



Sego Lily

Newsletter of the Utah Native Plant Society

May-July 2014
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Winged sandpuff (*Tripterocalyx carneus* var. *wootoni*) is a pink or white-flowered annual in the Four o'clock family (Nyctaginaceae) found in sandy desert shrub communities of southern Utah south to Mexico and Texas. Technically its flowers are comprised of five petal-like sepals and true petals are absent. Despite its showy appearance, this species is infrequently collected, suggesting that numbers may be low most years. Photographer Ty Harrison captured this image in April 2014 north of Ticaboo, near Glen Canyon National Recreation Area. See the article starting on page 8 for more about the remarkable bloom of winter annuals this year in southern Utah.

Utah Native Plant Society



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Sego Lily Editor: Walter Fertig (waltola64@gmail.com). The deadline for the August *Sego Lily* is 25 July 2014.

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Utah Native Plant Society Chapters

Unidentified Flowering Object

This month's UFO comes from frequent contributor Steve Hegji. This small herbaceous species from the mountains of northern Arizona is one of the first plants to emerge from snowbanks and frozen soils in the spring but then disappears from view by the time most other early spring wildflowers appear. As a result, it seems rarer than it probably is. Can you identify it?

The March Unidentified Flowering Object was *Fendlera rupicola*, submitted by Lee Hughes.

Have a UFO to share? Send it in! - *W. Fertig*

In Quotes: "Plants can survive without us, but without plants we would be toast" Neil deGrasse Tyson, *Cosmos*, 2014.

Bulletin Board

2014 Utah Native Plant Society Scholarship Winners: In May, the Utah Native Plant Society board voted to award research scholarships to three deserving candidates. Jeffrey Rose of the University of Wisconsin-Madison received \$500 for his work on cryptic speciation in the genus *Polemonium* in the western United States. Robby McMinn of Wichita State University was given \$500 for his study comparing the population genetics and demography of a wide-ranging native thistle (*Cirsium canescens*) and a narrow endemic (*Cirsium ownbeyi*, known only from NE Utah, SW Wyoming, and NW Colorado). Dr. Wayne Whaley and Dr. Jason Alexander of Utah Valley University were awarded \$600 for their research on an undescribed variety of *Lomatium grayi* and the interaction between different varieties of this umbel and the caterpillars of different subspecies of *Indra* swallowtail butterflies. Look for results from these studies in future issues of the *Sego Lily*.

The UNPS scholarship and small grants program is funded through donations by UNPS members and from sales of UNPS merchandise on our online store. The deadline for the next awards is August 15, 2014. To learn more about the program or to submit an application, go to the UNPS homepage (www.unps.org) and follow the programs link.

New Publication Schedule for *Sego Lily*: After many years of being a bimonthly publication, the *Sego Lily* is becoming a quarterly newsletter, starting with this issue. New issues will appear in February, May, August, and November to coincide with each of the four seasons. This change will help your umbel editor lead a more well-rounded life, much to the appreciation of Mrs. umbel editor. UNPS will continue to publish its technical journal, *Calochortiana*, on an annual or biennial basis, depending on the quantity of submissions. Issue 2 of *Calochortiana* will be available in the late Fall of 2014. As always, reader submissions to the *Sego Lily* are welcome and greatly appreciated!

Cedar Breaks Wildflower Festival: The 8th annual Cedar Breaks Wildflower Festival will take place from July 5-July 20, 2014 at Cedar Breaks National Monument, high atop Cedar Mountain east of Cedar City. Volunteer wildflower experts (including Doug Reynolds, back in Utah again after several years of exile in Massachusetts) will lead daily hikes at 10 AM and 1 PM, leaving from the Monument entrance station/visitor center. Additional wildflower activities and classes with the Zion Canyon Field Institute are planned for the weekends. For more information, call 435-586-0787.

Volunteer Opportunities in Salt Lake and Summit Counties: Residents of the Holladay/Millcreek/Murray areas of Salt Lake County interested in native plant restoration, monitoring, surveying, planting or weeding projects are urged to contact Tony Frates (unps@unps.org, or call 801-277-9240). We are working with Salt Lake County in connection with various natural spaces including Big Cottonwood East (Big Cottonwood Regional Park), Woodstock, Olympus Hills Park and others. Hikers, dog walkers, runners, mountain bikers, flower lovers, music lovers, gardeners, and weed warriors alike are all welcome.

Volunteers are also needed in Summit County (Park City area mainly). Summit Lands Conservancy, <http://www.summitlandconservancy.org>, has asked us to help them in walking some of their properties and making plant checklists this summer, and potentially becoming involved with other projects. If interested contact Tony Frates (unps@unps.org, or call 801-277-9240).

Have a botanical meeting or chapter event to publicize? Send announcements to the editor.

A Tale of Two Sileris

Pediocactus sileri, (Gypsum Cactus) and *Sclerocactus sileri* (House Rock Cactus), two different but often-confused rare cacti

By Dorde W. Woodruff



Left: *Pediocactus sileri* extends from the Arizona Strip into Utah near St. George and Kanab.
Below: *Sclerocactus sileri* grows on the Paria Plateau and vicinity in northern Arizona.
Bottom: Flowers of *Sclerocactus sileri*. Top photos by Gerhard Haslinger; bottom photo by Dorde Woodruff.



Pediocactus sileri is quite reminiscent of the common *Pediocactus*, *P. simpsonii*, with its round body that sits on the soil, short stiff spines, and relatively small yellow flowers; both can get quite massive.

Sclerocactus sileri has a slightly-depressed globose body that is partly underground, and narrow, ascending flowers, both typical of the small species of the genus. The *Pediocactus* has only straight spines, while the *Sclerocactus* has a long, white, hooked lower central spine. It does not get nearly as large as the *Pediocactus*. Flowers are white, pale pink, or pale yellow. (Colors are a little distorted in my 1966 Agfachrome slide shown at right.) Like other small species of *Sclerocacti*, if *S. sileri* is introgressed with the larger, taller, *S. parviflorus*, it will get to be short-cylindric in body shape.

The House Rock Cactus hasn't yet been reported from Utah, though it has now been found



on the Paria Plateau just a couple of miles south of the Utah part of the plateau. Volunteer crews from the Grand Canyon Trust did a vegetation survey of the Paria Plateau resulting in many more locations for this cactus.

Not only do they look quite different, but the Gypsum Cactus grows in desert shrublands in the gypsiferous soil of badlands. The House Rock Cactus typically grows in the red sandy soil of desert grasslands, or in bare soil under Pinyon-Juniper.

Causes for Confusion between these two species:

The frequent confusion of the two is in the literature, not the plants. How does this mix-up happen?

1. The same specific epithet, *sileri*, named after pioneer rancher, lawyer, and plantsman in "upper Kanab," A. L. Siler, who collected the specimens used as types. All of his specimen locations were given only as "Southern Utah". Before surveying, the exact location of the border with Arizona was not known.
2. Occurrence in the northernmost part of the Arizona Strip, near the border, or minimally into Utah. In the same general region though about 20 miles apart.
3. An ill-advised 1972 publication placing *Sclerocactus* into *Pediocactus*, not accepted by knowledgeable authorities, but having to be carried in synonymy.

People who don't know cacti well enough succumb to errors in the literature. Errors get carried on frequently – especially with the easy copying provided by the Internet. Somehow, even Edward F. Anderson who did work with cacti, confused the two in his 2001 book *The Cactus Family*, p. 629, where he describes *Pediocactus sileri* under the name *Sclerocactus sileri*. Arp placed *Sclerocactus* into *Pediocactus*, not *Sclerocactus* into *Pediocactus*. Even the online Atlas of the Plants of Utah had the map of *Pediocactus sileri* posted under the name of *Sclerocactus sileri*. This has now been fixed.

The 1972 publication (The World According to G. Arp)

Gerald Arp's paper in the *Cactus and Succulent Journal* was published in 1972. I met him at the First International Congress of Systematic and Evolutionary Biology in Boulder, Colorado, in August of 1973. His resources for this computer-

generated research were documents and specimens. At that time these two genera were not yet well understood, and of course publication lags behind research. He said his specimens were all sterile; taxonomists do not consider this definitive.

Arp worked only in Colorado at that time. But *Sclerocactus* extends from California to Texas, and *Pediocactus* extends from Washington, Idaho, and Montana to Arizona and New Mexico, with a few outliers in the prairie a little to the east.

I also talked to one of the two editors of the *Cactus and Succulent Journal*. He said they had pondered over whether to publish this, more than anything else, ever, and after they did, they regretted it

Once something gets into print in a proper journal, it has status. Some ill-considered papers cause more trouble than others. No reputable authority has accepted this one. Only the European, Halda, has gone along with it. His work exhibits extreme lumping, as he coalesced 14 different genera (currently accepted or not) into *Pediocactus*.

I believe Arp had good intentions, but he certainly used inadequate information. I expect he got carried away with this new tool, computers.

Distribution of *Pediocactus sileri*

In spite of Siler's usual location of only Southern Utah, *P. sileri* does have specific type localities. Engelmann's correspondence with Siler, before his 1896 publication of this species, is preserved in the Archives of the Missouri Botanical Garden (not available on the Internet yet). So that must be where the type locations came from. For some reason, maybe just because Pipe Springs was well-known and Cottonwood Springs was not, Cottonwood Springs as a type locality of the *Pediocactus* fell out of use. In those days springs were named in the plural, though now the singular is generally used. In recent decades only Pipe Spring was known as the type location. Looking for "Cottonwood Spring" in Mohave County, Arizona, of the 13 of them it's likely that the Cottonwood Springs designated by Engelmann is the one not far northwest of Fredonia. Specimens have been collected near there.

Even in 1922 the exact location of the border was evidently not known. In *The Cactaceae*, when Britton and Rose segregated the plant into the monotypic genus *Utahia*, they wrote, "Named with reference to its type locality in the state of

Utah.” Lyman Benson then placed it in *Pediocactus* in 1961.

For years a location in Utah was sought, and finally found. Distribution stretches from south of St. George down into the Arizona Strip, eastward to the area around Pipe Spring, continues on to the Fredonia area, then northward to around Kanab and to a few miles east, south of US 89.

Distribution of *Sclerocactus sileri*

By 1963, the House Rock Cactus was known to Phoenix area cactophiles. I met Rod McGill at the Desert Botanical Garden, and he told me where to find it and several other rare cacti of the area. In the spring of that year I found it a few miles north of the highway, next to the House Rock road. I gave a plant to Benson, who made a specimen of it.

Then *S. sileri* was found in more places, both east of the road in the rolling, sandy area at the foot of the Vermilion Cliffs, and west of the road in grassland, P-J, or desert shrubland. The farthest east location in lowlands is near the Cliff Dwellers lodge, where it is scarce. It was then found on the Paria Plateau, and in a few places on the mostly steep terrain below the rim.

Sclerocactus sileri had 9 known herbarium specimens, plus several duplicates, and 12 known locations from European cactophiles. Then between 2009 and 2013 volunteers from the Grand Canyon Trust’s vegetation survey of the Vermilion Cliffs National Monument added 27 specimens or photo vouchers and 30 observations, reported online on SEINet, the Southwest Environmental Information Network, and on the Intermountain Region Herbarium Network at USU. It is information from this survey that reduced the known distance between the two *sileris* to about 20 miles. Also it led to other knowledge about this previously-poorly-known cactus.

Is *Sclerocactus sileri* a Utah plant? We have more information now to think it probably is, in a minor way. The recent survey found two places on the Paria Plateau not much more than 2 miles south of the small, northern, Utah portion of the plateau. There is no reason to think it stops at the border. But parts of the plateau are very sandy. People have gotten stuck in the sand; consequently fewer people go where it is especially sandy. The northern part is not only remote but very sandy, which makes accessing the Utah part of the plateau difficult.



Above: *Pediocactus sileri* Photo by Daniela Roth

In addition to their work on the plateau and in the canyon of the Paria River just east of it, the survey found a few *Sclerocactus parviflorus* including one north of the river canyon almost in Utah. From a photo of the latter, it appears to be introgressed with *S. sileri*. If so, other plants of *S. parviflorus* just north of the border in that area would likely also be introgressed with *S. sileri*, another small presence of the House Rock Cactus in Utah. The UNPS cactus research team will be checking this out.

Nomenclature problem in *Sclerocactus sileri*

In 1969 Benson published *Sclerocactus sileri* in his 3rd edition of the *Cacti of Arizona*, probably wanting a name so he could include it in the book. He commonly named new species after the person who collected the type, had given him the plant, or told him about it. He appreciated the help of local people, and respected their work.

As usual, Siler had given the location of the specimen Benson used for the type only as Southern Utah. Since Siler by then was long gone, Benson no longer had the option that Engelmann had, of corresponding with Siler. Benson must have

thought it reasonable that the specimen was the House Rock Cactus, since it grows not that far from the Kanab area where Siler lived.

Now that photos of specimens may be easily received by email instead of having to visit an herbarium, I obtained a photo of this type specimen. After my long period of research on *Sclerocactus*, carried on to various degrees since 1960, I knew this was not the House Rock Cactus. It is the related *Sclerocactus blainei*. Although the House Rock Cactus does become spinier with age, there is no *Sclerocactus* other than *blainei* with a mass of spines such as exhibited by the specimen.

Fortunately, we had seen Fred White's Cedar City plants, which he brought to a UNPS meeting in 2006, a spinier variant of *S. blainei*. Fred's webpage from the time of discovery is still online at www.cactus-art.biz/schede/SCLEROCACTUS/Sclerocactus_spiniosior/Sclerocactus_spiniosior_blainei_Iron_Co_UT/Sclerocactus_spiniosior_ssp_blainei_Iron_Co_UT.htm. (Of course, as on many websites, the name of the taxon has not been updated.)

Siler probably didn't have much local opportunity for practicing his law profession, and he traveled frequently over to Beaver for court. It's reasonable to assume, since he would have always been looking for new plans to sell in his alternate occupation of plantsman, that he went through

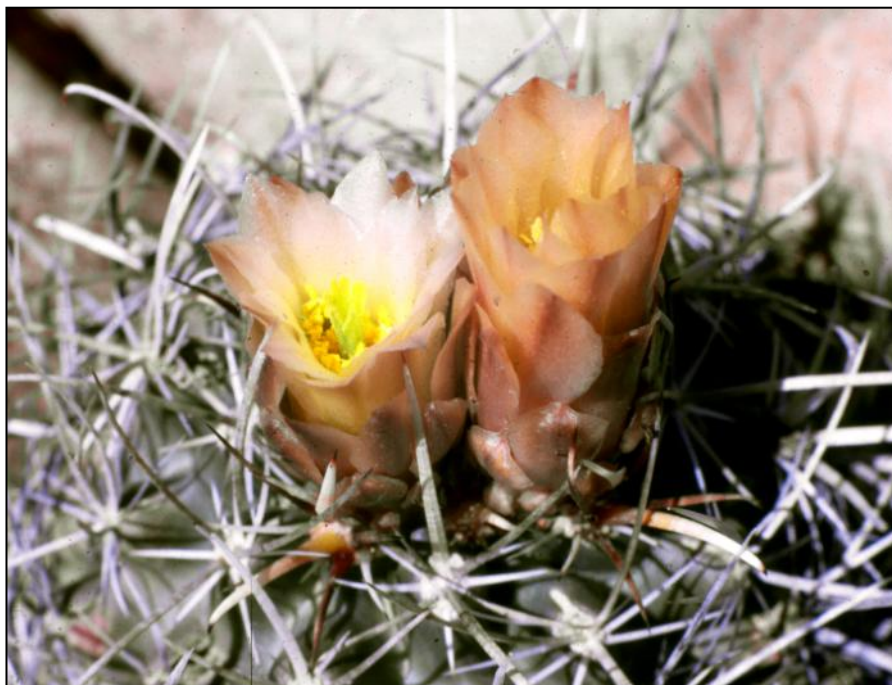
Cedar City and saw this variant of *Sclerocactus blainei*, from which he evidently made his specimen. They probably were more abundant then and thus easier to find, since all *Sclerocactus* have greatly declined due to various anthropomorphic activities.

It is ironic that these two plants in the same general area are, in part, widely confused by having the same specific epithet, and one of them is a misnomer. With this specimen not really representing the House Rock Cactus, there was no valid reason to name it after Siler.

A new type will have to be designated. The preferred nomenclatural practice is to conserve the name, with the new type. A paper must be written for the journal *Taxon*, then conservation of the name is voted on by the committee of the International Association of Plant Taxonomists. If they deny this, the plant may be given a new name to go with its new type. As much as it would help the confusion problem, it would be disruptive to have to change the specific epithet on documentation of the taxon.

If you should encounter *Pediocactus sileri*, *Sclerocactus sileri*, or both, in your work, I hope you now know (if you weren't acquainted with this problem before) to look carefully at mentions of these two, and make sure that the usage is correct.

More on the now-much-better-known, interesting species, the House Rock Cactus, to come....



Above: *Sclerocactus sileri* Photo by D.W. Woodruff

Winter Annuals Go Wild in Southern Utah

Text and photos by Ty Harrison, Emeritus Professor of Biology, Westminster College



Like so many discoveries in botany and science, serendipity (being in the right place at the right time) plays an important role. After a winter and long spring of “cabin fever” here in Northern Utah, I recently took off for a spring trip to Southern Utah, much as I remember doing as a botany student at the University of Utah over fifty years ago. I had forgotten how wonderful the spring flora of Southern Utah was, especially after some critically spaced fall storms.

While botanizing in the Cane Spring Desert area of southeastern Garfield County and Eastern Kane County, and in the Bullfrog area of the Glen Canyon Recreation Area north of Lake Powell, I witnessed an unusual winter annual flowering event. A friend, Gary Shields, who has been going there for 50 years, said that he has seen nothing like it. On April 26-29, 2014 a number of species were in flower on the Entrada sand dunes of the Hansen Creek Wash area north of Bullfrog. The sand

Above: Massive flowering of Oenothera albicaulis at Bullfrog Marina in April 2014.

dunes around the Bullfrog Marina area were covered with the White-stemmed Evening Primrose (*Oenothera albicaulis*) and blue/purple blossoms of the Notch-leaf Scorpion Weed (*Phacelia crenulata*). Based on flooding evidence along nearby Hanson Creek, the area had received some significant precipitation in the fall or winter of 2013. The rainfall was sufficient to germinate large numbers of dormant seeds and, in addition, the dunes were covered with a thatch of what I assumed was dead Six-week Fescue (*Vulpia octaflora*) which had matured in the fall and died over the winter.

An unstable Entrada sand dune field, 0.7 miles west of Highway 276 between mile marker 24 and 25, two miles north of Ticaboo, was dominated by Green ephedra (*Ephedra viridis*), Blackbrush (*Coleogyne ramosissima*) and Galleta or Curly

grass (*Hilaria jamesii*). Here I counted a population of 60 flowering Wooton's sand verbena or Winged sandpuff (*Tripterocalyx carneus* var. *wootonii*) plants. Walt Fertig had to correct my mis-identification of the plant as a pink-flowered *Abronia*. But a look at the fruit with its characteristic, translucent, triple wings, for which the genus is named, clearly identifies the species and distinguishes it from *Abronia*. It is a sand dune species found only in Garfield, Wayne and San Juan Counties of Utah. Its distribution extends to eastern Arizona, one county in southwest Colorado, western New Mexico, El Paso County in eastern Texas, and in the Samalayuca dune field south of Juárez in Chihuahua, Mexico (<http://museum2.utep.edu/chih/gardens/plants/TtoZ/tripterocalyxcarnea.htm>). The southern Utah distribution is at the northwestern limit of the species in North America. I'm not sure how variety "*wootonii*" differs from the species. The Flora of North America lumps *wootonii* in the more widespread variety *carneus*. It is apparent that more botanical work is warranted for this beautiful, disjunct, Chihuahuan Desert plant here in Utah.

Below: Phacelia crenulata and Oenothera albicaulis at Bullfrog Marina.

This attractive, deep pink flowered sand dune annual is worthy of cultivation. Stan Welsh even says "[t]his is a remarkably beautiful species when in full flower." I suspect that the Winged sandpuff, with its almost carmine-pink flowers having long floral tubes, is using migrating hummingbirds as their pollinator of choice. Four other areas along the Hansen Creek drainage within several miles had smaller populations of the Winged sandpuff. The plants were mixed with larger numbers of the white and smaller-flowered Fragrant sand verbena (*Abronia elliptica*), which I learned fifty years ago as *Abronia fragrans*. It is interesting that flowers of this plant are closed at mid-day and open at night, spreading their unique fragrance to attract night-flying hawkmoths in the moonlight. The White-stemmed evening-primrose, whose flowers also open at night, is probably using the same resident hawkmoths as its pollinators. We need to spend more evening time in the field watching the hawkmoths, but this year they certainly had millions of times more flowers than they could possibly pollinate. For those interested in learning more about the importance of hawkmoth pollination biology you must view the Youtube video which Tony Frates has linked to the UNPS home page: <https://www.youtube.com/watch?v=8IPQTs0cfqw>.





Above: Yellow Segó Lily (*Calochorus aureus*) along Cane Spring Loop Road south of Mt. Hillers.

The diversity of other annual plants, all blooming at the same time, was impressive. I did not recognize any of them and had to “key them out”. They included in no particular order: Sand dune ipomopsis (*Ipomopsis gunnisonii*) with its whitish, star-like flowers (possibly hawkmoth pollinated?); the yellow-flowered Broom-flax (*Linum aristatum*); the White-stemmed blazing star (*Mentzelia albicaulis*), Pretty daisy (*Erigeron bellidiastrum*), the flattish, white-flowered Annual townsendia (*Townsendia annua*); the Bent buckwheat (*Eriogonum flexum*) with its pretty basal rosette of leaves and delicately bent pedicels; the beautifully red-spotted petals of the Eastwood camissonia (*Camissonia eastwoodii*) with its purplish leaves; and the common Small-flowered milkvetch (*Astragalus nuttallianus*). A short annual lupine, probably the Dwarf lupine (*Lupinus pulchellus*) was found scattered over the dunes. There was also a dark-blue flowered borage with round leaves, which I have not been able to identify. I’m sure there were many other annuals which I may have missed in my brief exploration.

An on-line search of the weather record for the Bullfrog weather station showed that the area’s 30 year average precipitation is only 6 inches, a raging desert (<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ut1020>). But a rainfall event on Sept. 9-11, 2013 delivered a total of 2.39 inches of rain. An additional rainfall event from Nov. 21-24 delivered another 2.08 inches. These two sequential rainfall events in the cool fall period, 40 days apart (75% of the average yearly precipitation), were

strategically timed and sufficient to trigger germination and seedling establishment of this suite of winter annual species. Such events are rare and demonstrate how dormant seeds of these winter annuals can persist in the seed bank until coincident events occur, providing cooler soil temperatures and sufficient soil moisture for leaching germination inhibitors from the seed’s embryo.

Apparently the 40 days (six weeks!) between the Sept 11 and Nov. 21 storm events were sufficient to bring the Six-week fescue from seedling to flower, explaining the dead annual grass thatch observed among the spring-flowering winter annuals. For the other fall germinating annuals, fall rains are especially effective on sandy soils with deeper percolation and storage, allowing extensive root growth of all the fall-germinated plants.

These rare flowering events have been reported for both winter and summer annuals in the Mohave and Sonoran Deserts of Western North America (see Shreve and Wiggins *Vegetation and Flora of the Sonoran Desert*), but I have never witnessed such an occurrence in the sandy, Blackbrush deserts of the southern Colorado Plateau Eco-region. Janice Beatley’s famous ecological studies of the Mohave Desert of Southern Nevada showed how late fall storms, of over 1 inch, are critical in bringing desert winter annuals to flower (Beatley, Janice C., *Phenological Events and Their Environmental Triggers in Mojave Desert Ecosystems*, Ecology, Vol. 55, No.4, pp. 856-863, 1974). And the Bullfrog plants had two such storms, hence the massive flowering event.

This same storm event also triggered a massive flowering of the beautiful little yellow-flowered winter annual Rocky Mountain stickweed (*Cleomella palmeriana*). This Colorado Plateau endemic covered the normally barren, gray mud of the eroding Mancos Shale badlands, with a complete sheet of yellow, visible from miles away. These interesting badlands, immediately west of the Henry Mountain’s Mt. Hillers, at the headwater of Hansen Creek also had two tiny annual *Atriplex* species in early flower. The first was the Powell orache (*Atriplex powellii*), an interesting dioecious species of the Colorado Plateau, with broad silvery leaves. Most annual *Atriplex* species are monoecious. The second was the more common Silver orache (*Atriplex argentea*) with its swollen, jewel-like, salt-storing epidermal hairs, visible with a good hand lens. The most common perennial plant of these salt-laden, gypsiferous Mancos Shale badlands is the Utah endemic, Garrett Saltbush (*Atriplex garrettii*) named after Utah’s early

resident botanist A. O. Garrett who was an East High School teacher and author of *Spring Flora of the Wasatch Region*, published in multiple editions at the turn of the 1900's. This dioecious, gray-green mat-forming mini-shrub has interesting roundish leaves and grows with nothing else around it.

Across the sandy Cane Spring Loop road, south of Mt. Hillers, the Engelmann Hedgehog-cactus (*Echinocereus engelmannii*) was in full flower and the Pricklypear (*O. polyacantha* var. *hystricina*) was covered in flower buds, just beginning to open. This will put on quite a show for the Bullfrog Marina visitors where it covers the upper, sandy areas. The Claret Cup, or more recently the Mohave kingcup cactus (*Echinocereus mojavensis*) was blooming along the Burr Trail, north of the Bullfrog area. The cacti all appreciated the fall rain storms, probably doing slow photosynthesis over most of the winter.

The fall storms also benefitted the perennial liliaceous species, probably with winter/spring vegetative growth. I had not seen the Star Lily (*Leucocrinum montanum*) for many years and here it was in full bloom on the Entrada sands, together with the bright yellow flowered Colorado Plateau endemic Yellow sego lily (*Calochortus aureus*) which I had never seen before. A dwarf form of the white-flowered Nuttall sego lily (*C. nuttallii*) was found along the Burr Trail highway growing with several light yellow-flowered individuals, indicating how closely related these two species are. It would be interesting to see what kind of pollinators are attracted to the Golden sego lily as opposed to the white flowered one, both blooming at the same time.

For visitors to the Glen Canyon Recreation Area, a plant checklist for can be found on-line at: <http://swbiodiversity.org/seinet/checklists/checklist.php?pagenumber=2&cl=2670&dynclid=0&pid=21&searchsynonyms=1>.



Above: Winter annuals were in abundance in the Moab area too, this spring. Sarah Topp of Castle Valley took this photograph of a purple carpet of Phacelia outside of Arches National Park. Phacelia crenulata is an annual that flowers every year in moderate numbers, but can become extremely abundant in some years following a rainy winter.

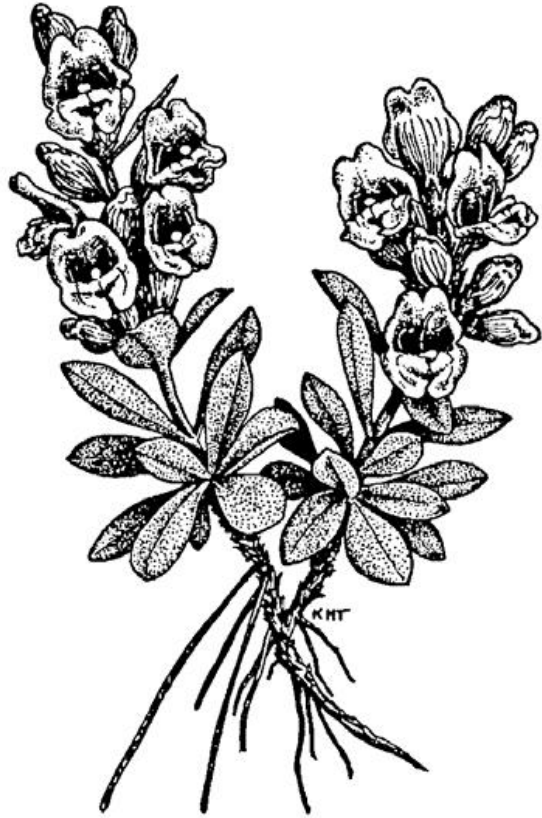
Inconvenient Penstemons: Will a Conservation Agreement Result in Less Protection for Two Critically Rare Utah Plants?

By Walter Fertig

If you are a subscriber to the *Sego Lily* you probably don't need to be convinced of the beauty and value of penstemons. Graham's penstemon (*Penstemon grahamii*) and White River penstemon (*P. scariosus* var. *albifluvis*) are especially delightful because of their dwarf habit and outsize, eye popping flowers. They are also quite rare. Regrettably, *P. grahamii* and *P. scariosus* var. *albifluvis* only occur on oil shales of the Green River Formation in the middle of the Uinta Basin in eastern Utah and northwest Colorado. Over 90% of the range of Graham's penstemon and 100% of the range of White River penstemon are on lands already leased or slated for leasing for oil shale, oil, and natural gas development. Both species are also threatened by road construction, competition from invasive weeds, grazing, off-road vehicle recreation, dust pollution, loss of pollinators, and inadequate protection.

Graham's penstemon was first proposed for listing under the Endangered Species Act (ESA) in 1975. White River penstemon joined it on the candidate list in 1983, shortly after it was discovered by Larry England, longtime botanist with the US Fish and Wildlife Service (USFWS) in Utah (now retired). Both species languished in candidate limbo for the next two decades, partly because pressure to develop mineral resources in the basin were low. This situation changed quickly in the early years of the 21st Century following renewed interest in oil shale development, new discoveries of oil and natural gas, and a shift in Bureau of Land Management (BLM) leasing policy following 9-11 that emphasized domestic energy production on public lands.

Citing these new threats, a coalition of conservation groups (including the Utah and Colorado native plant societies) petitioned USFWS in 2002 to list Graham's penstemon under the ESA. When the Service did not respond to the petition within the time required by law, the groups filed a lawsuit to force a decision. In a court settlement, USFWS agreed to review the case of *Penstemon grahamii*. In January 2006, the Service published a proposal to list the plant as Threatened and designate 3500 acres as critical habitat (more on this later). The proposal was expected to be made official following several months of public comment.



Above: Graham's penstemon (*Penstemon grahamii*) by

But just as it looked like Graham's penstemon would be protected, USFWS reversed course in December 2006 and withdrew the listing proposal (which also removed the species from the candidate list). The Service rejected the findings of its peer review panel (made up of leading experts on *Penstemon grahamii*), relying instead on input from the BLM, the federal agency responsible for mineral leasing on public and private lands. BLM downplayed the threats identified by the Penstemon experts, suggesting that its existing regulations were sufficient to protect the species and that mineral impacts were unlikely over the next 20 years.

In March 2007, the Inspector General for the Interior Department (which oversees both USFWS and BLM) issued a report citing rampant political interference in Endangered Species listing decis-

ions by political appointee Julie MacDonald. A few months later the non-profit Union of Concerned Scientists reported evidence of deliberate misinformation provided by the BLM to keep Graham's penstemon from being listed and thus interfering with mineral leasing and development in the Uinta Basin. The Center for Native Ecosystems and other conservation groups (again including UNPS and the Colorado Native Plant Society) used this new evidence to sue USFWS in 2008 over its decision to not list *Penstemon grahamii*.

The US District Court for Colorado ruled in favor of the plaintiffs in June 2011. USFWS (the agency responsible for enforcing the ESA) was found to have violated the act by failing to adequately consider all the threats to the species, ignoring the best available scientific data, and relying on unspecified conservation actions that have never been implemented or established to be effective. As a result of this ruling, USFWS once again proposed Graham's penstemon for listing as Threatened in August 2013. White River penstemon was added to the same listing proposal based on a settlement of a different lawsuit over the slow pace of species listings. With the proposed ruling, USFWS opened another period of public comments (as required by law), but it appeared that the two Uinta Basin beardtongues would finally be protected after more than 30 years of waiting.

Not so fast...

On May 6, 2014, the USFWS announced that it was re-opening the public comment period on listing Graham's and White River penstemons so that the public might consider an alternative called a Conservation Agreement. (CA) First popularized in the 1990s, CAs have mostly been used to avoid listing controversial species. Parties to a CA (which include the USFWS and various federal, state or private organizations) agree to adopt a series of mostly voluntary conservation measures that (in theory) make formal listing unnecessary. If conservation steps are not taken in good faith, or conditions for a species worsen, the Service still has the option to pursue listing.

In Utah, a CA was signed by the Forest Service and USFWS in 1995 to keep the Arizona willow (*Salix arizonica*) from being listed. The Agreement helped fund surveys that led to the discovery of several new populations, new research on the ecology and management of the willow, and construction of fences and exclosures to protect occurrences on Cedar Breaks National Monument. The CA was allowed to expire in 2005 and Arizona willow is no longer a high priority candidate for listing.

The draft Graham's and White River penstemon CA was prepared by SWCA Environmental Consultants on behalf of the USFWS and its partners: the State of Utah School and Institutional Trust Lands Administration (SITLA) Uintah County, Utah Public Lands Policy Coordination Office, Utah Division of Wildlife Resources (DWR), and the Bureau of Land Management (BLM). The goal of the draft CA is to "identify, avoid, minimize, and mitigate potential threats to Graham's and White River beardtongues and their habitats, and to promote the species' long-term persistence, thereby preventing the need for listing either species."

Sounds good so far, but as they say, the Devil is in the details.

In the 2013 listing proposal, USFWS identified nearly 68,000 acres of critical habitat for Graham's penstemon and another 14,900 acres for White River penstemon. Critical habitat is defined in the ESA as the core geographic areas occupied by a listed species that are vital to its long-term persistence and thus in need of heightened management attention. Designation of critical habitat does not change land ownership or automatically make the site a park or other protected area.

Unlike animals, plants receive far less protection under the ESA from direct harm or "take", especially on private lands. This dichotomy can be traced back to Roman Law, in which free-roaming animals were considered property of the crown, while sessile plants were treated as private property. On federal lands, listed plants are protected from harm caused by agency actions, but on private lands, plants can be dug up, plowed over, or stomped on by landowners (but not by trespassers) without penalty. The only restrictions on private lands relate to interstate trade of listed species, the use of some herbicides, and any stipulations that might apply if a landowner is receiving federal subsidies.

For the two Uinta Basin penstemons, listing will primarily impact energy development on public lands. If conflicts emerge between proposed development and the survival of the plants, the Service can require consultation among the affected parties under Section 7 of the ESA. The intent of this consultation is to find ways to minimize impacts, while usually allowing activities to go forward once modified.

The draft Penstemon Conservation Agreement would negate the designation of any critical habitat for Graham's and White River penstemon. Instead, a series of Penstemon Conservation Areas and Interim Conservation Areas would be estab-

Right: *White River penstemon* (*Penstemon scariosus* var. *albifluvis*)
by Kaye Thorne.



lished in 14 core areas occupied by the two species. The total acreage proposed for protection in the CA amounts to 49,400 acres, compared to nearly 84,000 acres of Critical Habitat recommended by USFWS. Of the nearly 45,000 acres in conservation areas, nearly 3/4 is managed by the BLM, with about 3000 acres on SITLA and DWR lands and 3000 acres in private ownership. The remaining lands occupied by the two penstemons are labeled “non conservation areas” and would be open to mineral development without any restrictions. Even in protected areas, ground disturbances would still be allowed for up to 2.5-5% of the habitat. Surface disturbances would also be allowed to within 300 feet of individual penstemon plants*. Interim conservation areas would be afforded protection only until such time as mineral development begins. The boundaries and distribution of proposed conservation areas can be revised periodically and sites removed if new populations are found to replace them.

Where impacts to the penstemons cannot be avoided, the draft CA calls for transplantation to other sites. Unfortunately, recent attempts by Red Butte Garden scientists to experimentally transplant Graham’s penstemons within the Uinta Basin have all failed (no similar studies have been done with the White River penstemon). The CA notes that Red Butte Garden has successfully kept some Graham’s penstemons alive for two years on the Garden grounds in Salt Lake City (where they are tended daily by doting staff) as evidence that transplantation is a feasible form of mitigation. Perhaps the most troubling part of the draft CA is that the management actions intended to prevent listing are nearly all voluntary. There is no

* These no-disturbance buffers are too small to provide sufficient foraging and nesting habitat for the bee species that pollinate *Penstemon grahamii*.

“poison pill” in the document that would lead to listing of either *Penstemon* species if the CA fails over its 15 year lifespan. Furthermore, the signatories to the agreement are primarily groups that have actively opposed listing in the past, or been found culpable in violating the ESA. None of the conservation groups that brought two successful legal challenges against USFWS were invited to be party to the agreement.

The USFWS is under tremendous political pressure to adopt the Conservation Agreement and avoid listing Graham’s and White River penstemon. Already the Service has been criticized for jeopardizing the energy industry in the Uinta Basin. A recent economic analysis suggested it would cost the industry over \$100 million per year to comply with Section 7 Consultations and from lost opportunity and reclamation costs. These figures are highly suspicious (if true, the industry would be fleeing the Uinta Basin, not doubling down for more development), and are intended to intimidate USFWS to not list these species. (Under Section 4 of the ESA, listing decisions are to be made on scientific data and threats to the species alone, not economic impacts.)

The USFWS has set a deadline of 7 July 2014 to accept new information and comments on the latest listing proposal for Graham’s and White River penstemons. Comments can be submitted electronically through the Federal eRulemaking Portal at <http://www.regulations.gov>. Use Docket No. FWS-R6-ES-2013-0081 for the proposed listing rule or FWS-R6-ES-2013-0082 to comment on critical habitat. Letters can also be sent by US mail to Public Comments Processing, Attn: FWS-R6-ES-2013-0081; Division of Policy and Directives Management, US Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042-PDM, Arlington, VA 22203. Copies of the draft Conservation Agreement, other USFWS documents, and background information on the two penstemons can be found under the “news” tab on the Utah Native Plant Society homepage (www.unps.org).

Listing under the ESA is no guarantee that a species will persist. But adopting the CA in place of listing (these are mutually exclusive proposals after all) provides significantly less protection for the two Uinta Basin penstemons. The CA would essentially codify business as usual in the basin which two judges have ruled is not acceptable. USFWS needs to hear from plant lovers who think the long, strange listing saga of *Penstemon grahamii* and *P. scariosus* var. *albifluvis* needs to be finally resolved—in the plant’s favor for a change!

Utah Botanica: Odds and Ends from the World of Utah Botany

By Walter Fertig

Oh Boy! More New Weeds for Utah

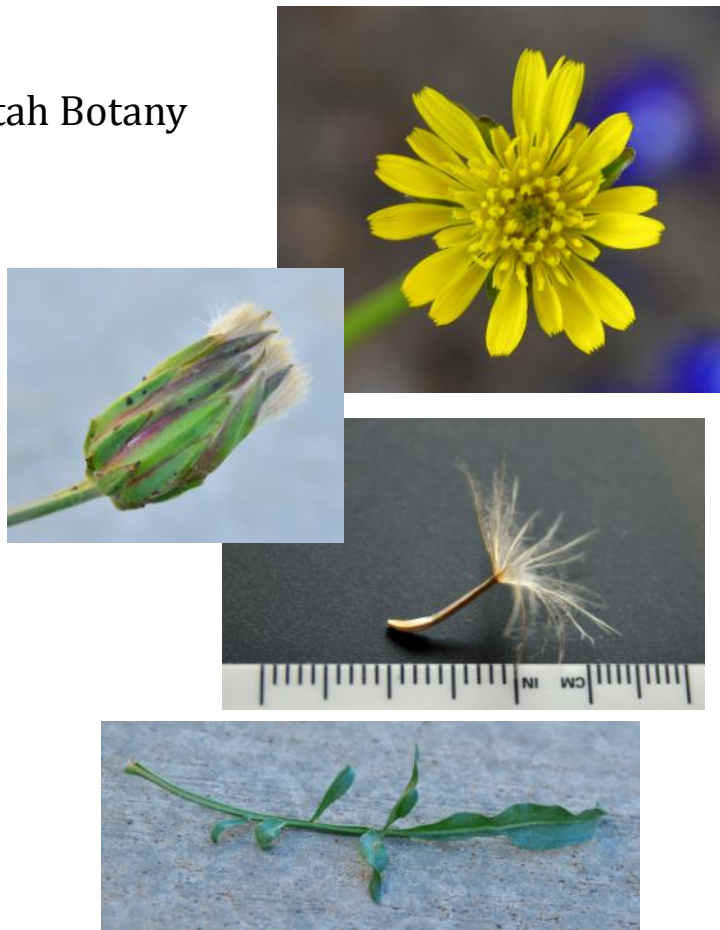
In 2008, former UNPS president Bill Gray sent me an email seeking help with identification of a mystery plant he found along a trail in Salt Lake County, not far from a construction site. The plant had the general appearance of a *Tragopogon* (Oysterplant) but had pinnately lobed leaves, not unlike a *Stanleya* (Prince's-plume). Based on Bill's description, I suspected he might have *Scorzonera* (*Scorzonera laciniata*), an introduced Composite that was not known from the Intermountain region when the Asteraceae volume of the Intermountain flora was published in the mid 1990s.

I had forgotten about Bill's discovery until this summer, when I read one of Steve Hegji's weekly emails about his wildflower jaunts in Utah. Steve mentioned that he had found an unusual Composite growing as a weed in his garden in the Salt Lake area. Like Bill, Steve had trouble keying the plant, since it is not included in our local state floras. Worse yet, *The Flora of North America* genus key has an error at lead 10 of the Cichorieae group, making it impossible to differentiate *Scorzonera* from *Tragopogon* (both have plumose pappus bristles). Steve finally confirmed his plant by consulting with Al Schneider and his Southwest Colorado Wildflowers Website. Al too had quite a time keying out *Scorzonera* the first time he found it in Colorado. Space does not allow me to reprint Al's pithy wisdom about keying *Scorzonera*, but it is well worth reading (www.swcolorado-wildflowers.com/Yellow%20Enlarged%20Photo%20Pages/scorzonera%20laciniata.htm).

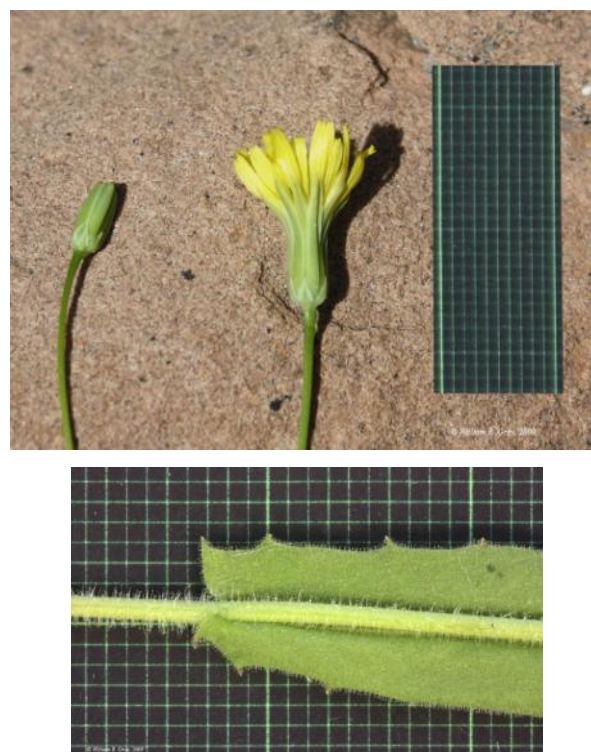
Scorzonera showed up for the first time in Arizona in 2011 at the Grand Canyon and Canyon de Chelly. It probably won't be long until it arrives in Zion National Park and southern Utah.

While emailing back and forth about *Scorzonera*, Bill Gray casually mentioned that he found another new weed for the state: Smallflower hawksbeard or *Crepis pulchra*. This annual has short, yellow-rayed flower heads like a dandelion but has beakless fruits and conspicuously long-stalked glandular hairs on the stems and petioles (see bottom photo at right). Native to Eurasia, Smallflower hawksbeard has spread over much of the southeastern and central US, but is relatively new to the west. Bill observed a large population of *Crepis pulchra* in Salt Lake County and has recently observed it at the south end of the valley too.

More new state records are probably out there—waiting in the weeds!



Above: *Scorzonera laciniata* flower heads (top and side view), fruits, and leaves, all by Steve Hegji. Below: flower heads and leaves of *Crepis pulchra* by Bill Gray.



Utah Native Plant Society



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