

Aquilegia

Newsletter of the Colorado Native Plant Society



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Aquilegia: Newsletter of the Colorado Native Plant Society

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

AQUILEGIA: Newsletter of the Colorado Native Plant Society

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Aquilegia is the newsletter of the Colorado Native Plant Society. Members receive four regular issues per year (Spring, Summer, Fall, Winter) plus a special issue for the Society Annual Conference held in the Fall. 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*. botanical illustrations, photographs, and other contributions should be sent to the editor.

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Front Cover Photo: *Macheraanthera coloradensis* by Steve O'Kane, 2016.

From the Editor

We saw the passing of a number of our friends this year including CoNPS members Vicky Trammell and Rich Scully. They were both dynamic, talented and good-natured people who contributed much to CoNPS. Vicky was an early member of CoNPS and served as President of the Metro-Denver Chapter for a number of years. Rich Scully, husband of CoNPS member Mary Jane Howell, was well-known for teaching popular CoNPS workshops on a variety of interesting plant groups such as the Potentillas.

Many members of CoNPS were also acquainted with Dr. Donald Pinkava of Arizona State University in Tempe, who passed away in July. Dr. Pinkava was Professor Emeritus of Life Sciences at ASU, and mentored many botanists. He was an expert in Cactaceae. Dr. Pinkava was well-liked by his students and all who knew him. He was quiet with an easy-going personality and a good sense of humor.

This issue of *Aquilegia* focuses on the 2016 Annual Conference that celebrated the 40th anniversary of the founding of the Colorado Native Plant Society and features a number of the founding members of CoNPS. This was meant to be published almost a year ago but kept getting bumped back. Coverage of the 2017 Annual Conference will appear in the Fall 2017 issue.

I am stepping down as editor of *Aquilegia* because of family obligations, so this is my last issue. My thanks to all of the excellent authors and photographers who have contributed to *Aquilegia* during my tenure and most especially to Linda Smith and Nan Daniels for their help proofreading and editing every issue of *Aquilegia* and Charlie Turner, who served as technical troubleshooter, solving the many computer problems that plagued me with every issue. Without their help, I couldn't have produced the newsletter. I am also grateful to Sally White and Sophia Warsh for their proofreading and editing help. Additional thanks go to Rob Pudim for his entertaining cartoons, to Mo Ewing and his colleagues for *Conservation Corner*, and Jim Borland for *Garden Natives*. Many photographers contributed their photos but Loraine Yeatts, Dave Elin, Audrey Boag, Rick Brune, and Charlie Turner contributed an especially large number. There are so many people who have helped to make *Aquilegia* what it is - too many to list - but you know who you are and you have my gratitude. Thank you also to Lenore Mitchell for all her work for CoNPS and her lovely tribute in the last issue of *Aquilegia*. You are an amazing volunteer and cherished friend.

With the beautiful and functional CoNPS website designed by Mo Ewing and the informative and attractive CoNPS eNews, edited first by Jen Boussetot and more recently by Linda Smith, CoNPS members receive current CoNPS information online and by email. Thanks to all of you who have made a difference!

Jan Loechell Turner

NEWS & ANNOUNCEMENTS

Rich Scully: 1951 - 2017

Richard Warren Scully, 65, of Lyons, Colorado, was born December 8, 1951 in Bayside, Queens, New York and died February 5, 2017. He passed away at home with his wife, Mary Jane Howell, at his side of a recurrence of lymphoma. He was predeceased by his parents, Martha and William Scully and is survived by his wife of 38 years, Mary Jane Howell, and his brothers, Doug, Steve and Tom Scully and their families. He earned degrees from Penn State University, Cornell University, and the University of Colorado, moving to Boulder in 1978, then to Lyons in 1999. Rich took pride in his work as an environmental engineer focusing on movement of chemicals in ground-water.

Rich's gentle, strong, and uncomplaining approach to life meant he very rarely mentioned his own sufferings or the imperfections of others. The joys of his life were engaging with nature and being with friends, usually at the same time. Constantly learning more about our native botany, he shared his knowledge as a popular instructor and field trip leader for the Colorado Native Plant Society. At home, he loved gardening to create a natural landscape with local plants and native materials. In addition to biking and hiking, Rich liked traveling and camping with Mary Jane in beautiful areas of Colorado and the Western US. He enjoyed working as a volunteer for many local agencies, including the City of Boulder, Boulder County, Jefferson County, Rocky Mountain National Park, and the Colorado Natural Heritage Program, primarily making surveys of rare plant populations. He was also an instructor for the Native Plant Master® program.

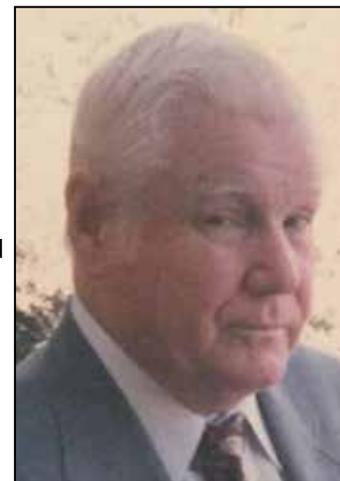


Rich Scully

Contributions may be made to the Colorado Native Plant Society. There will be an article about Rich in the next issue of *Aquilegia*.

Donald Pinkava, Professor Emeritus, Life Sciences, Arizona State University: 1934-2017

Donald J. Pinkava, 83, died on July 25, 2017. Donald received his Bachelors in Education, Cum Laude, in 1955 and was a member of the Phi Eta Sigma fraternity. He taught biological science at Solon High School in Ohio from 1955-1960. He then began teaching at Ohio State University and after receiving his doctorate in 1964, became the Director of the Herbarium and Professor of Botany at ASU, [Tempe, AZ] where he taught from 1964-2000, retiring as Emeritus Professor, Life Sciences. During his 35 years at ASU, Donald contributed to and wrote a myriad of research publications, taxonomy books and academic journals on Arizona Flora. He was also chairman of dozens of committees and belonged to many academic and professional societies. After retirement, he continued his research at the ASU herbarium and at the Desert Botanical Garden, primarily focused on the cacti of western North America and his final contributions on the chromosome series of cacti were made this year. Donald is survived by his wife, Mary, a daughter and two grandchildren. Donations may be sent to Desert Botanical Garden, Attention: Tribute Program, 1201 N. Galvin Parkway, Phoenix, AZ 85008 or you can make a donation online at www.dbg.org/tributes. Donations to the ASU Herbarium can be sent to Arizona State University Herbarium (ASU) c/o Elizabeth Makings, School of Life Sciences PO Box 874108 Tempe AZ 85287-4108. Please include a notation that your contribution is in memory of Dr. Pinkava. (Source: *Arizona Republic Obituary*)



Donald J. Pinkava

Vickey Trammell: 1939 - 2017

Victorine (Vickey) Trammell, age 78, passed away on June 28th, 2017. She was born in Ohio on March 3, 1939. She was married to James R. Trammell, Jr. for over 50 years. James and Vickey moved to Colorado where they attended graduate school at University of Colorado in Boulder, where James was a student of John Marr. Vickey and James' son, David, was in an accident and died as a teenager. Their twin sons, James and Scott, twins, survive Vickey.

Vickey was a popular biology professor at Arapahoe Community College for 30 years, where her husband, James, was chair of the Biology Department. Vickey was one of those people talented in many things including music, art, poetry, and writing children's stories. She played the violin in several orchestras and sang in several choirs. She was a talented gardener and had an amazing backyard that she loved to share with others. Vickey was known and loved at Roxborough State Park, where she taught plant identification and other topics to volunteer naturalists and the public. She also helped solve crimes as a member of Necro-



Vickey Trammell

(Continued on page 25)

2017 Fall Festival & Plant Sale!

Saturday, October 7, 11am – 4pm

The Fall Festival & Plant Sale will be held at the Audubon Center Chatfield, 11280 Waterton Road, Littleton

Register online at conps.org (Calendar of Events)

Last Day to Order Plants Online is October 1st!

BOOTHS

- Fall Plant Sale! Pre-orders available at CoNPS.org (Oct. 1st deadline) by High Plains Environmental Center and Harlequin's Gardens
- Audubon Society of Greater Denver and Audubon Rockies
- Colorado Native Plant Society with the Bookstore
- Front Range Wild Ones
- People & Pollinator Network
- Bird and bee houses, ceramic containers and more



Desert 4 O'Clock

PROGRAMS

Landscaping with Native Plants for Wildlife by Susan Tweit

11:30am, registration required, \$10

You've decided to bring nature home to your landscaping and add native plants. What's next? How do you design in beauty for you, and also habitat for wildlife? Join author Susan J. Tweit, a plant ecologist and all-around "nature geek" for a look at the fundamentals of landscaping with natives. We'll discuss knowing your garden style, how local "terroir" informs your landscape, weaving community with natives, and some of the keystone native plants for wildlife and garden health

Pollinators (for children + adults) by David Julie of CoNPS

1pm, registration required, \$10

Plants offer food in flowers to bees, butterflies, hummingbirds, and other pollinators in exchange for help in producing seeds. Learn about this fascinating relationship in a fun, participatory program for all ages.

Native Seed Swap with Front Range Wild Ones

2pm, free but registration is appreciated

The 2017 Seed Swap, hosted by Front Range Wild Ones, will be held in conjunction with the Colorado Native Plant Society Fall Festival, October 7th at Audubon Center at Chatfield in Littleton, CO. Saving seed to propagate your own plants is a rewarding way to expand your native plant garden and share your favorites with friends at the Seed Swap. <https://frontrangewildones.wordpress.com/news/>

How does a Seed Swap work?

Basically, bring any seed or volunteer plants that you've collected from your yard and take a similar amount from what is offered. All seeds and plants should be from species native to Colorado.

How do I prepare my seed?

1) Please bring your seed in a paper bag or envelope (one bag/envelope per species). Label the envelope with the botanical name, common name, size, flower color, and any other helpful growing tips. For example:

Liatris punctata, Dotted gayfeather
1 to 2 feet tall, purple spikes in August-October
Prairie plant with very long tap root

2) To take seed, use the blank envelopes and paper bags provided to take a portion of the seed you want. Be sure to write the label information on the seed envelope.

What if I don't have any seeds or plants to share?

Please come anyway! We always have plenty of seeds and plants, and you can consider a small donation to Front Range Wild Ones if you find some seed you can use. Plus, you'll have a great time at the festival! It's that simple! So start collecting seed as it ripens and spread the word among your native plant friends. For information on how to collect seed, please see our blog post at Front Range Wild Ones.

Beginning Backyard Birding by Kate Hogan, Community Outreach Coordinator

3pm, registration required, \$10

Do you know about the amazing birds living right outside your window? Practice your bird ID and learn some of the fascinating facts about our local bird population with the help of our friends from the Audubon Society. Backyard birding just may become your new favorite hobby! Presented by Kate Hogan, Community Outreach Coordinator of the Audubon Society.

The 2016 CoNPS Annual Conference in Boulder, Colorado: Celebrating the 40th Anniversary of CoNPS



Photo by Loraine Yeatts

The 40th Anniversary of the Colorado Native Plant Society was celebrated at the 2016 CoNPS Annual Conference, "Forty Years of Change: Plants, People, Places, 1976 -2016", and was held Sept. 24 at the University of Colorado, Boulder, in the auditorium of the MacAllister Building at the Sustainability, Energy, and Environment Complex.

With over 200 people registered for the CoNPS Annual Meeting, held Saturday, Sept. 24, the building was buzzing with activity. A number of vendors had interesting and informative displays, there was a large book sale and silent auction, and people were able to pick up their online plant sale orders from HPEC after the conference and purchase plants from Harlequin's Gardens.



John Marr at Science Lodge, 1957.
Photo courtesy of Ruby Marr.



Bill Bowman hosted the
CoNPS Annual Conference.
Photo by Audrey Boag.

Bill Bowman, University of Colorado Professor of Ecology & Evolutionary Biology and Director of the INSTAAR Mountain Research Station, hosted the 2016 CoNPS Annual Conference. CoNPS was very grateful to him for arranging such an excellent venue for the CoNPS Annual Conference and the Colorado Rare Plant Symposium. Dr. Bowman was also a speaker at the conference, presenting a talk, "Alpine Plants and the Changing Environment." It was very apropos that Dr. Bowman was the host considering that it was the 40th anniversary of CoNPS. The first (charter) president of CoNPS was the plant ecologist and CU Professor, Dr. John W. Marr (1914 - 1989), who served as Director of the Mountain Research Station and "was instrumental in the establishment of the Institute of Arctic and Alpine Ecology, which merged with Science Camp as the Institute of Arctic and Alpine Research (INSTAAR) in 1952." (Mission & History, Mountain Research Station, <http://www.colorado.edu/mrs/general-info/mission-history>). As the current Director of the INSTAAR Mountain Research Station, Dr. Bowman was the perfect person to represent John W. Marr at the conference. John's wife, Ruby Marr, was hoping to join Dr. Bowman at the conference, but was unable to attend because of health problems.

CoNPS Co-President, Charlie Turner, served as Master of Ceremonies and reviewed the accomplishments of CoNPS in 2016. In addition to talks by founders and early members, the speakers included a number of other outstanding scientists. Photos and information on the talks begin on page 8.



Charlie Turner Photo by Loraine Yeatts

A special treat for the 40th anniversary was the presence of many of the founding and early members. A panel of founders moderated by Dieter Wilken, discussed the formation and early days of CoNPS. They included Beth Painter, Sue Martin, J. Scott Peterson, David Buckner, Karen Hollweg, and Panayoti Kelaides. A number of founders and early members were in the audience including Bill Weber, CoNPS' first elected president (John Marr was the founding president), Rick Brune, Judy von Allefeldt, Miriam Denham, and Eleanor von Bargaen, the editor of CoNPS Rare Plant books, Jack Phillips, and others. Dieter Wilken, David Buckner, Panayoti Kelaides, and Bill Weber all gave talks at the conference. Photos of the founders are on page 7.

In the later part of the afternoon, there were concurrent sessions with a botany track and a horticulture track. As part of the botany track, students from Colorado universities gave lightning talks about their research. The talks were well-received and it presented a great opportunity for students from around the state to meet and discuss their research. The poster session served as an additional source of research information.

A slide show on the life of Sylvia "Tass" Kelso, was presented by Dave Anderson and Jill Handwerk of the Colorado Natural Heritage Program (CNHP)



Jill and Dave. Photo by Loraine Yeatts



Tass Kelso.
Photo courtesy George Maentz.



A special award was given to George Maentz (on left) in memory of his wife, Tass Kelso. Photo by Lenore Mitchell

Jill Handwerk received a CoNPS special merit award for her many contributions to Colorado botany and CoNPS. She also received an autographed, framed print of *Oxybaphus rotundifolius* by botanical artist and CoNPS member, Marjorie Joy. Jill served in CoNPS as Vice-President (1998-2000), President (2000-2004), Co-Chair of the Education and Outreach Committee (2000-2004), Annual Meeting Organizing Committee member, and Co-Chair of the Workshop Committee of the Colorado Native Plant Society. She also has contributed to the protection of rare native plants through the Adopt a Rare Plant Program, Rare Plant Monitoring Program, Rare Plant



Jill Handwerk. Photo by Pam Smith

Symposium, and Rare Plant Technical Committee. Jill is an excellent example of the difference one person can make in the protection and conservation of Colorado's native plants.

Elizabeth and Jerry Cook of the Regis University Library Archives were honored for their contributions to CoNPS and its records.

Elizabeth Cook cataloged and organized CoNPS collection of records including the minutes of Board meetings and other records (1976- present) and the print copies of the newsletters. Jerry Cook and others were responsible for scanning and digitizing all issues of *Aquilegia* and early copies of the Minutes. The Cooks spent many hours making the collection accessible and CoNPS is grateful to them and the Regis University Library for their efforts. This digital archives can be found on the Regis University Library website. The physical records can be visited in the Archives by appointment (303.964.3612). The online Minutes and archives of *Aquilegia* are available at <http://libguides.regis.edu/conps>.



Elizabeth & Jerry Cook.
Photo by Loraine Yeatts

Charlie and Jan Turner, Co-Presidents of CoNPS, were given a photograph of a columbine by Lenore Mitchell in thanks for their hard work for the past 3 years.

Following the talks, silent auction, book sale, plant sale, and photo contest, a pizza party celebrating CoNPS' 40th anniversary (photo on p. 17) was held and the winners of the photo contest were announced. Coverage of the photo contest winners was in the Fall 2016 issue of *Aquilegia*. On Sunday, field trips and tours took place (photos and reports on page 18).



Irene Shonle presented a framed photo to the Turners. Photo by Loraine Yeatts

BOOK SALE AND SILENT AUCTION

Photo by Audrey Boag



Photos by Loraine Yeatts



BethAnne and raffle tickets



Pat Murphy on right

As always, Pat Murphy and other volunteers including Denise Wilson did a great job running the Book Sale. BethAnne Bane was amazing as the organizer of the largest CoNPS Silent Auction in recent times.

CoNPS Founders & Early Members



From left to right: Dieter Wilken (standing) , Sue Martin, Beth Painter, David Buckner, Panayoti Kelaidis, Karen Hollweg, current co-president Charlie Turner (standing), J. Scott Peterson. Photo by Audrey Boag



Beth Painter and Dieter Wilken, renowned scientists and a married couple. Photos by Lenore Mitchell



Charlie Turner and J. Scott Peterson. Photo by Audrey Boag



Bill Weber, 1st elected CoNPS president. Photo by Loraine Yeatts



David Buckner and Panayoti Kelaidis. Photo by Audrey Boag



Eleanor von Barga & Miriam Denham. Photos by Loraine Yeatts



Karen Hollweg. Photo by Loraine Yeatts



Rick Brune. Photo by Audrey Boag



Jack Phillips. Photo by Loraine Yeatts



Jan Wingate and Loraine Yeatts of the Kathryn Kalmbach Herbarium, Denver Botanic Gardens. Photo courtesy L. Yeatts.

Selected Talks from the CoNPS 2016 Annual Conference

Forty Years of Progress in Pollination Biology, and What It Means for Citizen Scientists by Nick Waser & Mary Price

Report by David Julie, Chair, CoNPS Education & Outreach Committee

Nick and Mary described how the scientific understanding of plant / pollinator relationships has improved. Italian scientist, Federico Delpino (1833-1905), formalized the traditional interpretation that plants and pollinators are evolutionarily co-specialized. Delpino's "pollination syndromes" predict a flower's pollinators based on the flower's characteristics - color, size, shape, scent, rewards like nectar, etc. But nature is opportunistic and complex. As an example, Nick cited scarlet gilia (*Ipomopsis aggregata*), whose red, tubular flowers and dilute nectar suggest that it is pollinated by hummingbirds. (Bees often prefer yellow or purple flowers and concentrated nectar.) Margie Mayfield, Nick, and Mary observed that *Ipomopsis aggregata* is indeed pollinated by hummingbirds more than 90% of the time. However, they found that white-shouldered bumblebees (*Bombus appositus*) also sometimes pollinate *Ipomopsis aggregata* and that, on a per flower basis, they are better pollinators. Compared with hummingbirds, *Bombus apposition* transfer three times as much pollen, resulting in four times as many seeds being produced.



Nick Waser Photo by Audrey Boag

Nick showed an insightful plant/pollinator depiction prepared by Ruben Alarcon. Ruben counted the flowers and pollinator visits in a community during an observation period. He represented flower species as dashes on an upper horizontal axis and pollinator types as dashes on a lower horizontal axis. In both cases, the width of a dash indicates number of individuals. A line for each observed visit connects pollinator types to flower species, yielding a complex web, contradicting simple pollination syndromes. Interaction patterns changed throughout the day, perhaps due to temperature fluctuation and reward depletion. Interaction patterns also changed from week to week, due in part to plant and pollinator life cycles and to the relative abundance or scarcity of plants and pollinators among and between each other. Finally, as David Inouye indicated in his earlier presentation, many animals pollinate flowers besides bees: flies, wasps, butterflies, moths, beetles, birds, bats, etc.

Nick noted that 946 species of bees have been documented in Colorado, most of them solitary. Studies show more effective pollination where there are many bee species than where there are few. The most familiar bee to many people, the honey bee, is not native to the Americas. As commercial honey bee hives are moved about the country to provide pollination services to farmers, and as honey bee queens and attendants are shipped to beekeepers, parasites and diseases that afflict honey bees might be spread to wild bumblebees and solitary bees. For example, if a wild bee visits a flower that was previously visited by a diseased honey bee, might the wild bee become infected?

Nick shared that 2016 marks not only CoNPS' 40th anniversary, but also the 40th anniversary of Mary joining Nick at the Rocky Mountain Biological Laboratory and beginning their very successful scientific and personal (they are married) partnership.

Where has Plant Ecology Gone since 1976? by David Buckner

Report by David Julie



David Buckner Photo by Loraine Yeatts

David began by noting that ecology is a young scientific discipline that is sometimes regarded as messy in comparison with biology. Studying the relationship of living things with their environment encompasses a daunting number of variables, interactions, and feedbacks. David cited several important pioneers in plant ecology: Henry Cowles, John Weaver, William Cooper, John Marr, and Frederic Clements.

David stated that, due to the Endangered Species Act, ecology needs to be a hard science so it can provide evidence for policy decisions.

David made a plea to reintroduce breadth and natural history to ecology. While David commended digital repositories and the Natural History Network, he believes that plant identification expertise is a necessary tool to make advances in ecology. He shared that it took 10 years of field work to acquire the plant mastery that he believes is prerequisite. David also reaffirmed the counsel of his mentor, John Marr, for us to apply our knowledge of native plants to conservation efforts and land management decisions.

Who We Are Is What We Leave Behind, by Jack Carter delivered by Jennifer Boussetot

Report by David Julie

A family health emergency prevented Jack from attending the conference so protégé, Jennifer Boussetot, delivered his presentation. Jack portrayed the declining awareness of and appreciation for plants in education and society. Unlike their parents and grand-



Jen Bousselot Photo by Loraine Yeatts

parents, college students today rarely take classes on botany or zoology. Few children or adults are familiar with the flora where they live. We've become disconnected from the planet and ecosystems on which our existence depends. Our burgeoning human population is stripping earth of its trees and native vegetation to make way for modernization rather than recognizing their invaluable roles in a healthy environment. Jack's bleak assessment of the direction of humankind and our only planet reminded me of Jared Diamond's account of Easter Island in *Collapse: How Societies Choose to Fail or Succeed*.

What can CoNPS do? Educate. Advocate. Grow. Jack noted that elementary age children are receptive to learning about plants, especially from enthusiastic teachers who engage them in field observation, experiments, analysis, and recording. Middle school students can understand how evolution guides the natural world and changes within it. High school students can apply their knowledge of physical and biological sciences to understanding ecosystems and human

effects on them. Jack sees opportunities for CoNPS in youth education, enrichment for retired adults, citizen science, and teacher training. He also believes that CoNPS must grow its membership. (It was fitting that CoNPS' highly successful Membership and Marketing Coordinator ensured that Jack's message reached us.)

Jennifer noted that Jack and his wife, Martha, lead by example. They have provided free copies of his *Trees and Shrubs of Colorado* book to many teachers and students. Jack has also encouraged teachers to incorporate botany education in their curricula.

Using Course-Based Research Experiences to Advance Our Understanding of the Flora of Colorado, by Leo Bruederle **Report by David Julie**

Leo began by enumerating some key aspects of integrating research into college classes:

- Use scientific processes.
- Discover. Gain new knowledge.
- Address broadly relevant or important topics. For example, Leo got ideas from the notes that Weber and Wittmann made in their *Colorado Flora*.
- Collaborate. Form teams whose members have complementary skills.
- Iterate. Build on the research of previous classes.

Leo then recounted three examples, all of which leveraged electronic herbaria:

- Students evaluated Chihuahuan elements in Colorado flora.
- As part of her Masters thesis, Marika Majack, performed gap analysis on Potamogetonaceae focusing on 6 under-collected counties. She then did field follow-up collections that resulted in 34 new county records.
- Students updated Alice Eastwood's classic, *Popular Flora of Denver, Colorado*.

Leo concluded by citing contributions that CoNPS makes: networking, field trips, workshops, seminars, and grants for research.



Leo Bruederle Photo by Loraine Yeatts

Return of the Native: Panayoti Kelaidis **Report by Jessica Smith, Member of CoNPS Board**

This talk described the history of horticulture in Colorado, starting with a nod to the earliest gardeners in what is now Mesa Verde National Park. One of the early pioneers in horticulture in the state was Reinhardt Shultze, who created the first ornamental garden in Colorado. However, early gardens had a big emphasis on non-native species. Denver Botanic Gardens was created in the 1960s.

Dan Johnson, the current Curator of Native Plants and Associate Director of Horticulture, began the practice of using more native species. Today the Gardens showcase many native species, on the green roof, in the children's gardens and other spaces.



Panayoti Kelaidis Photo by Loraine Yeatts

This talk went on to name some of the heroes of Colorado horticulture. Names included Walter Pesman, a visionary landscape architect, George Kelly, first director of the Denver Botanic Gardens, Jane Ries, Denver's first female landscape architect, designing 1,000 gardens around Denver, Harry Swift and Larry Watson of Western Evergreens in Golden, Claude Barr (whose book, *Jewels of the Plains*, was on sale at the CoNPS bookstore) and Harlan Hamernik from the Great Plains. More current contemporaries, such as Kirk Fieseler, Jeff Ottersburg (Wild Ones Pueblo), Kelly Grummons (formerly of Timberline Gardens), Allan Taylor and Jerry Morris, conifer experts, Rick Brune and his prairie garden and of course, Panayoti Kelaidis, himself, were also named. The talk ended with thanks to the real heart of the Denver Botanic Gardens, Loraine Yeatts and Janet Wingate!

And More Presentations!

We were not able to recruit enough reporters to supply reports on all of the presentations, but thanks to Loraine Yeatts, Audrey Boag, and Lenore Mitchell, we do have photos of the speakers giving their talks. The talks were on a variety of subjects and the speakers were all quite interesting. The combination of scholarly, popular, and practical talks provided something for everyone.

Botany is Not Dead But This Plant Is - Jennifer Ackerfield



Jen Ackerfield Photo by Loraine Yeatts

A New Understanding of Lichens - William A. Weber



Bill Weber Photo by Loraine Yeatts

Forty Years of Change in Bioinformatics - Dieter Wilken



Dieter Wilken Photo by Loraine Yeatts

Alpine Plants and Their Changing Environment - Bill Bowman



Bill Bowman Photo by Loraine Yeatts

The Flies, Bees, and Birds That Pollinate Our Wildflowers - David Inouye



David Inouye Photo by Loraine Yeatts

Forty Years of Change at Rocky Mountain National Park - John Emerick



John Emerick Photo by Loraine Yeatts

Conservation of Colorado Flora on Rooftops - Jen Boussetol



Jen Boussetol Photo by Loraine Yeatts

Benefits of Native Plants in the Garden - Irene Shonle



Irene Shonle Photo by Loraine Yeatts

Installing Colorado Native Plants in the Landscape - Alison Peck



Alison Peck Photo by Loraine Yeatts

Abstracts of Lightning Talks

Strategic Precaution: *Mimulus gemmiparus* Moisture Content Thresholds for Cold Storage Dyan Harden

Department of Horticulture and Landscape Architecture, Colorado State University, 1173 Campus Delivery, Ft Collins, CO 80523-1173



Dyan Harden

Abstract

Mimulus gemmiparus W. A. Weber, budding monkey flower, is a Colorado endemic that is of viability concern. Factors including rarity, a rare mode of reproduction, limited dispersal for migration, unknown potential effects of climate change, and potential changes in conditions of suitable microhabitats all play roles in *M. gemmiparus* survival. Ongoing conservation efforts by researchers and federal and state land managers involve passive protection of existing known populations and active measures such as assisted migration/establishment. Ex situ propagation from field-collected propagules can provide large quantities of plant material for active conservation efforts, but short- to long-term storage parameters for propagules have not been empirically investigated. Interactions between water, temperature, and desiccation tolerance characteristics of the vegetatively-reproductive bulbil are key to determining optimal storage conditions. Differences in desiccation tolerance between populations may indicate populations at greater or lesser risk of decreased viability due to loss of frequency or duration of moist microhabitats. A pilot study in 2015 measured central tendencies and variances within and between plants and within and between four *Mimulus* ex situ propagated populations. Propagation protocols, determination of viability by germination test and tetrazolium chloride, best methods, and base measures from the pilot study were used for research of bulbil storage at -20° , -3° - 0° , and 3° - 5° C. These initial studies helped assess plant bulbil viability at variable moisture contents in search of a low-moisture content threshold to help determine best storage parameters. More study is needed using more controlled methods of desiccation or specialized pre-treatments such as the application of cold protectants to bulbils or meristematic tissue to preserve germplasm for longer time frames at or below freezing temperatures.

Floristic Inventory of McInnis Canyons National Conservation Area

Jessica Condon

Colorado Mesa University
jcondon@mavs.coloradomesa.edu
Advisor: Dr. Stephen Stern

Abstract:

McInnis Canyons National Conservation Area (MCNCA) consists of 123,430 acres of land managed by the Bureau of Land Management (BLM) in Mesa County, Colorado. Within the federally designated conservation area, 75,000 acres are protected as

part of the Black Ridge Wilderness Area that adhere to wilderness regulations with strict travel restrictions and limited accessibility. In 2012, the BLM granted permission and funding to Dr. Stephen Stern at Colorado Mesa University to conduct a full floristic inventory based on vouchered vascular plants for McInnis Canyons National Conservation Area (MCNCA). The primary goal of this study is to develop a species checklist for the plants of MCNCA for use by the BLM through input of collections into intermountainbiota.org. After two field seasons the checklist for MCNCA includes 434 species. There is a 67% overlap with the 512 species included in the Colorado National Monument's *Annotated Checklist of Vascular Flora* indicating a need for additional collecting in MCNCA. Future collection efforts should be concentrated to collect species in wet areas (seeps, springs, streams), species with late summer to autumn bloom times, as well as species in high elevation micro climates.

Measuring Rates of Vegetative Response to Riparian Restoration in the Gunnison Valley

by James Cooper, Graduate Student

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Western State Colorado University
600 South Adams St, Gunnison, CO 81231
University Advisor Dr. Thomas Grant III

Abstract

There is a clear upward trend in temperature from current models which suggest, that the average annual temperature is projected to increase by approximately 5.4°F by 2050 (Barsugli and Mearns 2010). Actions are needed to assist ecosystems



James Cooper Photo by Audrey Boag

to adapt to climate change. The purpose of this project is to quantify riparian response to restoration in order to accurately determine if there is an increase in the percentage of wetland cover. Vegetation richness and diversity have long been used as a metric to examine the health and functionality of riparian areas. In this presentation, four sites were compared using their values in vegetation frequency and change in the percentage of wetland cover in facultative and obligative plant species in Gunnison Valley, Colorado. The restoration was implemented using natural materials and placed in areas identified as critical habitat for the Gunnison sage grouse (*Centrocercus minimus*), a species currently listed as 'threatened' on the Endangered Species list. Percent wetland vegetation change values were derived from data collected during 2012-2015. I hypothesized that vegetation density would be higher in treated areas as compared to control sites. The study suggested that (1) when comparing the percent wetland change in cover from the first and last year of the study there was statistical significance, (2) comparing the sites among and within each other, there were no statistical significant findings, except for Redden and Flattop sites; and (3), of the analysis methods administered, looking at plant density temporally proved to have the most significant results in this study. The statistical results using ANOVA showed significance in one comparison in change in percent wetland

cover between sites (Redden – Flattop $p = .0043$), no finding of significance comparing treatments and controls, and the paired t-test showed high significance ($p = 0.0027$) when comparing the first year of data (varied) to the most recent year (2015).

How Do Native Annual and Biennial Species Affect Cheatgrass Abundance?

Carla De Masters, Master's Student

Department: Department of Integrative Biology
CU Denver

Thesis advisor: Dr. Rebecca Hufft

Abstract:

Bromus tectorum L. (cheatgrass) is the most widespread and problematic annual brome grass in the western United States, dominating more than 40 million hectares of rangeland in the Intermountain West. Areas of *B. tectorum* dominance are extremely difficult to restore via seeding with traditional seed mixes consisting of perennial grasses and forbs. The theory of limiting similarity postulates that functionally similar native species, that is, species which occupy similar ecological niches and perform similar ecological functions, may compete more strongly for resources with non-native invasive species, and thus potentially out-compete the non-natives. Here, I propose to test the applicability of the limiting similarity theory to *B. tectorum* using a suite of annual and biennial species native to Colorado and determining the impacts to *B. tectorum* aboveground biomass and seedling density when in competition with these species in a field competition study, located at Denver Botanic Gardens Chatfield Farms, in Jefferson County, Colorado. Seeds for this study were obtained from wild collections and the Bureau of Land Management's (BLM) Seeds of Success (SOS) program, which collects wild land native seed for research, development, germplasm conservation, and ecosystem restoration. The results of this experiment could help to inform *B. tectorum* management and current restoration practices and have a positive influence on the outcomes of degraded habitat restorations. Additionally, results of this experiment could help inform future wild seed collection target lists. Funding for this research was provided by the BLM, the Denver Botanic Gardens and the Colorado Native Plant Society.



Carla DeMasters Photo by Audrey Boag

Astragalus linifolius: When the Loss of a Rare Species is a Win for Conservation.

Joe Statwick, recent PhD graduate from the Department of Biological Sciences, University of Denver. Advised by Anna Sher at DU and Jennifer Ramp Neale at Denver Botanic Gardens, Department of Research and Conservation, jstatwick@gmail.com

Abstract:

Rare, narrowly endemic species are of conservation concern not only because of their small population sizes and limited habitat, but also because of an assumed lack of genetic diversity. We examined the microsatellite genetic diversity within and between two rare cryptic sister species of selenium hyperaccu-

mulators, *Astragalus rafaensis* M.E. Jones and *Astragalus linifolius* Osterhout (Fabaceae), the latter of which is a questionable taxon. When geographic distance between populations is accounted for, the two species are not genetically distinct. We therefore propose that *Astragalus linifolius* be subsumed into *Astragalus rafaensis*, which has priority. Additionally, the morphological characteristics that have been proposed in the past to separate these species appear to fall along a continuum, rather than forming a discrete separation between regions or genetic clusters, and likely represent simple regional variation. This combined species has a substantially larger population size than either species did individually, but is still known from fewer than 30 reliably documented locations overall. We recommend that the populations in the San Rafael Swell of Utah be considered a unique management unit because of geographic isolation from the populations in Colorado. Nonetheless, diversity within populations is relatively high and inbreeding is low, so conservation concern for this species should focus on minimizing current and future threats to its limited habitat.



Joe Statwick Photo by Loraine Yeatts

Vascular Flora of the South San Juan Mountains: a Natural History Inventory of Two Southern Rockies Slopes

Mathew Sharples, PhD Student

Dissertation Advisor: Dr. Erin Tripp
EBIO, University of Colorado, Boulder

Abstract:

A short breakdown of the total number of vascular plant species, number of species in each family, and largest genera in the south San Juan Mountains was presented, with notable new finds in the study area. The floristic affinities of the study area taxa was briefly described.



Mathew Sharples Photo by Loraine Yeatts

Abstracts of Poster Sessions

Moving Together: Plant and Fungal Colonization of High Elevation Barren Soils

Cliff Bueno de Mesquita, Steven K. Schmidt, and Katharine N. Suding

Department of Ecology and Evolutionary Biology and Institute of Arctic and Alpine Research, University of Colorado, Boulder, CO 80309.

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Abstract: Variation in plant responses to climate change suggests that other factors often mediate how plant ranges shift due to climate change. Species interactions are one such factor that can either promote or hinder the ability of a species to track climate. Despite the well-known and ubiquitous importance of soil microbes to plant fitness, the role of plant-microbe interactions in shaping plant distributions has rarely been studied or included in predictive models. In this experiment, we studied how fungi from tundra meadows or barren soil influenced the growth and survivorship of three alpine plants in the greenhouse and in the field. Results from the greenhouse study demonstrated the influence of different fungal communities on the growth and survivorship of *Deschampsia cespitosa* and *Oxyria digyna*, but not *Silene acaulis*. The field experiment is ongoing. The presence of tundra fungi in high elevation unvegetated areas may facilitate plant establishment in these areas as climate changes.

The Importance of Small Herbaria for Documenting Plant Biodiversity in Colorado: An Empirical Study

Ross A. McCauley

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Email Address: mccauley_r@fortlewis.edu

Abstract: Here in Colorado we have an extensive network of herbaria managed at public and private educational institutions, government agencies, and private entities. While most botanists agree that all collections are important for documenting plant biodiversity the reality is that smaller collections are often overlooked and their holdings receive less attention and care. As part of a larger initiative of the North American Network of Small Herbaria, I have surveyed the herbarium resources in Colorado as one of eight states being used to understand the importance of smaller collections to our botanical understanding nationwide. This assessment was made by gathering vouchered vascular plant collection data for forty species from large and small institutions. The 40 species were randomly selected, 10 from each of four categories: rare S1, rare S2, common native, and invasive. Collection data were partitioned by herbarium size into two classes, large (>100,000 specimens) and small (<100,000 specimens) collections. From these data sets, occurrence data were analyzed by collection size, county, specific locality, and date of collection. The four species categories were compared to determine the relative contribution of small collections to biodiversity patterns. Here in Colorado 29 collections were identified (27 in-state and 2 out-of-state with significant CO holdings) with 19 providing complete data for analysis resulting in 3185 specimens. It was

shown that in terms of contributing to novel county localities, novel geographic localities, and novel temporal localities large collections contributed 117, 1943, and 69 localities respectively and small collections 49, 720, and 61 localities respectively. In total large collections contributed 69% of the total specimens in the study while small collections contributed 31%. This study shows that complete understanding of our statewide plant biodiversity requires the inclusion of all herbaria and that ongoing efforts to database and digitize herbarium specimen data should prioritize the inclusion of all collections from a variety of institutional types.

Hybridization Via Long-Distance Pollen Dispersal Explains the Occurrence of Endemic *Ipomopsis* (Polemoniaceae) Across the Southern Rockies.

Author Names: Ross A. McCauley, Shilah Allen, Meredith Breeden, and Melanie Weber-Sauer

Affiliation Address: Fort Lewis College, Department of Biology, 1000 Rim Drive, Durango, CO, 81301, USA

Email Address: mccauley_r@fortlewis.edu

Abstract: In 2011 a new species of *Ipomopsis*, *I. ramosa* was described from Southwestern Colorado from a single isolated canyon. To better understand the species biology, we initiated a series of field studies focused on determining flowering phenology, pollination, breeding system, and seed dispersal and laboratory studies to investigate phylogenetic relationships. Field studies indicated that the species is an obligate outcrosser reproductively isolated from the similar and widespread *I. aggregata* with which it grows sympatrically by floral morphology, principally floral tube length and stamen insertion. Its principle pollinator is the White-Lined Sphinx Moth (*Hyles lineata*), although it is also visited early in the season by the migratory Western Tiger Swallowtail (*Papilio rutulus*). Phylogenetic relationships to other *Ipomopsis* of the Southern Rockies using the chloroplast trnL-trnF spacer point to a close relationship to geographically near populations of *I. aggregata*. Investigating the same relationships with the nrITS region points however to a more complex origin with a close relationship seen to two other narrow endemic species of southern Colorado and northern New Mexico, *I. polyantha* and *I. sancti-spiritus*. We propose that there may be a common origin for these endemic *Ipomopsis* in the migratory behavior of *Papilio rutulus* which may carry pollen long distances leading to occasional hybridization with establishment of discrete neo-endemic taxa in restricted geographic areas.

Do Early Flowers Bring More Aphids? Phenology of Plant-Insect Interactions in *Ligusticum porteri* (Apiaceae)

Samantha Trail and Emily Mooney

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University of Colorado at Colorado Springs, 1420 Austin Bluffs Parkway, Colorado Springs, CO 80918

Email Address: setrail@email.wm.edu and emooney@uccs.edu

Abstract: Climate change alters the timing of species interactions with effects on the distribution and abundance of impacted species. The best-studied examples of this phenomena are phenological mismatches among interdependent plants and pollinators. Besides pollination mutualisms, many other

species interactions may also be affected by phenological asynchrony. In this study system, aphids (*Aphis helianthi*) colonize the inflorescences of the host plant (*Ligusticum porteri*). Six years of monitoring at the Rocky Mountain Biological Laboratory (RMBL) indicates that advances in host-plant phenology (earlier flowering) increases the abundance of aphids. We expanded the study in 2016 to track insect phenology at two populations of *L. porteri* on the Front Range, which may show a similar pattern of phenology affecting herbivore abundance. Our unique data set shows how climate change may be affecting herbivore abundance through species interactions.

Luminous ID: Alpine Plant Recognition and Field Guide Smartphone App Developed for Niwot Ridge LTER

Jane G. Smith and Nathalie Chardon

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Abstract: Luminous ID is an alpine plant recognition and field guide smartphone app. that was launched in May 2015 after a year-long collaborative project between Niwot Ridge LTER and the University of Colorado, Boulder (CU). The app uses visual recognition software to identify the alpine cushion plant *Silene acaulis* in photographs taken by users. Positively identified *S. acaulis* photographs and associated location data are uploaded to a server. *Silene acaulis* is a common alpine species throughout the Northern Hemisphere, and information collected through this citizen science project will be used to quantify the spatial distribution of this plant. The field guide component of the app is comprised of photographs and information on alpine forbs commonly found at Niwot Ridge and the surrounding Indian Peaks Wilderness area, providing a useful tool for recreational visitors and scientists alike. Luminous ID is freely available for download on Android and Apple (iOS) mobile devices, and already has over 300 users. <https://luminousid.org/>

Evidence for Genetic Allopolyploidy in *Eutrema edwardsii* R. Br. (Brassicaceae): Implications for Species Level Recognition of *Eutrema penlandii*

Jared Mastin, Graduate Student

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Abstract: *Eutrema edwardsii* R. Br. (Brassicaceae) is an arctic-alpine mustard with a near circumpolar distribution. Its closest relative, *E. penlandii* Rollins, is a federally listed endangered species that is endemic to the Mosquito Range in the Southern Rocky Mountains. As part of a larger project addressing the systematics of the genus, we used allozyme analysis to examine genetic diversity and structure within and among populations of the two species. This was coupled with chromosome counts that were used to determine ploidy in *E. penlandii*, which has not been previously documented. Our results reveal that *E. penlandii* is diploid, in contrast to previously published chromosome counts of *E. edwardsii*, which exists as a tetraploid, hexaploid, and octaploid for which we assumed an autopolyploid origin. However, allozyme analysis revealed an allopolyploid origin for *E. edwardsii* as evidenced from fixed heterozygosity

involving two and three genomes. Allopolyploidy is the result of hybridization of two divergent species and chromosome doubling which leads to disomic inheritance of homologous chromosomes resulting in fixed heterozygosity, which is diagnostic with allopolyploidy. Our data further suggest that *E. penlandii* is one of the progenitors to *E. edwardsii*, although the identity of the other progenitors cannot be elucidated from these data. Some controversy exists over the classification of the two *Eutrema* species, which has implications for conservation, although these data support the recognition of *E. penlandii* as distinct. Ploidy distributions currently being generated should provide further insight into the evolutionary history of North American *Eutrema*.

Evidence of Ant-Mediated Seed Dispersal in Colorado Front Range Populations of Lilac Penstemon (*Penstemon gracilis* Nutt., Plantaginaceae)

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Abstract: Mutualistic relationships (mutualisms) are those in which the relationship benefits all species involved. One type of mutualism, myrmecochory, involves the dispersal of seeds by ants. This interaction between species has resulted in the evolution of certain traits that facilitate this relationship to the benefit of both mutualists. With myrmecochory, one such trait is the presence of a structure referred to as an elaiosome, composed of substances (e.g., proteins, fatty acids, lipids) that attract ants to seeds. The seed is brought to the ant nest, the elaiosome consumed, and the seed is discarded either in the tunnels of the nest or just outside. This behavior can aid in the survival of the seedling by reducing potentially negative effects of density-dependent factors such as competition, as well as aiding in avoidance of predation. Studies have shown that among myrmecochorous plants, elaiosome size normally increases with seed size, and influences rate of dispersal. However, the fatty acid oleic acid has been shown to attract ants to disperse seeds at the highest rate and often without a proportional reward. This study investigates the relative size and composition of elaiosome-like structures in Lilac Penstemon (*Penstemon gracilis*) along the Front Range of Colorado. Here, I present preliminary data on relative size and composition of these structures that were collected from Front Range populations of Lilac Penstemon. Further investigation will aid in understanding the development of co-evolutionary relationships between species.

Total Eclipse Photos by CoNPS Members

August 21, 2017

From left to right: Photosphere by Loraine Yeatts, Bailey's Beads by Loraine Yeatts, Eclipse by Mo Ewing.



THANK YOU

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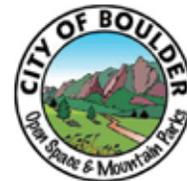


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What a Celebration! 40 Years of CoNPS!

REGISTRATION DESK



Many CoNPS volunteers helped out at the Registration Desk. At left, Linda Boley welcomes Sara Copp-Franz. On right, Amy Yarger valiantly steps in for a sick volunteer while Jannette Wesley greets an attendee. Photos by Loraine Yeatts.

EXHIBITS



Photo by Loraine Yeatts



Photo by Loraine Yeatts



Photo by Loraine Yeatts



Amy Yarger from Butterfly Pavilion. Photo by Loraine Yeatts



Photo by Loraine Yeatts



Photo by Audrey Boag

CoNPS 40TH ANNIVERSARY PIZZA PARTY



Photo by Audrey Boag

CATCHING UP WITH FRIENDS



David Buckner, Eleanor Von Bargen, and Janet Wingate. Photo by Loraine Yeatts



Lynn Riedel and Tim Hogan. Photo by Audrey Boag



Photo by Audrey Boag

PLANT SALE

PHOTO CONTEST & POSTER SESSION



Peggy Lyon enjoys a snack while viewing photos and posters. Photo by Loraine Yeatts.



Mikl Brawner of Harlequin's Gardens sold native plants. Photo by Loraine Yeatts

2016 Annual Conference Field Trips: A Sample



John Emerick discusses the flora and fauna of the foothills. Photo by Deryn Davidson.

John Emerick's Field Trip on Boulder's Mesa Trail Photos by Deryn Davidson



Photo by Deryn Davidson.

Bee Watch Field Trip led by Carol Kearns and Diana Oliveras Report and photos by Lenore Mitchell

We learned fascinating information and interesting techniques at this field trip at Denver Botanic Gardens Chatfield Farms. Colorado has 23 bumble bee (*Bombus*) species. They are social in colonies of 50-80 in lower elevations, with only 15-20 at around 8,000 feet. While the fertilized and fattened queen overwinters in a hole (often an abandoned rodent hole), other bumblebees don't overwinter in our harsh climate.

The queen uses a glycerol component as an antifreeze. She creates a thimble-like wax cone when ready to prepare for eggs. When she emerges in spring, she collects pollen and does all the work to establish a new colony. The first young are all tiny females. Males are produced in late summer to fertilize a queen and use pheromones and scent to locate a queen.

Non-native honey bees have been here for 400 years and form large hives. They require 4 to 5 acres of flowers to produce honey, so hobby bee raisers face many challenges.



Diana Oliveras and Carol Kearns. Photo by Lenore Mitchell

Resources Provided by the Instructors:

Websites

Buzz pollination video: <https://www.youtube.com/watch?v+SZ-rTndD1H10>

Other online sites: www.bugguide.net and: [farmtotable](http://farmtotable.org) (program for endangered pollinators)

Books

Natural History of Bumble Bees, A Source Book for Investigations by Carol A. Kearns & James D. Thomson, 2001.

Techniques for Pollination Biologists by Carol Kearns & David Inouye, 1993.

Sources for Citizen Science Projects and more information

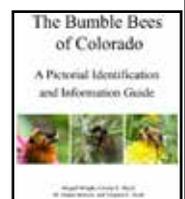
Xerces Society, Bees Needs

Lenore Mitchell is a CoNPS Board member, President of the Metro-Denver Chapter of CoNPS, and a Native Plant Master trainer.

Book Review & Notices (cont. from p. 21)

"The Bumblebees of Colorado - A Pictorial Identification and Information Guide" (71 pages)

by Abigail Wright, Crystal L. Boyd, M. Deane Bowers, and Virginia L. Scott from CU Museum of Natural History. PDF available free at <http://www.colorado.edu/cumuseum/sites/default/files/attached-files/thebumblebeesofcolorado-2017.pdf>



Rabbit Mountain Field Trip: Group Explores Little Thompson Overlook Trail

Report and photos by Nan H. Daniels

Led by Susan Spackman Panjabi, CNHP Senior Botanist, this field trip group of 14 met at the trailhead west of Longmont to orient themselves with this rare, very narrow foothills zone where the Great Plains grasslands transition into the mountains. This portion of the Dakota sandstone hogback juts out into the Denver Basin due to complex geologic faulting. It is a zone of biological transition. Several plant communities are represented here, from grasslands to shrublands to forests, and they support a variety of habitats for wildlife.

Botanic experience of the group ranged from expert to novice, and, by good fortune, they were joined by Tim Henson, who was the husband of former CoNPS President Ann Henson, who died of brain cancer in 2013. Rabbit Mountain was a favorite Open Space of theirs.

Botanizing all the way, the group progressed partway along the Little Thompson Overlook trail (one of 3 trails in the Open Space) to a point Susan calls her “personal” overlook. They identified more late-blooming plants than expected and keyed out several species, including Showy Vervain (*Glandularia bipinnatifida*), using William A. Weber’s *Colorado Flora: Eastern Slope*, Jennifer Ackers’ *Flora of Colorado*, James Ells’ *Rocky Mountain Flora*, and G. K. Guennel’s *Guide to Colorado Wildflowers* (2 vol.). Susan and Pam Smith agreed to assemble the lengthy plant list that resulted from the trip and post it on SEINet.

At the end of the hike, participants were encouraged to look a few weeks later for pods of Thin-leaved Milkweed (*Asclepias stenophylla* A. Gray), now listed in the Apocynaceae/Dogbane family, which is occasionally found on Rabbit Mountain. At noon, some of the group adjourned to the Stone Cup Deli in Lyons for lunch and further botanizing.

Nan H. Daniels is a Native Plant Master, and she and Curt Cole are volunteer stewards for the Colorado Natural Areas Program (CNAP), with a 2-section natural area in Park County. A member of CoNPS Northern Chapter, she is on the Aquilegia staff and the Conservation Committee and previously was on CoNPS Board. Nan recently retired from work as a GIS Analyst, specializing in natural resources and land use, having converted at mid-career from aerospace planning and high-tech manufacturing. Earlier, she served as a Peace Corps teacher trainer in the Philippines.



The group used a variety of sources to identify plants. Photo by Nan H. Daniels.



Tim Henson spots a raptor, as others identify an *Astragalus* for the plant list. Photo by Nan H. Daniels.



Groups confer on the trail. Extended hogback and foothills in background looking southwest. NHD.

2016 Colorado Rare Plant Symposium Report

by Jill Handwerk

Botanists and members of the Colorado Rare Plant Technical Committee (RPTC) were among the group of more than 80 people gathered in Boulder, CO, to attend the 13th Annual Colorado Rare Plant Symposium.



Photos in this article by Audrey Boag.

The symposium is the event that precedes the Colorado Native Plant Society's (CoNPS) Annual Meeting. The Colorado Natural Heritage Program (CNHP) and the Denver Botanic Gardens (DBG) host the Rare Plant Symposium jointly.

Everyone attending the symposium, whether a professional or amateur, had common interests in Colorado rare plants and their conservation. Many of the attendees have been involved for years working to advance rare plant conservation, and have new information from field observations, genetic studies, or information related to policy surrounding conservation issues. This forum offers participants the opportunity to share these observations, see herbarium specimens, have discussions, and learn the latest information on Colorado's rare plant conservation efforts.

Here are some highlights from the 2016 Symposium:

New populations of rare plants reported in 2016 included populations of the globally rare coral ipomopsis (*Ipomopsis ramosa*) and the Rocky Mountain monkeyflower (*Mimulus gemmiparus*). Several other species remain elusive, such as Heil's tansy mustard (*Descurainia kenheili*) and have not been found despite survey efforts.

New genetic information is available or studies are underway for the following species: Grand Junction milkvetch (*Astragalus linifolius*), San Rafael milkvetch (*A. rafaensis*), boatshaped bugseed (*Corispermum navicula*), Mancos shale packera (*Packera mancosana*), Kremmling beardtongue (*Penstemon penlandii*), North Park phacelia (*Phacelia formosula*) and *Sclerocactus* species of western Colorado and eastern Utah.

Germination studies for Pagosa skyrocket (*Ipomopsis polyantha*) indicate high rates of germination across treatments, which is good news for land managers involved in reintroduction and mitigation efforts.

Bernadette Kuhn demonstrated an interactive county map of rare plants that utilizes data from the Colorado Natural Heritage Program to develop county lists of rare plants with links to images and descriptions of the plant species along with information from



Bernadette Kuhn
Photo by Audrey Boag

previous symposia. See <http://www.cnhp.colostate.edu/download/maps.asp> where you can access free, downloadable pdf's of rare plant lists for each county.

Melissa Islam provided an informative demonstration of regional interactive herbaria in SEINet including examples of checklists and collection search capabilities available at <http://swbiodiversity.org/seinet/index.php>. The site hosts specimen collections from a network of regional partners including the Rocky Mountain Regional consortium that includes most of Colorado's herbaria. Ryan Allen at the University of Colorado Herbarium discussed the progress they have made in digitizing their collection, which is now 50-60% digitized. They plan to start integrating into SEINet in 2017.



Melissa Islam Photo by Audrey Boag.

Additional afternoon presentations highlighting 2016 research and conservation efforts are described briefly below:

Steve Popovich (USFS) introduced the team of people working on *Mimulus gemmiparus*, one of our rarest species. *Mimulus gemmiparus* is being considered for listing under the ESA. The species reproduces primarily vegetatively via bulbils.

Kevin Chu (CSU M.S. student) conducted a greenhouse study manipulating resource allocation by continuous removal of floral buds as they were initiated. He found that bulbil production is much higher when floral buds are removed, and concluded that the removal of floral buds can be used to increase bulbil production in natural populations.

Dyan Harden (CSU M.S. student) researched ex situ propagation and cold storage protocols for *M. gemmiparus* bulbils. Successful propagation was possible with consistently moist soil and ample light. Preliminary cold storage results indicate less than or equal to 10% germination observed over 12 weeks in some

Dyan Harden's Presentation Photo by Audrey Boag





Photos in this article by Audrey Boag.

bulbils after 9 months of cold storage. The next step is figuring out how to store bulbils without losing viability.

Mark Beardsley (EcoMetrics), who has been studying the species for many years, has been working on assisted migration of the species to new sites. This year he discovered new populations while looking for possible transplant sites. Both populations are near known sites and are good news for the conservation of the species.

Steve Olson (USFS) discussed the 2016 BioBlitz at the recently designated Brown's Canyon National Monument in Chaffee County. The Monument, which includes portions of the Arkansas River Valley, lies just north of Salida. Over 70 people including biologists from the USFS, BLM, CNHP and DBG as well as volunteers from CoNPS joined in the effort. Steve reported that 224 plant species, 3 reptile/amphibian species, 96 bird species, and 22 mammal species were found. Rare plants documented included *Asclepias hallii* and *Townsendia fendleri* as well as an interesting *Thalictrum* species found growing at a dry site. The USFS will use this data in the development of a management plan for the Monument.



Carol Dawson (BLM) presented information on the BLM rare plant-monitoring program in Colorado. Species monitored are either on the BLM sensitive species list or are federally listed with the ESA. On-going monitoring projects take a landscape level approach so that the effects of grazing, recreation or climate change can be measured across a species range thus providing quantitative methods to approach management decisions and species conservation.

Al Pfister discussed the need of a management plan for Pagosa skyrocket (*Ipomopsis polyantha*) populations on the City of Pagosa Springs land. The species, listed in 2011, has a very limited range and is located almost entirely on private lands or highway right-of-ways. The Colorado Department of Transportation (CDOT) recently conducted a successful transplant project. The Colorado Natural Areas Program/Colorado Parks and Wildlife (CNAP/CPW) with assistance from the USFWS, are purchasing a 77 acre parcel of occupied habitat. This purchase will allow CNAP to conserve and manage this core area of habitat. Additional efforts to conserve the species include cooperation with private land owners and the recognition of the species by the town of Pagosa Springs historic preservation board as part of the town's cultural history.

For more information:

All of the information from this meeting as well as from previous symposia are available online at the Colorado State University, Colorado Natural Heritage Program (CNHP) website: www.cnhp.coloradostate.edu

The Rare Plant Symposium is open to anyone with an interest in the rare plants of Colorado. Contact Jill Handwerk for more information at jill.handwerk@colostate.edu or Jennifer Neale at nealejr@botanicgardens.org and check the CoNPS website for details as they become available about next year's symposium at www.conps.org

Book Review & Notices (cont. from page 27)

wonder without obvious grandeur. She writes, "This is one of the blessings of the urban nature project: without the overtly magnificent to stop us in our tracks, we must seek out the more subversively magnificent. Our sense of what constitutes wilderness is expanded, and our sense of wonder along with it." And

it is that sense of wonder that creates deeply caring love for the dazzling intricacies of a natural world, so immediate even in urban environments, that we are joyously compelled to "liv[e] ing intelligently in its midst."

Suez Jacobson <suezjacobson@gmail.com>

(Cont. on bottom of p. 18)

Friday Night Reception at the CU Natural History Museum Art Exhibit



On Friday, Sept. 23rd, following the Rare Plant Symposium, a reception was held at the University of Colorado Natural History Museum where a display of botanical illustrations by members of the Rocky Mountain Society of Botanical Artists, RARE II (Colorado's imperiled plants), was viewed by visitors as they enjoyed snacks and conversed. The reception was hosted by the museum and the artists were there to greet the reception participants and answer their questions. The artwork was beautiful and the reception was quite popular. Many thanks to Suzanne Balog, Event & Communications Specialist, of the CU Natural History Museum for arranging the reception.

Many visitors also came to Norlin Library to view the exhibit, "The Naturalist," that focused on the life and work of William A. Weber. Our thanks to Norlin Librarians, Barb Losoff and Andrew Violet, for inviting us to the exhibit. Dr. Weber attended the reception and greeted visitors at "The Naturalist" exhibit. On November 16, 2016, Dr. Weber celebrated his 98th birthday.

Jane Shellenberger (below left) Connie Coulter, Peggy Lyon, Steve Olson (below right). All photos below by Jessica Smith.



Bill Weber, Jan L Turner (above left) Lisa Tasker and Denise Wilson (above right)



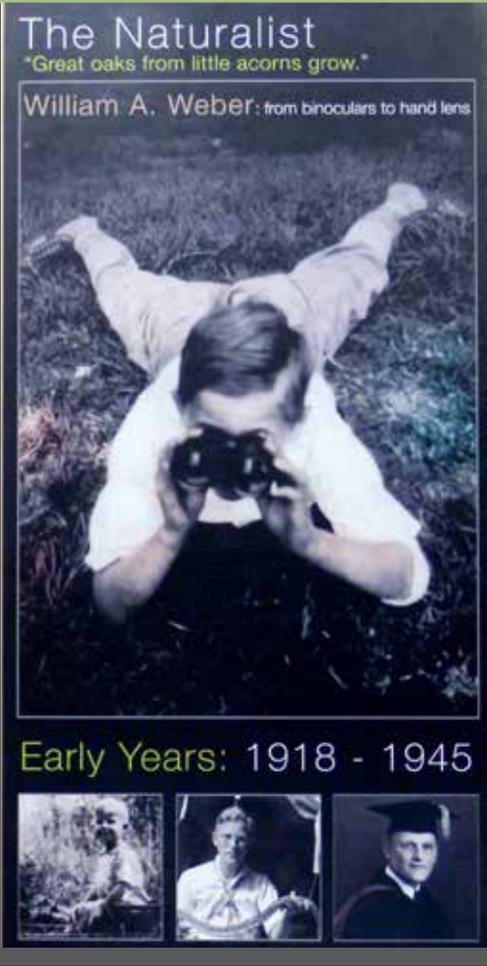
Art gallery (above); Jill Handwerk, Jessica Smith, Susan Panjabi (left) Dave Anderson (right). Photos by Audrey Boag.

Friday Night Reception: "The Naturalist" Exhibit in Norlin Library, University of Colorado: The Life & Work of William A. Weber Photos by Audrey Boag



Left: Bill Weber sang as he walked from the reception at the CU Natural History Museum to Norlin Library.

Below: Bill Weber at the Naturalist Exhibit answering questions.



A CoNPS Cache

by Bob Henry

Amid the many lively conversations during the lunch break on the first day of the 2016 CoNPS Annual Conference, I had a brief conversation with Karen Hollweg, one of the founders in attendance. During our brief chat, she mentioned that she had brought along a file relating to the early days of CoNPS and the Horticulture and Rehabilitation Committee.

In addition to having been one of the attendees at the 1976 T&E plant species workshop from which CoNPS sprang, Karen served on the first Board of Directors in 1976; that Board consisted of individuals selected to serve on an interim basis until an elected Board (as well as elected officers) could be put in place at the Founders Meeting later that year. Karen was also one of the members of the steering committee that organized the Society and planned its first general meeting in October 1976. She also became the first chairperson of the Horticulture and Rehabilitation Committee.

During the afternoon break, Karen retrieved the file from her car, and I took it home. The next day, I began to discover the trove of historical material it contains. In this article, I will try to show what I found. The exploration through the layers of papers became a bit of an archaeological dig, as you will see. It was perhaps not as exciting as the discovery of the Dead Sea scrolls, the Nag Hammadi library, or the Cairo genizah, but it was a treat nonetheless.



THE FILE

The file consists of a couple of inches of papers of various sizes slipped into a two-pocket folder of the type still in use. The folder was originally an ivory color, darkened only a bit by the mysterious grunge that lives in file cabinets

and on desktops and that mysteriously transfers itself to almost anything that is filed and refiled enough times. The edges and corners are a bit dented and crimped in evidence of its use as a working file.

An adhesive label on the front cover is a tad left of center and slightly askew. It shouts out the folder's original purpose and context in capital letters - A FOREST AND RELATED RANGELANDS WORKSHOP ON THREATENED & ENDANGERED PLANT SPECIES.



The folder is from the 1976 workshop at the Denver Botanic Gardens that led to the founding of CoNPS.

The first "E" in THREATENED seems to have a bit of a smudge, but a closer look reveals that a typo had been imperfectly obscured with correction tape or paper, and then retyped cor-

rectly, the final result being somewhat better than the original typo. In any event, it was the best that the technology of the day could do. This and an irregular font, i.e., one that is neither Elite nor Gothic, suggests that the label was typed on an IBM Selectric II, the mainstay of office machines in the 1970s.

Inside the folder, there are more signs that the file dates to an it-seems-like-only-yesterday time (to some CoNPS members) or to ancient history (to others). The two staples that hold it together have long-since lost their silvery shine and have taken on a layer of rust. Its contents include papers printed on mimeograph machines, and a few others in the telltale purple "ink" of ditto machines. Members old enough to remember those producers of "dittoes" will likely also remember earlier time when the copies were distributed in schoolrooms, still damp with alcohol that gave a unique odor that fifth grade boys delighted in inhaling while fifth grade girls rolled their eyes and wished some people were more mature. But I digress.

The left pocket mostly holds a large number of notes, handwritten on the backs of envelopes or whatever scraps of paper were handy when needed. One such scrap, a small one, had been Scotch-taped ("Scotch-taped" used to be a common verb) to the front of the pocket. The file predates the Post-It.

Behind the many smaller sheets and notes in the left pocket, a few 8 1/2 by 11 pages, a couple white and a couple blue, stand out. We will come back to those.

The contents of the right side of the folder are the bulk of the material, consisting of a stack of papers too high to fit in the folder pocket. These papers include notes and documents that might be categorized as (1) early activities of the Horticulture & Rehabilitation Committee, (2) newsletters and material relating to the early history of CoNPS more generally, and (3) documents related to the founding of CoNPS in 1976.

EARLY ACTIVITIES OF THE HORTICULTURE AND REHABILITATION COMMITTEE

While the organization and focus of CoNPS was still being discussed, a suggested working list of committees included eight committees, including "Horticulture and Revegetation", soon renamed the Horticulture and Rehabilitation Committee. As noted above, Karen Hollweg became the first chairperson of that committee.

Of all the committees, the Horticulture and Rehabilitation Committee had the greatest member interest. While the other committees struggled to recruit even a few members, an early list shows seventeen members for Horticulture and Rehabilitation.

With both numbers and enthusiasm, the Horticulture committee was out of the gates fast. There was also the spur of rapid growth and projected projects in Colorado and the environmental consequences of water projects, coal mining, and anticipated oil shale development. Committee members prepared a

policy statement on the use of native plants in revegetation of lands, published an article in the newsletter on growing native lawns, compiled lists of sources of native seeds and plants, and gathered information on seed collection and culture of native species. They were also actively involved in some of the Society's early advocacy efforts such as joining the opposition to the Foothills water development project near Denver. The file includes material on each of these, including early drafts of documents, correspondence, meeting notes, and the like. The file includes more mundane items as well, such as a handwritten list of expenses for 1976-1977, tracking against a budget of \$25.

NEWSLETTERS AND DOCUMENTS RELATING TO THE EARLY HISTORY OF CoNPS

Beyond the activities of the Horticulture and Rehabilitation Committee, the file contains considerable material on the early history of CoNPS.

Original copies of the newsletter for the first three years are in the file. The Founders Issue, published in late 1976, is included, consisting of an eight-page newsletter to which a membership application and a general statement of the goals of the new Society was attached. Volume I of the newsletter (1977) is complete, with all six issues (the newsletter was initially published bimonthly). Volumes II and III are also complete.

The dated newsletters make apparent that an archaeological principle at work – the deeper you dig into the pile, the older the material you find. True, the newsletters do not exactly follow the rule, but the correlation is pretty close. Older issues being nearer the bottom of the pile, you come after some time to the issue for July-August 1977 (Vol. I, No. 4). For some reason, the newsletter is third-page up, coincidentally open to a brief item that I had run across in my past reading of the newsletter archive. Under the head of "Society Communications," the CoNPS secretary at the time, Dieter Wilken, announced that he would be out of touch while botanizing for six weeks in Russia. After providing names and contact information for those who would carry on, he closed his note on "Society Correspondence" with:

"Any delays in response during the Secretary's absence will be attributed either to failure in reading this notice or to the Secretary, whichever you prefer."

Ouch!

This and innumerable other more serious tidbits in the newsletters over the years will entertain in addition to enlighten. A reminder: the complete archive of forty years of the newsletter is accessible online in the CoNPS archive at Regis University and (for recent issues) the CoNPS website.

Having dug our way through the layers to the early years of the Horticulture and Rehabilitation Committee, the newsletter, and general old stuff, we come to the bottom stratum.

THE BOTTOM LAYER: DOCUMENTS RELATED TO THE FOUNDING OF CoNPS IN 1976

Leaving aside the scraps and handwritten notes left pocket of the folder, and top couple of inches of paper on the right side,

we are left with a relatively few pages of the oldest material. But the dig has been worth it.

The bottom material is from the time leading up to the founding of CoNPS, and its earliest days.

Several items are from the Threatened and Endangered Plant Species Workshop (March 1976). There is an invitation to Karen Hollweg from Regional Forester W. J. Lucas to attend the workshop. There is also a copy of the workshop agenda, and a listing of the objectives of the workshop. (The most concrete result of the workshop – the establishment of a Colorado Native Plant Society – was not among them.) There is also the text of the keynote address at the workshop, given by Jerry Martinez of the Forest Service, who was also one of the organizers of the workshop.

"This is an historic moment for all Coloradoans, and it's particularly significant that this concern for the plants should be recognized during the centennial year of our magnificent state. Or, to put it another way, the first hundred years were a free ride. Now, we must give careful attention to threatened and endangered plants which constitute viable segments of the ecological balance of our great outdoors."

Jerry Martinez
(from Keynote Address, March 25, 1976)

On blue paper, a worksheet for group breakouts provides an outline for brainstorming sessions, leading to group reports later in the workshop.

Elsewhere in the file are items put together after the workshop. These include a summary of the proceedings which notes the decision to "develop a steering committee immediately to transpose desires into action with possibility to develop a state native plant society." There is also a Forest Service press release, dated April 20, 1976, "Committee to Plan Action for Preservation of Threatened Plants". The press release also mentions the possibility of establishing a native plant society.

Agendas, minutes, and notes of the steering committee meetings are also well represented. Minutes of an April 14 meeting, at which Dr. John Marr presided, record the major decision of the meeting: "A new organization would be formed – the COLORADO NATIVE PLANT SOCIETY."

Additional documents relate to the nuts and bolts of the organization of CoNPS – formal documents including the Bylaws and articles of Incorporation, and others such as a summary of the roles and scope of the anticipated CoNPS committees.

At some point, it may be helpful to copy and archive the historical documents to make them more generally available. Meanwhile, it is good to know that there is more of an historical record of the fledgling days that we might previously have thought. Beyond this lighter look at 1970s technology, the rusty staples, and some of the lighter side of the file, it provides interesting details and perspectives that can only come from original documents.

My custody of the file is temporary and will soon be placed in the CoNPS collection in the Regis University Library Archives.

If any readers of this have files or material that would be of interest, you are invited to contact us. We would love to add useful information to the archive.

Bob Henry, editor of Aquilegia from 2009 to 2013, lives in Cheyenne, Wyoming, and is the author of the soon-to-be-published Too Short to Bind: Homesteading at Rawhide Butte, a history of eleven homesteaders and their families, who left Iowa and took up "dry farming" in Wyoming under the Enlarged Homestead Act of 1909. He is also writing an informal history of CoNPS, and compiling an index to the first forty years of the CoNPS newsletter.

Bob Henry may be contacted at bh.prairieink@aol.com.

News & Announcements (cont. from page 3)

Vickey Trammell: 1939 - 2017 (cont. from page 3)

Search, using her knowledge of natural history and botany to locate bodies of victims. She was a valued member of CoNPS, serving in a variety of capacities, including President of the Metro-Denver Chapter. In 2015, she received a CoNPS Special Merit Award at the Annual Conference, where she appeared on stage to speak to the audience in spite of the progression of Parkinson's Disease. She had an incredibly active brain and an enthusiasm for learning and teaching even when her body was limited by the disease. She would ride through Roxborough Park in a golf cart when she could no longer hike. She was a truly remarkable person with an amazing spirit. For an article about Vickey, see *Aquilegia*, Fall 2015, page 25.

Donations can be made in her honor to the nonprofit "Friends of Roxborough". Mail checks to 4751 East Roxborough Dr, Roxborough CO 80125. Note: Much of this information and the photo were taken directly from her obituary. *JLT*

Vickey Trammell: Memories by Lenore Mitchell

One of Vickey Trammell's favorite places was a rustic bench beneath a solitary old cottonwood in a meadow of tall grasses and wildflowers at Roxborough State Park. Beginning in the early 1980s before this park was even open to the public, Vickey was among those who helped survey the flora followed by countless volunteer hours developing and monitoring research plots throughout the park. In addition, she led wonderfully informative hikes traversing the trails not only at Roxborough but also at many other Front Range locations. She had a way of finding special plants in hidden places, then leading others there with that warm smile of hers. Love of alpine flora led her to Loveland Pass Lakes, a place which so enchanted her that she'd sometimes sit in a sunny spot and sing joyfully. At Christmas time, she welcomed one and all to her home for caroling while she played various instruments, and she sometimes also entertained at Roxborough holiday celebrations. Mother, wife, teacher, volunteer, mentor, musician - Vickey wore many hats and influenced many with her warmth and wisdom.

Kudos to Volunteers at the 2016 CoNPS Annual Conference and 40th Anniversary

Many CoNPS members volunteered their time to make the 2016 CoNPS Annual Conference and 40th Anniversary a success. The Annual Conference Planning Committee consisted of Jan L. Turner and Lenore Mitchell (co-chairs), Charlie Turner, Jen Bousset (CoNPS staff member), Tom Schweich, Linda Smith (CoNPS staff member), Irene Shonle, BethAnne Bane, Jannette Wesley, Steve Olson, Catherine Kleier, Stephen Stern, Denise Wilson, Cecily Mui, Carol English, and Jessica Smith. BethAnne Bane was in charge of the Silent Auction and did an outstanding job as did Patrick Murphy, who ran the Book Sale with the assistance of Denise Wilson, who always pitches in and helps at the Book Sale as a cashier. Jen Bousset recruited volunteers and organized the lunch and pizza party celebration, and Jannette Wesley helped at the Registration Desk along with Linda Smith (CoNPS staff member) and other volunteers. Lenore Mitchell coordinated all of the field trips in addition to co-chairing the Annual Conference and put in endless hours helping in many different capacities.

Our gratitude goes to the founders, who made CoNPS possible, some of whom traveled many miles to attend the conference. Thanks also to all the speakers and presenters and field trip leaders who provided their services free of charge to CoNPS.

A number of people volunteered at the Conference. In addition to the Committee members. I don't have a complete list, but they included Sara Copp Franz, Linda Boley, Amy Yarger, Tom Zeiner, Kim Regier, Lauren Traylor, Don Parker, Cheryl Ames, Pat Butler, Cecily Mui, Sophia Warsh, David Julie, Kelly Ambler, Wendy Covert, Tamara Winter-Nelson, Melissa Islam, Jenny Neale, Nick Waser, and Mary Price. Apologies to those who were accidentally omitted from this list. *JLT*



Volunteer Tom Schweich (left) was in charge of the PowerPoint presentations including the computer, projector, and the sound system. David Inouye (right) confers with Tom. Beth-Anne Bane helped during concurrent sessions. Photo by Loraine Yeatts.

Founding Dates of Native Plant Societies of the United States: A Chronological List

by Jan Loechell Turner

In 2014, I conducted a survey of the founding dates of native plant societies in the United States. For the purposes of the survey, organizations that focus on native plants of their state or region were considered native plant societies. The American Horticultural Society maintains a list of native plant societies at <http://ahsgardening.org/gardening-resources/societies-clubs-organizations/native-plant-societies> and the Canada-based Native Plant Society of North America posts a list at <http://www.nanps.org/index.php/resources/native-plant-societies>. These lists were used as a starting point, providing the web addresses for the country's native plant societies. The websites of many of the societies contained the date the group was founded. If the founding date was not on the website, I contacted the president or another official of the society and asked for the founding date. In some cases, it was a bit confusing because the original group changed its name or location. Some native plant societies are regional, comprised of multiple states or restricted to a city or portion of a state. What follows is a chronological list by founding date of native plant societies. If you find omissions or errors in this list, please send corrections to JLTurner@regis.edu.

Chronological List

- 1900 New England Wildflower Society (Massachusetts) (includes Massachusetts, Maine, New Hampshire, and Vermont) was founded in 1900 as the Society for the Protection of Native Plants. <http://www.newenglandwild.org/about>
- 1901 The Botanical Society of Washington (D.C.) <http://www.botsoc.org/>
- 1903 Connecticut Botanical Society <http://www.ct-botanical-society.org/>
- 1917 Cincinnati Wildflower Preservation Society- SW chapter, Ohio NPS <http://www.cincywildflower.org/>
- 1917 Ohio Native Plant Society, Southwest Chapter (see Cincinnati Wildflower Society)
- 1941 Michigan Botanical Club <http://michbotclub.org/>
- 1951 North Carolina Native Plant Society. Originally the NC Wild Flower Preservation Society, they changed to their current name in 2004 <http://www.ncwildflower.org/index.php/about/history>
- 1961 Native Plant Society of Oregon NPSO 1961 <http://www.npsoregon.org/aboutnps.html>
- 1965 California Native Plant Society 1965 <http://www.cnps.org/>
- 1968 Botanical Club of Wisconsin ("Wisconsin's NPS") <https://sites.google.com/site/botanicalclubofwisconsin/home>
- 1973 Endangered Species Act of 1973 (ESA) <https://www.fws.gov/laws/lawsdigest/esact.html>
- 1975 Nevada Native Plant Society 1975 <https://nvnpns.org/>
- 1976 Arizona Native Plant Society <http://www.aznps.com/>
- 1976 Colorado Native Plant Society <https://conps.org/>
- 1976 Native Plant Society of New Mexico <https://www.npsnm.org/>
- 1976 Washington Native Plant Society <http://www.wnps.org/>
- 1977 Idaho Native Plant Society (Pahove) <http://www.idahonativeplants.org/inps/aboutus.aspx>
- 1978 Kansas Native Plant Society <http://www.kansasnativeplantsociety.org/about.php> (originally called Kansas Wildflower Society but changed name to Kansas Native Plant Society in 2004)
- 1978 Tennessee Native Plant Society <http://tnps.org/>
- 1978 Utah Native Plant Society <http://www.unps.org/index.html>
- 1979 Missouri Native Plant Society <http://www.missourinativeplantsociety.org/about>
- 1979/1980 Arkansas Native Plant Society <https://anps.org/>
- 1980 Florida Native Plant Society <http://www.fnps.org/who-we-are/history>
- 1980 Friends of the Maui Botanic Gardens (became the Native Hawaiian Plant Society in 1988?) <http://www.nativehawaiianplant-society.org/>
- 1980 Mississippi Native Plant Society <http://www.mississippinativeplantsociety.org/>
- 1981 Texas Native Plant Society <http://npsot.org/wp/about-2/who-we-are/>
- 1981 West Virginia Native Plant Society <http://www.wvnps.org/pressrelease2006.htm>
- 1981 Wyoming Native Plant Society <http://www.wynps.org/>
- 1982 Alaska Native Plant Society <http://www.aknps.org/>
- 1982 Minnesota Native Plant Society <http://mnnps.org/>
- 1982 Native Plant Society of Northeast Ohio <http://www.nativeplantsocietyneo.org/history/>
- 1982 Virginia Native Plant Society <http://vnps.org/>
- 1983 Louisiana Native Plant Society <https://www.lnps.org/>
- 1984 Great Plains Native Plant Society (South Dakota) info@gpnps.org <http://www.gpnps.org/membership.htm>
- 1985 New Jersey Native Plant Society <http://www.npsnj.org/index.html>
- 1986 Illinois Native Plant Society <http://www.ill-inps.org/index.php/about-us>. The Southern Illinois Native Plant Society was established in 1982 but expanded to the statewide Illinois Native Plant Society in 1986.
- 1986 Kentucky Native Plant Society <http://www.knps.org/>
- 1987 Montana Native Plant Society <http://www.mtnativeplants.org/>

- 1987 Oklahoma Native Plant Society <http://www.oknativeplants.org/>
- 1990 New York Flora Association <http://www.nyflora.org/>
- 1992 Maryland Native Plant Society <http://www.mdflora.org/history.html>
- 1993 Indiana Native Plant & Wildflower Society (INPAWS) <http://www.inpaws.org>
- 1993 Pennsylvania Native Plant Society <http://www.panativeplantsociety.org/about-us.html>
- 1994 Georgia Native Plant Society, <https://gnps.org/>
- 1996 South Carolina Native Plant Society <http://scnps.org/about-the-south-carolina-native-plant-society/>
- 1997 Finger Lakes Native Plant Society (central NY) <http://flnps.org/>
- 1998 Delaware Native Plant Society <http://www.delawarenativeplants.org/>
- 1999 Canadian Wildflower Society changed its name to the North American Native Plant Society (NANPS).
- 2010 Kinnikinnick Native Plant Society (of Idaho) (previously a chapter of INPS) <http://www.nativeplantsociety.org/history.htm>

Note: Outside the United States, the Canadian Wildflower Society formed in 1988. It changed its name to North American Native Plant Society in 1999 but NANPS is primarily local to Toronto, Ontario at this time. It has some members from the U.S. The mission of the Society is broad in geographic coverage, "Dedicated to the Study, Conservation, Cultivation & Restoration of North America's Native Flora." <http://www.nanps.org/index.php/home/what-is-nanps>

The Wild Ones is focused primarily on natural landscaping with native plants. It was formed in the Midwest but has chapters in other areas. Wild Ones' mission statement: "Wild Ones Native Plants, Natural Landscapes promotes environmentally sound

landscaping practices to preserve biodiversity through the preservation, restoration and establishment of native plant communities." <http://www.wildones.org/>

Jan Loechell Turner is past co-president of CoNPS and past chair of the Research Grants Committee. She has been editor of Aquilegia and chair of the Media Committee since 2013. She is Professor Emerita, Regis University, Denver. Jan and her husband, Charlie Turner, are authors/photographers of a number of wildflower guides: Wildflowers of Mesa Verde, Wildflowers of Red Rocks Park, Wildflowers of Bandelier, and Wildflowers of Canyon de Chelly. Their books are available through the CoNPS Bookstore and at the bookstores at the parks.

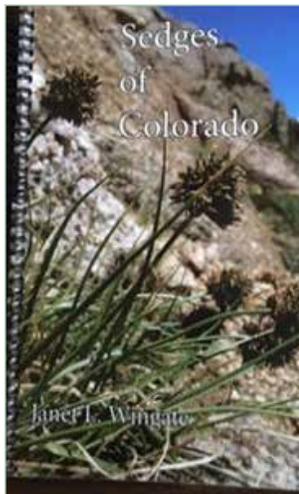
Book Review & Notice

Sedges of Colorado by Janet Wingate Now Available!

Sedges of Colorado. by Janet Wingate. Parker, CO: Wingate Consulting, 2017. 160 p., spiral bound. \$19.50.

This long-awaited book is now in print and available from the CoNPS online Book Store at <https://conps.org/conps-store/>. Published recently, this book is already a CoNPS bestseller.

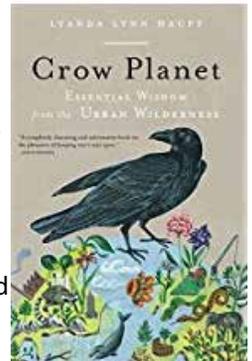
The key is lavishly illustrated with line drawings and the front cover features a color photo of a *Carex perglobosa* from Summit Lake by Loraine Yeatts. CoNPS contributed some funds toward the cost of the illustrations. Dr. Janet Wingate of Denver Botanic Gardens' Kathryn Kalmbach Herbarium is an expert on the grasses and sedges of Colorado.



Crow Planet : Essential Wisdom from the Urban Wilderness

Review by Suez Jacobson

Crow Planet : Essential Wisdom from the Urban Wilderness by Lyanda Lynn Haupt, 2011.



A long-time "big W" wilderness advocate, I know the power of wild places to transform lives, my own included, in specific and significant ways. So when I read the subtitle of Haupt's book, *Essential Wisdom from the Urban Wilderness*, I reacted to what I perceived was an oxymoron. But Haupt's case for "urban wilderness," and its power to change us, is passionately and convincingly argued through her careful observations of crows (among other creatures) – the most common of birds among us. Haupt's ultimate plea is for living differently. She challenges us to "act against a prevailing culture" of materialism and greed, enabled by the wild in our everyday world, a wild that's accessible even to the most urban of dwellers, a wild that teaches us to act "from a sense of rootedness, connectedness, creativity, and delight" to "truly conserve this earth."

Haupt gives us her generously personal story, her keen observations of the world at our doorsteps, and the tangible hope for living in communion with a natural world that brings wonder without obvious grandeur. She writes, "This is one of the blessings of the urban nature project: without the overtly magnifi-

(Cont. on p. 21)

CoNPS 2017 Denver Area Garden Tour

Text and Photos by Linda Boley

Thanks to all of you who offered your gardens for the June 10th tour and to all those who attended the tour. Each gardener was challenged by Colorado's heavy snow dumps in the spring and shredding hail storms and/or pounding rains and yet presented marvelous displays right on time. Your hard work was much appreciated by the rest of us.

Marcia and Randy Tatroe's permaculture gardens looked as great as ever. For a small residential property, every year they manage to wedge in more varieties of Colorado natives as well as many other favorite plant specimens. There are hundreds of flowers, cacti and succulents, edibles, and mature trees and shrubs. Of course, there is always the added attraction of odd-ball goodies of blue glass, rusty-metal road-finds, and handmade creatures that make the garden even more enjoyable. They have put great effort into making their gardens water smart, pesticide and herbicide free, educational, and fun.



Tatroe's Garden Dove

Don Ireland's award-winning Cherry Creek HOA efforts to replace bluegrass with more native and xeric specimens has been very successful in helping his HOA save up to 15 million gallons of water annually. The addition of evergreens, shrubs, and xeric flowers and ground covers has not only improved the visual appearance but the pleasure of living there.

Two old log cabins on a half-acre in Observatory Park have been turned into a lovely home for Donna Baker-Breningstall.



Baker-Breningstall's Yard

As you look through the trees from the road, you see a large wildflower meadow followed by a large complex of raised vegetable beds made from pine timbers; these beds use drip irrigation and hopefully will produce enough veggies

to pass along to others. Along the sides were native and other plant species including various hybrid clematis vines. The cool, meditative log cabin garden shed to one side adds to the picturesque garden.

A gardener who has managed to control herself by designing large areas of the same plant species, in contrast to my botanical zoo, is Jannette Wesley in Lakewood. Many of us could work harder at designing with threes and fives instead of "waves of two and groups of one" (as Panayoti Kelaidis said, at one of his lectures). Her back yard dips downhill to the property line with native shrubs along the edges and two to three foot wide paths of blue grama grass leading through the plants and a few contemporary sculptures. There is also a reseeding stand

of *Penstemon grandiflorus* that gave us all a spectacular, well timed show for the tour.

Bob Nold has a front garden of succulents, cacti, and shrubs that has not been watered since 1987 and still looks good. His back yard is filled with native, alpine, and foreign plant species. He also has a large collection of troughs that he built years ago and were planted by his late wife Cindy, who many of us knew. Bob knows his plant species and is a great person from whom to learn.



Wesley's Garden

As the day wore on, the temperature reached over 90 degrees and most of us were heading south for the last three gardens. The Carson Nature Center, located in South Platte Park, was one of those stops. This area was seriously washed out by the 1985 flood. The city of Littleton has done a nice job developing a small portion of this new park with a winding walkway through plantings of native trees, shrubs, and herbs as an educational tool for the schools and public. And yes, all the plants were nicely labeled.



Nold's Garden

Denver Botanic Garden's Chatfield Farms is well worth checking out any time of the year to see what is growing, blooming, and surviving. The gardens range from some designed by Lauren and Scott Ogden with many native and non-native plants to vegetable gardens, iris gardens, and rock and lavender gardens. There is also a Butterfly House and many pathways to explore. Panayoti Kelaidis spoke on the plants of the prairie.

Our last garden stop was Lenore Mitchell's yard near picturesque Roxborough State Park. Lenore has survived the onslaught of ravenous deer by planting a handsome bank of native and hybrid perennial plants in the mint and onion families and has found that many penstemons are also unappetizing.

Linda Boley is a member of the Boulder Chapter and is known for her lovely garden populated by beautiful works of art that Linda has created.



Lenore Mitchell's Yard

Note: The July 1, 2017 Boulder Garden Tour will be featured in the Fall 2017 *Aquilegia*!

Western Slope 2017 Spring Festival a Hit with Attendees!

By Mary Menz, Plateau Chapter

More than 60 people attended the CoNPS Western Slope Festival June 3. Speakers and attendees were from all over the state. Sally McCracken traveled from Woodland Park to attend.

"When I got the April's newsletter, the information on the Gunnison festival sparked me into action," said Sally. "My husband loves to fly fish and I love plants—a perfect match for attending the festival in Gunnison. We planned to be together, but to enjoy our own passions. About three days before we drove to Gunnison, he said, 'I think I will join you at the festival instead of fishing!' We each had a great time at the presentations and the two field trips we joined. Now the die is cast. I look forward to attending the annual conference in Colorado Springs in September."

The conference featured a variety of short presentations, including:

- Rare Plants and the USFS by Tyler Johnson
- Sagebrush Response to Climate Change by Tom Grant
- Sudden Aspen Decline: Impacts on Biodiversity by Jim Worrall
- Using Citizen Science to Protect Native Pollinators by Shay Hlavaty
- Rare Plants in the Gunnison Area by Peggy Lyon
- Western Slope Locales and Garden Plants by Panayoti Kelaidis
- Media Lunas, One Rock Dams, and Zuni Bowls: Improving Wetland Habitat and Diversity One Rock at a Time by Renee Rondeau
- What Can You Learn about the Climate by Counting Flowers by David Inouye

The weather was perfect and attendees couldn't wait to get outside and attend one of the six field trips that afternoon, which included:

- Skiff Milkvetch Survey led by Robin Bingham, PhD, Botany Professor at WSCU and with Dara Taylor, USFWS Botanist. Attendees visited skiff milkvetch survey locations at the Hartman Rocks area.
- Plant Diversity Monitoring led by Western State Colorado University student and BLM intern, Alex McCarty. Attendees visited an area where McCarty is surveying and collecting data on plant diversity, foliar cover, sage grouse habitats, gap intercept, and soils in the Gunnison Basin.
- Sagebrush Plant Community by Thomas Grant from Western State Colorado University during which attendees hiked around the sagebrush plant community and learned about the surprising diversity that is just steps outside of the Western State Colorado University Campus in Gunnison.
- Hartman Rocks Spring Wildflower Diversity by Barb Frase, PhD, Western State Colorado University. Attendees walked to two of her research sites, each of which includes aspen stands along the drainage, and diverse sage and aspen understory communities. One site featured a small perennial wetland where numerous forbs and shrubs were blooming. Attendees examined the diversity within and between the two communities and observed differences among two communities that were in close proximity to each other.
- Roundup Basin Wildflower Hike led by Gay Austin, BLM Natural Resource Specialist. Attendees explored a sagebrush and montane area.

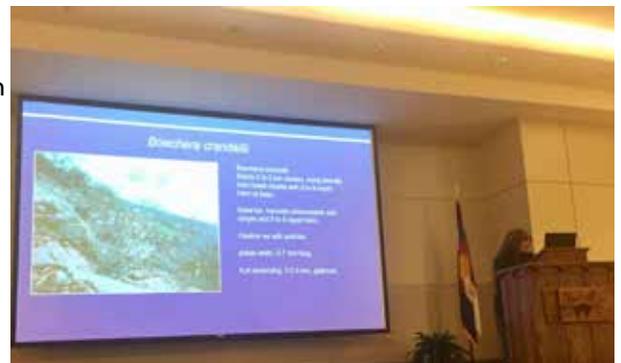
Peggy Lyon's conference topic "Rare Plants in the Gunnison Area" was timely. Three new populations of known threatened or rare native plant species were found during one of the botanist-led field trips offered to attendees after the Saturday presentations. Attendees who found the plants documented their findings on the report forms provided by Lyon after her talk.

"It's important that we pay attention to, collect the data and monitor these species," explained Lyon. "These important species are indicators of the continued health of our diverse ecosystems." Lyon is a retired botanist with the Colorado Natural Heritage Program.

The day wrapped up with a barbecue in a Gunnison park.



Photo by Jen Bousselot



Peggy Lyon's Talk. Photo by Jen Bousselot

Sunday field trips rounded out the weekend

On Sunday, attendees had the option of choosing from five hikes:

- A repeat of Tom Grant's Saturday hike.
- Bird Diversity led by Pat McGee, wildlife biology professor at Western State Colorado University, during which many nesting species were identified by sight and sound.
- Almont Triangle Aspen Enclosures led by Barb Frase, PhD, Western State Colorado University. Attendees visited a protected big game winter range 20 miles north of Gunnison and walked through rolling sage-covered hills. At the destination, there was a set of enclosures designed to prevent elk and mule deer from foraging on the aspen. Another set of enclosures focused on forb and grass community diversity.
- Riparian Restoration was led by Renee Rondeau, botanist with the Colorado Natural Heritage Program, and Gay Austin, BLM Natural Resource Specialist. Attendees visited Chance Gulch to observe changes in riparian vegetation and plant diversity in response to manually place Zeedyk rock structures.
- Crested Butte Land Trust hike at Woods Trail in Crested Butte was led by Heddy Peterson.

Reminder: Plant Lists on SEINet

Plant lists for many CoNPS-led field trips are available at the SEINet data portal, a collaborative effort that collects and distributes data for sharing environmental research in the western states. Peggy Lyon, for example, created a list from the Woods Trail, Crested Butte hike and has posted it for others to view at <http://swbiodiversity.org/seinet/checklists/>.

Mary Menz is a member of the CoNPS Plateau Chapter. When living in Teller County, she taught two sessions per summer of the Native Plant Master® courses offered by CSU Extension (2014 to 2016). Mary now lives in Ridgway and looks for wildflowers every day of the season.



Left to right Jai Misra, Anh Ngo, Dave Tolan, Lee Cassin, Juniper the dog (belongs to Tom), Dr. Tom Grant, Jim Pisarowicz, Kathy See (Dorothy Borland's sister). Photo by Jen Boussetot



Barb Frase leading field trip. Photo by Jen Boussetot

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Send completed form and full remittance to:
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Check box to receive information on volunteer opportunities

Calendar

CoNPS EVENTS

OCTOBER 2017

- Oct 7, 11am-4pm – CoNPS/Audubon Fall Festival and Plant Sale, Audubon Center & Chatfield, Littleton
- Oct 8, 10am-2pm – Boulder Chapter Field Trip: Introduction to Wetland Delineation Field Methods and Great Plains Plant Identification
- Oct 14, 9am-4pm – Plateau/CoNPS Workshop: Willows of Colorado, Grand Junction
- Oct 17, 6:30pm – Denver Chapter Program, Denver Botanic Gardens
- Oct 21, 9:30am-12pm – CoNPS Board Meeting, Golden

Events of Botanical Interest

- Oct10-12, 2017 – Natural Areas Association Conference in Fort Collins this year!
- Nov 2, 2017 – Pollinator Summit at Denver Botanic Gardens
- Feb 6-8, 2018 – Tamarisk Coalition's 16th Annual Riparian Restoration Conference, Grand Junction

Bill Weber Turns 99 on November 16, 2017. An Early Happy Birthday, Bill!



Bill Weber sang a humorous song at the 2016 CoNPS Annual Conference to the delight of the audience. Photo by Loraine Yeatts.



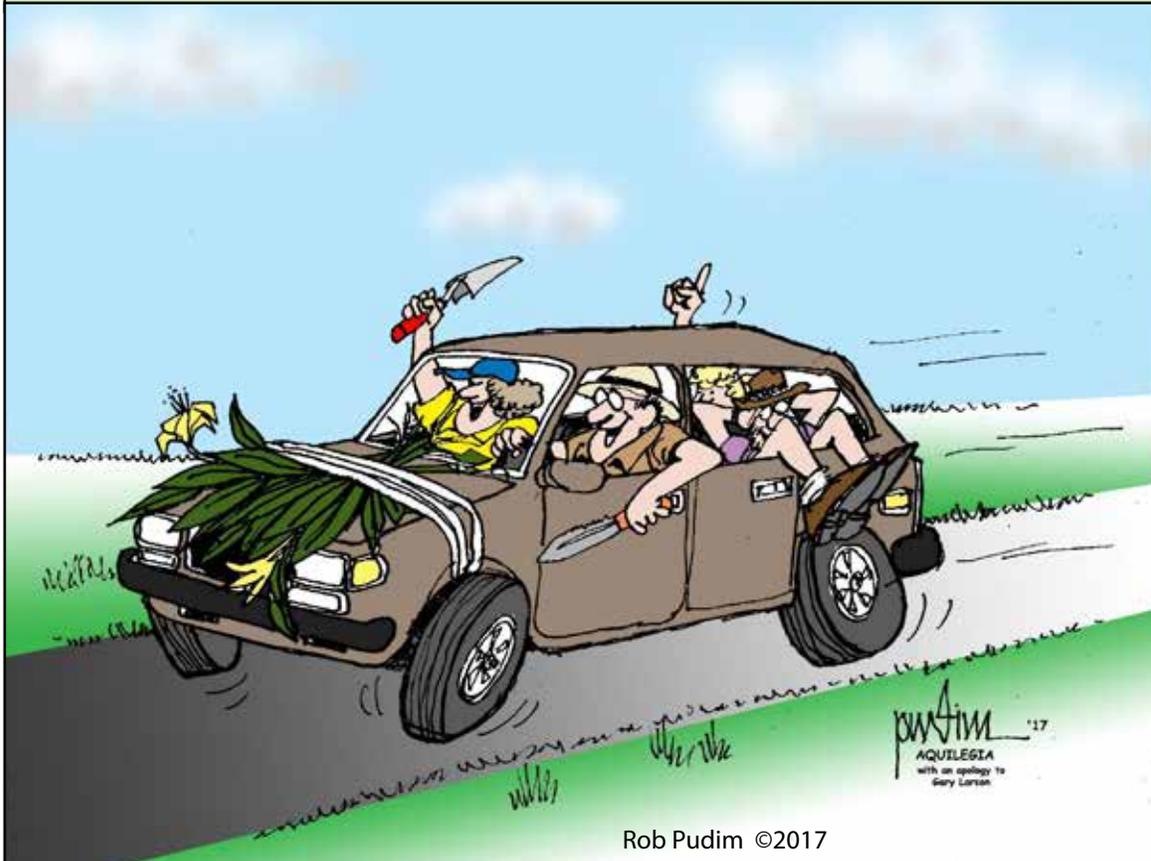
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Botanicum absurdum by Rob Pudim



Rob Pudim ©2017