

Aquilegia

Newsletter of the Colorado Native Plant Society

Dedicated to furthering the knowledge, appreciation and conservation of native plants and habitats of Colorado through education, stewardship and advocacy



-
- **Volume 37 – Number 1 – Spring 2013**
-

ISSN 2162-0865 (print) - ISSN 2161-7317 (online)

CONSERVATION CORNER

The Mount Evans Project

By Mo Ewing, Conservation Committee Chair

From his collecting visits in the 1950s, to an article he wrote in *Aquilegia* in August 1991, to the present day, Bill Weber has been a champion for Summit Lake on Mount Evans. In 1965 Bill nominated Summit Lake for designation as a National Natural Landmark because it was considered to be one of the finest examples of alpine tundra in the lower 48 states.

For the last couple of years, Bill has urged CoNPS to take over his role as the champion of Mount Evans, expressing a particular concern regarding the presence of non-native mountain goats which the Colorado Department of Wildlife introduced to the area in the 1960s. Last January a group of volunteers met with Bill and Ron Wittmann to consider taking on Mount Evans as a long-term conservation project for our Society.

Very quickly we realized that Ron and Bill were the only two people locally who knew much about Mount Evans and Summit Lake. Over the years Bill had brought many internationally renowned botanists to the lake to view its wonders, but otherwise very few people from our area were familiar with the plants and plant communities there.

Summit Lake is owned by the City and County of Denver as a result of its purchase, in 1924, of 160 acres around the lake, creating Summit Lake Park and adding it to its Mountain Parks system. In March 2012 CoNPS volunteers met with Bob Finch, the Director of Natural Resources for Denver Parks and Recreation to discuss how to work together to preserve Summit Lake. Bob asked us to map the rare plants and plant communities found there.

(continued on next page)

ETHICS AND PROTOCOLS OF PLANT COLLECTING

As we enter the growing season, it is a good time to revisit ethics and procedures regarding plant collecting on public and private lands. “How many plants can I collect from a population?” “Should I avoid collecting if the species is rare?” “Do I need a permit to collect if I am on public land?” “Can I collect on private land?” These are among the typical questions pondered by those who wish to collect.

For answers - and where to go for more information - read the article on this subject by Steve Popovich, Field Studies Chairperson, inside on page 4.



Ligularia holmii

Photo by Mo Ewing

Interestingly, in spite of the fact that botanists had collected plants from the lake since 1939, the plant communities at the lake had never been described or mapped. Also the rare plants had never been mapped using GPS technology.

One of our first goals was to get CoNPS volunteers up to the lake to begin to understand what was there. Some of our research indicated that many of Summit Lake's plants had not been documented nor collected since the 1950s and 1960s. What had changed since then?

We first set up a database of plants made up of lists that Bill Weber had created for an article he wrote for *Aquilegia* in 1991, and a more recent list he made in 2004. We then added to that list by researching collections from nine herbaria across the U.S. from the University of Colorado to the New York Botanic Gardens.

Our research produced a list of 142 species of flowering plants that had been documented or collected at Summit Lake since 1939. Bill indicated that the truly unique aspect of Summit Lake flora was its extensive collection of mosses. A review of moss species at the University of Colorado herbarium in Boulder produced a list of 85 species of mosses found at Summit Lake

Armed with our species lists, Loraine Yeatts, Janet Wingate, Megan Bowes, Fran Enright, Linnea Gilman and Mo Ewing spent a total of 25 person-days over the summer identifying, collecting and mapping the plant communities and rare plants at the lake.

Summit Lake Park is located in a glacial cirque with a huge, gently sloping terminal glacial moraine that fans out to the northeast toward Denver. If you stand just below the Mount Evans Road which traverses the park, the glacial moraine is so flat that it seems to slope up to a ridge below the park. Because of the flatness of the moraine and because that area is underlain by permafrost, there are extensive peat wetlands around, and especially below, the lake.

The lake itself is at 12,840 feet elevation and, at 33 acres, is by far the largest lake in Colorado over 12,500 feet. Since the CoNPS volunteer corps were concentrating on Summit Lake Park, we did not get into the extensive lower wetlands; but looking at Mount Evans from Google Earth, those wetlands could easily be as large as 150 acres -- all this at almost 13,000 feet!

Because of the extensive wetlands and because the park is located in a cirque, the park has many different aspects, slopes and hydrological regimes. This diversity results in a large number of very distinct plant



Peat Fen on Terminal Glacial Moraine

Photo by Mo Ewing

communities. We identified and mapped 15 different plant communities, each with its own special suite of plants.

We saw and documented 119 species of flowering plants, eight of them considered rare: *Chionophila jamesii* (G3 S4), *Draba crassa* (G3 S3), *Draba exunguiculata* (G2 S2), *Draba grayana* (G2 S2), *Kobresia simpliciuscula* (G5 S2), *Phippsia algida* (G5 S2), *Muscaria monticola* (G5T5 S1), and *Spatularia foliolosa* (G4 S1).



Draba grayana

Photo by Mo Ewing

The Colorado Natural Heritage Program has given *Draba crassa* a conservation ranking of “vulnerable” in Colorado, but Loraine Yeatts says it is common in the alpine.

Bill Weber had told us that every time he has gone to the lake he has found new, undocumented species there. Last summer was no exception. We identified ten new species of flowering plants including: *Campanula parryi*, *Draba crassa*, *Festuca thurberi*, *Hierochloa hirta* ssp. *arctica*, *Juncus albescens*, *Ligularia holmii*, *Phlox condensata*, *Poa reflexa*, *Saxifraga hyperborea*, and *Taraxicum scopulorum*.

We also documented *Selaginella densa*, a clubmoss, which had never been collected before. It seems rather strange that this plant had never been collected at Mount Evans, since it is common in the alpine.

We did not find 43 species of previously documented Summit Lake flowering plants. Among these were five rare species including *Delwiesia pattersonii* (G3G4S3), *Draba fladnizensis* var. *pattersonii* (G4 S2S3), *Mertensia alpina* (G4S1), *Alsinanthe stricta*, (G5S1) and *Alsinanthe macrantha*, (G3?S3?).

Draba fladnizensis var. *pattersonii* has not actually been collected at Summit Lake, but has been collected from the saddle between Mount Evans and Mount Epaulet, another biologically rich area on Mount Evans which we plan to study next summer. Additionally the *Mertensia alpina* specimen at Rocky Mountain

Herbarium in Wyoming was collected by a graduate student in 2004. It is one of 250,000 specimens at the herbarium which have never been verified or assigned an herbarium accession number! Since *M. alpina* is endemic on Pikes Peak, it is probably an incorrect identification. *Mertensia lanceolata*, which is found at Summit Lake, grows in a dwarf form in exposed areas that looks just like *M. alpina* except that its filaments are attached near the top of the corolla tube rather than well inside.



Mertensia lanceolata

Photo by Mo Ewing

We had no CoNPS volunteer who was knowledgeable enough to identify mosses, so Mo Ewing collected mosses at the lake and brought them down to Bill Weber in Boulder to identify. Of the 85 species of mosses previously documented at the lake, 30 species were found, including six considered to be rare in Colorado. In addition, six new, previously undocumented, species were collected and identified.

Linnea Gillman, a volunteer from the Denver Botanic Gardens, is now the first person to ever collect mushrooms at Summit Lake. She collected seven species, four of which have been identified including the species *Arrhenia lobata*, pictured below.

So, in spite of the fact that the summer of 2012 was very hot and dry, and the bloom on Mount Evans was quite constrained, we made excellent progress in beginning to understand Summit Lake; however, lots of questions remain. The plant community map is just the first sketch and needs to be refined, and its communities verified. We would love to find the 43 species of flowering plants, and 55 species of mosses which we did not find last summer. The portion of Summit Lake Park that extends into the Chicago Lakes Cirque, adjacent to the Summit Lake Cirque has never been inventoried. The same is true of the extensive glacial moraine and fen below (east) of the Park. In addition, we would like to have a full hydrological study

conducted in this fen, as it is probably the largest in the Southern Rocky Mountains found over 12,500 feet. And finally we would like to begin to explore the biologically rich saddle between Mount Evans and Mount Epaulet.

REFERENCES

“The Alpine Flora of Summit Lake, Mount Evans Colorado”, William Weber, *Aquilegia*, Volume 15, No. 4, July – August 1991, pp. 3-10.

“The Alpine Flora of Summit Lake, Mount Evans Colorado”, William A. Weber, recopied from *Aquilegia* 15:3-7, 1991, with additions and modifications, April 24, 2011, unpublished.



Arrhenia lobata

Photo by Linnea Gillman

ETHICS AND PROTOCOLS OF PLANT COLLECTING

By Steve Popovich, Field Studies Chairperson

As we enter the growing season, it is a good time to revisit ethics and procedures regarding plant collecting on public and private lands. “How many plants can I collect from a population?” “Should I avoid collecting if the species is rare?” “Do I need a permit to collect if I am on public land?” “Can I collect on private land?” These are among the typical questions pondered by those who wish to collect. That is a good thing, because these questions SHOULD be asked. The concepts of making sure one does not harm a plant population and securing permission for access to property seem straight forward, but the details can be complicated. Unfortunately, there are no clear-cut guidelines regarding the collecting of rare plants. Ethics dictate that we should not cause a plant population to lose viability or be adversely impacted by collecting specimens. The often-employed “rule of thumb” of harvesting one in twenty plants is, in fact, not based (as far as we know) on scientific data, and should not be blindly applied.

Justification for collecting a rare plant should be based on purpose and need, and the decision should always include good judgment. If a rare plant were to be collected to document a new site, or for research resulting in increased knowledge of how to conserve that species, or because the population would be destroyed by an imminent project such as a new

highway, and the plant is salvaged for transplantation or to make herbarium collections for scientific posterity, these reasons may be justified. If someone desires to add a rare plant to a personal collection or collects to seek notoriety, those reasons may be unjustified. It is helpful to ask, “Is the entire plant needed? Will photos work just as well?” Good photographs and detailed field notes are increasingly acceptable for recording plant discoveries, although most herbaria managers in our area still prefer physical specimens. A permit or formal authority is generally needed for collecting plants or plant parts on public lands, including the Bureau of Land Management, Forest Service, National Parks and Monuments, and State or local parks and open space. Collecting Threatened or Endangered species, or collecting any plants within an area closed to public access or in a National Park or Monument, are highly regulated.

Before considering collecting of any kind, it’s essential to check with the land administrator regarding permit requirements and conditions, which may vary substantially between agencies. Collecting permit conditions for National Forests in the Rocky Mountain Region generally preclude the collecting of rare plants, as well as collecting in a Wilderness Area or within 200 feet of a roadway, unless specific authority is given; there may be separate sets of conditions for other

agencies. Also, if collecting is for commercial gain rather than for research or personal use, then a different permit is often needed. There are scenarios where a permit is not needed on public lands – these include “incidental” small collections of common (never rare) plants – such as a bag of mushrooms for family consumption, top-snatched wildflowers to place in a vase, a grade-school leaf collection, or a scouting pine cone identification project.

Judges like to use the phrase “ignorance is no excuse for the law.” It is a collector’s responsibility to 1) obtain and carry on your person the appropriate collecting permit or permission from the land administrator or owner, 2) understand all restrictions, and 3) confirm permission for property access in advance (never trespass). Collecting from or entering private property – even if entering only to cross the property to get to the other side – is illegal without permission of the land owner. If you think you may be violating any of these responsibilities, or are unsure of property boundaries, it is far better to back away than to carry on. Failure to

obtain proper permits and access permissions can result in stiff penalties, including fines, criminal charges, reduced employment possibilities, and restrictions on entering public lands. At the very least, one’s personal reputation is tarnished.

In addition to the ethics and protocols discussed above, the Colorado Native Plant Society (CoNPS) has published guidelines on ethics of collecting, which are posted on its webpage at http://www.CoNPS.org/pdf/About_Us/ethics_of_collecting.pdf.

Because the permitting process can be confusing and ethical principles vary, these topics were addressed in last fall’s Rare Plant Symposium in Cañon City. The presentation is posted by the Colorado Natural Heritage Program at <http://www.cnhp.colostate.edu/teams/botany.asp#symposia>. Please inform yourself enough to feel confident that you have done your homework before collecting, and take advantage of the resources and guidance that CoNPS offers.

POSITION OPENING – PAID EDITOR OF *AQUILEGIA*

The CoNPS Board of Directors is looking for an entrepreneurial person to be the editor of our newsletter, *Aquilegia*. The Editor will work with the Media Committee and will be responsible for getting advertising, writing articles, contacting and collaborating with other writers, design of newsletter and final edits. Pay for this position will be obtained by the editor by selling advertising in *Aquilegia*.

The Editor duties will be to:

- meet with the Media Committee to develop ideas for issues, suggest topics, and identify possible collaborators and writers for articles;
- assure that all issues, vendors and articles fit appropriately within the CoNPS mission statement and ethics guidelines;
- sell advertisement space to vendors

- write articles, contact and collaborate with other writers, design the layout of *Aquilegia* and make the final edits;
- deliver finished work to printer;
- work with Administrative Assistant to make sure issues are delivered to members in a timely manner;
- work with Chapter Presidents and Workshop Coordinator to make sure that all field trips and workshops are announced in a timely manner; and
- assure that all deadlines for *Aquilegia* are met.

Please send resumes to Crystal Strouse at csnativeplants@gmail.com by April 1, 2013. Please add “CoNPS Editor Position” in the subject line.

2013 FIELD TRIPS - COLORADO NATIVE PLANT SOCIETY

Our goal is to get as many people outside as possible, and there is no shortage of possibilities! Here are a few tips as you seek to venture out this field season:

- Please sign up for trips early as there may be limits to the number of participants. If full, many trips will also have waiting list; even if a trip is full now, get your name on the list and don't give up hope!
- Details on where and when to meet is available online on each chapter's web page, or by contacting field trip leaders.
- When attending a trip, be sure to bring a lunch, plenty of water, sun protection, bug spray, your favorite plant identification guides, a magnifying glass, packable rain gear, and layers adaptable to Colorado's unpredictable and rapid weather changes.
- All trips are free and open to members and non-members (subject to group size limitations).
- No pets are allowed on field trips.
- Please check each chapter's web page to see if any new trips have been added.
- Have fun!

All trips are subject to CoNPS field trip policies that emphasize "treading lightly" and adhering to strict limitations on plant collecting. These policies and guidelines are posted online at www.CoNPS.org.

BOULDER CHAPTER

SOUTH BOULDER FOOTHILLS WILDFLOWERS

May 9, Thursday, 5:30 p.m. to dusk or dark

Leader: **Melissa Dozier**

Join Melissa to romp the trails of Boulder's OSMP's Shanahan Ridge and learn about the area's abundant flowering plants. Last year at this spot, we identified over 50 flowering species! Sightings will likely include three or more native flowering cacti, loads of Penstemon, the lovely dwarf leadplant (*Amorpha nana*), a CNHP state-ranked imperiled/vulnerable species, and many others. **Meet:** OSMP Shanahan Ridge Trailhead, top of Lehigh Road at Lafayette St. No

parking lot or facilities, on-street parking only. Bring snacks, water, and your favorite key or field guide.

Melissa Dozier is a member and volunteer of the Colorado Native Plant Society and an all-around plant enthusiast. She currently works for the University of Colorado, and has worked in the past for the National Park Service and the California Invasive Plant Council. For more information and to register: e-mail Melissa Dozier, boulderCoNPS@gmail.com or call 720-402-0968.

BUTTON ROCK PRESERVE EVENING STROLL/PICNIC

June 13, Thursday, 6p.m. to 8p.m.

Leader: **Rich Scully**

Join Rich for a botanical stroll in this foothills canyon along the North Fork of Saint Vrain Creek. A highlight is the diversity of native shrubs. Bring dinner if you like.

Meet: To get there from the town of Lyons: Take Hwy 36 west four miles to County road 80. Turn left and continue for 3 miles to the gate. Parking is available at the gate. Meet at the east end of the parking area. If you arrive a little late we should be easy to find walking up the road. To carpool from north Boulder, meet at the OSMP Foothills Trailhead just north of the Broadway and US36 intersection.

Rich is well known for his superb CoNPS workshops. For more information: Rich Scully, richwscully@msn.com, 303-823-0766.

CARIBOU RANCH—CONIFERS AND COLORFUL WILDFLOWERS GALORE

July 11, Thursday; 5:30 p.m. to twilight

Leader: **Megan Bowes**

Visit the spectacular Caribou Ranch Open Space with its significant wildlife habitat and very diverse montane plant communities. We'll go on an easy hike to see seven of Boulder County's conifer species as well as paintbrush, arnica, locoweed and other wildflowers in the mountain meadows. And if we are "quick" enough, we'll be able to see the historic DeLonde homestead and barn—the latter well known to rock and roll enthusiasts of the 1960's and 70's. Bring

snacks, water, and your favorite key or field guide.

Meet: Caribou Ranch Open Space, located 1.5 miles north of the Town of Nederland off of the Peak to Peak Highway. Carpooling may also be arranged at the Boulder County Justice Center at 6th and Canyon.

Megan is a Volunteer Naturalist with Boulder County Parks and Open Space and has led a number of public hikes at Caribou Ranch. She is especially excited by the mix of natural and cultural history at this amazing open space property. For more information: Megan Bowes, bowesm@bouldercolorado.gov or call 303-561-4883.

SOUTH BOULDER CREEK RIPARIAN AND FLOODPLAIN RESTORATION

August 8, Thursday; 5:30 p.m. to twilight

Leader: Marianne Giolitto

Marianne will take us along the South Boulder Creek Trail to talk about the riparian and floodplain ecosystem as well as the ongoing restoration in the area. This area is part of the South Boulder Creek State Natural Area, and it supports the vast majority of critically imperiled mesic bluestem (tallgrass) prairie as well as two federally threatened species, the Preble's meadow jumping mouse and the Ute ladies'-tresses orchid. **Meet:** South Boulder Creek Trail access on the south side of South Boulder Rd, near 55th St.

Marianne Giolitto is the Wetland and Riparian Ecologist for Boulder Open Space and Mountain Parks. For more information: Megan Bowes, bowesm@bouldercolorado.gov or call 303-561-4883.

FRONT RANGE WETLAND PLANTS AND DRAGONFLIES

August 10, Saturday; 9a.m. to 12p.m.

Leaders: Megan Bowes and Ann Cooper

Dragonflies do not rely directly on specific plant species, but they do need healthy wetlands in which to carry on their lives. Join Megan and Ann to review wetland plants and plant associations and discover dragonflies and damselflies that rely on these wetlands for their wellbeing. Dragonflies are highly diverse and interesting to watch, but it is sometimes a puzzle what they are actually doing. Come learn more about these masterful hunters. Along the way, we'll be sure to identify many of the wetland plants that become

perches, food-finding hangouts, and places for the dragonflies to lay eggs. **Meet:** Waldon Ponds, 1 mile north of the intersection of 75th and Valmont. Bring snacks, water, close-focus binoculars if you have them, and your favorite key or field guide.

Ann Cooper is a naturalist and teacher-on-the-trail, an author who writes out of a passion for all things wild. She has recently fallen in love with dragonflies and is currently writing a Front Range field guide. For more information and to register: Megan Bowes, bowesm@bouldercolorado.gov or call 303-561-4883.

GORE RANGE CHAPTER

SYLVAN LAKE STATE PARK, EAGLE – FROM BUD TO SEED

Saturday, June 8, 9:00 a.m.

Saturday, August 24, 9:00 a.m.

Leader: Lynn Albers, Joanne Cermak, Nanette Kuich, Maggie Pedersen, Instructors, Native Plant Master Program

Sylvan Lake State Park has a fantastic range of plant diversity due to its high elevation and moisture. Join us early in the season, when many plants are just beginning to bloom, and again in late summer, when you can see the same plants at the end of their flowering cycle. This is a rare opportunity to be able to identify plants in various stages of development. **Meet** in the lakeside parking lot a little before 9 a.m., just inside the Sylvan Lake State Park entrance. There is a day use fee for entering the state park. From I-70: exit at Eagle (exit 147). Turn south and follow signs through town. Turn south on Brush Creek Road and travel 10 miles past the visitor center. Continue on Brush Creek Road until the road forks and becomes dirt. To reach the lake, at the fork, stay right and travel 5 miles to the entrance. Participation is limited, register by contacting Nanette Kuich at <mailto:kix@vail.net>.



METRO-DENVER CHAPTER

LAIR O' BEAR, JEFFCO OPEN SPACE PARK

March 15, Friday, 9:30 a.m. to noon

Leader: Lenore Mitchell

We'll hike approximately two miles to search for the beautiful early *Pulsatilla patens* (Pasque flowers) whose woolly foliage and cup-shaped blue flowers often bloom beside snow. Other ultra-early blooms such as the first spring beauty might surprise us, and we'll check shrubs for signs of bud swelling. **Meet** at 9:30a.m. at the parking lot; located 5 miles west of the town of Morrison on Bear Creek Rd. Bring water, a snack, and either Weber or Wingate. Plan to hike unless roads are too icy for the drive or weather just too cold. (Lenore will confirm plans by email).

Lenore has been a Native Plant Master Instructor in Jefferson County for 7 years. Register by contacting Lenore Mitchell, zap979sar@icloud.com

WILLIAM FREDERICK HAYDEN PARK ON GREEN MOUNTAIN

April 12, Friday, 4:30 p.m. to 5:30 p.m. easy walking; 5:30 p.m. to 7 p.m. moderate hiking

Leader: Judy King

Flowers bloom early here with the warm eastern exposure. See Easter Daisy (*Townsendia hookeri*), Cutleaf Daisy (*Erigeron compositus*) and others. Meet at the Alameda and Florida parking lot. From 4:30 p.m. to 5:30 p.m. we'll stick close to the parking lot for an easy walk to see what's in bloom. From 5:30 p.m. to 7:00 p.m. we'll hike up the mountain on a 3.2 mile loop to find more spring flowers and enjoy a fantastic sunset, deer, and a view of the city lights. Come for one or both times. Bring warm clothes and a flashlight.

Judy King is a Native Plant Master and leads flower walks for the Colorado Mountain Club. Register by contacting Judy King, 303-984-2987 or Judyflowerhiker@gmail.com.

WILLOWS FIELD COURSE

April 13, Saturday (Time, registration info and location to be announced)

Leaders: Randy Mandel & Travis Morse

Various locations, the field course will concentrate on the field identification through winter twigs for the following species: *Salix brachycarpa*, *Salix wolfii*, *Salix glauca*, *Salix monticola*, *Salix geyeriana*, *Salix drummondiana*, *Salix lucida* (*S. lasiandra*), *Salix bebbiana*, *Salix exigua*, and *Salix planifolia*. The course will also cover ID, form, habitat, and species suites.

Randy Mandel has 30 years of experience as a restoration ecologist and applied plant scientist. Mr. Mandel's graduate studies were at Colorado State University where he worked on two Masters-level projects: examination of the effect of environmental parameters upon site quality versus age analysis for Pinyon-Juniper stands throughout Colorado, New Mexico, and Arizona; and examination of natural clones of Quaking Aspen to note the effect of water relations and site conditions in comparison to genotype on fall leaf coloration. Mr. Mandel received his Bachelor of Science Degree from Colorado State University in Forest Biology, Concentration Physiology and Genetics. His expertise includes wetland, riparian, rangeland, desert, and forest ecology; plant taxonomy and synonymy; restoration/reclamation project design, layout, and implementation; site assessment and monitoring; site-specific seed collection and increase; native plant propagation and cultivation; wetland delineation; threatened and endangered species survey; and the integration of native species into traditional and modern landscape design. Prior to joining Golder, Mr. Mandel's past positions included: (1) Co-Founder/Senior Scientist, Rocky Mountain Native Plants Company; (2) Co-Founder/Senior Scientist, Warm Springs Wetland Mitigation Bank; (3) USDA-NRCS Regional Native Plant Specialist; and (4) Director of the USDA-NRCS Upper Colorado Environmental Plant Center.

Travis Morse founded Headwater Partners, LLC, in 2010, where he serves as operating CEO and focuses on the management of land, water, and wildlife resources in the Western United States. Travis specializes in field botany, wetland delineations, environmental permitting, wetland mitigation, and applied landscape ecology. Travis is an authority on wetland matters and has been in private practice as an environmental consultant for over 10 years, handling complex regulatory permitting and ecological issues across the United States. Prior to forming Headwaters, Travis worked as a regulatory project manager for the U.S. Army Corps of Engineers handling permits, approving wetland boundaries, and

resolving enforcement actions under Section 404 of the Clean Water Act, within the states of Colorado, Utah, and Arizona. Travis is a fourth generation Colorado ranch owner and holds a Bachelor's of Science in Environmental Planning from the State University of New York and a Master's of Science in Biology from the University of Nebraska.

ROXBOROUGH STATE PARK

April 20, Saturday, 9:30 a.m.

Leader: Lenore Mitchell

We'll hike the 2 mile Fountain Valley Trail to search for early spring blooms while also enjoying the short spur to spectacular Lyons Overlook, and later on we'll have a look at the Persee Place historic stone house. Shrubs such as mountain mahogany, shrub oak and wild plum line much of this wide and mostly level trail. **Meet** at 9:30a.m. at the parking lot behind the fire station before entering the Park. Daily entry fee per car: \$7.00. (Lenore has a parking permit). Bring water, a snack and either Weber or Wingate. Hike will take approximately 3 hours.

Lenore has been a Native Plant Master Instructor in Jefferson County for 7 years. Register by contacting Lenore Mitchell, zap979sar@icloud.com.

ROXBOROUGH STATE PARK

May 18, Saturday, 8:30 a.m.

Leader: Lenore Mitchell

We'll hike the three-mile South Rim trail to enjoy a wide variety of spring blooms such as *Townsendias*, *Erigerons*, *Lupines*, *Thermopsis* and many more including shrubs such as *Ribes aureum* (Golden currant) with its wonderful fragrance. Great views along the way! **Meet** at 8:30a.m. at the parking lot behind the fire station before entering the park. Daily entry fee per car: \$7.00. (Lenore has a parking permit). Bring water, a snack and either Weber or Wingate or Jack Carter's Trees & Shrubs of Colorado. Hike will take approximately 3 hours.

Lenore has been a Native Plant Master Instructor in Jefferson County for 7 years. Register by contacting Lenore Mitchell, zap979sar@icloud.com.

PLAINS CONSERVATION CENTER – WILDFLOWERS OF WEST BIJOU

May 31, Friday, 2 p.m. to 7 p.m.

Leader: Susan Smith

Discover a jewel on the prairie – the West Bijou valley – and the spring wildflowers that are tough enough to survive this semi-arid climate. This 10,000 acre natural area is owned and managed by Plains Conservation Center. In addition to scouting the short-grass prairie for flowers, we may also see herds of pronghorn, golden eagles, bison and more. Meet at Plains Conservation Center's Aurora site (21901 E. Hampden Ave., Aurora 80013) and carpool to West Bijou, approximately 30 miles east. Bring a sack / picnic dinner & water. Registration and details will be posted at a later date.

WHAT'S GOING ON IN THESE FENS, ANYWAY?

June 2nd, Sunday, 7 a.m.

Leader: Steve Yarbrough

Come enjoy a day of studying two very different fen wetlands with a focus not only on interesting plant assemblages, but also on the physical environment in these systems. We will tour two very different fens, High Creek and Geneva Park. We will attempt to take some measurements of pH, electrical conductivity, total dissolved solids, temperature, and possibly water levels. We will study the soils, bedrock, and even the macro-invertebrates of these wetlands. We will use our collective genius to decide what plants dominate both wetlands. And then we will conclude by trying to elucidate the major ecological differences that characterize the two fen wetland types. Plan on a long day in the high country! **Meet** at 7 a.m. to carpool at the Woolly Mammoth Parking lot (18540 US Hwy 40. Golden). Register by contacting Steve Yarbrough: steveandkenna@msn.com

CHIEF MOUNTAIN

June 9, Sunday (Date is subject to change.

Registration details and time will be posted at a later date)

Leader: Jeanne Willson

Explore the transition from mountain through subalpine to alpine with a focus on how the limber pines and bristlecone pines deal with life on the edge.

After a quick stop in Bergen Park, we'll take a drive up Squaw Pass through forests with most of Colorado's high altitude native evergreen trees. The trail is just under 3 miles round trip, and the elevation gain is about 950 feet. We'll make many stops on the way up the trail, ending on top of Chief Mountain with 360 degree views of mountains and plains, weather permitting, and close-in views of wildflowers. Plan on hiking for three hours plus time to drive from the I-70 roadcut. Bring warm clothes, snack and water, field guides, camera, etc.

Jeanne Willson holds a PhD in Botany from Cornell. She currently is Co-President of the Metro Denver Chapter of CoNPS and volunteers teaching natural history including geology, paleontology, and evolution with the Colorado Mountain Club and the Denver Museum of Nature and Science.

GOLDEN GATE CANYON STATE PARK

June 8, 2013, Saturday, 9 a.m. - 1 p.m.

Leader: Judy King

We hope to see the Calypso Orchid, Mountain Kittentails, and Baneberry among others. This is a State Park. The daily fee is \$7 unless you choose to carpool with someone who has an annual state park pass. Meet in Golden's North Parking Garage. Hiking level is moderate. Bring a lunch, water, plant keys, and appropriate hiking gear.

Judy King is a Native Plant Master and leads flower walks for the Colorado Mountain Club. Register by contacting Judy King, 303-984-2987 or Judyflowerhiker@gmail.com.

STAUNTON STATE PARK MASON CREEK

WILDFLOWERS

June 26, Wednesday, 6 p.m.

Leaders: Sue Schleuder & Deborah Darnell

Explore Colorado's newest State Park! Spend an evening hiking at Staunton State Park guided by State Park volunteers who are Native Plant Masters. Enjoy views of high rocky outcrops while learning about the plants of the upper Montane ecosystem. Discover interesting new plants while enjoying old favorites during this 2.5 mile hike to riparian areas of the Mason Creek Trail. This new park is located off Highway 285 18

miles south of C470. Register by contacting Sue Schleuder, sschleuder@highlandsranch.org.

DIAMOND LAKE AND THE FOURTH OF JULY TRAILHEAD

July 10, Wednesday (time to be announced)

Leader: Cheryl Ames

Diamond Lake - via - Fourth of July Trailhead, round trip 5.3 miles, round trip elevation gain 1200'. This trail will cross a couple of wet areas with breathtaking wildflowers and views and maybe even a moose or eagle viewing. Just some of the flowers are: Larkspur, Monkshood, stream asters, cow parsnip, buckwheat sulfur flower, lupines, owl clover, fireweed, king and queen's crown, yellow sedum, chiming bells, marsh marigolds, and many varieties of penstemon. One of the Forest Service Rangers has asked us to be on the look-out for Canada Thistles - take pictures and GPS coordinates. Since this is the Indian Peaks Wilderness, a permit is required and limited to 12. Register by contacting Cheryl Ames - 303-940-2043 - Cheryl_e_Ames@msn.com.

WOODPECKERS AND THE VEGETATION OF THE HAYMAN BURN AREA 11 YEARS AFTER

July 12, Friday (time to be announced)

Leaders: Paula Fornwalt and Chris Blakeslee

Meet in Sedalia for carpooling. All day; semi-strenuous hiking; take lunch and water. Visit the Hayman Burn area near Cheesman Reservoir 11 years after the fire with Paula Fornwalt, Research Ecologist with the USFS Rocky Mountain Research Station.

Paula has been studying the post-fire plant communities since the first year following the fire. What plants were common in the Hayman area before the fire, and what plants are common now? What did the fire do to the animal communities? Chris Blakeslee of the Denver Field Ornithologists has been following the nesting Lewis's and Red-headed Woodpeckers as well as other birds and mammals in the area. Register by contacting Chris Blakeslee, 303-694-4670.

GRASSLANDS OF THE FRONT RANGE MONTANE

**July 27, Saturday (Date is subject to change.
Registration info, time and location TBD)**

Leader: David Buckner

This field trip will explore a variety of locations in order to reveal the diversity of grasses in the Front Range Montane zone, with additional attention to the ecological position of grasslands in space and time. Effects of variation of soils and geomorphology relative to plains locations will be reviewed. Response of montane grasses (and other native plants) to fire, grazing, and other disturbances will be looked at in the field. Basic (though not comprehensive) grass ID “tricks and tips” will be interspersed during the day. Bring water, lunch and appropriate hiking gear and field guides.

David Buckner was born and raised in Boulder and attended the University of Colorado between 1966 and 1977, during which time he was granted B.A., M.A. and Ph.D. degrees. He has explored the long term dynamics of ecosystems at locations across the Intermountain West and Great Plains and has researched the pattern and rates of ecosystem recovery following disturbance across the same area. He has also conducted research into the nature of extremely old grasslands (greater than 2 million years old) in Boulder and Jefferson Counties, Colorado.

CASTLEWOOD CANYON STATE PARK September (Date, time, location and registration details to be announced at a later date)

Leader: Jeanne Willson

Four to five hour hike, 30 minutes from the Arapahoe Park and Ride. This charming State Park southeast of Parker is a geological gem full of human history, with plants normally living from the prairie to the high foothills crowded on top of each other. Our 7 mile loop hike will take us through two intimate canyons, past a 100 year old homestead and a spectacular FAIL of a dam. We'll also hike on top of a riverbed and past fossils of prehistoric forests.

Please be prepared to walk 7 miles over a good but rocky trail with about 700 feet of elevation gain; wear good walking shoes or hiking boots with long pants and bring water, lunch, raingear, sharp eyes, and field guides. Binoculars and camera are optional. The Park

has rattlesnakes and poison ivy, hence the long pants and sharp eyes recommendation.

Jeanne Willson holds a PhD in Botany from Cornell. She currently is Co-President of the Metro Denver Chapter of CoNPS and volunteers teaching natural history including geology, paleontology, and evolution with the Colorado Mountain Club and the Denver Museum of Nature and Science.

NORTHERN CHAPTER

Connie Gray is taking over as president of the Northern Chapter. Pam Smith, who has shouldered the job for several years, is stepping down but will still remain active in our activities. Connie is a newcomer to northern Colorado after many years of working with native plants in Georgia. She can be reached at cpowersgray@gmail.com.

The first formal hike of the summer will be in June at the Shambhala Mountain Center. Details are provided below.

In addition, the Northern Chapter is going to continue the informal hikes that we have been hosting for the past two summers. No experience is necessary to host an informal hike. Perhaps you have a local place for which you would like to get a plant list generated; leading one of these hikes is a good way to accomplish that. We are going to be offering at least two field trips each month beginning in mid-spring through the end of summer. Our trips will be at local open spaces (Fort Collins/Loveland area) on weekday evenings and longer weekend hikes will be held at locations farther away. Our trips are casual and allow participants to practice their skills keying out the plants we find and/or learn about and discuss general ecology, land use history, management issues etc., for the specific site.

We have not yet identified specific dates for some of the informal trips. A tentative schedule is included below that may change depending on weather conditions and hosts. Additional hikes will be added if there are volunteers willing to lead them – so become a host! Please contact Stacey Anderson, Vice President, at lichensonrock@gmail.com to volunteer to be a hike host or if you have any questions.

GUIDED HIKE: THE SPLENDOR OF SHAMBHALA MOUNTAIN CENTER (formal hike - registration is required)

June 29, 2013, 9:00 a.m. – 3:00 p.m.

Location: Meet at Albertson's parking lot on College in North Fort Collins to carpool to Shambhala Mountain Center, Red Feather Lakes

For over 30 years Shambhala Mountain Center has presented yoga and meditation programs in a peaceful valley near Red Feather Lakes. Jim Tolstrup, former Land Stewardship Director of Shambhala Mountain Center, will lead this moderately strenuous hike to see spectacular wildflowers and a campus landscaped with sustainability and native plant conservation in mind. Visitors will also get a tour of the Great Stupa of Dharmakaya, the largest example of Tibetan Sacred Art & Architecture in the Western Hemisphere.

Cost: \$7.00 per person (for a buffet lunch with a vegetarian option) at Shambhala Mountain Center. To register contact: Jim Tolstrup (970) 622-9676. Go to the link below to read more, including a quote about SMC from Panayoti Kelaidis at www.shambhalamountain.org/gardens/



Shambhala Mountain Center

INFORMAL HIKE SCHEDULE

No registration is necessary - just show up at the time and dates provided in the Northern Chapter eNewsletter. Updates will be posted monthly in the eNewsletter as they become available. These postings will include meeting time, place, and dates. If you are a

current Colorado Native Plant Society Northern Chapter member you should already be receiving your eNewsletter. However, to attend the hikes you do not have to be a member so please bring friends and family!

- APRIL: Pineridge Natural Area, Fort Collins
April 28 – Pawnee Buttes (joint trip with Denver Chapter)
- MAY: Soapstone Prairie
Bobcat Ridge Natural Area, Masonville
- JUNE: Lory State Park East Valley Trail
Indian Meadows, Poudre Canyon
High Plains Environmental Ctr., Loveland
(joint trip with Boulder Chapter)
- JULY: Zimmerman Lake
Horsetooth Mountain Park, Horsetooth Falls Trail
- AUG: South Zimmerman Trail
Hewlett Gulch (post-fire recovery)
- SEPT: Lory State Park Arthur's Rock Trail
Trap Lake, Poudre Canyon
Red Feather Lakes area

PLATEAU CHAPTER

MCINNIS CANYONS FIELD TRIP

April 27, 2013

Leader: Stephen Stern

Stephen Stern will lead this field trip to the McInnis Canyon National Conservation Area to enjoy the spring flora. Please RSVP to Stephen Stern at stern.r.stephen@gmail.com if you plan on attending or have additional questions.

SCLEROCACTUS MONITORING

May 11, 2013

Leader: Gina Glenne

Details to follow through email and on the CoNPS Plateau Chapter website.

SKIFF MILKVETCH MONITORING

No set date, but likely June 21-23 or 28-30

If you are interested in additional activities or would like to propose your own, please contact Stephen Stern at stern.r.stephen@gmail.com or (970) 248-1674.

RECENT PUBLICATIONS BY CoNPS MEMBERS

By Jan Loechell Turner

Because there were so many new publications by CoNPS members last summer, instead of book reviews, this issue contains a brief description of each item. Full reviews of many of the publications will appear in future issues of *Aquilegia*.

COMPUTER APPLICATION

Colorado Rocky Mountain Wildflowers (App).

Al Schneider and Whitney Tilt; software by Katie Gibson. www.highcountryapps.com (see website for free trial of partial app.). 2012. \$9.99.

Many CoNPS members are familiar with Al Schneider's excellent website Southwest Colorado Wildflowers (<http://swcoloradowildflowers.com>). Now you can enjoy Al's photographs and informative descriptions on your iPhone, iPad, Android phone, or Kindle Fire. Over 600 plants are included on this app. Entries include multiple photos of each plant, scientific and common name, family, a description, and tidbits of interesting information.

Al and his wife, Betty, are the discoverers of three new Colorado plant species: *Gutierrezia elegans*, *Ipomopsis racemosa*, and, with Loraine Yeatts, *Packera mancosana*. Al is President of the San Juan/Four Corners Native Plant Society.

FOLD-OUT LAMINATED GUIDE

Wildflowers of the Southern Rocky Mountain: Colorado, Northern New Mexico, & Southern Wyoming: A Guide to Common and Rare Native Species. Photos and text by Janice Lindsey Huggins. Austin, TX: Quick Reference Publishing (www.quickreferencepublishing.com), 2012. laminated, 9" x 4", \$7.95.

Arranged by flower color, this handy, 12-page, folding, laminated quick reference guide covers over 100 wildflowers that may be encountered on hikes in the Rocky Mountains of Colorado, Northern New Mexico, and Southern Wyoming. Each entry includes

a color photo of the plant (with insets of fruit, when applicable), common name, scientific name, bloom time, and description of the flower, plant, and leaf. Rare, threatened, and poisonous plants are indicated with icons.

Janis Huggins (www.highcountrywild.com), is the talented author of *Wild at Heart*, 2005 winner of the Colorado Book Award, non-fiction (see book review, *Aquilegia*, 2007, vol. 31, issue 1, page 5)

BOOKS

Colorado Flora: Eastern Slope and Colorado Flora: Western Slope. William A. Weber and Ronald C. Wittmann. 4th edition. 2012. A review of this set will appear in a special issue of *Aquilegia*, which will be published next month.

Denver Mountain Parks: 100 Years of the Magnificent Dream, by Wendy Rex-Atzet, Sally L. White, and Erika D. Walker. John Fielder Publishing, Denver, CO. 144 pages. With a foreword by Dr. Thomas J. Noel, afterword by W. Bart Berger. Illustrated by John Fielder. Available August 1, 2013.

Meet the Natives: A Field Guide to Rocky Mountain Wildflowers, Trees, and Shrubs: Bridging the Gap between Trail and Garden. M. Walter Pesman. Revised and expanded by Dan Johnson. Photography by Loraine Yeatts and Dan Johnson. Preface by Panayoti Kelaidis. 11th ed. Boulder, CO: Johnson Books, a Big Earth Publishing company, 2012. \$24.95.

Arranged by color, the 11th edition of *Meet the Natives* has a new, contemporary look with beautiful color photographs of more than 500 native plants by Loraine Yeatts and Dan Johnson.

Dan Johnson is Curator of Native Plants at the Denver Botanic Gardens. Photographer and botanist Loraine Yeatts volunteers at the Kathryn Kalmbach

Herbarium at the Denver Botanic Gardens and is the author, with Janet Wingate, of *Alpine Flower Finder*.

Rocky Mountain Wildflowers. Colorado Mountain Club Pack Guide. Marlene Borneman (photographer) and James Ells. Golden, CO: Colorado Mountain Club Press, 2012. 200 pgs. \$12.95. ISBN 978-937052-03-4.

A nice feature of this book that is that the attractive color photos are relatively large (3.25" x 6.6"). A box within the photo provides the common name and scientific name of the species and its plant family, habitat/ life zone, distinguishing traits, and bloom season. Plants are arranged by flower color.

Marlene Borneman is a photographer who has climbed all of the Colorado 14'ers. James Ells, PhD, is a retired horticulturist from Colorado State University Extension and author of numerous publications.

Those Elusive Native Orchids of Colorado. Scott F. Smith. www.blurb.com, 2012. 79 pages. \$38.95.

This handsome book is designed with white text and color photographs of orchids set on black paper. Entries include scientific name with pronunciation and meaning, common names, habitat, and other items of interest. Varieties and color forms are pictured.

Scott Smith is a field botanist, photographer, and international plumber.

Organic Gardener's Companion: Growing Vegetables in the West. By Jane Shellenberger. Golden, CO: Fulcrum, 2012.

This is an informative, well-written guide to growing organic vegetables in the challenging climate and soil of the West. An entire chapter is devoted to pollinators and another to beneficial insects.

Jane Shellenberger is the editor of the *Colorado Gardener* news magazine, which recently celebrated its 15th year of publication.

In this issue of *Aquilegia*

24 field trips

5 workshops

dates for 2013 Annual Meeting and Rare Plants Symposium, and

programs at 6 chapters ...

and more
on the way!

The Colorado Native Plant Society is dedicated to furthering the knowledge, appreciation and conservation of native plants and habitats of Colorado through education, stewardship and advocacy.

EFFECTIVE POLLINATION IN A RARE COLORADO ENDEMIC: *PENSTEMON DEGENERI*

By Carol English

“In the case of rare plants, it is only by identifying and understanding the habitat needs of their pollinators that we can begin to assure the plant’s survival” - Xerces Society, 2003

Appreciating and protecting native flowering plants requires an appreciation for and protection of their pollinators. In North America, 99% of all pollinators are insects and most of these insects are bees (Xerces Society 2003). For rare plants, especially those that depend on particular pollinators for successful reproduction, knowing the effective pollinators is essential to properly manage these plants. Sadly, studies indicate worldwide declines both for native plants and their pollinators (Buchman et al 1996). For thesis research supervised by Dr. Leo P. Bruederle at the University of Colorado Denver, I attempted to identify the effective pollinators for *Penstemon degeneri* Crosswhite (Plantaginaceae), a rare Colorado endemic.

Penstemon degeneri

With approximately 25 sites known from 6000' to 9200' in south central Colorado, *Penstemon degeneri* is ranked G2/S2 (globally imperiled and threatened in the state) by the Colorado Natural Heritage Program, CNHP. Population size ranges from dozens to thousands of individuals varying markedly with location and seasonal precipitation (Beatty et al. 2004, C. English, unpublished data). Previous studies on several other penstemons with similar floral morphologies — pale lavender corollas with wide ventral lobes — have revealed a diversity of insect visitors including bees, wasps, flies, butterflies and beetles; however, effective pollination typically involves pollen wasps, mason bees, and bumble bees (Kimball 2008, Tepedino et al., 1999, 2006, Wilson et al. 2004). The pollen wasp is known to be dependent on *Penstemon* pollen, and past studies by Crosswhite suggested that entire subgenera of *Osmia* species are dependent on *Penstemon* pollen and nectar for nourishment (Gess 1996, Crosswhite and Crosswhite 1966). In 2004, during a brief insect

visitation study, Susan Spackman (2004) found that bees, wasps, and flies were the primary visitors to *P. degeneri* flowers.



Penstemon degeneri

Photo by Dave Elin

Effective Pollination

An effective pollinator transfers copious amounts of pollen from the stamens of one plant to the stigma of another of the same species. Successful pollination also depends on the flower’s “acceptance” of the pollen, with most flowering plants being dichogamous, with male and female parts maturing at different times, thus making self-pollination less likely. They may be either protandrous or protogynous (Bertin 1993). Some penstemon flowers are known to be protandrous, with the pollen maturing days before the stigma becomes pollen receptive (Tepedino et al. 1999, 2006). It is possible to pry open the petals of a penstemon flower prior to anthesis (flower opening) and see that the stamens have dehisced, with pollen ready for dispersal once the flower opens. I have sometimes observed small bees that had wriggled their way into a flower prior to anthesis, taking advantage of being first on the “pollen scene” and bearing copious amounts of pollen. At this point, the style is straight and the stigma is not yet receptive. Within days, the majority of a flower’s pollen will have been dispersed and the style will bend toward the stamens. An incoming insect with a body covered with pollen can enter the flower and deposit pollen on the receptive stigma.

Discovering Effective Pollinators on *Penstemon degeneri*

One way to find out which species of insect are effectively pollinating flowers is to control flower visits and compare this to seed set. This method requires limiting pollination and seed set of numerous flowers, which is problematic for rare plants (Tepedino et al., 1999). Here, we ask the following questions: 1) Which insects visit *P. degeneri* most often? 2) How do insects behave on *P. degeneri* flowers and plants? 3) Which insects are most faithful to *P. degeneri* pollen (fidelity)? 4) Which insects carry copious amounts of *P. degeneri* pollen on the body parts that touch the stigma? Additionally we wanted to know if *P. degeneri* flowers are protandrous, at what point in time the stigma is receptive, and finally if *P. degeneri* can self-pollinate. To address these questions, we attended *P. degeneri* plants for two hours in the morning and afternoon once a week for three weeks at three similar sites (6000', 8000' and 9200' elevation) during three consecutive seasons (2007-2009). As an insect arrived, we identified the insect to the lowest taxonomic level possible and recorded how many plants the insect visited; how many flowers on each plant the insect visited; if the insect collected pollen, nectar or both; and if and how it deposited pollen on the stigma? To determine which insect species carried the most *P. degeneri* pollen, we captured insects from *P. degeneri* flowers for four hours once a week for three weeks at the same three sites during three consecutive seasons (2007-2009). We pinned and organized these insects in boxes and prepared them for subsequent examination. In the lab, we relaxed the insects in a chamber using carbolic acid. In order to determine fidelity, we used forceps to remove pollen from the scopal sacs of all female bees and quantified the percentage of *P. degeneri* pollen by comparing it to pollen from other flowers blooming in the area. For example, in 2007 many female bumblebees at Locke Park visited both *P. degeneri* and *Oxytropis lambertii* at similar frequencies.

Next, pollen on the insect bodies was qualified by carefully removing all pollen from five different body sections (dorsal head, dorsal and ventral thorax, and dorsal and ventral abdomen) using a dab of fuchsin gel and a sharp probe (Kearns 1993). We qualified the amount of body pollen using a scale of 0 (few to no *P. degeneri* pollen grains) to 3 (copious amounts of

pollen). We bagged plants in two populations to see if flowers would set fruit (self pollinate) without pollinators, and I hand pollinated flowers on day 1, 2 and 3 of anthesis to determine when the stigma was most receptive to pollen.

Results

As expected, we found *P. degeneri* to be protandrous. Pollen matures just as flowers begin anthesis, with the style curving down and the stigma becoming receptive around day two. We also found *P. degeneri* flowers to be capable of self-pollination, although seed set was quite low.

During my three years of fieldwork, only a few bee and wasp species were documented to be effective pollinators: several mason bees, one pollen wasp, and two bumblebees. Some mason bees carried 100% *P. degeneri* pollen in their scopae and on their bodies. Similarly, the percentage of pollen found on pollen wasps was often 100% *P. degeneri* pollen. Female pollen wasps carry pollen for their young in their crop and, since we did not examine crop pollen, fidelity was not determined; however, body pollen suggests that pollen wasps are highly faithful to *P. degeneri*. All bumblebees carried between 50%-75% *P. degeneri* pollen in their scopae and on their bodies; this was second only to the mason bees and wasps body pollen counts. However, there were two bumblebee species that visited the plants much more often than all other bumblebee species observed on *P. degeneri* flowers. When compared to other visitors, the effective pollinators visited the flowers most frequently, carried the highest percentage of *P. degeneri* pollen on their bodies, and were most faithful to *P. degeneri* flowers. Other bees carried smaller amounts of *P. degeneri* pollen in their scopae and on their bodies; as such, they may have pollinated some flowers, but not to the extent that mason bees, pollen wasps, and bumblebees did. It is interesting to note that we also found that mason bees conducted fewer flower visits and more plant visits compared to other effective pollinators — during the majority of visits mason bees made to *P. degeneri* plants, they visited only one or two flowers and flew off to another plant. In contrast, the majority of bumblebee and pollen wasp visits typically involved flowers on the same plant, thus promoting geitonogamy, a form of self-pollination.

Effective Pollinator Natural History

Obviously, precise timing is required for effective pollination to occur. However, insects have their own life cycles with events occurring that must coordinate with the life cycle of the flowers, as well. Fortunately, much is known about the effective pollinators we found on *P. degeneri*. Mason bees are native solitary nest building bees and, in Colorado alone, there are many different species in this genus. Most mason bees have a life cycle of one year, although bees living in adverse habitats such as deserts or semi arid conditions will adapt life cycles to environmental conditions (Xerces Society 2003). In the spring and summer months, male mason bees emerge first and wait for females to emerge. Males die soon after mating occurs and, subsequently, females undertake nest building, which also involves providing food and shelter for the young. You can often tell females from males while observing mason bees. Only females collect pollen and nectar, which they store in scopae located on their ventral abdomens (or bee bellies); therefore, mason bees with “belly pollen” are female. Most female mason bees construct their nests in hollow tubes, such as the pith of elderberry stems. They lay 5-6 eggs and each egg cell includes a ball of pollen and nectar (bee bread) for nourishment when they hatch, with the material separating cells differing among bee species (Xerces Society 2003). Once the nest is complete, the female bee seals the opening and sets off to make another nest. A female solitary bee will often create several nests in a season over a period of about three weeks, after which she dies. It is interesting to note here that penstemon flowers typically bloom for about three week’s duration, as well.

Pollen wasps in the Masarinae, a family of wasps, are unique as they collect pollen and nectar for nourishment, and are not predatory on other insects (Gess 1996). Different masarine species specialize on pollen from different genera, including *Penstemon*, *Phacelia*, and *Eriodictyon*, and are often important pollinators for species in these genera. Although Masarinae are found worldwide, excepting Antarctica, and most diverse in Southern Africa, the only genus found in North America is *Pseudomasaris*. Interestingly, this genus only occurs in western North America and the wasps do not live above approximately 8500’. Not surprisingly, we did not observe pollen wasps on *P.*

degeneri at our high elevation site above 9000’. They have similar habitat needs when compared to mason bees, and are solitary nest builders and make their nests out of mud attached to rocks. The females build the nests and collect nectar and pollen for the egg cells.



Pseudomasaris vespoides

Photo by Dave Elin

Bumble bees comprising genus *Bombus* in the Apidae behave very differently from both mason bees and pollen wasps. “Bumbles” are social insects and live in hives similar to honey bees, our non-native pollinator.



Bombus centralis

Photo by Dave Elin

Bumblebees are ground nesting, with hives typically containing up to 100 bees (Kearns 2001). The queen bee lives for an entire year, hibernates underground, and emerges in early spring to start her hive. By the end of the summer another queen bee will again survive the upcoming winter. Female bumblebees are the worker bees and store pollen in scopae on their rear legs. Bumbles tend to be generalist pollinators and forage on many different flower species. We found bumbles to be effective pollinators on *P. degeneri* at all three sites, but only during the very wet, cool summer of 2007.

As plant specialists, we often focus only on our beloved native plants and forget there is another half to the equation — the pollinator(s). For all of these pollinators and the plants they pollinate, changes in temperature and moisture are among the factors triggering their emergence and development. Most likely for pollinators that specialize on certain pollen types, such as the mason bees and pollen wasp on *P. degeneri*, synchronized timing between the two occurs, which has co-evolved over millennia. Hopefully, as our native habitats face challenges, such as global climate change, the synchronized timing of plants and their pollinator partners will continue.

References

- Beatty B., Jennings W. & Rawlinson R. (2004) *Penstemon degeneri* Crosswhite (Degener's Beardtongue): A Technical Conservation assessment. Prepared for the USDA forest Service, Rocky Mountain Region, Species Conservation Project. Denver, Colorado.
- Bertin R. (1993) Incidence of Monoecy and Dichogamy in Relation to Self-Fertilization in Angiosperms. *American Journal of Botany* 80(5): 557-560.
- Buchmann S. L. & Nabham G. P. (1996) *The Forgotten Pollinators*. Island Press, Washington.
- Crosswhite F. S. & Crosswhite C. D. (1966) Insect pollinators of *Penstemon* series *Graciles* (Scrophulariaceae) with Notes on *Osmia* and other Megachilidae. *American Midland Naturalist* 76: 450-467.
- Crosswhite F. S. (1967) Revision of *Penstemon* section *Penstemon* (Scrophulariaceae) II. A Western Alliance in Series *Graciles*. *American Midland Naturalist* 77: 28-41.
- Gess S. K. (1996) *The Pollen Wasps: Ecology and Natural History of the Masarinae*. Harvard University Press, Cambridge.
- Kearns C. (1993) *Techniques for Pollination Biologists*. University Press of Colorado, Niwot.
- Kearns C. & Thomson J. (2001) *The Natural History of Bumblebees*. University Press of Colorado, Niwot.
- Kimball S. (2008) Links between floral morphology and floral visitors along an elevational gradient in a *Penstemon* hybrid zone. *Oikos* 117: 1064-1074.
- Spackman Panjabi S. C. (2004) Visiting insect diversity and visitation rates for seven globally-imperiled plant species in Colorado's middle Arkansas Valley. Colorado Natural Heritage Program, College of Natural Resources, Colorado State University, Ft. Collins. Prepared by the Native Plant Conservation Alliance and the National Fish and Wildlife Foundation.
- Tepedino V. J., Sipes S. D. & Griswold T. L. (1999) The reproductive biology and effective pollinators of the endangered beardtongue *Penstemon penlandii*. *Plant Systematics and Evolution* 219: 39-54
- Tepedino V. J., Bowlin W. R. & Griswold T. L. (2006) Pollination biology of the endemic blowout *Penstemon* (*P. haydenii* S. Wats.: Scrophulariaceae) in Nebraska. *Journal of the Torrey Botanical Society* 133: 548-559
- Wilson P., Castellanos M. C., Hogue J. N., Thomson J. D. & Armbruster W. S. (2004) A multivariate search for pollination syndromes among *Penstemons*. *Oikos* 104: 345-361.
- Xerces Society. 2003. *Pollination Conservation Handbook*. The Xerces Society. Portland, Oregon.

ACKNOWLEDGEMENTS

We thank the Colorado Native Plant Society Field Studies Committee, USDA Forest Service, especially Steve Olson, and Bureau of Land Management, especially Dr. Carol Dawson for supporting this research. We also thank Dave Elin, as well as many CU Denver students who assisted in the field and laboratory, and Dr. Vince Tepedino (USDA ARS), Dr. Carol Kearns (CU Boulder), and Dr. Jim H. Cane (USDA ARS), who answered numerous questions regarding pollination biology. Financial support was provided by the Myrna P. Steinkamp Fund of the Colorado Native Plant Society.

FOREWORD TO ASPEN DREAMS BY JOYCE GELLHORN

By Steve Jones

In summer of 1975 I took a Rocky Mountain Nature Association field class taught by legendary alpine ecologist John Marr and his assistant Joyce Gellhorn Greene, a young ecologist and schoolteacher from Boulder. Early on, Dr. Marr's wife was hospitalized, and he excused himself for a major part of each class day. Joyce took over, leading us enthusiastically across the alpine meadows, tussock bogs, and boulder fields.

Joyce asked each of us to undertake a research project, and she didn't even blink when I said I wanted to study vegetation and soil characteristics of obscure frost hummocks. In fact, she got down on her knees beside me in the dank, spongy ground and reveled over my miniscule discoveries--assenting enthusiastically when I noted that soil temperatures are lower and vegetation more scarce on the west side of the hummocks, which are shielded from the sun's rays by afternoon thunderstorms.

That was my first experience with field ecology. Thirty-seven years later, I stood with Joyce in a verdant seep on Green Mountain, west of Boulder, admiring a patch of northern green bog orchids. Ruth Carol Cushman and I had invited Joyce to be a special guest on our monthly nature spot for KGNU public radio. Just a few days before, Joyce had sent out a frank and remarkably upbeat e-mail telling friends that her cancer had invaded her digestive system and that she didn't have much longer to live.

Seeing the bog orchids, Joyce rushed forward, beaming, and exclaimed, "Aha, here we have one!" When we came upon a rare golden coralroot orchid (an albinistic variant of spotted coralroot) growing under the pines nearby, she described its seed capsules as resembling "small yellow bananas drooping from a bright yellow stem."

I realized then what made Joyce uniquely Joyce. She didn't love nature, she reveled in it. And she was always moving forward, always eager to find whatever natural wonder lies beyond the next bend in the trail.

Her students tell, lovingly, of field trips extending far beyond the appointed hour and of hearing the expression "just a little farther" way too many times. One friend remembered, "We were reassured when Joyce insisted that the group would turn around by 2 p.m.--until we noticed that she wasn't wearing a watch."

It's these qualities--an intense love affair with the natural world coupled with forward-looking optimism and physical resolve--that enabled Joyce to survive the premature deaths of two sisters, a brother; and a son; the drifting away of a husband of 26 years; and two bouts with cancer. They inspired her to conduct groundbreaking research in the lives and adaptations of aspen trees, write poetic books about white-tailed ptarmigan and the alpine life zone, and introduce several thousand students, age 5 to 85, to field ecology.

These qualities enabled her to backpack for 17 days through Alaska's trail-less Brooks Range, climb 20,000-foot-high Island Peak near Mount Everest, and complete countless solo ski treks across the Continental Divide. At age 77, just a few weeks before entering hospice care for her non-treatable cancer, she completed an 80 mile trek through the high mountains of Bhutan, climbing all the way up to 14,600 feet.

"The physical activity felt good for my body, and the exertion stimulated my mind," she writes. "I gained strength with each passing day. Gradually a peacefulness enveloped me--I loved Bhutan, its diversity, its physical beauty, and its gentle people. Concerns regarding my own health slipped away and I gained a feeling of wholeness with the world." These qualities also helped her to forge a personal relationship with quaking aspen, whose leaves glistened "like green rain" around her family's summer cabin in the Colorado Rockies. She tells of how aspen clones (groves of genetically identical trees--the largest and oldest beings on earth) create a world of their own, damp, musky, and filled with life--from the mushrooms and wildflowers poking out of the leaf litter to the deer and elk who munch on the powder-

white bark, perhaps attracted by compounds related to aspirin. Through her words and experiences, we feel the soft light filtering down through the trembling leaves and begin to sense the beating heart of these wondrous beings, sometimes described as the "mothers of the forest."

Throughout this glowing memoir, Joyce compares her life experiences to those of aspen. And she's absolutely right. Her roots, acquired from loving and trusting parents, anchored her strongly to soil and rock. Her shoots, forged through relationships with family, friends, and students, engendered countless "clones," communities of supportive, like-minded folks who cherish nature. Her seeds, sprinkled across the full array of Rocky Mountain ecosystems, sprouted budding naturalists who will continue on with her work.

I'm honored to count myself as one of those Joyce sprouted naturalists. And I know that when I face my final journey, Joyce's eloquent words will inspire and

comfort me--like the morning sun nourishing a clump of alpine forget-me-nots or an autumn breeze caressing a hillside of shimmering aspen leaves.

(Reprinted with permission from Boulder County Nature Association Newsletter, Fall 2012, Volume 30 Number 4)

Joyce Gellhorn, a twenty-plus year member of the Colorado Native Plant Society, passed away last summer, July 27, 2012. She was a long time resident of Boulder County who was passionate about natural history, environmental preservation, and education. Joyce earned her BA and PhD at the University of Colorado in Boulder and taught biology and botany at Boulder High School from 1970 to 1990. She enjoyed teaching field classes on a wide variety of topics ranging from Identification of Wildflowers to Winter Ecology. Joyce authored three books: *Song of the Alpine* (2002), *White-tailed Ptarmigan: Ghosts of the Alpine* (2008), and *Aspen Dreams: A Memoir* (2012). Joyce will be missed greatly by all who crossed her path.

MEMBERSHIP APPLICATION AND RENEWAL FORM

Name(s)
Address
City State..... Zip
Phone ____-____-____ E-mail

MEMBERSHIP CLASS
Dues cover a 12-month period.

CHAPTER You are free to affiliate with any chapter you choose and to attend the meetings of any chapter. Chapters do not have drawn map boundaries; the locations below indicate the usual meeting place of chapter meetings.

- Boulder Gore Range Metro-Denver
- Northern Plateau
- Southeast Unaffiliated

- Individual (\$20.00)
- Family / dual (\$30.00)
- Senior (65+) (\$12.00)
- Student (\$12.00)
- Organization (\$30.00)
- Supporting (\$50.00)
- Lifetime (\$300.00)

OPTIONAL E-MAIL DELIVERY OF *Aquilegia*

Many members prefer to receive the newsletter electronically via e-mail, and this saves the Society considerable printing and postage expense. If you would like to receive the newsletter by e-mail, please check this box and provide your e-mail address above.

Please deliver *Aquilegia* electronically to the above e-mail address.

DONATION \$ _____ General Fund

Endowments in support of small grants-in-aid of research:

\$ _____ John Marr Fund: research on the biology and natural history of Colorado native plants.

\$ _____ Myrna P. Steinkamp Memorial Fund: research and other activities to benefit the rare plants of Colorado

Mail to: CoNPS Office, P.O. Box 200, Fort Collins, CO 80522.

Please make checks payable to "Colorado Native Plant Society". Dues and contributions are tax-deductible.

NOMINATIONS SOUGHT FOR CoNPS AT-LARGE DIRECTORS

Two At-Large Directors are completing their terms in 2013, leaving those positions open as of the last 2013 meeting in the fall, Vice-President Bernadette Kuhn announced. She is accepting nominations, which may be made by any CoNPS member. Nominees, who must be Society members and at least 18 years of age, attend CoNPS Board meetings (usually 4 per year), participate in Board business, and vote on issues that come before the Board for a 3-year term. CoNPS By-Laws provide

for 6 to 8 At-Large Directors to serve at any given time; currently there are six.

Deadline for nominations is May 15. The slate of nominees will be published in ballot form in the summer 2013 issue of *Aquilegia*. Submit your nomination to Bernadette Kuhn, at:

bernadettekuhnCoNPS@gmail.com, or
CoNPS VP, PO Box 200, Fort Collins, CO 80522

2012 – 2013 WORKSHOPS Colorado Native Plant Society



Colorado Native Plant Society Workshops are enjoyable learning experiences that include a lecture and hands-on interaction with plant material. Some workshops may also include a short field trip. Our presenters are industry professionals who have direct knowledge of their subjects and a desire to share it with others.

Workshops usually begin at 9 a.m. and end sometime between 2 and 3 p.m. and are held in various locations, usually along the Front Range of Colorado. We suggest that participants bring a lunch and any other materials as noted for each workshop.

In addition, individual chapters offer workshops and field trips.

Payment is required at the time of registration. You can directly register for each CoNPS Workshop online using your PayPal account or any major credit cards. If you would prefer to pay with a personal check made payable to “CoNPS”, please download the workshop registration form, *fill it out and mail it, along with your check, to CoNPS, c/o Linda Smith, 4057 Cottonwood Drive, Loveland CO 80538.*

The fee for attending a workshop is \$25 per session for members. Non-members must join CoNPS to register for a workshop. We hope you will join us and enjoy these workshops with us. The registration fee is non-refundable.

Participation is often limited and registrations are processed in the order received. If the workshop has already been filled, you will be notified, your check will not be deposited, and you will be added to the waiting list if that is what you desire.

If you choose to mail in your registration form, please contact Linda Smith to make sure there is room available. If you choose to register online, you don't need to do so. Contact Linda Hellow, CoNPS Workshop Coordinator, for updated schedules, meeting times and places, and fees at *CoNPSworkshops@gmail.com*.

The 2012-2013 workshops are being organized by the CoNPS Workshop Committee: Linda Hellow of Centennial, Workshop Coordinator; Colleen Cunningham of Golden; Jeff Jones of Woodland Park; Steve Olson of Pueblo West; and Denise Wilson of Golden. If you have suggestions for future workshops, please contact Linda Hellow at CoNPSworkshops@gmail.com. Please check the website periodically for updates and additional workshops.

SAGEBRUSH OF THE GORE RANGE

Saturday, March 16, 2013, 9a.m. – 12:30p.m.

Location: Colorado Mountain College, Edwards, CO

Presenter: Bernadette Kuhn

Cost: \$25

Join us as we examine the various characteristics of this aromatic plant. We'll thoroughly review sage morphology and taxonomy and help you through the steps toward accurate identification. Bernadette will bring many samples for close-up examination. Bring your hand lens! We'll also have microscopes available.

Bernadette Kuhn is a botanist with the Colorado Natural Heritage Program and has a master's degree in Botany, Taxonomy and Systematics from the University of Wyoming. She is also the vice president of CoNPS.

NATIVE PLANTS AND INSECTS WORKSHOP

Saturday, April 27, 2013, 9a.m. to 3p.m. (FULL)

Location: Butterfly Pavilion, Westminster, CO

Presenter: Amy Yarger, Director of Horticulture

Cost: \$35 (Please note price change)

For details, go to:

<http://www.CoNPS.org/Activities/workshops.shtml>

COLORADO MOSSES

May 18-19, 2013; Two-Day Workshop (FULL)

Sat. Workshop, 9 a.m. to 3 p.m. at a Boulder location

Sun. Field Trip, 9 a.m. to 3 p.m. at a trail TBD

Presenters: Ron Wittmann, Bill Weber & Paula Lehr

Cost: \$25

For details, go to

<http://www.CoNPS.org/Activities/workshops.shtml>

BIRDS, BEES, FLOWERS AND FOOD: EXPLORING COLORADO'S POLLINATORS

One-Day Workshop and Field Trip: Choose Saturday, June 22 or Sunday, June 23, 2013, 9 a.m. to 3 p.m.

Location: Boulder Open Space and Mountain Parks, Cherryvale Administrative Building, Boulder, CO

Presenter: Megan Bowes

Cost: \$25

A worldwide pollinator crisis has been prominent in news headlines, but it's not simply beekeepers and farmers who depend on the pollination services of the European honey bee and a whole suite of native pollinators. Pollinators enable the reproduction of native plants, which maintain the basis of most food webs—as well as the production of one out of every three bites we humans consume at the dinner table. This workshop will describe the process of pollination, how to identify the reproductive parts of a plant, as well as the roles birds, bees and many other insects play. We will also learn about the practical steps we can all take to improve native pollinator populations on our lands. The second half of this workshop will be in the field. Please dress appropriately and bring your *Colorado Flora Eastern Slope* and hand lens.

Megan Bowes is a Plant Ecology Technician with the City of Boulder Open Space and Mountain Parks Department and the Chair of the CoNPS' Horticulture and Restoration Committee. She's been a CSU Extension Native Plant Master Instructor for 5 years and has had a passion for plant-insect interactions since first working in the garden industry two decades ago.

DRABA ON BOREAS PASS

One-day Workshop – Sat., July 13, 2013, 9 a.m. – 3p.m. (FULL)

Location: South Park Ranger Dist. Office, Fairplay, CO

Presenters: Sheila Lamb, Steve Olson

Cost: \$25

For details, go to:

<http://www.CoNPS.org/Activities/workshops.shtml>

CHAPTER NEWS and ANNOUNCEMENTS

Please note: The CoNPS website (www.CoNPS.org) contains current information on planned activities. More detailed information is often available online.

BOULDER CHAPTER

Boulder Chapter programs are held on the second Thursday of each month (September through April) from 6:30 p.m. to 8:30 p.m. All meetings, except as noted, are held at the Community Room at the Boulder REI Store at 1789 28th Street (between Canyon and Pearl). For more information, please e-mail boulderCoNPS@gmail.com.

APRIL BOULDER CHAPTER MEETING:

Thursday, April 11, 2013

6:30p.m. REI Boulder Community Room
Jennifer Ackerfield, Colorado State University
Herbarium Collections Manager

BOULDER CONPS APRIL CONSERVATION PROJECT: Spurge Purge!

Sunday, April 21, 2013

Join CoNPS members, Wildlands Restoration Volunteers and other community members and help us purge the spurge from numerous locations in the foothills west of Boulder. Myrtle spurge (*Tithymalus myrsinites* syn. *Euphorbia myrsinites*) is a "List A" noxious weed that has escaped ornamental gardens and is now designated for statewide eradication by the Colorado Department of Agriculture. For more information or to sign up to participate, visit <http://www.wlrv.org>.

GORE RANGE CHAPTER

The Gore Range Chapter would like to highlight the 2 field trips we are planning this summer (find the details in the Field Trip Section of this newsletter), so please think about coming up to a little higher elevation here on the Western Slope to see our natives from bloom to seed!

If you have ideas for, or are willing to lead, field trips or workshops, please forward your interest to me, Nanette Kix, Gore Range Chapter President (kix@vail.net). You don't have to be a botanist - just take us to your favorite places!

Thank you for doing all you can to make our local chapter and state society thrive. There is so much to learn - share what you know!

METRO-DENVER CHAPTER

Monthly meetings of the Metro-Denver Chapter are typically held on the fourth Tuesday of the month (September through April), 7p.m., at the headquarters of the Colorado Federation of Garden Clubs, Inc. at 1556 Emerson Street. Parking is available on the street, directly behind the building, and behind the Strickland Building, 1553 Emerson St, with a permit that will be available at the first meeting when you arrive. The Metro-Denver Chapter welcomes everyone, members and non-members, to attend its free programs and field trips. For more information, please contact Jannette Wesley at metrodenverCoNPS@gmail.com.

SUMMIT LAKE PARK & STATE HIGHWAY 5 MT. EVANS FEN DETERMINATION AND WETLAND DELINEATION
March 26, 2013, 6:30p.m. refreshments; 7p.m. program
Presenter: Francesca Tordonato and Mo Ewing
Location: 1556 Emerson St., Denver

Summit Lake Park on Mount Evans, designated as a National Natural History Landmark, is one of the "Crown Jewels" of Colorado. Elevation, soils, slope, moisture and aspect create beautiful collections of plants all struggling to survive the harsh conditions of the high alpine.

The Colorado Department of Transportation (CDOT) proposed improvements to State Hwy (SH) 5 (Mount Evans Road), in Clear Creek County between mile markers 8.0 and 10 adjacent to Summit Lake Park. The repairs were proposed to address and correct unsafe conditions (hummocky, damaged and undulating roadway surface) resulting from frost heave. Summit

Lake (located near mile marker 9.0) is located at the base of a high alpine granite cirque (glacially eroded basin) and was formally designated a National Natural Landmark in 1965 by the Secretary of Interior after being nominated by Dr. William A. Weber. The National Natural Landmark designation was based on many of the physical and ecological features that are unique to Summit Lake, which includes a variety of extremely rare arctic-alpine plants, which are found here and within the Arctic Circle. A wetland delineation and fen investigation was performed in the summer of 2011 to provide information to CDOT and the U.S. Army Corps of Engineers regarding wetlands within the study area that could be impacted by the proposed project. Additional field and laboratory investigation was performed to categorize wetland types (i.e., meadow, wet meadow or fen) within the study area. Francesca's talk will feature an overview of the fen determination and wetland delineation conducted for the project. In addition, the talk will feature an update on some of the rare plant mapping and additional studies that have occurred since the fen determination in 2011. The talk will also feature some useful information about wetland policy and wetland/fen ecology!

Francesca Tordonato is an environmental project manager and biologist for the Colorado Dept. of Transportation- Region 1. She is a Colorado native and long-time CONPS member.

Mo Ewing is a retired conservation biologist who has studied everything from noxious weeds in the White Mountains of New Hampshire to rare and endangered plants on the shale barrens of northwestern Colorado. He currently volunteers at the Research Department at the Denver Botanic Gardens, serves as Conservation Chair of the Colorado Native Plant Society, and is a Rare Plant Monitoring Steward for the Colorado Natural Areas Program.

MEET THE NATIVES AGAIN

April 23, 2013, 6:30 p.m. refreshments, 7p.m. program
Location: 1556 Emerson St. Denver
Presenter: Dan Johnson

Dan's latest venture has been the revision and expansion of the wildflower guide *Meet the Natives*. Long a regional favorite first published in 1942 by M.

Walter Pesman, this eleventh edition features full color photos for the first time, with a new color-searchable format. This expanded edition also includes over one hundred additional wildflowers, grasses and cactus. Rare plants as well as invasive plants are also included. Gardening tips are included for native plants that thrive in the garden.

This presentation gives an overview of our region's life zones from the Plains to the Alpine, some of the wildflower highlights to be found along the trail, and tips on which ones perform well in the garden.

Dan Johnson has been gardening for as long as he can remember, and has worked in the horticulture industry for more than 30 years. His broad experience and formal training now include sixteen years with Denver Botanic Gardens Horticulture Department, where he designs and maintains numerous native and xeric gardens, currently as Curator of Native Plant Collections and Associate Director of Horticulture.

NORTHERN CHAPTER

The Northern Chapter meetings are the first Thursday of the month (unless stated otherwise), November through May, 7:00 p.m., at The Gardens on Spring Creek, 2145 Centre Ave., Fort Collins, CO. For further information, contact Northern Chapter President, Connie Gray, at cpowersgray@gmail.com.

Meetings and field trips are free and open to all. Prior to meetings, we meet for dinner with the speaker at Café Vino, 1200 S. College Avenue, Fort Collins at 5:30 p.m. Please join us.

TEN YEARS OF ECOSYSTEM CHANGES FOLLOWING THE HAYMAN FIRE

Thursday, April 04 2013, 7 p.m.

Presenter: Paula Fornwalt, Research Ecologist, US Forest Service, Rocky Mountain Research Station

It's hard to believe that ten years have passed since the Hayman Fire charred nearly 140,000 acres on the Pike National Forest. Paula will provide us with an update on her research examining how understory plant communities within the fire perimeter have changed

over the last decade. She will also share her findings on long-term patterns of postfire overstory tree mortality, tree regeneration and surface fuel dynamics.

PLATEAU CHAPTER

The Plateau Chapter generally encompasses the west-central and northwest area of Colorado from Grand Junction to Montrose to Gunnison to Glenwood Springs to Craig. Wherever you are in Western Colorado, come join us for meetings and field trips. Chapter activities are scheduled throughout the year. For more information, visit www.CoNPS.org or contact Chapter President Steven Stern at stern.r.stephen@gmail.com.

FROM BUD TO FLOWER TO FRUIT - WORKSHOP

March 30, 2013; 1p.m.

Workshop Leader: Eric Rechel

Location: Colorado Mesa University

Cost \$10

Eric will be discussing the environmental cues that initiate flower formation, the process of double

fertilization, and observe (and eat!) different fruit types. Please RSVP to Stephen Stern at stern.r.stephen@gmail.com if you plan on attending or have additional questions.

SOUTHEAST CHAPTER

Activities of the Southeast Chapter are scheduled throughout the year and include field trips and meetings. Regular chapter meetings (always with an educational focus) will begin in October in both Pueblo and Colorado Springs. Those wishing more information can e-mail us as SEtrips@gmail.com.

The Southeast Chapter welcomes your participation, no matter where you are in southeast Colorado. Activities will be scheduled throughout the year with most meetings in Pueblo and field trips to a variety of sites throughout the area.

Southeast Chapter meetings are held from 6:30 p.m. to 8:00 p.m. All meetings, unless otherwise noted, will be held at 701 Court Street in Pueblo. For more meeting information, please call Warren Nolan: (719) 543-6196.

2013 ANNUAL PHOTO CONTEST!!

Now that Spring is almost here, keep our contest in mind,
and your camera close at hand !

Submit Photos from April 1 – August 10, 2013

PRIZES

1st Place, Colorado Native Plant Landscapes/Habitats - \$50

1st Place, Colorado Native Plants - \$50

Go to <http://CoNPS.org/> for Contest Rules and Entry Form

2012 DONORS

The Society gratefully acknowledges those who have contributed in 2012 to our efforts to further the knowledge, appreciation and conservation of native plants and habitats of Colorado through education, stewardship and advocacy.

MYRNA P. STEINKAMP MEMORIAL FUND

For research and other activities to benefit the rare plants of Colorado

David Anderson
Sarah Bangert
Susan Beatty
John Brink
Leo Bruederle
Jeffrey Carter
Dina Clark
Wendy Covert
Kate Dwire
Barbara Galloway
Mark Gershman
Elisabeth Glass
Jill Handwerk
Ellen Heath
Ann Henson
Deborah Henson
Janis Huggins
Tina Jones
Ronda & Tony Koski
Susan Martin
Annyce Mayer
Tamara Naumann &
Peter Williams
Elizabeth Neely &
Alan Carpenter
Neal Osborn
Elizabeth Otto
Sandy Righter
Lawrence Robins
Terence Ryan
Carol Simmons &
David Steingraeber
Hazel Tuttle
Eleanor Von Bargaen
Amy Yarger

GENERAL ENDOWMENTS

Laura Backus
Sandra Friedley
Anna Naeser &
Gerald Terwilliger
F. R. Owens
Dickson Pratt

THE JOHN MARR FUND

For research on the biology and natural history of Colorado native plants

April Andujar
Brigitta Arvin
Sarah Bangert
Susan Beatty
Richard Beidleman
Leo Bruederle
Sandra & David Buckner
Jeffrey Carter
Dina Clark
Wendy Covert
Preston Cummings
Mary Damm
Carol & Jeffrey
Dawson
Jean Dietemann
Kate Dwire
Alexander Eschenbaum
Scott Franklin
Barbara Galloway
Mark Gershman
Elisabeth Glass
Elizabeth Hall
Ann Henson
Deborah Henson
Timothy Hogan
Ronda & Tony Koski
Marilyn McCord
Patrick Murphy
Neal Osborn
Judy Perkins
Herbert & Elaine Probasco
Mike Renth Family
Lawrence Robins
Terence Ryan
Betty Timson
Hazel Tuttle
Eleanor Von Bargaen
Olin Webb
Paige Wolken
Lorraine Yeatts



GENERAL DONATIONS

Mary Amstutz
Brigitta Arvin
Lorraine Aslakson
Sarah Bangert
Ellen Bauder
Mary Ann Bonnell
Megan Bowes
Barbara Browne
Martha & Jack Carter
Jackson Dennis
Jean Dietemann
Virginia Dionigi
Kate Dwire
Mo Ewing
Suzanne Folke &
Alex Tonnesen
Mark Gershman
John Giordanengo
Elisabeth Glass
Bob Henry
Dexter Hess
Theron Hunter
Marion Jones
Bill Loessberg
Hugh MacKay
Linda Moore
Claire Moore-Murrill
Linda O'Banion
Phil Phelan
Karen Pokorney
Mel Preusser
Polly Reetz
Sandy Righter
Lawrence Robins
Holmes Rolston
Katherine & James Shea
Sharlene Short
Laurel Starr
Lisa Subry
Francesca & David Tordonato
Hazel Tuttle
Sara Ungrodt
Karen Vail
Trudy White & Joaquin Garcia
Sharon Williams

MOUNT EVANS CONSERVATION FUND

Mo Ewing

Colorado Native Plant Society



The Colorado Native Plant Society is dedicated to furthering the knowledge, appreciation and conservation of native plants and habitats of Colorado through education, stewardship and advocacy.

Membership is open to all with an interest in our native plants and is composed of plant enthusiasts, both professional and non-professional.

Please join us in learning about, enjoying and protecting Colorado's native plants.

OFFICERS

President	Crystal Strouse	csnativeplants@gmail.com
Vice President	Bernadette Kuhn	bernadettekuhnCoNPS@gmail.com
Treasurer	Mo Ewing	moewing@q.com
Secretary	Denise Wilson	denise@denisecwilson.com
Admin. Asst.	Linda Smith	conpsoffice@aol.com

CHAPTER PRESIDENTS

Boulder	Danielle Levine (VP)	boulderCoNPS@gmail.com
Gore Range	Nanette Kuich	kix@vail.net
Northern	Connie Gray	cpowersgray@gmail.com
Metro-Denver	Jannette Wesley	metrodenvCoNPS@gmail.com
	Jeanne Wilson	riversong@centurylink.net
Plateau	Stephen Stern	stern.r.stephen@gmail.com
Southeast	Ed Roland	edwardrroland@gmail.com

BOARD OF DIRECTORS

Director	Brian Kurzel ('13)	brian.kurzel@gmail.com
"	Jenny Neale ('13)	nealejr@gmail.com
"	Robert Powell ('11)	robertlpowell@durango.net
"	Jan Turner ('12)	jltturner@regis.edu
"	Charlie Turner ('11)	conpscturner@gmail.com
"	Steve Yarbrough ('11)	steveandkenna@msn.com

STANDING COMMITTEES

Conservation	Mo Ewing	moewing@q.com
Education & Outreach	Jim Tolstrup	jim@suburbitat.org
Field Studies	Steve Popovich	stevepopovich@hotmail.com
Horticulture and Restoration	Megan Bowes	bowesm@bouldercolorado.gov
Media	Jan Turner	jltturner@regis.edu
Membership	Linda Smith	conpsoffice@aol.com
Research Grants	Catherine Kleier	ckleier@regis.edu
Sales	Linda Smith	conpsoffice@aol.com
Workshops	Linda Hellow	conpsworkshops@gmail.com
Editor, <i>Aquilegia</i>	Bob Henry	bh.prairieink@gmail.com
Webmaster	Yongli Zhou	shallopcq@yahoo.com
Website Editor	Linda Smith	conpsoffice@aol.com

AQUILEGIA

Newsletter of the Colorado Native Plant Society

Aquilegia is the newsletter of the Colorado Native Plant Society, and is available to members of the Society and to others with an interest in native plants. Four regular issues are published each year, plus a special issue for the annual Society meeting held in September

Announcements, news, articles, book reviews, poems, botanical illustrations, and other contributions should be sent to Linda Smith at conpsoffice@aol.com.

All contributions are subject to editing for brevity and consistency, with final approval of material changes by the author.

Articles from Aquilegia may be used by other native plant societies or non-profit groups, if fully cited to author and attributed to Aquilegia.

Deadlines

Submissions to Aquilegia are accepted throughout the year, although the usual deadlines for publication are:

- February 15 (Spring issue, published March 15)*
- April 15 (Summer issue, published May 15)*
- June 15 (Annual Meeting issue, published July 15)*
- July 15 (Fall issue, published Aug. 15)*
- October 15 (Winter issue, published November 15)*



P.O. Box 200
Fort Collins, Colorado 80522
<http://www.conps.org>



- CALENDAR -

**2013 Rare Plant Symposium
and
CoNPS Annual Meeting
September 27,28, 29, 2013**

Sponsored by the Boulder Chapter

May 15

**Deadline for nominations
for two new Board Directors**

2013 Field Trips Inside!