



Sego Lily

Newsletter of the Utah Native Plant Society

May 2013
(volume 36 number 3)



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Desert anemone (*Anemone tuberosa*) is an early-blooming perennial wildflower found on rocky slopes and cliffs in the Great Basin, Colorado Plateau, and Mojave deserts of western and southern Utah. This member of the buttercup family (Ranunculaceae) can be recognized by its 7-10 petal-like sepals (true petals are lacking) and numerous stamens and separate achenes arranged on a thimble-like receptacle. The Latin name *tuberosa* refers to the thickened, tuber-like roots, which are unique among *Anemone* species of Utah (but shared with several species from eastern North America and South America). Photo taken by Steve Hegji in early April on Stansbury Island, Tooele County.

Utah Native Plant Society



Utah Native Plant Society

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Website: For late-breaking news, the UNPS store, the *Sego Lily* archives, Chapter events, sources of native plants, the digital Utah Rare Plant Field Guide, and more, go to unps.org. **Many thanks to Xmission for sponsoring our website.**

Sego Lily Editor: Walter Fertig (walt@kanab.net). The deadline for the July 2013 *Sego Lily* is 15 June 2013.

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The *Sego Lily* is a publication of the Utah Native Plant Society, a 501(c)(3) not-for-profit organization dedicated to conserving and promoting stewardship of our native plants.

Utah Native Plant Society, PO Box 520041, Salt Lake City, UT, 84152-0041. Email: unps@unps.org

Chapter News

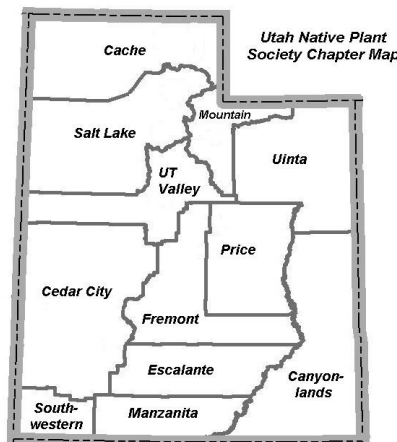
Cache: Alternascapes Garden Tour—Saturday May 4 from 11 AM to 4 PM, Zollinger Park (61 North 200 West Providence), \$5/person.

Richard J. Shaw Memorial Wildflower Walk, Tuesday, June 4. 6 PM at first parking lot up Green Canyon (east of North Logan). Meet at upper end near trailhead and restrooms.

Intermountain Herbarium Activities: Introduction to mushrooms, a workshop foray. Friday/Saturday May 17-18. Cost: \$40/person, preregistration required (min. of 6 people). Begins Friday at 6 PM at the herbarium. More info on herbarium webpage.

See the Bulletin Board (pg 3) for information on the herbarium's botanical foray to the Grouse Creek and Raft River mountains in late June. - Michael Piep

Escalante: The Escalante chapter will be hosting the US Forest Service on Friday, May 3rd for a presentation on climate change by Sue Bughman, Brooke Shakespeare, and Josey Muse. Topics will include the US Forest Service response to climate change and projects that address climate change



on Dixie National Forest. The meeting will be at 3 PM in the Escalante Interagency Office.

Manzanita (Kane County): Saturday, May 4: We will make a trek to the St. George area to explore the spring wildflowers of the Red Cliffs Desert Tortoise Preserve and the Beaver Dam mountains. We will start at the Grapevine trailhead at the Red Cliffs preserve at 9 AM. The trailhead parking area is located less than 1/10 of a mile west of Interstate 15 at the Washington Parkway exit (this is the first exit south of Harrisburg Junction). We will explore the Red Cliffs preserve until

noon, break for lunch, then resume the expedition to the Beaver Dam area taking the highway from Santa Clara towards Lytle Ranch. We will be too late for the great Joshua tree bloom, but many other desert shrubs and wildflowers should be flowering. The trip will run until 3 PM or so, allowing ample time for St. George shopping or dining.

Saturday, May 18: Our annual spring plant sale will be held in conjunction with Kanab's Amazing Earthfest celebration. Janett Warner will be on hand with her native wildflowers, shrubs, and trees from Wildland Nursery in Joseph. The sale will be held from 9-11 AM at the Kanab Farmer's Market on the lawn of the Kane County tourism bureau along highway 89 between the traffic lights.

ZCFI classes of interest: The non-profit Zion Canyon Field Institute of the Zion Natural History Association is sponsoring botany classes in the Zion NP area this spring. On May 5, learn about the flora and geology of the park in "Zion 101" with the rock doc, Ben Everitt and your umbel leader. On May 13, explore the wildflowers in the canyons of the Kolob area near Kanarraville. On June 8, learn about the [continued on page 4]

Bulletin Board

Red Butte Garden Rare Plant Hunters Need Your Help: Red Butte Garden could use your trained eyes and sturdy constitution in the field this year. As hard as we try, we can't be everywhere at once to see the exact moment when our beloved rare plants are blooming, fruiting, and producing seeds. There are a few particular ones that we are hoping to catch this year for conservation and research seed collection purposes, and we need you help.

Help us conserve these species by letting us know when you see these species in bud, flower, fruit, or setting mature seeds. Send a picture, GPS coordinates, and driving directions if possible. The target species are: *Astragalus striatiflorus*, *Cycladenia humilis* var. *jonesii*, *Lesquerella tumulosa*, *Pediocactus despainii*, *Pediocactus sileri*, *Pediocactus winkleri*, *Penstemon grahamii*, *Petalonyx parryi*, *Sphaeralcea gierischii*, and *Camissonia gouldii*.

Any time and travel spent looking for these plants can be counted as volunteer hours for Red Butte Garden and our Conservation Program. There are great benefits for Red Butte volunteers and you will be helping us meet our grant funding goals. Please, do not disturb the plants in any way or attempt to collect any seeds on your own. We would love to have you join us as we go to collect so that you will be covered under the legal permits. Please contact me with any questions about species or volunteering. Rita.reisor@redbutte.utah.edu, (801)585-5853. Thank you in advance for your help! - *Rita Reisor*

Photos Needed: Bruce Barnes of Flora ID Northwest is revising his Interactive Plant Key for the flora of Utah and is in need of a few photos. Of the 3418 species of flowering plants, gymnosperms, ferns, and lycophytes in his guide, he is missing just the following 12 species! If you have a photograph of one of these plants and are willing to share it, Bruce will include your name in the lower corner of the image, add you to the acknowledgements in the User's Guide, and send you a complimentary copy of the key (all while you retain copyright). The missing species (including their range in parentheses) are: *Aquilegia desolaticola* (NE Utah), *Boechnera pendulina* (statewide), *Eremogone loisiae* (N Utah and Wasatch Range), *Erigeron higginsii* (Washington Co.), *Erigeron huberi* (NE Utah), *Eriogonum domitum* (House Range in Millard Co.), *Lepidium moabense* (SC and SE Utah), *Navarretia furnissii* (N Utah), *Navarretia saximontana* (Garfield Co.), *Phacelia argylensis* (NE Utah), *Potentilla holmgrenii* (Juab Co.), and *Suaeda linifolia* (N Utah). Send images or questions to Bruce at flora.id@wtechlink.us

Herbarium Days at Utah Valley University (Saturday, May 25): The UVU Herbarium is holding another series of volunteer days for mounting the backlog of plant specimens. The next herbarium day will be Saturday, May 25, in the new UVU herbarium facilities. The herbarium will also be hosting a Utah Valley Chapter meeting toward the end of the volunteer session. Plant mounting will take place in SB 277 in the new Science Building and run from 1 PM until 5 PM and the meeting will start around 4 PM. For the meeting, I will continue my education seminar series on difficult-to-identify Utah plant families. Parking: the visitor lot (behind the Student Center near the wolverine statue) is closed due to construction. The Lakeside visitor lot (at the south entrance past the traffic circle off University Avenue), and the lots between the UCCU events center and the library are recommended parking locations. For further information, please call me (801-863-6806) or email (alexanja@uvu.edu) - *Jason Alexander*

Purge Your Spurge: Saturday, May 4 (9 AM to 2 PM): The 7th annual Myrtle spurge purge will be held at the Salt Lake REI store at 3285 East 3300 South. Myrtle spurge is an invasive species in the foothills of the Wasatch Range. Bag your spurge and bring it to REI to get 5 free native plants in exchange, or volunteer to pull spurge at Grandeur Peak from 7:30-9:30 AM or Rattlesnake Gulch from 9:30-11:30 AM. For more information, go to http://www.purgeyourspurge.org/pdf/PurgePoster2013_web.pdf. Sponsored by Salt Lake County Weed Program, Salt Lake Conservation District, Salt Lake County Open Space, REI, Utah Native Plant Society, Great Salt Lake Resource Conservation & Development Council, Salt Lake County Watershed Planning & Restoration, Bonneville Cooperative Weed Management Area, and Cottonwood Canyons Foundation.

Utah Botany Foray, June 27-30: Join plant lovers and botanists to explore and botanize the Grouse Creek and Raft River Mountains of northwestern Box Elder County. Arrive on Thursday, June 27 and spend the next two days in the countryside and depart on Sunday, June 30. You are responsible for your own camping equipment, food (Saturday there will be a pot luck with the Intermountain Herbarium providing the main course), permits, and equipment. Please contact the herbarium if you will be attending and to get additional information.

Calochortiana Volume 2 Deadline Extended: The deadline for submissions for the second edition of the Utah Native Plant Society's annual technical journal, *Calochortiana*, has been extended from 30 April to 15 October 2013 to better accommodate potential authors and reviewers. The inaugural issue is posted on the UNPS homepage (www.unps.org). For more information on format and review requirements, potential authors should contact *Calochortiana* editor, Walter Fertig (walt@kanab.net). Volume 2 of the journal will come out in December 2013.

Chapter News, continued

Manzanita Chapter, continued: hanging gardens of Zion (featured in the March Segó Lily). ZCFI classes require enrollment with the field institute and there is a moderate fee.

This past March and April, Manzanita chapter members volunteered their time on research projects for the US Forest Service and The Nature Conservancy. At our March meeting, Angela Gatto of Kaibab National Forest gave a presentation on rare plant species of the North Kaibab Ranger District in northern Arizona and invited chapter members to assist in surveying populations of Fick's pincushion cactus (*Pediocactus peeblesianus* ssp. *fickeiseniorum*) and Kaibab pincushion cactus (*P. paradinei*). Both of these rare cacti are endemic to the Arizona Strip and are candidates for potential listing under the Endangered Species Act. Chapter members volunteered dozens of hours helping the Forest Service count plants at known sites and survey potential habitat for new populations.

On April 19, three chapter members joined Elaine York of The Nature Conservancy for a plant "bio-blitz" of the White Dome preserve south of St. George. Our intrepid team (below) documented 30 plant species and two lichens in the western half of the preserve. Although not especially species-rich, White Dome is significant for its populations of several rare and unusual species, including the dwarf bear poppy (*Arctomecon humilis*), which was in full bloom. - *W. Fertig*

Below: UNPS members at White Dome Bio-blitz Photo by Elaine York.



Unidentified Flowering Object



This month's UFO comes from the Mojave Desert and looks like a prickly cactus with big basal leaves. Or is it?

The March UFO was *Epilobium angustifolium* (a.k.a *Chamerion angustifolium*), in the evening-primrose family (Onagraceae) submitted by Bill Gray. Did you notice the differences in the size and color of the styles between different flowers?

Have a UFO to share? Send it in!

Salt Lake: Wednesday, May 1: Ty Harrison has worked for a number of years on restoration of the Jordan River riparian corridor. Dr. Harrison will provide an illustrated program titled "The Ecology of Riparian Restoration" at 7 PM at Red Butte Garden. The talk will address the following questions: Who killed the Jordan River? Why does the Jordan River need restoration? What is riparian restoration and how is it done? The successful planting of native trees and shrubs on the Jordan River Migratory Bird Reserve in South Salt Lake County to restore habitat for neotropical migrant birds will be illustrated and discussed.

Wednesday, June 5: Last year Joel Tuhy of The Nature Conservancy's Moab office concocted a delicious and very nourishing alphabet soup of Utah's native plants. This year his presentation is entitled "Wildflowers and Repeat Photos". This will be in collaboration with TNC and we may have to move to a bigger venue. For now, it is scheduled for the Salt Lake REI (3300 S and 3300 E) at 7 PM. - *Bill Gray*

Southwestern: On Monday, May 6, Becca Lieberg of Zion National Park will discuss the park's efforts to grow and reintroduce native plant species. The meeting will be at the Canyon Community Center in Springdale (126 Zion Blvd.) at 7 PM.—*Barbara Farnsworth*

Utah Valley: The Utah Valley hiking group will now be holding hikes on Wednesday mornings. We will start at 9:15 AM for the May 1st hike. We will be hiking in several areas in and around Rock Canyon looking for Segó lilies. If you are coming from University Avenue in Provo, turn west on 2230 N and head towards the mountains. There may still be a detour due to pipeline construction, but just follow the detour heading in a generally west direction onto North Temple Drive (2300 N) and continue west. The road heads south to the entrance of Rock Canyon Trailhead Park. We hike starting at the Utah Heritage Garden right next to the parking lot on the north. If you would like to be included on a list for weekly emails on other hikes, please contact me at celestegk@gmail.com or call 801-377-5918.—*Celeste Kennard*.

Fungus Flowers Fool Botanist

By Peter Lesica, adapted from *Kelseya*, newsletter of the Montana Native Plant Society, Spring 1998

Buttercups are usually the first flowers on the grassy hills around Missoula, Montana. They rarely occur on the stony ridgetops, but prefer the deeper soils of the slopes and flats. Often at this time of year my eye will fall on a yellow spot of color among the green foliage, and I'll bend over to see what it is, only to find it's not a flower at all. It's the right size for a buttercup, but it looks like a cluster of light yellow leaves covered with small crystalline pustules.

This plant is our common rockcress (*Arabis* or *Boechera holboellii*) in the mustard family. Rockcress usually produces long stems with numerous white flowers later in the spring. But this plant is infected with a rust fungus in the genus *Puccinia*. Infection of rockcress occurs in the fall, and the fungus grows in the host plant during the fall and winter, altering the buds that produce next year's growth. In the spring, the plant is stunted with numerous short leaves instead of a normal, tall flower stem. Near the tip of the stunted stem the leaves are clustered and yellow with the reproductive structures of the fungus. A sugary nectar and even a mild scent is produced by the fungus at the same time.

These yellow clusters of leaves that produce nectar are called pseudoflowers. Flies and sometimes even bees are attracted to these pseudoflowers, and these insects are required for sexual reproduction between different strains of the rust fungus occurring in the same area. Pseudoflowers serve the same function for the fungus as real flowers perform for plants; they affect mating. But since the fungus can't produce flowers of its own, it resorts to forcing its host to do the job for it.

But that's only part of the story. Barbara Roy studied buttercups and the buttercup-like pseudoflowers of rockcress where they occur together in Colorado. She found that more in-



Above: *Puccinia* fungus producing a false "pseudoflower" at the stem tip of a rockcress (genus *Arabis* or *Boechera*). Small yellow pustules on the infected leaf surfaces contain fungal spores that can be transported by flies to other plants. Photo by Peter Lesica.

sects visited the true buttercups when they were with rockcress pseudoflowers than when they were with other buttercups. And more insects visited the fungally-produced pseudoflowers when they were with buttercups. Each receives more insect visits when in the company of the other than by themselves. Roy found that buttercups produce a large pollen reward for visiting insects but have little nectar. On the other hand, the fungal pseudoflowers produce no pollen, but have copious nectar. Apparently the pollen and nectar rewards together are more attractive than

either alone. The more visiting insects, the more likely is successful mating for both buttercups and fungus. In this unlikely way, the buttercup and fungus help each other produce more offspring.

Nature sometimes makes strange bedfellows. The fungus can infect the hapless rockcress and fool the insects, but it won't fool me again ... at least until next year.

Reference:

Roy, B.A. 1994. The effects of pathogen-induced pseudoflowers and buttercups on each other's insect visitation. *Ecology* 75:352-358.

Giving Ute Ladies-tresses a Hand

Local Land Trust Purchases 30 Acres to Protect Threatened Orchid

The Bear River Land Conservancy (BRLC) has established the Mendon Meadow Preserve with 30 acres of farmland and pasture purchased in Mendon, Utah, that provides habitat for Ute ladies'-tresses (*Spiranthes diluvialis*), an orchid listed as Threatened under the federal Endangered Species Act.

Funding for the acquisition was arranged by the US Fish and Wildlife Service (USFWS) to mitigate for habitat lost during recent construction projects in northern Utah. The BRLC is the local partner for the USFWS to secure the property and implement a habitat management plan to protect the orchid.

According to Betsy Hermann, USFWS Utah Field Office, "prior to its 2008 discovery at this property, the orchid was not known to exist in Cache County. Conservation of the site will protect the population from future development. With private sector help, we can not only provide money to the Conservancy for acquisition but also provide for future



management of the property to protect this species."

A management plan is being developed by the Conservancy and the USFWS that will also further the Conservancy's mission of protecting agricultural lands. Hermann explained, "This orchid needs wetlands with short or sparse vegetation and plenty of sunlight. Proper agricultural management can help provide these optimal conditions."

Dave Rayfield, Chairman of the Board for the Conservancy explained, "Our mission includes protecting critical habitats, but we are also committed to conserving part of our rapidly disappearing agricult-

ural base." Paul Willie, a life-long resident of Mendon and also a member of the Conservancy's Board of Directors, noted, "this land has been farmed since pioneer times and we'd like to see it continue in a similar way."

Dr. Mark Brunson, Utah State University ecologist and chairman of the Conservancy's Stewardship Committee, noted that this preserve will not only protect and aid in recovery of this species, but it will also conserve habitat for other species. "As more agricultural operations are moving from flood to sprinkler irrigation, we are losing our wet meadow habitat, which is critical for other species including wading birds and amphibians. It's important to protect lands for a wide range of habitat values and this parcel does that."

The Bear River Conservancy encourages interested residents to join as members of the organization. Rayfield noted, "We have already completed three significant projects and others are in the works. If we are to conserve these critical lands for posterity, we need help from the community. All hands are welcome!" - *Bear River Land Conservancy*



Above and left: Close up views of the inflorescence and individual blossoms of Ute ladies-tresses (Spiranthes diluvialis). This rare orchid has been listed as Threatened under the US Endangered Species Act since 1992. All or part of at least 20 populations of Ute ladies-tresses are protected or actively managed across its range, which extends from southern British Columbia and northern Washington to southwestern Montana, eastern Idaho, eastern Wyoming, western Nebraska, central Colorado, southern Utah, and eastern Nevada. Photos by Tony Frates.

UNPS Helps Fence Ute ladies'-tresses Population in Salt Lake County

Last year Blake Wellard, a graduate student at the University of Utah, discovered a small population of Ute ladies'-tresses orchid (*Spiranthes diluvialis*) growing in an interesting spring-fed wetland in the Mill Creek township of central Salt Lake County. The orchid is on the US Endangered species list and federally protected. The property is owned by Salt Lake County and is used as a flood detention basin called Hill View Basin and has been targeted for preservation and public interpretation. The wetland has been leased for an unknown number of years to horse owners for grazing. The rare orchid was found growing together with a variety of other increasingly rare (in Salt Lake County) native wild flowers like the annual Indian Paintbrush (*Castilleja exilis*), Sea Milkwort (*Glaux maritima*), Great Basin Centaury (*Centaureum exaltatum*), Nuttall Sunflower (*Helianthus nuttallii*) and Salt Spring Checkerbloom (*Sidalcea neomexicana*).

After a meeting with representative from the U.S. Fish and Wildlife Service and Salt Lake County Parks and Recreation at the discovery site, we guessed that the persistence of the orchid may be related in some way to the disturbance by grazing horses in this permanent, spring-fed wetland. However there was evidence that the horses were eating many of the flowers of the wetland plants as well as the orchids. The orchids and dicots are also found "hiding" around scattered but thorny Russian Olive saplings, which are invading the wetland. The flowering orchids were temporarily protected by heavy duty tomato cages in the summer and fall of 2012. An emergency grant from the Utah Native Plant Society paid for material to build a temporary fence around the identified population of approximately 8-10 plants. The fence was finished in April of 2013 and enclosed an area of approximately 800 square yards. We thought that this would be enough to get an accurate count dur-



Above: UNPS members and volunteers Larry England (left), Ty Harrison (center), and Amy Defreese (right) installing barbed wire for an enclosure to protect a population of the Threatened Ute ladies'-tresses orchid in Salt Lake County. The Russian olive at left was later cut down by Blake Wellard using a hack saw. Below: the seasonally flooded wetland site being fenced. Photos by Tony Frates.

ing the 2014 growing season in the absence of grazing.

Future plans include using UNPS volunteers to help kill the invading Russian Olive trees using a new E-Zject herbicide injection system which Salt Lake County Parks has purchased. It will be used at the Hill View Basin this spring to test the methodology. We have developed a species checklist for the site which

can be made available on request, and will be eventually published. An ecological assessment of the site including the hydrology will be done this summer, and recommendations on management and stewardship will be given to Salt Lake County Parks and the local U.S. Fish and Wildlife Service who have been helping with the project. - Ty Harrison



Highlights of the 2013 Utah Rare Plant Meeting

By Walter Fertig

On March 5, the Utah Native Plant Society and Red Butte Garden hosted the annual Utah Rare Plant meeting. Despite the looming government sequester, over 50 botanists from across Utah and the west were in attendance to hear presentations by 16 researchers.

Jena Lewinsohn of the US Fish and Wildlife Service opened the meeting with a report on conservation efforts on behalf of the Autumn buttercup (*Ranunculus aestivalis*). This federally listed species is restricted to the Sevier River Valley near Panguitch, Utah. The Nature Conservancy purchased one of two known buttercup sites in 1988. Despite protection, this population declined to just 18 plants in 2006. Starting in 2007, TNC and USFWS began reintroducing plants raised from tissue cultures by the Cincinnati Zoo and Flagstaff Arboretum. Unfortunately, long-term survival of the transplants has been low due to herbivory by voles. Another transplant is planned for 2013 with plants to be caged and part of the preserve grazed to reduce competition with other plant species.

Tony Frates, chair of the UNPS conservation committee, gave an overview of the taxonomy, life history, and pollination biology of Wasatch fitweed (*Corydalis caseana* var. *brachycarpa*). This variety occurs only in northern Utah, where it is restricted to stream banks and steep slopes on glacial deposits, primarily in canyons along the Wasatch Range. The distribution of this rare species may be limited in part by the availability of pollinators. The primary pollinator appears to be a long-tongued bumblebee (*Bombus flavifrons*) that has a body size and tongue length suited for the unusually shaped *Corydalis* flower. Smaller-tongued bees, however, are able to drill a small hole at the base of the flower to steal nectar without pollinating the blossom. Conservation of the native insect pollinators may be as important as protecting habitat



Above: *Kelsey's milkvetch* (*Astragalus kelseyae*), a recently described Utah endemic named for University of Utah herbarium manager Ann Kelsey, was added to the UNPS rare plant list in March 2013 as a species of Extremely High conservation concern. Photo by Steve Hegji.

to ensure the survival of Wasatch fitweed.

Hope Hornbeck of the consulting company SWCA gave a summary of monitoring work being done for the Pariette and Uinta Basin hookless cacti (*Sclerocactus brevispinus* and *S. wetlandicus*, respectively), two federally Threatened species endemic to the Uinta Basin. The main objectives of the project are to determine population growth rates, quantify habitat features, and determine if population trends are related to oil and gas development and climate change. Results from 2012 suggest that annual reproductive success varies widely but may be influenced by climate. Additional monitoring work is planned for 2013 as well as efforts to remap populations not observed since 2004.

Rita Reisor of Red Butte Garden discussed her own work on monitoring the survival of transplanted *Sclerocactus wetlandicus* plants in the Uinta Basin. Over 200 cacti have been transplanted at 149 sites since 2011 to protect them from damage by road construction and mineral exploration. Just 4% of the transplants died in 2012, although most were shorter or smaller compared to control populations. Rita also briefly described efforts by

Red Butte to reintroduce Gierisch's globemallow (*Sphaeralcea gierischii*), a candidate for potential listing under the ESA, at a reclaimed mine site in northern Arizona.

Blake Wellard, a graduate student at the University of Utah and peripatetic student of the state's flora, gave a presentation on his studies of Parry's sandpaper-plant (*Petalonyx parryi*) in the St. George area. This rare gypsophilic subshrub is threatened by habitat loss from development, mining, OHV recreation, competition from cheatgrass, and fire. Blake described surveying for *Petalonyx* using binoculars and finding the shrubs easy to see in the late afternoon light due to the reflection off their shiny leaves.

Robert Fitts, botanist with the Utah Natural Heritage Program, followed with a short summary of recent field surveys of several rare Utah plant species. These species included *Sphaeralcea gierischii* (ca 4000 plants observed south of Round Valley near the Arizona state line), *Astragalus sabulosus* var. *sabulosus* (ca 2100 plants in the Cisco Desert north of Moab), *A. sabulosus* var. *vehiculus* (ca 2000 plants north of Courthouse Wash near Moab), *A. iselyi* (nearly 3000 plants in the foothills of the La Sals), *Eriogonum domitum* (368 in-

dividuals at two sites in the House Range), and *E. mitophyllum* (ca 3700 plants on Arapien Shale south of Interstate 70 and threatened by gypsum mining). Robert also announced that the state heritage program is now affiliated with Utah State University.

Juli Baker of Utah State described research on the physical and biogeochemical characteristics of soils occupied by the Endangered Shrubby reed mustard (*Schoenocrambe* or *Hesperidanthus suffrutescens*). This Uinta Basin endemic occurs primarily on shallow, rocky, silt loam soils within shale beds of the Green River Formation and avoids more widespread sandstone beds. Detailed information on soil characteristics favored by Shrubby reed mustard will help conservationists develop more precise habitat models for the species.

Utah Valley University Herbarium curator Jason Alexander spoke about his work on developing an online checklist and flora of the Mojave Desert region of California, Nevada, Arizona, and Utah. When completed, the digital database will include links to distribution models and selected herbarium vouchers, and tips on identification. Jason also briefly discussed his efforts to apply morphometric analysis and digital images to the identification of problematic specimens of *Yucca*, just as others have done for keying cacti in the field.

Botanical consultant Dorde Woodruff discussed her research on Blaine's fishhook cactus (*Sclerocactus blainei*) in western Utah. When first described as a species in 1985 by Stan Welsh (and named for his son, Blaine), *S. blainei* was only known from eastern Nevada. It is presently known from at least 11 sites in Utah, primarily in Beaver and Iron counties. In vegetative condition, Blaine's fishhook cactus can be mistaken for a dead clump of bunchgrass, which may explain why it was overlooked for so long in Utah. The species is closely related to *S. spinosior* and can hybridize with other *Sclerocacti* where their ranges overlap.

Michael Piep of the Intermountain Herbarium spoke about the limited state of knowledge on the distrib-

ution and abundance of fungi species in Utah. Presently 1187 fungi taxa are known from the state, but nearly 60% of these are based on a single herbarium record. Nearly three-quarters of the known Utah species are microscopic, making it difficult to assess their status. Some specialists suggest that there are 3-10 fungus species for every vascular plant species. If true, fungal species richness in Utah could be 10500-35000 species. Due to a lack of taxonomists specializing in fungi, only 10-15% of all known species have been named.

Leigh Johnson of Brigham Young University gave a presentation on Mussentuchit gilia (*Aliciella tenuis*), a cryptic endemic of the San Rafael Swell in central Utah. Based on genetic analysis, Leigh has documented at least four distinct nuclear genome clades within the seven main populations of *A. tenuis*. This unexpected variability may be due to past introgression with other *Aliciella* species, including a possibly extinct or undiscovered taxon that has contributed a distinct set of genes.

Loreen Allphin Rapier, also of BYU, gave an update on her long-term genetic research on the complicated phylogeny of rockcress mustards in the genus *Boechea* (formerly included in *Arabis*). Hybridization, polyploidy, and asexual reproduction are rampant in this rapidly evolving group, making species determinations difficult. Microsatellite DNA studies are helping to tease out the diversity among species. Nearly 1/3 of the 109 *Boechea* species recognized in the *Flora of North America* are of conservation concern based on their small geographic ranges and low numbers. This includes a number of local endemics from Utah, such as *B. falcatoria*, *B. duchesnensis*, *B. goodrichii*, *B. perennans* var. *thorneae*, *B. vivariensis*, and at least one unnamed species.

Keeping with the mustard theme, Utah Valley University botany professor Jim Harris discussed his work on *Draba* species of the Deep Creek Range in western Utah. This range

has a mixture of igneous and calcareous strata and includes foothill, montane, and alpine habitats. Due to this diversity, the Deep Creeks contain 11 species of *Draba*—one more than the entire Uinta Range (which is 7 times larger). Several rare species occur in the Deep Creeks, including the endemic *D. kassii*, and two Nevada species recently discovered in Utah: *D. pedicellata* and *D. pennellii*.

Paleobotanist and Garrett Herbarium curator Mitch Power spoke about the utility of herbarium collections for studying changes in flowering times due to climate change. Temperatures in 2012 were the hottest on record and were 3.2 degrees warmer than average. Carbon dioxide levels in the atmosphere are now 400 ppm and the southwestern US has 21 more frost free days than it used to. Changes in climate are likely to increase drought, fire frequency, and the severity of storms. Historical and contemporary herbarium specimens can be used to gauge shifts in phenology that may be tracking climate changes and which may in turn alter ecological relationships. Much work has been done on phenology changes in the eastern US, Europe, and Africa, but more research is needed in the Great Basin and Colorado Plateau.

Ron Bolander of the Utah BLM gave a short summary of survey projects for several BLM Sensitive or federally listed plant species, including *Asclepias welshii*, *Cycladenia jonesii*, *Townsendia aprica*, *Penstemon pinorum*, *P. franklinii*, and a suite of Frisco Mountain endemics.

I wrapped up the meeting with a brief summary of revisions to the UNPS rare plant list. The rare plant committee met the previous day and reviewed 35 species, of which 14 had a change in status. Changes included adding *Astragalus kelseyae* and *Eriogonum mitophyllum* to the Extremely High priority list and *Eriogonum domitum* to the High priority list. Overall, there was a net increase of three species on the UNPS list.

Thanks to all the presenters and attendees for making the meeting successful, and to Red Butte Garden and UNPS for hosting the event.

Utah Botanica:

Odds and Ends from the World of Utah Botany

Alert Park Employee Discovers New Weed Species for Utah in Zion National Park: Dan McConnell, a biological technician for Zion National Park, was botanizing near the park's employee housing area in early April, 2013, when he observed a mat-forming, yellow-flowered, annual legume with small, bur-like fruit pods growing along the edge of a parking area. McConnell collected a sample for Zion's resource management herbarium and tried to key it using the park flora, but recognized it was something new. Using the internet, Dan identified his specimen as Bur-clover (*Medicago minima*), an exotic species native to the Mediterranean, but escaped in California and the southern United States. Dan sent me a high-resolution photo (below) and asked me what I thought. Based on the bur-like fruit, pubescence on the stem and leaves, and stipule features, the specimen matched the description of *M. minima* from the *Jepson Manual* of the flora of California. Thanks to Dan's sharp eyes, Utah has a new weed species!



Above: *Medicago minima* specimen, collected and photographed by Dan McConnell.

Medicago minima superficially resembles Black medick (*M. lupulina*) but differs in having spiny, bur-like, fruit. It will key to *M. polymorpha* in *A Utah Flora*, but is more hairy overall and has entire to shallowly toothed stipules, (*M. polymorpha* is nearly glabrous with deeply divided stipules). *Medicago arabica*, another weedy species found in northern Arizona, is also similar, but has a distinct reddish spot on each leaflet.

So far, Bur-clover is only known from Zion National Park and Washington County in Utah. Unfortunately, the weedy species is apparently widespread within the park in the visitor center and campgrounds, and up Zion Canyon near Zion Lodge. It has probably been in the park for several years at a low population density and is only now spreading and increasing in numbers.—*W. Fertig*



Above: BLM state botanist Ron Bolander (center) receiving the Linda Siebert Career Achievement Award. BLM photo.

BLM State Botanist Receives Career Achievement Award: Utah Bureau of Land Management state botanist Ron Bolander was recently presented with the Bureau's Linda Siebert Career Achievement Award at the 2013 North American Wildlife and Natural Resources Conference in Washington, D.C. Ron was recognized for his nearly 40 years of service to the BLM, most of it spent as the program lead for the Utah BLM's Threatened and Endangered Species and native plant programs. Among his accomplishments have been working on species recovery efforts for the Utah prairie dog, Wright's fishhook cactus, Dwarf bear poppy, and balancing OHV recreation and protection of Welsh's milkweed, the Coral Pink Sand Dunes tiger beetle, and wilderness values on BLM and state park lands in southern Utah.

More Trouble for Pinyons: As if our pinyon pines weren't already in enough trouble from habitat destruction, drought, wildfire, and infection from various disease agents, such as engraver beetles (genus *Ips*), pinyon tip moths, pinyon pitch borers, needle cast (from the fungus *Elytroderma deformans*), root rot fungus, and black stain root disease, a new malady appears to be affecting pinyons this spring throughout southern Utah and northern Arizona. Small pinyons, especially those under 5 feet tall, are turning brown from Pinyon needle scale (*Matsucoccus acalyptus*), a native, sap-sucking insect pest. Large infestations of needle scale cause older needles to turn yellow or brown and die. If too many needles are lost the entire tree can succumb, or be weakened and attacked by other pathogens.

Scale insects hatch in early June from cottony egg clusters laid around the root crown, in crotches of large branches, or in bark crevices. Immature "crawlers" head towards year-old needles, insert their hair-like feeding tubes, and secrete a black, wax-like coating for protection



Above: Sapling Two-needle pinyon outside of Kanab, Utah, infested with Pinyon scale insects on older foliage. Photo by W. Fertig, April 17, 2013.

—all on their first day of life. Female scale insects remain immobile until they reach maturity the following April, at which time they emerge from their wax shell, mate with winged males, and then lay a new generation of eggs.

Needle scale outbreaks may be correlated with long-term drought. Besides potentially removing an entire cohort of small pinyons, herbivory by scale insects can impact the microclimate surrounding affected trees. A recent study by A.T. Classen and colleagues from North-

Below: Five foot tall Two-needle pinyon on the Paria Plateau infested by Pinyon needle scale. Photo by W. Fertig, April 2013.



ern Arizona University found that scale insects reduced the leaf area index of infested trees by 39%, which in turn resulted in less crown interception of precipitation, higher soil moisture levels, and increased temperatures below trees. These effects may mimic potential changes associated with regional-scale climate change and could affect the species composition of the forest understory.

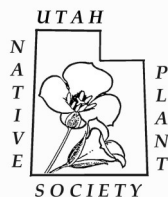
Homeowners can protect individual trees by removing and discarding the cottony egg masses by hand or with a garden hose. Trees that are infrequently but deeply irrigated tend to be less susceptible to scale. Pesticides can be applied to egg masses before they hatch, but needles should not be sprayed directly. Trees intended for nut production should also not be sprayed. - W. Fertig



New St. George Interchange Honors Native Plant:

While recently driving to the White Dome Preserve on the Southern Parkway south of St. George, I was surprised to see a new road sign acknowledging the largest genus in the pea family (Fabaceae or Leguminosae) in Utah. Of course I had to stop and snap the picture above. The interchange presently leads to nowhere, although industrial or residential development was probably planned before the 2008 recession began. In fairness to the Utah Department of Transportation, Astragalus Drive does not occupy habitat of the endangered Holmgren’s milkvetch (*Astragalus holmgreniorum*, in fruit in bottom photo), which is found on nearby SITLA and BLM lands. The Nature Conservancy is working with the state agencies to protect some habitat of this species in the vicinity of Interstate 15. - W. Fertig

Utah Native Plant Society



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If you have a smart phone you can now access the UNPS website via the QR at left. If none of this makes sense to you, just stare at the image and see if you can find the pony. At the UNPS website you can access the *Sego Lily* in living color, download previous issues, read late breaking UNPS news, or buy wildflower posters, cds, and other neat stuff at the UNPS store.

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