



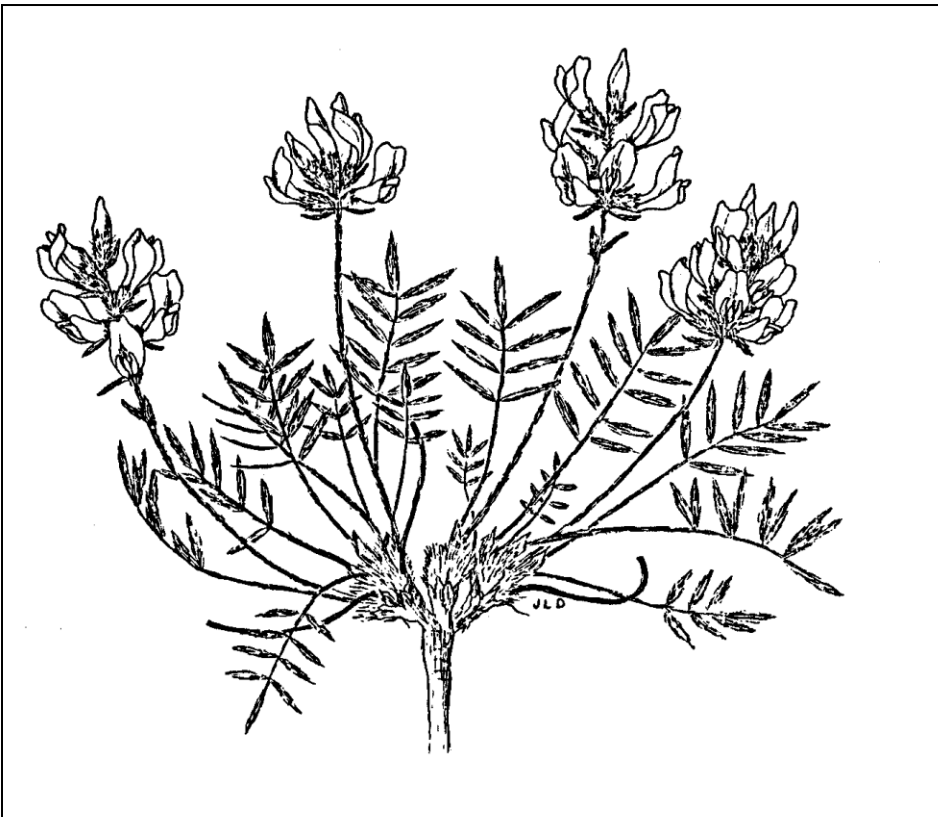
Castilleja linariifolia

Castilleja

Publication of the Wyoming Native Plant Society

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Above: Wyoming locoweed (*Oxytropis nana*), by Jane L. Dorn, is a state endemic that graces the cover of the current flora (Dorn 2001). It was also first mascot of Wyoming Native Plant Society (1982-1994), and appeared on our 20th Anniversary Issue in May 2001 [*Castilleja* 20(2)].

ability of a species to withstand stochastic disturbance, i. e., random events (Wolf et al. 2015). Resilience is positively related to population size and growth rate and may be influenced by connectivity within and between populations. Generally speaking, populations need abundant individuals within habitat patches of adequate area and quality to maintain survival and reproduction in spite of disturbance.

Wyoming endemics do not “hang out in crowds” with most other plant species. They tend to be in areas with sparse plant cover. They generally don’t fraternize with other endemics; there is no single region with a monopoly on endemism, though the Middle Rockies and Wyoming Basins Ecoregions have the highest numbers of endemics and tilt the diffuse pattern of endemism toward the western part of the state.

Few locations support more than one state endemic. Bottom line: Each of the 36 Wyoming endemics offers its own rendition of resilience. (Cont. p. 9)

Cowboy State Endemics:

36 Renditions of Resilience

By Bonnie Heidel, Wyoming Natural Diversity Database

Thirty-six flowering plants, including species and varieties, are endemic to Wyoming. If there is any common denominator among our state endemics, they are generally species of rugged habitat with “fierce independent streaks” relative to many of our other plants.

Wyoming endemics are resilient. **Resilience** is a term widely used by architects and disaster response teams, now gaining usage in species conservation (USFWS 2016). Resiliency describes the

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WYNPS News

Renew and VOTE: HELP US RING IN THE NEW YEAR – dues are due for 2020!! The calendar year is the WYNPS membership year. Enclosed is your renewal form, a 2020 ballot and introductions to a great slate of candidates. Renewals can also be done online through PayPal, and voting can be done through the Society homepage: www.wynps.org. Votes need to be received by 31 January – thank you.

2020 Annual Meeting: Please mark your calendars for the weekend of June 26-28, for the 2020 annual meeting in Laramie, including a Rocky Mountain Herbarium Friday evening event. Saturday and Sunday hikes will feature two state endemics and early alpine plants of the Medicine Bow Range (weather-permitting☺). Look for an agenda in the next newsletter.

Call for scholarship and grant applications: The call for student scholarship and small grant applications is also in this issue. They are being accepted now through 15 February, by mail or the WYNPS email address. *Please post and circulate this announcement.*

WYNPS Board – 2019:

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(tetonplants@gmail.com). ...Check the chapter homepage for an exciting slate of talks!

Contributors to this Issue: Robert Dorn, Katy Dufy, Bonnie Heidel, B. E. Nelson, Dorothy Tuthill.

Message from the President

(w) Ho (w) ho!
and
Winter Greetings!



My major resolution for 2020 isn't a new one: seize every opportunity to promote awareness, appreciation and protection of all native plants and other native species, particularly rare species and those threatened by climate change. Driving cross-country from the East Coast to the Greater Yellowstone Ecosystem this past November renewed and strengthened my commitment. Unlike so much of the U.S. where human activities dominate, Wyoming has extensive public lands, especially national parks, designated wilderness and other natural areas where native plants flourish and natural processes continue to occur with considerably less human influence than in intensively developed places. At this cold and snowy time of the year, I am reminded what a privilege it is to live where I can witness firsthand fine-tuned plant and animal adaptations to winter. And I firmly believe I'm just one of many supporters of the Wyoming Native Plant Society who share similar native plant resolutions.

~Katy Duffy

Welcome New Members: We welcome the folks who joined since March: Kelly JS Carnahan, Big Piney; Gail Isaacs, Dubois; Meg Gilbert and Julie Holding, Jackson; Michael Hamilton, Pasadena, CA; Paige Hellbaum, Buffalo; Carlyn Hunter, Wilson; Stephanie Slaymaker, Dubois.

Treasurer's Report: Balance as of 27 Nov 2019: Scholarship = \$536; General = \$7,610.82; Total = \$8,146.82.

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

Botanistis' Bookshelf:

Phenomenal Family Guide

Spellenberg, R. and N. Zucker.

2019. **The Sunflower Family: A guide to the family Asteraceae**

of the contiguous United States. Sida, Bot. Misc. 52. Botanical Research Institute of Texas, Fort Worth, Texas, U.S.A. Color illustrations. 574 pp. ISBN: ISBN-13: 978-1-889878-65-2. (\$45.00 plus shipping)



Book review by B. E. Nelson, RM

The Sunflower Family is the largest family of flowering plants in the United States and in the world, one that is on the radar of botanists, farmers, gardeners, and land managers across the country. This year, an extraordinary treatment of the family came out in print by Spellenberg and Zucker (2019), featuring every single one of the 428 genera in the lower 48 states and southern Canada.

The amazing array of genera in the family are represented in high-quality photographs that show diagnostic characteristics of each genus. The accompanying text describes generic characteristics, a section called comments that include positive or negative economic impacts and uses with a highlight of distribution and habitat, and finally, a section called “compare” that simply lists one or more genera that are easy to confuse with the genus under review. In the back of the book is a list of “Waifs and Mysteries”, escaped cultivars that do persist and plants which have been reported but could not be verified.

This book can be appreciated on many levels. It starts out with an extensive Introduction that explains the structure and terminology of the flowers using colored diagrams, then gives common identifying features of the 13 prominent tribes. This is followed by a review of each tribe (number of genera and species, world distribution, number of genera and species in the U.S., diagnostic characteristics).

It is organized by the 25 tribes found in the country, and each genus within the tribe presented in an intuitive sequence from smallest to biggest of flower head sizes. The organization of the book and care in its assembly offer a pictorial documentary of relations and divergence. It provides an easy immersion into the technical terminology and fundamentals of classification.

The new book is extremely easy to use for a work that complements and largely follows the taxonomic

conventions in highly technical publications on the Sunflower Family of recent decades, including the three volume treatment of the entire family in *Flora of North America* (Barkley et al. 2006), and not long afterward, *Systematics, Evolution and Biography of Compositae* (Funk et al., eds. 2009). It provides a visual representation of every genus in Wyoming, and by the current Wyoming checklist counts maintained at RM, there are 121 genera in the Asteraceae.

These points are underscored in book jacket text, promoting the publication as:

“...the only comprehensive identification guide to the Sunflower Family of the contiguous U.S. and southern Canada. Here, 1765 photos help identify 428 genera and nearly 700 species of sunflowers, daisies, asters, and their relatives found outside of cultivation. From lowly cudweeds to lively daisies and statuesque sunflowers (baffling to the beginner), the plants in this family are notoriously known as the DYCs (the darned yellow composites). Includes geographic ranges, habitats, genus descriptions, supplementary comments, with cross-referencing to similar genera. All in minimally technical language.”

The book is larger (and thicker!) than a typical field guide at 6 5/8” x 9 5/8” (1 1/4” thick). But it has the same efficient use of space and is suited for both public and professional audiences...and libraries.

The top of the acknowledgements page has what may be the original book title envisioned by the authors: “*A Book to Promote Botanical and Environmental Education, Greater Appreciation, and Conservation of the Sunflower Family in the U.S.A.*” Over the course of ten years, 180,000 miles and ample endowments of persistence and passion, the husband-wife authorship team have produced that remarkable, unprecedented book come true – a *must- have* book for anyone interested in the Asteraceae (Sunflower Family).

References

- Barkley, T.M., L. Brouillett, and J.L. Strother. 2006. Asteraceae. In: *Flora of North America* Editorial Committee, eds. 1993+. *Flora of North America North of Mexico*. 12+ vols. New York and Oxford. Vols. 19-21.
- Funk, V.A., A. Susanna, T.F. Stuessey and R.J. Bayer, eds. 2009. *Systematics, Evolution, and Biography of Compositae*. International Association for Plant Taxonomy, Vienna, Austria.

Rocky Mountain Herbarium Milestone: 1,000,000th specimen

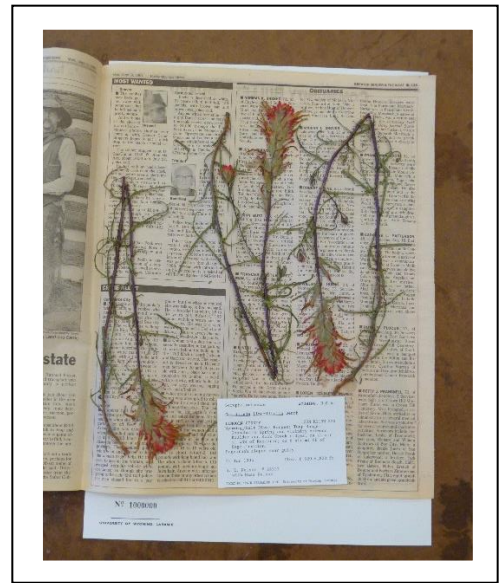
By Dorothy Tuthill, Biodiversity Institute
[Reprinted from RM Friends Newsletter 5(2)]

The Rocky Mountain Herbarium (RM) will be mounting specimen number 1,000,000 in January! The specimen selected is a *Castilleja linariifolia* (Wyoming Indian paintbrush) collected by Curator Ernie Nelson in 1993, in Lincoln County. The mounting will occur during the January Board of Trustees meeting. Once the glue is dry, this honored specimen will be framed for permanent display; its first public appearance will be during the Millionth Specimen Event. See the Stay tuned for more information on this spectacular event.

A bit more on the selected species and specimen:

Castilleja linariifolia is, of course, the Wyoming state flower. Its range includes 11 western states, extending as far west as the Channel Islands. Wyoming is at the eastern edge of its range—in fact, Wyoming Indian paintbrush is not found in the eastern plains of Wyoming, nor in parts of the Bighorn Basin. To find out exactly where to see *C. linariifolia* in Wyoming, check out the RM database.

Dr. Grace Raymond Hebard of the University of Wyoming, “a force to be reckoned with,” proposed this species to be the Wyoming state flower, at a time when many states were adopting state flower emblems. Another UW person, Dr. Aven Nelson, strongly opposed the selection because: Indian paintbrushes are not common throughout the state; there are too many varieties and only an expert can tell them apart; they are parasitic, feeding on the roots of other plants; there was no wide-spread support for the plant; and the fringed gentian chosen by Wyoming schoolchildren was a sentimental favorite.¹



Above: The *Castilleja linariifolia* specimen (Nelson 26353 RM) will be mounted ...and framed... next month as the 1,000,000th specimen at RM.

Apparently, Dr. Hebard did not let the sentimentality of schoolchildren dissuade her, and the state legislature adopted *Castilleja linariifolia* as the state flower in January 1917.

Wyoming Indian paintbrush has another, older connection to Wyoming: the species was described by George Bentham in 1846 from a specimen collected in 1842 by John Fremont, with locality identified only as Wyoming; Rocky Mountains.

The millionth specimen is one of 17,446 collected during an inventory of the Salt River and Wyoming Ranges conducted by Ron Hartman and Ernie in 1992-93 for the US Forest Service. Ernie was assisted by his son Russ, about 12 at the time. According to Ernie, Russ feared being captured by “werevoles” during this trip. Fortunately, he escaped every time; unfortunately, he failed to collect a voucher, so that observation remains unverified.

¹https://www.netstate.com/states/symb/flowers/wy_indian_paintbrush.htm. December 4, 2019

Delisting of Colorado Butterfly Plant

Colorado butterfly plant was removed from determination as Threatened under the Endangered Species Act, in a decision announced by the U.S. Fish and Wildlife Service (<https://www.federalregister.gov/documents/2019/11/05/2019-24124/endangered-and-threatened-wildlife-and-plants-removing-oenothera-coloradensis-colorado-butterfly>) on November 5, 2019. The first-ever delisting of a Wyoming species was heralded as a recovery success. This starts a phase referred to as the Post-Delisting Monitoring stage of study. Watch for more Colorado butterfly plant news...next year!

Growing Native Plants

Part 34. More Rock Garden Plants

By Robert Dorn

Astragalus spatulatus, Draba Milkvetch, is a mat forming perennial to 4 inches tall and 6 to 24 inches across, more densely matted in dryer areas of the western half of Wyoming. The leaves are mostly simple and narrow and up to 2.5 inches long but usually much less. The flower color can vary but is usually pink-purple with often cream colored wing tips, each flower up to .35 inch long and in clusters of 2 to 11 on short stems among the leaves. They appear from May to July. The plants occur naturally in open, often gravelly or rocky places in the plains, basins, and mountains. They prefer full sun and dry, well drained soils. They can be grown from seed which should be scarified before planting. Seed is commercially available.



Astragalus spatulatus, Goshen County

Eremogone hookeri, Hooker Sandwort, is a perennial forming tight, usually mounded, cushion mats to 6 inches across. The leaves are very narrow and to 2 inches long but usually much less. The flowers are white, to 0.4 inch long, and in dense clusters at the tips of short flowering stems to 3 inches high. They often cover the entire mound. They appear from May to July. The plants occur naturally in open rocky or sandy areas in the plains and basins. They prefer full sun and well drained soils. They can be grown

from fresh seed but germination may be low. Seed is commercially available.



Eremogone hookeri, Goshen County

Penstemon laricifolius, Larchleaf Penstemon, is a perennial to 8 inches tall and forming loose mats to 1 foot across. The leaves are very narrow and less than 1 inch long. The flowers are from white to pink or lavender, to .75 inch long, and in small clusters scattered along the upper half of the stems. They appear in June and July. The plants occur naturally on dry, rocky, open places, often on limestone, in the plains, basins, and mountains. They prefer full sun and dry, well drained soils. They can be grown from seed sown outdoors in the fall or cold stratify for 30 days or more for spring seeding. Seed is commercially available.



Penstemon laricifolius, Sweetwater Co.

Penstemon virens, Green Penstemon, is a perennial to 16 inches tall and somewhat mat forming. The leaves are to 2.5 inches long and rarely to 1 inch wide. The flowers are blue-purple, to .75 inch long, and scattered along the upper half of the stems. They appear from May to August depending on elevation. The plants occur naturally in rocky or gravelly places in the upper edge of the plains, the foothills, and mountains. They prefer full sun and dry, well drained soils. They can be grown from seed sown outdoors in the fall.



Penstemon virens, Converse Co.

Stenotus acaulis, Stemless Goldenweed, is a perennial to 6 inches tall forming mats to several feet across. The leaves are narrow, to 2 inches long, and mostly basal. The flowers are yellow, the heads to 1.5 inches across, solitary at the stem tips, but often nearly covering the mat. They appear from May to July. The plants occur naturally in dry, open places in the plains, basins, and mountains. They prefer full sun and dry, well drained soils. They can be grown from seed which is commercially available.



Stenotus acaulis, Uintah Co., UT

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

Western Confluence

NATURAL RESOURCE SCIENCE AND MANAGEMENT IN THE WEST

Look for a theme issue that features a special class of Wyoming plants - NONNATIVE SPECIES - in the upcoming issue of *Western Confluence*, a magazine about natural resource science and management in the West. It will be posted at the Western Confluence homepage:

<https://www.westernconfluence.org/>

Cowboy State Endemics, continued from p. 1

In recent decades, Wyoming has lost a few endemics,... FORTUNATELY not because they went extinct, but because outlying populations have been discovered in adjoining states. Everything on the compiled list of state endemics (Table 1) represents herbarium documentation and point-in-time review of such documentation.

We also gain endemics from time to time, in cases when a taxon known only from Wyoming is published as new to science. The most recent such addition was smooth summer milkvetch (*Astragalus hyalinus* var. *glabratus* Evert ex Dorn) as published in 2014 by Robert Dorn, ...who is also the champion in having published taxonomic circumscriptions or revisions for more state endemics among Wyoming plants (total=11) as well as discovering more than anyone else. Plant taxonomists are hard at work on a couple more possible state endemics, developing the scientific documentation needed before they are included on the state checklist by Rocky Mountain Herbarium and on the roster of state endemics.

This recent gain in state endemics is the exception rather than the rule. Most Wyoming endemics have been known for a long time. Wyoming locoweed (*Oxytropis nana*) that adorns the cover of all three editions of *Vascular Plants of Wyoming* (Dorn 1988, 1992, 2001), was first collected by Thomas Nuttall in 1834, long before statehood. Laramie columbine (*Aquilegia laramiense*) was first collected by Aven Nelson in 1895, and he went on to describe it the next year (Nelson 1896).

How does Wyoming's number of state endemic plants stack up with other states? Nebraska had exactly one endemic plant species, blowout penstemon (*Penstemon haydenii*)...until an intrepid Wyoming BLM biologist discovered it (actually, *re-discovered* it) in Wyoming. So now, Nebraska, as with other northern Great Plains states, have zero endemic plant species. California, by contrast, has endemic plant species numbering in the 1000's, long recognized for the

high level of endemism in its flora (Stebbins and Major 1965).

Three large plant families contain over half of Wyoming's endemics, including the Mustard Family (Brassicaceae; 9 endemics), the Aster Family (Asteraceae; 8 endemics) and the Bean Family (Fabaceae; 8 endemics). Technically, there's a 37th endemic species: fruit rockcress, or Yellowstone rockcress (*Boechea fruticosa*), as collected by Aven Nelson in Yellowstone National Park in 1899 and described by him (Nelson 1900). While it is accepted in the *Flora of North America* treatment (Al-Shehbaz and Windham 2010), botanists have searched to relocate it unsuccessfully ever since 1939, and some hold that it may represent a non-persisting hybrid or robust variant of a common species.

Wyoming endemics are almost evenly split between montane settings, i.e., the Middle Rockies Ecoregion, and basin settings, i.e., the Wyoming Basins Ecoregion (Figure 1). This is not to say that they are found throughout such regions; the majority are highly restricted, sometimes at foothills elevations intermediate between mountains and basins. They may otherwise be restricted to unusual substrates, e.g., the volcanic ash of the Beaver Rim landscape where three endemics converge. They may have underlying habitat commonalities, e.g., the tectonically active Yellowstone Plateau where geysers, thermally-influenced soils in general, and tectonic influence on lake levels, provides habitat for another three endemic species that are restricted to Yellowstone National Park (Whipple 2012).

Wyoming, like many other states, has political boundaries that have no bearing on biological ones. There are close to twice as many species that have over half or more of their known records or known extent in Wyoming rather than outside state boundaries. A few such species straddling state lines are actually more limited in their total number of records or their total aerial extent than some of the *de facto* state endemics. (Continued, p. 9)

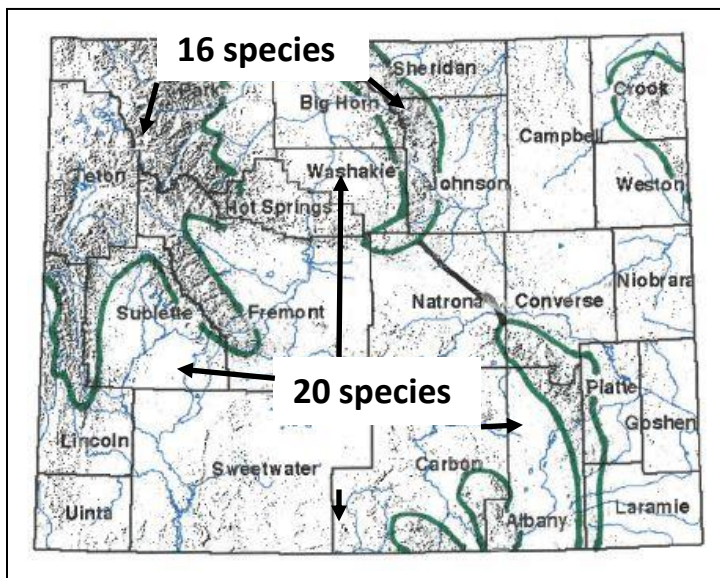
Table 1. WYOMING ENDEMIC PLANT SPECIES

Scientific Name ¹	Common Name ²	Family ³	Global/State ranks ⁴	Ecoregion	Endangered Species Act Status
<i>Abronia ammophila</i>	Yellowstone sand verbena	Nyctagin-	G1/S1	MR	Petitioned; listing denied. Former C2 candidate.
<i>Agrostis rossiae</i>	Ross' bentgrass	Po-	G1/S1	MR	Petitioned; listing denied. Former C2 candidate.
<i>Aquilegia laramiensis</i>	Laramie columbine	Ranuncul-	G2G3/S3	SR	Former C2 candidate for listing.
<i>Artemisia porteri</i>	Porter's sagebrush	Aster-	G2/S2	WB	Former C2->3C candidate.
<i>Artemisia simplex (Sphaeromeria simplex)</i>	Laramie chickensage (Laramie false sagebrush)	Aster-	G2/S2	WB	Former C2 candidate for listing.
<i>Astragalus drabelliformis</i>	Big Piney milkvetch	Fab-	G2G3/S2S3	WB	Former C2 candidate for listing.
<i>Astragalus gilviflorus var. purpureus</i>	Dubois milkvetch	Fab-	G5T2/S2	WB	Former C2 candidate for listing.
<i>Astragalus hyalinus var. glabratus</i>	Smooth summer milkvetch	Fab-	G5T1/S1	WB	None.
<i>Astragalus jejunus var. articulatus</i>	Hyattville milkvetch	Fab-	G3T1/S1	WB	Former C2 candidate for listing.
<i>Astragalus proimanthus</i>	Precocious milkvetch	Fab-	G1/S1	WB	Former C2 candidate for listing.
<i>Astragalus shultziorum</i>	Shultzs' milkvetch	Fab-	G3Q/S3	MR	Former C2->3C candidate.
<i>Boechea pusilla</i>	Small rockcress	Brassic-	G1/S1	MR	Petitioned; listing denied. Former C2 candidate.
<i>Boechea williamsii var. williamsii</i>	William's rockcress	Brassic-	G3QT3Q/S3	WB	Former C2->3C candidate.
<i>Cirsium pulcherrimum var. aridum (Cirsium aridum)</i>	Cedar Rim thistle	Aster-	G2Q/S2	MR	Former C2 candidate for listing.
<i>Cryptantha subcapitata</i>	Owl Creek miner's candle	Boragin-	G2/S2	WB	Former C2 candidate for listing.
<i>Cymopterus williamsii</i>	Williams' springparsley	Api-	G2G3/S2S3	MR	Former C2 candidate for listing.
<i>Descurainia torulosa</i>	Wyoming tansymustard	Brassic-	G2/S2	MR, WB	Petitioned; listing denied. Former C2 candidate.
<i>Elymus simplex var. luxurians</i>	Long-awned alkali wild-rye	Po-	G3TNR/S1S2	WB	None.
<i>Eriogonum umbellatum var. cladophorum</i>	Yellowstone sulphur buckwheat	Polygon-	G5T1/S1	MR	None.
<i>Ipomopsis spicata var. robruthii</i>	Kirkpatrick's ipomopsis	Polemoni-	G5T2/S2	MR	Petitioned; listing denied. Former C2 candidate.
<i>Oxytropis nana</i>	Wyoming locoweed	Fab-	G3/S3	WB	None.
<i>Penstemon absarokensis</i>	Absaroka beardtongue	Plantagin-	G2/S2	MR	Former C2->3C candidate.
<i>Penstemon paysoniorum</i>	Payson's Beardtongue	Plantagin-	G3/S3	WB	Former C2->3C candidate.
<i>Phlox pungens</i>	Beaver Rim phlox	Polemoni-	G3/S3	WB	Petitioned; listing denied. Former C2 candidate.
<i>Physaria condensata</i>	Tufted twinpod	Brassic-	G2G3/S2S3	WB	Former C2->3C candidate.
<i>Physaria dornii</i>	Dorn's twinpod	Brassic-	G1/S1	WB	Petitioned; listing denied. Former C2 candidate.
<i>Physaria eburniflora</i>	Devil's Gate twinpod	Brassic-	G2G3/S3	WB	Petitioned; listing denied. Former C2 candidate.
<i>Physaria fremontii</i>	Fremont bladderpod	Brassic-	G2/S2	MR	Former C2->3C candidate.
<i>Physaria macrocarpa</i>	Large-fruited bladderpod	Brassic-	G2/S2	WB	Former C2 candidate for listing.
<i>Physaria saximontana var. saximontana</i>	Rocky Mountain twinpod	Brassic-	G3T3/S3	WB	Former C2 candidate for listing.
<i>Pyrrcoma clementis var. villosa</i>	Hairy tranquil goldenweed	Aster-	G3G4T2/S2	MR	None.
<i>Stephanomeria fluminea</i>	Teton wire-lettuce	Aster-	G2/S2	MR	None.
<i>Townsendia condensata var. anomala</i>	North Fork Easter-daisy	Aster-	G4T3/S3	MR	None.
<i>Townsendia microcephala</i>	Cedar Mountain Easter-daisy	Aster-	G1/S1	WB	Petitioned; listing denied. Former C2 candidate.
<i>Trifolium barnebyi</i>	Barneby's clover	Fab-	G1G2/S1S2	MR	Petitioned; listing denied. Former C2 candidate.
<i>Yermo xanthocephalus</i>	Desert yellowhead	Aster-	G1/S1	WB	Threatened.

¹Follows nomenclature of RM, ²Follows common names of PLANTS database in most cases; ³Family name but without "-aceae"; ⁴Natural Heritage global (G) and state (S) ranks – 1=critically imperiled, 2=imperiled, 3=vulnerable; 5=secure. In addition, "T ranks" are added below the species level for varieties, and they follow the G rank. A complete table with Wyoming Species of Concern status, elevation zone, ecoregion, landform and habitat categories is available on request. See Fig. 1 (next page) for ecoregions.

Only one Wyoming endemic is listed under the Endangered Species Act (ESA), desert yellowhead (*Yermo xanthocephalus*) – listed as Threatened. This is perhaps the only Wyoming endemic that has had such intense monitoring (Scott and Scott 2009) or such scrutiny of its resiliency, as recently published by Dibner et al. (2019). What we rarely hear about are the 35 other Wyoming endemic species and more widespread species that were reviewed in past or present ESA status review processes (Table 1) and NOT listed as Threatened or Endangered (Heidel 2013). Every one of our state endemics are Wyoming plant species of concern or potential concern (Heidel 2018) and many are also designated sensitive by federal agencies. *If we don't keep track of our endemics, who will!?!?*

Figure 1. Wyoming Ecoregions



State endemic plants of Wyoming by ecoregion*

Middle Rockies – 16 species
(Ecoregion includes northwestern Wyoming and Big Horn Mtns)

Southern Rockies – 1 species
(Ecoregion includes Laramie Range)

Wyoming Basins – 20 species
(Ecoregion includes basins of western 2/3 of Wyoming)

Black Hills – 0

Northern Great Plains – 0

*One of the endemic species is in two ecoregions

References

Al-Shehbaz, I. A. and M. D. Windham. 2010. *Boechea*. Pages 348-412 in Flora of North America Editorial Committee, editor. Flora of North America North of Mexico. Vol. 7. Magnoliophyta: Salicaceae to Brassicaceae. Oxford University Press, New York, NY.

Dibner, R. R., M. L. Peterson, A. M. Louthan and D. F. Doak. 2019. Multiple mechanisms confer stability to isolated populations of a rare endemic plant. Vol. 89(2).

Dorn, R. D. 1988. Vascular plants of Wyoming, 1st ed. Mountain West Press, Cheyenne, WY.

_____. 1992. Vascular plants of Wyoming, 2nd ed. Mountain West Press, Cheyenne, WY.

_____. 2001. Vascular plants of Wyoming, 3rd ed. Mountain West Press, Cheyenne, WY.

Heidel, B. 2013. The Endangered Species Act at 40: a Hundred Reasons to Celebrate. *Castilleja* 32(4): 1, 5-6.

_____. 2018. Wyoming plant species of concern and of potential concern. Posted at: <http://www.uwyo.edu/wyndd/species-of-concern/plants/>.

Nelson, A. 1896. First report on the flora of Wyoming. University of Wyoming Experiment Station Bulletin 28:1-218.

_____. 1900. *Botanical Gazette* 30: 190-191.

Scott, R.W. and B.J. Scott. 2009. *Yermo xanthocephalus* Dorn - A Research Report. Prepared for Bureau of Land Management. Central Wyoming College Herbarium and Scott Environmental Resources, Inc. in cooperation with Wyoming Natural Diversity Database. Riverton, WY

Stebbins, G. L. and J. Major. 1965. Endemism and speciation in the California flora. *Ecological Monographs* 35(1): 1-137.

U.S. Fish and Wildlife Service. Species Status Assessment Framework, August 2016 Version 3.4. Posted at: https://www.fws.gov/endangered/improving_esa/pdf/SSA%20Framework%20v3.4-8_10_2016.pdf.

Whipple, J. 2012. Endemic plants of Yellowstone. *Yellowstone Science* 20:17-24

Wolf, S., B. Hartl, C. Carroll, M. C. Neel and D. N. Greenwald. 2015. Beyond PVA: Why recovery under the Endangered Species Act is more than population viability. *BioScience* 65: 200-207.

Wyoming Native Plant Society – Renewal and Ballot

Return to: Wyoming Native Plant Society – P.O. Box 2449 – Laramie, WY 82073 – or to: www.wynps.org

2020 WYNPS RENEWAL

Name: _____

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- Check one: New member Renewing member
 Check here if this is an address change.
 Check here if you prefer to receive the newsletter electronically.

Payment:

- WYNPS annual membership: \$10; or
 WYNPS annual membership with scholarship support: \$20 (\$10 for membership and \$10 for Scholarship fund)
 WYNPS Lifetime membership: \$300 (\$150 for membership and \$150 for Scholarship fund)

In addition to the statewide organization, we have two chapters. Membership in chapters is optional; chapter members must also be members of the statewide organization.

2020 WYNPS BALLOT – Please mail for arrival by January 31 or email wynps@wynps.org

Please vote for one person for each Officer position, and for the At-Large positions:

President ____ Katy Duffy (Jackson) Secretary/Treas. ____ Dorothy Tuthill (Laramie)
Vice President ____ Lynn Stewart (Dubois) At-Large (2-year term) ____ Emma Freeland (Lander)

Write-in candidate and office : _____

[**Thank you** to Katy Duffy, Lynn Stewart and Dorothy Tuthill for running again! We appreciate your time and expertise. Katie Haynes has a 2-year term and will be completing the second year.]

Candidate Biographies

Katy Duffy worked as resources education ranger in Grand Teton and Yellowstone National Parks, was an early champion of the Teton Plants Chapter, and is pleased to serve as President.

Emma Freeland is a botanist at the BLM in Lander, where she runs a native seed collection program and is involved with conserving some of Wyoming's rarest plants. Emma's first WYNPS meeting was the 2011 Best of the Bighorns, and she's been hooked on the Society and Wyoming's native plants ever since. In 2014 Emma completed her Masters degree in Floristics in the Botany Department of UW under Dr. Ron Hartman, where she came to appreciate the value of complete inventories and meticulous curation. When she's not in the hills with a hand lens, Emma enjoys backpacking in the Winds and experimenting with composting methods. She helped organize the 2019 annual meeting in Atlantic City and would love to serve the Society and its mission.

Lynn Stewart has a degree in Outdoor Recreation and Wildlife Biology. He helped organize our successful annual meetings in Dubois, and just this past year, in Atlantic City.

Dorothy Tuthill is Associate Director of the Biodiversity Institute, officer of American Penstemon Society, and native plant gardener extraordinaire, plus resident master weaver at Cowgirl Yarn (Laramie).



Wyoming Native Plant Society

2020 MARKOW SCHOLARSHIP/SMALL GRANT

Applications are due February 15, 2020. Awards will be made in April, 2020.

Electronic copies of this application are also posted on the WYNPS homepage at: www.wynps.org

The Wyoming Native Plant Society promotes appreciation, understanding and conservation of native plants and plant communities through its annual scholarship/small grants program. For scholarships, thesis research may address any aspect of botany including floristics, taxonomy, ecology, genetics, plant geography, range science, paleontology, pollination biology, physiology, and mycology. For small grants, projects such as botany curriculum development, public native plant gardens, and other forms of outreach will be considered. **This competition is open to all grad students who conduct research in Wyoming, residents of Wyoming or members of WYNPS.**

Proposals must pertain to native plants/vegetation of Wyoming. Preference will be given to proposals expected to generate research data or promote public understanding. Up to \$1,000 may be covered for a scholarship proposal, and up to \$500 for a small grant proposal. *Awards defray direct project costs, excluding labor or conferences.* Eligible expenses include:

1. Direct costs of travel, meals, and lodging for research or education projects.
2. Supply and service expenses used for the sole purpose of the project (e.g., consumable supplies such as laboratory chemicals, soil and nursery stock, and services such as phone and computer time).

The deadline for proposals is February 15. Awards will be announced in April. The proposal should be no longer than three pages and include the following:

- Name, mailing address, telephone number (land &/or cell as appropriate) and email address of the applicant.
- Name, mailing address, contact person's name & phone number for any organization that will be directly involved with the applicant when executing the proposal.
- Short abstract of the study or project (2-5 sentences).
- Description of the study or project: objectives, methods, description of final product, and short description of past similar work (if applicable). Garden proposals should include plant lists, an educational component, and explicitly address long-term maintenance plans.
- Description of how the study or project will benefit native plants or plant conservation in Wyoming.
- Overall budget showing amount requested from WYNPS (\$1,000 or less), the intended purpose of the funding, and other funding sources.
- Timeline for completion of the major components of the study or project.
- Brief statement of applicant's qualifications or biography.
- Name, address, email address or phone number of two people as references.

Successful scholarship or grant recipients will be required to submit a final report (due no later than February 15, 2021) documenting the study or project accomplishments to WYNPS, written for a broad audience and suitable for publication in our *Castilleja* newsletter. **Please send completed applications to:** Wyoming Native Plant Society, P.O. Box 2449, Laramie, WY 82073; or wynps@wynps.org .

Common Name Conundrum

If every flowering plant endemic to Wyoming had "Wyoming" in its common name, there would be at least 36 flowering plant taxa named for our state (see article, this issue). However, common names have not been assigned (or re-assigned) based on geography.

According to the PLANTS database, only two of our state endemics are referred to by state: Wyoming locoweed (*Oxytropis nana*) and Wyoming sand verbena (*Abronia ammophila*). However, Wyoming botanists have never used the latter but instead refer to it as "Yellowstone sand verbena", because the species is restricted to Yellowstone Lake.

Often, if a plant has a scientific epithet that represents a state, then the state name is usually part of its common name. The PLANTS database has several such cases, e.g., Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), Wyoming kittentails (*Besseyia wyomingensis*), and a couple lichens, for example Wyoming xanthoparmelia lichen (*Xanthoparmelia wyomingica*). These three species are widespread in Wyoming, even though not all of their distribution are here.

...We'll claim 'em!

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!

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