



# Sego Lily

*Newsletter of the Utah Native Plant Society*

## ***Lost and Found in Salt Lake County***

by Bill Gray



*Above: Bitterroot (Lewisia rediviva) grows on well-drained, coarse gravelly areas in the foothills in late spring to early summer. Lewisia was named for Meriwether Lewis by Frederick Pursh. For more on Pursh, see the article starting on page 10. Photo by Bill Gray*

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Lady Bracknell says in Oscar Wilde's *The Importance of Being Earnest* "To lose one parent is a tragedy, to lose both parents is just plain carelessness." The same may be said of some of our lovely wildflowers – we don't always care enough to keep track of where they are, and sometimes they get lost for ever.

This year I have been delighted to encounter two gorgeous little plants in Salt Lake County that were on my 'most wanted' list. Neither are rare globally, and I had seen both of them occasionally away from my home territory, but each had a particular appeal related to my now 12-year old project of photographing all the plants of our local area. My reference source for this was Lois Arnow's 1980 edition of *Plants of the Central Wasatch Front*, as this is what I built my *Cyberflora* CD upon.

Most challenging was Woodnymph (*Moneses uniflora* of the Wintergreen family) that adorned the cover – the only plant illustrated in the entire book! The cover shows a full face view of a distinctive 5-petaled flower on a diminutive plant. The real clincher, though, was the text which noted "This plant was last collected in our [continued on pg 9]"



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### Many thanks to Xmission for sponsoring our website.

For more information on UNPS: Contact Bill King (582-0432) or Susan Fitts (356-5108), or write to UNPS, PO Box 520041, Salt Lake City, UT, 84152-0041 or email [unps@unps.org](mailto:unps@unps.org)

*Sego Lily* Editor: Walter Fertig ([walt@kanab.net](mailto:walt@kanab.net)). The deadline for the November 2009 *Sego Lily* is 15 October 2009.

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## Chapter News

**Cache:** Saturday, September 19: activity to be announced. Join us in a surprise outdoor activity. We are keeping this one under wraps until it is ready to hatch. One hint though—it will be happening up Logan Canyon!

Saturday, October 17—Annual UNPS Members Meeting hosted by the Cache Chapter and to be held at the Cache Valley Learning Center. Time and Speaker to be announced.

Herbarium activities: White Pine Lake Walk, Saturday, September 5, 9 AM. Meet at Tony Grove Lake Parking Lot. This enjoyable walk is loaded with wildflowers and will be led by Dr. Mary Barkworth. We recommend lots of water and a lunch. The hike usually takes 4 hours round trip. Contact Mary Barkworth at [mary@biology.usu.edu](mailto:mary@biology.usu.edu) for more information. —*Michael Piep*



**Cedar City:** Last month's program featured Bill Gray of the UNPS state board and his exquisite photographs taken in Australia of exotic wildflowers that only grow in that area. The presentation was followed by a reception honoring the remarkable Winnie

Washburn, founder of both the Cedar City and Escalante chapters, who moved to Monte Vista Grove, CA, on August 5th. Mayor Sherratt spoke briefly about the wonderful contributions Winnie made during her 'too few' years in Cedar City. Winnie was presented with a membership in the Huntington Botanical Gardens. Many comments were made about Winnie's boundless energy, positive impact, and the many contributions she made to the community.

Thanks again to Winnie for her charitable donations of all proceeds from her garage sale to the local chapter (a very generous \$700).

On September 15-16, a Waterwise Workshop will be held for professionals and homeowners at the Festival Hall, 105 N 100 E in Cedar City. Topics will include planning and designing your landscape, turf options, efficient irrigation design, and more. Register on-line or pick up forms from Iron County Extension by 11 Sept.—*Alice Maas*

**Escalante:** Saturday, August 22, 9 AM: Seed collecting and propagating field trip with Maria Ulloa, botanist from the Richfield BLM office. Meet downtown at the marquee and bring interested friends and family. We will be going up the Main Canyon Road into the Dixie National Forest. Please bring your own water and sack lunch, plus paper envelopes and markers. Afterwards, join us for a BBQ potluck at the Deltony's west of Escalante.

Saturday September 19, 9 AM: "The Fungus Among Us!" field trip. Search for edible mushrooms with Craig Sorensen around the Barker Reservoirs. See the wonderful variety of colors and shapes of fungi. Craig will identify the only two species that he is certain are good for human consumption! Meet at the marquee and we will carpool. Bring water, a sack lunch, and your camera.

September 23-24, 10 AM—5 PM: Escalante Art Festival. Please advise us if you can work one or two hour shifts at the ENPS table. Thank you for thinking of things to donate to sell. Proceeds will be split 50/50 between ENPS and the Main Street Committee. This is our only fundraiser for both activities and your support is appreciated.—*Harriet Priska*

**Fremont (Richfield area):** The xeric plantings at the Sevier County courthouse in Richfield have flourished and the county commissioners are pleased with the results. Especially showy have been the Firecracker penstemon, Missouri primrose, and *Nepeta*. The south parking strip is eye-catching with sprouts of Little bluestem alternating with mounds of Apache plume.

Also the native plant garden at Sam Stowe Campground in Fremont State Park is in its second year, showing real development. We're finding which plants are happy in this location, which are not, and which ones are delicious treats for rabbits, rockchucks, and deer. All penstemons are thriving and resisting local critter attacks. Oakleaf sumac and *Ephedra* are also making the lovely red rock canyon home.

We invite anyone interested to join us and our hikemaster Bob for



the September 11-13 hike and campout at Deep Creek in Millard County. Contact Bob at 435-527-1099 for further information.

We are sponsoring a Member Appreciation Dinner on September 26. Location is to be announced. Meat will be furnished by the chapter and potluck by the members. If you are planning to attend, please contact Maria Ulloa at 893-2176.

Since our 2009 calendar was highly successful, the chapter will be creating a new calendar. We are inviting all chapters in the state to submit dates of major 2010 events for their chapters so they can be added to the calendar. Submissions should be sent to [jbnielson@sisna.com](mailto:jbnielson@sisna.com) by September 15.—*Janet Nielson*

**Manzanita (Kane County):**

The chapter's fall plant sale will be held on Saturday, September 5 in conjunction with the Kanab Farmer's Market. Janett Warner of Wildland Nursery will be on hand with her usual eclectic selection of native shrubs, grasses, and wildflowers grown in Joseph, Utah.

On Tuesday, September 29 we will have an evening field trip to Diana's Throne and The Sand Hills, north of Hwy 89 and Coral Pink Sand Dunes. This area always has a good show of fall flowering composites and other

*Above: UNPS members experience Arizona willow (Salix arizonica) up close and personal at Cedar Breaks NM on the Society's annual field trip (July 18) sponsored by the Cedar City chapter. Photo by Harriet Priska.*

wildflowers for our viewing enjoyment (and many will be in fruit). Meet at the Best Friends Welcome Center (on the lower road paralleling Kanab Creek) at 6 PM to view the gardens before leaving at 6:30 PM to carpool to Diana's Throne.—*Walter Fertig*

**Salt Lake:** Kipp Lee has stepped down as chapter president to concentrate on finishing his botany studies at the U of U. Thanks Kipp for all the work you did to help get the chapter moving again after a long quiescence. Our new president will be Marni Ambrose, and we hope to put together a varied program of winter talks and summer walks.

In late May Kipp and Bill Gray organized a camping trip to the Wedge Overlook in San Rafael Swell, which was attended by 9 members. We had a great time getting away from Salt Lake's unseasonably wet Spring. Although the diminutive *Pediocactus despainii* had already finished blooming it was a treat to see the tiny balls starting to bury themselves as they dry out for the summer. There were great displays of the Lavender-leaf Sundrops (*Calylophus lavandulifolius*) and the always intriguing *Gilia stenothyrsa*. - *Bill Gray*

## Help Wanted!

### Dinosaur National Monument Can Grow—With Your Help

Although John Wesley Powell's flotilla had passed through the area in 1869, the Green River drainage in Utah's northern Uinta Basin was still largely unexplored in the early 20th Century. Paleontologist Earl Douglass of the Carnegie Museum had a hunch that the exposures of Morrison Formation rocks in the vicinity of Split Mountain (where the Green saws through massive rock walls) might be a good place to hunt for dinosaur bones. Douglass hit paydirt in the summer of 1909, and his dinosaur quarry eventually became the centerpiece of Dinosaur National Monument when it was created by President Woodrow Wilson in 1915.

Earl Douglass purchased a small farm near his beloved quarry, which has remained in his family to this day despite the expansion of the monument in the 1930s and 1960s. This 80 acre inholding is centered on Orchard Draw (as the family called it) or Orchid Draw (as depicted on USGS maps) and is located just west of the monument's quarry visitor center. For botanists, Orchard Draw is as significant a motherlode of rare and endemic plant species as the adjacent Quarry is for dinosaur bones. At least 9 rare and unusual plant species are known from Orchard Draw, including Jones' amsonia (*Amsonia jonesii*), Duchesne milkvetch (*Astragalus duchesnensis*), Dinosaur milkvetch (*A. saurinus*), Uinta Basin cryptanth (*Cryptantha breviflora*), Duchesne spring-parsley (*Cymopterus duchesnensis*), Giant helleborine orchid (*Epipactis gigantea*), Orchard snakeweed (*Gutierrezia pomariensis*—which was first discovered as a new species by Stan Welsh from a specimen taken at Orchard Draw), and the federally Threatened Ute ladies'-tresses (*Spiranthes diluvialis*). Many of these species are highly threatened in the Uinta Basin and are only protected within Dinosaur National Monument. Loss of this critical inholding to development



would impact their survival, as well as potentially detract from the paleontological and historical values of the monument itself.

Earl Douglass' heirs have offered to trade the Orchard/Orchid Draw inholding to the federal government for BLM lands in Colorado that would transfer to a local ranching family. If approved by Congress, the inholding would be incorporated into Dinosaur National Monument and be added to an existing Special Botanical Interest Area on the south side of Split Mountain.

If you would like to see this botanically important area protected in perpetuity, please contact our state congressional delegation and ask them to support the Orchard Draw land swap. - Walter Fertig

### Help Needed to Save the Dwarf Bear Poppy

*Editors Note: In the July issue, we mistakenly reported that the funding for TNC's White Dome Preserve near St. George was already complete. Larrisa Barry, communication director with TNC offers a correction and an appeal for help!*

The Nature Conservancy needs your help to protect some of the last remaining habitat for the

*Above: Dwarf bear poppy (*Arctomecon humilis*) just visited by a departing bee. Photo by Shirley Surfus.*

dwarf bear poppy (*Arctomecon humilis*), an endangered wildflower found in Washington County, Utah, and nowhere else on Earth. The Conservancy and its partners have already secured protection for 330 acres of critical habitat in south St. George, creating the White Dome Nature Preserve. Thanks to recent federal funding, the Conservancy is now poised to acquire an additional 470 acres—completing the preserve and establishing a viable oasis for a range of at-risk Mojave desert species.

To make these vital land purchases, the Conservancy must still raise more than \$300,000 in private donations from supporters. In burgeoning Washington County, human impacts have already destroyed 50 percent of the dwarf bear poppy's historic habitat. The White Dome Nature Preserve will not only protect precious land for the poppy, but it will give scientists a chance to study the plant's life cycle and pollination processes, creating a restoration plan to ensure the poppy's long term survival. To help the Conservancy complete the White Dome Nature Preserve, contact Heidi Mosburg at [hmosburg@tnc.org](mailto:hmosburg@tnc.org) or (801) 531-0999.

## Native Gardens and Native Animals

By Peter Lesica

Reprinted from the Summer 2009 issue of *Kelsey*, the newsletter of the Montana Native Plant Society

Development has converted millions of acres of native vegetation to urban and suburban landscapes. Preservation of the remaining native habitat is critical, but allowing for the survival of native species in altered environments also has a major part to play in conservation.

Recent studies have shown that gardening with natives can play a role in conserving native diversity in urbanized landscapes. The most commonly mentioned reason for using natives in landscaping is that exotic plants can escape cultivation and become troublesome or even destructive weeds. Indeed, more than half of the noxious weeds in the United States were first introduced for horticultural purposes. But there are other ways that gardening with natives can help conserve biological diversity. Evidence that native urban landscaping results in greater animal diversity and abundance is beginning to accumulate.

Douglas Tallamy and colleagues at the University of Delaware compared a half dozen Pennsylvania suburban yards landscaped with native plants to similar yards with conventional exotic ornamentals and turf. They found that there were three times more species of native butterfly and moth larvae and twice as many insectivorous bird species in the native compared to conventional yards. Moreover, both native birds and butterflies were more abundant in the native yards. This should not be surprising because the vast majority of herbivorous insects, such as butterfly larvae, are specialists—they thrive on only one or a few closely-related plant species. Non-native plants, no matter how pretty they are, just won't do for a meal. And since non-native yards have fewer insect species, there are fewer insectivorous birds as well.



Native pollinators are not as dependent on native flowers as herbivorous insects are on their food plants. For example a monarch caterpillar must feed on milkweed, but the monarch butterfly will sip nectar from many different flowers. Furthermore, some exotic plants are actually beneficial to native pollinators. For example, leafy spurge, which was introduced as an ornamental, produces copious, easily-accessible nectar and is regularly visited by native bees. Nonetheless, non-native ornamentals often will have flowers that are not beneficial to native pollinators. A team of Oxford researchers compared native pollinator visitation to five native and several non-native horticultural plants in England. They found that all five natives were commonly visited by native bees and flies. On the other hand, one of the exotics was of subtropical origin and was bird rather than insect-pollinated. In addition, some of the non-native species failed even to produce nectar.

*Above: Milbert's tortoiseshell butterfly (Aglais milberti) on Cut-leaved groundsel (Senecio eremophilus) at Brian Head Peak on Cedar Mountain. Photo by Ken Kingsley.*

It is clear that additional studies on the thousands of introduced ornamentals are needed to sort out which species can be beneficial for native animals. Many may be as good as some natives. But right now it's a good bet that, all else being equal, natives will do more for our birds and bees than conventional landscaping.

### References

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## ***Species Richness and Complementarity: Sizing Up Utah's National Parks, Monuments, Recreation Areas, and Historic Sites***

By Walter Fertig

In order to stave off the threat of widespread species loss, conservation biologists hope to eventually create a network of protected areas across North America that will preserve a representative sample of the continent's full native plant and animal diversity. National park units are an important component of this network, as they are among the most highly protected of all lands and are managed with an emphasis on preserving native species. Utah has one of the highest concentrations of national parks and monuments in the United States, as well as one of the richest biotas.

But how effective is the existing system of Utah parklands in meeting the goal of full representation of biological diversity? To find out, I compiled vascular plant species checklists for 14 national parks, monuments, recreation areas, and historic sites in the state managed by the National Park Service and the Bureau of Land Management into a master species database derived from the 4th edition of *A Utah Flora* (Welsh et al. 2008). I wanted to see how many species were present in these parklands, what sort of species were absent, and how important each park was to the overall network. I hoped that patterns might emerge that would help guide future protection efforts for geographic areas, habitats, and species that remain inadequately protected.

**Species Richness:** Not surprisingly, I found that larger parklands, on average, had the greatest number of species (also called species richness or alpha diversity). Based on data current through 2008, Grand Staircase-Escalante National Monument (GSENM) had the highest species richness of any of the parklands I examined, with 999 taxa. At over 761,000 ha, GSENM is also the largest protected area in Utah. Overall, the six largest parks all had the larg-

Rank of Park Units in Plant Species Richness (based on data through 2008)		
Park	# Vascular Plant Taxa	Size (ha)
1. GSENM	999	761,070
2. ZION	991	59,900
3. GCNRA	889 (863 in UT)	505,868
4. CARE	888	97,895
5. DINO	757 (485 in UT)	85,096
6. CANY	600	136,610
7. BRCA	587	14,502
8. ARCH	523	30,966
9. NABR	428	3,099
10. CEBR	354	2,491
11. HOVE	340 (240 in UT)	318
12. TICA	235	101
13. RABR	224	65
14. GOSP	149	1,107

est floras (see table above). Likewise, the six smallest units had the lowest species richness. These patterns generally hold if park area is normalized by taking the natural log of the area, though Zion National Park then emerges as having the richest flora with 90.1 species/ $\ln(\text{area})$ , followed by Capitol Reef National Park and Grand Staircase\*.

**Protection Status:** The 14 parklands studied here contain at least 2007 of the state's 3659 native and naturalized vascular plant species (54.8% of the flora of Utah). Rare or endemic species (those with ranges limited to a small geographic area) are more than twice as likely as common or widespread species to be missing from the protected area network.

\*New discoveries in Zion NP in 2009 have increased the park's flora by nearly a dozen species and have enabled the park to pass GSENM in total plant species richness. The complete list of new species will be published in a future issue of the *Sego Lily* at the conclusion of the field season.

Protection also tends to be biased towards species found in habitats of low economic value. In the Colorado Plateau area, 70% of the unprotected plant taxa occur in just 12 hotspots of endemism (the La Sal, Abajo, Henry, Tushar, Boulder, and Pine Valley mountains, Book Cliffs, Tavaputs and Fish Lake plateaus, Sevier Valley, Uinta Basin, and San Rafael Swell). Many other unprotected species are found on low elevation private lands.

**Comparing Floras—the Importance of Complementarity:** While small parks tend to have fewer species, their contribution to the overall protected area network may greatly exceed their diminutive size due to the concept of complementarity. Also called beta diversity, complementarity measures the degree of dissimilarity between the floras of different parks. The fewer species that two parks have in common, the greater the degree of complementarity and the more important the contribution of the park with the most unique flora. Parks with high beta diversity tend to have relatively high numbers of endemic or rare species that might not otherwise be represented in the protected area network.

The table on page 7 documents the degree of similarity (or dissimilarity) between each of the 14 parklands I analyzed. The data in the upper right hand columns show the number of species shared among parks. This number can be deceiving because of the disparity in size between many parks. Jaccard's Coefficient of Similarity (JCS) is a useful way to compare the size of floras by taking into account disparities in overall species richness. Based on JCS, two of the smallest parks (Golden Spike NHS and Cedar Breaks NM) are the least similar to other parks, and thus make significant contributions of unprotected species to the network.

**Number of Species in Common**

<b>Park</b>	ARCH	BRCA	CANY	CARE	CEBR	DINO-UT	GLCA-UT	GOSP	GSENM	HOVE-UT	NABR	RABR	TICA	ZION
ARCH		215	402	414	73	260	425	75	418	182	293	160	80	324
BRCA	0.24		250	390	227	229	288	81	423	126	224	85	111	365
CANY	0.557	0.267		455	83	261	495	80	482	198	342	179	83	367
CARE	0.415	0.359	0.44		168	321	547	90	648	204	353	178	129	499
CEBR	0.091	0.318	0.095	0.156		92	103	29	172	37	89	32	75	202
DINO-UT	0.347	0.272	0.317	0.305	0.123		293	90	329	137	220	95	110	281
GLCA-UT	0.442	0.248	0.511	0.454	0.092	0.278		87	630	201	360	208	96	469
GOSP	0.125	0.124	0.12	0.095	0.061	0.165	0.094		108	63	66	27	62	97
GSENM	0.378	0.364	0.432	0.523	0.146	0.285	0.511	0.104		214	357	195	140	613
HOVE-UT	0.313	0.18	0.308	0.221	0.066	0.233	0.223	0.193	0.209		162	88	42	180
NABR	0.445	0.283	0.499	0.367	0.128	0.317	0.387	0.129	0.334	0.32		137	79	299
RABR	0.272	0.117	0.278	0.191	0.059	0.155	0.237	0.078	0.19	0.234	0.266		22	157
TICA	0.118	0.156	0.11	0.13	0.146	0.18	0.096	0.193	0.128	0.097	0.135	0.05		156
ZION	0.272	0.301	0.3	0.362	0.177	0.235	0.339	0.093	0.445	0.171	0.267	0.148	0.146	

**Jaccard's Coefficient of Similarity**

Annotated checklists for 16 parks, monuments, and historic sites managed by the National Park Service in the Northern Colorado Plateau Network (NCPN) are now available as downloadable pdfs from the NCPN website (<http://science.nature.nps.gov/im/units/ncpn/>). These checklists were developed from 2004-2008 and include information on species confirmed for each park with an herbarium voucher, plants reported in literature (without a voucher), species that are falsely reported or questionable, and species that may potentially occur in the park based on records from the vicinity. Each list is annotated with information on synonyms, common name, growth form, geographic distribution, nativity, abundance, flowering period, habitat preferences, and other data of interest.

Left: Map of Utah showing the distribution of parklands examined in this study and their standard abbreviations: ARCH (Arches National Park), BRCA (Bryce Canyon National Park), CANY (Canyonlands National Park), CARE (Capitol Reef National Park), CEBR (Cedar Breaks National Monument), DINO (Dinosaur National Monument), GLCA (Glen Canyon National Recreation Area), GOSP (Golden Spike National Historic Site), GSENM (Grand Staircase-Escalante National Monument), HOVE (Hovenweep National Monument), NABR (Natural Bridges National Monument), RABR (Rainbow Bridge National Monument), TICA (Timpanogos Cave National Monument), ZION (Zion National Park).



## ***Mighty Phragmites: USU Researcher Studies Wetlands Invader***

By Mary-Ann Muffoletto  
Reprinted with permission from  
Utah State Today

When Utah State University researcher Karin Kettenring tells relatives in her native New Jersey that she moved to the Intermountain West to teach and study wetland ecology, she receives incredulous stares and a few unsuppressed chuckles.

“Utah? They ask—’Isn’t that a desert?’” says Kettenring, who joined USU’s Department of Watershed Sciences faculty in August 2008. “I have to explain that, yes, Utah has wetlands and they’re among the state’s most critical ecosystems.”

Wetlands are especially important in an arid region, she says, as they supply many of the basic needs of wildlife—food, water, a breeding ground and shelter from predators—in a surprisingly compact space.

Among Kettenring’s current research projects is the investigation of a prolific invasive plant known as *Phragmites australis*. The white-tasseled plant is often referred to as Common reed. The pesky perennial, which is threatening native ecosystems, is a type of grass.

“When I first flew in to the Salt Lake International Airport and drove up to Logan, I noticed *Phragmites* all along Great Salt Lake,” she says. “I knew they had a stronghold back East but didn’t know they were so pervasive in this region.”

Prior to joining USU, Kettenring studied the plant extensively in the Chesapeake Bay area, where she served as a postdoctoral fellow for the Smithsonian Environmental Research Center. She’s continuing her study of *Phragmites* here in the West.

“With my students and colleagues, I’m investigating how this plant is spreading, why it is so successful, and what the best ways are to control it” she says. “Among the questions we’re asking is has something changed about the environ-



*Above: Karin Kettenring, assistant professor in the Department of Watershed Sciences, walks through an invasive grass called Phragmites in a Logan, Utah, wetlands area. Photo courtesy Utah State University. Right: Phragmites australis from Manual of the Grasses of the United States, second edition, revised, by Agnes Chase, 1950.*



ment that’s accelerating *Phragmites* growth?”

Kettenring says increased fertilizer and sediment runoff from farms, residential developments and industrial areas could explain *Phragmites*’ proliferation. Climate change may also be contributing to the plant’s spread.

*Phragmites* secretes gallic acid, which is toxic to native plants. Researchers at the University of Delaware recently announced findings that increased ultraviolet rays from the sun, a possible consequence of warming temperatures, degrades gallic acid and produces another toxin, mesoxalic acid, which also hinders the growth of native plants.

Aside from toxins, Kettenring says *Phragmites* crowds out native plants with its sheer physical size above and below ground. “*Phrag-*

*mites* can reproduce by seed or rhizomes,” she says. “Left alone, it can take over a large area in just a few years.”

Rhizomes are fleshy underground stems that grow horizontally to form extensive reed beds. Highly adaptable, *Phragmites* can form reed beds in a variety of soils and water types. “Lateral shoots from *Phragmites* may grow as much as 16 feet per year” Kettenring says. “And it grows stalks that rise 10 to 15 feet tall.”

Uncontrolled, *Phragmites* prevents the growth of native plants, including varied species of bulrush that provide critical food and nesting habitat for birds. “Wildlife managers typically use herbicides such as glyphosate to control *Phragmites*,” Kettenring says. “Commercial applications of glyphosate are approved for use near wetlands but they’re not always effective. Among the things we’re investigating is when the best time is to spray herbicides and how much should be applied. We’re also investigating other methods of control, including flooding of wetland areas.”

## Lost and Found in Salt Lake County

[continued from page 1]

range in 1906 (Garrett 2022 UT)\*". From that point I kept it in mind while hiking in the spruce-fir communities of our local Wasatch Mountains in late summer, but drew a complete blank until this year. Was it very rare? Had we already destroyed its habitat? Or was it merely very elusive?

Then in early August, while I was leading a wildflower walk for Save Our Canyons, one of the group told me she had seen some Woodnymphs by a trail in Big Cottonwood Canyon. The habitat sounded right, and I knew her to be a good observer, so I immediately planned a visit. Thanks to good directions we found 2 small populations by the trail. As implied by the epithet '*uniflora*' a single flower was on each stem. Five wavy white petals and 10 large stamens surrounded a dark green female center that could be taken for a medieval hand weapon. All flowers were facing demurely downwards, but the stems will progressively straighten as they develop further, until the ripe seed capsule will be facing upwards. The flowers are about  $\frac{3}{4}$  inch across, on a 2-3 inch stem. Since the plants were sufficiently numerous I collected a couple to add to Garrett's own 1906 collection in the U of U Herbarium that bears his name. There we discovered that Lois Arnow herself had also been inspired to go searching for Woodnymphs and had located some in 1980!

The other challenge was Bitterroot (*Lewisia rediviva* of the Purslane family). This is another low-growing plant with beautiful white/pinkish flowers. It was first collected on July 1, 1806 by Meriwether Lewis on his epic exploration of the Northwest. His original specimen, more than 200 years old, still sits in the Lewis & Clark herbarium in Philadelphia. Or at least the petals do. The fleshy roots had sprouted in Lewis's dried herbarium specimen

\* Herbarium specimens are identified by the name of the collector, his/her specimen number, and an abbreviation to indicate the herbarium where the collection is deposited.



Above: Woodnymph (*Moneses uniflora*). Look for it in late summer on cool shady slopes in high spruce-fir forest. Woodnymph likes loose crumbly leaf litter similar to that enjoyed by other members of the Wintergreen family. Photo by Bill Gray.

and were removed by a Mr. M'Mahon, and planted. They grew back to life - hence the epithet '*rediviva*'! Sadly, M'Mahon's gardening skills were not up to the task of cultivating a dry land species in the humid East and the plant did not survive more than a year.

Arnow's description finishes with the comment "Known in our range from a single population near the southern boundary of Salt Lake County (*Woodruff 1469 UT*)". Dorde was able to give me general directions, but I did not find the plant until this year. From her description it seemed unlikely that the habitat would have been disturbed greatly by human activities since her discovery. A flurry of coincidences led to a successful trip in late May. First, a visitor to the UNPS website sent photos of a plant in Washington County, that proved to be Bitterroot. Second, non-blooming plants were found near I-15 in Tooele County. Then, while helping to make a plant list for Corner Canyon Regional Park in southeast Salt Lake County I was told about a plant that grew further along the trail towards Lone Peak, and we knew it had to be the one. Bill Nelsen and I were

both successful in locating a small population in full bloom.

Slender half inch succulent leaves are all that can be seen above ground in early Spring, and these may be shriveled by the time buds appear. The buds seem to grow directly out of the ground, then burst open into stunning two-inch wide wonders that have a passing resemblance to cactus flowers: the Purslane and Cactus families are closely related. This population seems very vulnerable, growing on an outcrop of unusual soil. Its best chance for survival is probably for it to be forgotten again for a while, rather than to be loved to death.

So both of these plants, though uncommon locally, have a very wide distribution, and are in no danger as species. However, both are very precious as local examples of the beauties that are out there awaiting one's own individual discovery. It helps tremendously to spend time with other flower enthusiasts who can share their knowledge of where the gems are to be found. I feel fully recompensed for the time spent showing others how to look, and what to look for.

Other plants are not so lucky with their choice of living quarters. Our foothill and stream habitats around the valleys are prime targets for development, or have been severely altered by grazing and water management. Two beautiful plants that may survive only in protected areas around the Salt Lake Valley are Yellow Lady Slipper orchid (*Cypripedium calceolus*) now known only from Red Butte Canyon Research Natural Area, and Beckwith's Violet (*Viola beckwithii*), which was rediscovered by Faye Rutishauser in Red Butte Garden natural area two years ago. Despite a lot of searching by Salt Lake Chapter members over several years this once fairly common native has not been found outside the confines of the garden.

Do you have seldom seen plants in your area? Would you be willing to share stories about them? If so, please contact Bill Gray (cyberflora@xmission.com).

## What's in a Name? Pursh and Purshia

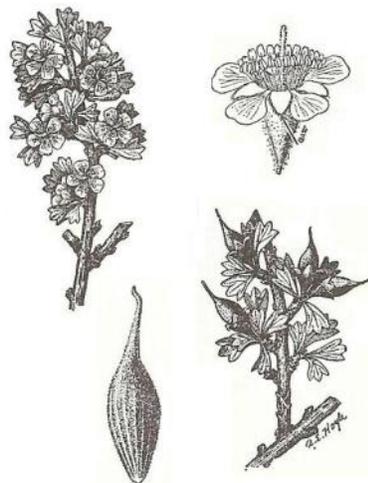
By Walter Fertig

Frederick Pursh sought botanical fame in North America, but due to some unscrupulous deeds achieved greater infamy instead. Despite publishing one of the first floras to cover North America, he died penniless at the age of 46 with the reputation of a drunkard and a cheat. Perhaps it is no surprise that “bitterbrush” is a common name of the genus named in his honor.

Pursh was born in Saxony in 1774 and was educated in the ways of horticulture and taxonomy at the Royal Botanical Gardens in Dresden. At the age of 25, Pursh emigrated to the United States where he was employed at several botanical gardens in Baltimore and Philadelphia.

In 1805, Pursh was hired by Benjamin Smith Barton to work as a plant collector and assist with the preparation of Barton's planned flora of North America. Barton had previously written the first American textbook of botany and was regarded as one of the young republic's leading botanists. President Jefferson had tapped Barton to provide training in botany and medicine to Meriwether Lewis and to describe any new plant species documented by the Corps of Discovery. The elderly Barton's days as a field collector were well past, and he hired several capable younger botanists (including Thomas Nuttall) to go into the wilds seeking new plant species. Pursh spent two years exploring eastern North America from South Carolina to New Hampshire and the Great Lakes, collecting hundreds of specimens for his mentor and gaining valuable first-hand experience with the flora.

Meriwether Lewis returned to Philadelphia in 1807 with about 150 botanical specimens in need of identification and publication. Technically, Barton remained in charge of publishing Lewis' discoveries, but his advanced age, poor health, and decreasing productivity (Barton's flora never came close to being



*Above: Bitterbrush (Purshia tridentata), a widespread yellow-flowered member of the rose family with achenes having a simple style (lacking the feathery ornamentation of Cliffrose). Purshia was named by DeCandolle to commemorate Frederick Pursh, a famous (some might say notorious) taxonomist of the early 19th Century who described 40 new species from the Lewis and Clark expedition—including Bitterbrush. Illustration by A.E. Hoyle from Range Plant Handbook (US Department of Agriculture 1937).*

completed) prompted Lewis to hire Pursh for the task. Pursh was paid \$70 to organize the collection, prepare illustrations, and write new species descriptions as part of a planned publication on the scientific findings of the Lewis and Clark expedition.

Unfortunately, this publication was never completed. Lewis committed suicide in the fall of 1809. Barton failed to live up to his obligations to publish the collections of the Lewis and Clark expedition before his own death in 1815. Meanwhile, Pursh continued to work on the collections, but left Barton's employment and eventually returned to England. Pursh ultimately published 94 of Lewis' collections as new species in his 1813 publication *Flora Americana Septentrionalis* (Latin for “Flora of North America”). Forty

of the names Pursh gave to these specimens are still accepted, including three new genera he described: *Lewisia* (bitterroot) and *Clarkia* (clarkia) named for the explorers, and *Calochortus* (literally “beautiful grass”). Pursh's book included nearly 3100 species from North America and was well received by the botanical community as the leading flora of its time.

Pursh might be forgiven for absconding to London with the Lewis and Clark material, given that Barton had failed in his publishing responsibilities. Where Pursh got into trouble, however, was in helping himself to collections of undescribed species sent to England for safekeeping by English collectors Thomas Nuttall and John Bradbury. Pursh took the liberty of publishing his own names for their materials, denying both men their rights to name the plants as they saw fit. Nuttall would overcome this slight by publishing his masterpiece *Genera of North American Plants* in 1818, which supplanted Pursh's flora as the preferred reference for the continent. Bradbury never recovered and abandoned his pursuits in botany altogether. He remained bitter for the rest of his life and his angry correspondence regarding Pursh did much to tarnish the German's reputation.

Pursh returned to North America in 1816 to establish a botanic garden in Montreal and to collect specimens towards a flora of Canada. His specimens were destroyed in a fire and the project was never completed. He died in 1820 having never restored his reputation from that of a botanical charlatan.

One of the Lewis and Clark plants that Pursh described as a new species was *Tigarea tridentata*, a yellow-flowered shrub with three-lobed, wedge-shaped leaves in the rose family, collected by the explorers west of Lewis and Clark Pass in western Montana in 1806. The genus name proved to be illegitimate under the technical rules of nomenclature and was replaced with

*Purshia* by Decandolle in 1816. Originally, the concept of *Purshia* was restricted to two shrubby species from western North America with one or two achenes lacking an elongated, feathery style. Recently, the genus has been expanded to absorb four species formerly placed in the genus *Cowania* based on evidence that the genera are capable of hybridization.

*Purshia tridentata*, the bitterbrush or antelope bitterbrush, is a multi-branched woody shrub that often grows nearly prostrate to the ground and occurs widely across western North America, from southern Canada to northern Arizona and New Mexico. True to its name, the foliage of the plant is extremely bitter tasting to us, but quite palatable to deer, elk, and livestock. The stunted habit is often a consequence of heavy browsing, as bitterbrush can become tall and upright where protected or in favorable, sandy soils. Bitterbrush is also important ecologically for the nitrogen-fixing bacteria that live in specialized nodules on the plant's roots.

Cliffrose (*Purshia mexicana* var. *stansburyana* or *P. stansburiana*) resembles bitterbrush, but tends to be a taller shrub with one main trunk, five-lobed leaves, and creamy white petals. It also differs in having numerous achenes, each tipped at maturity with an elongated, feathery style that helps disperse the fruit. The leaves of cliffrose are frequently coated in a resin-like varnish which helps impart an unpleasant taste to humans, but less so to browsing animals. Southwestern Indian tribes used the bitter leaves to induce vomiting, to make cough syrup, and to wash wounds or treat skin problems. Leaves and twigs were also used to make a gold dye and the shredded bark was valuable as stuffing for pillows and baby beds.

The type locality of *Purshia mexicana* var. *stansburyana* is Stansbury Island in the Great Salt Lake. The plant was collected there by Captain Howard Stansbury in 1850 during his survey of a potential railroad route around the Great Salt Lake. Stansbury was a topographical engineer by training, but like many other early explorers in the west kept an eye out for unusual



plant specimens. His collections are among the earliest to come out of Utah.

Bitterbrush and cliffrose can hybridize when they grow together and the two taxa are thought to have given rise to a third species, *Purshia glandulosa* or Desert bitterbrush. This species strongly resembles *P. mexicana* in flower and leaf characters but has the fruit traits of *P. tridentata*. In Utah, Desert bitterbrush is found primarily in the Beaver Dam Mountains west of St. George.

Cliffrose is a popular garden ornamental in the west because of the beauty and sweet aroma of its flowers. Plants are often available from native plant nurseries or can be grown from seed following 30 days of cold stratification. *P. mexicana* thrives in rocky soils and full sun, though in hot climates may do better on a shadier north aspect.

Though less showy, bitterbrush is also used in cultivation. It can be grown from stem cuttings or seed that is cold stratified for 90 days. Plants do best in full sun or light shade on moist, well-drained soils.

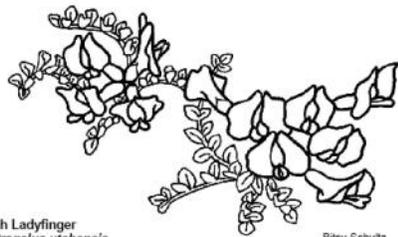
Cliffrose is sometimes confused with Apache plume (*Fallugia paradoxa*), another shrubby species in the rose family with enlarged, feathery styles in fruit. Apache plume is distinct in having white flowers and leaves that are

Above: Cliffrose (*Purshia stansburiana* or *P. mexicana* var. *stansburyana*) in flower. The aromatic blossoms of cliffrose may cover the entire plant and be smelled from several feet away. Photo by W. Fertig.

densely yellowish-woolly below, rather than whitish hairy in *Purshia*. *Fallugia* is also distinctive in having separate male (staminate) and female (pistillate) plants and unisexual flowers (this is the 'paradox' of *F. paradoxa*!). Hybrids between Apache plume and Cliffrose have been reported in the past from northern Arizona. Recently, the validity of these hybrids has been questioned, as they appear to be *P. mexicana* plants with aberrantly developed stamens. Though closely related, the two genera are in no danger of being combined.

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