Castilleja linariifolia

Castilleja

Publication of the Wyoming Native Plant Society

Oct 2015, Volume 34(3)

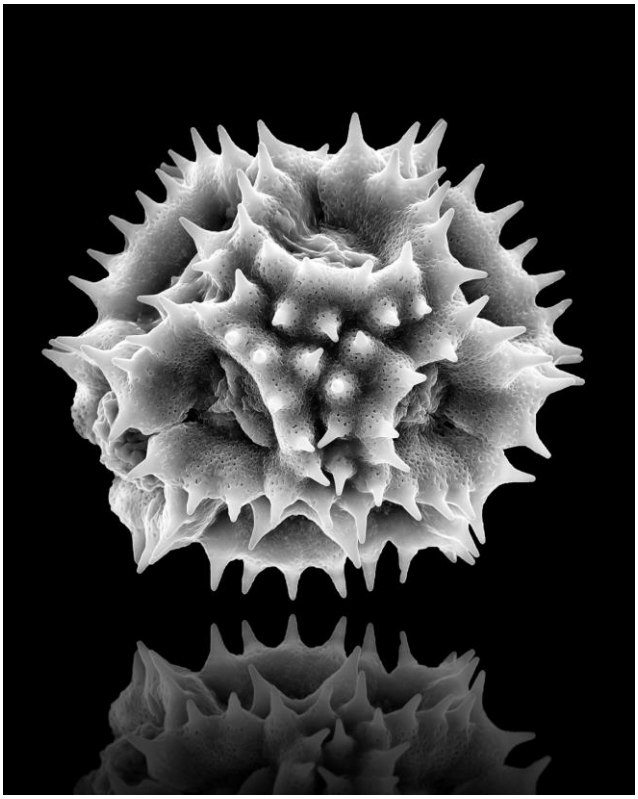
Posted at www.wynps.org

Sagebrush Die-off Scare

By Karen Clause, Natural Resources Conservation Service and Jill Randall, Wyoming Game & Fish Department

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) mortality has been reported across the state over recent years, from Lyman to Sundance, with a marked increase of reports occurring from 2010 to 2014. Biologists noticed extensive mortality in 2014 near Fontenelle Reservoir which prompted a multi-agency group to convene for a field tour in July 2014. As a result, a call for data went out statewide, asking field personnel to record locations and take photos of sagebrush die-off areas.

Possible causes are under investigation including: 1) Drought/Climate; 2) Flooding; Sediment/Soil Chemistry; 4) Insects; 5) Soils; 6) Disease; 7) Herbivory (Wildlife, Wild Horses, Domestic Sheep, Cattle); 8) Plant Age; 9) Oil and Gas Activity; and 10) a combination of any of the above, particularly in combination with the severe drought of 2012. Climate conditions, combined with other variables, are the primary suspects due to the extensive but discontinuous pattern of reported mortality. Correlation of die-off appears to be tied to extreme weather events, whether they be high snowpack (2011), extreme drought (2012), or flooding followed by freezing temperatures (fall 2013). The drought of 2012 was *exceptional* due to extremes in both high temperatures and low precipitation compared with data collected since 1895. Precipitation data indicates 2012 was the driest on record, even when compared with other noteworthy events in 1988 (significant wildfire year) and in the 1930's (Dust Bowl). Also, temperature data indicates 2012 was the hottest on record. The combination of these events contributed to extreme Palmer Drought indices and dismal growing conditions on arid rangelands (continued, p. 3).



Above: True aesthetics in a False dandelion (*Agoseris glauca*) pollen grain, by Marc Brock. Striking photographs will be on display from October 15 – December 11, in a show entitled "Art from a Scientific Perspective." It spans micro- to macroscopic scales of the Plant Kingdom featuring the works of Robert Baker and Marc Brock, postdoctoral researchers in the Botany Department (University of Wyoming). The display will be in the Berry Biodiversity Conservation Center, Laramie.

In this issue:

WYNPS News

2016 Annual Meeting: SAVE THE DATE – the 2016 Annual Meeting of WYNPS will be June 17-20 in the Wind River Range around Dubois, WY. Look for more information in coming issues.

Aspen leaf by Frances Clark, posted at tetonplants.org

Message from the President:

I love fall, and watching all of nature preparing for another Wyoming winter. But, as I watch the leaves turn and disappear, it always brings upon me a sense of urgency. I find myself scrambling to squeeze as much out of the field season as I can, realizing there is still so much I haven't seen or done this summer. In the flurry of fall activities, it's easy to forget how great the summer really was, and all that has been accomplished this year. So, with that…here are some of my reflections:

- I am very proud that the Society now has an Excellence in Botany Award, named after its first recipient Ronald L. Hartman, Curator of the Rocky Mountain Herbarium.
- I am very thankful to the Teton Chapter, now Teton Plants, for organizing such a great joint annual meeting this year with Idaho. I learned a lot, and enjoyed the scenery, plants, and the great social interaction with fellow native plant enthusiasts.
- I am very excited to work with the local folks in Dubois as we plan next year's annual meeting.

With that, I wish you all a happy fall…time to get out those winter pacs again!

~Karen Clause, President

New Members: Please welcome the following new members to WYNPS: Brian Beauvais, Cody; Tom Holton, Jackson; Dawn Loomis, Powell; Piper Martin, Laramie; Ashley Owen, Jackson; Lynn Stewart, Dubois.

Nominations: Karen Clause, President will appoint a nomination committee - 2016 Board nominations can be sent to her at: kdclause@centurytel.net.

Treasurer's Report: Balance as of 21 Sept 2015: Scholarship = $1,860; General = $6,501; Total = $8,361.

Contributors to this Issue: Ann Boelter, Marc Brock, Frances Clark, Karen Clause, Robert Dorn, Bonnie Heidel, Kristina Hufford, Patricia McIlvenna, Jill Randall.

WYNPS Board – 2015
President: Karen Clause, Pinedale (kdclause@centurytel.net)
Vice-President: Brian Sebade, Laramie (bsebade@uwyo.edu)
Sec.-Treasurer: Ann Boelter, Laramie (boelter@uwyo.edu)
Board-at-large:
Walt Fertig, Phoenix, AZ ('14-'15) (waltola64@gmail.com)
Bob Giurgevich, Sheridan ('15-'16) (bobgiurgevich@live.com)

Other contacts:
WYNPS homepage: www.wynps.org; also on Facebook
New name: **Teton Plants – a Chapter of Wyoming Native Plant Society**: Amy Taylor, Treasurer (tetonplants@gmail.com) and a homepage at http://www.tetonplants.org/
Sublette Chapter: Julie Kraft, President (jewelyjoe@hotmail.com)
Editor: Bonnie Heidel (bheidel@uwyo.edu)
Webmaster: Brenna Marsicek (brennamarsicek@gmail.com)
Bighorn Native Plant Society: Jean Daly, Treasurer (P.O. Box 21, Big Horn, WY 82833

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

2015 Annual Meeting Photos will be featured in the December issue!

Above: 2014 Lincoln County mortality in depressional landscape position

Above: 2014 Carbon County mortality in an upland landscape position

The sagebrush mortality events reported in southwest Wyoming appear to fit into two categories: 1) die-offs of sagebrush in closed basin and depressions potentially associated with effects of fall 2013 flooding and/or changes in soil chemistry; and 2) die-offs of both sagebrush and perennial grass that occur across all soil types and landscape positions across large landscapes (an example is focused around 18 Mile and Buckhorn Canyons east of Fontenelle Reservoir). Additionally, there have been desert sagebrush, salt shrub, and perennial grass die-offs documented by the U.S. Forest Service in the Flaming Gorge National Recreation Area. Their monitoring has demonstrated recovery of sagebrush and some, but not all, perennial grasses. However, desert salt shrub communities have yet to make a recovery in that area.

A small number of monitoring locations have been established in the Green River Basin, and preliminary data shows that sagebrush is making a recovery from existing mature plants that were sometimes >90% defoliated with only one or two living branches. At least some of the sagebrush that was reported as dead is surviving and at least some of the reported die-off was a die back. However, results vary by site, and while some areas show remarkable recovery of forbs and grass, others have little to no recovery of the understory even after experiencing the wettest May on record for the lower Green River basin. Based on 2014-2015 observations and monitoring, as well as a similar event documented in Colorado in 2003 (following 2002 drought conditions), it is possible sagebrush has a dormancy mechanism in cases of extreme drought where it defoliates, but will come back when moisture conditions allow. Sagebrush seed production was phenomenal in 2015, but it remains to be seen if consecutive good years will allow for re-establishment of a new sagebrush cohort.

At this point in time, the true geographical extent or acreage affected is unknown, as are long-term mortality levels. Reported data indicates there may be well over 1 million acres of big sagebrush affected. It will take additional resources to adequately sample the entire state, but U.S. Geological Survey (USGS) personnel are currently assessing remote sensing as a potential method.

The recent sagebrush die-off/dieback appears to be a significant ecological event that will require further investigation and monitoring to better understand the effects on vegetation, soil resources as well as implications for livestock and wildlife that rely on these areas for cover and forage. The USGS is leading statewide efforts and inter-agency monitoring efforts. We hope to better understand this ecological phenomenon and how it relates to management actions and the ecological dynamics of the sagebrush ecosystem in Wyoming.

…What plants increased after sagebrush die-off in some monitoring plots? Look no farther than p. 6, with the image of Scarlet globemallow (*Sphaeralcea coccinea*), a widespread native of basins and plains.

For more information or to report a sagebrush die-off area, please contact Karen Clause at karen.clause@wy.usda.gov.

Botanist's Bookshelf -

Pearce, Fred. 2015. The new wild: why invasive species will be nature's salvation. Beacon Press, Boston, MA. xvi + 245 pp. [ISBN 978-0-8070-3368-5]. $26.95.

Review by Robert Dorn

Fred Pearce is an environmental journalist based in London. He attempts to make a case for using exotic or alien species to restore nature in areas that have been impacted by man, virtually the whole planet in his view. This may be plausible in the most highly disturbed areas like his native England and most of the rest of Europe but is not appropriate for our area, even though he claims that it is. So why read the book? He brings up many points that are worth thinking about that may be applicable for our area. Furthermore, many of his statements need to be challenged.

Part 1 of his book deals with islands where human introductions have decimated the existing plant or animal life or islands that have been recolonized by introductions. Using this as background, he moves on in Part 2 "to examine our misplaced notions about how aliens affect the real world and how we do conservation." Our efforts "fail because conservationists have indulged ill-founded myths about aliens, pristine ecosystems, and how nature works." Part 3 attempts to provide solutions: "conservationists must stop spending all their time backing loser species – the endangered and reclusive. They must start backing some winners [aliens]." He fails to recognize that the endangered, especially evolutionarily young species, may be the most valuable for genetic resources that will be useful in the future and that aliens may make a bad situation worse.

In the introduction he states that, "There are very few, if any, pristine ecosystems to be preserved." That may well be true, but there are many less than pristine ecosystems that may be worth preserving, which he implicitly rejects as well. Then in Part 1 he states that, "A broad time horizon shows there is no such thing as a native species." That statement can be easily refuted by defining "native species." We have defined native plants (Dorn & Dorn 2007) as "those that grew naturally in the Rocky Mountain area prior to settlement by European immigrants." Those that were introduced from other places since settlement are exotics or aliens, not natives. Furthermore, a narrow endemic species recently evolved is a species native to the place that it occurs and has always occurred.

Next Pearce shows a poor understanding of our natural landscapes and ecology: "Cheatgrass domination is often described as a step toward desertification, but almost certainly it held back the soil erosion and desert spread that would have followed long-term grazing of sagebrush by European cattle." Cattle do not eat sagebrush except incidentally or if starving and there is nothing else to eat. There are many ranchers who would be extremely happy if their cattle ate sagebrush!

In attempting to make a case for exotic species, he states that, "Many of those invading species accused of pushing out natives have simply moved into ecological space created by the decline of the natives." He presents no good data to back up that sweeping statement. This is probably the exception rather than the rule. I remember a nice native prairie in the Black Hills that 30 years later was transformed into an exotic weed patch with no evidence of any abuse of the land. The native plants seemed to have been simply pushed out by competition from the exotics. A prairie once useful for grazing was replaced by a useless weed patch. This brings up another point that he only hinted at in passing: "we humans will want to intervene, to preserve what we like and need for our own ends." A primary objective in using land is to manage the use so that it is sustainable. Allowing exotics to invade, as Pearce proposes, nearly always compromises that objective. If a land use has been destructive, there may be a place for some exotics in a restoration project. Some are also useful for food. Otherwise it is best to keep exotics out if at all possible. The vast majority of them serve no useful purpose but simply degrade the usefulness of the land. On the other hand, a point Pearce does not bring up, humans are part of nature just as are the other animals. As such, anything humans do to change the natural makeup of things is natural and should be left to its undisturbed outcome. On those grounds, leaving exotics alone no matter where they are or how they got there might be justified. It would not be in the best interests of the human species, however. Pearce also maintains that exotics increase biodiversity. That may or may not be the case depending on th

Despite the book's shortcomings, it serves as a basis for discussion of our objectives in conservation and whether or not our approaches are the best or could be improved.

Reference Cited

Dorn, R. D. & J. L. Dorn. 2007. Growing native plants of the Rocky Mountain area. www.lulu.com, ID:768231.

Growing Native Plants

Part 17. Prairie Gardens

By Robert Dorn

Four of the five grasses in Part 12 of this series are suitable for the prairie garden, namely *Andropogon gerardii*, Big Bluestem; *Bouteloua gracilis*, Blue Grama; *Buchloe dactyloides*, Buffalograss; and *Schizachyrium scoparium*, Little Bluestem. Big Bluestem and Buffalograss prefer a more moist site than the other two species. Grasses that may be more desirable include *Achnatherum hymenoides*, Indian Ricegrass; *Elymus lanceolatus*, Thickspike Wheatgrass; *Elymus trachycaulus*, Slender Wheatgrass; *Hesperostipa comata*, Needle and Thread; *Koeleria macrantha*, Junegrass; and *Nassella viridula*, Green Needlegrass. Prairie gardens also include flowering forbs of which five examples follow. Go to the Society website to see them in color.

Oxytropis lambertii, Lambert Locoweed, grows to 10 inches tall and wide. The leaves are basal and pinnately compound. The flowers are pink-purple fading to purple, upto 1 inch long, clustered near the tip of leafless stems, and appear from May to July. The plants occur naturally in open, often rocky areas of the foothills, basins, and plains. They prefer full sun and dry to moist, well drained soils. They are toxic, especially to horses. They can be grown from seed that should be scarified before planting. Plant about ½ inch deep. It is also in the nursery trade.

Oxytropis lambertii, Albany County

Penstemon eriantherus, Hairy Penstemon, grows to 16 inches tall and 10 inches wide. The leaves are opposite, to 5 inches long and 0.5 inch wide, and covered with short hairs. The flowers are pale lavender to pink-lavender or blue with purple lines on the lower petals, to 1.75 inches long, with a prominent yellow tongue bearing long white hairs, and clustered along the upper half to two-thirds of the stem. 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 sown outdoors in the fall. Seed is commercially available.

Penstemon eriantherus, Albany County

Ratibida columnifera, Mexicanhat or Prairie Coneflower, grows to 2 feet or rarely 4 feet tall and 18 inches wide. The leaves are to 4 inches long and pinnately lobed or divided. The ray flowers are yellow or partly to totally purplish-red, spreading to reflexed, and overtopped by an elongate cone of usually reddish-brown disk flowers, the entire flower head to 2.5 inches long. They appear from July to September, rarely earlier. The plants occur naturally in dry, open areas of the plains and basins. They prefer full sun and dry, well drained soils and are drought tolerant. They are short-lived but self seed readily. They can be grown from seed planted ¼ inch deep. It is also in the nursery trade.

Ratibida columnifera, Albany County

Senecio spartioides, Broom Groundsel, grows to 3 or 4 feet tall and wide with a bushy growth form. The leaves are narrow, sometimes with narrow lobes, and to 4 inches long. The ray and disk flowers are yellow, the heads to 1.5 inches across, with many heads clustered at the tips of stems and branches. They appear from June to October, variety *multicapitatus* in early summer, varieties *fremontii* and *spartioides* in late summer. The plants occur naturally in dry, open areas of the plains and basins. They prefer full sun and dry, well drained soils. They are poisonous to livestock but avoided by them if adequate forage is available. They can be grown from seed which is easily collected and is commercially available.

Senecio spartioides, Goshen County

Sphaeralcea coccinea, Scarlet Globemallow, grows to 8 inches tall and about as wide. The leaves are deeply lobed and to 2 inches long and wide. The flowers are deep salmon-orange, to 1.5 inches across, and clustered along the upper part of the stems. They appear in June and July or rarely earlier. The plants occur naturally in dry, open areas of the plains, basins, and foothills. They prefer full sun and dry conditions and are adaptable to a wide variety of soils including sand, clay, and alkaline. They can tolerate extreme drought and heat. They can be grown from seed cold stratified for 60 days for spring planting or from rootstock cuttings. Seed is commercially available.

Sphaeralcea coccinea, Moffat County, Colorado

Monarchs and Milkweeds

Monarchs are some of the most charismatic and amazing butterflies in the world. With their distinctive coloring, long-distance migrations, and dependence on a specific group of plants - milkweeds, this species is a marvel and a delight.

In Wyoming, we have very little information about monarchs. Researchers have heard for years that they're common, though the folks seeing monarchs haven't had a place to send in information about their sightings. Every county has at least one observation, but we do not know how common monarchs are in our state.

With widespread help, we can better understand where monarchs travel through Wyoming, what time of year, how many, and whether they reproduce here. We can also find where the 10+ species of milkweeds exist, see if they're hosts to any monarch young, and harvest some of their seeds to plant in nearby gardens. You can do this next year by submitting observations of any monarchs and/or milkweeds you find in Wyoming to the WyoBio website (http://www.monarchsandmilkweeds.org/). Pictures, information about where the butterfly or plant was, date, how many, and other details are very important!

A National Strategy to Support Native Plants

By Patricia McIlvenna and Kristina M. Hufford,
Ecosystem Science and Management,
University of Wyoming

In recognition of the growing need for restoration of native plant communities, the Department of the Interior announced the National Seed Strategy for Rehabilitation and Restoration on August 17. The strategy was developed through a multi-party collaboration led by the Bureau of Land Management to address current and anticipated needs in the development, storage, and application of native plant materials. Four primary goals were identified for cooperative development across federal, state, local, tribal, nonprofit, and private sectors:

1. "Identify seed needs, and ensure the reliable availability of genetically appropriate seed."
Cooperating partners will collect available information on current seed supply and demand. They will use this information to ensure sufficient quantities of native plant materials that are adapted to environmental conditions at rehabilitation and restoration sites.

2. "Identify research needs and conduct research to provide genetically appropriate seed and to improve technology for native seed production and ecosystem restoration."
Research will be conducted to develop guidelines for the identification of genetically appropriate seed.

New and ongoing studies will result in species-specific protocols for effective seed production, seed storage, restoration site preparation, and germination methods.

3. "Develop tools that enable managers to make timely, informed seeding decisions for ecological restoration."
Areas for development that have already been identified include additional training programs, certification for restoration practitioners, creation or improvement of ecoregional restoration guides, and seed source databases.

4. "Develop strategies for internal and external communication."
The National Seed Strategy will only lead to a change in restoration practice if new guidelines are employed by stakeholders. Existing methods of distribution of program materials will be improved and new avenues for communication will be explored.

Wyoming agency personnel are already engaged in activities to meet these goals, including the Seeds of Success collection teams underway at the University of Wyoming and at BLM field offices around the state. The National Seed Strategy is available in full at:

www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/fish__wildlife_and/plants/seedstrategy.Par.66250.File.dat/SeedStrategy081215.pdf

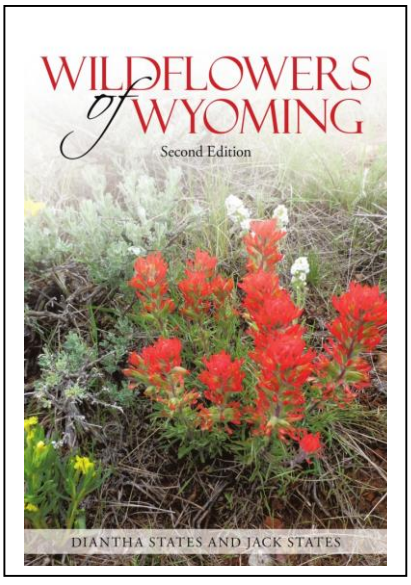
---

Botanist's Bookshelf:
Two Books Are Back in Print as Second Editions

Barr, C. A. 2015. Jewels of the Plains – Wildflowers of the Great Plains Grasslands and Hills, 2nd ed. University of Minnesota Press, Minneapolis, MN. 320 pp. Available as both cloth jacket print book and ebook. [ISBN 978-0-8166-9801-1]. $27.95+tax, shipping.

This is a revised edition of the classic guide to the wildflowers of the Great Plains, incorporating new scientific information, with an introduction and supplemental notes by James Locklear, Lauritzen Gardens in Omaha, NE.

States, D. and J. 2015. Wildflowers of Wyoming, 2nd ed. Available as both paperback print book and ebook from www.lulu.com. 196 pp. Paper cover. [ISBN 978-1-4834-3081-2] $35.97+tax, shipping



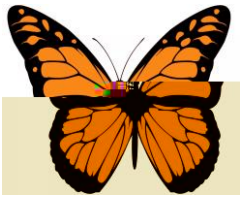
This updated version is back in full color, with over 325 of the showy wildflowers in 216 genera and 54 families. Sections to aid identification are included.

Upcoming U-WY Botany Dept. Lecture -

Three Decades of Monitoring Plants and Pollinators in the Rocky Mountains

David Inouye, president of Ecological Society of America, will give a talk sponsored by the University of Wyoming Botany Department on December 3, 2015, @3:10 pm, addressing "The effects of global and regional climate change on phenology of wildflowers and animals in the Colorado Rocky Mountains". The seminar will be held in the Berry Biodiversity Conservation Center on Lewis Street, with a reception to follow in the Louis O. and Terua P. Williams Conservatory, Aven Nelson Bldg. on 9th Street.

The full schedule of the Department seminar series is posted on the homepage: http://www.uwyo.edu/botany/ .



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 scholarships and small grants awards. Membership is open to individuals, families, or organizations. To join or renew, you can do it on-line (www.wynps.org) or return this form to:

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

Name: _____

Address: _____

_____

Email : _____

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.
[ ] Sublette Chapter annual membership: $5.00
[ ] Teton Plants Chapter annual membership: $5.00

Total enclosed: _____ THANK YOU!

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