



Castilleja linariifolia

Castilleja

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The World Needs More...

[*Fill in the Blank*]!!

By Bonnie Heidel, *Castilleja* Editor

University of Wyoming's new publicity logo, *The World needs more COWBOYS*, has successfully garnered publicity, while spurring a rash of alternative worldly wishes and commentary. Shortly before the new logo was announced, I learned that members of the U.S. House and Senate legislative chambers came up with an alternate view that the UNITED STATES NEEDS MORE BOTANISTS (no mention of cowboys), as announced through a national native plants listserv for native plant societies.

Information on what has been called the "Botany Bill", is posted at legislative links for the respective chambers (H.R. 1054 Botanical Sciences and Native Plant Materials Research, Restoration and Promotion Act - <https://www.congress.gov/bill/115th-congress/house-bill/1054/text?r=5>); S.3240 - Botanical Sciences and Native Plant Materials Research, Restoration, and Promotion Act - <https://www.congress.gov/115/bills/s3240/BILLS-115s3240is.pdf>). It addresses far more than staffing and may never get out of committee. Regardless, this is a chance to ponder what could happen if the country, and Wyoming in particular, had more botanists.

One provision of the "Botany Bill" in each chamber addresses the hiring of botanists by the Department of Interior. The Senate version even goes so far as to propose that the Pathways program, so widely used in

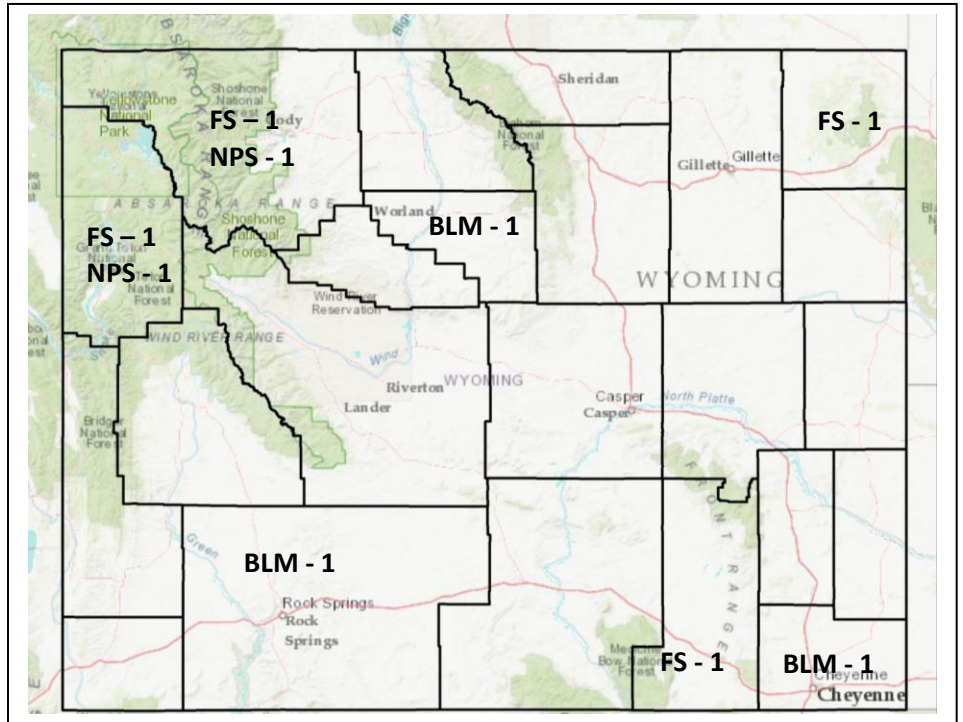


Figure 1. Federal Botanist Distribution in Wyoming, by County

other biological disciplines, should become a career path option for new and recent botany graduates. By current estimates, Wyoming has an average of 1 Botanist per 3,772,951 acres of federal land (if the Botanist category includes Ecologists) using statewide tallies of federal acreages (Figure 1; Table 1). The majority of federal public land units and over half of federal land acreage in Wyoming are devoid of botanists. So a Botany Bill might change this, if current staff can get it off the ground. (Cont. on p. 3)

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WYNPS News

WYNPS Board Nominations: Fall is the time to put out a call for nominations to the WYNPS Board. Candidates will appear on the ballot in December. To nominate any member (*including yourself!*) for 2019 Board positions, please contact Charmaine Delmatier, President (delmatier@wyoming.com), or by the general WYNPS mailing address.

New Members: Please welcome the following new members to WYNPS: Troy Fieseler, Kemmerer; Martina Keil, Moran; Streeter Parker III, Jamul, CA; and Carmen Springer-Davis, Casper.

WYNPS Board – 2018

President: Charmaine Delmatier, Washington (delmatier@wyoming.com)
Vice-President: Katy Duffy, Jackson (owlpals@wyellowstone.com)
Sec.-Treasurer: Dorothy Tuthill, Laramie (dtuthill@uwyo.edu)
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Webmaster: Dorothy Tuthill (dtuthill@uwyo.edu)
Sublette Chapter: Julie Kraft, President (jewelyjoe@hotmail.com)
Teton Plants: Amy Taylor, Treasurer; (tetonplants@gmail.com). *Check the chapter homepage for an exciting slate of talks, September through May!*

Message from the President

What a treat and privilege to witness the enthusiasm, friendship, and professionalism at this year's annual field conference. We were honored to have Orval Harrison as our main speaker and Sherel Goodrich as our field leader. What extraordinary men. I want to thank each of you who annually help make our field trips a wonderful learning endeavor; but mostly for the camaraderie. This will be the end of my fourth time as President and I am humbled by all of you. Next year's trip will take us to another remote area of Wyoming; South Pass. Now a National Historic Landmark, it has been a well-used route for emigrants to Oregon and California. It divides the Wind River Range to the north and the Oregon Buttes to the south. Several are already jumping in to make this yet another exciting annual trip. If you want to participate with planning possible scenarios, places to journey, or topics, please join the wagon train! We will be based out of Lander, but as always there are several places in the wild to overnight. The proposed weekend is June 15 and 16, which coincides with the full moon! I can't wait!

~Charmaine Delmatier

Contributors to this Issue: Charmaine Delmatier, Katy Duffy, Robert Dorn, Bonnie Heidel, Dorothy Tuthill.

Next Issue: Please send articles, ideas and announcements for the next issue by 23 November.

Wyoming Native Plant Society
P.O. Box 2449
Laramie, WY 82073

In Memoriam: Ronald Hartman

Wyoming and botanists across the country lost a leader, pacesetter, colleague and mentor on June 30, 2018, in the death of Ronald Hartman. Ron spent 38 years as Curator of Rocky Mountain Herbarium and Professor of Botany at the University of Wyoming, mentoring 52 graduate students over his career. The Wyoming Native Plant Society dedicated its award for professional excellence in his name (2015). He received the Distinguished Service Award from the American Society of Plant Taxonomists (2016), and the Wyoming Biodiversity Science Award (2017) for his lifetime of work. Ron earned Emeritus Professor status upon his retirement. During his years as a botanist, he described species new to science, authored and co-authored many plant taxonomy publications and contributed treatments to the Flora of North America volumes, the Intermountain Flora, and the Jepson manual, and a species of *Elaphandra* and the *Hartmaniella* genus were named after him. *Look for future information on a Memorial.*



The World Needs More... (continued from p. 1)

The aspirations of Botanists and Cowboys are not mutually exclusive, and in fact, some of Wyoming's key players in maintaining botanical and vegetation resources are range conservationists and members of the ranching community. Botanists have anchored the University of Wyoming botanical and ecological leadership position in the state, region and country going back to 1887 and its first faculty, among whom was Aven Nelson. He went on to found the Rocky Mountain Herbarium, served as the 10th President of the University of Wyoming, and mentored leading figures in botany and range management.

Botany is, paradoxically, a splintered discipline and a biological hub. The word "botany" is also relatively obscure, and the "*botanic*" word root might be linked to skin care products more than to science in the

public eye. Botany and ecology are sometimes mistaken for *only* plant identification and plant species composition, but they are also the "heavyweights" in landscape energy budgets and associated climate conditions, anchor to ecosystem services, frontiers of taxonomy and evolution, and they delve into rare plant species conservation and major parts of molecular biology. That is only the beginning – botany in the broadest sense encompasses fundamentals of forestry, range management, landscape reclamation/restoration and wildlife habitat management, underpinnings of agriculture and horticulture,...and *yes*, weed management.

The world could definitely use more botanists (and botany-grounded professionals). Maybe the place to start changing the world is close to home.

Table 1. Federal Botanist Distribution in Wyoming, by Agency¹

Department	Agency	Tally of areas	Tally of Botanists based in WY federal lands	Mean acres per Botanist ² and min/max values	Acres without Botanists
Dept of Agriculture	U.S. Forest Service	7 National Forests ³ plus natl grassland	4	1,892,268 (201,134 - 3,190,947)	1,107,436
Dept of Interior	Bureau of Land Management	10 Field Offices	2 (plus 1 Statewide Botanist!!)	2,500,000 (est.)	13,550,771 (est.)
Dept of Interior	National Park Service	2 major parks; 4 other units	2	1,062,042 (224,053 - 1,900,032)	220,887

Note: The sum of federal acreage in Wyoming is 30,183,609 ac, from: Vincent, C.H., L.A. Hanson and C.N. Arguata. 3 March 2017. Federal Land Ownership Overview and Data. Congressional Research Office. The source of botanist employment data is personal experience. Additional information about the Botany Bill is posted on a website of the Native Plant Conservation Campaign (<https://botanybill.weebly.com/>).

¹ Tally of full-time botany positions in federal land-managing agencies. It does NOT include seasonal employees, interns...or the stoic botanical work by natural resource professionals in other disciplines.

² Based on the acreage of the public land unit where the person is based, not on agency acreage statewide.

³ Three of the seven national forests straddle state lines in which most of the national forest is outside Wyoming, and in most cases, there is a Forest Botanist or Ecologist position based in the adjoining state.

2018 WYNPS Annual Meeting – July 20-22, in Hams Fork Country



Above: *Epilobium canum* (“hummingbird trumpet”) greeted tourgoers with its audacious red.
By Lynn Stewart.



Above: Sherel Goodrich led the tall forb tour and, (Left) Talked shop with B.E. “Ernie” Nelson.
By Charmaine Delmatier.



Above: Orval Harrison provided an open air lecture on early exploration of the area, based on his book “History of Star Valley: Natural, Cultural, and Economic”, 1st place winner of the 2016 WY Historical Society non-fiction award.
By Charmaine Delmatier.



Left: The hummingbird trumpet plant (above) was fated for a plant press, at the hands of intrepid tourgoers, Jill Randall and Julie Kraft (left and right, respectively).
By Charmaine Delmatier.

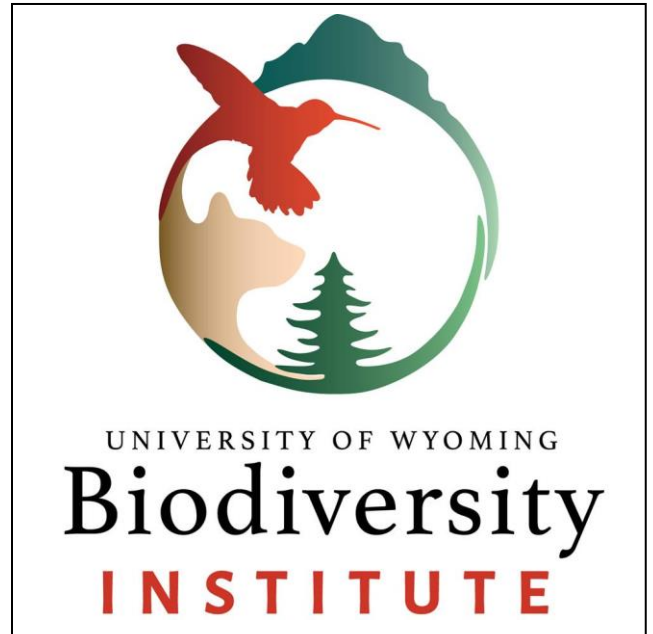
Upcoming Event - Prickly Puzzles: Exploring the Colorado Flora

Come hear Jennifer Ackerfield, author of *Flora of Colorado*, give a public talk about “Prickly Puzzles: Exploring the Colorado Flora”, on 16 October (Tuesday) at 5:30 pm in the Berry Biodiversity Conservation Center (University of Wyoming, on Lewis Street). The event is free and open to the public, co-hosted by the Biodiversity Institute, Rocky Mountain Herbarium, and Extension Service. The talk will be followed by a reception.

Biodiversity Breakthrough or Breakdown?

On July 27th, 2018, the University of Wyoming (UW) announced closure of the UW Biodiversity Institute by the end of the year in December. The text in the news release on the decision was prefaced with UW’s commitment to biodiversity research and promise of future breakthroughs, also acknowledging the vital importance of the Biodiversity Institute in elevating the profile of biodiversity science.

The Biodiversity Institute was established in 2012 with generous funding from Robert and Carol Berry through the Wolf Creek Charitable Foundation. Their earlier donations -- matched by the Wyoming Legislature -- made possible construction of the Berry Biodiversity Conservation Center on the UW campus. The need for a more formal approach to fundraising was the stated basis for the sudden decision, and by inference, the transition or breakthrough to a new approach.



In the absence of news since July, this newsletter draws from past Biodiversity Institute announcements, events and publications as the kinds of collaboration and accomplishment at risk by such a decision:

Events

- Bioblitz events around the state, prominently including native plants
- Citizen Science statewide conferences and initiatives
- Daytime and evening programs featuring prominent botany/ecology speakers, facilitated for UW academic audiences, and popular plant programs co-hosted with the Rocky Mountain Herbarium for the general public
- Native plant walks co-hosted with the Rocky Mountain Herbarium for the general public
- Program in Ecology events and opportunities that promote student research
- Promoting and conducting tours of the “native plant green roof” at the Berry Biodiversity Conservation Center and of the nationally-significant Rocky Mountain Herbarium. There have been over 150 school group tours (K-12) lead by Biodiversity Institute staff at UW!

Initiatives

- Lifetime achievement awards for Biodiversity Sciences including leading Wyoming botanists
- New place-based educational curricula including “Sagebrush Expedition” for 5th graders
- WyoBio portal for people to contribute species data

Publications

- Key to the Conifer Trees of Wyoming
- Monarchs and Milkweeds Guide
- Mountains and Plains, as contributor and promoter
- Plants with Altitude, Regionally Native Plants for Wyoming Gardens
- Distribution center for other state, regional and national publications such as the Pocket Guide to Sagebrush

Botanists' Bookshelf (General Public Bookshelf, too!):

Elpel, Thomas J. 2013, 6th ed. **Botany in a Day, The Patterns Method of Plant Identification.** HOPS Press. [Look for new edition out shortly.] Color illustrations. 235 pp. ISBN: 978-1-892784-35-3.

Book review by Katy Duffy

"Get *Botany in a Day!*" is one of the best pieces of advice I've ever gotten. It's what Jackson botanist Kevin Taylor said in answer to my question about how to improve my knowledge of plant families. That was easily ten years ago. I bought *Botany in a Day, The Patterns Method of Plant Identification* by Thomas J. Elpel and I've frequently relied upon it to learn (and re-learn) family characteristics. A few years ago, I discovered and bought the

6th edition, this one in full color. To my joy, this edition contains many of the new family associations.

While the book is aimed at people who harvest wild plants for medicinal use, it offers exactly what I requested: a non-overwhelming means of learning how to recognize members of the plant families found in the U.S. No, it hasn't—and won't—turn me into a professional botanist. That would take years and a lot more effort and study on my part. But *Botany in a Day* has enhanced my love of wildflowers by providing me with a graphically illustrated, practical and understandable introduction to botanical terms and plant family characteristics.

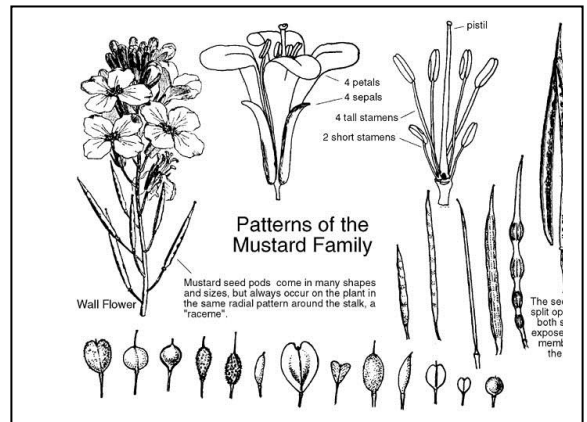
The inside front cover has an illustrated and most useful Quick Guide to Flower Terms. There's an explanation of plant evolution and phylogeny and the medicinal and herbal uses of various plants, plus which ones are poisonous. Page 24 is a procedure to use to profile your flower before you use the keys; this page may be copied for use in classrooms, so I use it with classes and tours I lead that focus on Yellowstone wildflowers. There are

illustrated keys for dicot flowers, trees and shrubs and monocot flowers to aid users in determining the family to which a mystery plant belongs. All of this can be found in Part I, along with concise descriptions of the mint, parsley, mustard, pea, lily, grass, rose and aster families that are illustrated with color photos and line drawings.

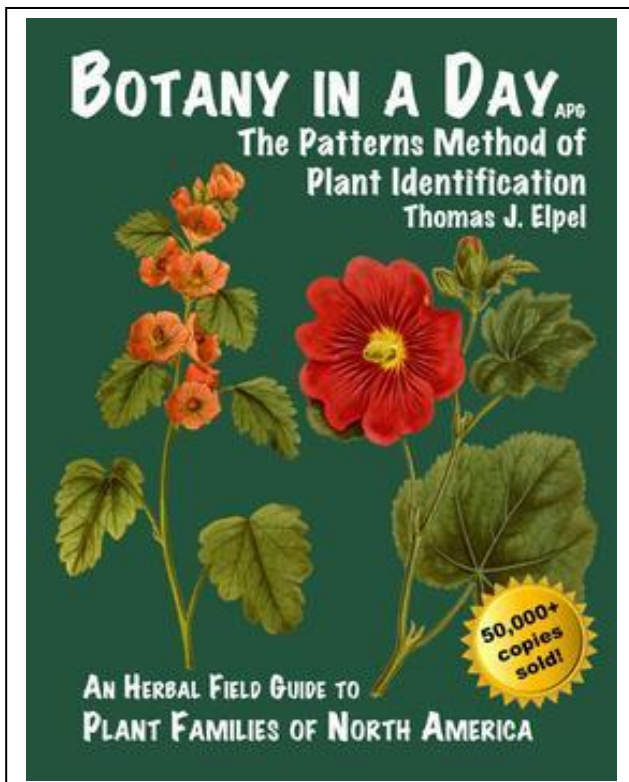
Part II is a reference guide to North American plant families. Coverage of each family includes specific characteristics, one or more representative genera and herbal uses. Color illustrations and line drawings accompany the text for each family.

Although numerous taxonomic changes have occurred since the sixth edition was published in 2013, I have found that *Botany in a Day* continues to offer an appropriate starting point for identifying particular plant species. For those who prefer learning by video, Thomas Elpel has a video for you: <https://www.youtube.com/watch?v=D1DePIU15z4>.

Botany in a Day continues to enlighten me and I've received nothing but positive feedback from people I've encouraged to read it. Check it out!



Above: Example of information on the Mustard Family (Brassicaceae) as printed in *Botany in a Day*



23rd Street Wildscape

By Jane Greaser

The new 23rd Street Wildscape is located at 1959 N 23rd Street, Laramie, as a public native plant garden in a residential neighborhood. It has been and remains an aspiration come to life thanks to the WYNPS Small Grant funds which jumpstarted the project. For years I wondered if it would ever really happen.

What I've learned since spring when I fractured my wrist would fill a book, but, of greater importance, was the fact that I have had the good fortune to have enough help and support of friends, volunteers, WYNPS members, and husband throughout the injury and physical therapy.

One day in early summer Dorothy Tuthill made a visit to help me begin identifying what I had in my field that was native and other species I needed to discourage. I kept all this in mind as I weeded and watered. Later in the summer Ernie Nelson, WYNPS member from the Rocky Mountain Herbarium came out and further educated me as to many more acceptable species of forbs and grasses which seemed to appear in just a few weeks. He also strongly advised me the smooth brome had to go, which I thought was kind of pretty.



Above: Installing trenches and landscaping.
By Jane Greaser

Friends donating time and/or materials, etc. are many. Among them are Bob Blake who crafted a nice wooden sign and logo to set at the east entrance to the Wildscape, and Steve McIntyre cut up an entire pine tree for me to make stools for children to sit on when we have nature talks and activities. Ron Schreibeis has answered numerous questions on email and text as well as donated much of the tubing and other parts for the drip system.

With berms, flagstone, and some existing native life already in place, our first step was the drip system, consisting of trench digging by volunteers and laying pipe by RM Reclamation, then partial backfilling, leaving open places for adding emitters. Later came plant shopping in about three different waves, beginning with Laramie Garden Club sale, which was great fun because of all the native plants they had available this year at low prices. Various trips to nurseries during the summer yielded about a third of the number of plants used in the garden. With \$45 remaining, I hope to find fall bulbs somewhere to put in soon.

Another summer misfortune occurred-- 2 rounds of contact dermatitis during which I couldn't be in the sun. Also, my goal of one large order for the rest of the plants did not happen; it was already too late for good selection of pure native species, but I was able to come by a Big Wyoming sagebrush, a RM Penstemon, and 3 nice yellow buckwheat.

Doing better and getting back outdoors I began learning more about what I had around the property that was classified as usable in the 23rd St Wildscape. I was able to transplant white sagebrush, soapwort, and Veronica to the project, thereby adding 3 more to my plant list, bringing the native species count to 50. It was my opinion that 9 non-native plants should remain in the garden since they are bee friendly and have been there at least 35 years. Three plants were sold to me as native because of the common name; I hadn't learned to look at the scientific names very closely. This was a most valuable lesson.

Some final touches coming this week are adding nice labeling using common names engraved by Star Awards, and monument pro John Montgomery will smooth out the vertical side of one of the south boulders and engrave "23rd St Wildscape." Gorilla hair mulch for protection from cold soon to come will be laid next week and will hopefully hold in the good moisture.

Wishing I could have accomplished more makes me want to prolong summer somehow and keep going, but we must always factor in winter so, like me, nature gardens can take a rest from growing season and allow the new fresh green to return a little more mature next spring.

A huge welcome to plant society members, fellow gardeners, and public to visit before it freezes!

(Jane Greaser was a 2018 Markow Small Grant recipient.)

Growing Native Plants

Part 29. Forbs for Dryer Sites

By Robert Dorn

The term "Dryer" here does not refer to desert conditions but rather to prairie-like or foothills conditions where annual precipitation is around 12 to 18 inches. In the dryer areas, supplemental watering may be necessary to grow these plants.

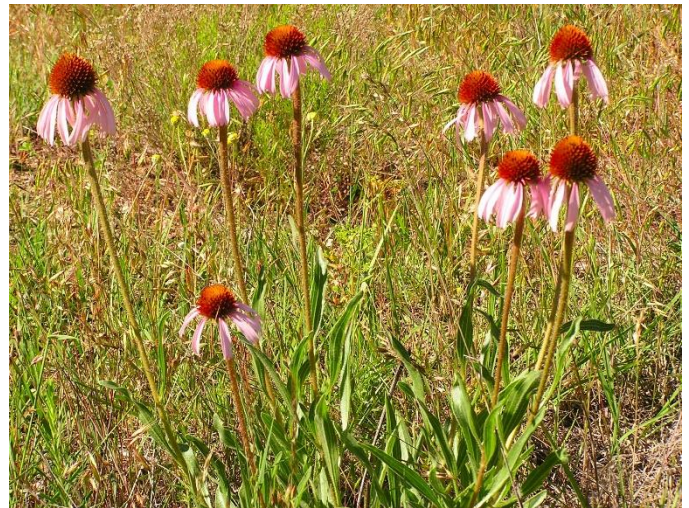
Calochortus nuttallii, Nuttall Mariposa-lily, is a perennial to 12 inches tall growing from a bulb. The leaves are grass-like, to 7 inches long, and wither away shortly after flowering. The flowers are to 2.5 inches long, 1 to 4 per stem, normally white with the inner base of each petal marked with a reddish-brown to purple band or spot above a circular yellow gland area. They appear from May to July. The plants occur naturally in open places of the plains, basins, and lower mountains often with sagebrush. They prefer full sun and well drained soils but will tolerate some clay. They must be kept dry after flowering. They are considered a challenge to grow. Mulching in winter may help survival. They can be grown from seed that has been cold stratified for 60 days or more. Do not dig the bulbs from the wild nor purchase wild-dug bulbs. The plants may take 3 years to flower. Seed is commercially available.



Calochortus nuttallii, Custer County, SD

Echinacea angustifolia, Prairie Coneflower, is a perennial to 2 feet tall and half as wide. There are one to few stems per plant. The leaves are to 8 inches long and 1.5 inches wide. The leaves and stems are prickly

hairy. The ray flowers are pink to light purple and are reflexed downward from the flower head. The disk flowers form a raised mound and are reddish- or purplish-brown. The flower heads are to 3 inches across at the stem tips. They appear from June to August. The plants occur naturally in dry areas of the plains. They prefer full sun and grow in both clay and well drained soils. They are drought tolerant. They are easy to grow from seed but are slow to establish. Cold stratification of the seed for 90 days may be helpful. Small seedlings with one leaf can be transplanted readily but plants with two or more leaves are difficult to transplant. They can also be propagated from rootstock cuttings or divisions once the plants are well established but do not divide every year. It is in the nursery trade.



Echinacea angustifolia, Fall River County, SD

Mentzelia decapetala, Tenpetal Blazingstar, is a biennial or perennial to 3 feet tall and 2 feet wide with 1 to few stems. The leaves are coarsely toothed or lobed, to 6 inches long and 1.5 inches wide, with short barbed hairs which cling to clothing. The flowers are white or cream colored to pale yellow, fragrant, and to 6 inches across. They open in late afternoon and evening but are normally closed during the rest of daylight. There are many flowers per plant and they bloom over a long period from July to September. The plants occur naturally in dry, open, barren areas in the plains and basins. They prefer full sun and dry rocky or clay soils. They can be grown from seed sown outdoors in fall or cold stratify for 60 days or more for spring planting. Plant with a very thin soil cover. Seed is commercially available.



Mentzelia decapetala, Goshen County

Penstemon angustifolius, Narrowleaf Penstemon, is a perennial to 16 inches tall with 1 to several stems. The leaves are narrow and elongate. The flowers are blue to blue-purple and to 0.75 inch long densely clustered for about half the stem. They appear in May and June. The plants occur naturally in dry, often sandy places on the plains. They prefer full sun and dry to moist sandy soils. The plants can be grown from seed planted outdoors in fall or cold stratified for 90 days or more for spring planting. Barely cover with soil. Don't expect high germination.



Penstemon angustifolius, Goshen County

Solidago rigida, Stiff Goldenrod, is a perennial to 18 inches tall and 12 inches wide. The leaves are to 6 inches long and 4 inches wide. The flower heads are golden-yellow, each to 0.5 inch across, but densely clustered in a broad crown at the tips of the stems. They appear from August to October. The plants occur naturally in dry open areas of the plains. They prefer full sun and well drained soils. They can be grown from seed surface sown outdoors in the fall but germination may be poor. They can also be grown from rootstock divisions. Seed is commercially available.



Solidago rigida, Crook County

To see the above plants in color, go to the newsletter on the Society website.

To see the above plants in color, go to the newsletter on the Society website.



When you think of me

Think of mountains and trees,

Think of rivers and streams,

My spirit will be with you

Every time you climb a mountain,

Collect a plant, or try to identify

what you just collected,

Then you'll know I'm free,

Fulfilling my dreams.

(From a Facebook posting on Ron Hartman's homepage; author unknown.) See p. 3

Wyoming Native Plant Society is a non-profit organization established in 1981 to encourage the appreciation and conservation of the native plants and plant communities of Wyoming. The Society promotes education and research through its newsletter, field trips, annual student scholarship and small grants awards. Membership is open to individuals, families, or organizations. To join or renew, please return this form to:

Wyoming Native Plant Society
P.O. Box 2449
Laramie, WY 82073

Name: _____

Address: _____

Email : _____

Check one: New member Renewing member

Renewing members, check here if this is an address change.

Check here if you prefer to receive the newsletter electronically

Membership

WYNPS annual membership: \$10.00

WYNPS annual membership + scholarship support: \$20.00
(\$10.00 for membership and \$10.00 for Scholarship fund)

WYNPS Lifetime membership: \$300 (\$150 for membership and \$150 for Scholarship fund)

Sublette Chapter annual membership: \$5.00

Teton Chapter annual membership: \$5.00

Total enclosed: _____ THANK YOU!

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