



# Sego Lily

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# GROWING WHEELER'S ANGELICA

by Tony Frates

Of the some 60 species of the circumboreal genus *Angelica*, a genus in the Apiaceae (formerly Umbelliferae and informally the Carrot or Parsley family), just four of those are known to definitively occur in Utah. Of those four, one is a globally rare species known only from Utah and another is peripherally rare.



Inflorescence of white flowers and long dilated sheaths. City Creek Canyon, July 22, 2007

## Background information

*Angelica wheeleri* has a G2 NatureServe rank (NatureServe 2017) and is ranked as having a “Watch” priority by UNPS (Alexander 2016) and is on the USFS Intermountain Region (R4) sensitive species list for the Uinta-Wasatch-Cache National Forest. It is only known from Utah with a scattered distribution in Cache, Juab, Piute, Salt Lake, Sevier, Tooele and Utah counties. It was reported as having a few as 11 occurrences despite that wide distribution by Franklin (2005). More occurrences since that time have been documented, but the total number of known occurrences remains low. *A. wheeleri* grows in very wet riparian communities typically along streams or in seeps or springs. Most collections are below 6,800 ft. (especially in northern Utah and along the Wasatch Front) in the range of 5,600 to 6,800 ft., but as low as 5,380 ft. but also occurs at some unexpected high elevations in the 9,000 to 10,000 ft. range that need

to be revisited (UNPS 2018, NatureServe 2017). *A. wheeleri* is only known from a few occurrences in Salt Lake County, all in the upper foothill to lower mid-montane elevation range.

Common names for the *A. wheeleri* include both Wheeler's Angelica and Utah Angelica. The species was named by Sereno Watson in 1873.

Species within *Angelica* have dorsally compressed, winged fruits. They also have inflated, dilated sheaths (while other species in the Apiaceae have a somewhat similar characteristic, in this genus, they are typically more significantly expanded) from which the cauline leaves then grow, somewhat like a celery stalk. They are also known for their medicinal properties (and hence the genus name) and over the centuries dozens of species in the genus have been used for a wide variety of human afflictions, and so they naturally have potential for drug development (Sarker 2004).

Like a number of other species in the genus that occur in our region (except for *A. pinnata* which is much shorter), *A. wheeleri* is a tall forb which can easily be well over 6 feet tall (over 2 meters). The stout perennials have hollow stems. Mature plants can appear somewhat ostrich-like in having a bushy appearance below with a tall, straight “neck” that is somewhat more delicate above. Plants are mostly glabrous other than in the inflorescence with serrate leaves that are quite variable, with the lower leaves biternate but the cauline leaves, growing from particularly long, dilated sheaths, are pinnate to ternate with terminal leaflets that can range from being lobed to notched to entire.

*Angelica kingii* has G4S1 NatureServe rank for Utah and has a “Watch” status as scored by UNPS. Known Utah occurrences are limited to the Deep Creek Range and are potentially facing increased threats as a result of increased cattle grazing. It has a distribution that includes Nevada, California and Idaho and is therefore peripherally rare in Utah. It grows at mid-montane elevations in streamside communities.

The other two *Angelica* species that occur in Utah are *A. roseanna* and *A. pinnata* (the most widespread of the

Cover Photo: Maggie Wolf looks skyward at some very tall *Angelica wheeleri* specimens.

four).

Obligate wetland plants like Wheeler's *Angelica* in the arid western United States are generally of increasing conservation concern. *A. wheeleri*'s rarity is a bit difficult to assess given the fact that its number of occurrences are low and population sizes at those locations are often not particularly large. Yet its distribution cannot be described as being very narrowly restricted inasmuch as it occurs over a north-south aerial distance of some 240 miles (from the Tushar Mountains to near Logan) occurring in a narrower east-west band of roughly 60 miles from the Utah Plateaus north to the Wasatch Mountains). It does not seem to have any obvious limiting factors such as geology nor known pollinator or other limitations. The extent to which it may be intrinsically rare is difficult to determine given its relative obscurity and its few known occurrences over such a broad area; presumably it is not. Whether it may be relictual or a neoendemic can only be based on speculation, and given the complicated nature in part relating to how *Angelica* is thought to have spread into North America via at least six different "dispersal" events since the middle Late Miocene from both Europe and Northeast Asia (Liao 2012).

Potential threats to *A. wheeleri* include urban development, stream channelization, water diversions, other watershed and stream alterations, recreation and invasion by exotic plant species (NatureServe 2017). In addition, impacts from livestock grazing have been noted in more recent years and there is evidence of some natural herbivory: vegetation belonging to this species has been found in black bear scat in the Hobble Creek area (Black 2004).

The species appears to be prone to foliage damage by naturally occurring pathogens (Garrett 1910) that could become much worse given continuing warmer temperatures and longer summers with increasingly erratic moisture patterns. This threat has not previously been considered with respect to this species. Some species of *Angelica* have already been shown to be prone to a variety of pathogens (Mazur 2005).

### Look-alikes and confusion

*A. wheeleri* has often been confused with, or included within, other taxa and may have occasionally been overlooked given the number of tall, white or past-flowering members of the family that grow in wet areas including *Cicuta maculata* (deadly poisonous), *Pastinaca sativa* (yellow flowers), *Heracleum lanatum*, and *Levisticum officinale* (i.e. Lovage, has yellow flowers, and while not reported from Utah, has been putatively observed in City Creek Canyon, and is now considered to be *Angelica officinale* based on fairly recent genetic

research (see Yuan 2015). To a lesser degree it could be confused with *Ligusticum filicinum* as well as with *Angelica pinnata* which tends to grow at higher elevations and is a much smaller plant with very different leaf morphology, and *Angelica roseanna* which also grows at higher elevations and in different habitat (rocky/talus slopes) and which can be fairly easily distinguished from *A. wheeleri*.

*A. kingii* was not treated in Albee (1988) and was instead included within *A. wheeleri*. This led to the report of *A. wheeleri* growing "near the UT-NV" border (Ehleringer 1992 p. 110). *A. wheeleri* as presently understood does not grow near the UT-NV border. Like *A. wheeleri*, *A. kingii* can be found in streamside communities, wet meadows or other areas with damp/wet soils and it also has white flowers and can be reasonably tall.

Of all of these potential look-alikes, *A. wheeleri* has to my knowledge only been observed co-occurring in northern Utah with *Heracleum lanatum* although that resemblance is only superficial and then only from a distance, and they are readily distinguishable even then including by habitat preference.

*A. wheeleri* has also been confused with *A. arguta* and *A. ampla*, neither of which are currently known from Utah. *A. arguta* has been reported in nearby Piceance Basin in northwestern Colorado (Goodrich 2014). Other collections currently assigned to *A. arguta* from Utah appear to belong to other taxa. A lone report of *A. ampla* from Utah in Salt Lake County belongs to *A. wheeleri*.

### A.O. Garrett, City Creek Canyon and Rusts

Without realizing it at the time, a small group of UNPS members led by Bill Gray enroute to look for a different, higher elevation endemic species stopped to visit the site where Albert O. Garrett probably made the type collection of *A. dilatata* almost exactly 100 years earlier.

On July 25, 1907, Albert O. Garrett (1870-1948) collected a specimen of a species of *Angelica* from City Creek Canyon which he had identified as *Angelica lyallii* that was sent to Aven Nelson with the Rocky Mountain Herbarium at the University of Wyoming in Laramie. Nelson subsequently named it as a new species, *Angelica dilatata*. Nelson (1859-1952), a Rocky Mountain plant specialist, would have been likely largely unaware of *A. wheeleri* which at the time was largely only known from south-central Utah, and not as far north as where Garrett started to find it and where even from that area it was being confused with other species. Hence Avens (in Coulter 1909) included the northern Utah *A. dilatata* in a floristic treatment of the central Rocky Mountains without any consideration of

*A. wheeleri* named over 35 years earlier. It wasn't until 1940 that Carrot family experts Mildred Mathias (1906-1995) and Lincoln Constance (1909-2001) realized that the Garrett specimen was a match for the earlier described *A. wheeleri*.

*A. wheeleri* is only known from a very few occurrences in Salt Lake County, all in the upper foothills to lower mid-montane elevation range; the 1907 Garrett location appears to still represent one of the oldest known collections belonging to this species in the county. When discussing however a rust species that he found on *Angelica dilatata*, Garrett refers to specimens related to a rust (a type of fungi) collected near Upper Falls in Provo Canyon of July 3, 1903 and in Red Butte Canyon on July 12, 1904 (Garrett 1910). Those rust collections would represent even earlier collections of the host plant. Interestingly, the rust that Garrett found was later named as a new species, *Puccinia poromera* (Holway 1913), which seems to still be an accepted species to this day and still known only from Utah.

Garrett clearly was very familiar with the differences between *A. wheeleri* (i.e. to him, *A. dilatata*) and the more common and widespread *A. pinnata* (which was also named by Sereno Watson and many others in the genus), but some of his specimens have been mistakenly assigned to other taxa.

Another early Utah botanical pioneer, Marcus Jones, made an *A. wheeleri* collection in late August of 1901 in Piute County (one sheet of which he placed under *A. lyallii* - now *A. arguta* - and another sheet from the same collection that he placed instead under *Ligusticum verticillatum*; annotated in 1940 to *A. wheeleri* by Mathias & Constance), but despite living in Salt Lake City (as did Garrett), he does not appear to have made any Salt Lake County collections of *A. wheeleri*.

### Red Butte Canyon

Inspired by the City Creek Canyon experience and based on a tip by the Utah Heritage Program botanist Ben Franklin of another Garrett collection of *A. wheeleri* in Red Butte Canyon, three of us (Bill Gray, Kipp Lee and I) made arrangements to visit the canyon in an attempt to relocate that collection site. Red Butte Canyon is not open for general public access and requires advance permission including a permit (Dr. John Sperry of the University of Utah arranged for my/our access to the canyon on several occasions and his assistance in that regard is deeply appreciated). Arnow (1971) had previously documented that the species occurred in the canyon, but we did not have any other specific locality information.

While we did not initially find the species based on Garrett's locality description received via Ben Franklin,

we did find a nice population of at least several hundred plants farther up the canyon. In the few side drainages where *A. wheeleri* occurs in Red Butte Canyon, it briefly dominates the stream and streamside drainages which then flow into the main creek (but occurs only very sparingly along Red Butte Creek). Where *Heracleum lanatum* (Cow Parsnip) co-occurs in a given area, it tends to occupy drier areas farther away from the stream and in general tolerates drier habitats than *A. wheeleri*. The occupied habitat by Wheeler's Angelica in Red Butte Canyon is in three drainages over a total aerial distance of less than 2.5 miles which might be considered a single population consisting of three main occurrences (but with a few scattered plants in between). The lone known City Creek Canyon occurrence is only about two aerial miles to the northwest.

The absence of livestock grazing in a special place like Red Butte Canyon has no doubt been very beneficial for this species. It does seem to thrive best in areas with natural, uninhibited stream or spring systems that are not grazed by introduced animals. The encroachment of various invasive plant species is however an increasing concern in Red Butte Canyon along with the continued integrity of the stream systems.



A small amount of seed was collected here. Foliage and seed bundles were literally falling off the plants when touched. Red Butte Canyon, August 18, 2007.

Beavers were important architects in the canyon but yet were removed based on unfounded concerns, and the canyon's health including the narrower, deeper and colder stream systems plus other stabilizing impacts that have significant hydrological impacts upon which *A. wheeleri* likely depends could ultimately be placed in jeopardy. See the sidebar article relating to the importance of Red Butte Canyon.

Wheeler's Angelica plants were by the third week in August of 2007 heavy with seed and desiccating. While we were there only to observe, after our small group had disbanded, I was taking one last photograph and touching a nearby plant when some stems leaves and seed heads practically fell into my hands. After taking some seed pictures, I decided to take these few materials with me to document the occurrence. Keeping a few of the seeds for a collection, I had perhaps at most another dozen or so that I decided to broadcast just to see what would happen, and largely then forgot about them.



Lime-green seeds are shaped like tiny watermelons, and were consistently about 5 mm long. They seemed to have eight ribs (four to each half) with the seed splitting from the wings laterally from the base. Seeds appeared mostly glabrous without magnification but are minutely pubescent with a few spreading hairs.



Prolific seed producers in nature; plants in cultivation have not produced seed like this.  
Red Butte Canyon, August 18, 2007.

### **An unplanned growing experiment that has so far continued for ten years**

A location with a reasonable open exposure sun was not available to broadcast the seeds at my residence, although, *A. wheeleri* seems to be very capable in nature of growing in environments under birch and other canopies. In order to ensure at least a more or less consistent amount of moisture, the seeds were broadcast on the north side of a residential structure that is partly unshaded but where probably not much more than a half day of sunlight is typically available in the spring/summer. In this north-facing wet strip, a sprinkling system not under my direct control provided a fairly high amount of moisture every other night in the growing months. No hand or other watering was provided. While typically moist and not dried out, the amount of moisture available was without question much less than what the plants receive in nature.

There was no special soil preparation. The seeds were not stratified but simply broadcast and I made no attempt to cover them other than to use some pea gravel to help protect them and to hold the soil in place.

Pea gravel is useful also as a mulch and helps to lessen the impact of rainstorms and other waterings. Other native wetland plants had been previously growing where the seed was planted, mainly *Mimulus guttatus* and *Epipactis gigantea*. There was no existing problem with weeds, and the soil was mostly bare where the seeds were planted/broadcast.



Example of a plant in spring with its "feet" wet under natural conditions. Flowering occurs later. Red Butte Canyon, June 1, 2008

The elevation where the seeds were sown was at 4,360 ft. which is over some 1,000 ft. lower than where the lowest elevation plants along the Wasatch Front have been found and over 1,300 ft. lower than where the seed was collected.



In cultivation: One year old plants probably plants A, June 19, 2009, and B, July 18, 2009. A two year old plant, May 8, 2010 .

Growing with *A. wheeleri* in the garden wet strip was *Epipactis gigantea* mostly grown from seed. Plants that were also co-occurring and grown from seed over the time of the experiment in the wet strip have included *Senecio hydrophilus*, *Oenothera elata*, *Euthamia occidentalis* and *Helianthus nuttallii*. *H. nuttallii* in particular seemed to lack the vigor it can normally display in terms of both plant height and amount of flowering by this more light limited location.

2013: Plant A flowered for first time, Plant B did not.

2014: Plant A did not flower but Plant B did flower.

2015: Neither A nor B flowered.

2016: Plant A flowered, but Plant B did not.

2017: Both A and B flowered; B had a second flowering stalk for first time.

#### Growth diary excerpt notes

May 9, 2009: two plants, same as last year.

July 5, 2011: Plants are no more than about two feet tall.

April 16, 2010: small leaves have reappeared on both plants, and again quite early, and before most other things in the wet garden.



Four-year old plant (Plant A at left nearest to sprinkler). Plant B mostly not visible behind the lupine. May 6, 2012, in cultivation.



First year flowering (Plant A). July 6, 2013, in cultivation.

#### Growth summary by year

2007: Small amount of seed hand broadcast into the wettest place available and lightly covered with pea gravel.

2008: Two plants germinated the following spring (referred to as Plant A and Plant B). Plant A was slightly closer to a sprinkler head than Plant B. The plants were growing within a short distance (about 20 inches) from one another.

2009-2012: Each plant continued to reappear and grow somewhat taller each year. Heights were roughly similar although Plant A was larger.

June 27, 2013: one plant sending up its first stalk. Should mean that is it going to flower for the first time this year. Amazingly has just sent up about a foot of new growth in the last day. I did not notice this tall/huge new stalk and it wasn't there either yesterday or the day before. Major growth spurt. Am getting some little bug on the newest shoot. Sprayed with Neem.

June 29, 2013: (Plant A) has shot up its first vertical flowering stalk, over a foot of growth in the last few

days of very warm temperatures (100 degrees yesterday); probably three weeks ahead of plants at higher elevations.

July 5, 2013: First flower (Plant A). Umbel still partially stuck to the sheath. This is following two nightmarish thunderstorms two nights in a row. Will probably be 95 degrees today.

July 6, 2013: upper/top flower still partially stuck to sheath, plant is 120 cm tall. Three more inflorescences are trying to emerge, one just below the current one, but two more significantly lower on the stem. Peduncles arise from the stem axil within an open-hollowed portion of the sheath.

July 8, 2013: Upper flower fuller out; five more in pre-anthesis.

July 11, 2013: Plant is flowering in five more places below the first/uppermost inflorescence.

July 24, 2013: Small dragonfly and a housefly were observed on spent flowers. There has been an unusual amount of July rain.

Aug. 7, 2013 – while the uppermost and first inflorescence (22 cm wide) which flowered first and then was followed by six lower inflorescences (all smaller, 10-12 cm wide), today noticed a very small inflorescence, only about 4 cm, almost in full flower, atop a slender stem that has arisen near the base and main stem from the plant, but separate from it, with also much smaller leaves and sheaths. This separate/new stem is only about 42 cm tall.

Aug. 8, 2013: younger fruits appear almost glabrous; mature fruits contain scattered hairs. Crushed leaves and fruits have a mild, pleasant, difficult to describe aroma (my first reaction to it is was that it was spice-like and for some reason reminded me of pepper, but that description does not do it justice). The fruits (mericarps) are mainly ellipsoid and ribbed with sparse short erect to spreading hairs. In materials I have seen, the hairs have been soft-woolly (and not dense as sometimes described).

Aug, 10, 2013: Today noticed a second short, slender stem arising separately and near the base of the stem, this shorter than the last and it too is about to flower. This will be the 8<sup>th</sup> flowering stalk.

Aug 15, 2013: two more slender branches are base are going to produce flowers (but not quite yet). The 8/10/13 second stem is still flowering, the first one is nearly done but still with a few flower left, but there are going to be two more.

Aug. 26, 2013: all of the upper inflorescences have completed flowering, but the second stem that started



Seemingly unexpected lower stem flowering later than the rest of the plant (Plant A). Only observed this season. August 13, 2013, in cultivation.

to flower on Aug. 10 is still flowering. The flowering sequence started at the top of the plant and then moved down (the uppermost flowering head is an extension of the stem whereas the rest emerge from the sheath axil). The very upper/first inflorescence started on July 5 and was finished by July 14. Five others started on July 11 and also remained in flower for 9 days. Same pattern continued in terms of longevity. During the time of flowering, beetles, flies and wasps were attracted to the flowers.

Mid-Sept 2013: Branches etc. starting to desiccate. Looking closer at the insides of the hollow stem: they have a faint celery stalk odor, not surprisingly. The inner surface is coated with a smooth, white styrofoam-like layer that is about 1 mm thick, and which is somewhat thicker than the outer surface layer. It looks like perfect temporary insulating material that also is



New growth has consistently been observed starting in late winter. March 1, 2014, in cultivation.

able to perhaps add considerable structural strength.

June 29, 2014: First bloom in 2014.

Aug 3, 2014: The plant that bloomed last year (and the first time either had bloomed) is not the plant that is blooming for the first time this year. Maybe the same plant doesn't necessarily bloom every year once reaching adulthood?

Feb 26, 2015: first signs of new growth/small green leaves at base of both plants.

April 6, 2015: The two *Angelica wheeleri* plants are into their sixth or seventh year, and are now each about a foot across and maybe six inches tall.

(no record of either plant flowering in 2015)



Cauline leaves are highly variable. June 27, 2017.



Closeup of flowers. July 3, 2016, in cultivation. While insect damage was not later noticed, note a number thrips, which feed on plant juices, present in many of the flowers.

May 10, 2016: Inspected hail damage. At least five or six *Senecio* petioles are broken. Plant will survive but has been damaged. The hail storm yesterday broke a few *Angelica wheeleri* stems too but they seem less affected. Other tall forms not affected.

June 28, 2016: Plant A starting to flower (which was the first plant to flower and is larger) Growing with *Epipactis gigantea* (in flower blooming for past 10 days, very early).

July 12, 2016: *Angelica wheeleri* is in full bloom, in fact, center/tallest stem of the eastern plant A is now past flowering.

Oct. 11, 2016: only Plant A flowered this year. Flowers seemed to mostly not produce fruits but there were some (i.e. a relative few per umbel). Leaves have turned red, lower are becoming absent, cauline leaves gone,

stalk is still standing but completely dry at this point. Fruits at this point are well-dried and seemingly no sign of hairs (ovary should be scabrous or hairy). *A. wheeleri*'s seeds/fruits appear to be most like *A. pinnata*.

Oct. 11, 2016: Seed germination experiment since only one of the plants flowered this year: placed around a dozen seeds into a moist paper towel in turn in plastic bag with some indirect sun exposure. Seeds not particularly plentiful on plant.

Oct. 19, 2016: two seedlings apparent from the moist paper towel experiment. Geitonogamous self-pollination (pollination of one flower by the pollen of a different flower of the same plant) is known in the Apiaceae (Lariusin 2012).

March 11, 2017 new growth apparent on both plants – a number of leaflets at the base

June 24, 2017: both plants have produced flowering stalks; the eastern plant A started to bloom today; the west plant B started to bloom shortly thereafter, at least as of June 27, 2017

June 27, 2017: second *Angelica wheeleri* (west plant B) now also in bloom.

July 4, 2017: Eastern plant B has a second flowering stalk. First time that has happened.

Feb 9, 2018: New growth observed particularly with respect to plant A but also plant B. Extremely warm temperatures (already up into the lower 60's) and almost no freezing nighttime temperatures have presumably triggered an exceptionally early start.

### **Some initial conclusions based on this growth experiment so far**

(1) *Angelica wheeleri* appears to be long-lived or at



least capable of living for a long time (in an ex situ setting, for at least a decade as observed so far);

(2) It took the plants five to six years before reaching maturity. This may have been due or at least in part to less than optimum moisture and sun requirements as compared to plants growing under natural conditions, but it may also be an indication of why it is important that populations are not unnaturally disturbed early in their lifecycle in order to continue to maintain robust populations. One study suggests that that polycarpic perennials typically do not mature sooner in the wild than in cultivation (Bender 2000). My guess though is that the plants would have reached maturity sooner in their normal streamside environment.

(3) It does appear that *A. wheeleri* is self-compatible (see Oct. 2016 growth diary excerpt notes). Plants in cultivation however did not produce anywhere near the amount of seed that plants in nature can produce, and the species no doubt greatly benefits by cross-pollination; seed set for other plants in the same cultivated wet strip is also much lower than normal than for plants in natural conditions presumably due to significantly fewer available pollinators.

(4) Whether the unexpected alternating flower pattern of mature individuals is typical or an anomalous result of the plants in cultivation or was a result of lack of sufficient moisture is unknown; if plants in nature exhibit this pattern, then it would limit the amount of seed that a given population was able to product in any given year. Continual moisture availability during the spring and summer is certainly critical to the ability of the species to survive/thrive.

(5) While not flowering until much later, plants start to slowly grow quite early in the spring, earlier than most other perennial herbaceous wetland flowering plants. This growth habit could be important in terms of managing occurrences to again ensure that the plants remain undisturbed through their fairly long growing season, and are not subjected to herbicide or other sprays of any kind nor subjected to any kind of livestock or other unnatural grazing.

## References

- Albee BJ, Shultz LM, Goodrich S. 1988. Atlas of the vascular plants of Utah. Salt Lake City (UT): Utah Museum of Natural History. 670 pp.
- Alexander J. 2016. The Utah Native Plant Society rare plant list: version 2. *Calochortiana* (3):3-247. <http://www.unps.org/Calochortiana/CalochortianaMay2016Num3.pdf>
- Arnow LA. 1971. Vascular flora of Red Butte Canyon, Salt Lake County, Utah.
- Master's thesis. Salt Lake City (UT): University of Utah. 388 pp.
- Arnow L, Albee B, Wyckoff A. 1980. Flora of the Central Wasatch Front, Utah: a manual of the ferns, fern allies, conifers, and flowering plants growing without cultivation in Salt Lake and Davis counties. Salt Lake City (UT): University of Utah. 663 pp.
- Bender MH, Baskin JM, Baskin CC. 2000. Age of maturity and life span in herbaceous, polycarpic perennials. *The Botanical Review*: 66(3): 311-349.
- Black H. 2004. Black bears of Utah's east Tavaputs plateau. Report for Utah Division of Wildlife Resources, contract no 92-0530. Provo (UT): Brigham Young University. 126 pp.
- Consortium of Intermountain Herbaria. 2017. [accessed Jan 13-Feb 8, 2018]. <http://intermountainbiota.org/portal/index.php>.
- Coulter JM. 1909. Revised by A. Nelson. New manual of botany of the Central Rocky Mountains (Vascular Plants). New York: American Book Company. 646 pp.
- Cronquist A, Holmgren NH, Holmgren PK. 1997. Intermountain flora: vascular plants of the Intermountain West, U.S.A. Vol. 3A, Subclass Rosidae (except Fabales). Bronx (NY): The New York Botanical Garden. 446 pp.
- Ehleringer JR, Arnow LA, Arnow T, McNulty IB, Negus NC. 1992. Red Butte Canyon research natural area: history, flora, geology, climate, and ecology. *Great Basin Naturalist* 55(2): 95-121.
- Franklin MA. 2005. Plant information compiled by the Utah Natural Heritage Program: a progress report. Prepared for Utah Reclamation Mitigation and Conservation Commission. Publication No. 05-40, Utah DWR. Salt Lake City (UT): Utah Department of Natural Resources, Division of Wildlife Resources, Utah Natural Heritage Program. 334 pp.
- Garrett A. 1910. The smuts and rusts of Utah. *Mycologia*, 2(6): 265-304. doi:10.2307/3753293
- Goodrich S, Huber A. 2014. Uinta flora. Ogden, Utah: USDA Forest Service-Intermountain Region. 314 pp.
- Holway EWD. 1913. *North American Uredinae*, 1:90.
- Honker AM. 1999. Been grazed almost to extinction: the environment, human action and Utah flooding, 1900-1940. *Utah Historical Quarterly* 67(1):24-47. Full issue available at: <http://digitallibrary.utah.gov/awweb/awarchive?item=34910>
- Lariushin B. 2012. Apiaceae family: volume 2. CreateSpace Independent Publishing Platform. 422 pp.

- Lenz LW. 1986. Marcus E. Jones: western geologist, mining engineer and botanist. Claremont (CA): Rancho Santa Ana Botanic Garden. 486 pp.
- Liao CY, Downie SR, Yu Y, He XJ. 2012. Historical biogeography of the *Angelica* group (Apiaceae tribe Selineae) inferred from analyses of nrDNA and cpDNA sequences. *Journal of Systematics and Evolution*, 50:206–217. doi:10.1111/j.1759-6831.2012.00182.x
- Mazur S, Szczeponek A. 2005. Occurrence of fungal diseases on angelica (*Archangelica officinalis* Hoffm.) in the region of Małopolska. *Acta agrobotanica*, 58(2): 137-150. doi:10.5586/aa.2005.040
- NatureServe. 2017. NatureServer Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. [accessed Feb. 6, 2018]. <http://explorer.natureserve.org>.
- Ohmart RD. 1996. Historical and present impacts of livestock grazing on fish and wildlife resources in western riparian habitats. In: Krausman PR, editor, *Rangeland wildlife*. Denver (CO): Society for Range Management. p 245-279.
- RangeNet. 2004 (estimated publication date; filmed in 1997). *Our western public lands* [TV series]. Episode #2: Red Butte Canyon. Produced and directed by Jane Baxter. Filmed on either May 4 or May 5, 1997. <http://rangewatch.org/library/owpl/index.html>. Also on YouTube.com. [accessed Feb 6, 2018]. <https://www.youtube.com/watch?v=rpU6UwMENPA>.
- Sarker SD, Nahar L. 2004. Natural medicine: the genus *Angelica*. *Current Medicinal Chemistry*, 11(11):1479-1500. <https://doi.org/10.2174/0929867043365189>
- Utah Native Plant Society (UNPS). 2003-2018. *Utah rare plant guide*. [Internet]. Frates AJ, editor/coordinator. Salt Lake City (UT): Utah Native Plant Society. [accessed Feb. 3, 2018]. <http://www.utahrareplants.org>.
- Watson S. 1873. New plants of northern Arizona and the region adjacent. *Amer. Naturalist* 7:299-303. <http://www.journals.uchicago.edu/doi/pdfplus/10.1086/271140>
- Welsh SL, Atwood ND, Goodrich S, Higgins LC [eds]. 2015. *A Utah flora*, fifth edition, revised. 2015 summary monograph. Provo (UT): Brigham Young University. 987 pp.
- Yuan QJ, Zhang B, Jiang D, Zhang WJ, Lin TY, Wang NH, Chiou SJ, Huang LQ. 2015. Identification of species and materia medica within *Angelica* L. (Umbelliferae) based on phylogeny inferred from DNA barcodes. *Mol Ecol Resour*, 15:358–371. doi:10.1111/1755-0998.12296

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# The Importance of Red Butte Canyon

by Tony Frates

Ecologist Dr. Robert Ohmart (1938-2018) who taught at Arizona State University called Red Butte Canyon one of the most unique areas in western North America. The unique history that led to the creation of Fort Douglas and the need to protect Red Butte Canyon as watershed for the military led to long term protection of a canyon that would have otherwise been subjected to high levels of environmental degradation. When management for the canyon was transferred from the military to the U.S. Forest Service in 1969, the area then continued to be protected and the seven mile long canyon enjoys a Research Natural Area designation. Its proximity to a large metropolitan area is also unusual.

Following the removal of the beavers after their existing in the canyon from 1928-1983 after being extirpated prior to that, there was a major storm/flood event (corresponding to the major 1983 Salt Lake valley flood event), and in the absence of beavers, Dr. Ohmart noted

that some 55 plant species either became difficult to find or disappeared, pointing out the importance of beavers as a keystone species in terms of improving riparian habitat for wildlife and flora (see also Ehleringer 1992 p. 108 with respect to the presence/absence of beavers and impacts). Nonetheless, Dr. Ohmart was impressed with Red Butte Canyon streams that were working in a proper functioning condition (Ohmart 1996). Soils in the canyon, he noted, were stabilized with minimal erosion because of the lack of having been grazed by domestic livestock, and the streams were in balance with sediment loads. In the absence of livestock grazing, vegetative cover was far denser and streams more densely shaded leading to colder, deeper streams with higher oxygen levels, and also higher levels of nitrogen favoring cold adapted vegetation. Overgrazing instead makes the water temperatures warmer, the stream channels wider, and



Note the *Angelica wheeleri* plants in the lower foreground of the picture that are past flowering and that have turned yellow-brown in front of the cattails, following a stream as it flows down to the creek. Plants growing in full exposures like this are less commonly seen at this location and are shorter in stature than the plants growing instead in more shaded areas (also along the same drainage). Red Butte Canyon, August 18, 2007

nitrogen deficient (RangeNet 2004).

The 511 species reported by Arnow (1971) for the canyon declined to 484 some twenty years later (including some 94 non-native species) although some of that decline was due to nomenclatural changes or misidentifications but also due to the 1983 flood event. As has been noted elsewhere along the Wasatch Front, a significant increase in the noxious weed species *Isatis tinctoria* and *Linaria dalmatica* occurred in the canyon between 1970 and 1990 (Ehleringer 1992). While weeds in the canyon tend to be limited to road sides and trails and more open areas, species such as *Cirsium arvense* and *Cynoglossum officinale* seem to be making increasing impacts into the area and are direct threats to *A. wheeleri*. And even more alarming, the dreaded *Euphorbia myrsinites* which was not reported in prior published studies is making its way into the canyon and poses a very serious threat.

Endemics that occur in Red Butte Canyon (with at least

four of those are only known to occur within Utah) include:

*Angelica wheeleri*

*Ericameria obovata* (syn. *Haplopappus watsonii* var. *rydbergii*)

*Erigeron arenarioides*

*Lathyrus brachycalyx* var. *brachycalyx* (Great Basin endemic)

*Penstemon humilis* var. *brevifolius*

*Penstemon leonardii* var. *leonardii* (as treated by Welsh 2015)

*Penstemon platyphyllus*

State rare taxa that occur in or near Red Butte Canyon includes a very small occurrence of *Viola beckwithii*, highly rare for the state with a UNPS ranking of "High" and an outdated NS S2 ranking (should be S1), has been found near the base of the canyon. A small and limited

occurrence of *Cypripedium parviflorum* var. *pubescens* (syn. *C. calceolus* var. *pubescens*), not originally documented also occurs in the canyon, and co-occurs with *Angelica wheeleri* and other orchid species; it is ranked as High by UNPS, with NatureServe (NS) rank of S1, and is a Uinta-Wasatch-Cache sensitive species. Some eight species of orchids are known from the canyon. A leaf thought to be *Calypso bulbosa* may have actually been the *Cypripedium*, discovered later, or perhaps even an *Epipactis gigantea* leaf, a species which was observed growing with *A. wheeleri* in one location during an August 2007 visit. Another S1 species which has been obscurely known from Utah, *Solidago gigantea*, is found in the canyon and grows with *A. wheeleri* as well. *Geranium bicknelli* with an S1S2 NS rank and a UNPS ranking of "Medium" is another species reported from Red Butte Canyon and is only obscurely known from the Wasatch Front with no known other extant occurrences in Salt Lake County, with a disjunct location in Utah in the Uinta Mountains.

Other taxa of interest are present and that may be treated differently in the future such as *Chlorocrambe hastata* (considered rare by the *Flora of North America* but it does occur in more counties than reported there). Another species with a limited northern Utah distribution but which also occurs elsewhere is the interesting *Clarkia rhomboidea*, and *Astragalus beckwithii* var. *beckwithii* at the eastern edge of the Great Basin in terms of its range, and which is now

known from only a few places in Salt Lake County as well as the beautiful *Epilobium canum* var. *garrettii*. Taxa that have been largely extirpated from the Salt Lake valley/Wasatch Front such as *Erigeron glabellus* (currently known from only one other location) have been reported from the canyon. And others.

If one considers the history of Utah never taught that involves just how impoverished our rangelands were as early as the 1880's (as reported by Marcus Jones (Lenz 1986)), much less by 1902 during the five months that Albert Potter, chief grazing officer of the US Dept. of the Interior's Division Forestry, spent in Utah decrying the state of our forests and vastly overgrazed lands (Honker 1999) long before federal agency management came into being, we are indeed fortunate to have a more or less preserved canyon ecosystem to teach future generations and to continue to learn lessons about the natural world.

As a refuge for a species like *Angelica wheeleri* and all of the others, one can only hope that Red Butte Canyon will be maintained as a Research Natural Area, that invasive species can be somehow managed and kept to a minimum with otherwise minimal disturbance, and that the Utah Division of Wildlife Services will return beavers to the canyon as was requested by the Forest Service in 1991 (Ehleringer 1992). And as a barometer of the health of our own living space, a healthy Red Butte Canyon speaks well for our own future.

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## Report says mountain goats are damaging alpine ecosystem

Sharon Sullivan Moab Sun News

Posted: Thursday, February 15, 2018 9:01 am

(Re-printed with permission from Moab Sun News)

Non-native mountain goats have wandered into the La Sal Mountains Mount Peale Research Natural Area (RNA) – where they're not supposed to be, according to U.S. Forest Service regulations that exclude non-native grazing in the protected area.

A new report titled "Modified by Mountain Goats" by Marc Coles-Ritchie of Grand Canyon Trust documents evidence of mountain goats kicking up dusty wallows in the soil, and trampling sensitive plants in the La Sals' alpine region. Grand Canyon Trust staff and volunteers say they have found hoof marks, fur and goat droppings, and have seen mountain goats inside the 11,000-foot Mount Peale RNA.

The Division of Wildlife Resources has been translocating mountain goats to high-elevation mountaintops throughout Utah for the past 50 years, said Morgan Jacobsen, DWR conservation outreach manager, in an email to the Moab Sun News.

The translocations provide wildlife enthusiasts, including hunters, hikers and photographers, with opportunities to enjoy the mountain goats in the backcountry, Jacobsen said.

In 2013 and 2014, the division introduced 35 mountain goats into the La Sal Mountains. The animals were captured from herds in the Tushar Mountains in central Utah, where they were blindfolded, and airlifted by helicopter to a staging area, before being taken by horse trailer to the La Sal Mountains. The number of mountain goats in the area has since grown to 70; the DWR has said it would like to eventually see the herd grow to 200.

The La Sals' upper alpine area is home to unique vegetation, including five "Species of Conservation Concern" – such as the La Sal Daisy – a plant endemic to the area, meaning it has not been documented anywhere else in the world. The area also supports at-risk species such as pika, and more common animals like marmots. To protect these species, the Forest Service established the 2,400-acre Mount Peale RNA in 1988, to preserve the habitat in a "virgin or unmodified condition."

According to the Grand Canyon Trust report, "nonnative mountain goats have caused observable physical damage to plants and soil," since the ungulates were introduced to the La Sal Mountains in 2013. The report states conditions at 59 percent of 44 survey sites within the Mount Peale RNA have declined from 2015 to 2017.

Also referred to as Rocky Mountain goats, the species are native to southeast Alaska, Canada's western Rocky Mountains, and parts of Washington, Oregon, Idaho and Montana.

A lawsuit is pending to compel the Forest Service to take action to protect the area by removing the goats. But the Forest Service is "not the enemy," said Tony Frates, of the Utah Native Plant Society.

"The Forest Service got put in a terrible position," he said, when the Utah DWR, whose job is to manage wildlife, placed the animals on federal lands the Forest Service is expected to manage for habitat.

"There was a letter from the Forest Service regional forester asking not to put the mountain goats there at that time, or at least delay (the translocation) but it went forward," said Barb Smith, district wildlife biologist for Manti-La Sal National Forest. "It was approved by (the DWR) wildlife board."

When a plant obtains a foothold in the harsh, alpine environment, it tends to grow slowly, in small patches, over a period of decades. Those species are often referred to as "cushion plants" because they cluster into compact, little mounds.

"The plants can grow up to 100 years old," said longtime botanist and Grand Canyon Trust Utah Forest Program Director Mary O'Brien. "If you're there when they are blooming you see native bees, bumblebees; it feels like a magical place."

"I have hiked up into the alpine area," she added. "It's an absolute gem, walking above 11,000 feet in alpine (terrain), with plants scattered at the top of their growing capability."

Lifelong Moab resident and sportsman George Dalton also hikes regularly in the area, but he welcomes the

presence of mountain goats in the La Sals, believing that the animals fill an ecological niche.

"They're living in the high elevations where not a lot of other mammals live," he said. "From what I've seen, they're not damaging the high-elevation terrain they live in."

From time to time, Dalton said he's encountered deer and elk on his hikes, and he doesn't see the benefit to removing mountain goats from the range.

"I've seen elk right up in those rock slides," he said. "By eliminating the goats, I don't know that that protects (the terrain) because other wildlife go up there, also."

The state wildlife agency points out that mountain goats can be viewed as a substitute for bighorn sheep that used to live in the area.

But the two species require different habitat, Frates noted. Mountain goats, unlike bighorn sheep, prefer higher elevations in the summer and can climb up to where sheep can't reach, he said.

"The problem is there's very little up in the La Sals; there's a small amount of habitat," Frates said. "The goats have been observed in the RNA – that's the heart of the issue. A herd of 200 would be devastating."

In 2016, Grand Canyon Trust lead attorney Aaron Paul filed suit in federal district court for the district of Utah asking the courts to order the Forest Service to forbid the introduction of mountain goats into the La Sal Mountains, and remove any goats found in the Mount Peale RNA.

"The Forest Service is supposed to maintain that area as pristine, virgin – you can't have a non-native species," Paul said.

The Forest Service claimed it lacked jurisdiction, and the case was dismissed. The Grand Canyon Trust and the Utah Native Plant Society appealed the decision.

"In the next few months, we expect oral arguments on the case," Paul said. "We want the Forest Service to follow its rules. They've got to keep the RNA virgin, in a non-modified condition. That's all we're asking them to do."

But Dalton said he's concerned that the two groups could be opening a can of worms by seeking the elimination of a non-native species, questioning whether chukar would be the next to go.

"I would say that there are lots of species around here that are non-native," he said.

Jacobsen said the translocation project was largely

funded through Utah's conservation permit program.

"This program allocates a small number of hunting permits each year to conservation organizations that are sold at banquets and fundraising opportunities," he said.

Specifics on the cost of the program were not immediately available, Jacobsen said.

Frates said private sportsman groups shouldn't be telling state agencies what to do.

"Part of our contention is federal agencies should have a right to control land they manage," Frates said. "Now we have these goats – we don't want them shot – we want them taken out by helicopter, the way they came," he said. "There was no study done in advance of their release."

Baseline data was never compiled because the Forest Service never expected the mountain goats to be introduced – "the Forest Service was blindsided," Frates

said.

The DWR has since partnered with the Forest Service to write a cooperative monitoring plan for mountain goats in the La Sals, including areas within and outside the Mount Peale RNA, Jacobsen said.

Forest Service wildlife biologist Smith said scientific studies were established in 2015 – "it's all part of a five-year monitoring plan," she said.

"We're doing actual vegetation monitoring of endemic plants in the La Sals," Smith said. "We will be able to say more once the data is analyzed."

#### More Information

The entire Grand Canyon Trust report can be viewed at: [www.grandcanyontrust.org/modified-mountain-goats](http://www.grandcanyontrust.org/modified-mountain-goats)

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## UNPS Grant-in-Aid Update for the 2017 funding cycle

by Raven Reitsstetter, Small UNPS Grants Committee

The year 2017 brought some very exciting grant applications ranging from molecular biology research to educational activities to grow a new generation of botanists.

**Matt Wang** received a grant in the amount of \$1000 for his project aimed at developing a molecular based protocol for investigating genetic diversity in populations of the endangered *Sclerocactus wrightiae* using spine clippings. *Sclerocactus wrightiae* is endemic to the Utah counties Emery, Garfield, Sevier, and Wayne and faces a new threat from a recently identified beetle larva in the Capitol Reef area and adjacent BLM lands, raising concerns of inbreeding depression. We are looking forward to the results of the study and the introduction of a new tool for determining population genetics for cacti. Matt is working with the Chicago Botanical Garden conducting his research.

**Randall Violett** from Southern Utah University has received \$200 for the field trip phase of a biology education project that aims at introducing students to Utah plants. Undergraduate students will collect seeds and other plant material in the field and subsequently grow the plants in a greenhouse setting. The ultimate goal is to have students design and conduct research projects to learn how human pressures impact the

survival of these plants. In addition to the outcomes of the research projects students at Southern Utah University will be introduced to the flora of Southern Utah and will be able to develop an understanding and appreciation for rare Utah plants.

**Jana Leinbach** from the US Forest Service received a grant in the amount of \$1000 to support the continuation of a project aimed at the introduction of viable populations of the listed *Phacelia argillacea* on public lands. The initial project started as a collaboration between the US Fish and Wildlife Service, The Nature Conservancy, Red Butte Garden, Brigham Young University, Utah Valley University, Rocky Mountain Research Station and the Uinta-Wasatch-Cache National Forest. The grant will help to continue a monitoring study to determine plant establishment and survival of previously seeded plots on National Forest land.

## Utah Native Plant Society Grant-in-Aid Program

The application window for the Utah Native Plant Society Grant-in-Aid program is open for the year 2018. The main target population are students at institutions of higher learning, however, faculty and citizen scientists are also welcomed to submit proposals for scientific research projects. Grants will be awarded for research projects or educational programs that focus on Utah's flora with an emphasis on rare and/or endangered plants. Please see the UNPS website for

details <http://www.unps.org/PAGES/grantprogram.html>

**The deadline for proposal submissions is April 15 2018.**

Applicants will be informed about the grant committee's decision by the end of May. Please send inquiries about the program to [grants@unps.org](mailto:grants@unps.org)

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## 1st Annual Weed Day

### **RELEASE: 1st Annual Weed Day – Logan Ranger District, Bridgerland Audubon Society and Utah Native Plant Society**

**What:** 1st Annual Weed Day - Logan Ranger District, Bridgerland Audubon Society and Utah Native Plant Society

**When:** Saturday, May 19, 2018, 9:00 a.m. – 1:00 p.m.

**Where:** Canyon Entrance Park, 1<sup>st</sup> Dam, US 89 and Canyon Road, Logan UT

**Contact:** Lisa Thompson, Volunteer and Partnership Coordinator (see below).

**The Logan Ranger District of the Uinta-Wasatch-Cache National Forest, Bridgerland Audubon Society and the Utah Native Plant Society invite the public to join us for the 1st Annual Weed Day.**

The public is invited to participate in the community wide event. The ongoing efforts offer fun, exercise, a chance to meet new people as well as give back to the local community.

The goal of this project is to help reduce and eradicate invasive weeds threatening the native plant community of the local area. Invasive weed species threaten the ecological integrity and biological diversity of plant

communities within the project area and have caused adverse impacts to recreation, wildlife and other important social and resource values.

Target weeds include, dyers woad, burdock, houndstongue, Scotch thistle and other invasive weeds. Control methods will include hand pulling, digging and possible bagging.

We will meet at First Dam at 9:00 a.m. for a safety meeting and weed orientation before heading out to the assigned areas. Volunteers will meet back at First Dam at 1:00 p.m. for a "bring your own" lunch.

Volunteers should wear protective clothing, including gloves, long pants, long sleeved shirts, sturdy footwear and lots of drinking water. Some tools will be provided but it is recommended to bring your own weeding tools and shovels.

Please join the Logan Ranger District, Bridgerland Audubon Society and the Utah Native Plant Society as we work to protect our land by preventing the spread of noxious weeds in Cache County.

*For more information, contact:*

**Lisa Thompson**, Volunteer and Partnership Coordinator, Logan Ranger District, (801) 625-5850

**Dave Wallace**, Utah Native Plant Society, (425) 750-5913

or **Hilary Shughart**, [hilary.shughart@gmail.com](mailto:hilary.shughart@gmail.com)

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## Have you designated the Utah Native Plant Society as your Charity for Amazon Smile?

If not, you can change Your AmazonSmile Charitable Organization with these directions from the Amazon website:

On your first visit to AmazonSmile ([smile.amazon.com](http://smile.amazon.com)), you are prompted to select a charitable organization from our list of eligible organizations. You can change your selection at any time.

To change your charitable organization:

Sign in to [smile.amazon.com](http://smile.amazon.com) on your desktop or mobile phone browser.

From your desktop, go to **Your Account** from the navigation at the top of any page, and then select the option to **Change your Charity**. Or, from your mobile browser, select **Change your Charity** from the options at the bottom of the page.

Select a new charitable organization to support. More info: <http://smile.amazon.com/about>.

# Utah Rare Plant Meeting

**Tuesday, March 6, 2018, 8 a.m. - 4:30 p.m.**  
**Swaner Forum, Natural History Museum of Utah**  
**301 Wakara Way, Salt Lake City**



## **Rare Plant Enthusiasts!**

It's time, once again, to start thinking about the Utah Rare Plant Meeting coming up on March 6th. Joining us is a great way to get a jump-start on spring and get you thinking about this year's exciting botanical excursions. This meeting is an ideal setting for an introduction to the broad range of rare plant issues in Utah. Researchers, students, federal, state, and local agencies, consultants, and the public are welcome to attend.

## **Schedule:**

Check-in/setup/light breakfast 8 a.m. - 9 a.m.  
Meeting/presentations: 9 a.m. - 4:30 p.m.

## **Cost: \$25\* (\*Students/Presenters: \$15)**

Meals: NHMU catered light breakfast, lunch, and

beverages will be provided. Vegetarian and gluten-free options will be available within the buffet-style lunch.

**Registration:** To register please visit the following link at the Utah Native Plant Society website:  
<http://www.unps.org/urpm2018.html>

**Mobile device registration:** [m.unps.org](http://m.unps.org)  
(or <http://www.unps.org/mobile/index.html>)

For registration/payment questions - Tony Frates:  
[unps@unps.org](mailto:unps@unps.org), (801) 277-9240

*Hosted by the Utah Native Plant Society, Garrett Herbarium and the Natural History Museum of Utah*



# A Rare Poster, Indeed

by Catherine King, President Salt Lake Chapter UNPS

Most of you are aware of the beautifully charming wildflower poster that has been sold by the Utah Native Plant Society for many years, but may not have seen the other poster, "Threatened and Endangered Plants of Utah." The exquisite drawings of this poster were rendered by the same, talented David Gardner with accompanying calligraphy by Pamela Johnson. It was printed in 1995, and in the twenty-three years that have gone by, not only has the status of some of the plants changed but also, so have some of the scientific names.

What is really important is the concept of rare plants and how, in its 40 year history, the Utah Native Plant



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800. 848. 2400  
SALT LAKE CITY, UTAH 84155  
Threatened and Endangered Plants  
of Utah  
UTAH NATIVE PLANT SOCIETY  
Preserve Utah's Native Flora  
ARTIST DESIGNED - DAVID GARDNER  
CALLIGRAPHY - PAMELA JOHNSON

Society has tried to protect their very existence. Sometimes it feels like a losing battle, as the population of our state continues to grow and development encroaches on fragile habitats. The delicate *Arctomecon humilis*, the Dwarf Low Bearclaw

Poppy pictured on this poster, is considered one of the rarest of poppies on this planet. A 6,800 acre housing development in St. George has recently been announced that will abut the fragile White Dome habitat of this federally listed endangered species.

The "Rare Plant" poster is the "poster child," if you will, for our organization, depicting some of the plants you may never get to see in person, just because they are so rare and protected. The diminutive "Despain's Cactus" *Pediocactus despainii*, emerges from the soil



long enough to flower in the spring and then shrinks back down into the ground for protection. It is easy to walk all over it and not even know it's there. The orange-bronze flowers can be as big as the cactus, which is sometimes as large as a fifty cent piece. *Pediocactus despainii* is named after Kim Despain, a long-time, enthusiastic member of UNPS who first discovered it.

"Maguire's Primrose," *Primula maguirei*, which grows in only one canyon in northern Utah and is designated a threatened species by the federal government, so captivated the heart of a Czech botanist that we feared for his life as he dangled over cliffs to photograph it.

*Sclerocactus wrightiae* "Wright's Fishhook Cactus," so



artfully portrayed on the poster, is not as endangered as *Sclerocactus brevispinus* (not on the poster), a cactus that is teetering on the edge of extinction, partly from damage by trampling cattle and compounded by drought. Dr. Lyman Benson named *Sclerocactus wrightiae* for Dorde Wright Woodruff, another UNPS member and highly respected cactus expert.

“The Last Chance Daisy,” *Townsendia aprica*, may be rather aptly named, as its chances for survival are slim. A positively adorable plant, *Townsendia aprica* grows in a tight mound of silver-gray leaves that are covered in early spring with yellow daisy flowers. These are just a few of the twenty rare plants illustrated on the poster.

Beyond the pure pleasure of enjoying native plants in the wild, whether they are rare or not, is the importance of plants to our daily lives and overall existence. There is that essential connection between plants, pollinators, birds, animals, and humans.



Order posters at [unps.org](http://unps.org)

The Utah Native Plant Society stands as an advocate for that connection. Protecting the most rare of these plants is one of the functions of our organization, as we once again prepare for another Rare Plant Meeting. The funds from the sale of the “Threatened and Endangered Plants of Utah” poster go towards organizing such meetings and funding research grants. Consider adding this poster and the art of David Gardner to your collection today, it is available on the [unps.org](http://unps.org) website, go to the Posters link. It is also sold at the Natural History Museum of Utah and Red Butte Garden gift shops. The size of the poster is 24” x 32,” just slightly smaller than the “Utah Wildflowers” poster (23” x 34”), but the two posters are very attractive when hung side by side. Personally, the “Threatened and Endangered” poster is my favorite.

# Spring Wildflowers of Utah's Red Rock Desert

by Peter Lesica and Walter Fertig

## Book review by William Gray

Trillium Press, MT, 2018. Paperback, 235 pages. \$20. Distributed by Mountain Press, Missoula, MT.

Here is a small book that will make a fine travel companion when you visit Southeast Utah in the Spring – surely one of the real privileges that come from living here. It is targeted to readers who have a mid level interest in botany, and who want to broaden their knowledge rather than just learn a few more plant names. The authors are both professional botanists with extensive knowledge of the area and its plants. Peter Lesica, headquartered in Montana, has authored several books on the plants of that region. He has also made

many Spring botanical trips into Southern Utah. Walt Fertig lived for many years in Southern Utah, creating official plant surveys for the parks – and serving UNPS in many roles. We hope he will always get a chance to come back and visit every Spring.

Geographically the book's coverage comprises roughly the area south of Price and east of the higher plateaus: thus it includes the San Rafael Swell and most major parks and monuments except for Zion and Cedar Breaks. Within that area a second cutoff is elevation. Coverage is limited to the Pinyon-Juniper belt and below, and so excludes the intrusive mountain ranges and high spots such as Boulder Mountain. Not much is lost because those higher regions don't really bloom until later in the year. It still leaves plenty of desert to explore (not all redrock), and lots of plants to choose from! Of course many of the plants are also to be found in the surrounding areas.

A very useful introductory section includes descriptions and photographs of some of the major plant communities. Not only do these illustrate the general

### Spring Wildflowers of Utah's Red Rock Desert



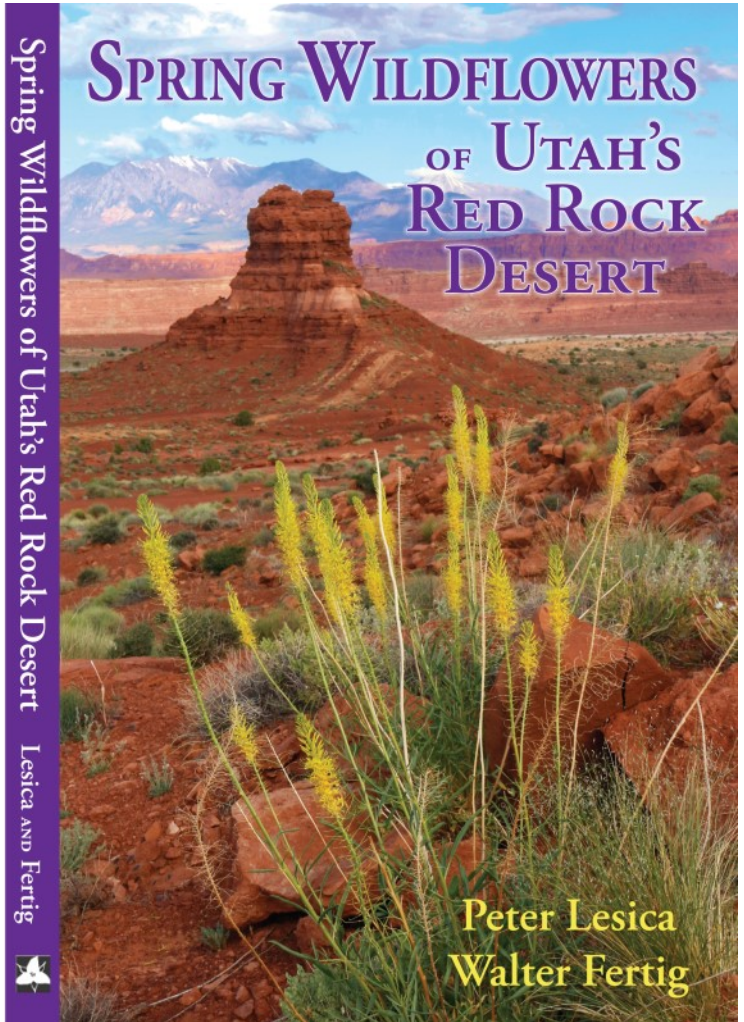
This comprehensive book features 500 species of the common spring wildflowers, trees and grasses of the Red Rock Desert of southeast Utah and adjacent states with photographs and full descriptions of nearly 300 of these plants. The plants are arranged to make identification easy and there is a helpful glossary. Information includes habitats, identification tips and aboriginal uses as well the national parks and monuments where each plant can be found. The different vegetation types occurring in southeastern Utah are described, and historical information on the botanical exploration of Utah is found throughout. This book will help anyone learn the wildflowers of this beautiful and interesting part of our country.



Peter Lesica has worked as a botanist for 40 years, primarily in Montana but including almost two dozen springtime trips to southern Utah. He and Shannon Kimball are authors of *Wildflowers of Glacier National Park* and *Trees and Shrubs of Glacier National Park*, also published by Trillium Press.



Walter Fertig has worked as a natural heritage program botanist in Wyoming and Washington. He has nearly 30 years of experience studying rare plants and plant geography in the Rocky Mountains, Colorado Plateau, and Pacific Northwest. He is the author of plant checklists for each of the major national parks and monuments in southern Utah (available as PDF documents from <https://science.nature.nps.gov/im/units/ncpn/Index.cfm>).



landscapes but they are subsequently referred back to in the plant descriptions, guiding readers as to where particular species are most likely to be found.

I really like the broad choice of plants – it's not just showcasing a few of the most photogenic flowers. About 300 species are covered with full descriptions and photographs, and many more are given briefer mention. Common trees and some of the more distinctive grasses have their own sections, a nice touch.

The great majority of species are arranged primarily by flower color (white, yellow, blue, red, green or inconspicuous) indicated by color tabs; they are then subdivided according to a few other simple criteria (separate petals, united petals, aster-like, and three or six petals). For the most part this works well but to my eye there are difficulties with the always ambiguous blue/red division, with blue being made too inclusive. In practice it is not likely to bother the user much because the format lends itself to riffling through with a thumb: just don't stop too soon. The 'green or inconspicuous' section is very well represented with distinctive plants that make up a significant part of the flora.

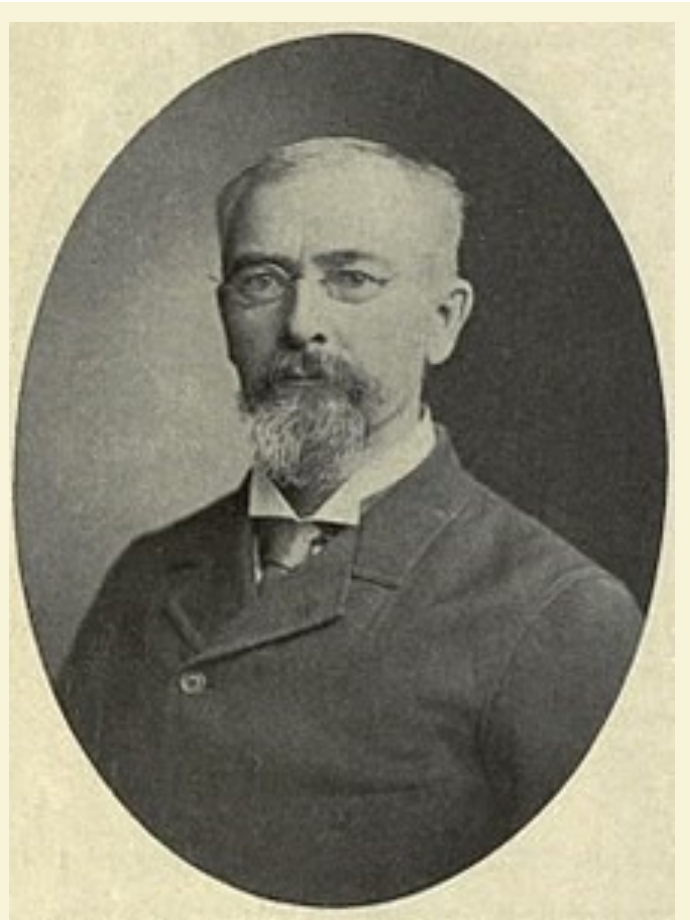
Each species has one or two color photographs and is identified by common and scientific names and family. The authors have chosen to use *Intermountain Flora* as their source for botanical names. Some of these are now outdated, but an appendix lists the more common alternatives in current use. There is simply no easy solution to the naming problem as yet. Text for each entry consists of three parts:

**DESCRIPTIONS:** very clear with minimal technical jargon; a short glossary covers the less common vocabulary.

**HABITAT AND RANGE:** truly useful, including references back to the soil types and plant communities described in the introduction. The broad geographic range is then specified, followed by a list of the various parks and monuments where the plant can be found.

**NOTES:** a mix of interesting facts about the plant and its uses, and comments on similar species, often with a secondary photograph.

Physically the book is well produced and feels sturdy in the hand. It should hold up well in the field. In addition I suspect that for many people it will find its greatest use once they are back home and looking at their photos on a computer. Usually they will be able to identify the plants or come very close. Then they will more easily be able to access the enormous resources of the Internet, including the extensive photographic databases such as the excellent *Southwest Colorado Wildflowers* at <http://www.swcoloradowildflowers.com>.



### **wonka's Botany Flashback: *Deseret News, May 12, 1880***

“Utah’s Flora--We had a visit this morning from Prof. Jones, whose explorations in the Rocky Mountain Territories we noticed a few days ago. This gentleman has just returned from St. George. His trip to Southern Utah was for the purpose of collecting botanical specimens for several universities. He has secured about 5,000 specimens representing 200 species, and would have obtained many more if it had not been for the backwardness of the season. He intends spending two or three months in Utah, and part of the time will attend to the botanical class which he commenced to-day. Prof. Jones will visit other parts of the Territory, and contemplates publishing a work devoted to the flora of this region, no adequate text book for the study of which exists. He says Utah is specially notable for the vast number of medicinal plants to be found within her borders. We hope to see a place in the museum of the near future, specially devoted to the science of botany.”

**In Tribute:**

**Barney Barnett 1956-2018**

by Catherine King, President Salt Lake Chapter UNPS

The Utah Native Plant Society and many other gardening organizations in Utah lost a horticultural leader with the unexpected passing in January of Barney Barnett. For the past thirty years, Barney and his wife Della have operated Willard Bay Gardens, selling a wide variety of plants, but always promoting native and water-wise plants.

Known to all of us as Barney, his given name was William Robert Barnett. he was born and raised in Thermopolis, Wyoming. Barney met his wife Della while in the horticulture program at Ricks College and later completed his BS at BYU/Idaho. In 1988, they moved to Willard, Utah and bought Chadwick's Nursery, renaming it Willard Bay Nursery.

Willard Bay Nursery quickly became a destination for "hard to find" plants and Barney was almost always there, ready to answer any questions, giving quick, on-the-spot courses on plant care and gardening advice. He not only knew the common names for the plants he sold but also the scientific names and was happy to



share them with anyone who would listen. He also had a prodigious memory for names overall, including all the people he encountered at his nursery, in his classes and community activities.

Barney was a member of many plant associations and societies, including the Wasatch Rock Garden Society, and served as the Western Region Director for the Perennial Plant Association for six years. Over the last thirty years, he taught courses on plant identification at Utah State University, Brigham Young University/Idaho, and Salt Lake Community College. He was also very active in the community, including serving as scoutmaster for many years.

The Salt Lake Chapter of UNPS was fortunate over the years to have Barney give several presentations about gardening with native plants. He would not only show slides and share horticultural information about the best native plants for different garden applications, but always came with plants to give away as prizes.

Barney made a big impact on the use of native plants in gardens in Utah and taught so many to appreciate their beauty. His enthusiasm was infectious and his generosity was legendary. He was smart, had a wonderful sense of humor, loved his work, family and community and he was just a great guy and will be missed.



## UNPS Board of Directors and Committees *by Kipp Lee*

Following the Annual Members Meeting, the following 14 individuals were nominated and elected to Board of Directors. Officers were elected at our December meeting and include the following;

### Officers:

President-Kipp Lee  
Vice President-Robert Fitts  
Secretary-Cathy King  
Treasurer-Bill Stockdale  
Chairman of the Board-Bill King

### Board Members also include:

Jonathan Barth  
Susan Fitts  
Tony Frates  
Celeste Kennard  
Wayne Padgett  
Adrienne Pilmanis  
Raven Reitstetter  
Susan Sims  
Dave Wallace

### Committees:

In addition to our officers, Board Members also chair over committees which include the following:

Conservation-Tony Frates, Bill King, and Susan Sims  
Education-Celeste Kennard, Robert Fitts  
Horticulture-Kipp Lee  
Invasive Species-Dave Wallace, Jonathan Barth  
Publications-Cathy King  
Website/Internet-Tony Frates  
Rare Plant List/Rare Plants-Robert Fitts  
Small Grants-Raven Reitstetter, Adrienne Pilmanis  
Communications and Publicity-Cathy King  
Membership-Susan Sims

We are currently in need of members who are interested in participating in any of the committees. Participating on a committee is a great way to get involved whatever your interest in native plants may be. The conservation committee in particular is in

desperate need of volunteers to assist in reading over documentation, attending meetings, and assisting in many other areas related to plant conservation. If you love pulling weeds or want to organize weed pulls, the Invasive Species Committee might be for you. If you want to organize native plant workshops or classes, the Horticulture committee is perfect for you. Have some fun doing something on behalf of our native plants.

Please contact anyone on the Board of Directors if you are interested in joining or need further information. We are open to ideas, suggestions, and assistance. The committees help promote the mission of the Utah Native Plant Society.

## Wasatch Rock Garden Society

### Upcoming Event at Red Butte Garden:

Guest Lecturer:

**Kit Strange from  
Kew Botanic Gardens**

### *“Travels in Armenia”*

**Monday, April 30, 2018, 7- 9:00 p.m.**

The Wasatch Rock Garden Society and the North American Rock Garden Society are once again pleased to partner with Red Butte Garden in presenting an exceptional international speaker, Kit Strange, Alpine Horticulturist from Royal Botanic Gardens, Kew in London, England.

According to an interview in the British periodical *Horticulture Week* (2009), Kit started at Kew after earning her RHS diploma at Wisley. She is an alpine bulb specialist and spends much of her time potting and maintaining bulbs as well as growing alpine plants. In addition to that, she travels in the field in search of new botanical treasures to grow in the gardens at Kew.

Her presentation on “Travels in Armenia” will give us insight on what that kind of field work involves and what discoveries she made along the way. Armenia has a climate quite similar to Utah with hot and dry summers and cold and snowy winters. It is located in the South Caucasus region of Eurasia, bordered by Georgia to the north, Turkey to the west, Azerbaijan to the east and Iran to the south. The plant material discovered there should translate well to gardens in Utah.

*Reception and light refreshments following lecture.*

*Admission free to WRGS and RBG members, regular garden admission for non-members.*

## Your UNPS Salt Lake Chapter Calendar *William Gray*

**Wednesday March 7th: SL Chapter at REI (3300 East and 3300 South), 7:00 pm**  
**Research Natural Areas: Landscapes with a View of the Past, Present, and Future**

**Wayne Padgett** former Botanist with the US Forest Service. Research Natural Areas (RNAs) are landscapes that represent relatively undisturbed conditions. They are a window into how ecosystems might look had they not been altered by human activities over time. They are invaluable in understanding, defining, and describing natural variability and how we can better manage public lands in a sustainable manner into an uncertain future.

**Wednesday April 4th: SL Chapter at REI (3300 East and 3300 South), 7:00 pm**

**Bruce Pavlik and Lisbeth Louderbeck** will give a presentation about their research on a native Utah potato.

**Wasatch Rock Garden Society Upcoming Event at Red Butte Garden:**

Guest Lecturer: Kit Strange from Kew Botanic Gardens

**"Travels in Armenia"**

Monday, **April 30th:** 7 - 9:00 p.m.

Reception and light refreshments following lecture.

Admission free to WRGS and RBG members, regular garden admission for non-members.



### Utah Native Plant Society

Utah Native Plant Society  
PO Box 520041  
Salt Lake City, UT, 84152-0041.

To contact an officer or committee chair  
write to Webmaster: [unps@unps.org](mailto:unps@unps.org)

#### Officers

President: Kipp Lee (Utah Co.)  
Vice President: Robert Fitts (Salt Lake Co.)  
Secretary: Cathy King (Salt Lake Co.)  
Treasurer: Bill Stockdale (Salt Lake Co.)

Board Chair: Bill King (Salt Lake Co.)

UNPS Board:

David Wallace (Cache Co.)  
Tony Frates (Salt Lake Co.)  
Susan Fitts (Utah Co.)  
Wayne Padgett (Salt Lake Co.)  
Raven Reitsstetter (Tooele Co.)  
Celeste Kennard (Utah Co.)  
Jonathan Barth (Salt Lake Co.)  
Adrienne Pilmanis (Salt Lake Co.)  
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Small UNPS Grants: Raven Reitsstetter & Adrienne Pilmanis  
Communications and Publicity: Cathy King  
Membership: Susan Sims

#### Chapters and Chapter Presidents

Cache: Michael Piep  
Canyonlands: Diane Ackerman & Sarah Topp  
Cedar City: Matt Ogburn  
Escalante: Fremont: Marianne Breeze Orton  
Manzanita: Mountain: Salt Lake: Cathy King  
Southwestern/Bearclaw Poppy: Utah Valley: Susan Sims

Website: For late-breaking news, the UNPS store (posters, etc.), the *Sego Lily* archives, Chapter events, sources of native plants, the digital Utah Rare Plant Field Guide at [unps.org](http://unps.org).

Webmaster inquiries at [unps@unps.org](mailto:unps@unps.org)

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UNPS Chapter Map





Utah Native Plant Society  
PO Box 520041  
Salt Lake City, UT 84152-0041

**Return Service Requested**

## Utah Native Plant Society Membership

New Member

Renewal

Gift Membership

Membership Category

Student \$9.00

Senior \$12.00

Individual \$15.00

Household \$25.00

Sustaining \$40.00

Supporting Organization \$55.00

Corporate \$500.00

Lifetime \$250.00

Choose Mailing

US Mail (B&W Hardcopy newsletter)

Digital (Please save UNPS printing costs and trees)

Contribution to UNPS scholarship fund \$ \_\_\_\_\_

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Please send a complimentary copy of the *Sego Lily* to the above individual.

Please enclose a check, payable to Utah Native Plant Society and send to:

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Or easily pay membership with PayPal at  
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