

Aquilegia

Magazine of the Colorado Native Plant Society

Volume 44 No. 3 Summer 2020

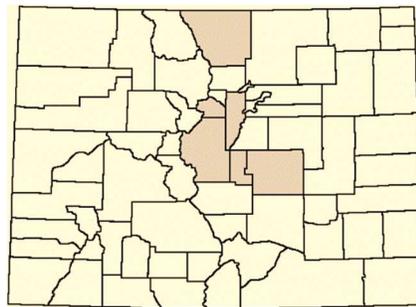




James's alumroot, *Telesonix jamesii* (Saxifragaceae). James's alumroot—or brookfoam—was first collected by Edwin James on Pikes Peak in 1820. It is usually found in the cracks of granite outcrops at 8,700-13,050 ft elevation, although the plant can also be found on scree slopes. While it seems to prefer east and north exposures on these surfaces, it can be found growing in full sun to full shade and in variable levels of moisture. Most populations are found on Pikes Peak granite, but there are a few outlier populations in Rocky Mountain National Park, which are on Precambrian gneiss and schist. *T. jamesii* is 60-180 mm tall, with glandular-pubescent stems and leaves.

Alumroots (*Heuchera spp.*) are often found nearby *Telesonix*. Be careful not to confuse the plants when they are not in bloom. *Telesonix heucheriformis*, which has a wider distribution, was once considered a variety of *T. jamesii*, but is now categorized as its own species.

The name *Telesonix* is derived from Greek; “tele” translates as “perfect” and “onyx” translates as “claws.” *T. jamesii* has been reported to be used medicinally by the Cheyenne. KA



Map adapted from Ackerfield, J. *Flora of Colorado*, (2018), p. 757.

Botanicum absurdum by Rob Pudim



© Rob Pudim

PHOTO CREDITS: James's alumroot, *Telesonix jamesii*; FRONT COVER © Mike Kintgen; PAGE 2 © Kelly Ambler, Pikes Peak region, July 13, 2020. BACK COVER: © Mo Ewing, *Aquilegia coerulea*, Crested Butte, and *Oenothera sp.* and others, Pawnee Buttes.

Aquilegia uses Jennifer Ackerfield's *Flora of Colorado* (2018, second printing) as its preferred guide to plant naming conventions. Readers may also want to familiarize themselves with other guides such as *Colorado Flora*, Eastern and Western editions, by William A. Weber and Ronald C. Wittmann (2012), as well as The Biota of North America Program online guide to North American Vascular Flora (<http://www.bonap.org/>), and other resources.

Aquilegia: Magazine 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

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Members receive at least four regular issues per year (Spring, Summer, Fall, Winter). At times, issues may be combined. All contributions are subject to editing for brevity, grammar, and consistency, with final approval of substantive changes by the author. Articles from *Aquilegia* may be used by other native plant societies or non-profit groups if fully cited to the author and attributed to *Aquilegia*.
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17TH Annual Colorado Rare Plant Symposium

“Globally Imperiled Plants Found on the Front Range and Central Rockies”

Friday September 18

8:30 AM to 2:30 PM

Registration is \$10 per person at <https://conps.org>. The Colorado Rare Plant Symposium is held each fall in conjunction with the Colorado Native Plant Society's annual conference. Hosted by the Colorado Natural Heritage Program, the symposium is an annual meeting to address current status and conservation needs of rare plants in Colorado.

This year the symposium is going virtual and consists of three short sessions. Topics will include:

- A progress report on the conservation actions needed for the Tier 1 and Tier 2 plant species included in the 2015 State Wildlife Action Plan;
- An update to the Floristic Quality Assessment revision; and
- A photo review of the rare plants found on the Front Range and Central Rockies in Colorado.

The 2015 State Wildlife Action Plan included plants for the first time and identifies conservation needs and actions for 120 of Colorado's rarest plant species including federally-listed species such as *Astragalus*



osterhoutii, and endemic species like *Aliciella sedifolia*. Jessica Smith of CNHP will provide a review of the conservation needs of these species and the actions that have been taken to date to meet those needs. The Rare Plant Addendum to the SWAP can be viewed at

[https://cpw.state.co.us/](https://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx)

[aboutus/Pages/StateWildlifeActionPlan.aspx](https://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx)

In 2007, CNHP published Colorado's initial FQA report that included Coefficient of Conservation or C-values for the Colorado flora for 80% of the known taxa at that time (Rocchio et al. 2007 <https://cnhp.colostate.edu/download/documents/2007/FQAFinalReport.pdf>).

However, since 2007 there have been numerous taxonomic changes to the Colorado flora—with new species added to the flora, and other species dropped. During 2019 and 2020, CNHP updated the C-values for the 20% of the flora that did not yet have values. C-values are assigned to each plant taxa based on its affinity for natural habitats (for example, those not affected by human disturbance). Land managers can apply the C-values to a plant list for an area, which can then be used to help quantify the quality of that

site. Many of the new C-values were evaluated using habitat quality information collected from nearly 3,000 wetland and riparian plot locations (see <https://cnhp.colostate.edu/cwic/tools/plot-database/>).



At the 2020 meeting, Pamela Smith of CNHP will present the new C-values calculated for the 20% of the flora that did not have values. She will also discuss how the new online calculator works and how the values were evaluated for the update. In addition, through this effort a

number of sources of taxonomic information have been cross-walked for the entire Colorado plant list including the USDA PLANTS database, Weber and Wittmann (2012), and Ackerfield (2015).

In the afternoon session, CNHP botanists will provide a photo review of the rare plants of the Front Range and Central Rockies in Colorado. This will include several species of *Aletes*, *Potentilla*, *Penstemon*, and local favorite *Physaria bellii*.

CNHP tracks the location and condition of over 500 imperiled plants. Tracking and monitoring efforts guide effective management and protection of those species and thereby prevent extinctions or statewide extirpations of Colorado's native plant species. ►



Aliciella sedifolia (stonecrop gilia). © Connie Colter



Physaria bellii (Front Range or Bell's twinpod).
© Georgia Doyle

◀ CNHP conducts field surveys for rare native plants; designs and implements monitoring studies; produces models, best management practices, and conservation strategies; and develops detailed maps

for rare plants as well as noxious weeds. The CNHP team has active members on the Colorado Rare Plant Technical Committee, the Colorado Weed Advisory Committee, the Colorado Native Plant Society, and NatureServe. Colorado Natural Heritage Program staff works closely with botanists and land managers across Colorado to develop the state's most comprehensive and accurate dataset of Colorado's rare flora.

Annual presentations and species-specific meeting notes are available for past years at <https://cnhp.colostate.edu/projects/colorado-rare-plant-symposia/>

View the Colorado rare plant guide at <https://chnp.colostate.edu/library/field-guides>

Past presentations and species-specific meeting notes are available on the CNHP website for 2004-2019. View or download copies of past symposia presentations at <https://cnhp.colostate.edu/projects/colorado-rare-plant-symposia/> or view the Colorado rare plant guide here: <https://cnhp.colostate.edu/library/field-guides/>

Contact Jill Handwerk for more information at (970)491-5857 or jill.handwerk@colostate.edu 

Member Input Needed for Virtual Social

Peaks to Prairies: CoNPS Members in the Field!

By Lenore Mitchell

Share your summer activities!

Eventually we'll be able to hike together again, attend in-person meetings and workshops, and give and receive hugs. In the meantime, we can still share.

Whatever you're doing this summer, wherever you are from—Durango to Denver, La Junta to Grand Junction—if it involves native plants, tell us about it! Whether you're doing research, sleuthing around for rare plants, taking fun hikes to worship the blooms, or working away at native plant garden projects, please snap a few pics and jot down a few notes.

Send a few photos and your brief notes to Tom Schweich (tomas@schweich.com) no later than August 25 so we can include you and your activities in the member slide show during the virtual social at this year's annual conference. Include a photo of yourself, preferably in the midst of your activity.

Here is the agenda for the Virtual Social on Friday, September 18. The following is included with your paid conference registration:

- Welcome to the conference and announcements;
- Narrated presentation about a July 2020 hike to Pikes Peak to commemorate the 1820 Long's Expedition to Colorado;
- Narrated presentation of slide show with photo contest finalists and first place winners;
- Narrated presentation of slide show depicting state-wide member projects, including research, hikes, and gardening related to native plants; and
- Brief narrated slide show to introduce key people who keep CoNPS running, including board members, chapter presidents, and others.

44TH Annual CoNPS Conference

“Peaks to Prairies—Plants in the Land of Extremes”

Friday through Sunday, September 18-20
Four sessions over three days

Welcome to the 2020 Annual CoNPS Conference, hosted by the Metro-Denver Chapter, which now has 420 members. State-wide membership totals more than 1100 members in six chapters and includes everyone from professional botanists to beginning plant enthusiasts.

This year’s Annual Conference is brought to you in a webinar format that allows participants to join in from the comfort of their own homes.

We look forward to having as many as 500 native plant lovers gathering virtually to hear and watch this year’s expert speakers.

Daily schedules contain ample break times and a lengthy lunch time on Saturday. In addition, recordings of select presentations may be available for viewing by registered participants for a limited time after the conference—in case you either missed a presentation or wish to repeat it. Audience questions may be submitted via chat boxes during live presentations.

Thanks not only to all conference committee members whose efforts have made this year’s conference possible, but also to the many other volunteers who’ve offered their assistance. Kudos to everyone for

making the best of a challenging situation. We give a very special note of gratitude to each of our speakers.

State-wide leadership of CoNPS begins with the operating committee comprised of: Ginger Baer, Deryn Davidson, Mo Ewing, Ann Grant, Irene Weber and Amy Yarger. In addition to the OC, CoNPS board of directors includes chapter presidents and members-at-large. CoNPS staff includes Linda Smith, who keeps us all organized as administrative coordinator, Denise Wilson as marketing and events coordinator, and Kathy Okon as the workshop coordinator. Volunteers from all over the state contribute in various ways to CoNPS success and new volunteers are always welcome.

Thanks to this year’s conference committee members: Kelly Ambler, Courtney Cowgill, Sue Dingwell, Mo Ewing, Lenore Mitchell, Tom Schweich, Bruce Tohill, John Vickery, and Denise Wilson. Special thanks to *Aquilegia* managing editor Mary Menz and associate/design editor Kelly Ambler.

Registration

See page 11 for registration information. Registrants will receive an email with details for accessing all webinar events. There will be instructional materials available for those unfamiliar with webinar formats.

Speakers and Presentations

(arranged in order of presentations)



Heidi Steltzer **“The richness of plants in the mountains benefits people”**

Mountain regions are home to 25% of the earth’s biodiversity, provide water to billions of people, and sustain us by providing refuge. The Colorado mountains are a unique

place for plant life, and one that is changing quickly due to the warming of our planet and a changing snow pack. Heidi will provide insights into the benefits that

mountain plants provide for people to inform why we should conserve these incredible species. They are resilient, and this contributes resilience to each of us.

Heidi Steltzer, PhD, is professor of environment and sustainability at Fort Lewis College in Durango. Heidi is a mountain scientist, explorer, and science storyteller. She has spent 25 years conducting field studies in remote regions of Colorado, Alaska, Greenland, and China to understand how mountain ecosystems are unique and valued regions of our world. She is a lead author on high mountain areas in a recent intergovernmental panel on climate change report and has testified before US Congress on climate change. Find her on social media @heidimountains ►



Mike Kintgen “Circumboreal Alpine Plants and Biogeography”

Mike will share some of the circumboreal element in our flora—species found both in Colorado and in places as diverse as Newfoundland, Kamchatka, Norway,

Iceland, and Switzerland. Colorado's flora share diverse links with mountainous and high latitude regions around the world. Mike will show how Colorado flora is linked to that of Eurasia and South America. He will also dip into the Asiatic element in Colorado's high elevation flora, as well as links with the flora in places as far away as Patagonia. Lastly, he will brush on the rich, endemic North American influence on our flora which includes genera such as *Penstemon*, *Eriogonum*, *Calochortus*, and *Heuchera*.

Mike Kintgen is the curator of alpine collections at Denver Botanic Gardens, where he has been a formal part of the staff since 2004. He has played an informal role since 1992, having started as a volunteer at age eleven. His botanical travels have taken him to most of Western Europe, European Russia, Morocco, and Argentine Patagonia.



Jennifer Boussetot “Colorado Native Plant Availability in the Green Industry”

Native plant aficionados often struggle to find Colorado native plants available in the green industry. Often that is due to two things: lack of demand

so most producers do not grow them, and the fact that many Colorado native plants are not as attractive in containers so most gardeners don't buy them. Because of this, Jen and others have acquired USDA funding and have begun plant finishing protocol research on several of the species in Plant Select® that are native to Colorado. Jen will talk about one of her greatest passions—how to ensure that our beloved Colorado native plants become more available in the green industry.

Jennifer Boussetot, PhD, is an assistant professor in the department of horticulture and landscape

Architecture at Colorado State University. Jen completed her doctorate research studying green roof species selection, including Colorado native plants, at Colorado State University in 2010. Jen also does research ensuring that Colorado native plants are marketable in the green industry. She is a previous marketing and events coordinator for CoNPS and is co-author of the CoNPS-published 3rd edition of Common Southwestern Native Plants.



Jennifer Ackerfield “Thistle Be Fun: Untangling Taxonomy and New Species Discoveries”

Have you ever wondered what defines a species, or how new species are discovered and named?

Well, wonder no longer! Join Jennifer as she talks about the process of defining a species and all the lines of evidence that scientists use to inform this decision. After laying the groundwork for how species are named, she will discuss an exciting development in her alpine thistle research.

Many members of CoNPS participated in Team Thistle, a citizen science initiative in which Jennifer asked members to “get high on alpine thistles” with her. Through this initiative, approximately 50 collections of alpine thistle were made and observations recorded on iNaturalist. She used several of these collections and observations in her research and discovered an unnamed species hidden right under our noses! This exciting discovery also highlights the need and importance of field studies, iNaturalist observations, archives, and natural history collections.

*Jennifer Ackerfield, PhD, is the head curator of natural history collections at Denver Botanic Gardens. She was previously a curator at the Colorado State University herbarium and also taught plant identification at CSU. Most notably, she is the author of the Flora of Colorado. She has been studying the flora of Colorado for 25 years and has traveled extensively across the state documenting its rich floristic diversity. She received her master's in botany with a concentration in taxonomy and systematics in 2001 and is currently working on her PhD in botany, studying the taxonomy and evolution of the genus *Cirsium* (thistles) in North America. Jennifer has worked with the Colorado Native Plant Society, Colorado Natural Heritage Program, US Forest Service, Colorado BLM, Rocky Mountain National Park, and Mesa Verde National Park. ►*



◀ **Shannon Murphy**
“Light Pollution Affects Invasive & Native Plant Traits Important to Plant Competition & Herbivorous Insects”

Many exotic invasive species have traits that allow them to outcompete native species when there

have been changes in the environment relative to conditions under which the native plants have evolved. However, invasions in urban settings have been insufficiently studied, including exploring the impacts of the uniquely urban stressors of streetlights.

Plant physiology and phenology are impacted by Artificial-Light-at-Night, but no studies have yet examined if light pollution differentially affects native versus invasive plant species. We tested the hypothesis that ALAN affects plant traits important to plant fitness and susceptibility to herbivory and found that these effects differ between some invasive and native grass species. As urbanization increases, its role in understanding invasion biology becomes more important, especially when an urban disturbance such as ALAN benefits the growth of invasive species.

Dr. Shannon Murphy is associate professor of biology at the University of Denver. She graduated from the University of Colorado at Boulder in ecology and evolutionary biology. She received her PhD in ecology and evolutionary biology from Cornell University and completed two post doctorates, one at the University of Maryland in entomology and the other at the George Washington University in biology.



Steve Yarbrough
“Fen Ecosystems of Colorado”

Finns? Or Fins? No....Fens! Fens are groundwater-fed, peat-forming wetland ecosystems. Where exactly are they hiding out and why the heck are they so

interesting for native plant enthusiasts?

Fens contain a great number of Colorado rare plant species and even a few globally rare species. They occur in a variety of landscapes and boast some interesting chemistries. What conservation measures and strategies are being used with fens and what difference will it make in the long run? Steve will

provide some insights from 22 years of balancing through, plunging in, and rescuing himself from a variety of fens across Colorado.

Steve Yarbrough is a senior ecologist and professional wetland scientist working for Tetra Tech, Inc., in Golden, Colorado. He has enjoyed a 36-year career in the environmental consulting field. His job assignments typically involve siting studies for renewable energy projects, assessing impacts, obtaining required permits, and monitoring the recovery of damaged resources, including wetlands and native prairie. He has previously served on the CoNPS board of directors and served stints as field trip coordinator and workshop coordinator for the society. He is currently a member of the conservation committee.



Tim Seastedt
“Climate Change Effects on Herbaceous Plant Community Composition in the Colorado Front Range”

The high elevation ecosystems of the Colorado Front Range have been under study by CU

researchers for 70 years, a time period sufficient to study impacts of climatic changes. Climate and atmospheric inputs are the dominant change factors of high elevation ecosystems, but these drivers influence a complex terrain that is impacted unevenly by local growing season length, moisture, and nutrient limitations. These differential outcomes produce differential changes in vegetation composition across the landscape that benefit components of the alpine flora while penalizing others. Willow invasions into herbaceous areas have, perhaps, been the most dominant change to date. The entire alpine zone is undergoing elevation changes, but these changes are controlled by the interaction of climate changes with local abiotic and biotic factors.

Tim Seastedt is professor emeritus for the department of ecology and evolutionary biology and is a fellow, Institute of Arctic and Alpine Research, University of Colorado, Boulder. Seastedt spent a decade studying grasslands in Kansas prior to coming to Colorado in 1990. He became the principal investigator of the Niwot Ridge long-term ecological research program in 1992 and has continued studies to date on plant and soil interactions in herbaceous ecosystems on both at the top and bottom of the Front Range. ☯

“Peaks to Prairies—Plants in the Land of Extremes”

Conference Schedule

Friday Virtual Social Event: Highlights from 2020

Time	Description	Speaker
6:30 PM to 9:00 PM	Introduction	Denise Wilson
	Pikes Peak commemorative hike	Kelly Ambler
	Photo contest winners	Bruce Tohill
	Break	
	Peaks to Prairies: CoNPS Members in the Field	Tom Schweich
	Break	
	Key people who keep CoNPS running	Moderator(s)

Session 1: Saturday morning

Time	Description	Speaker
8:30 AM	Join webinar	Moderator(s)
9:00 AM	Introductions, instructions	Moderator(s)
9:10 AM	The Richness of Plants in the Mountains Benefits People	Heidi Steltzer
9:55 AM	Break	
10:05 AM	Circumboreal Alpine Plants and Biogeography	Mike Kintgen
10:55 AM	Break	
11:10 AM	Colorado Native Plant Availability in the Green Industry	Jennifer Boussetot
11:55 AM	Session closing and midday break	Moderator(s)

Session 2: Saturday afternoon

Time	Description	Speaker
1:30 PM	Announcements, other	Moderator(s)
1:40 PM	Thistle be Fun: New Species Discoveries	Jennifer Ackerfield
2:25 PM	Break	
2:35 PM	Light Pollution Affects Invasive & Native Plant Traits Important to Plant Competition & Herbivorous Insects	Shannon Murphy
3:20 PM	Session closing and day-end	Moderator(s)

Session 3: Sunday afternoon

Time	Description	Speaker
1:00 PM	Getting started, other	Moderator(s)
1:10 PM	Fen Ecosystems of Colorado	Steve Yarbrough
1:55 PM	Break	
2:10 PM	Climate Change Effects on Herbaceous Plant Community Composition in the Colorado Front Range	Tim Seastedt
2:55 PM	Conference closing	Moderator(s)

Annual Silent Auction Benefits CoNPS Activities

The Annual Conference traditionally hosts a silent auction to benefit CoNPS. This year the auction will be online! Proceeds support the Colorado Native Plant Society's wide-ranging projects including education, conservation, native plant gardening, botanical and horticultural publications, and activities.

Denise Wilson and the silent auction committee seek your donations for this event. We are accepting only small, mailable, above \$20 value items, and requesting that donors hang on to them and mail them to the winning bidder afterward. Donors can bill CoNPS for shipping cost reimbursement, but we also appreciate the donation of your time and shipping cost, if you are able to do so. To submit an item, email to Denise 1) 2-3 good quality photos showing different angles (one picture of the cover is good for a book), 2) a short description, 3) and the value.

Denise suggests donations might include—

- Sample of a member artist's painting, photography, or other work; flat, small and no glass;
- Greeting cards, stationary, markers, pens, stickers, and so on;
- Tee shirts, hats, gloves, raingear, gaiters, UPF clothing, technical fabric clothing;

- Water bottles;
- Lightly used backpacks, items to fill a backpack, other outdoor gear;
- An unopened bottle of wine or liquor;
- SMALL garden tools, art, statuary, wind chimes in "like new" condition;
- Gift cards;
- Any unused SMALL gift you've received and would like to find a home for; and
- Money that the committee can use to make a great gift basket.

We are asking donors who are able to donate their time and shipping cost to hang onto the item until the end of the auction, and then mail it to the winning bidder for us.

If you or your business are interested in donating an item for the silent auction, please contact Denise at deniseclairewilson@gmail.com Likewise, if you'd like to volunteer to help with the silent auction, contact Denise.

Auction preview will be available September 1-11. Bidding on silent auction items will be open September 12-20.

Annual Photo Contest—Call for Entries

Have you taken some spectacular photos of native plants this summer or in years past? If so, consider entering the CoNPS annual photo contest. Photos may only be submitted electronically with a completed entry form. You must be a CoNPS member to participate.

Entries can be made in any of five categories including:

- Colorado Native Plant **Landscapes**;
- Colorado Native **Plants**;
- **Artistic** (of Colorado Native Plants or Native Plant Landscaping);
- Colorado Native Plants & **Wildlife** (including native insects/pollinators); and
- Native Plant **Gardens**.

Contest rules and agreements are posted on the CoNPS website. Photos may be submitted to the

contest August 1-31. Photos will be displayed on the CoNPS website and judged by CoNPS members prior to the conference (September 1-15). Winners will be announced on September 18 during the Friday night social.

Entries must be a single work of original material taken by the contest entrant. No more than one photo per category may be submitted. Photos may be from previous years (for example, you may submit a photo that you took in 2013). A \$50 prize will be awarded to the first place winner of each category.

Contest is open to CoNPS members only. Please see the CoNPS website for entry forms:

<https://conps.org/xyyyzz-2020-photo-contest/>

Questions? Contact Bruce Tohill at tohillb@msn.com

Reporters Needed for the Annual Conference

Are you willing to write a summary of one or two of the presentations from the Annual Conference? If so,

please contact Mary Menz (Mary.T.Menz@gmail.com) or Kelly Ambler (alpineflowerchild@gmail.com)

Registration

Registration is available online at <http://conps.org>. Please log in if you are a CoNPS member, then proceed to the Calendar of Events to register. Online registration ends September 15.

If registering by mail, please complete the following registration form for each person attending and submit by September 7.

Mail registration form and payment to: CoNPS, c/o Linda Smith, 4057 Cottonwood Dr., Loveland, CO 80538

Name (first, last) _____

Phone _____ **Email** _____

Mailing address _____

The registration fees include attendance to the Annual Conference webinars on Saturday and Sunday, September 19 and 20 plus the Friday night virtual social on September 18. A separate fee is charged for attending the Rare Plant Symposium. An optional practice webinar is also included in the registration.

Member registration*

The 17 TH Annual Rare Plant Symposium @ \$10	_____
The 44 TH Annual Conference @ \$30	_____
Optional donation	_____
Membership Renewal (if necessary)	_____
Individual @ \$25	_____
Family/Dual @ \$35	_____
Senior or Student @ \$17	_____
Plant Lover @ \$50	_____
Supporting @ \$100	_____
Patron @ \$250	_____
Benefactor @ \$500	_____
Lifetime @ \$800	_____
<i>Aquilegia</i> print subscription @ \$20/year	_____

Total enclosed \$ _____

Non-member registration. Consider becoming a member! See page 26.

The 17 TH Annual Rare Plant Symposium @ \$10	_____
The 44 TH Annual Conference @ \$35	_____
Optional donation	_____

Total enclosed \$ _____

* A limited number of scholarships are available. See CoNPS.org for details.

The Annual Conference Committee appreciates all businesses and individuals who have contributed gift certificates or merchandise to our online auction to help defray cost of this year’s event. Business logos are displayed online at CoNPS.org and will be displayed in *Aquilegia* beginning Fall, 2020.

Featured Story

Celebrating the Bicentennial of Stephen H. Long's Expedition Part 3 of 4: The Ascent of Pikes Peak and Noteworthy Species Found

By Mike Kintgen and Jen Toews

This is the third in a series of four articles about the Long Expedition to the Rocky Mountains.

On July 14, 1820, Edwin James and two other men trudged slowly up what would later be named Pikes Peak. Without today's well-maintained trail system, the ascent would have been especially grueling. It would first have been a long bushwhack through the forest and then a tedious scramble through the talus. It is also easy to imagine that James, the first American botanist of European descent to see the alpine tundra of Colorado, would have been distracted by the flora. Indeed, in his diary and *Account* James lists many species he encountered on this excursion, from the charismatic sky-blue alpine forget-me-not (*Eritrichium nanum* var. *elongatum*) to the circumboreal mountain dryad (*Dryas octopetala*) to the narrowly endemic James's alumroot (*Telesonix jamesii*), which Torrey would later describe.

By 2:00 PM that day, the trio was so exhausted that they stopped for food and rest at a stream about one mile above tree line. That is when they realized that if they continued, it would be impossible to return to camp by nightfall where they had stashed their food and shelter. However, the prospect of summiting the mountain was irresistible and they hiked on.

Just one day prior, James and four others had begun their ascent of the Pikes Peak massif. The plan was

for two men to accompany James to the summit, while the other two would attend to the horses at a camp on Boiling Springs near present-day Manitou Springs. Initially, Lieutenant Swift and his guide Bijou were also in the party. Their duty was to obtain observations for measuring the height of the peak. Having completed this task, they returned to base camp on Fountain Creek where Stephen Long and the rest of the party waited.

Twenty-five miles from Long's base camp and higher up Fountain Creek, James and the others set up a horse camp. Around 3:00 PM and after breaking for lunch and a quick rest, James, Verplank, and Wilson left the horsemen behind and pressed toward the summit. They traveled all of two miles before setting up a precarious camp for the night (their camp would have been on Ruxton Creek). Apparently, "[b]ecause of the steep sides of the ravine, the men placed a pole on the ground between two trees; by laying their beds on the uphill side, they were thus prevented from rolling down into the creek during the night." Before falling asleep, James wrote a somewhat discouraged note in his diary: "[W]e laid down to rest for the night, having found few plants or anything else to reward us for our toils."

On the 14th, James and his two companions hung their camping supplies and food in a tree near their campsite. They planned to return before nightfall. By daybreak they were once again bound for the ►



Eritrichium nanum var. *elongatum* (alpine forget-me-not). © Jen Toews



Dryas octopetala (mountain dryad).
© Mike Kintgen

◀ summit. Interestingly, the route they took up the mountain is nearly the same as the route of the Pikes Peak Cog Railway today.

At around 4:00 PM, James, Verplank, and Wilson reached the 14,115 ft. summit of what would become known as America's mountain. They were the first Americans of European descent to have done so. It must be mentioned that Native Americans had undoubtedly already climbed the mountain during their long history in the region.

Meanwhile, back at base camp, Major Long and Lieutenant Swift had mathematically calculated the height of the mountain to be 11,507.5 feet. They arrived at this figure because they had calculated the elevation at their base camp along Fountain Creek to be 3,000 feet. They surmised that Pikes Peak was another 8,507.5 feet above them. In reality, their base camp was closer to 5,600 feet in elevation.

The short time James and the others spent on the summit was both literally and metaphorically the high point of the Long Expedition of 1820. The alpine was not what James expected. Instead of a barren wasteland, the men were greeted by a multitude of dwarf alpine plant species with showy, colorful flowers in full bloom. A quote from James sums up his surprise and delight with this biome:

"...a region of astonishing beauty, and of great interest on account of its productions; the intervals of soil are sometimes extensive, and are covered with a carpet

of low but brilliantly flowering alpine plants. Most of these have either matted procumbent stems, or such as including the flower, rarely rise more than an inch in height. In many of them, the flower is the most conspicuous and the largest part of the plant, and in all, the coloring is astonishingly brilliant....

...We met, as we proceeded, such numbers of unknown and interesting plants, as to occasion much delay in collecting, and were under the disagreeable necessity of passing by numbers which we saw in situations difficult of access. As we approached the summit, these became less frequent and at length ceased entirely."

It was late in the day, and after spending less than an hour on the summit, James and his party began their long descent. By sunset they reached timber line. Realizing they had lost the route back to their camp, they had no other choice but to spend the night with just a campfire and no food.

At first light on July 15, James and his companions were on the move back to the previous camp of July 13. Three hours later, as they neared their camp, they were greeted with a dense column of smoke. Apparently, they had failed to completely extinguish their campfire. The fire had burned their blankets, clothes, and most of their provisions. They were able, however, to salvage some fragments of charred buffalo meat for breakfast. Curiously, no other mention was made of what became of the fire. (Ironically, the Pikes Peak region has been the site of two of the ▶



Clockwise, from upper left. All photos © Mike Kintgen unless otherwise noted. *Minuartia obtusiloba* Rydb. (alpine sandwort) © Jen Toews, *Pinus flexilis* E. James (limber pine), *Trifolium nanum* Torr. (dwarf clover) © Mike Bone, *Trifolium dasyphyllum* Torr. & A. Gray (alpine clover) © Jen Toews, *Tonestus pygmaeus* Torr. & A. Gray (pygmy goldenweed), *Androsace chamaejasme* Wulfen subsp. *carinata* Torr. Hultén (boreal rockjasmine).



Clockwise, from upper left. All photos © Mike Kintgen unless otherwise noted. *Castilleja occidentalis* Torr. (Western Indian paintbrush), *Mertensia ciliata* E. James ex Torr. (alpine bluebells), *Chionophila jamesii* Benth (Rocky Mountain snowlover) © Jen Toews, *Penstemon glaber* var. *alpinus* Torr. A. Gray (alpine sawsepal penstemon), *Cymopterus humilis* (Pikes Peak alpine parsley © Panayoti Kelaidis; *Paronychia pulvinata* A. Gray (Rocky Mountain nailwort), *Mertensia alpina* Torr. G. Don (alpine bluebells), *Primula angustifolia* Torr. Raf., (alpine primrose).

◀ most costly forest fires in Colorado’s history, both since 2012.)

James, Verplank, and Wilson reached the horse camp shortly after NOON where the other two men awaited with a meal of fresh venison. At 7:00 PM, they arrived on horseback at their base camp farther down Fountain Creek, where the entire Long’s party was once again reunited.

During this three-day trip into the alpine world of the Southern Rockies, Edwin James observed and documented many alpine species, some of which had already been described from other regions of the country and world. Examples of previously described species include: alpine avens (*Geum rossii* var. *turbinatum*), alpine lily (*Lloydia serotina*), shrubby cinquefoil, (*Dasiphora fruticosa* ssp. *floribunda*, now *Potentilla fruticosa*), mountain sorrel (*Oxyria digyna*), mountain death camas (*Anticlea elegans*, now *Zigadenus elegans*), elephant’s head (*Pedicularis groenlandica*), alpine bistort (*Bistorta vivipara*), Whipple’s penstemon (*Penstemon whippleanus*), snowball or diamondleaf saxifrage (*Micranthes*

rhomboidea), moss campion (*Silene acaulis*), and marsh marigold (*Caltha leptosepala*, now *Caltha chionophila*).

In addition, James collected fifteen new species during these three days, which would be described from the Long Expedition of 1820:

- Boreal rockjasmine (*Androsace chamaejasme* Wulfen subsp. *carinata* (Torr.) Hultén);
- Western Indian paintbrush (*Castilleja occidentalis* Torr.);
- Rocky Mountain snowlover (*Chionophila jamesii* Benth), described July 14 in James’s diary as “a small plant somewhat resembling *Penstemon* with erect flowers;”
- Pikes Peak alpine parsley (*Cymopterus humilis* (Raf.) Tidestr.), a rare plant endemic to Pikes Peak;
- Alpine bluebells (*Mertensia alpina* (Torr.) G. Don);
- Streamside bluebells (*Mertensia ciliata* (E. James ex Torr.) G. Don.), though there is no record of this species in James’ diary or the *Account* and it was likely collected between Denver and Cañon ▶

◀ City in July, but certainly could have been collected during their Pikes Peak excursion;

- Alpine sandwort (*Minuartia obtusiloba* (Rydb.) House);
- Rocky Mountain nailwort (*Paronychia pulvinata* A.Gray);
- Alpine sawsepal penstemon (*Penstemon glaber* var. *alpinus* (Torr.) A. Gray);
- Limber pine (*Pinus flexilis* E. James,) that James described in his diary as having “leaves 5 in a fascicle, branches remarkably flexible;”
- Alpine primrose (*Primula angustifolia* Torr.);
- James’s telesonix (*Telesonix jamesii* (Torr.) Raf.) of which the type collection was made on Pikes Peak probably near Windy Point;
- Pygmy goldenweed (*Tonestus pygmaeus* (Torr. & A. Gray) A. Nelson);
- Alpine clover (*Trifolium dasyphyllum* Torr. & A. Gray); and
- Dwarf clover (*Trifolium nanum* Torr.).

Thus, as the first scientifically-trained botanist to venture to the alpine biome of Colorado and the southern Rocky Mountains, Edwin James left an indelible mark on the alpine flora of this region.

A few days after James’s ascent of Pikes Peak, Long commemorated the accomplishment by naming the mountain James Peak. Later the peak would be christened Pikes Peak after Zebulon Pike. Pike had spotted the mountain fourteen years earlier in November 1806, had attempted to climb it (wrong time of year), and had declared it to be unclimbable. However, the name Pikes Peak would stick. James’s name would be moved to a somewhat prominent mountain and the high point of the 17,015-acre James Peak Wilderness, which is nestled between Rollinsville, Central City, and Winter Park.

Since James climbed Pikes Peak in 1820, much has changed. Instead of bushwhacking their way up, hikers can now choose between a well-maintained 28-mile, class-1 hike up the mountain or a slightly more technical, but shorter, 14-mile hike. However, more people opt for the Pikes Peak Cog Railway (currently closed for improvements, but reopening in 2021). Still more opt to drive their vehicles up a curvy paved road followed by a shuttle ride to the summit. At the top, hikers, tourists, and their dogs, are greeted with a visitor center and gift shop serving warm food and beverages. James probably would have appreciated this. Also available for purchase is an assortment of tchotchkes and souvenirs stating the height of the peak.

On a clear day, visitors to America’s mountain are rewarded with a 360-degree view. To the east, the plains with their “amber waves of grain” gradually decrease in elevation until they are swallowed up by the horizon; the prominent Spanish Peaks tower to the south; and to the north and west the “purple mountains majesty” of the Rockies extend as far as the eye can see. In the foreground, colorful alpine plants abound and a small herd of bighorn sheep can be seen grazing. Two-hundred years later, it is safe to say that the Pikes Peak area remains “a region of astonishing beauty.”

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Mike Kintgen is the curator of Alpine Collection at Denver Botanic Gardens. His work has taken him across the globe to biomes similar to the Rocky Mountains and steppes of Western North America. He greatly enjoys working with regionally native flora and learning the botanical history of Colorado. Jen Toews works in the Plant Records department at the Denver Botanic Gardens and is a Colorado Native Plant Master® who advocates for native plants at every opportunity. In her free time, she enjoys expanding her native plants garden, hiking to see native flora, photographing native flora, and writing. 🌀

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Featured Story

Diné Bih Naniseh Bah Haneeh: Navajo Ethnobotanical Teachings

By Arnold Clifford

Editor's note: Approximately half of Colorado's Western Slope is part of the Colorado Plateau, an area that encompasses large portions of Colorado, Utah, Arizona, and Nevada. The 130,000 square-mile region is rich in geologic and floristic diversity. Arnold Clifford is a botanist, a geologist, and a Navajo elder. He is co-author of The Flora of the Four Corners (2013) and is working on a complete Diné Bih Naniseh: Flora of the Navajo Indian Reservation. The following article is reprinted with permission from the Winter 2016 issue of The Plant Press, (Vol 38, No 2), the newsletter of the Arizona Native Plant Society.

Navajo Culturally Significant Plant Species

Navajo people have lived within the physiographic boundaries of the Colorado Plateau for thousands of years before the arrival of the first European settlers. Their extensive understanding of plants and uses of plants were derived from knowledge passed down through Divine intervention of the Navajo Holy People into the lives of the early predecessors of the Navajo people. As a result of species range expansion, travel during herbal pilgrimages, experimentation, and trial and error, other new plant species were incorporated within the vast knowledge of plants.

Various Navajo deities have also instructed the people on uses of native plants and the importance of plants for the well being of the Navajo people.

Navajo Ethnobotany

Plants are sacred, alive, and dynamic, and Navajos refer to them as "Holy Plant People." Knowledge of plant use is interwoven with traditional religious

contexts, cultural oral tales, and history. Navajos have their own plant classification systems, just as the Europeans have in the sciences of systematic botany and plant taxonomy. Navajo herbalists recognize different individual plant species, including grouping together closely related species by generic Navajo names, similar in some respects to Western botanical scientists' use of Latin binomial scientific names for individual plant species. Navajo plant names are very descriptive names that may refer to the morphology of the plant, leaf color, medicinal connotations, ceremonial associations, tobacco types, and animals based on their morphological similarities.

Navajo Philosophy Relating to Plants

In the process of developing intimate relations with all plants, Navajo have drawn similarities between plants and their own bodies. Teachings include how plants are decorations, garlands, and jewelry of Changing Woman, Mother Earth. Plants also play roles in the human anatomy where our blood, arteries, and veins were modeled after the divaricated, branching nature of plant roots. That is how our arteries and veins began branching out of our hearts, the center of the body. The arteries branching into smaller vessels cover the whole human body, providing warmth, oxygen, and other life-giving minerals and elements to the body.

Plant roots function in a similar way as they break down and draw up vital nutrients, minerals, elements from the soil to distribute into all parts of the plant, to give plants life. The Navajo "Holy Plant and People" ►



Golden Mariposa (*Calochortus aureus*).
© Arnold Clifford



Navajo Tea (*Thelesperma megapotamicum*).
© Arnold Clifford

◀ are treated with respect, holiness, and reverence. When plants are collected for ceremonial use, or for medicinal healing properties, Navajo herbalists talk to the plants they need. Herbalists introduce themselves, stating their reason for collecting each plant, describing the ailment of patients in need of treatment, and calling out sacred plant names. Herbalists offer prayers and make offerings to plants that are gathered for use. This ensures the curative healing powers of the plant will be invoked, as well as extends protection to the herbalist gathering the plants.

Navajo Classification of Plants

Navajos have several classifications of plants. One simple Navajo classification is based on its intended use in ceremonies: as tobaccos, as food items, or in everyday utilitarian usage. Navajo plant classification is a primitive, systematic approach to better understanding the flora of the diversified habitats the Navajo people occupied. Classifying also provided a better understanding of different groups of closely related plant species. Navajo plant classification was partly based on floral morphology or physical similarities of natural families. One basic Navajo botanical classification of plants includes the identification of Life Way, Evil Way, and Beauty Way plant groups. These plants are associated with various ceremonial rites. Most plants have more than one use and can be classified under several different categories. A basic way Navajos classify plants is based on its uses: edible plants, medicinal plants, ceremonial plants, tobacco plants, utilitarian plants, dye plants, and plants for protection and for talismans.

Edible Plants

Native plant species are utilized for supplemental food, food additives, seasoning, spices, and sweet treats from flower nectars. Hundreds of plants are

used as foods, with different plant parts such as roots, stems, leaves, flower petals, flower nectar, assorted berries, tasty fruits, and grass seeds all providing valuable nutrients and sustenance for surviving in the desert wilderness environment.

Medicinal Plants

Medicinal plants constitute a large group known as the Life Way medicines. These plants are intended to sustain good health and mental wellness and they help to improve the lives of Navajos who reverently partake of them. Life Way plant knowledge was acquired from supernatural events involving the Holy People. The body of Rainboy was dismembered by lightning bolts sent by Big Thunder as punishment for being promiscuous. A restoration rite was held for Rainboy by the Holy People. Before the rite, insects, animals, and other holy deities were instructed to gather Rainboy's dismembered remains. Rainboy's remains were collected with different herbs that grew nearby. The dismembered remains and sacred herbs were brought back together, so a restoration rite could be performed. The holy plants were applied to different body parts of Rainboy, and each body part began to heal and was restored to health. From that time forward, these plants were considered plants that would heal that particular part of the human anatomy. The healing powers of these holy plants were "life-giving" and therefore, considered Life Way medicinal plants. There are about three hundred Life Way medicines available for Navajos to rely on for curative remedies.

Ceremonial Plants

Numerous species of trees, shrubs, grasses, and flowering, herbaceous forbs are used for different aspects and rites of Navajo ceremonials and chants. Plants designated for ceremonial use are employed to make ceremonial implements and paraphernalia, ▶



Morning Lily (*Oenothera caespitosa* var. *navajoensis*). © Arnold Clifford



Broadleaf Cattail (*Typha latifolia*). © Arnold Clifford

◀ such as prayer sticks, prayer wands, cigarettes for offerings to various deities, ceremonial masks, dry paint material, incense for fumigants, and for medicines administered during ceremonial rituals. Plants used in ceremonial rites are considered sacred and are therefore reserved for chanters and medicine people who perform these chants.

Tobacco Plants

Tobacco plants are utilized reverently. Most tobacco plants are used as offerings for various deities and sacred ceremonial animals. Tobaccos are smoked during ceremonial rites, ritual baths, sweat lodge cleansing rites, as well as during personal meditation and prayer sessions. Tobacco smoke helps to clear the mind and blesses the body and soul. Tobacco smoke also carries a person's prayer to the holy deities. Tobaccos utilized in Navajo society are not for pleasure, relaxation, or for recreational smoking.

Utilitarian Plants

Many plants are used to make every day utensils and household objects for domestic use, such as hair brushes for grooming, floor brooms, kitchen utensils, digging tools, farming tools, weaving looms, weaving tools, carding combs and spinning spindles, weaving dowels, bows, and arrows. Trees and larger shrubs are prepared for hogans, shade houses, sheep corrals, sweat lodges, fencing material, and firewood for heating, cooking, and ceremonial fires.

Native Dye Plants

Numerous plants are used by Navajo weavers for dyeing wool. Various plant parts provide natural dyes. The bark of some shrubs and trees yield red, reddish brown, and brown dye hues. The roots of canaigre dock can produce yellow, yellow-orange, and yellow-brown colors. Flowers and seeds of many plant species are also used to create many unique dye hues. Plants are normally boiled in an acidic solution containing a mordant, which helps the dye color to turn a richer hue and also helps the dye to fix to the wool fibers.

These are specialized plants used to ward off evil influences and also for the protection of individuals. Most of these plants are known by very few people, some are known only by certain clan or family groups. These plants are carried on a person for protection while they are at public functions where many people are in attendance, such as fairs, ceremonial gatherings, rodeos, and other public gatherings.

The Navajo Gods of Botany: The Humpback Gods

The Navajo Gods of Botany, Ah Ghaah Dah Hiskid Dih (Humpback Gods) are fertility gods and are of the utmost importance to the Navajo ceremonial system. Humpback Gods are sacred, powerful deities of native plants and seasonal weather, especially precipitation. They include the god of harvest, of abundance, and the fruits of the fields as well as a polymorphic deity incorporating desert bighorn and Rocky Mountain bighorn sheep, holy people, and humans. They are responsible for revegetation and reseeding the Earth with grasses, flowering plants, shrubs, and trees. In the process of reseeding, they bless each seed with all kinds of precipitation. During the coldest part of winter, when extensive stands of fog cover the desert

southwest, the Humpback Gods come out in large numbers, walking amid fog, each burdened and hunched over, carrying bags of seeds and precipitation. The humpbacks utter "Ah Woo" as they walk about in the cold, frosty fog, often stopping to shake their backs to release native plant seeds and precipitation. They do circular dances to poke each seed into the ground with their planting stick-cane. During the spring and early summer, the whole southwest is blessed with new flowering plants, grasses, and shrubs.

The Humpback God wears an inverted Navajo basket with an opening at the top to help secure it to the top of the impersonator's head.

The basket is painted black with a white zigzag all the way around the rim. The black represents night time clouds, with the white zigzag depicting lightning strikes between adjacent dark clouds. Standing upright around the rim of the baskets are numerous red flicker or red woodpecker feathers. The feathers represent sunbeams shining through clouds immediately after rain. On top of the basket are two bluish horns that represent dark clouds before and during rain. The whole head piece is a crown of thunder, lightning, and rain. Along the back is a rainbow with feathers attached along the crest. The feathers indicate sun rays radiating from the eastern horizon, and the rainbow indicates the presence of holy people and the blessings of rain. Under the rainbow is a dark, black sack with white bars. The hump contains mist, dew, frost, female rain, male rain, snow, all aspects of precipitation, and vegetation seeds of all types. Humpback Gods carry and walk with planting-stick canes. ▶



Navajo Humpback God weaving. © Zonnie Gilmore

◀ A Note from the Author

These stories of the Navajo Gods of Botany, Ah Ghaah Dah Hiskid Dih (Humpback God), the Navajo classification system, the sacred Navajo plant names and its uses were bestowed and blessed upon me from my late maternal grandmother Sarah Charley of Beclahbito, New Mexico.

This ancient, sacred, Navajo ethnobotanical knowledge comes from seven or more generations of my family. Sarah was taught by her late mother Irene Bennallie of Beclahbito, New Mexico. Both Sarah and Irene were instructed by Sarah's paternal grandfather, and both collected ceremonial herbs, medicines, and tobaccos for him. Sarah's grandfather was Tsao Lao Alth Tsosii (police slender, or slim police), who practiced the Shooting Way, Wind Way, and Beauty Way chants. He also specialized in Navajo herbal and medicinal application. I possess a small portion of this once vast family knowledge, and I feel it is time to pass this knowledge onto other Navajos.

This knowledge, I believe, belongs to the collective Navajo people as a whole. It belongs to Navajos willing to learn, willing to keeping an open heart to our traditions, our culture and our religious beliefs. If we horde such sacred knowledge, no one benefits; it all becomes lost. We have already lost over half of our ceremonial systems, including unmatched plant knowledge acquired by our ancestors who never had a chance to pass on their infinite knowledge of all aspects of Navajo teachings.

Examples of Navajo Plant Uses

Navajos still utilize 1,500 or more native plant species; however, plant knowledge is declining. In the past Navajos had a vault of plant knowledge that included more than 3,000 to 4,000 plant species occurring within the Colorado Plateau. Six different plants are

presented here to give an example of the diversity of plants available.

Aliciella cliffordii (Clifford's Diné Star, or Clifford's Gilia), a member of Beauty Way tobacco. They are essential plants required in a mixture of several plants that constitute the Beauty Way tobacco mixture. Different species of the genus *Aliciella* are called by the generic Navajo name Hozho Nah Toh (beauty tobacco) and are classified as Beauty Way plants. Clifford's Diné Star is a rare plant known only from the north foothills of the Lukachukai Mountains and the foothills of Mexican Cry Mesa, Arizona. Named after Arnold Clifford of Beclahbito, New Mexico.

Calochortus aureus (golden mariposa), a showy yellow-flowered member of the Lily family. The white bulbs below the ground are edible when fresh. They taste similar to peanuts. Its Navajo name is Alth Chiin Daah, which means children's food. Found south of Sheep Springs to Window Rock regions.

Oenothera caespitosa var. *navajoensis* (morning lily), a plant called **Kleeh Yih Ghail**, meaning night time turning white, or night bloomer. A plant used as a medicine to heal body sores. Found on weathered, grayish white-colored Mancos Shale surrounding the Shiprock region to the Four Corners. The papery, white flowers are very large.

Rumex hymenosepalus (canaigre dock), a plant of sandy places. Easily identified by its large wavy leaves and light reddish flowering stems. Its large, bunched root tubers are about a foot and half or more below the basal leaves. The tuber roots are boiled to produce various colors of orange-brown to brownish dyes. Thick lower stems are used to make Navajo pie fillings. In some species, the seeds are used medicinally. Its Navajo name, Chaa Ha Tiin Ni, refers to darkness dweller.

Thelesperma megapotamicum (Navajo tea, greenthread), a plant gathered to make Navajo tea, a mild stimulant, served as a beverage during meals or during social greetings. During illness, Navajo tea helps to reduce fevers, helping the body feel better. Boiling the plant produces different shades of a yellowish-orange dye that is used by weavers to dye sheep wool. Chiil Ah Whee (plant coffee) is the Navajo name. Found throughout the desert southwest.

Typha latifolia (broadleaf cattail), a multi-use plant growing in wetlands. Its fleshy roots are edible. Its long, broad leaves were used to make mats, skirts, and other useful items. Flower stalks provided ceremonial pollen and the fresh green flower stalks are also edible. When the flower stalks matured and were dry, they were collected for stuffing in pillows, pads, kid's toys and other items. The Navajo name, Ethel Nigh Teel, means cattail wide. The generic Navajo name is Ethel. ☯



Clifford's Diné Star (*Aliciella cliffordii*).
© Arnold Clifford

Basic Botany

All Life Depends on Plants

By Deryn Davidson

Do you know that a large percentage of our population is afflicted with something known as plant blindness? It's true. By definition, these poor people have "the inability to see or notice the plants in one's own environment," which leads to "the inability to recognize the importance of plants in the biosphere and in human affairs." It seems that most people favor animals over plants. Sure, animals might seem more charismatic and dynamic, but come on now! We would be nothing without plants.

All joking aside, plant blindness actually has some pretty big implications. The term was coined in 1998 by botanists James Wandersee of Louisiana State University and Elisabeth Schussler of the Ruth Patrick Science Education Center. It's quite a fascinating topic. The average person truly just doesn't process that there are plants in their view. Because plants grow close to one another, are a similar color, and don't move (much), humans tend to clump them together as "non-threatening things" and filter them out of the many, many other bits of visual data the eyes receive.

"There is a kaleidoscopic array of visual information bombarding our retinas every waking second, and plants are so easy to ignore unless they are in bloom," Wandersee says. "Plant blindness is the human default condition."

If people don't pay attention to plants, they won't place much importance on them and the role they play in our daily lives. They are, of course, not only food—they are medicine, they are fiber, they are fuel, they are beauty, and so on.

What can we do about this?? We can be plant advocates! I have no doubt that most, if not all, of the people reading this are already in that camp. Anytime there is an opportunity to tell our family, friends, neighbors, and even complete strangers about the wonders of plants, we should seize that moment. Stimulate their imagination with stories of your favorite plants and gardening moments.

Exposing younger generations to plants is key, too. I'm realizing that my 2.5-year-old has tons of books about animals, but very few about plants. Okay, he does have "Botany for Babies," but he also has two parents who are plant nerds. Perhaps if there were board books with photos of different plants, he would be able to identify penstemons and prickly pears just as quickly as he identifies horses and pigs.

Wandersee recommends having a plant mentor in your life, or you can be the mentor. I am encouraged by the huge uptick in interest around houseplants.

Apparently, houseplants are super hip right now. Surely that will have an impact on combating plant blindness and will extend beyond the walls of their homes as people come to appreciate the positive affects those plants have on them.

The work of volunteer programs like CoNPS, CSU Extension Native Plant Master® and Master Gardener programs, along with public botanic gardens, are doing a lot to help educate the public about the importance of plants.

So, if you're going on hikes with friends who don't understand why you stop every 10 feet to point out a plant, or if you have been putting a lot of time and effort into your garden and people aren't knocking down your door to compliment you, it's

probably because they just don't see the plants. Keep up the good work and little by little we'll help combat plant blindness together!

I do have to share that my 2.5-year-old is doing pretty well with his plant ID skills. So far on his list are yucca, ponderosa, pinon, juniper, cactus, oak, mint, dandelion, and daffodil.

Deryn has been a native plant enthusiast since her time as a horticulturist at the Lady Bird Johnson Wildflower Center. She is now the CSU horticulture extension agent in Boulder County and co-runs the Native Plant Master® program there. She is passionate about helping people understand the importance of native plants in our open spaces and natural areas and also in incorporating them into our urban landscapes. ♻️



Field crescent butterfly (*Phyciodes pulchella*) on a ragwort (*Packera* sp.).
© Deryn Davidson

Reintroduction of Wolves to Colorado: Could This Affect Our Native Plant Communities?

By John Emerick

This November, Coloradans will have the opportunity to vote on Proposition 107 to restore gray wolves to Colorado. Wolves were deliberately extirpated from Colorado during the first half of the 20th century. The last wolf in the state was killed in 1945. Since then a few wolves have wandered into Colorado, but most have been killed; there is no sustained population. If Proposition 107 passes, it would mandate the development of a scientifically-based wolf management plan; after which, wolves would be reintroduced to a small number of public land sites on Colorado's western slope.

Those of us who are passionate about our native plant species and plant communities, and who have spent considerable time on our public lands, have undoubtedly observed widespread degradation to these communities by wildlife and livestock grazing. In places of heavy grazing, plant community diversity is low and the composition of introduced plant species is often high. Add the potential impacts of climate



Forty-one gray wolves were introduced to Yellowstone National Park from 1995 to 1997. Their numbers tripled during the first few years, then settled to about 100 wolves in the park since 2009. If Proposition 107 is passed, wolves would be reintroduced to Colorado by the end of 2023 with the numbers of introduced wolves yet to be determined. Photo © National Park Service, Yellowstone National Park.

change and the degradation is liable to worsen. A fair question, then, is whether wolf reintroduction might have a beneficial effect on our native plant communities.

Wolves are a keystone species. Their activities as ungulate predators produce trophic cascades affecting plant survival, pollinators, birds, mesopredators such as foxes and weasels, and smaller herbivores such as rabbits and various rodents. It is difficult to estimate what the disappearance of wolves has meant to the structure of our native ecosystems.

Elk are the primary prey of Rocky Mountain populations of wolves. In Colorado, there are more than 280,000 elk, the largest population of any state. There are also 430,000 mule deer, mostly concentrated in western Colorado. However, there are also approximately 500,000 cattle and 175,000 sheep that also are grazed on public lands west of Interstate 25. Grazing by these ungulates has a significant impact on our plant communities.

To assess the potential impact of wolves on Colorado's landscapes, it is useful to examine the effect that wolves have had on Yellowstone National Park. Wolves were reintroduced to Yellowstone National Park beginning in 1995. That was also about the time when elk populations were at all-time highs in both Yellowstone and Rocky Mountain National Parks, and much has been written about resource damage due to elk in both places.

The most noticeable damage occurs in aspen groves and in riparian willow carrs, particularly if elk use these resources year-round or if unmanaged livestock overgraze these systems. When healthy, both ecosystems support a high diversity of sub-dominant plant species, as well as diverse animal communities including mammals, birds, and invertebrates. This diversity declines with prolonged heavy grazing. In Rocky Mountain National Park, excessive grazing of alpine tundra plants by elk may have contributed to the decline of ptarmigan numbers.

Aspen groves—typically clones in which the trees are interconnected by a common root system—produce shoots, or suckers, from the root system to expand the grove or to replace ageing or diseased trees. When the shoots are heavily browsed by elk and other herbivores, the groves fail to mature. Elk also gnaw the bark of aspen trees during late winter and early spring, and that can lead to infection of the tree by various diseases. Both situations in concert can eventually lead to the death of the entire clone. ►



Elk can severely damage aspen bark, which can lead to disease and death of the grove, as well as the loss of the other plant and animal species that depend on the ecosystem. The inset shows severely browsed aspen suckers. © John Emerick

◀ Riparian willow carrs, particularly those in broader valley bottoms, are commonly occupied by beavers. Willows and beavers are codependent. Beavers use the willows for food and building materials for their dams and lodges. Beaver dams raise the water table, providing shallow ground water that willows need. When willows are browsed heavily by elk, beavers leave due to over-competition with elk, beaver dams are no longer maintained, and streams and rivers begin to run straight and fast. This results in downcutting of the channel, a drop in the water table, and further demise of the willows. Sedges, grasses, and smaller shrubs that help to maintain channel stability are also affected by heavy elk browsing.

Many observations from Yellowstone National Park show that the presence of wolves keep elk moving, preventing them from yarding in riparian willows and aspen groves for long periods of time. There are both diurnal and seasonal movements of elk to avoid areas where wolves are active.

Despite many articles claiming that elk decline and ecosystem recovery in Yellowstone is due to wolf reintroduction, more recent investigations have shown that the situation is much more complicated. For example, cougar and grizzly numbers were also on the increase, which increased elk mortality, and there was a high volume of elk hunting outside of the Park. Beaver populations began to rise in some areas due to declining elk populations, benefitting riparian plant and animal diversity. While there certainly has been ecosystem recovery in some areas, there is little improvement in others. It is worth noting that as elk populations declined, bison numbers increased. Also, since wolves suppress coyote numbers, this could

have led to increases in the numbers of mule deer and pronghorn, two important prey species for coyotes.

The reintroduction of wolves to Colorado is likely to have mostly subtle and indirect effects on our native plant communities. Those effects will probably not occur until wolf populations increase to ecologically effective numbers and stabilize. Some over-browsed ecosystems might benefit through a wolf-elk-plant trophic cascade as has been documented in Yellowstone and Banff National Parks. However, Colorado has experienced almost a century without a full suite of large predators at a time when elk and livestock populations have been climbing on our public lands. The effects of overgrazing on some of these lands will not be reversed by wolves alone; that will also require a public commitment for effective wildlife and grazing management.

Certainly, there is concern from the ranching community about potential livestock depredation by wolves. This is to be expected. However, studies have shown that when wild prey is abundant, wolves will select those animals even when livestock are abundant. In the five states of the northern Rocky Mountains (Washington, Oregon, Idaho, Montana, Wyoming) there were in 2015 a total of 1,980,600 cattle in counties that also had wolves. In those same counties of that year, confirmed depredation of cattle by wolves was 148, or 0.007 percent. It has also been shown that the use of range riders and other predator coexistence strategies can drastically reduce livestock losses to wolves.

Proposition 107 is likely to succeed. According to a recent statewide survey completed earlier this year, ▶



A view of what was once a lush riparian willow carr in Rocky Mountain National Park. Heavy competition between elk and beaver forced the beaver to leave, resulting in a drop in the water table and ultimate death of the willows. What was once home to a thriving community of neotropical migrant birds such as the MacGillivray's and Wilson's Warblers, and plants such as the wood lily, is no longer existent. © John Emerick

◀ 84% of respondents favored the measure. While most ranching and hunting organizations oppose wolf reintroduction, there is high consistency between urban and rural communities, as well as between eastern slope and western slope communities in support of the proposition. Some have suggested that the popularity of the measure is driven by younger Coloradans who are more interested in ecology and conservation than their parents or grandparents.

Perhaps the reintroduction of wolves to Colorado—if it occurs—will be a catalyst for a larger, more holistic movement in which Coloradans will press for:

- Better scientifically-based wildlife management, including non-lethal predator control;
- More responsible livestock management, including predator coexistence strategies and cessation of over-grazing on public lands; and
- Programs to restore plant and animal diversity to our public lands where it has been lost due to excessive livestock grazing and large elk populations.

Native plants matter for ecological sustainability, for aesthetics, and for maintaining the integrity of the natural world. In the face of changing climate, we need to do as much as possible to conserve and restore our native plant communities. Wolves may be part of that equation.

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John Emerick, PhD, is on the emeritus faculty of the department of environmental science and engineering, Colorado School of Mines. In addition to his academic career, John has taught numerous field seminars on various aspects of Colorado's ecology for over 40 years, mostly in Rocky Mountain National Park. He has hiked extensively throughout the state. Nowadays, he spends part of his summers conducting field surveys for the Colorado Natural Heritage Program. 🌀

Basal Rosettes By Arthur Clifford

I have lust
For the living
The Holy Earth
And its giving

Many are such
Common things
The petals on sunflowers
Rayed sparrow's wings

In rapture joined
I am with these
We upward gaze
From our knees



Alpine spring beauty (*Claytonia megarhiza*) on Pikes Peak. © Kelly Ambler

Aspen for the Landscape

By Jim Borland

Not very long ago, every aspen planted in the landscape was collected from the wild. Collected with it was the possibility that any of a myriad of diseases and damage from over 300 insects, if not the insects themselves, came with it, too. These factors, combined with the difficulty of collecting sufficient supporting roots from a species whose root system meanders, non-tapered through the soil, result in losses commonly exceeding 50 percent.

The better aspen for your landscape is the one grown from seed. Yes, seed. Regardless of what you may have heard, aspen do, indeed, produce great quantities of viable seed. Small and losing viability rapidly after shed from the tree, aspen seed rarely finds natural conditions conducive to germination and early seedling success. Instead, the vast quantity of annually-shed seed is simply lost. A successful germination event in the wild is cause for celebration and papers written.

Yet when collected, cleaned, and sown under ideal nursery conditions, aspen seed quickly produces fast-growing, healthy, and strong trees free of diseases and insects. The seed-grown aspen is a tree far superior to those collected from the wild. When

properly grown, pruned, and dug, a much higher percentage of the root system goes with the seed grown tree to the landscape and local establishment is virtually 100% assured.

Through progressive nursery techniques that involve greenhouse sowings, specialized soils, carbon dioxide enrichment of the atmosphere, fertilization with every watering, and 24-hour-per day lighting, 12 feet of growth during the first season is common.

Why, then, are aspens still being dug and sold? They are cheap. And, as one coffee magnate once said, "You get what you pay for." Insist on seed-grown aspen for your landscape. Only when enough of us do this will the nursery industry make the appropriate changes and give us what we insist upon.

Jim has been fooling around with native plants for more than 40 years in private, commercial, and public venues. His home garden contains 1000s of native plants, most grown from seed at home and now not supplementally watered for 20 years. Jim has written hundreds of articles, given talks too numerous to count, and continues to grow and plant the two or three native plants not yet in his garden. ☺



Aspen (*Populus tremuloides*) tree (© Kelly Ambler); female catkins and male catkins (© Bryan Kochis).

Tips from the Pros

Still Seeing Mulch Years Later? Plant More

By Benjamin Vogt

If you planted a garden two to three years ago and you still see lots of wood mulch, then you need more plants. You're probably still seeing a decent number of weeds at this point, too (mulch isn't a magic weed bullet and, if too thick, often creates an ideal seed bed). So, you know, more plants. More layers. More density.

And if you are planting a garden today think about where you do *and* don't want to be in two- to three years:

1. Only put down 1" of mulch if you are using it. More mulch = less plant sowing while generally inhibiting forb and grass growth.
2. Put plants on 12" centers (12" apart) and no more.
3. Consider mixing potted plants and seeds to increase coverage. In spring, sow grasses and annuals among what you planted. In mid-to-late fall, consider a dormant seeding of perennial forbs among what you planted. (Maybe what you plant is the highly designed part, or plants that need a head start because they work on roots first like baptisia and amorpha and silphium, [or other plants suited to Colorado]).

What do you do if you are on a constrained budget?

1. See #3 above. The best advice is to plant the architectural plants—trees, shrubs, and perennial flowers—that take longer to establish and serve as the backbone for the design. You may also want to plant aggressive species and let them start to self-sow or run asap.
2. Get plugs. Most landscapers and nurseries get their plant material from wholesalers, and that requires a business license. But you can also get them (if you're east of the Great Plains) via Izel Native Plants (<https://www.izelplants.com/>), which works as a middleman for wholesalers to sell to the public. That means if you need plants in quantities of 32 and 50 you can get them for a much better per-plant cost.

My new book will attempt to better align these two perspectives, as both are critical for the success of urban gardens that both appeal to and involve people and wildlife together. It is critical that people find nature-inspired gardens beautiful, while it is just as critical that wildlife find them beautiful as well. Just



because one has host plants does not mean the garden is beautiful to wildlife, and just because one has a diversity of flowers doesn't mean the garden is beautiful to wildlife.

Benjamin Vogt is the author of A New Garden Ethic: Cultivating Defiant Compassion for an Uncertain Future. His prairie-inspired design firm, Monarch Gardens, is based out of Nebraska.

<https://www.monarchgard.com/thedeepmiddle/still-seeing-mulch-years-later-plant-more>

News, Events, and Announcements

Please check the **Calendar of Events** online at <https://conps.org/mfm-event-calendar/#!calendar> for chapter meetings, garden tours, and other events. With the evolving COVID-19 situation, CoNPS is not hosting any in-person events. The status of future CoNPS events might also change.

CoNPS may offer some chapter meetings, workshops, and lectures as webinars or other online meetings. Others might be postponed or canceled. Field trips are also being scheduled, but may be canceled or postponed. These will be posted online and will be promoted via the CoNPS E-News.

CoNPS Chapter Events

Plateau Chapter

Help with Native Vegetation Efforts Grand Junction Wednesday mornings

Colorado West Land Trust and the City of Grand Junction are looking for volunteers for the ecological restoration of the Three Sisters/Lunch Loops recreational area south of Grand Junction. Legacy land uses and last year's development of a recreational pathway through the area have impacted soils and native vegetation.

The revegetation project aims to restore native vegetation and establish sustainable community stewardship of the resources. The properties are owned by City of Grand Junction and protected by conservation easements held by the land trust. A grant awarded from Colorado Youth Corps Association (and GoCO) enabled the project to use crews from Western Colorado Conservation Corps to do some of the heavy lifting, but the rest is being done by land trust employees and volunteers.

Volunteers meet Wednesday mornings to do the work. With the pandemic, it has been tricky to engage many volunteers, but social distancing and mask wearing practices are in use. The public, and especially CoNPS members, are invited to participate in the revegetation effort. For more information, contact monument.stewards@gmail.com

Learn About Plants Used by the Utes on the Western Slope Montrose

Thursday, August 20 10:00–11:00 AM

The Plateau Chapter invites CoNPS members on the Western Slope to learn more about Ute ethnobotany at the Ute Indian Museum in Montrose. After the short program, attendees may want to stay for an hour to help weed a section of the garden in preparation for fall mulching. Bring gloves and a trowel.

The Ute Indian Museum is in the final stages of a complete restoration of its native plant garden. The new Ethnobotany Garden is the result of a two-year makeover of an existing garden space. Chinese willow

have been replaced with coyote willow; Shasta daisies have been replaced with Rocky Mountain penstemon, scarlet gilia, and more; and nearly all non-native plants have been removed and replaced with native plants.

Plant stakes paid for by a generous CoNPS Mission Grant have been installed to inform visitors about the names of plants in the garden.

Interpretive signage is currently being designed and will be installed this fall. Curriculum is also being developed to educate school children and museum visitors about Ute ethnobotany. For more information and to RSVP, contact mary.t.menz@gmail.com

Southeast Chapter

Watershed Restoration in Action! Colorado Springs Saturday, August 15 8:30–10:00 AM

Join local citizen scientist and CoNPS member Gary Rapp for an engaging discussion and demonstration of how riparian forests can be restored to protect us from stormwater damage and enhance native pollinator and songbird habitat.

Please meet at the Shooks Run Agroforestry Project terrace garden at the north end of North Shooks Run Park, about a 200-yard walk north from on-street parking near 653 N. Franklin St. (just west of its intersection with N. Prospect St.). Please observe City Park and Recreation rules for COVID-19 posted at: <https://coloradosprings.gov/parks>

Cross-Pollination Events

October 1-November 3
Colorado Parks & Recreation Annual Conference
<https://www.cpra-web.org/page/SessionProposals>

October 6-8
Sustaining Colorado Watersheds Conference
Avon, CO
<https://www.watereducationcolorado.org/programs-events/conferences/>

CoNPS Webinars

CoNPS offers webinars on a variety of native plant topics. Sign up for these webinars on the CoNPS website (<https://conps.org/mfm-event-calendar/#!calendar>). New webinars are constantly being added to the calendar.

Ecosystems in Colorado's Southeast Prairie **Saturday, August 15; 9:00 AM–NOON** **Presenter: Carol English, MS**

This workshop focuses on several ecosystems within the Western Great Plains Ecoregion including the shortgrass prairie, shale barrens, sandhill shrubland, playas, and southwestern great plains canyon areas. Carol will cover the native plants and animals that are dependent on plant species in this region. Participants will also learn about the different types of rare plant communities that occur in these areas.

Carol English has been involved in the field of natural resources and education for more than 30 years. She holds a BS in earth science, teaching certificate, and MS in biology. Carol has presented natural resource classes and programs at Yosemite Institute, Outward Bound, and Jefferson County Open Space. She is a certified Native Plant Master® and taught Native Plant Master courses for nine years. In addition, Carol has worked as a botanist for the Colorado Natural Heritage Program, Yosemite National Park, and Colorado State Land Board. She has owned her natural-resource based business for seven years.

Learn How to Use iNaturalist **Tuesday, August 25, 2020 9:30–11:00 AM** **Presenter: Audrey Spencer**

Looking to contribute to citizen science? Or maybe you just want to share your observations and connect with scientists who can identify the plants, animals and other organisms you observe? Learn how to use this dynamic tool at a free webinar sponsored by the CoNPS education and outreach committee. Sign up at [CoNPS.org](https://conps.org). A link will be sent to registrants by or before Monday, August 24.

Wildscaping 101—Native Plants for Birds **Sunday, August 30; 1:00–3:30 PM** **Presenter: Kate Hogan, MS**

Are you passionate about native plants and want to learn more about the ecological connections between our natives and our Colorado bird life? Join Kate for an engaging and exciting webinar on ways to diversify the birds found in your own yard, using a variety of food groups provided by our native plants. Participants will review the newly created Native Plants for Birds handout designed in partnership with Denver Audubon, CoNPS, Audubon Rockies, and CSU Extension. This webinar is designed for all skill levels of native plant enthusiasts. Kate will review some of the science behind the essential need for native plants in our landscape, and some of the native plants that can be planted in the fall.

Kate Hogan has worked in the field of ecology for more than 20 years. She holds a BS in natural science and biology from the University of Puget Sound and an MS in nonprofit management from Regis University. For the last five years, Kate has worked at Denver Audubon as the community outreach coordinator, where she presents outreach programs throughout the Denver metro area and manages the Audubon Center at Chatfield.



◀ “Steve Olson”... continued from page 29

He grew up in the Chicago suburbs, too “clumsy and inept” for sports, by his own description. So he gravitated to nature. First the birds in his backyard. Then, while attending Southern Illinois University, the world of plants. It was a fragile and intricate world, he came to learn. There were layers. Understory and overstory. And everything was connected. For an early job out of college, Olson embarked into the cypress swamps of southern Illinois with a team. Someone noted the things that crept, crawled and buzzed. Someone noted the things that slithered and swam. Another noted the things that scampered, another the things that flew. And then there was Olson, who noted the things that grew, of which everything else was dependent upon.

He eventually had enough of the swamps and flatlands. “A change of scenery was necessary,” he says. And Colorado was that. The milkweed of the plains. The colorful cacti of the desert. Forests of ponderosa pine. Meadows of wildflowers, every color of the rainbow. Rugged cliffs and their surprising, persevering vegetation. The surprises found at every elevation range, from montane to subalpine to the extreme tundra, where flora somehow found a way.

Olson’s curiosity doesn’t require surprises. Here in an aspen grove on Pikes Peak, he observes things he’s come to expect. “All kinds of good stuff here,” he says, returning to his cross-legged position on the ground. Something grows below a rusted pipeline. “*Besseyia plantaginea*,” Olson says, referring to the flower commonly known as kittentails. Near it is one that goes by pussytoes, for its pad shape. Olson carefully peels back grass. “For people with sharper eyes,” he says, revealing a minuscule blossom that upon closer look appears to be a perfect, white diamond. “Rock jasmine.” He picks a furry-feeling strand and smells a scent that recalls some cleanse. He picks sage to smell that soothing scent, too. He moves onto a perennial, starry solomon’s seal. He admires the flower barely in bloom. “Nothing spectacular,” he says. “Just kind of nice.” 🌀

In Memorium: Stanley Smookler

January 23, 1929–March 28, 2020

Amateur Botanist, Friend, and Mentor

By Denise C. Wilson

I first met Stan in 2006, when I was looking for a local expert on the plants of Golden Gate Canyon State Park. The Chicago Botanic Garden had hired me to collect native, wild seed for the Kew Gardens Millennium Seed Bank. GGCSP had recommended I contact Stan, because he had established an herbarium starting in 1991. In it was more than 600 voucher specimens; and boy, he knew the plants of that park!

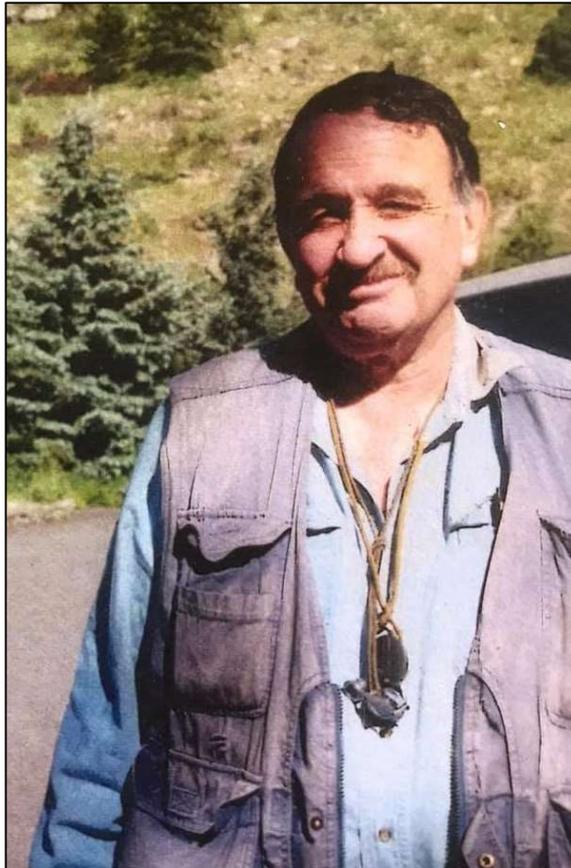
On one of our forays near a trailhead at the southern end of the park, Stan found a substantial population of early cinquefoil (*Potentilla concinna*). It's a relatively small plant, so we were on hands and knees with noses to the ground, when a hiker came up and asked, "Did you lose a contact lens?" Stan replied, "No, we're collecting seeds of *Potentilla concinna*!" The man replied, "Oh yeah, I thought that!"

Stan had been working with long-time companion Linda Senser and Steve Austin on the GGCSP identification and voucher project for some time. Still, he liked to tell me that the seed collection work was his first paid botany gig. I remember him calling out the species name as we found them. Sure enough, when we ran the plant through the key, he'd be right. When he wasn't, he would sulk like Walter Matthau in the movie "*Grumpy Old Men*." He thought he should be right all the time.

SEINet has 805 voucher collections by Stan and those do not include vouchers from the GGCSP herbarium, because it hasn't digitized them. Stan took it upon himself to make a list of local plants that the Denver Botanic Gardens Kathryn Kalmbach Herbarium did not yet have. He then worked with Linda Senser for fifteen years collecting those vouchers.

The GGCSP herbarium collection eventually topped 800 voucher specimens. Throughout the years, Stan and Linda maintained a species list with all the locations and descriptions.

Stan was a patient mentor, always sharing his knowledge. Together we eventually collected more than 100 seed accessions within GGCSP for the original seed bank, the Seeds of Success Program, and the Dixon National Tallgrass Prairie Seed Bank.



Stan Smookler at Golden Gate Canyon State Park. © Linda Senser

Panayoti Kelaidis once verified that Stan had found alpine aster (*Aster alpinus*), not in its typical location, which is the tundra, but at GGCSP! This plant is native to the mountains of Europe (including the Alps) with a subspecies in Canada and Alaska.

However, Stan's greatest find was in 1982. It was the Ute lady's tresses (*Spiranthes diluvialis*), which is now a US Fish & Wildlife threatened species. He alerted Dr. Bill Weber, who called in Charles Sheviak, a prominent native orchid specialist from New York. Charles subsequently described this species with the type locality from the area where Stan had found the plants.

Stan passed away March 28 in Boulder. He loved to encourage people to study plants and to share knowledge.

I will always be grateful and carry the memories of our fieldwork. I owe him a great debt, but Stan would never want to be paid back.

Denise is the CoNPS marketing and events coordinator, in addition to running Wilson Associates, Inc., a botanical contracting firm specializing in native seed collection for the National Park Service. She worked for Chicago Botanic Gardens for twelve years, contributing to three of their seed banks while taking seasonal positions in plant vegetation. Her botany master's degree was completed May 2009 from the University of Colorado, Denver, with a geographic information systems certificate. ☺

Member Profile: Steve Olson

Colorado's Go-to Botanist Steve Olson Sets Sights on Retirement By Seth Bolster

Editor's note: the following is reprinted with permission from the June 24, 2020, edition of The Gazette. Steve Olson is a long-time CoNPS member, chair of the field studies committee, and a member of the Aquilegia review board.



US Forest Service botanist Steve Olson looks at lichen he found on Pikes Peak on Tuesday, June 2, 2020. Olson is the lone botanist for the Pike and San Isabel national forests and Cimarron and Comanche grasslands. Photo by Christian Murdock, *The Gazette*.

Steve Olson stops along the Pikes Peak Highway and enters a spruce forest to see what he can find. "Let's see what this is," he says, crossing his long, skinny legs and folding downward to the ground. His arms are gangly, like branches, his fingers spindly, and they gently inspect this green patch. It's not an inch away from his glasses, which rest at the crook of his nose. He sits as if in communion, or like a kindergartner at story time. "A-ha," he softly remarks. It's Pikes Peak parsley. One of a kind, Olson explains, found only around this summit and the neighboring slopes of Almagre. It's something about this particular soil, Olson says, this crumbly granite. "It's been suspected in a few other places," he says, "but nothing definitive."

It would be easy to confuse. Pikes Peak parsley looks like some clump you might find in your backyard. That is if you're someone without the analytical eye of Olson. He's the US Forest Service botanist assigned to the 3 million acres defining the Pike and San Isabel national forests and Cimarron and Comanche grasslands. You can find Pikes Peak parsley—its scientific name is *Oreoxis humilis*—within a database of some 2,200 other hard-to-pronounce plant names that Olson has compiled. This has been a project of his for the nearly 20 years he's spent at his Forest Service post in Pueblo.

In the broader management of the PSICC, his duty is to protect rare life that grows from the earth. Permit renewals will reach his desk. A continued request for an overhead power line, for example. Or a new permit proposing construction, or logging, or mining, or gas and oil exploration. Olson will turn to his database to see what flora might be harmed.

Here on the side of the Pikes Peak Highway, it's easy to imagine a cement drainage — built as part of the mountain's long history of development and commercialism — consuming ground where Pikes Peak parsley might have once sprouted. True, Olson says. Pikes Peak parsley was probably impacted. But for as globally rare as it is, "within this place, it's clearly not hard to find," Olson says, "and it seems to be fairly happy." Here in early June, he's pleasantly surprised to see some yellow already bursting forth, not long after snow melted from these high elevations. "It's just getting started," he says.

Olson, however, is wrapping up. He's looking to retire in the coming months. He'll leave behind that database for his successor — assuming there will be one. It's hard to know for sure amid ongoing uncertainties with the Forest Service's budget, which has been increasingly consumed by wildfire management. For fiscal year 2021, the agency's proposed cuts were described as "an improvement over past years' recommendations" by the National Association of State Foresters, "but nearly all of those proposed cuts would be made to state and private forestry programs."

Olson has been the lone botanist assigned to the entire PSICC. He concedes those 2,200 plant entries hardly scratch the surface of the vast and varied beauty and mystery of his assigned "unit," covering the Kansas prairie, the canyonlands of southern Colorado, the famed rivers of Chaffee and Fremont counties, the foothills of America's Mountain and other 14,000-foot peaks spread across the Sangre de Cristo, Sawatch and Mosquito ranges. Olson's database "is one of those things that'll never be complete," he says. "Because there's always something new showing up."

He often roams like this, quick to curl himself down to the ground for investigation. He brings binoculars, because he's a bird aficionado. "But also it's a labor-saving device," he says. He might train the binoculars on a distant ridge and decide he need not go there.

Efficiency has been key to his job. A permit request comes, and "the ultimate goal is to look at every single site," Olson says. "But the reality is, for as big a place as the Pike and San Isabel and Cimarron and Comanche is, you have to find ways to do it more efficiently." Hence his database, which he can refer to from his desk. It was mostly built from his desk, using past research and other available online catalogs.

The project started as he had to learn about what he called "a whole new world." That was Colorado compared to the Midwest.

"Steve Olson"... continued on page 27 ►

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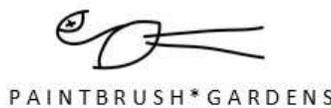
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Can You ID these Flowers?



Answers: (clockwise, from upper left): golden saxifrage (*Saxifraga chrysantha*), tufted alpine saxifrage (*Saxifraga cespitosa*), spotted saxifrage (*Saxifraga bronchialis* var. *austroriparia*), splash saxifrage (*Saxifraga flagellaris* ssp. *crandallii*), alpine brook saxifrage (*Saxifraga rivularis*), nodding saxifrage (*Saxifraga cerna*); all in the Saxifragaceae family. © Anna Wilson

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