Castilleja

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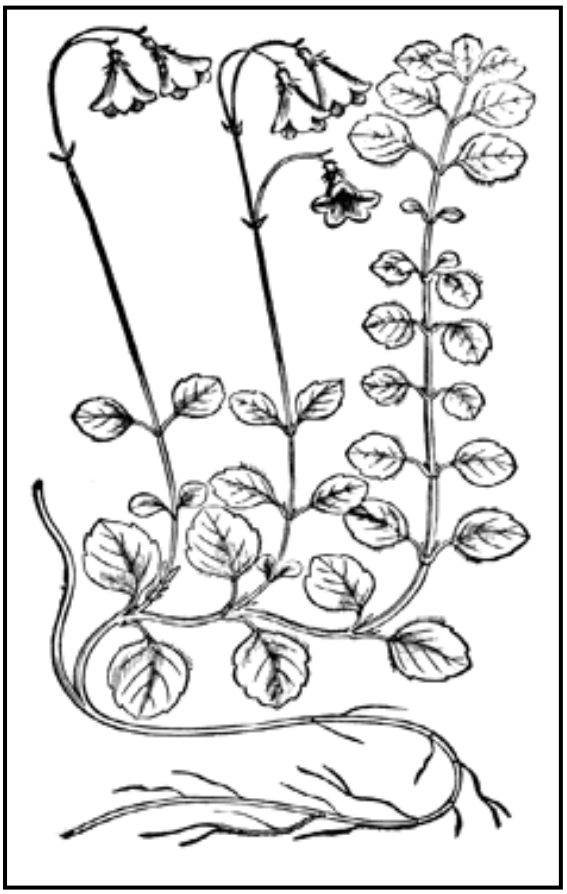

Above*: Linnaea borealis* (twinflower). From: Rudbeck, Olof. 1720. Index plantarum praecipuarum, quas in Itinere Laponico anno 1695, observavit Dn. Olaus Rudbeck, Filius. Acta Literia Sveciae. Imprint Upsaliae. With very kind permission of the Linnean Society of London.

Linnaea borealis evoked the admiration of Linnaeus in his Lapland expedition. It was named after Linnaeus by Gronovius, his mentor. Linnaeus adopted it as his botanical mascot, and acknowledged the honor in self-effacing humor:

> "*Linnaea* was named by the celebrated Gronovius and is a plant of Lapland, lowly, insignificant and disregarded, flowering but for a brief space - from Linnaeus who resembles it." (1753.*Species Plantarum.*)

****Linnaea borealis* grows in over half of Wyoming counties.****

In this issue:

Back to the Future with Linnaeus

Worldwide communities of biologists marked the 300th birthday of Carl Linnaeus in 2007 and celebrated his contributions. He is known as the leading architect of modern taxonomy and nomenclature (Godfray 2007). He personally named about 7700 plant and 4400 animal species. His understanding of taxonomic relationships and natural order carried over into a "big-picture" understanding of the natural world and habitat relations (Sjögren-Gulve et al. 2007). How did one person accomplish so much? His fascination with the natural world, and perhaps his *de facto* career began at age 4. There lies a clue to the acclaim of his students and popularity of his lectures. He was widely-regarded for including fieldtrips with his lectures, conveying the excitement of experiential learning. The values of good botany work and example only increase with time. BH

References

Godfray, H.C.J. Linnaeus in the information age. Nature 446:259-260.

Sjögren-Gulve, P., E. Langström, A. Baldi, P. Ibisch, V. Kati, B. Livoreil and N. Selva. 2007. Conservation biology and the 300th anniversary of the birth of Carl Linnaeus. Conservation Biology 21(4):905-906.

WNPS News

Mark your calendar for the **2008 Annual WNPS Meeting** – July 11-13. This is the year to come to Jackson Hole! *See the next page.*

Proposed By-Laws Amendments: For the proposed By-laws amendments, we have votes from 1/3 of WNPS membership but need response from another 1/3 for any outcome to be official. Voting on officers and board members is also still open; all votes are due by the Annual Meeting. If you have not voted, we would appreciate hearing from you. Electronic or printed copies of the ballot are available from Ann Boelter (amb749@yahoo.com).

Keep us on track this millennium! WNPS is on the verge of a new millennium as gauged by our current checkbook set. In organizational frugality, we are on our last set of checks with "19___" printed in the dateline. Membership renewals make all the difference in this no-frills approach. Please see the address label on the newsletter for the membership year you last renewed. If you would like to double-check the most recent date of your renewal on file, contact Ann Boelter. *We are totally up-to-date in these!*

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

WNPS Board – 2007

President: Beth Burkhart '07	605-673-3159
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Bighorn Native Plant Society: PO Box 21, Big Horn, WY 82833 (Jean Daly, Treasurer)
Webmaster: Melanie Arnett (arnett@uwyo.edu

New Members: Please welcome the following new members to WNPS: Jeff Brasher, Laramie; Kriss Brown, Lander; Sandy & Mike King, Billings, MT; Tina Kruse, Casper; Mary Mastin, Grand Junction, CO; Laura Norman, Lander; Phil Ogle, Cheyenne; Susan O'Neill, Casper; Eve Warren, Worland; Diane Wiganowsky, Cheyenne.

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Teton Chapter events

Saturday, March 22
10:30 AM - 1:00 PM (or longer, if people desire)
Celebrate spring with an outing. Meet at the main Cache Creek trailhead for a short walk - we'll pick the trail depending on snow and mud conditions. See how to identify plants using early buds and bare twigs! Bring a lunch and gear appropriate for the weather.
Leader: Susan Marsh
Phone: 733-5744

Contributors to this issue: Yelena Kosovich-Anderson, Ann Boelter (AB), Bonnie Heidel (BH), Mark Lesser (ML), Rachael Markko (RM), and Amy Taylor (AT). All contributions are welcome; the next deadline is April 18.

Treasurer's Report: Balance as of 15 Feb 2008 - General Fund: $1,580.00; Markow Scholarship Fund: $1,471.00. Total Funds: $3,051.00. AB

Message from the editor

Newsletters always risk serving up stale, old information as though it were new. Maybe you already saw a million-and-one emails and listserve announcements on the topics that are in this issue, or just made it through your winter reading pile backlog of journals and magazines. Did we miss the newsworthy news? More importantly, of the tasks that you personally pursued in the name of Wyoming native plants and landscapes, what ones do you think should be made more widely known?

…At risk of becoming totally stale *and* archaic, we are bringing the "old" insights of Linnaeus to the forefront in this first newsletter issue of the new year. BH

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2008 Wyoming Native Plant Society Annual Meeting

Jackson Hole and Grand Teton National Park
July 11, 12, 13

Significant snowfall in the Tetons promises wonderful wildflower displays for the 2008 Wyoming Native Plant Society Annual Meeting. The Teton Chapter invites ***you*** to three days of glorious botanizing, July 11-13, in and around Grand Teton National Park. Field trips will take place all weekend. A highlight of this year's annual meeting is a Saturday evening program at Teton Science Schools, Kelly Campus, where we will also and have a catered dinner[1]. A final agenda with complete details will be provided in the May newsletter, along with a pre-registration for the catered dinner and camping. All WNPS events are open to the public.

❋ Friday, July 11: afternoon plant walk, socializing at campground

❋ Saturday, July 12: Field trips all day, many in Grand Teton NP

Evening Program at Teton Science Schools (TSS):
5:00 Social Hour, Tour of TSS and the Markow-Murie Herbarium
6:00 Dinner at Teton Science School ($15/person)
7:00 Robert and Jane Dorn: "Landscaping with Native Plants"

❋ Sunday, July 13: Half-day field trip

Photo by Charmaine Delmatier

Robert and Jane Dorn will speak on "Landscaping with Native Plants" in the Saturday evening talk at Teton Science Schools, coinciding with their recently published book, "Growing Native Plants of the Rocky Mountain Region", 2007 (www.lulu.com/content/768231; book review by Walter Fertig in *Castilleja* May 2007). Because the book is printed as ordered, copies will not be for sale at the annual meeting. However, you can order in advance at a discounted rate of $50 including shipping (publisher's price $82.94 +shipping) and get it signed at the annual meeting. Contact the Dorns at linglebird@yahoo.com for details on ordering the book version. The CD-rom version is available at www.lulu.com/content/787924 for $7.50 plus shipping.

Accommodations/Camping: Grand Teton National Park and Bridger-Teton National Forest offer many campsites but few can be reserved in advance. Therefore, the Teton Chapter offers to make same-day reservations on Friday and Saturday (July 11-12) at Gros Ventre Campground in GTNP (a large campground; no electrical hook-ups). It is located near the Gros Ventre River and Teton Science Schools, with great views of the Tetons and incredible birding and other wildlife watching opportunities. Campsites are $17/night (half price for seniors), are large, and can be shared with up to 2 vehicles per campsite. The Teton Chapter will take reservations requests in the next issue. If you plan to make your own lodging arrangements (hotel, lodges, etc.), reserve early! Jackson Hole and the surrounding area are very popular summer destinations. AT

Other information:
Annual Meeting Coordinator: Amy Taylor 307-733-3776, ajrtaylor@hotmail.com ; Teton Chapter of WNPS
Grand Teton National Park: 307-739-3300, www.nps.gov/grte; entry is $25 per vehicle for one to seven days (also good for Yellowstone National Park).
Bridger-Teton National Forest: 307-739-5400, www.fs.fed.us/r4/btnf
Teton Science Schools: 307-733-1313, www.tetonscience.org
Chamber of Commerce: 307-733-3316, www.jacksonholechamber.com

❋ ***This is the year to come to Jackson Hole - hope you can join us!*** ❋

[1] The Teton Science Schools, Kelly Campus is also home to the Markow-Murie Herbarium. The herbarium was renamed in 2004 in memory of Stuart Markow, a well-known botanist in Wyoming.

Teton County Native Plant Species List

By Rachel Markko
Teton Conservation District NR Specialist

The Teton Conservation District (TCD) has joined forces with Teton County, Teton Science School (TSS) and over forty other area plant related agencies to create a *Native Plant Species List* for use with Teton County's land development regulations (LDRs). In the fall of 2006 the TCD was approached by the Teton County Planning Department (TCPD) with the need to revise an out-of-date *"Landscape Plant Materials for the Teton County Area"* list referenced in the LDRs. The LDRs currently require the use of native plants for reclamation purposes (Division 49100, Grading and Erosion Control Standards). The LDRs also advise that all landscape areas beyond 200 feet of the building area utilize native plants (Division 4100, Landscaping Standards). The *Native Plant Species List* aims to help provide greater consistency and clarity to meet these standards. "When landowners asked what species would be acceptable, we were unable to point them to a single source, since our current list includes a number of non-natives. The new list will be a huge help." said Maggie Schilling, Staff Planner, TCPD. The TCD hopes that the list will also serve as an educational tool to area landowners and managers.

267 species are listed with 68 graminoids, 132 forbs, and 67 trees. Each species has 13 characteristics that include information such as duration, life form, growth form, fire resistance, toxicity, and soils. Over fifty lists, books, websites, and brochures have been cross referenced and compared to the list. Agency staff and the Natural Resources Conservation Service (NRCS) Plants Database http://plants.usda.gov/ have proven to be essential in the creation of the list. The Native Seed Network, an institute for applied ecology, has an on-line searchable site http://www.nativeseednetwork.org/ for finding seed for sale and making sure each species on the list is commercially available. Other noted references include Richard J. Shaw's Vascular Plants of Grand Teton National Park and Teton County an Annotated Checklist, and additional area seed distributer lists. In addition to area government agencies and non-profit organizations, over 100 area plant related businesses will be sent the list and informed of its purpose.

With help from Tara Hodges and of the Wyoming Game and Fish Department a special bear icon for the list has been created to point out specific species such as Chokecherry (*Prunus virginiana*), Elderberry (*Sambucus racemosa*), and Huckleberry (*Vaccinium membranaceum*) to growers in Conflict Priority Zone 1 within Teton County of their attractiveness to bears. This serves as reminder to people to be responsible neighbors and to remember, "A fed bear is a dead bear!"

In addition to the list, the TCD has helped fund a "Working Together to Improve Restoration of Native Landscapes" project. This is a four-year project initiated by Teton Science Schools to address the need in Teton County of improved availability, awareness and use of native plant restoration techniques and resources. Currently, we are gathering available information on native plant species in the area and developing a brochure and website summarizing these available resources. In the near future, we will be identifying potential native plant reclamation sites on public and private lands as well as discussing native seed collection and planting sites within GTNP. Seed collection has been completed and we plan to reseed in the fall. Partners on this project also include the Jackson Hole Community Foundation, GTNP, NRCS, and the Jackson Hole Land Trust.

If you would like to help review the DRAFT Teton County Native Plant Species List or would like more information about the "Working Together to Improve Restoration of Native Landscapes" project, contact Rachel Markko at (307) 733-2110 or by email (rachel@tetonconservation.org). Thank you! RM

The Teton County land development regulations (http://www.tetonwyo.org/plan/nav/100141.asp) set standards for new development in unincorporated segments of the county. What is different about Teton County is that those regulations address native plants! The regulations apply to construction of some water retention ponds and major construction sites, and do not apply to lawns, or to all landscaped areas. Around the sites of new homes in particular, they only address the zone 200 feet away from buildings. Don't expect any petunia patrols. The regulations provide standards that, in combination with the list of native species that are commercially available, open up a wealth of information resources and ways for residents to work with the native plant life all around them.

Additions to the Wyoming Vascular Flora

A recent publication by Brasher et al. (2007) documents additions to the weedy Wyoming vascular flora, not reported in Dorn (2001). It is highlighted here as a call for botanists, weed specialists and land managers to be watching for these species.

- Mountain knapweed (*Centaurea montana*) is a cultivated plant that has escaped and naturalized in Fremont County on the Middle Fork of the Popo Agie River. It is closely related to other knapweeds that are designated as noxious in Wyoming.
- Rush skeletonweed (*Chondrilla juncea*) was previously reported without vouchers from Big Horn and Lincoln counties, and is now confirmed in Sublette County along Hwy. 191 between Jackson and Pinedale. It is a serious noxious weed in Idaho.
- Austrian yellowcress (*Rorippa austriaca*) is documented in the state for the first time from Sublette County in the New Fork valley, and may have the potential to invade a variety of moist agricultural lands and wetland habitats.

In addition, common viper's-bugloss (*Echium vulgare*) is already known from the state flora in Albany, Laramie, Platte and Uinta counties, but researchers added information from recent collections and surveys in Wyoming as well as Colorado to suggest that it potentially could become a noxious weed in Wyoming.

For further information on these species see the article (Brasher et al. 2007) and the Wyoming Pest Detection Program homepage (http://www.uwyo.edu/capsweb/Default.ASP).

References

Brasher, J., S. Enloe, A. Peterson, A.G. Currah and B.E. Nelson. Additions to the flora of Wyoming and Colorado. 2007. Madroño 54(2):210-211.

Dorn, R.D. 2001. Vascular Plants of Wyoming, 3rd ed. Mountain West Publishing, Cheyenne, WY.

Additions to the Wyoming Bryophyte Flora

Two publications chronicle recent additions to the Wyoming bryophyte flora, as researched and compiled by Eckel (1996, 2007).

Lemly et al. (2007) identified species of *Sphagnum* new to the state of Wyoming in fens that formed over acidic geothermal springs in Yellowstone National Park (*Sphagnum lindbergii, S. capillifolium, S. riparium*). These species are unknown or rare in the Rocky Mountains of the United States.

Lenz (2006) documented the first record of *Warnstorfia tundrae* at a fen of the Big Horn Mountains, also representing the first collection in the lower 48 states.

References

Eckel, P.M. 1996. Synopsis of the mosses of Wyoming. Great Basin Naturalist 56(3):197-204.

Eckel, P.M. 2007. County checklist of the mosses of Wyoming. Res Botanica, a Missouri Botanical Garden Web Site. http://www.mobot.org/plantscience/resbot/1Bryo.htm August 17, 2007.

Lemly, J.M., R.E. Andrus and D.J. Cooper. 2007. *Sphagnum lindbergii* Schimp. In Lindb. and other new records of *Sphagnum* in geothermal fens, Yellowstone National Park, Wyoming, USA. Evansia 24(2): 31-33.

Lenz, M.J. 2006. *Warnstorfia tundrae* (Arnell) Loeske (Campyliaceae) new for Wyoming. Evansia 23(3): 68.

Figure 1. *Sphagnum* in a natural setting

***Sphagnum*: How to recognize it in the field**

By Yelena Kosovich-Anderson

The *Sphagnum* genus, widely referred to as *Sphagnum* or peat moss, is one of the largest in the bryoflora of the U.S. Rocky Mountains. No less than 20 species of it have been recorded in this area over the last centuries. Nowadays, reports on new findings of *Sphagnum* representatives in our region showing up on the pages of scientific journals evoke keen interest of the local botanical community. This note is a brief instruction for everyone interested on how to recognize peat moss in the field.

The list of the following *external* characteristics of this unusual plant are evidence that you have found peat moss:

1. **Large sizes of plants**. Compared with other mosses, *Sphagnum* is typically a robust plant, normally reaching lengths from 2-6 inches (5-15 cm).
2. **Mat-forming growth**. Individual plants of *Sphagnum* are usually aggregated into dense or loose mats that are composed of hundreds of shoots forming hummocks or carpets/lawns in natural settings (Figure 1).
3. **Specific color of mats**. *Sphagnum* always has a whitish tint caused by the presence of many dead cells (most of the *Sphagnum* plant is made up of dead cells!). Most species of *Sphagnum* have additional pigmentation: they are often tinged with red, yellow, brown and even bluish color.
4. **Spongy texture**. *Sphagnum* is an old Greek name most likely derived from "sphoggos", a sponge. The sponge-like texture of *Sphagnum* is caused by the abundance of the above-mentioned dead cells that are able to momentarily fill with a large amount of water. The walls of these cells are porous that allows these cells to easily absorb water and retain up to 25 times their dry weight in water. As it happens, the whole mat of *Sphagnum* acts just like a sponge.
5. **Unique branching pattern**. Erect, normally simple stems of *Sphagnum* bear spirally arranged fascicles of 3-12 (-14) branches (Figure 2). The fascicles are sparser on the lower part of the stem and crowded at the apex. Branches are typically dimorphic: 1-3 or more branches in each fascicle are shorter, thicker, and more or less spreading, the other are long, slender, and hanging parallel with the main stem. Branches are clustered into fascicles along stem. No single group of mosses has such a characteristic type of branching pattern.
6. **Presence of a head**. Unlike the other of mosses, *Sphagnum* has a great "mop-like" head composed from several branch clusters/fascicles crowded at the apex in a compact capitulum.

As you can see, *Sphagnum* morphology has very distinctive features. The relatively large size of shoots, unique branching pattern, presence of a distinct head, and whitish tint of mats (often with various pigmentation) make this genus one of the easiest among mosses to recognize in nature even without a magnifying lens. And, of course, when hunting for *Sphagnum*, do not forget that habitat requirements of this genus are also very peculiar – it occupies mainly peat-forming wetlands that are often highly acidic. Most of the *Sphagnum* species throughout the temperate zone of the Northern Hemisphere are found in such environments. Some interesting *Sphagnum* also grow on wet humus, or rocks, sometimes in water.

(cont. next page)

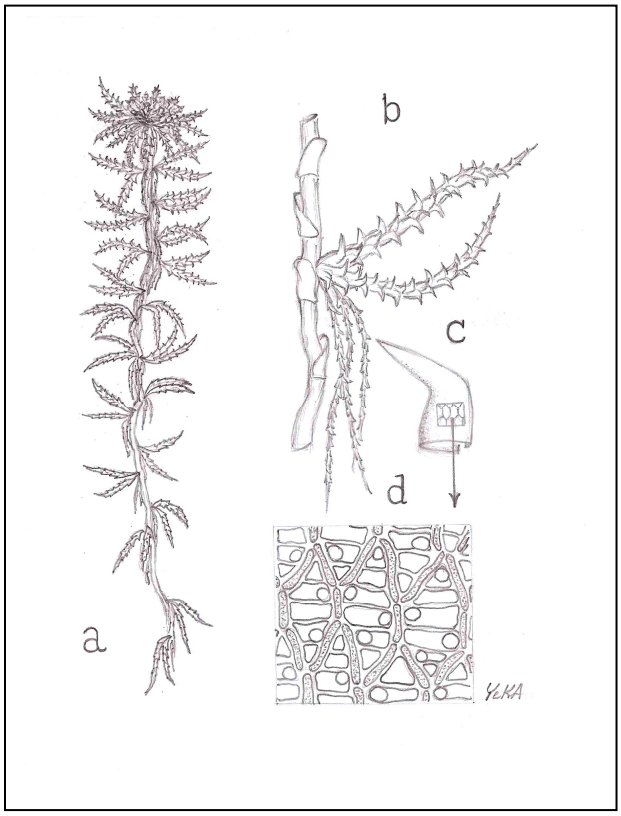

Figure 2. *Sphagnum*. By Yelena Kosovich-Anderson

a. *Sphagnum* habit
b. Portion of the stem showing a fascicle of branches
c. Branch leaf
d. Cells of branch leaf (water-absorbing dead cells are large and porous and have distinctive hexagonal/rhomboidal form; they are surrounded by vermicular chlorophyll-containing cells)

(continued from p. 6)

Have a little practice, patience and observation and you'll definitely be able to differentiate peat moss from any other group of plants. But the determination of such a complicated genus like *Sphagnum* to the species level demands special bryology skills and use of the compound microscope. If you would like to "get a feel" of the process of making *Sphagnum* species determinations, you may want to consider the following books:

References

Crum, H.A, and L.E. Anderson. 1981. Mosses of Eastern North America. Columbia University Press, NY. (Technical publication. Contains line illustrations and detailed descriptions of many *Sphagnum* species that can be found in the West)

McQueen, C.B. and R.E. Andrus. 2007. Sphagnaceae. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 14+ vols. New York and Oxford. Vol. 27, pp. 45-101.

Weber, W.A. and R.C. Wittmann. 2007. Bryophytes of Colorado: Mosses, Liverworts and Hornworts. Pilgrims Process, Inc. Santa Fe, NM. (Excellent book on bryoflora of neighboring state. Provided with good and simple dichotomous key on *Sphagnum*; includes almost all known Wyoming *Sphagnum* species.)

U.S. Forest Service Releases Native Plant Material Directive

The U.S. Forest Service recently released a national directive on native plant materials (Forest Service Manual 2070). With the exception of reforestation policy there was no previous policy for the use of native plants. Native plants are also integral to rangeland management and watershed restoration, and have been identified as key components in the implementation of administrative priorities to combat invasive species and facilitate wildland restoration efforts.

The new policy is posted at <http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?2000!.. The major points of the policy include:

* Native plant materials will be the first choice in revegetation for restoration and rehabilitation of native ecosystems where timely natural regeneration of the native plant community will not occur.
* Non-native, non-invasive plant species may be used when:
  - Needed in emergency conditions to protect basic resource values.
  - As an interim, non-persistent measure designed to aid in the re-establishment of native plants.
  - When native plant materials are not available.
  - In permanently altered plant communities.
* Under no circumstances will non-native invasive plant species be used as plant material for restoration, rehabilitation or reconstruction of native ecosystems.
* Forest Service staff will use the best information available to choose genetically appropriate native plant materials for the site to be restored.

Ponderosa Pine in the Big Horn Basin

By Mark R. Lesser

The Big Horn Basin is one of the driest regions of Wyoming and the vegetation reflects that aridity, dominated by shrubland species such as greasewood (*Sarcobatus vermiculatus*) and Wyoming big sagebrush (*Artemesia tridentata* var. *wyomingensis*). But did you know that there are also ponderosa pine (*Pinus ponderosa*) in the Big Horn Basin? Well there are, and I am not talking about a few stunted individuals here and there. I have inventoried over a thousand trees at locations that are up to 80 miles west of ponderosa pine's main distribution in the Big Horn Mountains.

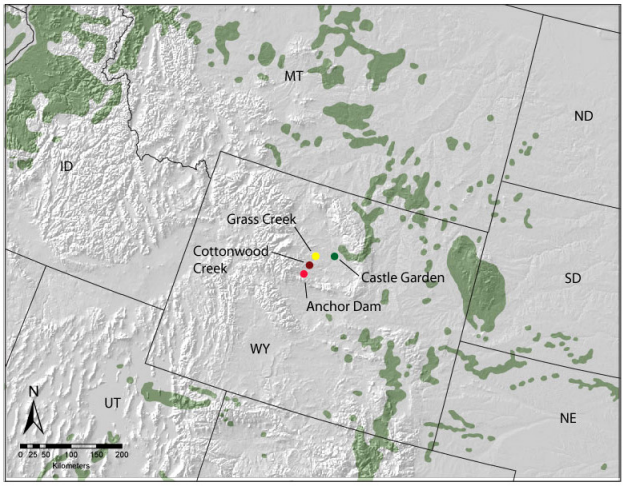

Figure 1. Range of *Pinus ponderosa* in Wyoming and adjacent states (dark shading), and the location of the four study populations

During the summer of 2007, I explored and inventoried four populations of ponderosa pine in the Big Horn Basin (Figure 1). Two of these populations (Cottonwood Creek and Castle Garden; Figure 2) are represented in the *Atlas of Vascular Flora of Wyoming* (Rocky Mountain Herbarium 1998), however the other two (Grass Creek and Anchor Dam) are not, and it appears that ponderosa pine has a stronger foothold in the Big Horn Basin then may have been thought. This is particularly interesting because several studies show that global warming and increasing CO^2 levels will lead to increases in the natural range of ponderosa pine, specifically across the Yellowstone Plateau in western Wyoming (Rehfeldt *et al.* 2006, Shafer *et al.* 2001). These currently disjunct populations in the western Big Horn Basin are positioned to possibly be the frontrunners of this anticipated expansion.

Figure 2. Ponderosa Pine at Cottonwood Creek. Photo by Mark Lesser

While global warming and rising CO^2 provide the necessary climate conditions for ponderosa pine to live in these new areas (Rehfeldt *et al.* 2006), the question of what factors are involved in how the trees actually get to newly suitable environments and then establish and expand once there is still, to a large extent, a mystery. The purpose of this study is to get at the underlying drivers of colonization, establishment and expansion into new territory. These four disjunct populations in the Big Horn Basin provide a perfect natural laboratory in which these drivers can be studied.

The first phase of the project involved using increment cores to age the trees in these populations to determine when the initial colonization events and the subsequent recruitment and expansion have occurred. Findings to date show an amazing pattern in colonization and recruitment over the last 500 years. In the populations analyzed to this point (Castle Garden, Grass Creek, and Cottonwood Creek), initial colonization occurred during the first half of the 17^{th} century with low population levels persisting until the mid 18^{th} century. At that time all three populations show a striking pulse in recruitment. Interestingly this recruitment pulse occurs at all of the sites at the same time, and coincides with a climatic transition from dry to wet conditions based on the reconstructed (Cont. next page)

precipitation record (Gray *et al.* 2004). Obviously, climate is playing a role in the development of these populations; however climate is not providing the whole story. There are lots of similarly wet periods in the record that do not correspond to recruitment pulses. Ecological and genetic factors are most certainly interacting with climate to dictate when and where recruitment occurs through time.

The next phase of research will analyze the genetic structure of these populations across the landscape using molecular markers. By combining the temporal age record with the spatial genetic structure I will be able to look at the relative influences of climate, population density and genetic variation on colonization, establishment and expansion of these range edge populations. Stay tuned for more results!

Mark R. Lesser (mlesser@uwyo.edu)
University of Wyoming, Program in Ecology, Department of Botany

References

Gray, S.T., C.L. Fastie, S.T. Jackson, and J.L.Betancourt. 2004. Tree-ring based reconstructions of precipitation in the Bighorn Basin, Wyoming since 1260 A.D. Journal of Climate 17:3855-3865.

Rehfeldt, G.E., N.L. Crookston, M.V. Warwell, and J.E. Evans. 2006. Empirical analysis of plant-climate relationships for the western United States. Int. J. Plant Sci. 167(6): 1123-1150.

Rocky Mountain Herbarium. 1998. Atlas of Vascular Flora of Wyoming. University of Wyoming. http://www.sbs.utexas.edu/tchumley/wyomap/atlas.htm

Shafer, S.L., P.J. Bartlein, and R.S. Thompson. 2001. Potential changes in the distributions of western North America tree and shrub taxa under future climate scenarios. Ecosystems. 4:200-215.

Midway Milestone: Flora of North America

By Nancy R. Morin, Southwest Regional Coordinator, Flora of North America

More than 900 botanists working as part of the Flora of North America project have now catalogued over half of the genera of higher plants native to or naturalized in North America north of Mexico, and hope to finish by 2011. The Flora of North America is the first comprehensive and scientifically authoritative publication treating the 20,000-plus species of plants in both the United States and Canada. Fourteen volumes have been published (including an introductory volume). A total of 30 volumes are planned to be published.

The Flora of North America makes many lifetimes of study and the best knowledge from regional floras available in print and electronically. Authors base their work on knowledge of plants in the field, herbarium specimens, and review of the literature. The project also has a network of regional reviewers. Authors and editors work as volunteers; grants and donations support technical editors and botanical illustrators. The books are published by Oxford University Press-US available at www.oup.com/us/fnaseries). More information on Flora of North America and treatments from published volumes are available at www.fna.org.

For more information contact Nancy R. Morin, FNA Business Office, P.O. Box 716, Point Arena, California, 707-882-2528, nancy.morin@nau.edu or Ronald Hartman, Rocky Mountain Herbarium, 307-766-2256, rhartman@uwyo.edu .

One-time FNA sales

It's not too late if you want to start a library of Flora of North America (FNA) volumes. The Colorado Native Plant Society is extending FNA sales to Wyoming Native Plant Society members, with the recent decision that FNA volumes will no longer be stocked in the CoNPS bookstore. For a complete list of the CoNPS bookstore inventory, see (http://www.conps.org/bookstore.html). Five of the original fourteen volumes are available at sale prices in *limited* quantities.

- Volume #1 -- $75.00 each (plus $5.00 shipping).
- Volume #2 -- $75.00 (plus $5.00 shipping).
- Volume #5 -- $50.00 each (plus $5.00 shipping).
- Volume #22 -- $75.00 each (plus $5.00 shipping).
- Volume #26 -- $75.00 each (plus $5.00 shipping).

Make your checks payable to: Colorado Native Plant Society. Mail your order and check ONLY after emailing or phoning to make certain that the items are available, by contacting: Mary Ellen Ford; Phone: 303-449 -7334; E-mail: Fordmaryel . Mail orders to: Colorado Native Plant Society, c/o Mary Ellen Ford, 2133 13th Street, Boulder, CO 80302.

Announcing:

Western Wetlands Monitoring and Assessment Workgroup, 3rd regional meeting
April 29, 30, & May 1, 2008
Rushmore Plaza Holiday Inn in Rapid City, SD

You are invited to the Western Wetland Workshop organized by EPA Region VIII in collaboration with states and tribes. The goal of this workshop is to assist states and tribes in developing new programs or enhancing existing programs to monitor and assess wetlands of the Rocky Mountains and High Plains. The workshop offers practitioners an opportunity to share technical information regarding wetland monitoring and assessment methods, study designs, and assessment approaches currently in use in the region and in the United States.

The workshop is intended for both developers and users of wetland monitoring and assessment tools including wetland and water quality scientists and managers with federal, state, and tribal agencies, academic institutions, and private organizations. Meeting support is being provided by the International Water Institute. Workshop information, including registration form, logistics, agenda, and background information are posted on a workshop website hosted by the International Water Institute at http://www.internationalwaterinstitute.org under the "Western Wetland Monitoring and Assessment Workgroup" link.

There is a $30 registration fee to help cover workshop expenses. A block of rooms is being held at the Rushmore Plaza Holiday Inn at a group rate of $69 until March 20, 2008. Call 1-800-HOLIDAY to make your reservation. Ask for the "Region 8 Wetland Monitoring & Assessment Workshop" to receive the conference rate. For information regarding the Rushmore Plaza Holiday Inn, go to: http://www.rushmoreplaza.com

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Announcing:

6th Annual Black Hills Ecologist & Botanist Workshop

Thursday. **March 20, 2008**; 9:00 am – 4:00 pm
Western Dakota Technical Institute –
Corporate Education Center
800 Mickelson Dr. • Rapid City, SD

You are invited to the 6th Annual Black Hills Ecologist and Botanist Workshop, March 20 in Rapid City, SD; sponsored by the National Park Service, Black Hills National Forest and The Nature Conservancy. The workshop offers biologists and natural resource managers throughout the area an opportunity to learn the latest research developments and experimental management outcomes. A slate of 12 presentations is offered. For further information, contact: Amy Symstad (asymstad@usgs.gov; 605-745-1191).

Presentations

- Steve Rolfsmeier – A possible Carolinian relict flora in the Nebraska Sandhills
- Mark Gabel and Dan Tackett – A Range Extension for *Cypripedium montanum* Douglas ex. Lindley (Orchidaceae) into the Black Hills of South Dakota
- Marie Curtin – Seed longevity: where do those numbers come from?
- Amy Symstad – Canada thistle treatment at Badlands National Park: What happens afterward?
- Jack Butler – Current projects at the Rapid City Forest and Grassland Research Laboratory
- Stefanie Wacker and Jack Butler – Understory vegetation response to timber harvest in the Black Hills
- Beth Burkhart – Black Hills National Forest plant monitoring 2000-2007: Interactions with adaptive management and other results
- Chelsea Vollmer – Update on Black Hills National Forest restoration of McIntosh Fen
- Eugene Bolka – Mystic Ranger District noxious weed program
- Bob Paulson – New TNC work in the Conata Basin
- Bob Gitzen – Update on the NPS Northern Great Plains Monitoring Plan
- Peter Brown, Cody Wienk, and Amy Symstad – Forest history and structure at Mount Rushmore National Memorial

The full agenda is posted at:
http://www.nps.gov/ngpfire/bheco.htm >

Critical Habitat of Threatened Plant Species' Withdrawn from Mining

On January 30, 2008, the Bureau of Land Management withdrew 360 acres in Fremont County from surface entry and mining for 20 years to protect desert yellowhead (*Yermo xanthocephalus*; USDI BLM 2008). Desert yellowhead was designated a Threatened species in 1998, it is known from one population, and critical habitat was designated for 360 acres in and around the population in 2002. The 2008 withdrawal action was prompted by an opal-hunting bonanza that began in March 2005 with release of a Wyoming Geological Survey report on gem-grade opal in the vicinity of desert yellowhead's single population (see *Castilleja* 25(1)).

USDI Bureau of Land Management. 2008. 51 CFR Public Land Order No. 7688. Withdrawal of Public Lands for the Protection of *Yermo xanthocephalus* Plant Habitat; Wyoming. Federal Register 73(20):5586.

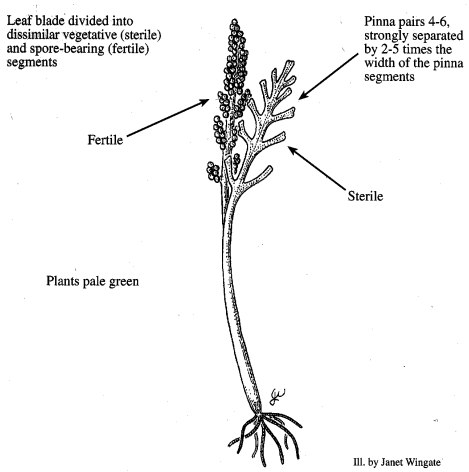
Candidate Plant Species Dropped

Slender moonwort (*Botrychium lineare*; also called narrowleaf grapefern), a member of the adder's-tongue family (Ophioglossaceae), was dropped as a Candidate for potential listing by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act, in a notice posted on December 6, 2007 (USFWS 2007).

UWFWS cited recent studies that have found this fern to be more widely distributed in North American than originally suspected and under less imminent threat. There are no other Wyoming plant species on the official candidate roster. It remains on the sensitive species list of the U.S. Forest Service Rocky Mountain Region (http://www.fs.fed.us/r2/projects/scp/assessments/index.shtml), and regional status information is posted at the species conservation assessment homepage (Beatty et al. 2003), plus addenda.

Slender moonwort was first described as a new species by the late Warren H. Wagner and Florence Wagner in 1994, became a candidate for listing in 2000, and was first discovered in the Black Hills of Wyoming in 2003 (Reyher 2004). The species is currently known from 22 sites spread across eight states (Alaska, Colorado, Minnesota, Montana, Oregon, South Dakota, Washington, and Wyoming) and two Canadian Provinces (Alberta and Yukon Territory).

Moonworts are primitive vascular plants that can be recognized by their single, green fleshy leaf blades that are divided into two morphologically distinct fronds. The fertile frond (sporophore) has clusters of ball-like spore cases that resemble grapes (hence, the alternate common name "grapefern"). The vegetative frond (tropophore) is the primary photosynthetic surface.



Botrychium lineare, by Janet Wingate
(From: Colorado Rare Plant Field Guide, Spackman et al. 1997)

Slender moonwort remains on the U.S. Forest Service sensitive species list in Region 2. Black Hills moonwort sleuths are monitoring it to assess trends. There is more to moonworts - and moonwort status - than meets the eye.

References

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson (2003, November 12). *Botrychium ascendens* W.H. Wagner (trianglelobe moonwort), *B. crenulatum* W.H. Wagner (scalloped moonwort), and *B. lineare* W.H. Wagner (narrowleaf grapefern): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/botrychiums.pdf [date of access].

Reyher, D. 2004. *Botrychium lineare* confirmed in Wyoming. *Castilleja* 23(1):7.

U.S. Fish and Wildlife Service. 2007. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Proposed Rule. Federal Register 72(234):69034-69106.

Announcing:

2008 Wyoming Master Gardener Conference

April 25-27, 2008
Holiday Inn, Cody, WY

You are invited to the 2008 Wyoming Master Gardener Conference, offered for master gardeners and anyone with a green thumb interested in gardening techniques in the Rocky Mountains. The program includes speakers, tours, workshops, and trade fairs. The agenda and online registration available from Wyoming Cooperative Extension Service offices and are also posted by at: http://outreach.uwyo.edu/conferences/mastergardener/ ; however, native plant topics are not in the current posted agenda. Registration costs are $175 for the full 3-day conference, and reduced daily registration fees are also available. This year's event is being hosted by the Park County Master Gardeners. Additional information about the Master Gardener program in Wyoming is posted at: http://ces.uwyo.edu/Master_Gardener_Main.asp .

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

The Wyoming Native Plant Society is a non-profit organization established in 1981, dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state 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 Member
($7.50 goes to the Markow Scholarship Fund)

Check one:

_____New member
_____Renewing member

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