



VOL. 17 NO. 1

JAN / FEB 1994

CALENDAR OF EVENTS

- Jan. 14** **UNPS Board Meeting.** Red Butte Gardens Conference Room, 390 Wakara Way, Friday
Research Park, 7:00 pm.
- Jan. 25** **Cache Chapter Meeting.** Tour the Intermountain Herbarium with Mary Barkworth, Tuesday
Director. Meet at the Herbarium in the basement of the Junction on the Utah State campus
7:00 pm in Logan.
- Jan. 26** **Salt Lake Chapter Meeting.** To be announced. Watch for your blue card.
- Jan. 29** **Conference: Population Growth, Ethics and the Environment.** This is a one- Saturday
9:30-3:00 day conference at the University Park Hotel focusing on the impacts of unchecked
population growth, and what Utahns can do to promote sustainability, education and
planning. Keynote speaker is Dottie Lamm of Colorado. Six breakout sessions. Open to
the public. \$20 registration fee includes lunch. To register, call 521-2623.
- Feb. 26** **Cache Chapter Meeting.** " Looking at Trees in Winter". Fieldtrip led by Robert Fitts. Saturday
Call Robert (753-5613) for details of meeting place. Trip begins at 9:00 am.
- Feb. 23** **Salt Lake Chapter Meeting.** To be announced. Blue card will give details.
- June 10-11** **Threatened & Endangered Plants Fieldtrip.** These dates are tentative, but mark
Fri.-Sat. your calendars now. Lori Armstrong, botanist for the BLM, will host this trip which will
probably take us into the northern part of Kane County.

1994 Officers and Committee Chairs

Chairman of the Board	Brent L. Shipley	268-2601
State President	David Gardner	649-3355
State President Elect	Alice Hreha	532-1539
State Treasurer	Andy Boyack	278-8596
Newsletter Editors	Jo Stolhand	521-0069
	Janet Williams	364-4546
Salt Lake Chapter President	Open	
Secretary	Joan Livingston	295-7825
Cache Valley Chapter President	Robert Fitts	753-5613
Membership Committee Chair	Pamela M. Poulson	581-3744
Endangered Plants Committee Chairs	Ben Franklin	838-5418
	Duane Atwood	625-5599

Board Members at Large: Sherman Rrough, Dick Hildreth, Dave Okelberry, and Dick Page

UNPS FUNDS CONSERVATION PROJECTS

Andy Boyack
UNPS Treasurer

The Utah Native Plant Society has helped fund several conservation related projects this year.

We contributed \$1000 to BYU's Department of Botany and Range Science for field studies of the rare *Cycladenia humilis*. We also contributed \$2000 for studies of rare taxa by Renee Van Buren and Loreen Allphin in the same department.

The Coral Pink Sand Dunes State Park was given \$1000 to help fence a Habitat Conservation Area.

Snow College needed a microscope for botanical work so we helped them buy one with a contribution of \$2377.

As a result of our offer of a reward for finding a *Cypripedium calceolus*, Lynn Bohs found one and we paid her \$100. We have not yet had any takers on our offer of a reward for finding *Echinocactus polycephalus*.

We also contributed 45 of our Utah Native Plant posters to KUER for their fall fund drive.

URBAN FORESTRY BOARD NEEDS NEW MEMBERS

The Salt Lake City Urban Forestry Board, an advisory group to the Salt Lake City Urban Forester, Mayor and City Council on matters pertaining to the City's Urban Forestry Program, currently has volunteer positions for three neighborhood council Districts and the Sugarhouse Business District.

Members representing each of the Council Districts must reside in that district. Business district representatives do not have to live in the district but do need to work in that district.

Neighborhood Districts Openings:

- District #2 (Council Member is Paul Hutchison)
- District #4 (Council Member is Alan Hardman)
- District #7 (Council Member is Don Hale)

The Board meets in the evening on the first Tuesday of each month in the City Hall. A time commitment of five hours a month is asked to best serve on the Board. If you are interested in becoming a Board member and serving your community, please call 972-7818 for an application.

VOLUNTEERS NEEDED

The Utah Natural Heritage Program is a centralized repository for information about the biodiversity of Utah. The program can provide information helpful for land use planning, environmental and permit review, ecological preserve selection, or research and education. These data are site-specific and are especially useful as an information tool by developers in pre-planning stages to avoid unnecessary conflicts, costs, and delays. Information is collected and stored in the program's integrated data management system of map files, manual files, and computer database and Geographic Information System. Data are indexed in a variety of ways including latitude/longitude, Township/Range/Section, watershed, land ownership, endangerment status, or scientific name.

Volunteers are needed to obtain data on Utah rare plant species of concern to the Utah Natural Heritage Program. Collection and annotation data will need to be transcribed from collected specimens onto "Herbarium Log Sheets" designed specifically for the acquisition of such data. Volunteers will be needed to visit each of the three major Utah university herbaria and potentially the smaller universities where substantial collections exist.

If you can help, or for additional information, please contact Ben Franklin, Botanist, Utah Natural Heritage Program, 355 West North Temple, 3 Triad Center, Suite 450, Salt Lake City UT 84180-1204, (801) 538-5418; Fax 521-0657.

UMNH'S 1994 WINTER LECTURE SERIES DESERT SEA: THE GREAT SALT LAKE

The beauty and mystery of the Great Salt Lake attracts visitors from all over the world, yet it is often perceived as hostile and inaccessible to those who live around it. To provide Utahns with an overview of this saline neighbor, the Utah Museum of Natural History will present a four-part series, which runs Wednesdays, January 19 through February 9, to show that "this seeming wasteland that cries out for our intervention, is in truth a thriving community, resisting any attempt at refinement," according to Curator of Education Marlene Lambert-Tempest. "This year's lecture series is a celebration of the inherent values of this predominant and priceless feature of the landscape." Lectures are at 7:30 pm at the U of U Fine Arts Auditorium, \$5 each. For more info: 581-4887.

Lichen Presentation for Utah Native Plant Society

22 SEPTEMBER 1993

Sherman G. Brough

WHERE DO YOU FIND LICHENS?

Most lichens cannot compete where green plants grow well; instead, lichens are found in harsh, inhospitable locations. These places usually have in common: a) mineral nutrients available only in small amounts; b) a small or inconsistent supply of water, frequently due to rapid run-off; and c) exposure to wide temperature extremes because of direct exposure to sun or cold conditions. Some of these inhospitable locations are rock surfaces, sterile soil, dead limbs and trunks of trees.

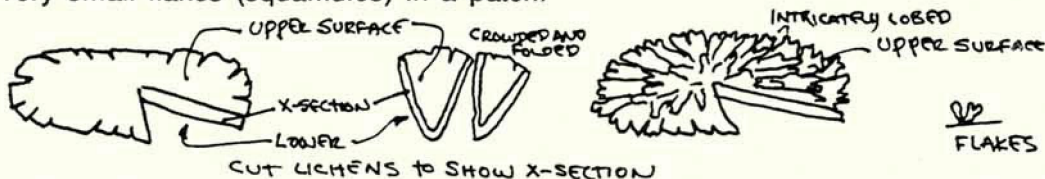
If you are an untrained and casual observer you may see lichens on tree trunks but only as background organisms. Many describe the features of bark or rock, but are really describing the lichens growing on these surfaces. Most people can recognize lichens after lichens have been pointed out to them, and with keen observation can begin to realize that they come in spectacular arrays of shape and color. It isn't until you begin to collect different kinds that you can distinguish the subtle differences. I collect what I think is "one kind" of lichen. After bringing the collection back to the laboratory for identification and more critical study, I frequently find that I had really collected two, three, or more species. Lichens frequently grow in mixed patches. Lichen identification is not for the impatient and casual observers.

HOW DO YOU TELL ONE LICHEN FROM ANOTHER?

Lichens are difficult to identify. They require keen, critical observation to see the differences. Some of the major problems to lichen identification are listed. 1) The sheer numbers of kinds; more than 20,000 species have been described, over 2000 from North America alone. 2) Lichenologists have developed their own names for lichen structures, many are difficult to comprehend from written descriptions or keys. Help from an expert will save days of time and frustration. 3) Good photographs are difficult to make; lichens are a challenge for photographers because of their "in between" size. If photographed by a regular camera, details can not be seen; if a close-up lense is used, details are seen but the character of the whole lichen cannot be visualized. 4) To identify many lichens, lichen substances need to be identified either by chemical tests, crystal identification, or chromatography tests. Outlines for substance identification are found on page 5 and 6. It's difficult to get some of the proper chemicals. 5) The publications for identification of Lichens, until recently, were either highly technical and almost impossible for the layman to understand; or the lichens collected did not quite fit the keys or descriptions. Confident identification is difficult for all lichens except for a few of the common ubiquitous species. The best guides at present are listed on page 7, but still the books cover too great a geographic area and therefore include too many species to be useful to the layman or beginner here in Utah. For this reason I have taken very specific habitats within a small geographic range, in order to reduce the number of species to a workable level for beginners. This will give you an easier start, help you to understand new terminology and give you confidence. Before long you should be able to identify most common lichens found in the Salt Lake area. These species included in the accompanying key are common throughout the state of Utah, however expect other common species in other areas. The key does not include the strictly crustose lichens, because much of their identification is based upon the microscopic characteristics of the spores, the "crusts" therefore, cannot be easily identified without a microscope. Some species listed in the key were not collected by me, and are listed within brackets [], however these lichens are known to exist in Big Cottonwood Canyon, because of lists published by Seville Flowers, University of Utah (1954).

Key to the Common Lichens at the mouth of Big Cottonwood Canyon, Utah.

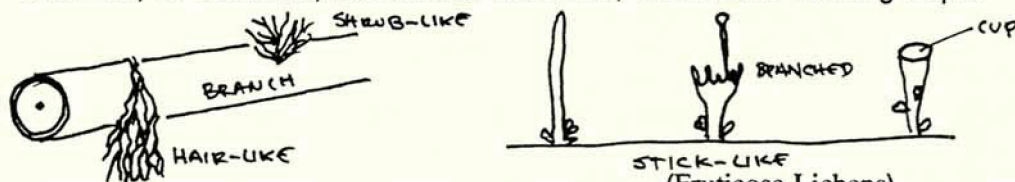
- 1a. Lichen (thallus) two dimensional with definite upper and lower surfaces. Leaf-like or disc-like, sometimes folded and/or crowded together; frequently intricately lobed; or crust-like, adhering tightly to, or submersed within the substrata; or very small flakes (squamules) in a patch.



CUT LICHENS TO SHOW X-SECTION

2

- 1b. Lichen (thallus) three dimensional, with length, width, and a distinct height. Hair-like, or stick-like, sometimes branched, sometimes forming cups.

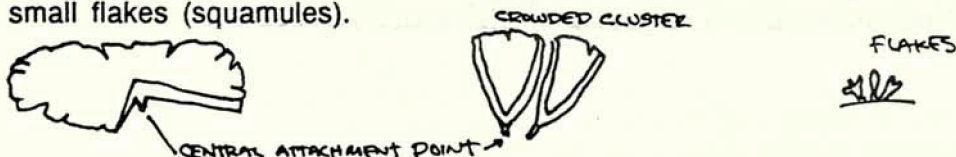


STICK-LIKE

(Fruticose Lichens).

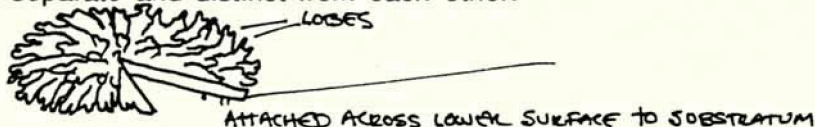
5

- 2a.(1a) Each thallus, attached by a single central point (look for scar), (often thalli may be crowded together in clusters); or attached from the end of small flakes (squamules).



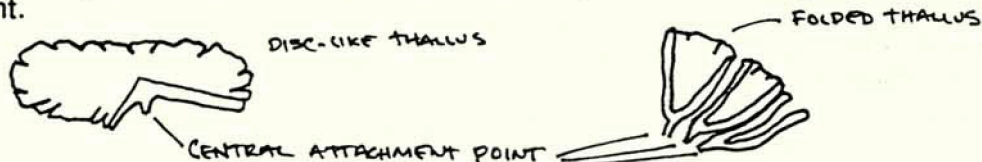
3

- 2b. Each thallus attached across undersurface, leaf-like and frequently lobed, (often thalli separate and distinct from each other).



4

- 3a.(2a) Each single thallus disc-like (some discs folded) and attached by a central point.



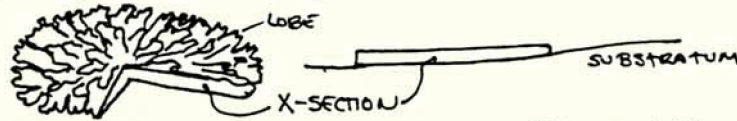
(Umbilicate Lichens). 6

- 3b. Each single thallus flake-like, and attached by the end. Flakes (squamules) numerous, in patches.



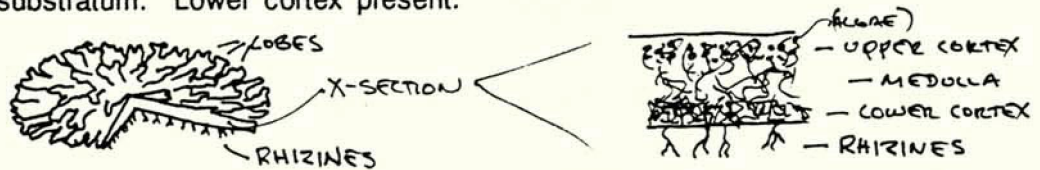
(Squamulose Lichens). 5

- 4a.(2b) Thallus crust-like, sometimes lobed, adhering tightly to or within the substratum; lower layer (cortex) absent. Entire thallus difficult to remove, without including substratum.



.....(Crustose Lichens).7

- 4b. Thallus leaflike; frequently, intricately lobed; often attached across underside by "rootlets" (rhizines). Entire thallus can be removed from substratum. Lower cortex present.



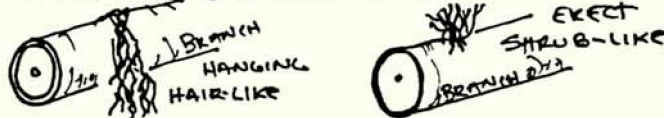
.....(Foliose Lichens).8

- 5a.(1b, 3b) Thallus stick-like, erect and hollow (a podetium); branched or unbranched; often forming cups; arising from a bed of squamules.



.....*Cladonia chlorophaea*

- 5b. Thallus hair-like, hanging or erect from tree and shrub branches or bark.

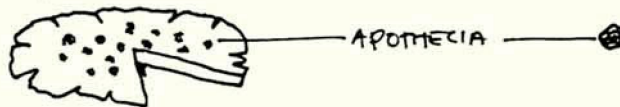


.....(various Genera, e.g. *Evernia*, *Usnea*)

- 6a.(3a) Thallus **without** fruiting-body-discs (apothecia). Medulla C-.

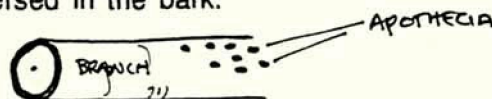
.....*Dermatocarpon reticulatum*

- 6b. Thallus with apothecia. Medulla C+ red.



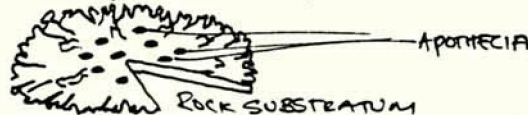
.....[*Umbilicaria*]

- 7a.(4a) Growing on wood or bark. Fruiting-body-discs (apothecia) black, **without** an apparent thallus. Immersed in the bark.

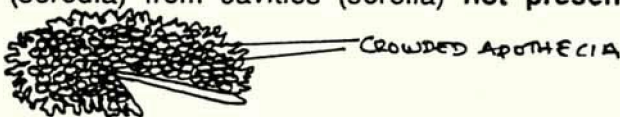
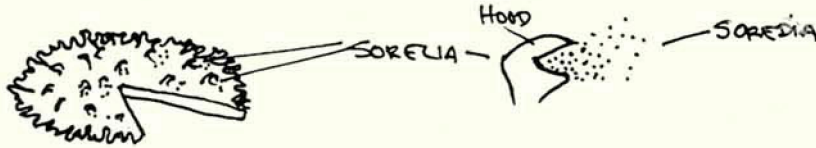


.....*Buellia punctata*

- 7b. Growing on rock. Apothecia arising from distinct thallus growing on bark.



..... Various Genera e.g. [*Rhizocarpon*, *Lecidia*, *Lecanora*]

- 8a.(4b) Thallus bright orange to yellow.9
 8b. Thallus white or gray. K+ yellow.11
-
- 9a.(8a) Thallus K+ purple10
 9b. Thallus K- [*Candellaria concolor*]
-
- 10a.(9a) Thallus with fruiting bodies (apothecia) often crowded across thallus.
 Granules (soredia) from cavities (sorelia) **not present**.
- 
- *Xanthoria polycarpa*
- 10b. Thallus **without** apothecia. Soredia erupting from hood-covered sorelia present.
- 
- *Xanthoria fallax*
-
- 11a.(8b) Thallus growing on bark. *Physcia caesia*
 11b. Thallus growing on rock and shale. *Physcia elementei*

S. G. Brough:1993b

Lichen Tests for Chemical Substances

Lichens can be identified without making chemical color tests; however, using K, C, and P reagents confirms your observations, helps to identify the lichen substance(s) present, and can be used to help predict the dye color that may be obtained from the lichen. Recipes for K, C and P solutions are listed below. Always dispose of lichen tissue that has been contaminated with test substances.

K solution

10 g KOH dissolved in 90 ml H₂O. (10% solution)

This is a very strong caustic lye solution and should be handled with care. Used to detect some depsidones e.g. Salazinic, Stictic, Norstictic acids, etc. and Parietin. Expiration date = Several months.

C solution

Bleach solution (e.g. "Chlorox" etc.) undiluted.

Is used for detection of Lecanoric, Gyrophoric, Umbilicic acids, etc. Reaction is often very faint and very brief (seconds) because of the bleaching of the color. Expiration date = Several months.

P (PD) solution (Steiner's solution)

10% sodium sulfite solution (10 g Na₂SO₃ dissolved in 90 ml H₂O)

5-6 drops detergent (e.g. "Photo-flo")

1 g p-phenylenediamine (this substance available mainly from lichenologists)

Add detergent to sodium sulfite solution then dissolve as much p-phenylenediamine as possible. (Stir and shake for several minutes.) Filter the saturated solution and keep the liquid solution in a dark bottle. This solution will stain black, all objects it comes in contact with. Some consider the substance toxic, don't allow it to touch your skin.

Used to detect depsides and depsidones with aldehyde grouping (CHO).

Expiration date = One month.

Reagent and reaction	Meaning, e.g.	lichen substance(s) indicate
C -	when C is applied to the lichen part, there is no change in color.	
C+ orange or red	when C is applied the reaction is positive and produces the color indicated. Color is weak and fleeting. Orchil (AFM) dyes.	Gyrophoric acid Lecanoric acid and others
K+ yellow	color is yellow. Light yellow-tan (BWM) dyes.	Atranorin, Thamnolic acid and others.
K+ yellow changing to red	color is yellow but slowly changes to orange or red Orange-brown (BWM) dyes	Norstictic acid, Salazinic acid, and others
K+ purple	orange pigmented lichens becoming purple when K is applied. Pink to orchil (AFM, no heat) dyes turning blue in light.	Parietin

K -	yellow pigmented lichens not reacting with K. Permanent Yellow dyes (BWM)	Vulpinic acid
KC+ orange	apply K followed by C, the resulting color is orange.	Barbatic acid, Physodic acid, and others.
P+ orange	color is orange when P is applied.	Thamnolic acid and others
P+ red	color is red when P is applied	Fumaprotocetraric acid and others.

Recrystallization of Lichen Substances:

Extract lichen substances by a) crushing and piling lichen on microscope slide and adding enough acetone to thoroughly soak the lichen but not enough to run off the slide. b) Allow acetone to evaporate. Extract once or twice more. The lichen substances will collect on the slide as a powdery residue. c) Blow the lichen off the slide. d) Scrape the lichen substance into a pile. e) Break up a coverslip and use approximately 1/4 of it to cover the lichen substance. f) Add just enough recrystallization solution to just fill up the space between slide and the coverslip-portion. (If an entire coverslip is used, too much recrystallization solution is added resulting in such a diluted concentration that the small amount of lichen substance cannot crystallize quickly. g) Heat the slide gently until bubbles just begin to form under the coverslip. h) Cool then observe the slide under the microscope and watch crystals form. If crystals are not seen within ten minutes, set the slide aside for a day or two before observing again. Crystal photographs are found in Hale' book.

Recrystallization solutions

G.E. solution

3 parts glycerin : 1 part acetic acid.

Used for recrystallization of lichen substances.

Expiration date = keeps indefinitely.

G.A.W. solution

1 part glycerine : 1 part 95% Alcohol : 1 part water.

Used for recrystallization of lichen substances.

Expiration date = Keeps indefinitely.
crystallization

Recommended Identification Manuals.

Vitt, D. H; J. E. Marsh and R. B Bovey. 1988. *Mosses Lichens and Ferns of Northwest North America*. University of Alberta Press.

Hale, M. E. Jr. and M. Cole. 1988. *Lichens of California*. University of California Press.

Hale, M. E. Jr. 1991. *How to Know the Lichens*. Wm. C. Brown Company.

WHERE DID THE SARVIS TREE GET ITS NAME?

William S. Logan, M.D.

Arguably one of the loveliest trees of the Appalachian forest is the under-appreciated sarvis, *Amelanchier arborea*. Although it goes by many common names such as shadblow, Juneberry and serviceberry, nearly all mountain folk know it as "sarvis." How did such a dainty tree get burdened with such an ungainly name, and what is a "sarvis" anyway?

It is widely assumed that "sarvis" is a countrified version of the word "service," hence the serviceberry. One popular book on trees states that the name derives from the "luscious berries [that] serve man, bird, and beast." While romantic sounding, that is just plain flummery.

Another common story attributes the name to the practice of itinerant preachers making early spring rounds to remote colonial or pioneer villages. At that time a memorial service would be held for those who had died during winter. One can imagine the beautiful white flowers of the service tree being the only garlands of the forest so early in the season, thereby taking its name from a solemn occasion. This is a charming story with lots of appeal. Alas, it is not true.

Today there is a native tree of Europe, including England, known as the wild service tree. This is not a species of *Amelanchier*, but is instead a whitebeam, *Sorbus torminalis*. Although still debated, its common name of service tree is believed to be derived from "sarviss," a good Shakespearean English form of the ancient Latin "sorbus," the name for a fruit-bearing tree, *Sorbus domestica*, that the Romans cultivated. Thus, "service" is represented as a genteel corruption of "sarviss."

But how does this relate to our sarvis tree, since there are no whitebeam native to our woods? The answer lies in the fruit, which in morphology (if not in quantity) is almost identical to *Sorbus*. Both trees are arborescent members of the rose family, *Rosaceae*, and the fruit of *Sorbus* and *Amelanchier* are pomes of similar size and color. One can imagine a Colonial Englishman, impressed with the resemblance of the fruit to the familiar whitebeam fruit back home, affixing the proper Elizabethan appellation "sarviss" to it. Today, in pockets of Appalachia, the King's English survives. Thus, "servis" derives from "sarviss," itself a corruption of "sorbus," the Latin name for a very close

relative of our "sarvis" tree. Presto, end of mystery! Still...I sorta like the story about the itinerant preacher.

Reprinted with permission from The Newsletter of the Southern Appalachian Botanical Society, Autumn 1993.

RARE PLANTS IN THE UINTAS

In the deep, scenic canyon of Rock Creek in the southwestern Uinta Mountains, Nature Conservancy scientists and federal foresters are teaming up to protect a 65-acre rare plant community.

The subalpine spruce bog and talus habitat, reaching to almost 11,000 feet, is home to a long list of species, including 12 members of the sedge family--five uncommon or very uncommon in Utah. Botanists have identified three clubmosses previously unknown in Utah. Several dozen species of shrubs, grasses, rushes and herbs grow higher up.

"Unlike the rest of the Uintas, with their vast sheets of ancient red quartzite, all these species are growing on limestone over an elevation range of 1500 feet," says The Nature Conservancy's Utah Public Lands Coordinator Nick Van Pelt.

Because of the diversity of unusual plant life, the site qualified as a "Special Interest Botanical Area" and is being given extra protection by the Ashley National Forest's Duchesne Ranger District. Special Interest Areas can be botanical, zoological or geological areas which support plants or animals significant because of their color, life history, rarity or other features.

The South Fork of the Rock Creek site is surrounded by a large timber sale scheduled for 1994-95. Thanks to input from Van Pelt, forester Alan Young has been willing to adjust the boundaries of the sale so that the botanical area is now enlarged and protected by a buffer zone.

Young and Van Pelt hope that some money from the sale of about 1 million board feet of wood can be designated for long-term protection and interpretation of the Botanical Area.

"Special recognition goes to botanist Sherel Goodrich, who discovered the spruce bog, as well as other staff members of the Ashley Forest who pooled information and helped make changes to the timber sale layout," says Van Pelt. A small grant from the Utah Native Plant Society helped with some of the costs of field and office work.

Reprinted from Basin, Range & Rimrock, Newsletter of the Great Basin Field Office of The Nature Conservancy, Fall, 1993.

UNPS SEGO LILY
c/o Jo Stolhand
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, UT 84152-0041

Non-Profit Org.
U.S. Postage
PAID
Salt Lake City, Utah
PERMIT No. 327

Address Correction Requested

membership Application

☐ New Member ☐ Renewal ☐ Gift

Name _____

Street _____

City/State _____

Zip _____ Phone _____

If Gift, from: _____

Check membership category desired:

- ☐ Student/Senior\$ 5.00
☐ Individual\$ 10.00
☐ Family\$ 15.00
☐ Supporting\$ 30.00
☐ Corporate\$ 30.00 and up
☐ Life\$250.00

☐ 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 it to:

Pam Poulsen, treasurer,
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, Utah 84152-0041

(If you prefer not to cut this out of your Sego Lily, feel free to copy
the membership form or simply write the information down and
mail it with payment for the category of membership.)

Membership Application

☐ New Member ☐ Renewal ☐ Gift

Name _____

Street _____

City/State _____

Zip _____ Phone _____

If Gift, from: _____

Check membership category desired:

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VOL. 17 NO. 2

MAR / APR 1994

CALENDAR OF EVENTS

- Mar. 22** **UNPS Board of Directors Meeting.** Red Butte Gardens Conference Room,
Tues. 7:00 390 Wakara Way, Research Park.
- Mar. 23** **Salt Lake Chapter Meeting: "Rare and Endangered Species of Utah"**
Wed. by Renee Van Buren, a student of Kimball Harper's, who is doing her dissertation
7:00 on Utah's endangered Autumn Buttercup. Come in the west door of the Dept. of
Natural Resources Bldg, 1636 West North Temple, SLC.
- Apr. 27** **Salt Lake Chapter Meeting: "Noxious Weeds of Utah"** by Kathy Jo
Wed. 7:00 Pollock, U.S. Forest Service. Dept. of Natural Resources Bldg., SLC.
- May 25** **Salt Lake Chapter Meeting: "Wildflowers: Celebrating National**
Wed. 7:00 **Wildflower Week,"** by Wayne Padgett, U.S. Forest Service.
- June 10-11** **Threatened and Endangered Plants Fieldtrip.** Lori Armstrong, botanist
Friday-Sat. for the BLM, will be our host for this trip to Kane County. We will meet Thurs.
night (June 9) at the Ponderosa Grove Campground (north of the Coral Pink Sand
Dunes). See next page for itinerary. Please contact Jo Stolhand (521-0069) if
you wish to participate in this fieldtrip.
- June 16-18** **Mushroom Hunt.** The Mushroom hunt will be early this year. Dr. Kent
Thursday-Sat. McKnight assures us we will find mushrooms on Mt. Nebo at this time of year. We
are making reservations at the Forest Service's Blackhawk Campground on the Mt.
Nebo Loop. Sites will accommodate up to 200 attendees and will be available from
2 pm Thurs. through 1 pm Saturday. Friday night there will be a slide show at the
Poteetneet School in Payson, and Saturday afternoon we will have our steak fry.
The cost of \$15/member, and \$20/nonmember (half-price for children 10 and
under) will include breakfast and dinner on Fri. and Sat. and camping fees. Please
send your money to secure your reservation to David Okelberry, 3522 West
4305 South, West Valley City, UT 84119 (801-968-6190). Pre-registration
is essential.

UNPS T&E FIELDTRIP ITINERARY

We will meet Thurs. night (June 9) at the Ponderosa Grove Campground (next to the Coral Pink Sand Dunes). Friday will be spent seeing *Asclepias welshii*, the Tiger Beetle and the Kanab Ambersnail areas. From these sites we plan to travel across the Skutumpah road and possibly see *Camissonia exilis*, *Cryptantha cinerea* var. *arenicola*, and *Pediomelum epipsilum*, and then on to Kodachrome Basin to see *Lesquerella tumulosa*. Time permitting, we will also stop to explore some sandstone side canyons. Friday night we will camp at the Grosvenor Arch Campground. Saturday will be spent looking for *Xylorhiza cronquistii* and *Pentstemon atwoodii* with hopefully more time for exploring some side canyons. Dinner will be provided on Friday night. Please contact Jo Stolhand (521-0069) if you wish to participate in this fieldtrip.

Salt Lake Chapter Meeting SPECIAL GARDENS

Brent Shipley
UNPS Chairman of the Board

At the January meeting of the Salt Lake Chapter, Marv Poulson, a landscape contractor in the Salt Lake area and a member of UNPS, shared some pointers on developing and maintaining "special gardens." Marv explained to those in attendance that soil is the foundation for doing anything horticulturally. Marv's formula for developing a good soil mixture: "Take what you've got and amend it." He provided a number of pointers for developing a good soil mixture starting with typical topsoil materials found in and around the Salt Lake Valley. Marv explained that "all plants grow in a habitat," and creating the right habitat for a plant, or choosing the right plant for the habitat, is key to developing special gardens. Marv noted that "natives do great in our alkaline soils." He suggested planting behind boulders because they can provide shade in the summer and protect the plants from the wind during the winter. He noted that it is appropriate to place large rocks in special gardens, but that they too should be "planted" so that they will look like a natural part of the landscape.

Marv showed a series of slides illustrating the

use of native plants in special gardens and provided the list of "Native Plant Candidates for that Special Garden" included in this issue.

The Salt Lake Chapter extends its thanks to Marv for sharing the information and his personal experience with using native plants to enhance those unique habitats and special gardens.

The Chapter meeting ended with the election of George Simmons as the new President of the Salt Lake Chapter for 1994. George has lots of good ideas for chapter functions and activities, and he is going to be calling on many of you to assist with implementing them. We are all looking forward to a great year.

EXPLORING FOR UTAH'S BIG TREES

Sherman G. Brough
UNPS Board Member

Traveling US Highway 50 between Scipio and Salina, one gradually ascends south up the Juniper and Sagebrush covered hills to a broad flat valley, Upper Round Valley. On the north end of this valley one is surprised by the appearance of a large shallow body of water, Scipio Lake. One is struck by the dryness and bleakness of the valley and wonders how there is enough water in the area to fill and maintain this shallow lake.

About three miles south of the lake on US 50, a sign indicates a Forest Service campground to the west. A blacktop road (4 miles) leads to a most interesting and overlooked oasis, Maple Grove Campground, always cool and inviting even on the hottest of summer days.

One soon discovers the major sources of water for the valley. Much of the water appears to come from two creeks, Ivie Creek and Pharo Creek. Part of the water is runoff from the Pahvant Mountains located to the west and south, but the stream flow is maintained throughout the dry summer from springs at the head of these two creeks.

The south fork of Ivie Creek flows through Maple Grove Campground (elevation 6575 ft.). Local residents use one of several springs as it comes gushing out of the rock as a source of water, filling up containers with the cold clear water. The stream seems to have a constant flow throughout the year and is planted with trout. Word gets around quickly and the fishing is "hot" for a few days before the stream is quickly fished out.

I presume that the Civilian Conservation Corps (CCC's) in the 1930's improved the camping area with roads, a water system, toilet facilities, and an amphitheater. The log benches of the amphitheater have rotted away for the most part, but the concrete stage still exists among tall Aspen on the east side of a beautiful meadow. The Forest Service maintains about a dozen campsites, and the water and toilet facilities.

The north fork of Ivie Creek is likewise spring-fed and the two forks join about one mile downstream. This north fork flows near a magnificent grove of Gambel Oak in a parkland setting. Many of the oak trees measure more than 15 m (45 feet) high and 126 cm (50.5 inches) in circumference (radius 20.4 cm). Some of the large oaks have been cut down recently and an inspection of the stumps shows that near the core of the tree, 2.5 cm spans 13 annual rings, while the same distance toward the outside covers 23 years. A conservative calculation of estimated age of the larger standing trees is 147 years. One tree with a circumference of 240 cm (96 inches), (radius 38.9 cm), may be 326 years old, if we use the same basis for calculation. This tree may have been a single tree that branched into two trees early in its life, or two adjoining trees that grew together. The latter condition may be the most likely, because of the estimated age being close to twice the age (147 years) of the majority of trees.

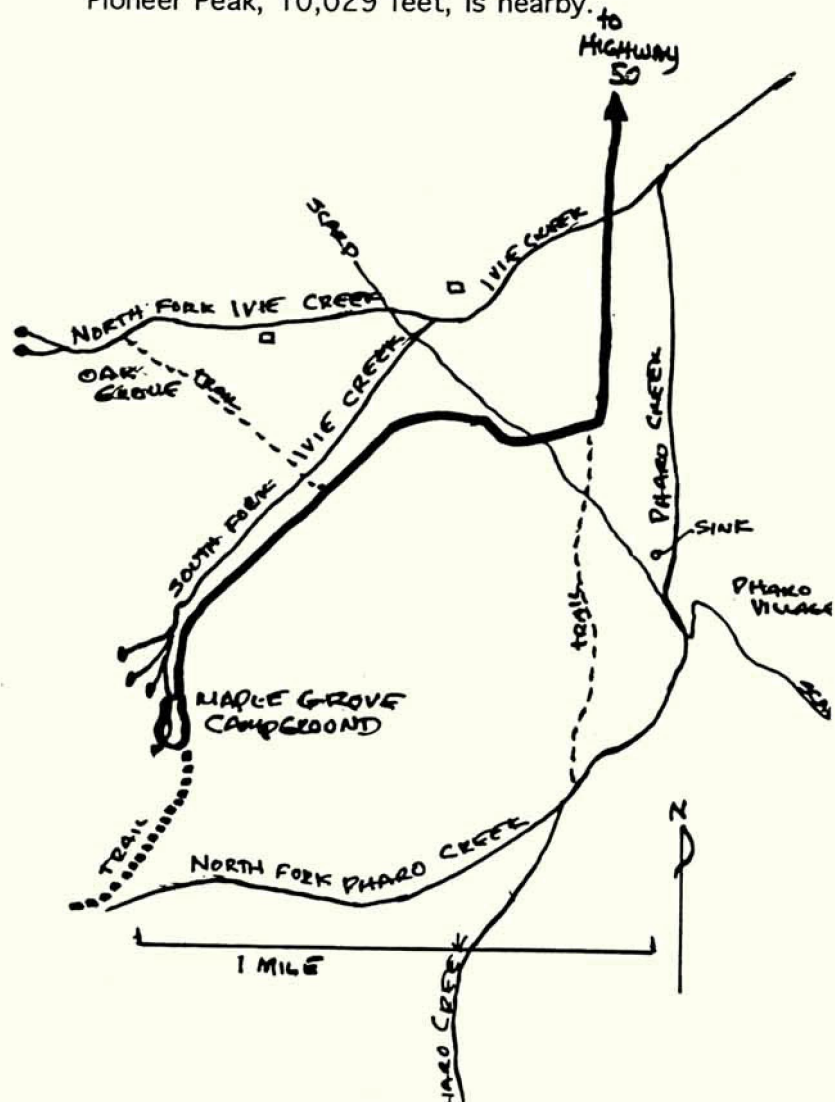
Pharo Creek is south of Maple Grove Campground. A north fork of this creek flows out of the mouth of the canyon above Maple Grove Campground, and is also spring-fed. Where it runs off the scarp into the valley it flows by the remains of an Indian village which was excavated by anthropologists from the University of Utah in the 1960's. The hilly remains of the dig are quite evident among the sagebrush. Evidence uncovered indicates that this area was inhabited by Fremont Indians around 1200 AD. Corn, a major source of food, was grown on the flat ground surrounding the village and stored in adobe granaries. Worked obsidian and chert chips are infrequently found around Pharo Village which has been covered by sedimentation from floods, but chips are abundant on the top of the scarp, and north, at least all the way down to the north fork of Ivie Creek. Erosion continuously uncovers chips and pottery. A large sinkhole about 5 m deep has been formed sometime within the past few years, west of Pharo Village between Pharo Creek and the scarp.

Maple Grove Campground area is one of my favorite spots for exploration. The variety of habitats leads to a large diversity of plant species

present.

I have recorded fifteen species of trees, a large number for such a small area. You should be able to spot *Abies concolor*, White Fir; *Acer glabrum*, Rocky Mountain Maple; *Acer negundo*, Boxelder; *Cercocarpus ledifolius*, Curlleaf Mountain Mahogany; *Crataegus douglasii* var. *rivularis*, Black Hawthorn; *Juniperus osteosperma*, Utah Juniper; *Juniperus scopulorum*, Rocky Mountain Juniper; *Malus* sp., edible Apple; *Pinus edulis*, Two-needle Pinyon Pine; *Pinus ponderosa*, Ponderosa Pine; *Populus angustifolia*, Narrowleaf Cottonwood; *Populus tremuloides*, Quaking Aspen; *Prunus virginiana*, Chokecherry; *Quercus gambelii*, Gambel Oak and *Salix exigua*, Coyote Willow.

I would also expect a great diversity of herbaceous plants, lichens, and algae in the meadow areas and aquatic habitats along the perennial streams, in Scipio Lake and surrounding meadows, as well as in the dry sagebrush/rabbitbrush desert, all within walking distance of the campground. I would expect even more diversity and additional tree species in the alpine areas west and south of Maple Grove Campground. The highest peaks of the Pahvant Range exceed 10,000 feet, and Pioneer Peak, 10,029 feet, is nearby.



UPDATE OF CONSERVATION PROGRAMS at RED BUTTE GARDENS and ARBORETUM

Therese Meyer
Conservation Horticulturist

The Conservation Program at Red Butte Gardens and Arboretum has been gaining momentum over the past two years, with many more species brought into protected cultivation, and substantially increased coordination of CPC projects with those of government agencies. The Garden now maintains 17 species as part of the CPC's National Collection; we are conducting field surveys on three other plants for the Bureau of Land Management.

This increased level of activity has led to an augmentation of our staff. Given that most of the rare plants in the Great Basin are edaphic endemics, we feel particularly fortunate to have recruited Dr. Alyce Hreha, who recently completed a doctorate in biogeography. The complex floral distribution as it relates to the geology and soils in our region requires a researcher with expertise in these subjects, as well as a thorough knowledge of the plants.

Dr. Hreha is developing a regional strategy for the Great Basin so that we can better coordinate and integrate our efforts with other conservation organizations in this enormous and geographically diverse six-state area. This will help us set priorities and reach goals more effectively. As elsewhere, one difficulty in doing conservation work in our region revolves around information sharing: much of what we learn is via word of mouth, or is in the form of unpublished government or NGO reports. But as conservation workers and experts in many organizations transform themselves into a working group, we have begun to build a network of concerned organizations and individuals upon which our conservation work is now based. The goal is to bring people and their information together within a scheduled, institutional context so that we can more readily exchange data, set priorities, avoid redundancy, and thereby use our collective means more efficiently.

This past winter marked the end of a multi-year drought in the West, and the plants have responded with substantially improved growth and seed production. Summer was a favorable time to collect seed without adversely affecting wild

populations.

Several examples of ongoing conservation work at Red Butte are illustrative of our program:

We recently travelled through Southern Utah and were able to collect seed from all the known Dwarf bearclaw poppy (*Arctomecon humilis*) sites in southeastern Utah. This listed endangered species has an immature embryo in new seed which apparently requires several years of maturation in the gypsum rich cryptogamic soil to germinate. This soil reservoir thus contains seed in varying stages of maturity, and thereby represents a pool of germinable seed should optimal conditions arise. At the same time, the remaining pool of immature nongerminable seed provides a mechanism for the species to maintain a well-protected seed bank in the ground. From our field observations, germination is triggered in mature seed by a two-week period of rain combined with warm temperatures.

For two years we have maintained a soil seedbank from an *Arctomecon humilis* site at our greenhouse. Our hope is that the seed in the soil will be maturing, and can be triggered to germinate under controlled conditions. With the recent addition to our collection of this season's seed, we soon hope to be able to begin growing this species at our garden.

We coordinate our work on Jones cycladenia (*Cycladenia humilis* var. *jonesii*) with Utah State University and National Park Service researchers: they are doing the field work and we are in charge of off-site propagation and curation. This species appears to be losing its dependency on seed, and now seems to depend almost exclusively upon vegetative reproduction in the wild. Gibberellic acid and stratification have not yet encouraged germination.

Our work on Silverleaf buckwheat (*Eriogonum argophyllum*) has been rewarding. This small plant is restricted to a 20-acre hot springs area in Nevada, on private land used for cattle grazing. Fortunately for the plant, the cattle seem to stay away from the hot springs most of the time, affording the site some natural protection. Germination of the seed is difficult due to high tensile strength of the inner membrane surrounding the embryo. Surgical removal of this layer produces many embryos growing in tissue culture media, but transplanting to soil leads to death. Planting seed into sterile media produces some seedlings, but these do not thrive and generally wither under greenhouse conditions. Analysis of the water from the hot springs shows it to have very high sodium levels, which may be critical for the plant. Regardless of the

difficulties, we have managed to nurture several greenhouse plants to maturity in protective cultivation. These have flowered and produced seed (after hand pollination) in the greenhouse.

Clay phacelia (*Phacelia argillaceae*) is a success story at Red Butte. We have grown the plants in the greenhouse with either gibberellic acid or moist stratification to break seed dormancy, and have produced ample seed from hand pollination. This federally listed endangered species grows in three or four small areas south of Salt Lake City in extremely steep, crumbly clay slopes. These are subjected to grazing by rabbits, deer and sheep, and to increased erosion resulting from road and rail work. One large site, however, has been protected by a fence erected by The Nature Conservancy and, combined with our ability to propagate the plant, its survival seems to be assured.

Last Chance townsendia (*Townsendia aprica*), listed as threatened, is another success story for Red Butte. We have now grown it from seed through several successive generations. We have found that it requires specialized insect pollinators or hand pollination under magnification to assure fertilization. Casual paintbrush treatment of the flowers was ineffectual. Since it has come to our attention that there are flower color variations, we are now collecting additional seed from the wild to enhance the genetic variation in the National Collection.

But Red Butte's big news this year is its rescue of Ute Ladies' Tresses (*Spiranthes diluvialis*) from a Bureau of Reclamation gravel pit in eastern Utah. The Bureau created perfect habitat for this now threatened terrestrial orchid 30 years ago when it excavated numerous gravel pits while constructing the Steinaker Dam. The orchids typically inhabit stream channels in adjacent hills, and revegetated the gravel pits once construction was complete. The U.S. Fish and Wildlife Service identified 61 plants last fall; this spring we brought in 208 plants, some of them tiny seedlings. We have the collection at Red Butte Garden in a specially designed raised bed with subsurface drainage and above-surface drip irrigation, the first time this has been attempted on this species. We hope to learn more about its growth requirements and reproductive physiology in the process. The orchids flowered in August, producing seed that we were able to store for future research and experimentation.

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RESTORING DIVERSITY: Strategies for Rare Plant Reintroductions

Peggy Olwell, Manager
Conservation Programs, CPC

Bulldozers are poised to begin construction on a new subdivision while government officials, developers, and botanists decide the most workable strategy for the endangered plants that occur on the site. The decision is made to dig up the plants and move them to another site.

A very rare plant species exists at only one known site. The integrity of the population and the habitat is threatened. What is the best conservation tool to prevent extinction of this species? The decision is made to collect cuttings and seeds to introduce onto a more protected site.

A coal seam is scheduled for strip mining; however, an endangered species is located on it. The decision is made to establish a "safe site" within the seam where a large natural concentration of endangered plants occur. Those plants on the seam but outside this area are moved into a second designated "safe site" some distance away from the natural concentration.

These are just a few examples of the many situations that botanists and conservationists face on a daily basis when working with threatened and endangered plants throughout the United States. Ken Berg, National Botanist for the Bureau of Land Management, likens these and similar experiences to emergency medical technicians arriving at the scene of an accident trying to make the best out of a bad situation. To make matters worse, many of the tools in the conservationist's medical bag have not been thoroughly tested and are, therefore, rather controversial. Such is the case with the movement of plants from one site to another, and it is happening on a scale larger than many would think.

The Center, as curator of the National Collection of Endangered Plants, is being increasingly asked to participate in and even supply plant material for restoration and reintroduction projects. Because of the still ill-defined nature of reintroduction science, ethics and techniques, the Center felt obligated to address this topic and the various policy issues surrounding it. This was done with funding from the Joyce Foundation, the U.S. Department of Interior's Fish and Wildlife Service and Bureau of Land Management, and the Society for Ecological Restoration.

We began with an analysis of policy statements gleaned from 17 documents provided to us by individuals and organizations involved in natural resource protection and land management: federal and state government agencies, an international conservation organization, a professional scientific body, an industrial corporation, a native plant organization, and a private party. Most of the documents were quite recent; none were dated before 1987, and the majority were in draft form. Collectively, they represented diverse approaches, attitudes and concerns, reflected the needs of the organizations writing them, and were generally identified as first attempts at addressing reintroduction issues.

As a means of giving greater form and cohesion to these efforts, a Steering Committee was established to guide the planning and organization of a national conference on plant reintroduction, and to oversee publication of the proceedings. The Conference, "RESTORING DIVERSITY: Is Reintroduction an Option for Endangered Plants?," was held in St. Louis on April 20-22, 1993 and attracted more than 230 individuals from around the world. Participants included scientists from universities, federal and state government agencies, conservation organizations, botanical gardens, and private industry.

The conference met for three days to critically explore the value of ecological restoration as a strategy for conserving rare and endangered plants. A particular emphasis was put on addressing the major biological, regulatory, political, and strategic issues that arise when reintroduction is applied to species that are rare or in danger of extinction. Case studies and workshops were added to the agenda to give real world experience to the sessions.

Basic issues such as the following were addressed: when should reintroductions be conducted, how should they be conducted, who should conduct them, how long should the reintroduction be monitored, how is success of a reintroduction determined?

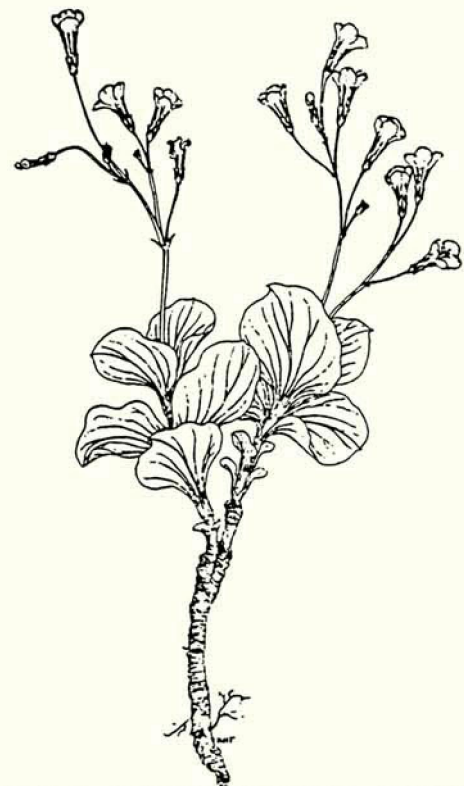
Many key points emerged from the conference, but probably the most widely held was that translocations, ie reintroductions or introductions, should be viewed as experiments. A consensus position developed which acknowledged that little was known about how to restore more endangered plants to natural habitats.

With 25 percent of the U.S. Fish and Wildlife Service's plant recovery plans (as of 1990) recommending the use of reintroduction as a means to recover species, and with translocation used

more and more in mitigation negotiations, there was general agreement that substantially more scientific and technical knowledge was necessary to proceed successfully in such directions. Finally, none of the Conference speakers felt we were at the level of understanding where we should trade viable habitat of an endangered plant for a reintroduced population.

Proceedings, edited by Don Falk, Peggy Olwell, and Connie Millar, are being published by Island Press and are expected to be available in Fall 1994. Reintroduction and restoration guidelines are to be included as an appendix to the book.

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ENDANGERED SPECIES UPDATE

by Larry England, USFW

Within the state of Utah there are 20 plant taxa currently listed as endangered or threatened species under the protection of the Endangered Species Act. Two species, the Winkler cactus (*Pediocactus winkleri*) and Arizona willow (*Salix arizonica*), are currently proposed as endangered and about 130 species are currently under review for potential protection under the Act. Several academic, conservation, and governmental organizations and individuals are actively engaged in research, survey and management contributing to the conservation of Utah's endangered and threatened species and only a few of those individuals involved have been mentioned. Notes and comments on the current conservation status of Utah's listed plant species are as follows:

Maguire primrose (*Primula maguirei*) is an extremely narrowly restricted species, endemic to the lower reaches of Logan Canyon, growing only on dolomitic limestone cliffs and boulders. The species is listed as threatened. A recovery plan has been developed by the Fish and Wildlife Service. The Forest Service is closely monitoring the species and is ensuring that all activities within Logan Canyon do not adversely affect it. Red Butte Gardens is working with this species in an effort to develop horticultural techniques to propagate this species in captivity and to reintroduce it into natural settings if the need arises.

Clay phacelia (*Phacelia argillacea*) is endemic to Spanish Fork Canyon growing on steep shale slopes of the Green River Formation. The species is listed as endangered. A recovery plan has been developed. The species has two known populations, both on private land. The larger population, at the old Tucker townsite, is a preserve owned by The Nature Conservancy. The Tucker population was, just prior to The Nature Conservancy's acquiring the property, heavily damaged by a sheep herd bedding on its limited habitat. Afterwards the population was nearly extirpated by deer grazing on clay phacelia seedlings effectively preventing reproduction. The Nature Conservancy has constructed a deer proof fence around this population. As a consequence of the fence, the species population has rebounded and has returned to population levels that existed before the sheep bedding episode.

The Forest Service has surveyed potential clay phacelia habitat in Spanish Fork Canyon, and while no populations have been discovered on public land, potential sites have been discovered which may be suitable for the establishment of additional populations of the plant. Lori Armstrong and Dr. Kimball Harper of Brigham Young University have conducted research on the biology and ecology of the clay phacelia in order to determine the management and recovery strategies necessary to conserve the species. Red Butte Gardens is working to develop

horticultural techniques to propagate this species in captivity and to reintroduce it into appropriate natural settings as soon as they can be identified.

Ute ladies'-tresses (*Spiranthes diluvialis*) has the largest distribution of any listed plant in Utah (other listed orchid species in the east and midwest have similar distributions). The species is usually found growing in coarse soils along stream sides. Populations once existed from the Platte River in eastern Colorado to the Great Basin in eastern Nevada. Significant populations still occur in the Uinta Basin along most streams on the south flank of the Uinta Mountains and along Diamond Fork in Spanish Fork Canyon. Smaller populations still occur at two locations near Utah Lake, along the Provo River below Jordanelle Dam, along the Green River in Browns Park and in Dinosaur National Monument, at Hog Canyon also in Dinosaur National Monument, near the Fremont River in Capitol Reef National Park, and along Deer Creek in Garfield county.

Listed as threatened, a team has been organized to develop a recovery plan for this species. A major goal of the proposed recovery plan will be the protection of existing populations and the reestablishment of Ute ladies'-tresses populations along the Jordan, Weber and other streams of the Wasatch Front. As with other species, Red Butte Gardens is working with this species in an effort to develop horticultural techniques to propagate this species in captivity and to reintroduce it into appropriate natural settings as soon as they can be identified. Anna Arft of Colorado University and Lynn Riedel at Dinosaur National Monument are both involved in research of the species biology and ecology in an effort to determine the species and habitat characteristics and management techniques needed to conserve the species. The Forest Service, Bureau of Land Management and the Park Service are monitoring populations of this species to ensure their long term survival. The Bureau of Reclamation and the Central Utah Water Conservancy District have sponsored several inventories for this species to determine potential impacts on this species as a consequence of water development projects such as the Central Utah Project. Environmental mitigation requirements of the CUP completion act with its appropriated funding should contribute significantly to the recovery of this species.

Heliotrope milk-vetch (*Astragalus montii*) is an extremely narrowly restricted species, endemic to calcareous soils of the Flagstaff Formation on the tops of Heliotrope, Ferron and White Mountains on the south end of the Wasatch Plateau. The species is listed as threatened with designated critical habitat on Heliotrope Mountain. The species entire population is on public lands managed by the Forest Service. The Forest Service has been monitoring this species continually for 13 years. The Arboretum at Flagstaff is working with this species in an effort to develop horticultural techniques to propagate this

species in captivity and to reintroduce it into natural settings if the need arises.

Barneby ridge-cress (*Lepidium barnebyanum*) is endemic to three ridges growing in nearly pure white calcareous limestone. The species populations are all within a mile of each other and are four to five miles south of Duchesne in the Indian Creek drainage. The species is listed as an endangered species and a recovery plan has been developed. the species occurs on Ute Indian tribal land who control activities which affect this species. In addition the Bureau of Land Management and the Bureau of Indian Affairs control oil and gas development which is the species primary external threat.

Three **reed-mustards** (*Schoenocrambe argillacea*, *S. barnebyi*, and *S. suffrutescens*). These reed-mustards are very rare endemics growing in desert shrub-lands. The clay reed-mustard (*S. argillacea*) and shrubby reed-mustard (*S. suffrutescens*) occur in the same general area near the Green River in the southern portion of the Uinta Basin. The Barneby reed-mustard (*S. barnebyi*) has two populations, one in the southern portion of the San Rafael Swell near the point where Muddy Creek exits the Swell and the other in the Sulfur Creek drainage near Fruita. All three species occur on public lands managed by the BLM. The shrubby reed-mustard also occurs on private and Ute Tribal lands, and the Barneby reed-mustard occurs Capitol Reef National Park. The clay reed-mustard is listed as threatened, the other two are listed as endangered. A draft recovery plan covering all three species has been prepared and released to the public for comment.

Uinta Basin hookless cactus (*Sclerocactus glaucus*) is endemic to cobbly desert soils above the flood plains of the Colorado river in Colorado and Green River in Utah. In Utah the species is found only in the Uinta Basin from short distance upstream of the junctions of the Duchesne, White and Green Rivers downstream to the vicinity of Nine Mile Creek at the south end of the Uinta Basin. The species is listed as a threatened species and a recovery plan has been developed. The species has populations on public land managed by the BLM and the FWS and on Ute Tribal lands. This species has the potential for recovery and delisting in the near future if the recovery plan tasks can be implemented.

Wright fishhook cactus (*Sclerocactus wrightiae*) is endemic to clay soils between the San Rafael Swell and Capitol Reef in central Utah. The species has several small disjunct populations mostly on public land managed by the BLM and NPS, who have been monitoring them. The species is listed as endangered and recovery plan has been developed. Red Butte Gardens is working to develop horticultural techniques to propagate this species in captivity and to reintroduce it into natural settings if the need arises.

Maguire daisy (*Erigeron maguirei*) is endemic to sandstone canyons in the San Rafael Swell and Capitol Reef. The taxonomic variety *Erigeron maguirei* var. *maguirei* is listed as endangered and a draft recovery plan is being developed by the FWS. The FWS and BLM funded research on the phylogenetic relationships, distribution and abundance of this species, this research preformed by Dr. Rene VanBuren and Dr. Kimball Harper at Brigham Young University demonstrated that the two varieties of *Erigeron maguirei* (var. *maguirei* mostly from the San Rafael Swell and var. *harrisonii* from Capitol Reef are genetically identical and should not be taxonomically separated). this and other status information has provided the necessary information needed to justify down-listing of the species. The FWS will propose the listing of the entire species as threatened. The Arboretum at Flagstaff is working to develop horticultural techniques to propagate this species in captivity and to reintroduce it into natural settings if the need arises.

Last Chance Townsendia (*Townsendia aprica*) is endemic to fine silty soils with small disjunct populations along the Emery and Sevier county line from I-15 south to Capitol Reef National Park. The Species is listed as threatened and a recovery plan has been developed. The species occurs primarily on public lands managed by the BLM with small populations on lands managed by the Forest Service and Park Service. The species largest populations occur on sedimentary strata immediately above the only potentially strip minable coal beds in Utah. Red Butte Gardens is working with this species in an effort to develop horticultural techniques to propagate this species in captivity and to reintroduce it into natural settings if the need arises.

San Rafael cactus (*Pediocactus despainii*) is endemic to calcareous soils within the San Rafael Swell. The species is listed as endangered. The FWS will develop a recovery plan for this species this year. This species along with *Pediocactus winkleri* are the most desirable and sought after native species for cactus collections in the state. the species is also impacted and threatened by off-road vehicle use and other land disturbing activities within its habitat. The species habitat is on public land managed by the BLM which has effectively protected its populations.

Jones cycladenia (*Cycladenia humilis* var. *jonesii*) has four widely scattered populations on seminiferous clay soils, three in southeastern Utah and one in northern Arizona. The species is listed as threatened with much of its habitat on lands with mineral claims. The geologic formations on which Jones cycladenia grows has potential for uranium mineral development. Sedonia Sipes and Dr. Vince Tepedino of Bee Biology Laboratory at Utah State University have conducted research on the biology and ecology of the species in order to determine the management and recovery strategies necessary to conserve the species.

Navajo sedge (*Carex specuicola*) is totally endemic to the Navajo Nation and has one known population in Utah and several in Arizona. The species is restricted to desert seeps and springs and is threatened by habitat disturbance from livestock grazing and trampling and dewatering of its habitat for other human uses. The species is listed as threatened. The species is recognized by the Navajo Nation as a species of concern and they are attempting to provide for its conservation.

Kodachrome bladderpod (*Lesquerella tumulosa*) is an extremely narrowly restricted species, being endemic to calcareous shale hills of the Winsor member of the Carmel Formation at Kodachrome Basin in Kane county near the Garfield county line. The species is the most recently listed plant species in Utah being listed as endangered on October 6, 1993. Most of the species population occurs on one section of State of Utah and private land with the remainder on surrounding public land managed by the BLM.

Welsh's milkweed (*Asclepias welshii*) is restricted to four populations on sand dunes in southern Kane county and adjacent Coconino county, Arizona. the overwhelming majority of the species population is on the Coral Pink Sand Dunes.

The species is listed as threatened and its Coral Pink Sand Dunes and Sand Hills populations are designated as critical habitat. A recovery plan has been developed for this species. the species is threatened by excessive off-road vehicle use. Half of the Species population is on public lands in both Utah and Arizona managed by the Bureau of Land Management. The other half of the species population is on the State of Utah's Coral Pink Sand Dunes State Park and is managed by the Utah Division of Parks and Recreation who have attempted to provide for the conservation of Welsh's milkweed by directing concentrated recreational off-road vehicle use away from the more vegetated portions of the dunes with the larger concentrations of Welsh's milkweed. Dr Brent Palmer of Southern Utah State University has been conducting research on the biology and ecology of the species in order to determine the management and recovery strategies necessary to conserve the species.

Siler Cactus (*Pediocactus sileri*) is restricted to a narrow band of scattered populations on gypsiferous clay soils of the Moenkopi Formation from the White Dome and Warner Ridge south of St. George in Washington County then across the Arizona Strip at the base of the Vermillion Cliffs reentering Utah in the Johnson Wash drainage in Kane County. The Species was recently downlisted from endangered to threatened. The species is the largest and spiniest in its genus and like other pediocactus is highly sought after for cactus collections. However, due to its peculiar soil requirements it is difficult to grow in greenhouses and gardens. It is also vulnerable to habitat disturbance from off-road vehicle and domestic livestock trampling and mineral development. Habitat in Utah is

primarily on public land managed by the BLM and on State of Utah Land.

Dwarf bear-poppy (*Arctomecon humilis*) is endemic to gypsiferous clay soils of Moenkopi Formation. The species range forms an arc from the vicinity of Santa Clara Butte and Boomer Hill to the south flank of Red Bluff to the Price City Hills to the White Dome to the west flank of Warner Ridge then finally to the Shinab Kibe. The entire range is within 10 miles of the center of St. George and is broken into separate stands by stretches of unsuitable habitat either eroded away or displaced by human development. It is threatened by the encroachment of human activity onto its habitat, most significantly from recreational off-road vehicle use but also mineral development and actual and potential road, utility and building construction. The species population is on a mixture of public land managed by the BLM, State of Utah land and some private property. The BLM has excluded its habitat from off-road vehicle use and has signed it as such. A portion has been fenced to exclude off-road vehicle use. Off-road vehicle use, however, continues taxing the BLM's limited resources to control it. The Desert Tortoise Habitat Conservation Plan for Washington County will provide additional conservation measures for the dwarf bear-poppy.

Deanne Nelson and Dr. Kimball Harper of Brigham Young University have conducted research on the biology and ecology of the species in order to determine the management and recovery strategies necessary to conserve the species. Red Butte Gardens is working to develop horticultural techniques to propagate this species in captivity and to reintroduce it into appropriate natural settings as soon as they can be identified.

Autumn Buttercup (*Ranunculus aestivalis*) is endemic to wet meadows along the upper Sevier River in Garfield County. There are currently two known populations both on private property, one owned by The Nature Conservancy near Bear Valley Junction Between US highway 89 and the Sevier River. The other is in the immediate vicinity. Listed as endangered, a recovery plan has been developed for it. It is threatened by livestock overgrazing and the encroachment of weedy vegetation.

Recent taxonomic studies by Dr. Rene VanBuren and Dr. Kimball Harper of Brigham Young University have demonstrated the phylogenetic uniqueness of this species and have elevated this taxa to full species rank, it was once a variety of *Ranunculus acrisiformis*. Dr. John Spence of the National Park Service and Dr. Nick VanPelt of The Nature Conservancy have been conducting scientific studies monitoring the population dynamics of this species. The Nature Conservancy has removed grazing from its autumn buttercup preserve. The species initially thrived from its release from grazing pressure but now may be under pressure from weedy vegetation in its plant community. Habitat for the species may be acquired as part of the Central Utah Project biological mitigation funding.

Native Plant Candidates For That Special Garden®

by
Marv Poulson
(801) 486-2131

<i>Hederotheca jonesii</i> Devils Backbone Daisy	<i>Haplopappus acaulis</i> Stemless Goldenweed	<i>Echinocereus engelmannii</i> variegatus Variegated Spine Hedgehog	<i>Sclerocactus pubispinus</i> spinosior Pink Great Basin Fishhook Cactus
<i>Juniperus communis</i> Common Juniper	<i>Haplopappus lanceolatus</i> Meadow Goldenweed	<i>Echinocereus</i> <i>triglochidiatus inermis</i> Spineless Hedgehog	CAMPANULALES <i>Campanula parryi</i> Parry Bellflower
<i>Ephedra torreyana</i> Torry Ephedra	<i>Hymenoxys acaulis</i> Stemless Woollybase	<i>Echinocereus</i> <i>triglochidiatus</i> <i>melanacanthus</i> Clustered Hedgehog	<i>Campanula scouleri</i> Scouler Harebell
<i>Ephedra viridis</i>	<i>Hymenoxys grandiflora</i> Large Flower Woollybase	<i>Mammillaria tetrancistra</i> Fishhook Cactus	<i>Campanula uniflora</i> Arctic Harebell
<i>Galium aparine</i>	<i>Lygodesmia grandiflora</i> Showy Rushpink	<i>Neolloydia johnsonii</i> Beehive Cactus, Pineapple Cactus	<i>Lobelia cardinalis</i> graminea Cardinal Flower
AGAVACEAE <i>Agave utahensis</i> <i>utahensis</i> Utah Agave	<i>Machaeranthera</i> <i>tanacetifolia</i> Tansyleaf Aster	<i>Opuntia basilaris</i> <i>basilaris</i> Beavertail Cactus	CARYOPHYLLALES <i>Achyronchia cooperi</i> Frost Mat, Chaff Nail
ASTERALES <i>Anaphalis margaritacea</i> Pearly Everlasting	<i>Machaeranthera</i> <i>tortifolia</i> Hurtleaf Woody Aster	<i>Opuntia erinacea</i> <i>utahensis</i> Utah Prickly Pear	<i>Arenaria hookeri</i> Hooker Sandwort
<i>Antennaria alpina</i> Alpine Pussytoes	<i>Psilostrophe sparsiflora</i> Green Stem Paper Flower	<i>Opuntia phaeacantha</i> <i>discata</i> Desert Prickly Pear	<i>Silene douglasii</i> Douglas Silene
<i>Antennaria rosea</i> Rose Pussytoes	<i>Senecio triangularis</i> Arrowleaf Groundsel	<i>Opuntia polyacantha</i> <i>juniiperina</i> Juniper Prickly Pear	<i>Silene lemmonii</i> Yellow Silene
<i>Antennaria umbrinella</i> Mountain Pussytoes	<i>Townsendia florifer</i> Flowering Townsendia	<i>Opuntia polyacantha</i> <i>polyacantha</i> Starvation Prickly Pear	<i>Silene petersonii minor</i> Minor Peterson Catchfly
<i>Arnica cordifolia</i> Heartleaf Arnica	<i>Townsendia incana</i> Gray Townsendia	<i>Opuntia pulchella</i> Dwarf Cholla	<i>Silene petersonii</i> <i>petersonii</i> Peterson Catchfly
<i>Arnica mollis</i> Hairy Arnica	<i>Townsendia mensana</i> Low Townsendia	<i>Opuntia ramosissima</i> Diamond Cholla	<i>Abronia villosa</i> Sticky Sand Verbena, Desert Verbena
<i>Aster engelmannii</i> Engelmann Aster	<i>Townsendia minima</i> Dwarf Townsendia	<i>Pediocactus simpsonii</i> <i>minor</i> Small Simpson Pincushion	<i>Mirabilis multiflora</i> Colorado Four O'Clock
<i>Aster foliaceus</i> Leafy Aster	<i>Viguiera multiflora</i> Showy Goldeneye	<i>Pediocactus simpsonii</i> <i>simpsonii</i> Simpson Pincushion	<i>Eriogonum brevicaula</i> Shortstem Buckwheat
<i>Baileya multiradiata</i> Desert Marigold	<i>Wyethia helianthoides</i> White Mulesears	<i>Sclerocactus parviflorus</i> Plateau Fishhook Cactus	<i>Eriogonum holmgrenii</i> Holmgren Buckwheat
<i>Balsamorhiza hookeri</i> Hooker Balsamroot	ASTERALES <i>Wyethia scabra</i> Rough Mulesears	<i>Sclerocactus parviflorus</i> <i>intermedius</i> Intermediate Plateau Cactus	<i>Eriogonum inflatum</i> Bottlebush, Inflated Buckwheat
<i>Balsamorhiza sagittata</i> Arrowleaf Balsamroot	CACTALES <i>Coryphantha</i> <i>missouriensis marstonii</i> Clover Pincushion Cactus	<i>Sclerocactus pubispinus</i> <i>pubispinus</i> Yellow Great Basin Fishhook Cactus	<i>Polygonum bistortoides</i> American Bistort
<i>Cirsium wheeleri</i> Wheeler Thistle	<i>Coryphantha vivipara</i> <i>desertii</i> Desert Beehive Cactus	<i>Claytonia exigua</i>	
ASTERALES <i>Erigeron argentatus</i> Silver Daisy	<i>Coryphantha vivipara</i> <i>vivipara</i> Beehive Cactus		
<i>Erigeron garrettii</i> Garrett Daisy	<i>Echinocereus engelmannii</i> <i>chrysocentrus</i> White Spine Englemann Hedgehog		
<i>Erigeron glaucus</i>	<i>Echinocereus engelmannii</i> <i>nichollii</i> Nichol Hedgehog		
<i>Erigeron utahensis</i> Utah Daisy			
<i>Gaillardia parryi</i> Parry Blanketflower			
<i>Gaillardia pinnatifida</i> Hopi Blanketflower			

Native Plant Candidates
For That Special Garden
by Marv Poulson

Claytonia lanceolata
Lance Leaf Spring Beauty

Claytonia megarrhiza
Large Root Spring Beauty

Claytonia perfoliata
Miner's Lettuce

Lewisia leana
Lean Bitter Root

Lewisia pygmaea pygmaea
Dwarf Bitter Root

Lewisia rediviva
Common Bitter Root

Montia perfoliata
Miners Lettuce

CARYOPHYLLALES
Atriplex spp.
Saltbrush

CELASTRALES
Pachystima myrsinites
Western Mountain Lover

Shepherdia rotundifolia
Roundleaf Buffaloberry

Ceanothus fendleri
Fendler Mountain Lilac

CORNALES
Cornus canadensis
Canada Dogwood

CYPERALES
Stipa comata comata
Needle and Thread Grass

ERICALES
Arctostaphylos patula
Green Leaf Manzanita

Arctostaphylos pringlei
Pink Manzanita

Arctostaphylos uva-ursi
Kinnikinnick, Sandberry

Kalmia polifolia
microphylla
Bog Laurel

Chimaphila umbellata
occidentalis
Pipsissewa, Prince's Pine

Pterospora andromedea
Pinedrops

Pyrola asarifolia
Liverleaf Wintergreen

Pyrola minor
Lesser Wintergreen

Pyrola secunda
Sidebells Wintergreen

GENTIANALES
Amsonia jonesii
Jones Bluestar

Asclepias ruthiae
Ruth Milkweed

Gentiana affinis
Rocky Mountain Gentian

Gentiana simplex
Single Flower Gentian

Gentianella amarella
heterosepala
Englemann Gentian

Gentianella tortuosa
Jones Gentian

GERANIALES
Geranium caespitosum
Small Leaf Geranium

Geranium richardsonii
Richardson Geranium

Geranium viscosissimum
Sticky Geranium

Linum kingii
Utah Mountain Flax,
King Flax

GRAMINALES
Bouteloua hirsuta
Hairy Grama Grass

Oryzopsis hymenoides
Indian Rice Grass

GUTTIFERACEAE
Hypericum formosum
St. Johnswort

Viola adunca
Blue Violet

Viola canadensis
Canada Violet

IRIDALES
Iris missouriensis
Missouri Iris

Sisyrinchium
angustifolia
Eastern Blue Eye Grass

Sisyrinchium bellum
California Blue Eye Grass

LAMIALES
Monardella odoratissima
Clover Head Horsemint

LILIALES

Yucca angustissima
kanabensis
Kanab Yucca

Yucca baileyi
Bailey Yucca

Yucca elata

Yucca harrimaniae
Harriman Yucca

Yucca smalliana

Allium acuminatum
Common Wild Onion

Allium cristatum
Crested Onion

Allium nevadense
Nevada Onion

Dichelostemma
multiflorum
Wild Hyacinth

Triteleia douglasii
Bluedicks, Wild Hyacinth

Triteleia lutea analina
Golden Brodiaea, Pretty Face

Tradescantia
occidentalis scopulorum
Spiderwort

Calochortus bruneaunis
Northern Mariposa Lily

Calochortus elegans
Elegant Mariposa Lily

Calochortus flexuosus
Flexible Stemmed
Mariposa Lily

Calochortus nuttallii
Sego Lily

Camassia quamash
Blue Camas Lily

LILIALES
Disporum trachyandrum
Fairybells

Erythronium grandiflorum
Dogtooth Violet, Glacier Lily

Fritillaria atropurpurea
Leopard Lily

Fritillaria pudica
Yellow Bell

Smilacina racemosa
False Solomon Seal

Smilacina stellata
Wild Lily of the Valley

Xerophyllum tenax

Zigadenus elegans
Elegant Death Camas

Zigadenus paniculatus
Foothill Death Camas

LOASALES
Mentzelia pumila
Dwarf Blazing Star

MALVALES
Malvastrum rotundifolium
Desert Five Spot

Sidalcea malviflora
Checker Broom

Sphaeralcea caespitosa
Jones Globemallow

Sphaeralcea fendleri
Fendler Globemallow

Sphaeralcea parviflora
Nelson Globemallow

MYRTALES
Asarum caudatum
Western Wild Ginger

Clarkia rhomboidia
Broad Leaf Clarkia

Epilobium paniculatum
paniculatum
Autumn Willowherb

Oenothera caespitosa
Morning Lily

Oenothera flava
Yellow Evening Primrose

MYRTALES
Zauschneria latifolia
Hummingbird Flower

ORCHIDALES
Calypso bulbosa
Calypso Orchid, Fairy Orchid

Epipactis gigantea
Helleborine

Habenaria dilatata
White Bog Orchid

Habenaria sparsiflora
Watson Bog Orchid

Habenaria viridis
bracteata
Long-bracted Bog Orchid

Native Plant Candidates
For That Special Garden
by Marv Poulson

<i>Spiranthes porrifolia</i> Leek Leaf Ladies Tresses	<i>Polemonium pulcherrimum</i> Pretty Jacobs ladder	<i>Delphinium nelsonii</i> Nelson Larkspur	<i>Astragalus scopulorum</i> Rocky Mountain Milkvetch
<i>Spiranthes romanzoffiana</i> Hooded Ladies Tresses	<i>Datura wrightii</i> Angles Trumpet, Sacred Datura	<i>Delphinium nuttallianum</i> Nuttall's Larkspur	<i>Astragalus utahensis</i> Utah Milkvetch
POLEMONIALES <i>Cryptantha barnebyi</i> Barneby Cat's-eye	POLYPODIACEAE <i>Notholaena parryi</i> Parry Cloak Fern	<i>Ranunculus adoneus</i> Alpine Buttercup, Marsh Marigold	<i>Lotus corniculatus</i> Birds Foot Trefoil
<i>Cryptantha confertiflora</i> Golden Cat's-eye	POLYPODIALES <i>Adiantum capillus-veneris</i> Maidenhair Fern	<i>Ranunculus glaberrimus</i> Sagebrush Buttercup	<i>Lotus longibracteatus</i> Long Bracted Trefoil
<i>Cryptantha flava</i> Yellow Cat's-eye	<i>Cryptogamma crispa</i> Parsley Fern	<i>Ranunculus juniperinus</i> Juniper Buttercup	<i>Lotus wrightii</i> Wright Trefoil
<i>Cryptantha grahamii</i> Graham Cryptantha	<i>Pellaea breweri</i> Brewer Cliff Brake Fern	<i>Ranunculus repens</i> Creeping Buttercup	<i>Lupinus bicolor</i> Two Tone Lupine
<i>Cryptantha humilis</i> Dwarf Cat's-eye	<i>Woodsia oregana</i> Oregon Woodsia Fern	RHOEADALES <i>Arabis drummondii</i> Northern Rock Cress	<i>Lupinus concinnus</i> Elegant Lupine
<i>Hackelia floribunda</i> Showy Stickseed	PRIMULALES <i>Dodecatheon alpinum</i> Alpine Shooting Star	<i>Arabis lignifera</i> Rock Cress	<i>Lupinus lepidus</i> Stemless Lupine
<i>Lithospermum incisum</i> Showy Stoneseed	<i>Dodecatheon pulchellum</i> Pretty Shooting Star	<i>Arabis perennans</i> Common Rock Cress	<i>Lupinus varicolor</i> Many Color Lupine
<i>Mertensia brevistylis</i> Wasatch Bluebell	<i>Primula nevadensis</i> Nevada Primrose	<i>Lesquerella rectipes</i> Colorado Bladder Pod	<i>Trifolium gymnocarpon</i> Naked Fruit Clover
<i>Mertensia oblongifolia</i> Western Bluebell	<i>Primula parryi</i> Parry Primrose	<i>Lesquerella tumulosa</i> Kodachrome Bladder Pod	<i>Trifolium wormskioldii</i> Wormskjold Clover
<i>Myosotis alpestris</i> For Get Me Not	RANALES <i>Anemone deltoidea</i> Mountain Windflower	RHOEADALES <i>Physaria chambersii</i> Chambers Twinpod	<i>Cercocarpus ledifolius</i> Curl Leaf Mountain Mahogany
<i>Hydrophyllum capitatum</i> Mountain Waterleaf	RANALES <i>Anemone globosa</i> Cutleaf Windflower	<i>Corydalis aurea</i> Golden Corydalis, Golden Smoke	<i>Fragaria chiloensis</i> Duchesne Strawberry
<i>Hydrophyllum occidentale</i> Western Waterleaf	<i>Anemone multifida</i> Globe flower	<i>Corydalis caseana</i> Fitweed Corydalis	<i>Geum macrophyllum</i> Large Leaf Avens
<i>Phacelia fremontii</i> Fremont Phacelia	<i>Anemone occidentalis</i> Western Windflower	<i>Dicentra formosa</i> Western Bleeding Heart	<i>Geum rossii</i> Ross Avens
<i>Phacelia utahensis</i> Utah Phacelia	<i>Anemone tuberosa</i> Desert Anemone, Desert Windflower	<i>Dicentra uniflora</i> Steershead	<i>Geum triflorum</i> Prairie Smoke, Purple Avens
<i>Gilia aggregata</i> Scarlet Gilia	<i>Aquilegia formosa</i> Western Columbine	<i>Argemone munita</i> Armed Prickly Poppy	<i>Petrophytum caespitosum</i> Rock Spiraea
<i>Gilia congesta</i> Dwarf Gilia	<i>Aquilegia micrantha</i> Alcove Columbine	ROSALES <i>Sedum debile</i> Opposite Stonecrop	<i>Potentilla anserina</i> Common Silverweed
<i>Phlox austromontana</i> Desert Phlox	<i>Aquilegia scopulorum</i> Rock Columbine	<i>Sedum divergens</i> Divergent Stonecrop	<i>Potentilla crinita</i> Hair Tuft Cinquefoil
<i>Phlox longifolia</i> Long Leaf Phlox	<i>Clematis occidentalis</i> Blue Clematis	<i>Sedum integrifolium</i> Roseroot Stonecrop	<i>Potentilla fruticosa</i> Shrubby Cinquefoil, Tundra Rose
<i>Phlox multiflora</i> Many Flowered Phlox	<i>Clematis pseudoalpina</i> Rocky Mountain Clematis	<i>Astragalus chloodes</i> Grass Milkvetch	<i>Potentilla gracilis</i> Slender Cinquefoil
<i>Polemonium foliosissimum</i> Leafy Jacobs ladder		<i>Astragalus desperatus</i> Rimrock Milkvetch	<i>Rubus parviflorus</i> Thimbleberry
<i>Polemonium occidentale</i> Blue Jacobs ladder			<i>Heuchera ovalifolia</i> Roundleaf Alumroot

<i>Heuchera parviflora</i> Littleleaf Alumroot	<i>Castilleja linariaefolia</i> Narrow-leaf Paintbrush	<i>Pedicularis groenlandica</i> Elephant Head	<i>Penstemon procerus</i> modestus Modest Small Flowered Penstemon
<i>Lithophragma glabrum</i> Woodland Star	<i>Castilleja miniata</i> Scarlet Paintbrush	<i>Pedicularis parryi</i> Parry Lousewort	<i>Penstemon utahensis</i> Utah Penstemon, Utah Beardtongue
<i>Parnassia fimbriata</i> Fringed Grass of Parnassus	<i>Mimulus cardinalis</i> Cardinal Monkey Flower	<i>Penstemon acaulis</i> Stemless Beardtong	<i>Penstemon whippleanus</i> Whipple Penstemon
<i>Saxifraga odontoloma</i> Brook Saxifrage	<i>Mimulus lewisii</i> Lewis Monkey Flower	<i>Penstemon caespitosus</i> Mat Penstemon	UMBELLALES <i>Cymopterus newberryi</i> Sweetroot Spring Parsley
RUBIALES <i>Linnaea borealis</i> Twin Flower	<i>Mimulus parryi</i> Parry Monkey Flower	<i>Penstemon caespitosus</i> <i>desertipicti</i> Limestone Penstemon	<i>Lomatium foeniculatum</i> Desert Parsley
SCROPHULARIALES <i>Orobancha uniflora</i> One-flower Cancerroot	<i>Orthocarpus densiflorus</i> <i>noctuinus</i>	<i>Penstemon cyananthus</i> Wasatch Penstemon	<i>Lomatium grayi</i> Milfoil Parsely
<i>Castilleja angustifolia</i> <i>flavescens</i> Yellow Desert Paintbrush	<i>Orthocarpus luteus</i> Yellow Owl Clover	<i>Penstemon deustus</i> Hot Rock Penstemon	<i>Orogenia linearifolia</i> Indian Potato
<i>Castilleja chromosa</i> Common Paintbrush	<i>Pedicularis centranthera</i> Pinyon Juniper Lousewort	<i>Penstemon grahamii</i> Graham Beardtong	
	<i>Pedicularis contorta</i> Twisted Lousewort	<i>Penstemon humilis</i> Low Penstemon	

I have enjoyed searching out some specimens from specialty growers and look forward to discovering new sources. I do not consider collecting from nature as an option, other than occasionally collecting a few seeds under appropriate permit.

Suggested Retail Sources of Hard to Find Native Plants and Seed

Mail Order

Forest Farm
990 Tetherow Road
Williams, OR 97544-9599
Phone: (503)846-6963

Lamb's Nurseries
E. 101 Sharp Ave.
Spokane, WA 99202

Rocknoll Nursery
9210 US 50
Hillsboro, OH 45133-8546

Rocky Mountain Rare Plants
P.O. Box 20483
Denver, CO 80220-0483

Siskiyou Rare Plant Nursery
2825 Cummings Road
Medford, OR 97501
Phone: (503)772-6846

Local

The Rock Garden
399 Harrisville Road
Ogden, Utah 84404
Phone: (801)392-0042

Willard Bay Gardens
7095 South Hwy. 89
Willard, Utah 84340
Phone: (801)782-8984

UNPS SEGO LILY
c/o Jo Stolhand
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, UT 84152-0041

Address Correction Requested

Non-Profit Org.
U.S. Postage
PAID
Salt Lake City, Utah
PERMIT No. 327

BARGAIN OPPORTUNITY

The UNPS Board of Directors has voted to change the dues schedule for membership in the Society. As of April, dues are going up. The categories of membership are as follows:

Student	\$6.00
Senior	\$10.00
Individual	\$12.00
Household	\$20.00
Sustaining	\$35.00
Supporting	
Organization	\$50.00
Corporate	\$250.00 & up
Lifetime	\$250.00

**Renew your membership before
April 1 and SAVE NOW!**

MUSHROOM LOVERS

Hope's Mushroom Cookbook by Hope Miller is now available for \$19.95, autographed and postpaid. Send your check to Hope Miller, 209 Pine Drive, Blacksburg, Virginia 24060.

Membership Application

☐ New Member ☐ Renewal ☐ Gift

Name _____

Street _____

City/State _____

Zip _____ Phone _____

If Gift, from: _____

Check membership category desired:

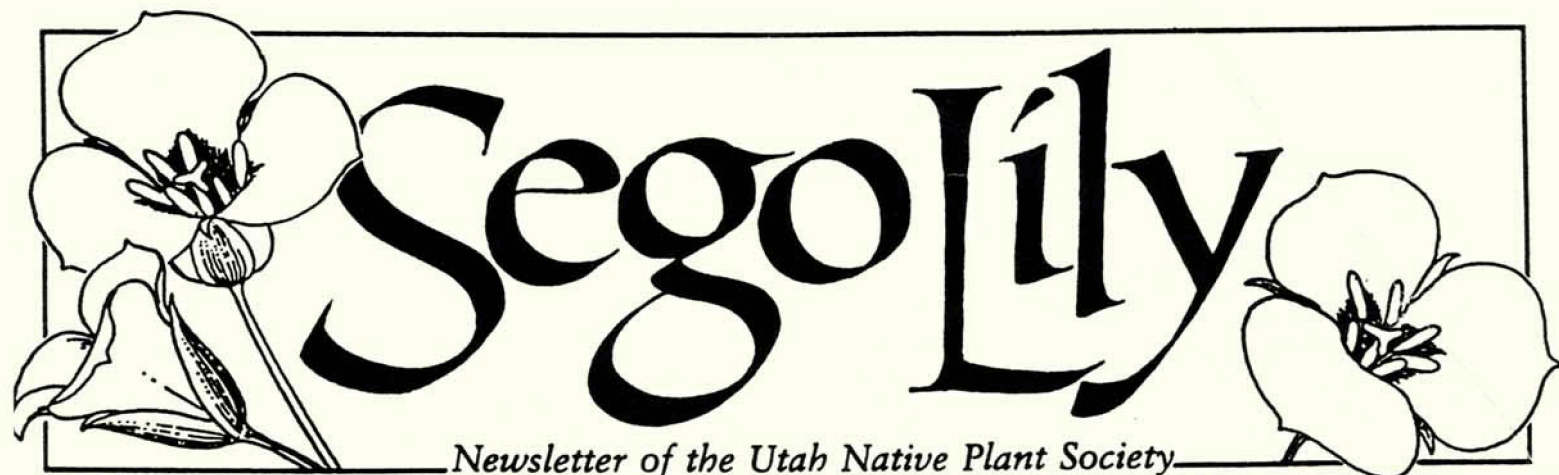
- ☐ Student/Senior.....\$ 5.00
☐ Individual.....\$ 10.00
☐ Family.....\$ 15.00
☐ Supporting.....\$ 30.00
☐ Corporate.....\$ 30.00 and up
☐ Life.....\$250.00

☐ 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 it to:

Pam Poulsen, treasurer,
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, Utah 84152-0041

(If you prefer not to cut this out of your Sego Lily, feel free to copy the membership form or simply write the information down and mail it with payment for the category of membership.)



VOL. 17 NO. 3

MAY / JUNE 1994

CALENDAR OF EVENTS

April 30
Saturday.

Primula maguirei Fieldtrip. Meet at First Dam up Logan Canyon at 10:00 am. Bring a lunch.

May 21
Saturday
7:30 am

Fieldtrip to Rush Valley led by Rodd Hardy, Range Ecologist for BLM. We will search the southern part of Rush Valley for Mound Cryptanth and Pohl Milkvetch. Help is needed to "Find, Photo and Flag" these endangered species. Meet at the District BLM Office in West Valley City, 2370 So. 2300 West. Call Rodd at 977-4361 at work or 876-2416 at home in Mt. Green with questions or to let him know you are coming. Bring a lunch, guides, hand lens. Another trip is planned for June to check for other endangered species.

May 25
Wednesday
7:30 pm

Salt Lake Chapter Meeting: "Wildflowers: Celebrating National Wildflower Week," by Wayne Padgett, U.S. Forest Service. Come in the west door of the Dept. of Natural Resources Bldg, 1636 West North Temple, SLC.

May 28
Saturday
8:30 am

Fieldtrip to Golden Spike Monument led by Robert Fitts, and co-sponsored by the Cache Chapter and Audubon, to compile a plant list of the area. Meet at the Information Desk. If you arrive late, ask at the Desk for directions to find the group or check near the railbeds.

June 10-11
Friday-Sat.

Threatened and Endangered Plants Fieldtrip. Lori Armstrong, botanist for the BLM, will be our host for this trip to Kane County. We will meet Thurs. night (June 9) at the Ponderosa Grove Campground (north of the Coral Pink Sand Dunes). See Mar/Apr issue for itinerary. Please contact Jo Stolhand (521-0069) if you wish to participate in this fieldtrip.

June 16-18
Thurs-Sat.

Mushroom Hunt. See article in this issue for details. Make your reservation with Dave Okelberry, 3522 West 4305 South, West Valley City, UT 84119 (801-968-6190) now. Pre-registration is essential.

MUSHROOM HUNT 1994

Dave Okelberry
UNPS Board of Directors

On June 16, 17 and 18 our Nature Outing and Mushroom Hunt will be held at Blackhawk Campground, Nebo Loop, Payson Canyon. We have section A 4, 5, 6, and 7 in the campground reserved for up to 200 people. There are also 18 horse spaces in section E. Reservations are good from 2 pm Thursday until 1 pm Saturday.

We will have our regular group of experts we've had before, plus maybe even a few more.

We want everyone to feel free to come to any part or the whole thing, whatever fits into your schedule.

There's no cost for the outing, but since there's no other cooking in the campground we'd like a donation for food:

\$20.00 per person if not a member of UNPS

\$15.00 per person if a member of UNPS

Half price for children 10 and under.

We will start at Peteetneet School in Payson at 8:00 am on Thursday and will leave from there in all directions to begin searching. Lunch will consist of Pierre and Connie's famous french bread, cheese and fruit, etc. which you'll take with you unless we decide to meet in a common place for lunch.

After lunch, you can get your camp set up, spend the afternoon hunting mushrooms, or sightseeing the great area. Friday night we'll head back to Payson (it's not far) where there are several good eating places. You're on your own for dinner. The slide show will start at 7:00 pm at the Peteetneet School. Get there when you can, we'll not start the lecturing until after 8:00 pm. After the show it's back to camp for the night.

The next morning get up early or late for a sourdough pancake breakfast. Then its off on the great hunt. Lunch is the same as Thursday. Friday night we'll have a dutch oven dinner. Tex Parker and Ardean Watts are the evening's entertainment. Bring all your talents and instruments to get into the act.

Saturday is a new day with the same agenda: breakfast, hunt, then a big mid-day dinner, starting at 11:30 am, of marinated turkey steak

plus trimmings.

The mushrooms we find will be put on display at the Peteetneet School. This will give you time to stop and look over the display and get home before too late.

Horses will not be allowed in A camp at all and if you visit E camp it will be at your own risk. Horse people will hunt mushrooms with their own separate group.

If you prefer a motel, Comfort Inn in Payson is giving us a group rate:

\$42.00 + tax for 1 queen bed/room

\$48.00 + tax for 2 queen beds/room

You may call them at 1-800-228-5150 to make reservations.

Anyone with dutch ovens or cooking abilities and willing to help with the cooking please let me know.

Make your reservations for the Hunt before June 1st. The list is filling fast. Pre-registration is required. Make checks payable to UNPS and send them, with your completed Application to Participate (see this issue), to:

Dave Okelberry

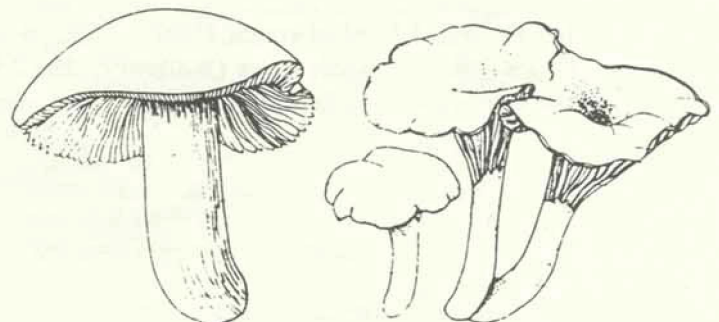
3522 West 4305 South

West Valley City, UT 84119.

Call me at 968-6190 for directions to Peteetneet School in Payson.

MUSHROOM LOVERS

Hope's Mushroom Cookbook by Hope Miller is now available for \$20.00, autographed and postpaid. We have 48 copies on hand. Send your check to Dave Okelberry, see address above, or buy one at the Mushroom Hunt.



EEK!

IT'S ASTERACEAE - PHOBIA!!!

Pam Poulson, Manager of Environmental Education
Red Butte Garden and Arboretum

There are many wildflower watchers who have a great fear of the Aster (ASTERACEAE) Family. I'm not too sure why this malady is so prevalent.

Perhaps it is because ASTERACEAE is the third largest family in the world (behind Grasses (POACEAE) and Orchids (ORCHIDACEAE)). Or perhaps it is because the family is called by many names: ASTERACEAE, COMPOSITAE, Aster Family, Sunflower Family, Daisy Family, etc.. But most likely, is the fact that it is a family that is different from any other flowering plant family because of the structure of the inflorescence.

In the Aster Family, many tiny flowers are arranged or composed in what is called a composite head. The simple part of this is that the individual flowers all have basically the same structure. The complex part of all this is the seemingly unending number of possibilities of combinations and permutations of these simple parts.

Professional Botanists don't mind the identification part of the Aster Family--some even find it fun and challenging. What they do mind is the astronomical numbers of possibilities and the minute differences among the possibilities.

COMPOSITE HEAD

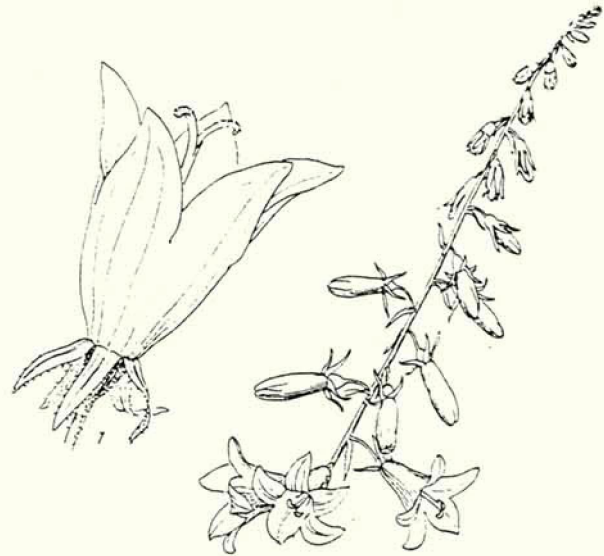
To make the entire family much easier for us all, just think of the composite head arrangement. Remember this basic fact: **When you are holding what appears to be a single daisy with several white petals and a yellow center, you actually have in your hand an inflorescence composed of hundreds of individual flowers.**

Stated even more simply: everything that looks like a daisy or a sunflower with a seemingly hard knob of a center and radiating "petals" is an ASTERACEAE. That's just the beginning. We'll get to the Thistles and Dandelions in a minute.

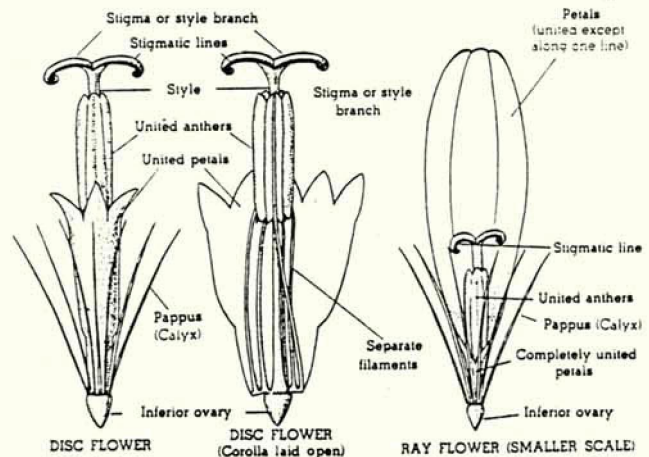
UNITED PETALS/INFERIOR OVARY

Now this next statement of fact is either going to make it all totally clear or hopelessly confuse. This, however is the most important concept to remember when looking at an ASTERACEAE: **the closest plant family relative of ASTERACEAE is the Bluebells, CAMPANULACEAE.** (You've got to be kidding, right?)

Look at the structure of CAMPANULACEAE. **Each flower is recognized by five lobes or five united petals. Also, five united sepals, two stigmas and an inferior ovary.**

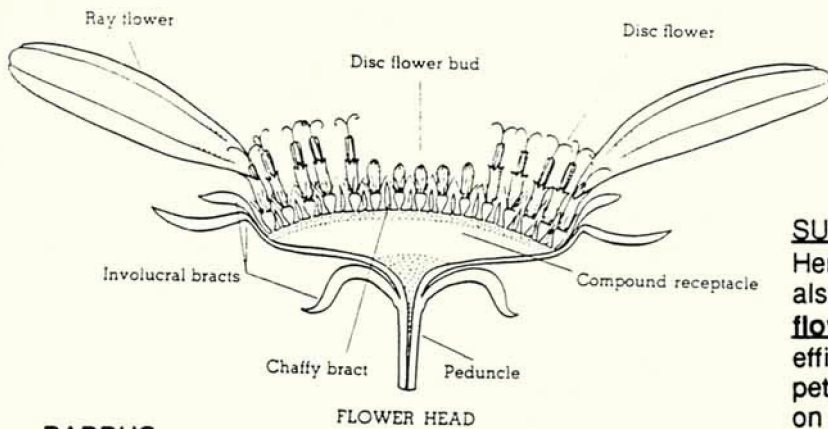


With me so far? Now, blast apart the composite head of an Aster. Get out your magnifying glass and take a look at those tiny individual flowers that were the hard knob in the center. **Wow! Each flower is recognized by five lobes or five united petals. Also, two stigmas and an inferior ovary!**



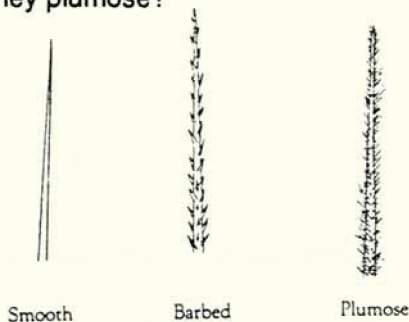
DISK FLOWERS/RAY FLOWERS

The flowers of the hard knob in the center are called **disk flowers**. The radiating "petals" around the disk flowers are also individual flowers called **ray flowers**. You can easily distinguish a disk flower from a ray flower because a **disk flower is radially symmetrical, while a ray flower is bilaterally symmetrical.** Also, ray flowers are not always complete. In other words, they may not have both male and female reproductive parts. Remember this for later.



PAPPUS

What happened to the five united sepals? Hah! They evolved into the pappus (the fuzzy or scaly thing at the top of the ovary.) What flower needs a protective calyx when surrounded tightly by several of your fellow blossoms? The appearance of the pappus bristles is very important. Is there a pappus present or did it fall off when you took the flowers apart? Are the bristles smooth? Are they barbed? Are they plumose?



RECEPTACLE

The pedistal that all the disk flowers and all the ray flowers are perched upon is called the receptacle. Often the texture of the receptacle is an important identifying feature. After you have pulled all the disk and ray flowers off of the receptacle, what shape and texture remain? Is the receptacle flat, concave, convex, or down-right domed and pointy? Is the receptacle smooth? Is it bristly? Is it chaffy (sort of little scales all over it)? Did the receptacle have scales on it that fell off when you took the flower apart?

PHILLARIES

What are these green things around the outside of the flowers, holding the composite head together? If they are not sepals, what are they? They are phillaries or bracts. Bract is a term used in plant physiology that seems to describe anything that doesn't fit into the leaf or sepal category. ASTERACEAE is well developed in the bract department.

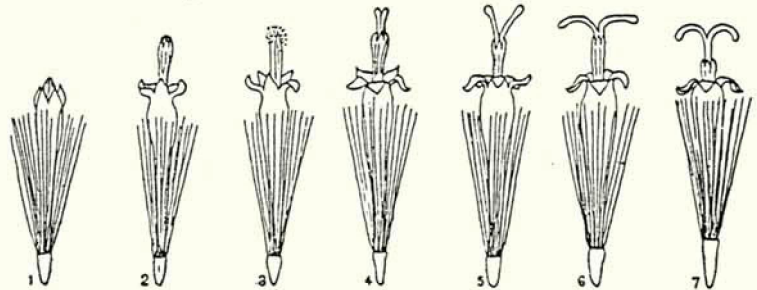
What about dandelions and thistles. They don't have any hard centers--oops, I mean disk flowers. Look closely. Remember the differences between ray flowers and disk flowers? Look for radial symmetry vs. bilateral symmetry. You'll find that thistles are made up exclusively of disk flowers while dandelions and chicory are made up of ray flowers. Take a guess at what the Western Cone Flower is composed of!

SUCCESSFUL REPRODUCERS

Here's another statement that may be news to a few, but is also extremely relevant: **The only reason for a flower is to produce offspring.** Some of the most efficient seed producers are those plants that have no petals, and are either wind or water pollinated. Depending on which family you are considering, this can be taken as either an evolutionarily primitive method of reproduction (mosses), or an evolutionarily advanced method of reproduction (water lilies and grasses).

One of the reasons ASTERACEAE is so "complex" is that this family has evolved a method of reproduction that is well beyond the other plants. ASTERACEAE is at the tip end of an evolutionary twig on the tree of adaptation. ASTERACEAE has developed what is considered the most efficient flower arrangements for successful reproduction of seed: Place a couple of hundred flowers at the tip of a branch. Make sure that each flower devotes its energy to the production of only one seed. Guaranteed success! If you don't believe this statement, take inventory sometime of how many of our pernicious weeds are members of this family. Reproductive success is a major factor in the definition of a weed.

Some ASTERACEAE are also designed to pollinate themselves. Normally, the ready and willing stigmas emerge from the flower, passing through the tightly united stamens, which are at that time not ready to dispense ripe pollen. The fertile stigmas stand exposed, waiting for an insect whose legs are covered with pollen from another plant to come along. In the event that an insect does not come by, the stigmas are well prepared. Maybe self pollination wasn't such a bad idea after all. The stigmas begin to curl backward to reach for the now ripened pollen grains waiting on stamens within the same flower! Voila! Pollination success! A seed is born! A weed is on its way!



GIVE IT A TRY!

The ASTERACEAE is a family that is often ignored by wildflower watchers--identification seemingly impossible. Not really so. Just a lot of study and looking and comparison involved. Even professionals take this family one bite at a time, dividing it up into 12 tribes or sub-families. Don't be afraid!

COMMITTEES AND COMMITMENT

Brent L. Shipley
UNPS Chairman of the Board

Your UNPS Board of Directors (BoD) met on 12 April to discuss ways to further the objectives of the Society and plan some of the activities for the coming months. We discussed opportunities that the Society provides for its members to become involved in promoting, conserving and protecting the native plants and natural habitats of Utah and the Intermountain Area. We hope that the Society is providing the right opportunities and we want to reflect the desires and interests of the membership in conducting the affairs of the Society.

Five master committees were established and partially staffed at the BoD meeting. Those committees and the support areas that they will serve are as follows:

Executive Committee. The executive committee is established by our bylaws and is made up of the President, Vice President, Secretary, Treasurer, other State Officers, and the Chapter Presidents.

Nominating Committee. The nominating committee is also required by our bylaws and is appointed by the President for the purpose of locating and presenting BoD candidates to the membership at the annual Members meeting.

Conservation Committee. The conservation committee is designed to cover functions for conservation, threatened and endangered species, horticulture, seeds, and plant sales. Chairperson is Alyce Hreha. Dick Page and Duane Atwood from the BoD will work with this committee.

Education Committee. The education committee will cover functions for education, publications, newsletter, library, archives, photography, and field trips. Chairperson for this committee is Jo Stolhand. Other committee members from the BoD are Dick Hildreth, Dave Okelberry, and Janet Williams.

Development Committee. The development committee will cover functions for finance, budget, grants, membership, and public relations. Chairperson for this committee is Sherman Brough. Members from the BoD are Andy Boyak and Jo Stolhand.

The initial task of these committees is to develop a mission statement for the functions that they will fill. The chairperson and members that have been listed above are the representatives from the BoD. We need the involvement of the members to make these committees truly reflect your point of view and objectives. Please contact the chairperson for the committee that you are interested in participating on. You may also be asked by the chairperson to participate, without your having volunteered. I will be serving as an ad-hoc member on all of the above committees. If I can find the time, you can too!

RED BUTTE GARDEN & ARBORETUM WILDFLOWER HOTLINE REPORT Late April 1994

Pamela Mills Poulson

Spring is approaching from the south, right on schedule. The deserts of Utah and the southwest are looking fine!

In the desert between Utah and Las Vegas, at Valley of Fire State Park, along the Arizona Strip, in the Virgin River Gorge and around St. George, wildflower blooming is underway and is just passing its peak. Watch for pink Sego Lily (Calochortus flexuosus), Indian Paintbrush (Castilleja spp.), Scorpion Weed (Phacelia spp.), Desert Globemallow (Sphaeralea spp.), Pink Sand Verbena (Abronia villosa), Desert Chicory (Rafinesquia neomexicana), Pepperweed (Lepidium fremontii), Wooley Daisy (Eriophyllum spp.) Prickly Poppy (Argemone spp.), Desert Marigold (Baileya multiradiata), both yellow and white Evening Primroses (Oenothera spp.), Yuccas (Yucca spp.), Creosote Bush (Larrea divaricata), Prickly Pear Cactuses (Opuntia spp.) and Hedgehog Cactuses (Echinocereus spp.).

As usual, wildflowers have been blooming in Zion National Park since January, the display is colorful and will continue through September. Right now the fruit trees are just finishing up their bloom. Among the wildflowers, watch for Creeping Oregon Grape (Mahonia repens), Fremont Barberry (Mahonia fremontii), Zion Sweetvetch (Astragalus zionus), Zion Draba (Draba zionensis), Wanderer Violet (Viola nephrophylla), Indian Paintbrush (Castilleja chromosa), Utah Penstemon (Penstemon utahensis), Wallflowers (Erysimum spp.), Yellow

Cat's Eye (Cryptantha confertifolia), Prince's Plume (Stanleya pinnata), Utah Serviceberry (Amelanchier utahensis), Zion Sweetpea (Lathyrus zionis), Manzanita (Arctostaphylos ssp.), Early Draba (Draba ssp.) and fields of Musk Mustard (Chorispora tenella) and Filaree (Erodium cicutarium). Watch in the hanging gardens for Shooting Star (Dodecatheon pulchellum). The campgrounds are open and fill up on weekends.

Thanks to Bart Anderson, an avid Naturalist from St. George, there has been a Wildflower Hotline especially for the St. George, Zion National Park and Arizona Strip area for over six years now. Bart also guides hikes into the wildflowers. This week Bart admonishes us to take a closer look at Desert Carnage, also known as Wild Rhubarb (Rumex ssp.) which is a tall leafy plant growing in sandy washes. Call Bart Anderson's St. George Wildflower Hotline (801) 628-6200, then dial 1301, then dial 3.

Since the Canyonlands area is nearly 2000' higher than the St. George area, it is in a completely different vegetation zone than St. George. The Moab area, as well as Lake Powell, San Rafael Swell, Uinta Basin, Monument Valley, San Juan River area, etc., are all part of the high Colorado Plateau desert. Blooming is looking good there and Gary from Arches National Park predicts peak blooming that will run from the last week in April through the middle of May.

Right now, watch for: Indian Paintbrush (Castilleja chromosa), Milkvetch (Astragalus ssp.), Mustards (Physaria, Draba, Descurania and Streptanthus ssp.), Biscuitroots and Desert Parsleys (Lomatium and Cymopterus ssp.), Rockcress (Arabis ssp.), Peppergrass (Lepidium fremontii), Purple Funnel Lily (Leucocrinum montanum), Western Wallflower (Erysimum ssp.), Curly Dock (Rumex ssp.), Bastard Toadflax (Commandra pallida), Dwarf Evening Primrose (Oenothera pallida), Eaton's Penstemon (Penstemon eatonii), Desert Holly (Atriplex hymenelytra), Fremont mahonia (Mahonia fremontii), Utah Serviceberry (Amelanchier utahensis), Wild Onion (Allium ssp.), Yellow Cat's Eyes (Cryptantha spp.), Skyrocket Gilia (Gilia aggregata), Claret Cup Hedgehog Cactus (Echinocereum triglochidiatus), Singleleaf Ash (Fraxinus anomala), African Mustard (Chorispora tenella), and Filaree (Erodium cicutarium).

In southeastern Utah the campgrounds are filling up every day. Get there early in the day on Thursday if

you want a camp site for the weekend.

Salt Lake City and the Great Basin Desert have about the same blooming schedule as Moab, all at about 4,400 feet elevation. Capitol Reef is 1,000 feet higher than Moab and is in the early stages of desert bloom now. Bryce Canyon is at 7,500 feet and will begin to bloom in about two weeks. Cedar Breaks is at 10,000 feet and should begin to bloom in late May or early June, depending on the snowmelt.

Along the foothills of the Wasatch Front from Nephi to the Idaho border, we have received many reports. Watch in moist north and east facing locations for Indian Potato (Orogenia linearifolia), Snow Buttercup (Ranunculus jovis), Glacier Lily (Erythronium grandiflorum) and Spring Beauty (Claytonia lanceolata). Desert Parsleys (Cymopterus ssp.) are out in abundance and even Milkvetch (Astragalus cibarius) is blooming. Yellow Bells (Fritillaria pudica) are blooming right now and if you're real lucky you may see Steer's Head (Dicentra uniflora) among the Sagebrush (Artemisia tridentata). Fat buds on the Arrowleaf Balsamroot (Balsamorhiza saggitata) and many leaves of Foothill Death Camas (Zygadenus paniculatus) and Sego Lily (Calochortus nuttallii) promise a foothill bloom this year that will peak in mid to late May. Watch for Sego Lilies (Calochortus nuttallii) on the foothills in mid to late May.

Wherever you go in Utah, watch for three blooming weeds: African Mustard (Chorispora tenella), Filaree (Erodium cicutarium) and Burr Buttercup (Ranunculus testiculatus).

The mountains will begin their bloom at the usual time in early June and peak in late July. Utah is a great place for wildflowers because we can see something blooming from January through September!

Listen to KUER at 11:00 am on Friday mornings and KRCL 7:30 am on Monday mornings for weekly wildflower updates or call the Red Butte Garden Wildflower Hotline at 581-IRIS.



UNPS PROGRAMS AND FUNCTIONS

APPLICATION TO PARTICIPATE

Name _____ Tel. No. _____

Street/P.O. Box _____

City _____ State _____ Zip Code _____

() I am a Member of UNPS. () I am not a Member of UNPS. () I am submitting a UNPS Membership Application along with this application for participation.

I am applying to participate in the following program/function of UNPS:

() Annual Mushroom Hunt, being held on _____.

() Annual T & E Conference, being held on _____.

() Other: _____.

() In addition to myself, this application is for other household members as follow: _____

I am attaching () a personal check, () cash, () other _____ in the amount of \$ _____ for the participation fee for this program/function for myself or for myself and the household members listed above. This fee covers the following:

_____ Members @ \$ _____ each,

_____ nonmembers @ \$ _____ each, and

_____ children under 10 yrs of age @ \$ _____ each.

Acceptance of Personal Responsibility While Participating

I/We understand that my/our membership in UNPS, or my/our participation in this program/function as a nonmember of UNPS, may include a variety of educational and recreational programs organized by UNPS. Some of these programs will include travel and activities in natural areas and associated risks. I/We recognize that there are inherent risks associated with travel and outdoor activities. I/We accept full responsibility for managing my/our own participation in such activities and will not hold UNPS responsible for the actions of any other participants or any accidents or injuries sustained during my/our participation in such programs/functions.

If this application is being submitted for more than one member of a household, I have authority as the head of the household to sign this application and accept its provisions on behalf of the other members of the household. If not, then each applicant's signature must be included below.

Signature _____ Date _____

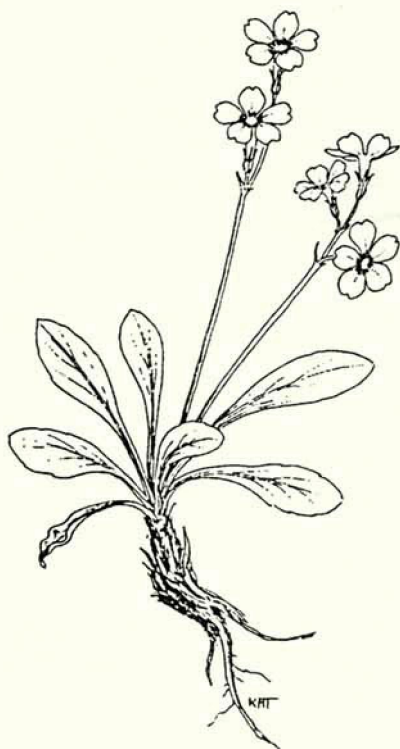
Mailing Address:
(Please, do not mail cash.)

UNPS Application to Participate
P.O. Box 520041
Salt Lake City, UT 84152-0041
(or, as otherwise directed.)

UNPS SEGO LILY
c/o Jo Stolhand
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, UT 84152-0041

Address Correction Requested

Non-Profit Org.
U.S. Postage
PAID
Salt Lake City, Utah
PERMIT No. 327



PRIMULA MAGUIREI

Maguire's Primrose
Saturday, April 30
Meet 10:00 a.m. at First Dam in Logan
(mouth of Logan Canyon)

Membership Application

☐ New Member ☐ Renewal ☐ Gift

Name _____

Street _____

City/State _____

Zip _____ Phone _____

If Gift, from: _____

Check Membership category desired:

- ☐ Student \$6.00
- ☐ Senior \$10.00
- ☐ Individual \$12.00
- ☐ Household \$20.00
- ☐ Sustaining \$35.00
- ☐ Supporting Organization \$50.00
- ☐ Corporate \$250.00 & up
- ☐ Lifetime \$250.00

☐ 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 it to:

Membership
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, Utah 84152-0041

(If you prefer not to cut this out of your *Sego Lily*, feel free to copy the membership form or simply write the information down and mail it with payment for the category of membership.)



VOL. 17 NO. 4

JULY / AUG 1994

CALENDAR OF EVENTS

June-Sept No Salt Lake Chapter meetings for these months.

July 26
Tuesday
7:00 pm

Mushroom Lovers Unite. A sizeable group from the UNPS Mt. Nebo Foray expressed interest in forming a chapter of the **North American Mycological Association in Utah** and the organizational meeting will be held on Tues., July 26, 1994 at the home of Ardean Watts, 660 S. University St. (1335 E.) at 7:00 pm. Officers will be elected and activities discussed with fresh mushrooms on display, weather permitting. Refreshments. RSVP to Ardean 581-1931 only if you can't come and wish to be a member of the organization.

Aug. 20
Saturday
8:00 am

Energy Efficient Landscaping Workshop to be held at the U. of U. Business Bldg. Lecture Hall. Fee is \$25 at the door and includes break out sessions and a luncheon. Registration begins at 8:00 am on Sat. Much interesting information for the homeowner on water conservation and energy efficient landscaping will be presented. For more information contact Dick Hildreth at 581-8936, Red Butte Garden.

Aug. 27
Saturday
9:30 am

Grand Opening Day for New Visitor Center at Red Butte Garden. Entrance fee at the gate of \$3.00. (Entrance fees will be required at the Garden from this date on, so it would be well to buy a membership for free year-round admission.) Ribbon cutting ceremony at 9:30. Featured speakers, activities for children all day long. For more information contact Dick Hildreth at 581-8936, Red Butte Garden.

Aug. 27
Saturday
8:00 am

Uinta Mushroom Foray led by Frank Anderson. Meet at 8:00 am sharp at the southeast corner of the Regency Theatre/K-Mart parking lot on Parleys Way. Bring a lunch and an item for the pot-luck dinner to be held between 3 and 4:00. Bring meat to grill if desired. We need stoves and cooking utensils to cook the mushrooms so please contact Dave Okelberry at 968-6190 if you can bring a stove. This trip is contingent on the weather (if we don't get rain we won't have mushrooms, so contact Dave in advance to make sure its a GO.

Listen to KUER at 11:00 am on Friday mornings and KRCL 7:30 am on Monday mornings for weekly wildflower updates or call the Red Butte Garden **Wildflower Hotline** at 581-IRIS.

ANNUAL UNPS/AGENCY RARE PLANT FIELD TRIP

Duane Atwood
UNPS Conservation Committee

A small group with enthusiasm for rare plants met at the Ponderosa Campground north of the Coral Pink Sand Dunes which are west of Kanab, Utah, Thursday evening June 9th. After a light breakfast Friday morning the group visited a population of Welsh milkweed, Asclepias welshii, with Dr. Brent Palmer. Brent has been studying this species for the BLM and has established monitoring plots to determine trends for this federally listed species. Other species observed in the area were: Juniperus osteosperma, Pinus ponderosa, Oenothera pallida, Penstemon palmeri, Penstemon comarrhenus, Leptodactylon pungens, Senecio multilobatus, Erysimum asperum, Comandra umbellata, Cryptantha cinerea, Cryptantha circumscissa, Cryptantha fendleri, Abronia fragrans, Plantago patagonica, Erigeron divergens, Descurainia, Tradescantia occidentalis, Hymenopappus filifolius, Verbena bracteata, Yucca kanabensis, Quercus gambelii, and Wyethia scabra.

The next stop was at a recently discovered population of Cycladenia humilis var. jonesii in Arizona just south of the Utah line and west of Pipe Springs. This site is the largest population of this federally listed endangered species. Other species observed were: Psilotrophe sparsiflora, Peteria thompsonae (a species named for Mrs. Thompson, the sister of John Wesley Powell who discovered the species while the Powell party was located in Kanab), Astragalus amphioxys, Yucca baccata, Chaetopappa ericoides, Stanleya pinnata, Gutierrezia microcephala, Eriogonum thompsonae (another species named for Mrs. Thompson), Stipa hymenoides, Hilaria jamesii, Bromus tectorum, Amelanchier utahensis, Purshia mexicana, Ephedra torreyana, Pinus edulis, and Juniperus osteosperma.

From here the group visited a site of Phacelia constancei north of Fredonia and Pediocactus sileri east of Kanab. The Pediocactus is a federally listed species. The type collection of this salt desert shrub species was collected at Pipe Springs, Arizona. Early collectors thought the Springs were in Utah and the species was named Utahia sileri.

Our next target species was Penstemon ammophilus in Johnson Canyon. This canyon was the route used by pioneers when traveling to the

Kanab area. It is also an area where some of the early cowboy westerns were filmed and an old movie town still exists a short way up the canyon from the main highway. The group was unsuccessful in locating the Penstemon, but we did see some other interesting plants such as Penstemon laevis, Dithyrea wislizenii, Castilleja scabrida, Brickellia oblongifolia, and the other dominant pinyon, juniper, ponderosa, and oak trees in the area.

We stopped at the type locality of Phacelia pulchella var. atwoodii along the Skutumpah road above Johnson Canyon. This is also one of the few sites where Camissonia exilis occurs. Due to the dry season these species probably did not flower this year and we were unable to view them. However, we were able to see other plants such as Phacelia constancei, Gaillardia spathulata, Lepidium montanum var. stellae, Verbena bracteata, and Calochortus nuttallii. The area had been well used by livestock.

By this time the heat, gnats, and thoughts of a dutch oven dinner drove the crew on a speedy flight to Grosvenor Arch over a 65 mile dirt road, with a short stop at one of the interesting gorges along the way. By 8:00 in the evening we could smell the sweet aromas coming from the ovens and by 8:45 Brent Shipley opened them for us to devour. This resulted in at least a half hour quiet time for a usually gabby group. For those who did not go on the trip, you really missed a great six course meal. We all agreed that Brent should be designated "the cook" for these outings!

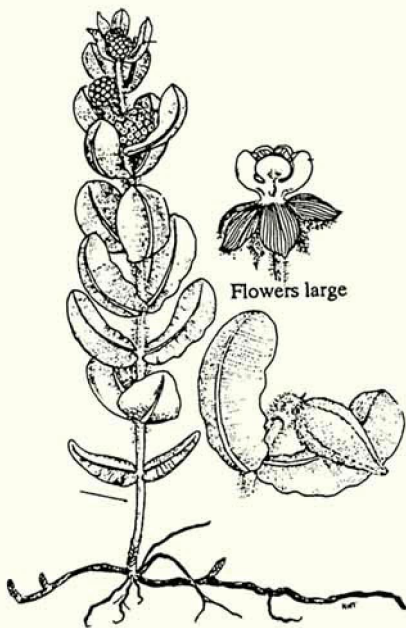
Saturday morning we traveled to Four-mile Bench and visited the only known population of Xylorhiza cronquistii. We collected seeds for viability/germination tests and other studies. The species is thought to be a hybrid between S. tortifolia and X. canescens. We retraced our route back to the Arch and then traveled towards Cannonville, Utah, stopping at the interesting habitat of Lesquerella tumulosa. This species is a low growing clump forming plant, endemic to the white shale member of the Carmel Formation.

We drove up the east fork of the Sevier River on the Dixie National Forest stopping for lunch at Podunk Guard Station. After lunch we spent a short time looking for Salix arizonica, a species proposed for listing as endangered in Arizona. An old Forest Service collection taken on the "Sevier National Forest", Utah in 1913 was located last year in the Forest Service National Collection now housed at the University of Wyoming. We collected one look-alike. The last stop was at the proposed Claron Botanical Area in Red Canyon. This area has a large

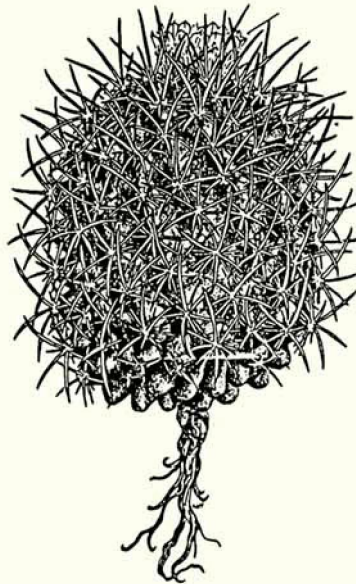
number of rare species endemic to the Red Wasatch Limestone Formation. Among the interesting plants are *Pinus longaeva*, *Penstemon bracteatus*, *Lomatium minimum*, *Townsendia minima*, *Cryptantha ochroleuca*, *Castilleja parvula* var. *revealii*, *Eriogonum aretioides*, *Eriogonum panguicense* var. *alpestre*, *Silene petersonii*, *Linum kingii*, and *Oxytropis jonesii*.

Many thanks to Lori Armstrong, Richfield BLM botanist, who lead the group and to the others who participated.

Next year's TES field trip will be planned by Doug Stone and me. Save up your vacation time because we will have a very exciting trip--you will not want to miss it.



ASCLEPIAS WELSHII



PEDIOCACTUS SILERI



XYLORHIZA CRONQUISTII



CYCLADENIA HUMILIS VAR. *JONESII*

RNA

Jo Stolhand
UNPS Education Committee

What should you do when you encounter an RNA in the wilderness? If you stick to designated trails you are not likely to run head on into an RNA, but in the eventuality of such an occurrence, proper etiquette suggests that you skirt the area of confrontation and view from a distance. You see, an RNA is a Research Natural Area. It is an area set aside by the US Forest Service, a pristine area relatively undisturbed by man and his 'civilizing' practices (grazing, mining, water control, or recreation). The BLM also has restricted areas, designated ACEC, Areas of Critical Environmental Concern.

RNAs are "lands that are protected for the purposes of maintaining biological diversity, conducting non-manipulative research and monitoring, providing reference or control areas for management activities ... and fostering education". Recommendation and designation for RNAs usually comes from the forest or district level. The Nature Conservancy has also played an active role in the scouting and developing process. Recommendation for designation is usually included in the draft or revision of a forest plan and is subject to public input.

An example of an RNA is the Red Canyon Research Natural Area. There are no posted trails into it and no one is likely to give you directions without a permit. Although hiking in the area is not encouraged, there are no fences or guards to prohibit entrance.

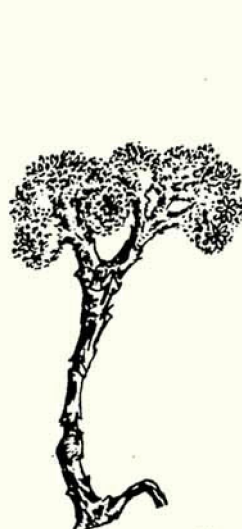
The Red Canyon RNA was initiated in 1982 in response to a need to preserve endemic species on the Clarion geological formation. Joel Tuhy from The Nature Conservancy did the fieldwork "aimed at finding a compact, noncontroversial site with as many of the endemic rare vascular plants as possible."

Joel provided the following description of Red Canyon: "Spectacular cliffs and breaks characterize the eroded margins of the Paunsaugunt Plateau, one of the high plateaus extending down the center of Utah. The Red Canyon RNA is a small, intermittent, ovoid watershed that contains mixed-conifer forests (mainly of Douglas fir, ponderosa pine, and bristlecone pine). Derived from limestone or contrasting basalt, soils are vivid-hued beneath the open, usually stunted, forest and woodland stands and their shrubby understories. Extending from 7250 to 7937 feet in elevation, the entire site has an xeric, nearly 'badland' appearance. More cryptic features than the geology and the woody vegetation are confirmed occurrences of 13 regionally endemic vascular plant taxa within an area of 460 acres that is no wider than 1.25 miles. Examples are Eriogonum aretioides (Widtsoe buckwheat), and Cryptantha ochroleuca (Yellow-white catseye). There are about 132 plant species present, including 10 of trees and 22 of shrubs."

Although you are discouraged from seeking out RNAs, in this particular instance there is a proposed SIA (USFS Special Interest Area) which has the same endemic plants in much the same setting. SIAs are "lands designated to protect, and where appropriate, foster public use and enjoyment of areas with scenic, historical geological, botanical, zoological, paleontological, or other special characteristics". The Nov/Dec 1991 issue



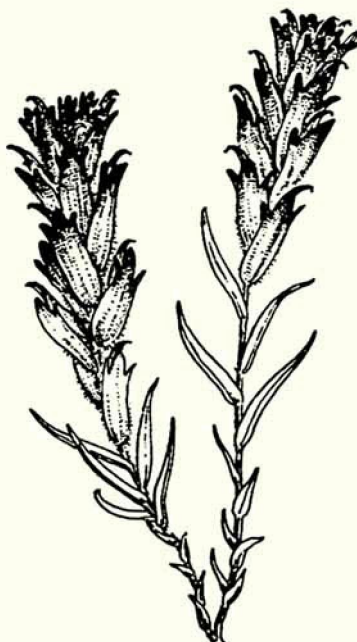
Phlox gladiiformis



Eriogonum aretioides



Lomatium minimum



Castilleja parvula var. revealii



Penstemon bracteatus

of Sego Lily has an article on the proposed Claron Botanical Area.

In Utah there are 19 Research Natural Areas and four more proposed. So what are the chances you will stumble into an RNA? RNAs are not overgrazed, strip-mined, strip-cut, or scarred with trails--in other words, they are relatively inaccessible (sources tell me that a helicopter would be necessary to reach a certain RNA perched on a plateau). One easily accessible RNA is Red Butte Canyon which is rarely unlocked to the public. It is gratifying to know that some of our natural treasures are being held for the security and benefit of future generations.

The Utah Native Plant Society would like to encourage a gathering of interested parties to produce a "shopping list" of habitats and species that should be set aside as representative of our state. Maybe some of our more hearty and adventurous members would become involved in scouting for suitable areas. Input and interest is needed from all of our members in promoting the designation of RNAs and ACECs. They embody the purpose of the Society to encourage appreciation, education and conservation of native plants.

List of Endemic Species, Red Canyon RNA

Phlox gladiiformis

Oxytropis Jonesii

Draba subalpina

Cymopterus rosei

Cryptantha ochroleuca

Lesquerella rubicundula

Silene petersonii var. minor

Eriogonum aretioides

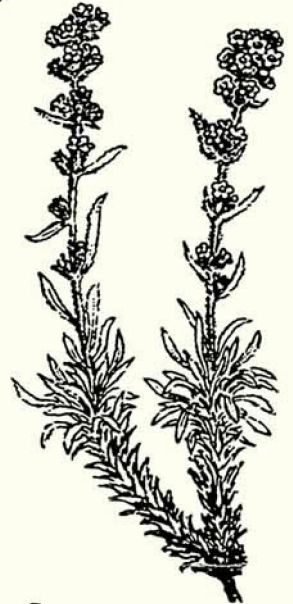
Penstemon bracteatus

Townsendia montana var. minima

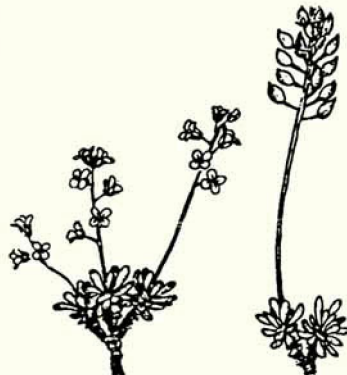
Eriogonum panguicense



Eriogonum panguicense



Cryptantha ochroleuca



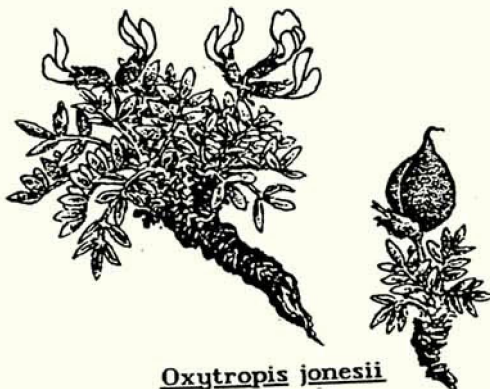
Draba subalpina



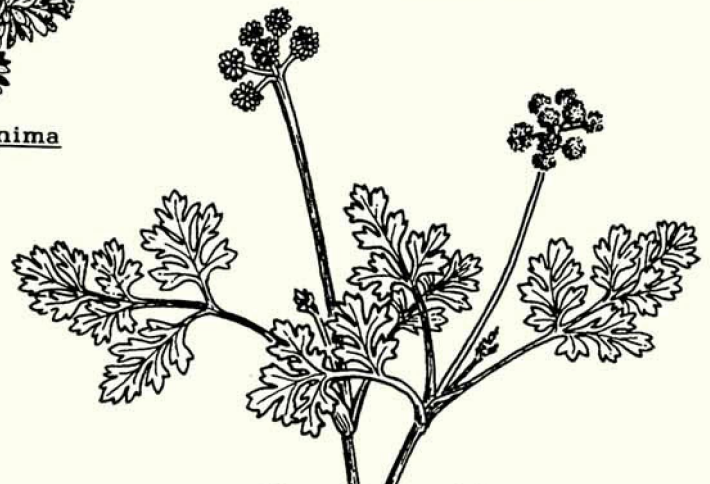
Lesquerella rubicundula



Townsendia minima



Oxytropis jonesii



Cymopterus minimus

RUSH VALLEY FIELD TRIP

Andy Boyack
UNPS Treasurer

A search for the endangered species, Polh Milkvetch, (*Astragalus lentiginosus* var. *pohlii*) was made by the UNPS May 25 led by Rodd Hardy, range ecologist with the BLM.

This species is listed on the rare plant list, Category 2, and has been recently spotted in 2 or 3 locations in Rush Valley and one is Skull Valley. The object of our search was to find and mark more locations. We made spot checks every mile or so in suspected areas in both Rush and Skull Valleys. The plants we found were in greasewood, shadscale, and four wing saltbush communities, usually in drainage areas or small depressions in the ground level. The plants were low growing, mostly prostrate, and probably two or three weeks beyond bloom, often in or near cryptogamic soil. The seed pods had short stems, a distinctive characteristic of the Pohl variety.

Other plants found in the same area were Pygmy Sagebrush (*Artemisia pygmaea*), *Gilia congesta*, Mound Cryptanth (*Cryptantha compacta*), *Townsendia florifer*, Wallflower (*Erysimum capitatum*) Globemallow (*Sphaeralcea coccinea*) and Evening Primrose (*Oenothera caespitosa*).

This trip was reminiscent of the two field trips we made to the same area, Rush Valley, some years ago with Dr. Howard Stutz who gave us a thorough introduction to the CHENOPODIACEAE family.

THE 1872 HARDROCK MINING LAW

Nancy S. Keate

The Hardrock Act states that all federal lands are free and open to mineral exploration. The right of free access no longer applies to all federal lands, as some lands have been withdrawn by presidents or Congress and set aside as military bases or recreation lands. However, more than half of federal lands, including the national forests are open to mining. The law requires no lease, no permit, nor any other federal approval prior to entry. The miners have a 'right to mine.'

The Act originally applied to 'all valuable mineral deposits.' Congress has since removed some classes of minerals from the terms of the law.

Oil, gas, and coal, fertilizer materials, and gravel, sand, and cinders have all been placed under systems calling for lease or sale and the payment of royalties. The law still covers gold, silver, uranium, copper, molybdenum, iron, lead, aluminum, and gemstones.

Before a strike is made a miner is protected by the doctrine of *pedis possessio*. This gives the miner exclusive possession of the ground in the area where the prospecting is being conducted. These rights are not a vested property right against the United States. The federal government can terminate the exploration process without being required to pay any compensation to the miner.

When a discovery of a valuable hardrock mineral is made the rights become an unpatented mining claim, which is a vested property right, good against the United States and everyone else. Each unpatented claim is 20 acres and as many as eight individuals can join together to group claims--a total of 160 acres. There is no limit to the number of claims a miner may have.

With an unpatented mining claim, the miner has the exclusive right of possession and enjoyment of all surface included within the lines of the claim's location. The miner can use the property in any manner that is reasonable incident to mining. This includes constructing a home, cutting timber, grazing cattle, and diverting water.

It is not hard to keep an unpatented claim active. The miner is required to conduct annual "assessment" work. Since 1976, miners must file an annual report with the Bureau of Land Management.

After a true discovery, miners have their right to mine, an almost absolute right to remove minerals under the claims and they make no payment to the United States for doing so. If the United States wants the unpatented claim back for another use, the government must compensate the claimant for the value of both the land and the minerals.

Fraudulent claimants and small miners with marginal claims have time and the law on their side. It takes a costly administrative hearing and sometimes a court challenge to remove these 'miners' and they are allowed to remain on the land during this time. Even if the government wins a proceeding, the land is still open to mining and the claimant is entitled to reenter the claim.

Holders of unpatented claims can patent the land. A miner who has made a discovery and put in \$500 worth of assessment work in labor or improvements can acquire a patent, i.e. a deed. The fee is \$5.00 per acre for lode claims, \$2.50 for

placer claims. The miner is deeded 20 acres of land and minerals or 160 acres for association claims. In addition, the miner is entitled to another 5 acres of nonmineral land for use as a mill site.

In all, the government has issued about 65,000 mining patents, totaling 3 million acres. In 1990, the BLM issued 448 patents covering 7324 acres.

The original law had no provisions for environmental protection. Approximately 50 billion tons of mining and processing waste have been left at mine sites to pollute land and water.

In 1974, the U.S. Forest Service adopted mining regulations. The regulations require a miner to give notice to the agency before disturbing surface resources. If the disturbance is significant the miner must file a plan of operations that must receive agency approval. While approval is pending the work can continue under agency guidelines to minimize adverse environmental impacts. Reclamation is required after mining is complete. There are no provisions for fines or the shutdown of mines for noncompliance. The BLM adopted regulations in 1981 and they are even more lax than those of the Forest Service. Most operations that disturb less than 5 acres are outside the regulations--they are only required to give notice. These comprise about 80% of the mines on BLM land. For larger mines, operators must file a plan of operations, but the requirements for posting bonds and for reclamation are vague. There are no provisions for fines or penalties or for the shutdown of mines in noncompliance.

In 1993, The U.S. Senate and House of Representatives passed bills for mining reform. Each included such items as royalties and reclamation requirements. The two versions are, however, very different and a committee has not yet been appointed to work out a compromise. The law has not yet been reformed.

Further Reading:

Crossing the Next Meridian, Charles F. Wilkinson, Island Press.

Public Land & Mining Law, Loren L. Mall, Butterworth Legal Publishers.

The Mining Law: A Study in Perpetual Motion, John D. Leshy, Resources for the Future.

Mining America: The Industry and the Environment 1800-1980, Duane A. Smith, University Press of Kansas.

Clementine: a periodical by the nonprofit Mineral Policy Center which works with community groups on mining problems.

Nancy S. Keate is working on her doctorate in Biogeography. She currently teaching Conservation and Natural Resources at the University of Utah.

FRANK SMITH'S VIOLET: A NEWLY DESCRIBED SPECIES FROM LOGAN CANYON

R. Douglas Stone

Utah Natural Heritage Program

Utah Department of Natural Resources

The Logan Canyon drainage of northern Utah is well known for its endemic flora of perennial herbs restricted to limestone and dolomite outcrops. A recent addition to this suite of rare species is Frank Smith's violet (*Viola frank-smithii* N. Holmgren). First discovered in May 1989 by botanist Frank J. Smith at Millville, Utah, it was formally described as a new species in September 1992.

Similar species. It is almost unbelievable that a species as distinctive as *V. frank-smithii* could have avoided detection for such a long period of time, especially in a thoroughly botanized area like Logan Canyon. The only other species with which it might be confused is the widespread and common *v. adunca* J.E. Smith ex Rees which also occurs in the canyon. Frank Smith's violet is distinguished from *v. adunca* by the length and shape of the corolla spur; by the pattern of venation on the lower corolla lip; and by the fact that it is always completely glabrous (i.e., herbage lacking hairs). Also, the two species usually occur in very different habitats: *v. adunca* in loamy soils of shaded forest understories and moist forest openings, *v. frank-smithii* in bare rock crevices without any noticeable soil accumulations.

Distribution and abundance. In 1993, the Utah Natural Heritage Program completed a field inventory of Frank Smith's violet in cooperation with the Wasatch-Cache National Forest. The aim of this project was to collect data on the distribution and abundance of *V. frank-smithii* and to describe its habitat conditions and relationship to on-going land and resource management activities. Based on the results of this inventory, there are now 11 known occurrences spanning an elevational range from 5,400 to 6,800 feet. The largest populations, each consisting of about 1,000 plants or more, are located in Card Canyon, the Right Fork of Logan Canyon, the west slope of Logan Canyon above China Wall, and in Cottonwood Canyon. The total population size is estimated at 10,000 individuals.

Habitat Frank Smith's violet is one of the few rock-dwelling violets in North America. Most of the known locations are on cool, northerly

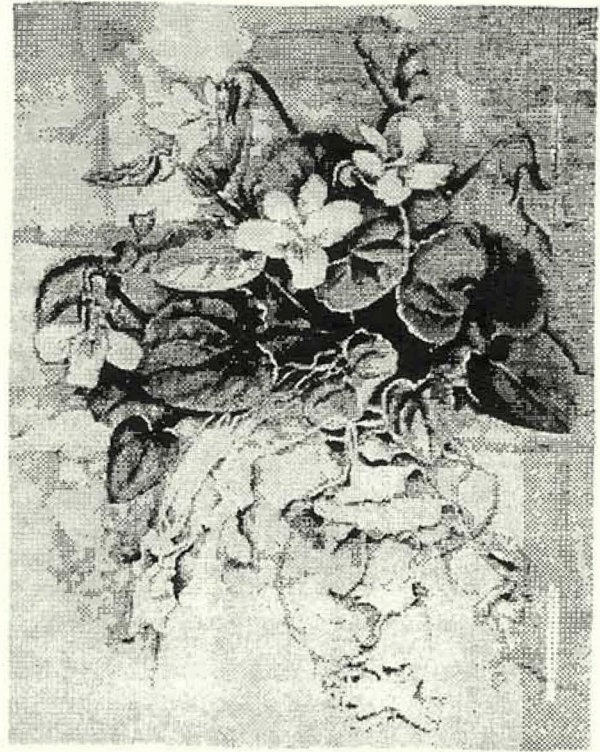
exposures which remain shaded for at least part of the day. Open to dense stands of Douglas-fir (*Pseudotsuga menziesii*) are usually present on the adjoining canyon slopes, often with Rocky Mountain maple (*Acer glabrum*) or bigtooth maple (*A. grandidentatum*) in the understory. This forest cover provides additional shading to the cliff bases where Frank Smith's violet seems to occur in greatest abundance. Other plant species frequently associated with *V. frank-smithii* include: alum root (*Heuchera rubescens*), rock-spiraea (*Petrophytum caespitosum*), Musineon lineare, *Aster kingii* var. *kingii*, Maguire's primrose (*Primula maguirei*), Cronquist's daisy (*Erigeron cronquistii*), curl-leaf mountain-mahogany (*Cercocarpus ledifolius*), prickly-phlox (*Leptodactylon watsonii*), western bluebells (*Mertensia oblongifolia*), and mosses. *Viola frank-smithii* was found growing with the endangered Maguire's primrose at four locations: the Right Fork of Logan Canyon, above China Wall, near mile marker 385, and at the rock climbing area known as "Heartland" (approximately 0.4 miles northeast of mile marker 385).

Biology. There is no evidence of vegetative propagation in *Viola frank-smithii*, and the mode of reproduction is probably sexual. Flowering occurs from about mid-May through early June. The colored petals and scent of *Viola* flowers attract pollinating insects which are said to be guided into the nectar-bearing spur by linear markings, or "honey guides," on the petals. Many species of violets also possess cleistogamous, self-pollinating flowers near the base of the plant, providing a mechanism by which some seed set will take place even in years when conditions do not favor outcrossing. However, cleistogamy has not been observed in *V. frank-smithii*.

The ripening capsules of many *Viola* species build up turgor pressure, eventually causing the seeds to be released in an explosive manner. Also, violet seeds are often dispersed by ants which feed on the seed-appendages. Either of these seed-dispersal mechanisms could explain how plants of *V. frank-smithii* can be found growing under rock overhangs and in other improbable places seemingly in defiance of gravity.

Status. Frank Smith's violet is a rare and locally endemic plant which occurs in a very limited habitat. Its restricted geographic range lies entirely on lands administered by the Logan Ranger District, Wasatch-Cache National Forest. The U.S. Fish and Wildlife Service presently considers *V. frank-smithii* a Category 2 candidate for possible listing under the federal Endangered

Species Act. It has also been proposed for management as a Sensitive species in Forest Service Region 4.



Watercolor illustration by Kristy Morris.

FROM THE PRESIDENT... (OF THE UNITED STATES)

Forwarded by Nancy Shaw
Research Botanist
U.S.F.S. Intermountain Research Station

...Attached is an executive memorandum from the President directing the use of native plants in landscaping, water conservation, and other land ethic practices. It will be up to individual federal agencies to develop a means to implement this direction. We ought to put this in the newsletter so folks can encourage their local feds to comply when new buildings/landscaping occur.

THE WHITE HOUSE
Office of the Press Secretary

For Immediate Release

April 26, 1994

MEMORANDUM FOR THE HEADS OF EXECUTIVE
DEPARTMENTS AND AGENCIES

SUBJECT: Environmentally and Economically
Beneficial Practices on Federal Landscaped Grounds

The Report of the National Performance Review contains recommendations for a series of environmental actions, including one to increase environmentally and economically beneficial landscaping practices at federal facilities and federally funded projects. Environmentally beneficial landscaping entails utilizing techniques that complement and enhance the local environment and seek to minimize the adverse effects that the landscaping will have on it. In particular, this means using regionally native plants and employing landscaping practices and technologies that conserve water and prevent pollution.

These landscaping practices should benefit the environment, as well as generate long-term cost savings for the Federal Government. For example, the use of native plants not only protects our natural heritage and provides wildlife habitat, but also can reduce fertilizer, pesticide, and irrigation demands and their associated costs because native plants are suited to the local environment and climate.

Because the Federal Government owns and landscapes large areas of land, our stewardship presents a unique opportunity to provide leadership in this area and to develop practical and cost-effective methods to preserve and protect that which has been entrusted to us. Therefore, for Federal grounds, Federal projects, and federally funded projects, I direct that agencies shall, where cost-effective and to the extent practicable:

- (a) use regionally native plants for landscaping
- (b) design, use, or promote construction practices that minimize adverse effects on natural habitat;
- (c) seek to prevent pollution by, among other things, reducing fertilizer and pesticide use, using integrated pest management techniques, recycling green waste, and minimizing runoff. Landscaping practices that reduce the use of toxic chemicals provide one approach for agencies to reach reduction goals established in Executive Order No. 12856, "Federal Compliance with Right-To-Know Laws and Pollution Prevention requirements;"
- (d) implement water efficient practices such as the use of mulches, efficient irrigation systems, audits to determine exact landscaping water-use needs, and recycled or reclaimed water and the selecting and siting of plants in a manner that

conserves water and controls soil erosion. Landscaping practices, such as planting regionally native shade trees around buildings to reduce air conditioning demands, can also provide innovative measures to meet the energy consumption reduction goal established in Executive Order No. 12902, "Energy Efficiency and Water Conservation at Federal Facilities," and

(e) create outdoor demonstrations incorporating native plants, as well as pollution prevention and water conservation techniques, to promote awareness of the environmental and economic benefits of implementing this directive. Agencies are encouraged to develop other methods for sharing information on landscaping advances with interested nonfederal parties.

In order to assist agencies in implementing this directive, The Federal Environmental Executive shall:

(a) establish an interagency working group to develop recommendations for guidance, including compliance with the requirements of the National Environmental Policy Act, 42 U.S.C. 4321, 4331-4335, and 4341-4347, and training needs to implement this directive. The recommendations are to be developed by November 1994; and

(b) issue the guidance by April 1995. To the extent practicable, agencies shall incorporate this guidance into their landscaping programs and practices by February 1996.

In addition, the Federal Environmental Executive shall establish annual awards to recognize outstanding landscaping efforts of agencies and individual employees. Agencies are encouraged to recognize exceptional performance in the implementation of this directive through their awards programs.

Agencies shall advise the Federal Environmental Executive by April 1996 on their progress in implementing this directive.

To enhance landscaping options and awareness, the Department of Agriculture shall conduct research on the suitability, propagation, and use of native plants for landscaping. The Department shall make available to agencies and the public the results of this research.

WILLIAM J. CLINTON

UNPS SEGO LILY
c/o Jo Stolhand
Utah Native Plant Society
P.O. Box 520041
Salt Lake City, UT 84152-0041

Address Correction Requested

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MUSHROOM LOVERS

Hope's Mushroom Cookbook by Hope Miller is now available for \$20.00, autographed and postpaid. We have 48 copies on hand. Send your check to Dave Okelberry, see address above, or buy one at the Mushroom Hunt.

T-SHIRTS: A COLLECTOR'S ITEM
AN ORIGINAL DESIGN BY VERA MCKNIGHT, ILLUSTRATOR OF PETERSON'S GUIDE TO MUSHROOMS is featured on the T-Shirts printed for this year's Mt. Nebo Foray. Sizes available are large, extra large, and extra extra large. \$10.00. Background color is white. Call Brent Shipley at 268-2601 to arrange to buy yours. These shirts will also be available for sale at the August Mushroom Hunt.

Call for papers from the **Wildland Shrub Symposium**, sponsored by the Shrub Research Consortium, to be held May 23-25, 1995 in Los Cruces, New Mexico. If you would like to present a paper send the title and abstract by Sept. 15, 1994 to Dr. Jerry Barrow, Jornada Experimental Range, Box 30003, Dept. 3JER, New Mexico State University, Los Cruces, NM 88003-8003.

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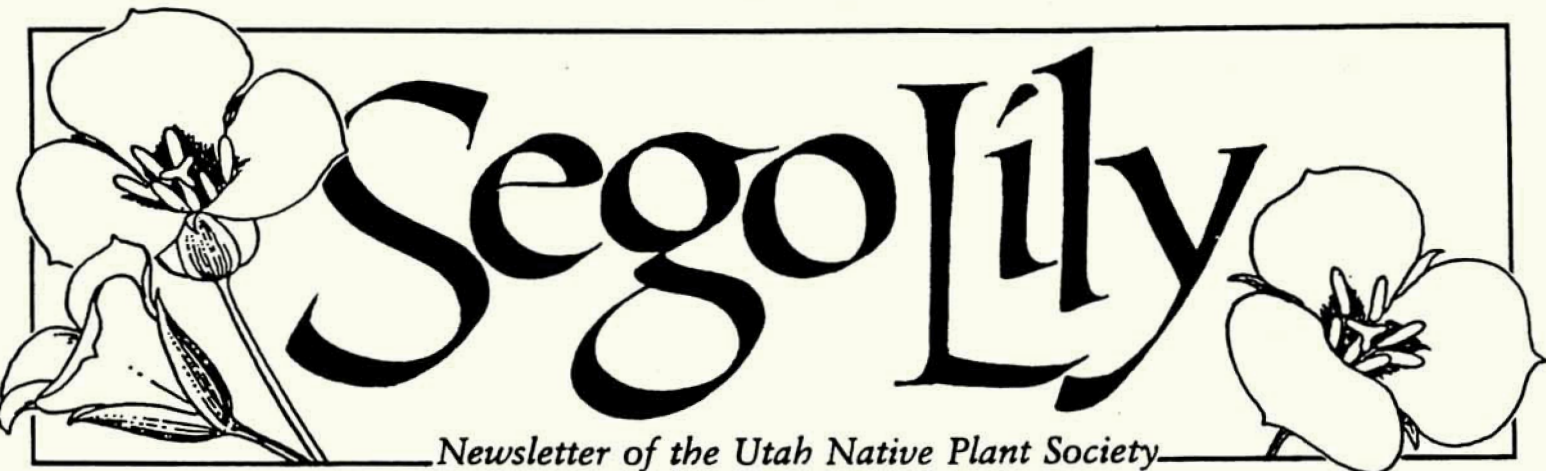
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☐ Please send a complimentary copy of the Sego Lily to the above individual.

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

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P.O. Box 520041
Salt Lake City, Utah 84152-0041

(If you prefer not to cut this out of your Sego Lily, feel free to copy the membership form or simply write the information down and mail it with payment for the category of membership.)



VOL. 17 NO. 5

SEPT/OCT 1994

CALENDAR OF EVENTS

- Sept. 7** **Board of Directors Meeting**, Red Butte Garden and Arboretum Office,
Wed. 18 B de Trobriand, Fort Douglas (N.E. corner of parade grounds) at 7:00 pm.
- Sept. 24** **Autumn Festival at Red Butte Gardens.** Plant sale, limited quantities.
2:00-6:00 Some native plants. Music, Kids Yard, Festivities. For more information
Sat. call the Arboretum info line 581-4747.
- Oct. 5** **Annual Meeting for All Members. New World Potluck Dinner.**
6:00 pm UNPS will provide the turkey. Red Butte Gardens. More information will follow
Wed. on your blue card.
- Oct. 26** **Salt Lake Chapter Meeting. UFO Night, Unidentified Flowering**
7:30 pm **Objects.** Bring your slides and photos of unidentified plants and get help naming
Wed. them. Dept. of Natural Resources, 1636 West North Temple, SLC, UT.

The Sego Lily is published six times a year by the Utah Native Plant Society, Incorporated, as a non-profit organization under the laws of the State of Utah. Contributions to the newsletter are welcomed and should be sent to co-editors, Jo Stolhand and Janet Williams, P.O. Box 520041, Salt Lake City, UT 84152-0041. Please state whether articles have been published elsewhere and require publisher's permission. The editors reserve the right to edit as needed and to select suitable articles for publication. Calendar items of interest to our membership are requested.

MUSHROOM LOVERS, ATTENTION!

July 26, 1994 will be remembered by some as the birthday of the **MUSHROOM SOCIETY OF UTAH**, an affiliated chapter of the North American Mycological Association. Twelve mycophiles were present and contributed their energy and ideas to get us up and running. Officers elected at that meeting include Ardean Watts, president; Geoffry Orr, vice-president; Esther Henriksen, Secretary; and Arthur Dyck, treasurer. Activities of the group will include sponsorship of mushroom forays, displays and educational lectures on topics of special interest to mushroom lovers with special attention to identification and wild mushrooms as food.

Meetings will be held the last Tuesday of alternate months beginning September 27 and continuing in November, January, etc., at 7:00 p.m. The public is invited to all meetings. Ken Jones, a professional mushroom picker and broker who is developing mushroom marketing arrangements with former Soviet Republics, China, Japan and Southeast Asia and a charter member of the Mushroom Society of Utah, will be the featured speaker at the September meeting which will be held at 660 So. University Street in SLC. Please bring any fresh wild mushroom specimens you might have to the meeting for display and identification.

The Mushroom Society of Utah welcomes new members. Dues are only \$20 per year which included membership in NAMA and personal mailings of several informative mushroom publications. Our membership is a good mix of professionally trained mycologists and beginners. All are important to us. Call Ardean Watts, 581-1931, for further information or, better still, send \$20 by check to Art Dyck, treasurer, 2037 E. 5290 So., SLC UT 84117, to be listed as a founding member of MSU. If you are already a NAMA member, local dues are \$10 per year.

The 1994 Frank Anderson Uinta mushroom foray sponsored by the Utah Native Plant Society will take place August 27. Interested persons should meet at the K-Mart/Regency Theatre parking lot on Parley's Way at 8:00 a.m. sharp with lunches, hiking gear and contributions to an afternoon pot-luck cook-out. The foray may be cancelled due to lack of rain. Call Dave Okelberry at 968-6190 for reservations and information.

NEW TECHNIQUES ENHANCE RESEARCH IN HERBARIUM

The Garret Herbarium at the University of Utah began with the work of Albert Garrett at the turn of the century, and his specimens still make up the core of the collection. Curators have included Walter Cottam, Seville Flowers, Del Weins and Lois Arnow. The herbarium became a part of the Utah Museum of Natural History in 1986, along with the transfer of other collections from the University of Utah Biology Department.

With a collection of 120,000 plant specimens and 1,000 types of seeds, the herbarium is used extensively by students, government agencies, businesses and members of the public such as the butterfly aficionados of the Utah Lepidopterists' Society. Scientists from the U. of U. and elsewhere check out specimens to use in their work.

The collection focuses primarily on the Wasatch Mountains and the Intermountain West, but new acquisitions are enriching its desert plant holdings, and exchange programs are adding specimens from locations in North America, Europe and South America. In addition to its historic uses in species identification, the collection is becoming increasingly important for new kinds of genetic and biochemical analysis. Another new technique is enzyme electrophoresis, which uses an electrical field to separate enzymes, facilitating assessment of genetic relationships.

Because the herbarium is located in a cool, dry climate and has never been subject to large-scale fumigation, germination of decades-old seeds into living plants is possible, as reported in the accompanying article.

GERMINATION UNLOCKS SECRETS FROM DECADES PAST

Elaine York Barton

Utah Museum of Natural History Volunteer

On the palm of my hand I hold one tiny seed about the size of a period at the end of a sentence. When placed beneath the microscope lens it appears more remarkable: shiny and black with miniature pits pockmarking the disc-shaped surface. Still, it hardly seems the bearer of life.

Seeds have always fascinated me. Small and inanimate, when sown within a nurturing environment, the resulting roots and cotyledons

stretch and grow beyond the seed coat to eventually produce a verdant, leafy individual which in its own time can produce new seeds. The seed I held in my hand, though, was exceptional in other ways. It had been collected, along with its parent plant, *Chenopodium botrys*, from a dry gravel streambed 20 years ago. It was pressed and dried in a plant press, mounted onto an 11 1/2 x 16 1/2 inch sheet of paper, and stored along with about 120,000 other plants in the Garrett Herbarium at the Utah Museum of Natural History.

The herbarium's dried plant specimens are used by a variety of scientific researchers--botanists, anthropologists, and geologists, among others. Properly prepared, each specimen retains identifiable botanical traits and can therefore be used for identification and comparative analysis.

A question, though, germinated in the mind of herbarium curator Michael Windham: "Are the seeds on the pressed specimens still viable?" If so, research possibilities would be greatly increased. Live plants grown from those seeds could be used for genetic and chemical analyses only possible with living tissue.

As a graduate student at the University of Utah I spent six months trying to answer this question under the expert tutelage of Dr. Windham. Seeds were removed from 86 different pressed plant specimens, originally collected between 1927 to 1991. The diversity of seed form and appearance was, in and of itself, amazing! Some of these wild seeds were remarkably similar to seeds I am familiar with, like poppy seeds, sunflower seeds, or small peas. In contrast, others were fantastic enough to belong to the imagination of a science fiction writer: miniscule blimps with long, wild, feather-like tails and heart-shaped grains enclosed in woody pods, wound in a tight corkscrew.

Every effort was made to ensure successful germination of the seeds. A literature search revealed that various plant species had specific germination requirements. Some, like *Distichlis stricta*, commonly known as salt grass, needed the seed coat nicked or scarified. Other seeds, *Purshia mexicana* or Cliffrose, for instance, required exposure to a period of cold temperatures (stratification) before germination was possible.

For some species we seemed to be forging new ground. Germination requirements were unknown. We tried a variety of techniques for these seeds: scarification, stratification, different growth mediums, different temperatures, different exposures to light, the addition of plant hormones.

In the end about 27% of the seeds sown resulted in germination. Considering the age and the narrow

parameters required for germination for some of these wild species, I was amazed by the outcome. The old seeds included in this study were those of the small-flowered globemallow (*Sphaeralcea parvifolia*) collected by Dr. Walter Cottam in 1927, and yes, they germinated!

Certain species apparently retain viability in the herbarium and are easy to germinate. For example, some seeds from every milkvetch (*Astragalus*) specimen, regardless of age, germinated. Yet repeated experiments with stickleaf (*Mentzelia*) resulted in no germinations. Hopefully, further research will increase our understanding of specific germination requirements and age limitations for herbarium seed viability. With this information in hand, we will be in a better position to preserve our precious botanical resources and explore the full research potential of the Garrett Herbarium.

And what about the seemingly lifeless *Chenopodium botrys* seed I once held in my hand? This little seed, which lay dormant on the herbarium shelf for twenty years, was sown, sprouted, grew, and was transplanted, eventually reaching about 10 inches in height. It flowered and produced hundreds of new, small, black seeds which were collected and stored for future research. Small portions of the live plant tissue were removed for genetic analysis. The whole project has left me wondering what is happening within the seeds as they rest in the herbarium for 20 or, as in the case of the globemallow specimen, even 67 years.

For many of the seeds, I know they're certainly not dead, only waiting.

Elaine York Barton holds a bachelor's degree in anthropology from the U of U, where she is now a graduate student in biology/education. Reprinted with permission from Utah Natural History, Vol. 25, No. 3, Summer 1994.

Call for papers from the Wildland Shrub Symposium, sponsored by the Shrub Research Consortium, to be held May 23-25, 1995 in Los Cruces, New Mexico. If you would like to present a paper send the title and abstract by Sept. 15, 1994 to:

Dr. Jerry Barrow,
Jornada Experimental Range,
Box 30003, Dept. 3JER,
New Mexico State University,
Los Cruces, NM 88003-8003.

AN INTEGRATED NEIGHBORHOOD IS TAKING ROOT IN A NEW 465-ACRE LANDSCAPE PROJECT IN UTAH

Residents range from geese to avocets, muskrats to mice, saltgrass to bulrushes

Dawn Henderson

When some of the taxes we pay are spent on such silly sounding projects as studying how fast catsup comes out of a bottle, it is gratifying to note that some private and public funds are spent on projects beneficial to us and this planet we call home. A case in point is the relocation, construction and landscaping of wetlands being wrung out to dry for the purpose of building new Salt Lake International Airport runways and other facilities. The 465-acre project to mitigate the impact of the airport's expansion is the largest ever undertaken in the United States.

From a taxpayers' perspective, one of the more agreeable facets of the project may be that their pockets are not being drained to finance it. Instead, travelers who may benefit from the airport expansion are picking up the tab. The Federal Aviation Administration sets aside a percentage of revenue from airplane ticket sales to pay for this and similar projects.

MITIGATING CIRCUMSTANCES

The 465-acre site replaces the ecological community types and various functions of more than 340 acres of existing wetlands lost due to airport-related construction. "The 340 acres will be impacted between now and the next 10 to 15 years," explains Sear-Brown Group's Mark Oliver, hydrologist, assigned to serve as project coordinator. "An extra 130 acres have been 'banked' in case additional wetland acreage is affected by the airport expansion."

Last year, the Consulting Engineers Council of Utah named Sear-Brown Group a Grant Award winner in recognition of the scope and sensitivity of the engineering firm's wetlands mitigation plan. The landscape design called for 135 acres of open water for duck and fish habitat, 110 acres of midflats and playas for shorebirds, 100 acres of wet meadows and uplands, and 120 acres of marsh area used by a wide range of birds for feeding and nesting. No new source of water was required, because the plan diverted water from an adjacent irrigation canal.

After the draft of an environmental impact statement was printed in April 1992, the mitigation project on the northwest outskirts of Salt Lake City limits proceeded forward almost as quickly as catsup flowing from a bottle. Employees of Granite Seed, Lehi, Utah, were dispatched in later '92 to gather 500 pounds of marsh seed--mostly hardstem and alkali bulrush--from the area around Great Salt Lake. Before the seed was planted, some 12 inches of native topsoil was dug up and stored while employees of Gibbons and Reed Co., Salt Lake City, rearranged some 900,000 cubic yards of earth to accommodate the landscape design.

In the beginning, except for stands of persistent and voraciously thirsty tamarisk, vegetation was scant--the result of years of using the land for sheep grazing. The Utah division of Randall & Blake, Inc. (RBI), headquartered in Littleton, Colo., is the environmental contractor charged with controlling the persistent tamarisk, revegetating the site with native seed, and mulching. "This wetlands mitigation project is different from what's been done before," notes Robin Ralphs, RBI's Utah area manager, "inasmuch as the revegetation specifications call for using seeds from plants native to the area."

After the native soil held in storage was transferred to planting sites, RBI employees drill-seeded and hydromulched some 3,000 pounds of the seed harvested by Granite Seed. The hydromulch mixture that was mechanically sprayed over 45 acres included a wood/fiber mulch with tackifier to reduce evaporation, maintain soil stability and even soil temperature, promote seed germination, control weeds and enrich the soil. Approximately 100,000 square yards of organic erosion control fabric was installed after the seed was planted.

Buckley Powder's Salt Lake City division supplied erosion-control products for the project. Some 35,000 square yards of permanent erosion-control mats were installed to protect dikes, berms and islands from shoreline erosion caused by wave action and the rise and fall of water of pond areas.

To the casual observer, a light blanket of green covering much of the seeded areas by late April '94 suggested a high rate of seed germination. But a more scientific inspection by less-casual observers in June will tell the tale. One lot of native bulrush seed was shipped to Kester's Wild Game Food Nurseries in Omro, Wisc., to propagate for back-up. Kester's is ready to ship 165,000 bulrush tubelings and 40 acres' worth of submersible-plant propagules to resore or fill in areas where seed didn't "take." RBI's contract for installing the plants may be reduced if seed planted last fall

indicates that plants propagated as back-up aren't needed, says Ralphs. All the planting will be done by the end of July.

Thickets of tamarisk still stand as evidence of the plant's feisty temperament. "The floods of '83 introduced this plant to our area," notes Oliver. An EPA-approved herbicide, Arsenal, was applied to help eradicate the aggressor. "But 100 percent eradication is not a realistic goal. Getting and keeping it under control is the goal," he says. "If all goes well, bulrushes will have a chance to become established over the next couple of years. Their habit of spreading rhizominous roots will help keep the tamarisk from becoming a serious problem."

When the mitigation work began, birds attracted to the construction scene were mostly seagulls. But as early as April '94, the project was already showing signs of maturity and fewer signs of its artificial beginning. The presence of avocets, Canadian geese and their goslings, and other winged creatures unknown to the novice bird watcher was definitely an encouraging sight.

Oliver monitors the project's progress several times a week. "It will need proactive management for the first 2 to 3 years and, after that, regular monitoring," he says. The Salt Lake City Airport Authority has already issued contracts to do the vegetation and wildlife monitoring in case corrective management is needed.

"The project is on course now and we're very optimistic. Wildlife use is well above what we expected," Oliver adds. "We hope that time and nature cooperate."

Reprinted with permission from Western Landscapes Plus, June/July 1994. Their editor's note: Among others who contributed services and expertise to the project are the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Utah Division of Wildlife Resources, the National Audubon Society, and private Salt Lake City duck clubs.



Dog-Tooth Violet

ONE GROUP ON THE 1994 MT. NEBO MUSHROOM FORAY

Dr. Sherman Brough
UNPS Board of Directors

A dry spring and predictions of a shortage of mushrooms turned out to be a reality as we searched moist areas for fungi. It was reminiscent of the summer of 1961 when Dr. McKnight and I, through a NSF grant, made collections and studied the Discomycetes of the Wasatch Front. Because of the paucity of Ascomycete fungi that summer, the research expanded to the western Uinta Mountains and south to the Fish Lake Area and included Basidiomycetes, and in fact anything fungal.

I knew from this experience that the habitats that would most likely produce fungi were the moist areas below snow fields, and the margins of seasonal runoff streams.

In the afternoon of the 16th of June, a group of about 12 participants in the Mt. Nebo Mushroom Foray and I left Blackhawk campsite and traveled to Nebo Basin Trailhead parking lot. We walked the road opposite the monument near the loop road and traveled north and west below the crest of the mountain. The soil was dry but we identified flowering plants as we hiked toward some visible snow banks in the distance.

All flowering plants were identified along the way using Mountain Plants of Northeastern Utah, Circular 319, by Berniece A. Andersen and Art Holmgren. It is a most helpful book for amateurs and recommended by me. It is available from the Extension Service at most county agent's offices and costs \$3.00. A fantastic bargain. The one drawback that is most frequently voiced is the lack of color for the line drawings. My recommendation for users is to carry along a set of colored pencils, then color the illustrations in the book as you find the species. This way you create your own Life Species List, and the coloring will slow you down so that you will be able to remember the plant more easily and for longer. Dog-tooth Violet, *Erythronium grandiflorum*; Western Spring Beauty, *Claytonia lanceolata*; Colorado Columbine, *Aquilegia coerulea*; Meadow Rue, *Thalictrum fendleri*, and Yellow Mountain Violet, *Viola purpurea*, were at their peak.

We eventually reached snow banks on the open terraced slope above the road. The snow was difficult to get to, the soil below the snowbank was moist only in a small band, because of the rapid runoff of the water and very dry conditions. The

lack of mushrooms was probably due to the lack of organic material in the soil, and the short time period during which the soil was warm and moist enough to initiate fruiting. Further on along the trail, in a cove of White Fir, *Abies concolor*, Engelmann Spruce, *Picea engelmannii*, and Quaking Aspen, *Populus tremuloides*, were three fairly large snow banks that were on flatter ground, had been moist for a longer period to time, and the soil contained more organic matter including sticks and logs. We found three slime moulds, some operculate and inoperculate Ascomycetes on the buried wood and dead herbaceous stems. One fungus that caught the attention of the group was the scarlet inoperculate Ascomycete, Eyelash Cup, *Scutellinia scutellata*; the Jelly Cup, *Guepinopsis alpina*, a representative of the Heterobasidiomycetes, and some dry gill fungi and pore fungi growing on the lower side of moist logs. The collecting was not spectacular but we had some enthusiastic and hard working participants. I was impressed with their patience and keen observation.

From a Wildlife officer returning from moose observations, we were told there were still snow banks further down the road at Salamander Lake. This was our objective on the second day.

On Friday, about two dozen Mt. Nebo Mushroom Foray participants left the campground and the surrounding, spectacular fields of Mule Ears, *Wyethia amplexicaulis*, at Blackhawk. The group included eager adults and families with very young "fungus hunters". We drove down the rutted road to the right of the monument at the Nebo Basin parking lot, past the collecting area of the previous day. We stopped at a flat area commanding a view of Utah Valley, a couple miles short of Salamander Lake. The mile or two walk remaining took us past a outstanding display of wildflowers which were identified. Salamander Lake (pond) still had some snow banks around it and the area was most moist because of surrounding Quaking Aspen, White Fir and Engelmann Spruce. The conditions seemed perfect for *Gyromitra gigas* but it was not to be found. Good collections of *Caloscypha fulgens*, the Green staining Orange Cup, were made. It was found on wet wood on the margin of the small ephemeral stream entering Salamander Lake. The participants of this group were eager, careful and patient collectors, including the young people who reported salamanders at Salamander Lake, some still with external gills, according to one of the young explorers. This group must have made a couple dozen collections of fungi or more. Not spectacular but respectable.

Mushrooms are not usually plentiful in the

Olympic Rain Forest even though there is plenty of rain and organic matter. Quite often a period of stress is required before a good fruiting of mushrooms occur. In 1961, after a dry summer similar to this year, good rains fell during August, in the Fish Lake area and a most spectacular array of Boletes and Russulas and other large mushrooms occurred. I would suspect, if heavy rains fall over a period of several days in August this year, mushroom collecting could be excellent until fall frosts occur.

The mushrooms of the Mt. Nebo Foray T-shirt, incidentally, were representative of the spring mushrooms that were expected. How many of them did you find?

T-SHIRTS: A COLLECTOR'S ITEM
AN ORIGINAL DESIGN BY VERA MCKNIGHT, ILLUSTRATOR OF PETERSON'S GUIDE TO MUSHROOMS is featured on the T-Shirts printed for this year's Mt. Nebo Foray. Sizes available are large, extra large, and extra extra large. \$10.00. Background color is white. Call Brent Shipley at 268-2601 to arrange to buy yours.

FLORA IDENTIFIED ON MT. NEBO

Paul Harding

Species Name

Aquilegia coerulea-Colorado Columbine
Arctium lappa-Burdock
Claytonia lanceolata-Spring Beauty
Cynoglossum officinale-Houndstongue
Erythronium grandiflorum-Glacier Lily
Gilia aggregata-Scarlet Gilia
Hackelia floribunda-Wild Forget-me-not
Hydrophyllum capitatum-Waterleaf
Lonicera tatarica-Honeysuckle
Mertensia ciliata-Mt. Bluebells
Penstemon cyananthus-Wasatch Penstemon
Penstemon eatonii-Eaton's Penstemon
Penstemon palmeri-Palmer's Penstemon
Polemonium foliosissimum-Leafy Jacob's Ladder
Polemonium occidentale-Western Jacob's Ladder
Polygonum bistortoides-Western Bistort
Prunus virginiana-Chokecherry
Ranunculus sp.-Buttercup
Rudbeckia occidentalis-Western Coneflower
Scrophularia lanceolata-Hare Figwort
Senecio sp.-Groundsel
Swertia radiata-Showy Gentian
Valeriana occidentalis-Western Valerian
Wyethia amplexicaulis-Mules Ears

GOLDEN SPIKE NATIONAL HISTORIC SITE: FLORISTIC BIODIVERSITY SURVEY

Linda Allen
Assistant Curator, Intermt. Herbarium
Utah State University

Michael Curto
Graduate Student, Biology Dept.
Utah State University

On May 28, enthusiastic NPS staff treated four members of the Cache Valley Chapter of UNPS, Robert Fitts, Laura Teerlink, Michael Curto, and Linda Allen, to a tour of the Golden Spike National Historic Site, located between Blue Creek Valley and the North Promontory Mountains in Box Elder County. A preliminary species list and vegetation synopsis were generated during the day-long survey; voucher specimens were collected and deposited at the Intermountain Herbarium. We couldn't explore the over 1200 acres encompassed by Golden Spike, so observations and collections were confined to the West Grade Auto Tour, the East Grade Auto Tour, and the Big Fill Walk.

We were surprised by just how much native vegetation persists throughout the landscape. Although previous land use has undoubtedly reduced both the quantity and diversity of native plants, the current floristic situation is not as bleak as sometimes portrayed for the region. The natural vegetation of the area falls into the broad category of Sagebrush Steppe, with Sagebrush (*Artemisia tridentata*) and Rubber Rabbitbrush (*Chrysothamnus nauseosus*) the most common shrubs, while subshrubs and other perennials include Matchweed (*Gutierrezia sarothrae*), Gumplant (*Grindelia squarrosa*), Prickly Phlox (*Leptodactylon pungens*), Globemallow (*Sphaeralcea*), Littleleaf Bricklebush (*Brickellia microphylla*), Prickly Poppy (*Argemone munita*), Milkvetchs (*Astragalus utahensis*, *A. bethwiskii*), Prairie Sagebrush (*Artemisia ludoviciana*), Evening Primrose (*Oenothera caespitosa*), Milfoil Lomatium (*Lomatium grayi*), Dustymaiden (*Chaenactis douglasii*), and Dwarf Cryptantha (*Cryptantha humilis*). Our schedule kept us from reaching the slopes that support the Passey Onion (*Allium passeyi*), which is endemic to the Blue Creek Valley region.

We were most impressed by the native grass component persisting on-site, with both cool and warm season grasses represented. Sandberg

Bluegrass (*Poa secunda*) accounts for a great portion of the cover; it forms extensive, dense, ground-hugging carpets in many areas with low relief. Its abundance may be easily overlooked owing to its short stature and because it is green only during the cool weeks of early spring; during the warmer months its brown color makes it hard to distinguish from both the soil and the introduced annual Cheatgrass (*Bromus tectorum*). Other cool season native grasses seen include Indian Ricegrass (*Stipa hymenoides*) and Squirreltail (*Elymus elymoides*). Common among the stands of Sandberg Bluegrass are the warm season grasses Purple Three-awn (*Aristida purpurea*) and Sand Dropseed (*Sporobolus cryptandrus*). Slopes are typically covered with dense stands of Bluebunch Wheatgrass (*Elymus spicatus*). Great Basin Wildrye (*Elymus cinereus*) and Creeping Wildrye (*Elymus triticoides*) were seen only in the more mesic sites such as drainages or north-facing slopes. The vegetational composition may have characterized much of the landscape prior to introduced grazing and dry-land farming and would be consistent with early descriptive accounts of the region.

Few native annuals were seen, with the exception of Common Sunflower (*Helianthus annuus*). It's been a dry year in northwestern Utah and the general lack of cool season native annual species could reflect the paucity of precipitation to date. There also may be a warm season annual floristic component not yet visible when the initial survey was done.

While the remnant stands of native plants are common, non-native plants constitute a large proportion of the present flora. We rounded up the usual cast of characters: Cheatgrass, Storksbill (*Erodium cicutarium*), Russian Thistle (*Salsola tragus*), and Bindweed (*Convolvulus arvensis*). Some, such as Intermediate Wheatgrass (*Elymus hispidus*) and Crested Wheatgrass (*Agropyron cristatum*), appear confined to the immediate paved roadside areas where extra moisture from runoff accumulates. Ecosystem integrity has been most compromised in those areas of highest disturbance such as railway roadbeds, existing roads, and the railway-related construction encampment sites.

Most gratifying was the interest expressed by the staff at Golden Spike in effecting vegetation restoration of some of the degraded areas. An abundance of remnant natives from which to harvest seed on-site will protect the genetic integrity of the local populations and reflects the growing awareness that biodiversity begins at the populational level.

PRELIMINARY SPECIES LIST

[based on three survey areas only]

NP = native perennial; NB = native biennial; NA = native annual
 IP = introduced perennial; IB = introduced biennial; IA = introduced annual

Scientific Name	Common Name	Form	Family
<i>Achillea millefolium</i> L.	Milfoil Yarrow	NP	Asteraceae
<i>Agropyron cristatum</i> L.	Crested Wheatgrass	IP	Poaceae
<i>Alyssum alyssoides</i> (L.) L.	Alyssum	IA	Brassicaceae
<i>Argemone munita</i> Dur. & Hilg.	Dwarf Prickly Poppy	NP	Papaveraceae
<i>Aristida purpurea</i> Nuttall	Purple Three-awn	NP	Poaceae
<i>Artemisia dracunculus</i> L.	Tarragon	NP	Asteraceae
<i>Artemisia ludoviciana</i> Nuttall	Foothill Sage	NP	Asteraceae
<i>Artemisia tridentata</i> Nuttall	Big Sagebrush	NP	Asteraceae
<i>Asperugo procumbens</i> L.	Catchweed	IA	Boraginaceae
<i>Astragalus beckwithii</i> T. & G.	Beckwith Milkvetch	NP	Fabaceae
<i>Astragalus utahensis</i> (Torrey) T. & G.	Utah Milkvetch	NP	Fabaceae
<i>Balsamorhiza hookeri</i> Nuttall	Balsamroot	NP	Asteraceae
<i>Brickellia microphylla</i> (Nutt.) Gray	Littleleaf Bricklebrush	NP	Asteraceae
<i>Bromus brizaeformis</i> Fischer & Meyer	Rattlesnake Chess	IA	Poaceae
<i>Bromus japonicus</i> Thunb.	Japanese Chess	IA	Poaceae
<i>Bromus tectorum</i> L.	Cheatgrass	IA	Poaceae
<i>Calochortus bruneauensis</i> Nels. & Macbr.	Sego Lily	NP	Liliaceae
<i>Calochortus nuttallii</i> T. & G.	Sego Lily	NP	Liliaceae
<i>Ceratocephalus testiculatus</i> (Crantz) Roth	Bur Buttercup	IA	Ranunculaceae
<i>Chaenactis douglasii</i> (Hook.) H. & A.	Dusty Maiden	NP	Asteraceae
<i>Chrysothamnus nauseosus</i> (Pallas) Britt.	Rubber Rabbitbrush	NP	Asteraceae
<i>Chrysothamnus viscidiflorus</i> (Hook.) Nuttall	Little Rabbitbrush	NP	Asteraceae
<i>Cirsium undulatum</i> Nuttall	Wavyleaf Thistle	NA	Asteraceae
<i>Convolvulus arvensis</i> L.	Field Bindweed	IP	Convolvulaceae
<i>Crepis intermedia</i> A. Gray	Gray Hawkbeard	NP	Asteraceae
<i>Cryptantha humilis</i> (Greene) Payson	Cat's Eye	NP	Boraginaceae
<i>Descurainia sophia</i> (L.) Prantl	Flixweed	IA	Brassicaceae
<i>Elymus cinereus</i> Scribn. & Merr.	Great Basin Wild Rye	NP	Poaceae
<i>Elymus elymoides</i> (Raf.) Swezey	Squirreltail	NP	Poaceae
<i>Elymus hispidus</i> (Opiz.) Meld.	Intermediate Wheatgrass	IP	Poaceae
<i>Elymus spicatus</i> (Pursh) Gould	Bluebunch Wheatgrass	NP	Poaceae
<i>Elymus triticoides</i> Buckley	Creeping Wildrye	NP	Poaceae
<i>Eriogonum cernuum</i> Nuttall	Nodding Buckwheat	NA	Polygonaceae
<i>Erodium cicutarium</i> (L.) L'Her.	Storksbill	IA	Geraniaceae
<i>Galium aparine</i> L.	Catchweed Bedstraw	NA	Rubiaceae
<i>Grindelia squarrosa</i> (Pursh) Dunal	Curlycup Gumweed	NP	Asteraceae
<i>Gutierrezia sarothrae</i> (Pursh) Britt. & Rusby	Matchweed	NP	Asteraceae
<i>Halogeton glomeratus</i> (Bieb.) Mey.	Halogeton	IA	Chenopod.
<i>Helianthus annuus</i> L.	Common Sunflower	NA	Asteraceae
<i>Hordeum murinum</i> L.	Rabbit Barley	IA	Poaceae
<i>Isatis tinctoria</i> L.	Dyers Woad	IB	Brassicaceae
<i>Lactuca serriola</i> L.	Prickly Lettuce	IB	Asteraceae
<i>Lepidium perfoliatum</i> L.	Clasping-leaf Pepperweed	IA	Brassicaceae
<i>Leptodactylon pungens</i> (Torrey) Nuttall	Prickly Phlox	NP	Polemoniaceae
<i>Lomatium grayi</i> Coulter & Rose	Milfoil Lomatium	NP	Apiaceae

<i>Lygodesmia grandiflora</i> (Nuttall) T. & G.	Showy Rushpink	NP	Asteraceae
<i>Marrubium vulgare</i> L.	Horehound	IP	Lamiaceae
<i>Melilotus officinalis</i> (L.) Pallas	Yellow Sweet Clover	IA	Fabaceae
<i>Menzelia dispersa</i> S. Watson	Bushy Blazing Star	NA	Loasaceae
<i>Mentzelia laevicaulis</i> (Hook.) T. & G.	White-stem Blazing Star	NP	Loasaceae
<i>Oenothera caespitosa</i> Nuttall	Tufted Evening Primrose	NP	Onagraceae
<i>Phlox longifolia</i> Nuttall	Longleaf Phlox	NP	Polemoniaceae
<i>Poa bulbosa</i> L.	Bulbous Bluegrass	IP	Poaceae
<i>Poa pratensis</i> L. •	Kentucky Bluegrass	IP	Poaceae
<i>Poa secunda</i> Presl	Sandberg Bluegrass	NP	Poaceae
<i>Prunus virginiana</i> L.	Chokecherry	NP	Rosaceae
<i>Salsola tragus</i> L.	Russian Thistle	IA	Chenopod.
(<i>Salsola iberica</i> Sennen & Pau)			
<i>Senecio multilobatus</i> T. & G.	Lobeleaf Groundsel	NP	Asteraceae
<i>Sisymbrium altissimum</i> L.	Jim Hill Mustard	IA	Brassicaceae
<i>Sphaeralcea munroana</i> (Douglas) Spach	Globemallow	NP	Malvaceae
<i>Sporobolus cryptandrus</i> (Torrey) A. Gray	Sand Dropseed	NP	Poaceae
<i>Stipa hymenoides</i> R. & S.	Indian Ricegrass	NP	Poaceae
<i>Thelypodium</i> sp.	Thelypody	NB	Brassicaceae
<i>Tragopogon dubius</i> Scop.	Yellow Salsify	IA	Asteraceae
<i>Triticum aestivum</i> L.	Cultivated Wheat	IA	Poaceae
<i>Verbascum blattaria</i> L.	Moth Mullein	IB	Scrophular.
<i>Verbascum thapsus</i> L.	Mullein	IB	Scrophular.
<i>Zigadenus</i> sp.	Death Camas	NP	Liliaceae

INTERMOUNTAIN FLORA, Vol. 5

Asterales is now available. If we order as a group this volume and any of the other four are available at a 20% discount. (10 books per group minimum.)

	Reg.	Discount	Post
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Vol. 3, pt. B, Fabales	58	46.40	1.86
Vol. 4 Asteridae			
except Asterales	75	60	2.40

Those who are interested in taking advantage of the group rate should send a check to c/o Utah Native Plant Society and mail to UNPS P.O. Box 520041, SLC, UT 84152-0041. Deadline to order is Sept. 30, 1994. Please indicate volume(s) and make check out for discount price plus postage. Anyone interested in purchasing all five volumes should order separately for a 25% discount. Contact Jo Stolhand (801-521-0069) for more information.

MUSHROOM LOVERS

Hope's Mushroom Cookbook by Hope Miller is now available for \$20.00, autographed and postpaid. We have 48 copies on hand. Send your check to Dave Okelberry, see address above, or buy one at the Mushroom Hunt.

PLANT IDENTIFICATION

TERMINOLOGY

An Illustrated Glossary. James G. Harris and Melinda Woolf Harris

If a picture is worth a thousand words this book with its 1700 illustrations of taxonomic terms would be priceless. If you have ever tried to key a plant and found yourself turning to the glossary of your flora to define "oblanceolate" or "glandular-villous" or "paniculate cymes" only to find you can't relate the verbal description to the plant in your hand this book is for you. Pictures show you how long and dense villous hairs are; pictures show you the leaf shape for an oblanceolate leaf; and pictures show you the inflorescence structure of a panicle and which flower blossoms first in a cyme.

This book was conceived for the student botanist (degree-seeking or week-end hiker). In the first part of the book terminology is arranged alphabetically. A second part groups related terms (i.e. terms that describe leaf structure or leaf surfaces) so they can be compared.

Members of the Utah Native Plant Society can order this book by sending a check for \$15.95 (regular \$17.95) postage paid to Spring Lake Publishing, Box 266, Payson, UT 84651. Please indicate that you are a member of UNPS for the special discount.

UNPS SEGO LILY
c/o Jo Stolhand
Utah Native Plant Society
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Sego Lily

Newsletter of the Utah Native Plant Society

VOL. 17 NO. 6

NOV / DEC 1994

CALENDAR OF EVENTS

Nov. 16 **Salt Lake Chapter Meeting.** Topic to be announced. Watch for your Blue Card
Wednesday with details to follow. **Utah Department of Natural Resources**, 1636 West
7:30 pm North Temple, Salt Lake City, Utah. Easy access from I-215 or North Temple.

December **Salt Lake Chapter.** No meeting this month. Have a happy holiday.

December **"Evergreen Christmas"** Purchase a living Christmas tree and then donate it to
TreeUtah and they'll plant it in a city park or cemetery. The cost of your tree is
tax deductible and they'll come to your home and pick it up. Call TreeUtah at
487-9494.

Jan. 11- **1995 Winter Lecture Series, Utah Museum of Natural History.**
Feb. 1 **"The Natural History of Sex."** The global environmental issue of explosive
Wednesdays population growth cannot be fully addressed without a thorough understanding
7:30 pm of sex. Fine Arts Auditorium, University of Utah. \$5.00 per lecture.



REPORT FROM THE CHAIRMAN UNPS BOARD OF DIRECTORS

Brent L. Shipley

This past year slipped by before we were able to accomplish everything that we wanted to (again). However, we've made some significant contributions during the course of the year. Both the Threatened and Endangered (T&E) Species Conference and the annual mushroom hunt were very successful and much enjoyed by all who attended. We have contributed significant funding to the Red Butte Garden and Arboretum wildflower hotline, and we have funded a couple of research projects to study T&E species. Significant progress has been made on the development of a new UNPS poster depicting T&E species from across the state. A new mycology club has been spawned as a result of our annual mushroom hunt activities. On the administrative side, we've revised the UNPS bylaws to more clearly depict the way we function and to enable us to be more effective in accomplishing our purposes.

During this time of increasing pressures for use of our state and nation's natural resources, there is a definite need for organizations such as UNPS to monitor and, when necessary, to fight for the conservation and preservation of our natural resources. I see UNPS as becoming a stronger force for protection and conservation of Utah's native plant species and plant communities. I don't think we are there yet, but we will be within a few short years, provided that is what we want to do. It is up to the members of the Society, those who are presently affiliated and the many who are yet to be brought in through the efforts of the leadership and members.

As a new Board of Directors is elected at the Annual Members' Meeting in October and the current Board is dissolved, we hope that some of our goals will continue to be pursued by the new Board. We have worked on a set of "Visions and Values" for the Society that would give us a better sense of our mission and the types of activities that we should be pursuing. We feel that the Society needs a better sense of direction and more clearly set goals and objectives. At this time there seems to be an increased interest in the Society and an opportunity to expand our ranks with both professional and amateur botanists/biologists. There has been interest expressed in starting new

chapters across the state. We need to continue to move ahead in these and other areas. As we do so, the Society will grow and become an even stronger force in the fostering of understanding and preserving the native plant resources of this great and beautiful state for future generations.

Thanks for a great year.

FEW STATE LAWS PROTECT NATIVE PLANTS

Anthony J. Frates

Utah has very few laws which help protect native plants. In 1983, however, the state's legislature passed a bill which requires proof of ownership when transporting forest products and native vegetation (see March and April 1983 issues of The Sego Lily.)

Reprinted below is the full text of the law as it currently exists (it was amended in 1987). The impetus behind the law's original passage was illegal Christmas tree cutting. You can help by (a) complying with the law if you intend to remove a tree from the wild and (b) asked your local Xmas lot attendant where the trees came from and whether the required permits were obtained. Of course, by purchasing artificial trees, trees grown on tree farms, or live trees you will help to reduce the economic incentive for backwoods Xmas tree entrepreneurs.

78-38-4.5. Proof of ownership required to harvest or transport forest products or native vegetation--Definitions--Requirements for proof of ownership.

(1) It is unlawful for any person, firm, company, partnership, corporation, or business to harvest or transport timber, forest products, or other native vegetation without proof of ownership. For purposes of this chapter:

(a) "Forest products" means any tree or portions thereof before it is manufactured into dimensional lumber, timbers, and ties, or mill peeled and made into power poles or house logs, including but not limited to coniferous and deciduous trees, Christmas trees, sawlogs, poles, posts, pulp logs, and fuelwood; and

(b) "Native vegetation" means all other forest, desert, or rangeland vegetation including but not limited to shrubs, flora, roots, bulbs, and seed.

(2) Proof of ownership requires possession of:

- (a) a contract, permit, or other writing issued by the landowner or proper state or federal agency;
- (b) a bill of sale, or other sales receipt;
- (c) a bill of lading or product load receipt;
- (d) a ticket issued by the seller authorizing harvesting or removal; or
- (e) any other legal instrument.

(3) The document required in Subsection (2) shall be issued by the landowner or proper state or federal agency and shall provide the following information:

- (a) date of execution;
- (b) name and address of person authorized to harvest or transport the products, if different from the purchaser;
- (c) a legal or other sufficient description of the property from which the products are harvested or removed;
- (d) the estimated amount or volume, species, and other pertinent information regarding the products harvested or transported;
- (e) the delivery or scaling point;
- (f) the name and address of the purchaser or the products;
- (g) the names and address of the landowner, agency, or vendor; and
- (h) and expiration date.

78-38-4.6 Enforcement

Any peace officer specified in Section 77-1a-1, or law enforcement officer, ranger, or special agent of the United States Forest Service or the United States Bureau of Land Management may:

- (1) stop any vehicle or means of conveyance, including common carriers, containing timber, forest products, or native vegetation upon any road or highway of this state for the purpose of making an inspection and investigation but may not unduly detain a driver of such vehicle or means of conveyance;
- (2) inspect the timber, forest product, or native vegetation in any vehicle, or other means of conveyance, including common carrier, to determine whether the provisions of this chapter have been complied with;
- (3) seize and hold any timber, forest product, or native vegetation harvested, removed, or transported in violation of this chapter; and
- (4) sell or dispose of the timber, forest product, or native vegetation as provided by rule by the appropriate agency.

78-38-4.7 Transportation of forest products or native vegetation into or

through the state.

Timber, forest, products, or native vegetation transported into or through the state must be accompanied by a shipping permit or proof of ownership.

78-38-4.8 Exemptions.

The provisions of this chapter do not apply to the transportation of:

- (1) wood chips, sawdust, and bark;
- (2) products transported by the owner of the property or his agent from which the products were removed; or
- (3) products for personal consumption incidental to camping and picnicking which is limited to the amount:
 - (a) needed for the duration of the picnic or campout; and
 - (b) used at the campsite.

78-38-4.9 Violation as a misdemeanor.

Violation of Sections 78-38-4.5 through 78-38-4.9 is a class B misdemeanor.

THE NATURE CONSERVANCY'S FOCUS ON THE COLORADO PLATEAU

Joel S. Tuhy

The Nature Conservancy is a private non-profit conservation organization whose single mission is to conserve biological diversity. We do this by seeking to maintain the habitats and ecological processes that living things need in order to survive. As we view it, biological diversity is made up of several interrelated levels or scales, including:

- 1. Genetic variation within and between populations of species;
- 2. Viable populations of individual species themselves;
- 3. Ecosystems that are composed of biotic communities (groups of species) and abiotic features (such as soil, water), along with the processes that have shaped and continue to sustain these ecosystems; and
- 4. Variety in the kinds of ecosystems, their patterns, and linkages across regional landscapes.

Historically, the Conservancy has worked most often, and most effectively, at the middle levels of

this range. We have seldom dealt directly with conservation of diversity at the genetic level, because such diversity is not easily "seen". Instead, our most effective strategy has been to acquire and manage both: (1) population of rare species within their habitats, and (2) areas where native biological communities or ecosystems remain mostly unaltered by recent human activities such as grazing or recreation. Essentially, we have focused scarce resources on those biological features that were at imminent risk of being lost forever. The result is the largest system of privately-owned nature preserves in the world, containing a wealth of rare species and natural areas.

At the large-scale end of the spectrum, the Conservancy has just recently begun to get involved in biological conservation at the regional level. We did this because we realized that a series of relatively small preserves (tens to a few thousands of acres each) might not be sufficient to maintain the biological features protected within such areas into the long-term future. To put it bluntly, the rare species and natural areas contained within a series of postage-stamp-sized preserves will almost certainly be lost if the land all around the preserves is allowed to turn into another Sahara Desert. Further, by focusing mainly on the rarest, most at-risk species and habitats now, we tend to neglect species and communities that are common today but might quickly become scarce if wide-scale habitat degradation occurs.

Because of these concerns, the Conservancy established its Last Great Places initiative. Its purpose is to achieve the conservation of biological diversity at all scales in a handful of model locations in the Americas and the Pacific Rim. Our local "Last Great Place" is a portion of the Colorado Plateau in south-eastern Utah and west-central Colorado, with Moab at its center.

The Conservancy's Great Basin Field Office launched the Bright Edge Campaign in order to develop our presence on the Colorado Plateau. The cornerstone of this campaign has been the successful establishment of the Moab Project Office. This satellite office is staffed by two full-time Conservancy employees who live in Moab and handle the day-to-day duties of our conservation work on the Colorado Plateau. Let me spend the remainder of this article by describing the highlights of our efforts in the region.

Our interest in the Plateau centers on a four-million-acre area roughly bounded by the Green/Colorado Rivers on the west, Abajo Mountains on the south, Dolores River on the east, and East Tavaputs Plateau on the north. It is a tremendously diverse area that includes most of the "life zones", as defined by elevation and substrate, on the Colorado Plateau at large. Within this area we have accumulated existing information on known locations and potential habitats of rare plant and animal species. We have also identified most of the major plant communities and their correspondence with varying elevations and soil types. Our conservation efforts include both our traditional focus on small-scale sites, and non-traditional (for us) regional conservation activities.

In keeping with our traditional approach to conservation, we have identified about 35 individual small-scale sites as targets for conservation action. For the most part these sites contain populations of (1) rare species; (2) rich and diverse wildlife populations; (3) little-altered ("relict") examples of common biotic communities; and/or (4) occurrences of unusual or scarce habitats. A few examples of these sites are as follows:

- The Matheson Wetlands Preserve, formerly known as the Moab sloughs, is located between Moab proper and the Colorado River. Co-owned with the Division of Wildlife Resources, this 875-acre area is the most visible sign of the Conservancy's presence in the region. As the only major wetland along the Colorado River in Utah it is literally an "oasis in the desert", and serves as home for part or all of the year to at least 160 types of birds plus many mammals, reptiles, amphibians, fish and invertebrates.
- The highlands between Castle and Professor Valleys northeast of Moab contain the Threatened Jones cycladenia (*Cycladenia humilis* var. *jonesii*), the Candidate Shultz stickleaf (*Mentzelia shultziorum*), and several little-disturbed mesa tops.
- The Mill Canyon-Courthouse Rock area northwest of Moab supports two Candidate plants: Cisco milkvetch (*Astragalus sabulosus*) and Trotter oreoxis (*Oreoxis trotteri*). It also contains substantial areas that appear never to have been grazed by domestic livestock, though rabbit and deer use is substantial.

- A number of pristine remnants of the region's common plant communities and cryptobiotic soil crusts occur within units of the National Park System

- The LaSal Mountains rise well above treeline and contain alpine tundra communities still in excellent condition, as well as the Candidate LaSal fleabane (*Erigeron mancus*).



ERIGERON MANCUS

Identifying these 35 small-scale sites with significant biological features is only the beginning of our work. We have also looked at potential threats to the long-term integrity of these biological features, and begun to design strategies for conserving the sites where the features occur. The most effective means of protection--and the Conservancy's historic method of operation--is to acquire ownership of the sites in question. However, only a minority of the 35 sites are in private hands from which the Conservancy can purchase them outright, or acquire some lesser legal protective interest (such as a conservation easement). The most visible, successful example of this technique to date has been the acquisition of the Matheson Wetlands Preserve, mentioned above.

The majority of our identified sites are on public lands administered by the Bureau of Land Management, National Park Service and Forest Service. We use two basic approaches, one more passive and the other more active, to achieve

conservation of the biological features on these public-land sites.

The more passive approach first involves sharing our information with the respective land management agencies to make sure that they are aware of the locations of sensitive biological features, such as rare species and natural areas. All of the federal agencies have laws and regulations that require them to maintain special-status species. By making the agencies aware of such species' locations, including new field discoveries that we make, we greatly reduce the possibility that these species will be harmed due to lack of knowledge. Further, we periodically visit sites to ensure that their species or communities are not being adversely affected. If potentially destructive impacts are seen, we will work cooperatively with the respective agency to seek to remedy the situation. Finally, we review as best we can the agencies' land-use plans to see if any proposed actions may adversely affect any of our identified sites or sensitive biological features. If potential impacts are noted, we will again work cooperatively to suggest alternatives that will minimize or avert any negative effects.

We have used the term "conflict avoidance" to describe the various facets of this more passive approach to biological conservation of public-land sites. While nowhere near as powerful as outright ownership, conflict avoidance can be a very effective and inexpensive means of conservation.

The more active means of conserving biological diversity on small public-land sites involves the agencies' establishment of special administrative designation for worthy areas. The Research Natural Area (RNA) title is used by the Park Service and Forest Service for areas that remain substantially unaltered by recent human influences. The RNA designation carries with it significant protective management stipulations against land-use activities that would alter these little-disturbed areas. This designation has been used successfully by the Conservancy in the LaSal Mountains, where we worked with the Forest Service to have them establish the Mount Peale RNA. We are also talking with the National Park Service to have them designate a number of little-disturbed sites on their lands as RNAs.

The Bureau of Land Management can use the Area of Critical Environmental Concern (ACEC) designation for similar purposes. The Conservancy

worked successfully with the San Juan Resource Area to have two natural-area ACECs designated in the mid 1980s. In the near future we will be submitting ACEC nominations for four sites on lands administered by the Grand Resource Area, including the Castle-Professor Valley highlands and the Mill Canyon-Courthouse Rock area. As noted above, both of these sites contain combinations of rare plants and little-disturbed plant communities.

Designation of special areas such as RNAs and ACECs is done through the agencies' formal plan development (or plan amendment) procedures. This can be a tedious and protracted process, but it has the advantages of subjecting the potential designations to public review, environmental impact assessment, and other aspects of the agencies' planning guidelines and NEPA compliances.

On a somewhat grander scale, the Conservancy has been a participant in the Book Cliffs Conservation Initiative. In cooperation with the Utah Division of Wildlife Resources we acquired two ranches in the Book Cliffs, including their accompanying federal grazing permits that cover roughly 400,000 acres. Through being a cattle permittee we have gained experience on grazing issues. We are working with the DWR and BLM on developing grazing management strategies for these allotments that address their use by both wildlife and livestock in a multiple-use context.

Beyond the site-based conservation techniques described above, we are also looking at how the land at-large can be managed so that its features and processes are sustained. Our broad purpose is thus to work toward conservation of all biological diversity on the Plateau, not just its rarest components, within a framework of sustainable land uses that support the people who live here. The techniques for doing this are relatively new and are still being tested in other regions of the west. We do not know exactly how this regional-level conservation work will evolve on the Plateau, but we believe that it will have certain characteristics:

- Regional-level conservation will incorporate human/societal needs and desires. People have a permanent place in the "system", both as an ecological force and as consumers of products from the land.
- We must know about the composition, functioning and ecological potential of the land in much greater depth than we do at present. We must especially

pay attention to biotic patterns, disturbance regimes and ecological processes at their various scales. For example, the functioning (and thus the management) of a small site may be influenced by factors or processes that operate at scales much larger than the site itself. We must study and monitor the whole range of appropriate scales over the region, with larger scales forming the context for smaller scales. Conservancy scientists have provided blueprints for how such an "ecological characterization" study can be done, though it will be expensive to do well.

- Land management agencies can no longer operate completely independently. The actions of any one agency almost always have effects beyond that agency's boundaries. Therefore there must be a means to coordinate among all agencies and governmental bodies. This would in no way supersede any agency's legal mandates. Rather, it would encourage each agency to work toward commonly-developed goals (one being regional-level conservation), insofar as their mandates allow. A grassroots-level group known as the Canyon Country Partnership has already been formed specifically for these purposes. Members of the Partnership include the National Park Service, U.S. Forest Service, Bureau of Land Management, Utah Division of Wildlife Resources, Utah Division of Parks and Recreation, Utah Trust Lands Administration, plus Grand, Emery, Carbon and San Juan Counties. The Conservancy is playing a key role in developing the scientific and technical information that land managers desperately need in order to make coordinated decisions involving the complete ecosystem.

The ultimate goal of these broadest-scale efforts, which we may never reach perfectly, is the notion of sustainable land management. It can be viewed as a set of land-use allocations: (1) that meet human desires and needs, and (2) that the "system" is able to maintain by itself indefinitely. It is a model that realizes the concept of "sustained yield", thereby enabling us to pass on the multiple land-use opportunities that we now have--and the biological features and functioning of the land itself --to all future generations.

These are exciting and challenging times for the Conservancy as we build our presence on the Colorado Plateau. We look forward to successful results from our efforts, both traditional and not-so-traditional, to conserve the Plateau's wealth of biological diversity in all of its forms.

UTAH NATIVE PLANT SOCIETY
1994 FORAY SPECIES LIST
Mount Nebo, June 16-18

CLASS Discomycetes

Helotiales

Dermataceae

Mollisia melaleuca (?)

Pezizales

Helvellaceae

Discina perlata

Pyronemataceae

Caloscypha fulgens

Scutellinia scutellata

Sarcosomataceae

Plectania nannfeldii

CLASS Hymenomycetes

Agaricales

Bolbitiaceae

Conocybe lactea

Boletaceae

Leccinum aurantiacum

Coprinaceae

Coprinus atramentarium

Coprinus micaceus

Psathyrella candolleana

Psathyrella gracilis (?)

Cortinariaceae

Inocybe sp.

Hygrophoraceae

Hygrophorus marzuolus

Paxillaceae

Paxillus involutus

Pluteaceae

Pluteus cervinus

Pluteus petasatus

Tricholomataceae

Clitocybe albirhiza

Flammulina velutipes

Lentinellus montanus

Lentinellus cochleatus

Lyophyllum sp.

Strobilurus occidentalis

Aphylllophorales

Corticaceae

Stereum abietinum

Polyporaceae

Antrodia vaillantii

Cryptoporus volvatus

Fomitopsis pinicola

Ganoderma applanatum

Gloeophyllum saepparium

Phellinus pini

Polyporus elegans

Polyporus subchartaceus

Pycnoporellus sp.

Dacrymycetaceae

Guepiniopsis alpina

CLASS Gasteromycetes - Puffballs, Stinkhorns, etc.

Lycoperdales

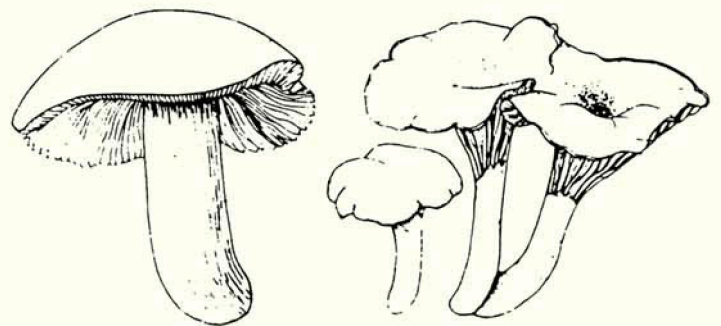
Lycoperdaceae

Bovista plumbea

Lycoperdon perlatum

Rhizopogonaceae

Rhizopogon sp.



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Continuing thanks to Dorothy Egan for
collating the newsletter every issue. We
couldn't do it without you, Dorothy.

MUSHROOM LOVERS

Hope's Mushroom Cookbook by Hope
Miller is now available for \$20.00, autographed
and postpaid. We have 48 copies on hand. Send
your check to Dave Okelberry, see address above,
or buy one at the Mushroom Hunt.

T-SHIRTS: A COLLECTOR'S ITEM

AN ORIGINAL DESIGN BY VERA MCKNIGHT,
ILLUSTRATOR OF PETERSON'S GUIDE TO
MUSHROOMS is featured on the T-Shirts printed
for this year's Mt. Nebo Foray. Sizes available are
large, extra large, and extra extra large. \$10.00 .
Background color is white. Call Brent Shipley at
268-2601 to arrange to buy yours. These shirts
will also be available for sale at the August
Mushroom Hunt.

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