Castilleja

Publication of the Wyoming Native Plant Society

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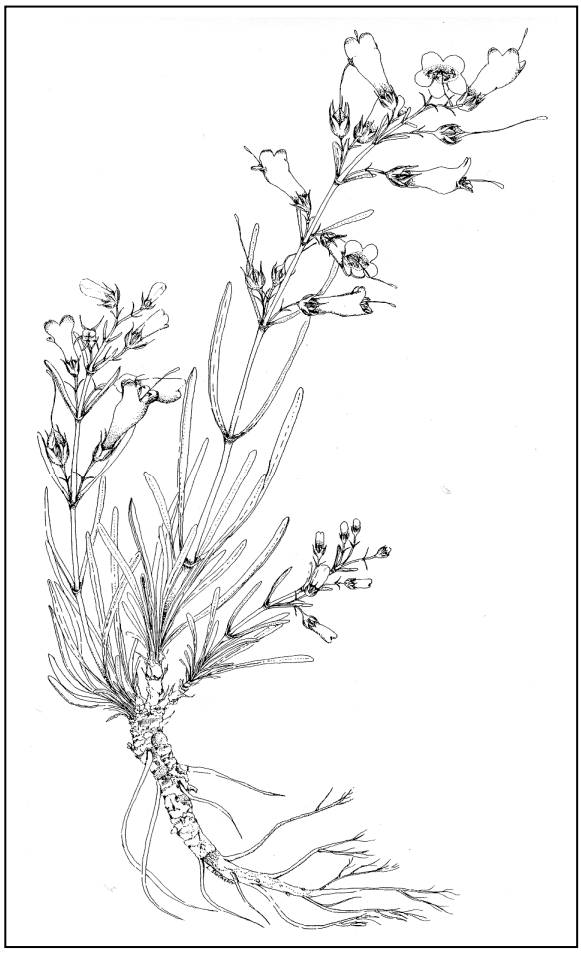

Cary's penstemon (*Penstemon caryi*), by Linda Shoemaker. From Fertig 1994. The 2001 WNPS Annual Meeting will end up on 25 Jun, Saturday at Tensleep Preserve, where Cary's penstemon and three other Bighorns endemics have a firm root-hold!

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Endemic Plants of the Bighorn Mountains

By Bonnie Heidel

Every mountain range makes a unique tug at the heartstrings, and each range defines the surrounding landscape. The Bighorn Mountains are even more for some Wyoming plants. They are literally the center of the universe for 11 species of concern as a major place, or *only* place, they live (Table 1).

Species that are geographically restricted to an area are called "endemics" of the area, a term that can be used in referring to native plants of a continent, a state, or smaller areas. Four of the eleven plants are strictly restricted to the Bighorn Mountains. All of the eleven Bighorn endemics have limited distributions whether or not they are restricted to this mountain range. Their total distribution is smaller than an average western state - less than the ~100,000 mi² size of Wyoming as the metric of averageness.

How do endemic plants arise? Some endemic plants of Wyoming may be adapted to habitat conditions that are so narrow that they are intrinsically restricted, like Ross' bentgrass (*Agrostis rossiae)* in geyser basins of Yellowstone National Park. Others may be a product of geographic isolation and adaptation processes over geological time. Most Bighorn Mountains endemics have a distribution pattern that suggests the latter. (Continued, p. 9)

WNPS News

Happy 30th Anniversary

2011 marks the 30th Anniversary of
Wyoming Native Plant Society

Mark your calendar: The 2011 annual meeting of Wyoming Native Plant Society will be on June 24-26 in the Bighorn Mountains. The itinerary is in this issue and in a field trip mailing -
You are cordially invited.

Wyoming Native Plant Society
P.O. Box 2500
Laramie, WY 82073

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New member: Please welcome the following new member to WNPS: Francesca Paolucci-Rice, Jackson.

Treasurer's Report: Balance as of 1 May: Scholarship = $2,675; General = $4,244.49; Total = $6,919.49.

Contributors to this Issue: Ann Boelter, Beth Burkhart, Bonnie Heidel, Amy Taylor.

Message from the President

This year the snow is lingering longer in northwestern Wyoming and the spring ephemerals are slow to emerge. I delight in the buttercups (*Ranunculus* sp.), turkey peas (*Orogenia linearifolia*), and occasional steer's head (*Dicentra uniflora*) that dot the melting landscape. I am reminded to pause and appreciate spring's renewal. At the same time, I eagerly anticipate the green season and its symphony of wildflowers. As WNPS celebrates 30 years, I also look forward to the many events surrounding native plants. I hope to see you at one of the many wonderful fieldtrips happening throughout Wyoming or at the annual meeting in the Bighorn Mountains June 24-26. In the meantime, I'll grease my hiking boots, dust off field guides, and hang up my skis for the season . . .or should I?
~Amy Taylor

Planting a New Idea! By now, you should have received a first-time flyer on plant hikes across Wyoming. Offering hikes is one of the most direct ways we can foster appreciation for wild plants and have fun in the process! In addition to the annual meeting, there are 21 hikes featured, even though we did have to annex a bit of Idaho, Montana and South Dakota in the process. This fieldtrip flyer venture will be revisited by the Board next fall. We'd love to hear your opinions and experiences, good, bad or otherwise. If you would like paper or electronic copies of the hike flyer to help post them, please see the WNPS homepage (www.uwyo.edu/wyndd/wnps).

-Thanks in advance to leaders and attendees alike.

If you have yet to renew for 2011, now's the time!

30th Anniversary

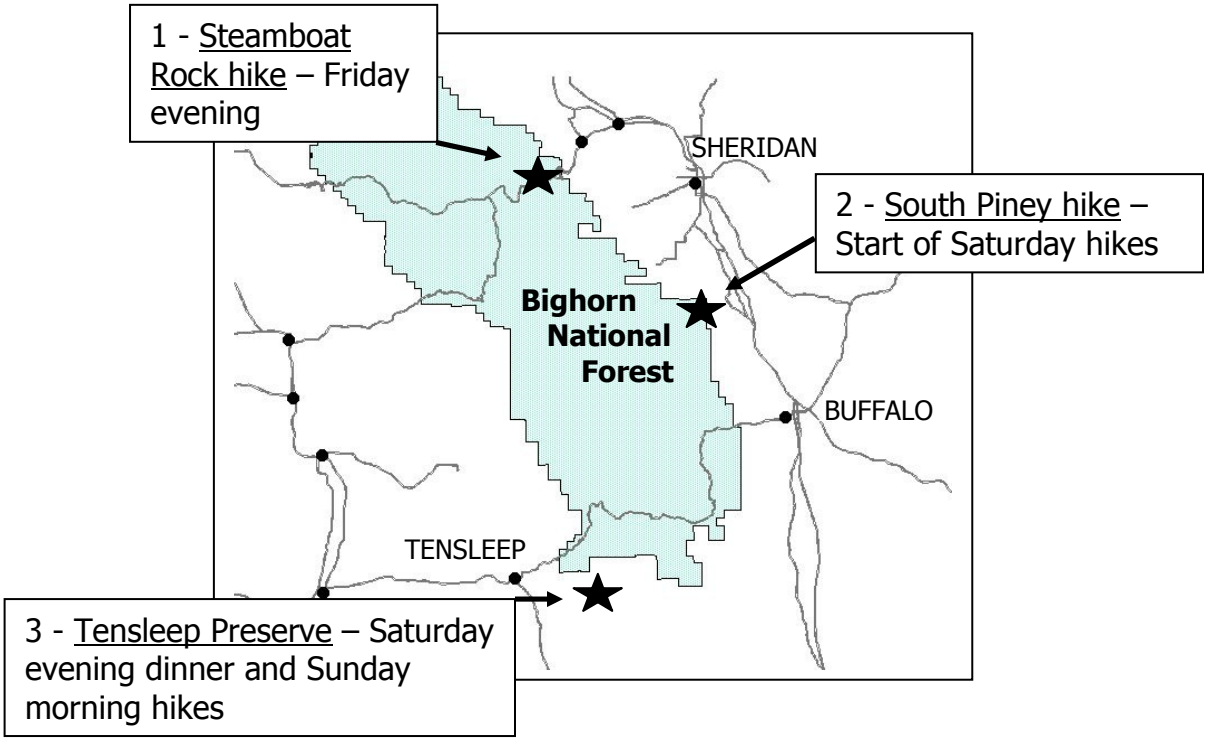
Wyoming Native Plant Society Annual Meeting

Best of the Bighorns

June 24, 25 and 26, 2011 (Friday – Sunday)

The Bighorn Mountains draw plant enthusiasts from near and far. All events are open to everyone. Please register ahead for camping and catered dinner. We are pleased to hold this joint event with Bighorn Native Plant Society.

Steamboat Rock marks the start of three days of adventure. Photo courtesy of USFS.



Friday, June 24
All day Arrival at USFS Campgrounds
5:30-7:30 p.m. Steamboat Rock hike
7:30-9:00 p.m. Dinner/Social at Birkholz Cabin

Saturday, June 25
9:00 a.m. – South Piney **hike** (meet at Story Fish Hatchery).
12:00 p.m. - picnic lunch
1:00 -5:00 p.m. – Southern Bighorn Mountains highlights (caravan on Hwy. 16)
5:00 p.m. – **Tensleep Preserve/Lodge**
Time to set up, wash up, and catch up at camp!

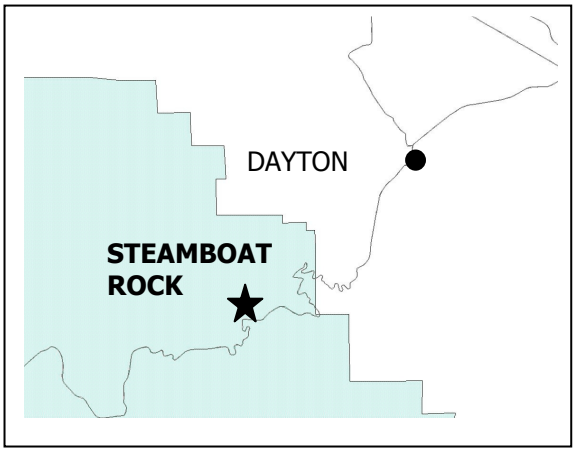
6:00 p.m. - Supper, catered by Second Street Bakery in Tensleep
7:00 p.m. –Evening Program
Best of the Bighorns – photography favorites of Claire Leon, and of Earl Jensen

Sunday, June 26
8:00 a.m. - Breakfast business meeting in the Lodge, coffee and muffins provided; bring a mug.
9:00 a.m. - Announcements; walk or caravan to start of hikes
Hike to Canyon Creek Rim – Cary's penstemon and more!
Hike up Canyon Creek valley – dramatic pictographs

June 24, Friday

5:30 p.m.-7:30: <u>Steamboat Rock Plant Hike</u>. Stunning flower displays and a panoramic evening hike up Steamboat Mountain promise something for everyone. Meet at the parking lot located at the base of Steamboat Mountain on U.S. Hwy. 14, ca. 1.5 miles east of the Burgess Junction Visitors Center, clearly visible on the north side of the highway. We don't have to walk far and will stay in sight – don't worry about being late. Leader: Dick Birkholz 307-752-0518.

7:30: Everyone is invited to a social immediately after the hike at the Birkholz cabin, between the Burgess Junction Visitors Center and Arrowhead Lodge, at Mile Marker 59 (look for a big public parking lot on the south side of the highway, and flagging marking a short walk from the lot to the cabin). Burgers, brats and utensils will be provided. You're welcome to bring your own beverages or use the grill.



June 25, Saturday

9:00 a.m.: <u>South Piney Creek Hike</u>. Visit Mountain lady's slipper in full bloom. Meet at the Story Fish Hatchery (follow the Fish Hatchery Rd west of Story). Leader: Claire Leon 307-783-2302. Bring a sack lunch.

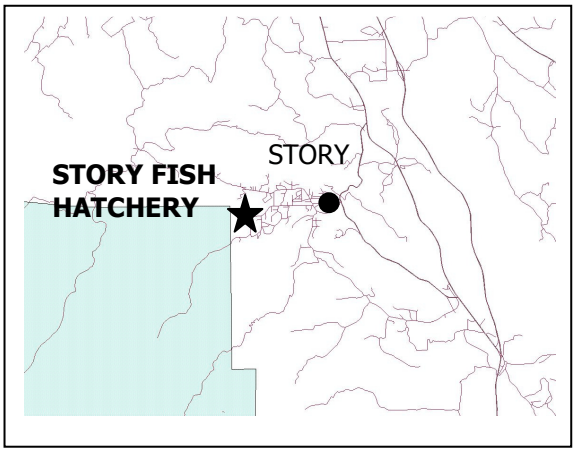
12:00 p.m.: Lunch

1:00-5:00 p.m.: <u>Southern Bighorn Mountains</u>. Caravan from Story along Highway 16, for a series of plant adventures, ending up in Tensleep.

5:00-6:00 p.m. Time to set up, wash up, and catch up at Tensleep Preserve, The Nature Conservancy

6:00 p.m.: Supper, catered by Second Street Bakery in Tensleep

6:45 p.m.: Evening Program, including: Best of the Bighorns, photo favorites of Claire Leon, Earl Jensen



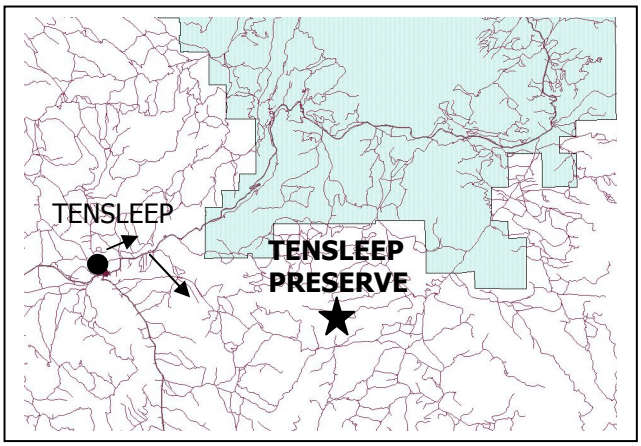
June 26, Sunday

8:00 a.m. Breakfast business meeting in the Lodge (coffee and muffins provided)

9:00 a.m.: Announcements. Walk or caravan to start of two hike options.

<u>Upland hike to Canyon Creek rim</u> – Cary's penstemon and more!

<u>Hike up Canyon Creek valley to pictographs</u> (be prepared for stream crossings)



2011 Annual Meeting Reservation Form

All hike events are free, and every event is open to the public. If you plan to attend the annual meeting, but don't need dinner or camping reservations, please return this form as we'd still like to know you are coming! Reservations are to be received by **June 14** to help prepare**.**

Name _____

Address_____City_____State_____Zip_____

Phone_____ E-Mail_____

Number in party_____ (No dogs, please, on Saturday or Sunday events)

I'd like to participate on: _____ Friday _____ Saturday _____Sunday

JUNE 24, Friday – *Have a camping spot waiting!*

USFS Campground Reservations: Friday night camping space can be reserved in advance by phone or online: 1-877-444-6777 (Mon.-Sat.) or online at: www.recreation.gov .

Nearest campsites are at North Tongue, Prune Creek and Sibley Lake campgrounds ($12-14/site). The cost of a second vehicle at the same site is $8, but cannot be paid in advance. Invite a friend to "your pad!" Electric hook-up is available only at the Sibley Lake Campground ($18/site). Reserve in advance!

These U.S. Forest Service Campgrounds are managed by Gallatin Canyon Campgrounds.

JUNE 25, Saturday

Catered Dinner at Tensleep Lodge, 6:00 p.m.
Catered menu includes Megan's Homemade Tomato Soup, deluxe sandwich, beverage, and rave desserts. Please circle if your diet is vegetarian, gluten-free, or has other needs:_____. Kitchen space is also available for use.

Number of people_____ x $7.50 per person = _____

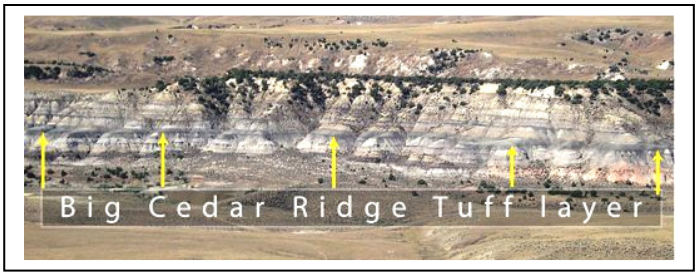
Use of Tensleep Preserve Facilities

Number of adults: _____ x $12.50/adult= $_____

Children (12 and under): _____ free

Includes options of tent camping, bringing your camper, or use of a canvas tent with two cots/tent – the latter is on a first-come, first-serve basis, so register early! Hot showers, kitchen facilities, and use of the whole lodge are included, in addition to WNPS providing Sunday morning coffee and muffins,.

_____Please indicate if you prefer the canvas tents with cots – bring your own sleeping bag and pillow – and the name of the second person (if you are registering separately)_____.
Make checks out to: Wyoming Native Plant Society and mail to WNPS, P.O. Box 2500, Laramie, WY 82073.
See you there!



Big Cedar Ridge has been designated as an Area of Critical Environmental Concern (ACEC) by the Bureau of Land Management - Worland. Its 260 acres of outcrop are managed primarily for research, public education, and fossil interpretation.

Exploring the Fern-Filled Flora of the Bighorn Basin

(Editor's Note: Wyoming Native Plant Society is going back in time during the 30th Anniversary Year -- straight back to the Cretaceous. We are offering a hike lead by Dr. Scott Wing, Smithsonian Curator of Paleobotany, and Dr. Carol Stromberg, University of Washington, Burke Museum.)

Big Cedar Ridge is a small island of juniper and limber pine in the sea of grass and sagebrush that fills the southeastern Bighorn Basin. The vegetation and bits of shade at the top of the ridge are not the only attractions, though. Big Cedar Ridge itself is made of a rock unit called the Meeteetse Formation, a pile of mudstone, coal and sand that was deposited about 73 million years ago on the western coastal plain of a wide continental seaway that extended to Iowa. A strange blue-gray layer of weathered volcanic ash lies in the middle of the hill, and within it are millions of plant fossils. Even more amazing, many of these fossil plants are preserved where they grew in life, making it possible to study them almost as if they were a living community!

The strange blue-gray layer was a mudflow of volcanic ash that suddenly entombed the entire landscape, an unusual event that has been called a "Botanical Pompeii." To date, fossil collections from 100 sites at Big Cedar Ridge have produced about 175 types of plants, many of them new to science. Several kinds of ferns were very abundant, and altogether ferns made up half of the identified fossils. The single most abundant plant was the palmetto, *Sabalites* sp., which covered almost 25% of the area of identified fossils. Although flowering plants with broad leaves (magnolia-relatives and true dicots) were highly diverse (>70 types), they were relatively rare, making up only ~12% of the area of identified fossils.

On July 9, we will hike Big Cedar Ridge, collect plant fossils from different locations along its nearly 4 km length, and have lunch amid the *living* plants on top of the ridge. The east face of the ridge, where the fossils are exposed, is steep, so wear sturdy shoes. A brick hammer with chisel end will help you split the rocks to expose the fossils. Bring a hand lens to appreciate the intricate details of the fossils, and some extra tissue in case you want to wrap a specimen or two to take home.

Above: A subtropical fern in the Matoniaceae, one of many fern fossils to outnumber angiosperm fossils at Big Cedar Ridge. Photo by A.C. Morey. ©Smithsonian Institution.

The July 9 hike runs from 10 a.m.-2 p.m. and is among many hikes featured in the 2011 WNPS hike flyer. The event is free and open to WNPS members and the public at large, and will he hosted in collaboration with the Buffalo Bill Historical Center in Cody, the Washakie Museum in Worland, the BLM – Worland, and the Berry Biodiversity Conservation Center of the University of Wyoming, Laramie. Tour-goers are also invited for light refreshments and waived admission at the Washakie Museum after the hike. *For the 30th anniversary year, we are promoting statewide plant hikes beyond the annual meeting – feedback is welcome!*

Dugout Gulch Botanical Area – More of the Story

By Beth Burkhart

In the March 2011 issue of *Castilleja*, Robert Dorn shared some history about the origins of the Wyoming Native Plant Society. He provided a brief glimpse into the botanical wonders of Dugout Gulch and talked about successful advocacy there for botanical resources by WYNPS. I have been fortunate to enjoy visiting Dugout Gulch myself for the last ca 12 years and continuing advocacy for good stewardship of the area by Black Hills National Forest (NF). I would like to pick up where Robert Dorn left off in his article and tell you more of the story about Dugout Gulch.

It was proposed for consideration for protective management status because of the diversity of native plant species (including rare plant species) and plant communities found in Dugout Gulch in the late 1970s and early 1980s by Robert Dorn and others. Wyoming Natural Diversity Database/TNC prepared Suitability Investigation Reports for the Black Hills NF on several areas, including Dugout Gulch. The Suitability Investigation Report for Dugout Gulch Botanical Area was prepared by Hollis Marriott and submitted to Black Hills NF in 1989. Designation of Dugout Gulch Special Botanical Area was recommended "for protection of the native flora, vegetation, and natural processes occurring in the area." Management recommendations were provided, including:

"Human disturbance should be kept at a minimum. Towards this end, the following actions should be taken:

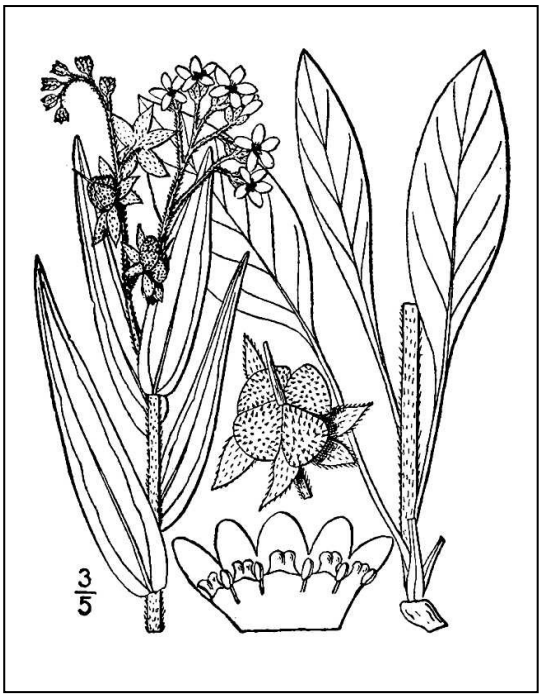
a) withdrawal from locatable mineral entry;
b) withdrawal from oil/gas leasing;
c) exclusion from other development, e.g. access roads to projects on adjacent lands;
d) exclusion from logging;
e) exclusion from grazing."

Happily, Dugout Gulch Botanical Area was designated in the 1997 Black Hills National Forest Land and Resource Management Plan (aka Black Hills NF Forest Plan), along with seven other Management Area 3.1 Botanical Areas (one other in Wyoming: Upper Sand Creek Botanical Area and six in South Dakota). Altogether, Black Hills NF Botanical Areas comprise 7,348 acres, or less than 1% of Black Hills NF. According to the Black Hills NF Plan, the Desired Future Condition of Botanical Areas includes that "Management emphasis is on conserving or enhancing areas of botanical interest and, where appropriate, developing and interpreting these areas for public education. These areas are protected to maintain their botanical interest values…Vegetation, habitat, soil productivity, and water quality are usually unaffected by humans…"

Black Hills NF 1997 Forest Plan (and 2006 Phase 2 Amendment) Standards and Guidelines for Botanical Areas reflect the recommendations found in the Dugout Gulch and other Suitability Investigations:

- withdrawal from mineral entry is allowed when necessary to protect botanical values;
- logging and wood gathering activities are allowed only when necessary to maintain, restore, or enhance botanical values and tentatively suitable timber lands within are not part of the Black Hills NF suitable timber base;
- closure to vehicles is supported (legal closure order was completed in 2005 after OHV damage to Black Fox Botanical Area and public input to Black Hills NF);
- livestock grazing is allowed if it does not conflict with botanical values.

One might think the story could wrap up here with a "happy-ever-after" ending, but that is not the case. I returned to the Black Hills in 1999 with U-WY M.S. Botany in hand - to live, work and play. As Field Trip Coordinator for the Great Plains Native Plant Society (from 2000 to the present), it seemed a natural to focus field trips on Botanical Areas where we would be able to observe native plant species and communities of high value and in good condition. However, this wasn't what I found as I explored Black Hills NF Botanical Areas, including Dugout Gulch. In Dugout Gulch, I discovered development of a nature trail on an old road bed. This was a disturbance that opened the door for non-native invasive species. Inadequate attention has been paid to these invasive species, leading to the current condition where houndstongue (*Cynoglossum officinale*) and burdock (*Arctium minus*) are a major understory component from the north end spreading south, and buckthorn (*Rhamnus cathartica*) is such a large part of the incoming tall shrub/tree vegetation that it is unclear to me if the botanically native hophornbeam/Sprengel's sedge and paper birch/hazelnut communities recognized in the Suitability Report will persist in the long term. Marriott's 1989 Suitability Report does not include buckthorn on the Dugout Gulch plant species list and states: "The birch and pine are essentially weed-free. No significant weed infestations were seen in the drainage bottom, although houndstongue is common." This is not quantitative baseline information, but it seems clear that major change has taken place relative to non-native species in this area that is supposed to be managed as a refuge of native botanical diversity.



Cynoglossum officinale. From: Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols.* Charles Scribner's Sons, New York. Vol. 2: 502. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc.

The 1989 Dugout Gulch Suitability Report does not report in detail on livestock grazing, but states: "Even in August, after the season's grazing was well underway, the herbaceous vegetation was not cropped to near ground level…However, the relationship of grazing history and other disturbance to present vegetation condition is unknown." By designating Dugout Gulch as a Botanical Area in 1997, the Forest Plan directed management priority to botanical values over multiple uses (including livestock grazing) [note: compared to 1% of Black Hills NF designated as Botanical Areas, approximately 80% of Black Hills NF is designated in management areas prioritizing livestock grazing as a multiple use]. According to current Black Hills NF range plans, Dugout Gulch Botanical Area is not managed as a grazing pasture. However, the permittee on the adjacent allotment is allowed to trail livestock through the area to his allotment in the spring and back in the fall. Livestock use beyond what would be expected from livestock trailing through the Botanical Area has been observed since the early 2000s. The 2006 Black Hills NF Monitoring Report (posted on the www) documents livestock accessing a yellow lady's slipper (*Cypripedium parviflorum*) occurrence and trampling and chewing on plants (despite a Forest Plan Standard that specifically requires livestock be restricted from Region 2 sensitive species, such as yellow lady's slipper, in Botanical Areas). The 2007, 2008, and 2009 Black Hills NF Monitoring Reports all document impacts from livestock grazing in Dugout Gulch, including utilization and trampling of Region 2 sensitive species (yellow lady's slipper and foxtail sedge (*Carex alopecoidea*). [The 2010 Black Hills Monitoring Report is not yet released.] Drs. Audrey and Mark Gabel of Spearfish, SD and I have personally observed livestock impacts in 2009 and 2010 well beyond those explained by an efficient trailing activity – and have observed livestock grazing in the Botanical Area. We reported our observations to Bearlodge Ranger District/Black Hills NF. I requested in 2009 and 2010 to observe the livestock trailing in order to better understand the activity and its impacts to botanical values. Both years, Bearlodge RD range personnel informed me that the permittee would not be trailing livestock through Dugout Gulch Botanical Area. They acknowledge unauthorized or trespass livestock in Dugout Gulch, but have not been able to control it. It remains unclear if the unauthorized use alone is resulting in impacts of a large number of livestock along the length of the Botanical Area occurred, as observed by Gabels and myself.

In summary, citizen observations support that Black Hills NF is not managing Dugout Gulch in a manner protective of botanical values relative to livestock use. While some Black Hills NF Botanical Areas have little documentation of their "botanical values", resulting in ambiguity when trying to determine conflicts with livestock impacts, the 1989 Dugout Gulch Suitability Investigation Report provides a solid foundation for understanding the botanical values for the area and analyzing how they are affected by livestock use.

Who knows what the "rest of the story" will be for Dugout Gulch Botanical Area? Or for other Botanical Areas on Black Hills NF? My main goal in following up on Robert Dorn's article is to echo his closing sentiment: "*It doesn't hurt to be vocal… I would hope that some of our younger members, if they are so inclined, will become active in speaking out and pursuing protections for important native plant areas.*" It seems increasingly important that native plant advocates participate in efforts to educate people and monitor/manage native botanical values for protection and conservation. If those that know and understand and appreciate botanical values don't, who will?

Polarization of positions is not helpful to achieve resource management goals – open communication is necessary. To that end, I am leading a field trip for the Great Plains Native Plant Society to Dugout Gulch Botanical Area on September 10, 2011. Come acquaint yourself with the wonders of Dugout Gulch Botanical Area and brainstorm on ideas for management protective of botanical values! See the hike flyer and Great Plains Native Plant Society homepage (www.gpnps.org).

Endemics of the Bighorn Mtns. (cont. from p. 1)

The geological history and geography of the Bighorn Mountains set the stage for endemism.

> *"About 60 million years ago, the area that is now the Bighorns began to bow upward, due to compression of the crust, while basins to the east and west began to sag. This continued for several million years, causing the crust to rupture, creating thrust faults on the east and west side of the range. The Paleozoic and Mesozoic sedimentary rock that once covered the top of the range were mostly eroded away by streams during uplift, but are preserved along the flanks of the range where the steeply dip into adjacent basins. The Bighorn Range differs from other Wyoming ranges that are bound on only one side by a thrust fault…" (Lageson and Spearing 1988).*

Table 1. Endemic plants of the Bighorn Mountains. (*Asterisked species are restricted to the Bighorn Mtns.)

Common Name	Scientific Name
Hyattville milkvetch*	*Astragalus jejunus var. articulatus*
Williams' desert-parsley*	*Cymopterus williamsii*
Bighorn fleabane	*Erigeron allocotus*
Rabbit buckwheat	*Eriogonum brevicaule* var. *canum*
Howard's forget-me-not	*Eritrichum howardii*
Sheathed musineon	*Musineon vaginatum*
Mountain lousewort	*Pedicularis pulchella*
Cary's penstemon	*Penstemon caryi*
Woolly twinpod	*Physaria didymocarpa* var. *lanata*
Hairy tranquil goldenweed*	*Pyrrocoma clementis* var. *villosa*
Hapeman's sullivantia	*Sullivantia hapemanii*
Soft aster*	*Symphyotrichum molle*

The resulting stratigraphy of the Bighorn Mountains might also be thought of as a "geological onion", with the youngest geological layers on the exterior. Most endemic plants of the Bighorn Mountains are associated with one or more sedimentary formations, the outer layers of the onion, rather than the ancient gneiss and the igneous plutonic rocks that generally form the core. The collective distribution of endemic plants encircles the Bighorn Mountains at foothills and montane elevations and sedimentary formations at the north end (Figure 1). Only one endemic plant is at alpine elevations, Mountain lousewort (*Pedicularis pulchella*), extending onto granitic substrate.

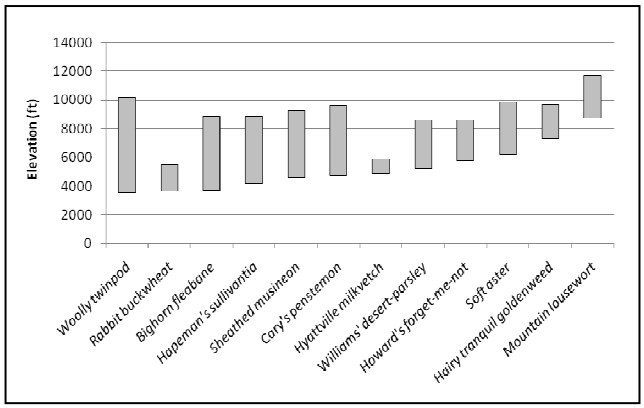


Figure 1. Elevation ranges of Bighorn endemic plants*

Hapeman's sullivantia (*Sullivantia hapemanii*) is the endemic that encircles the Bighorns most completely, as a plant of cold springs, seeps, streams and rivers where waters pass through limestone or dolomite. The rest of the regional endemics are all upland plants, with distributions skewed to the east, west, north or south of the Bighorn Mountains. They include species like Woolly twinpod (*Physaria didymocarpa* ssp. *lanata*) that spans over 6000 feet in elevation. It does not occupy the full gradient – only suitable sedimentary bedrock intervals.

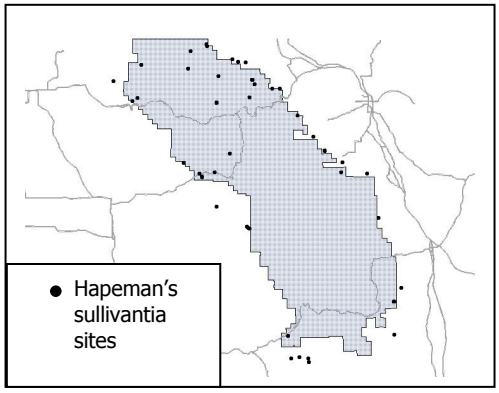


Figure 2. Distribution of Hapeman's sullivantia in the Bighorn Mountains*

In the upcoming annual meeting in the Bighorn Mountains, we look forward to visiting many of these Bighorn endemic plants!

Literature Cited

Fertig, W., C. Refsdal, and J. Whipple. 1994. Wyoming Rare Plant Field Guide. Wyoming Rare Plant Technical Committee, Cheyenne Wyoming.

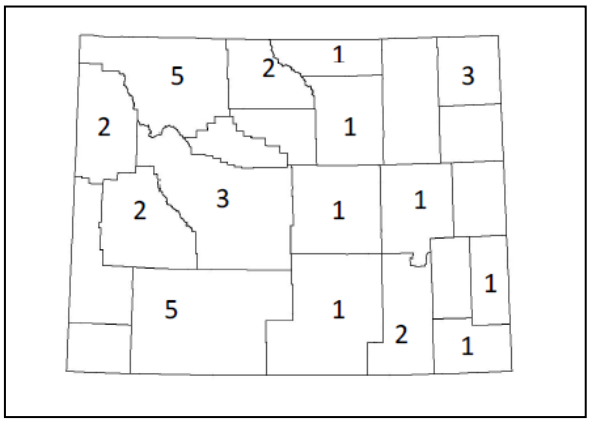
Lageson, D.R. and D.R. Spearing. 1988. Roadside Geology of Wyoming, 2nd ed. Mountain West Publishing Company, Missoula, MT.

*Data from Rocky Mountain Herbarium and Wyoming Natural Diversity Database

Wyoming, We've Got You Covered…Almost

How completely has Wyoming Native Plant Society (WNPS) covered the state in 30 years of annual meetings? The following map represents each of the counties where annual meetings *started.* This is far different than where they ended up (as with the 2011 blitz through three counties).

Annual Meeting Destinations of Wyoming Native Plant Society (1981-2011)



One could spend a lifetime and not see every corner or every wild plant of Wyoming counties. For a complete list of past WNPS annual meeting hikes, see the WNPS homepage and click on "activities."

Wyoming Native Plant Society
P.O. Box 2500
Laramie, WY 82073

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, and annual student scholarship award. Membership is open to individuals, families, or organizations. To join or renew, return this form to:

Wyoming Native Plant Society
P.O. Box 2500, Laramie, WY 82073

Name: _____
Address: _____
Email: _____

___ $7.50 Regular Membership
___ $15.00 Scholarship Supporting Membership
___$200.00 Life Membership

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 rather than a paper copy