "vascular plants," and select "all vascular." Then go farther down and click on "Filter by Geography." Click on "county," and pick the counties you're interested in. Go farther down yet and click on "Display." Drag up the green bar (Charts and Data) at the bottom of the screen to get a list of the species of concern in your county. By clicking on the names of individual species you can get more information.

Erratum

Due to an editing error, the the article about Joanne Jennings in the Fall 2010 issue of Kelsey incorrectly credited Linda Lyon with designing the new pollinator garden in Bozeman. Instead, the person behind that design and effort was long-time MNPS member Linda Iverson. Apologies to both Lindas!

Once you have your list of plants, go to the conservation page of the MNPS website (www.mtnativeplants.org/Native_Plant_Conservation) and click on the word "Threats." This page gives you everything you will need. There is a list of species with their ranks, a spreadsheet database with information on the specific threats and a form with instructions that you can download and send in to make your contribution. You could also attend the next Montana Plant Conservation Conference (February, 2012 in Helena) and contribute your information in person. Your information will help land managers prioritize conservation actions and help preserve our native flora.



MNPS Chapters & the Areas They Serve

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

All MNPS chapters welcome members from areas other than those indicated. 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 mailing label tells you the following:

CHAPTER AFFILIATION: CAL=Calyпсо; CF=Clark Fork; F=Flathead; K=Kelsey; MF= Maka Flora; VOF=Valley of Flowers

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Use this form to join MNPS only if you are a first-time member! To renew a membership, please wait for your yellow renewal card in the mail. **Moving? Please notify us promptly of address changes at mnpmembership@gmail.com.**

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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 *Kelsey*, 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 typed, saved in Microsoft Word or rich text format (rtf), and sent electronically to: carokurtz@gmail.com or mailed to Kelsey Editor, 645 Beverly Avenue, Missoula, MT, 59801.

Changes of address, inquiries about membership, and general correspondence should be sent to MNPS Membership, 398 Jeffers Road, Ennis, MT 59729. 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 *Kelsey* 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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Montana Native Plant Society

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