Sego Lily
Newsletter of the Utah Native Plant Society

May 2009

Vol. 32, No. 3

In this issue:

Disturbance and the Establishment of Yellow Star-thistle

By Dr. Julie Rieder, Colorado State University

In 2002, the Utah Native Plant Society awarded a research grant to Julie Rieder for her doctoral studies on Yellow starthistle at Utah State University. We are pleased to present a condensed version of her report, prepared specially for UNPS. The full report, with complete methods, results, figures, and full citations, can be accessed on the UNPS website.

Plants that are called "ideal weeds" are generally annuals or short-lived perennials that possess a particular set of characteristics that allow rapid response to resources made newly available by disturbance. Yellow starthistle (*Centaurea solstitialis*) is one such plant that we would expect to respond positively to disturbance. A native of the Mediterranean, Yellow starthistle has many characteristics that allow rapid response to disturbance, including a rapid growth rate, a high reproductive output (29,000 seeds/m^2), a persistent seed bank and a lack of true dormancy, and the potential to disperse long distances.

Although invasion by Yellow starthistle is of great environmental and economic concern and this species has spread over large areas of the western United States, surprisingly few experiments have investigated disturbance as a facilitator to its invasion. Furthermore, context can greatly alter the role of disturbance in the plant invasion (i.e., disturbance size, timing and year to year variation, community composition and diversity, and native vs. non-native ranges).

In the present study, I examined the response of Yellow starthistle to different levels of soil disturbance. Specifically, I was interested in whether larger-scale soil disturbances, as might be caused by humans (e.g., plowing), enhance the initial stage [continued on page 8]

*Cover: Yellow starthistle (*Centaurea solstitialis*) blossoms with a crab spider eating a bee. Photo by J.P. Rieder.*

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

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

Sego Lily Editor: Walter Fertig (walt@kanab.net). The deadline for the July 2009 *Sego Lily* is 15 June 2009.

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

Chapter News

New Chapter Map: Of Utah's 29 counties, 12 currently have designated Utah Native Plant Society chapters (though a few of these are presently dormant). If you live in a county without an active chapter, you can still participate in UNPS chapter events. The map at right depicts the distribution of existing chapters and the general area that they cover. Members are encouraged to contact their chapter representatives (www.unps.org) or check the chapter activities on the UNPS website and in the *Sego Lily* to find out about upcoming events. Most activities are open to the public and not restricted to UNPS members residing within each chapter territory. Members from counties without a chapter (or with an inactive one) might also consider banding together with fellow plant enthusiasts to form a new chapter.—*W. Fertig*

Cache: May 9 (Sat) "What's New at the Zoo". Time: 11- 3pm. Place: Willow Park Zoo, Logan. Cost: Free. Visit our booth to learn about native flowers and their pollinators at this fun new activity for families in Logan.

May 15-16 (Fri-Sat) Introduction to Mushroom Identification. Time: 6 pm. Place: The Intermountain Herbarium (USU campus). Cost: $40. This popular workshop led by Michael Piep of the herbarium introduces concepts, literature and terminology for identifying mushrooms in Utah. The Saturday session takes place in Logan Canyon where several habitats will be visited and the species in fruit will be discussed. There is even the possibility of finding a species or two to sample. This workshop, offered by the herbarium, is cosponsored by UNPS, the Mushroom Society of Utah, and the Bridgerland Mushroom Society.

May 27 (Wed) May Meeting. Time: 7 pm. Place: TBA. We will have a presentation on wetland plants and communities. Our speaker will be announced shortly.

May 30 (Sat). Mushroom Foray. Time: 9 am. Place: First Dam parking lot (we will car pool from here). Cost: Free. We will join the folks from the Bridgerland Mushroom Society on their monthly foray. We will be heading to the dikes and marsh edges on the west side of the

valley. This is an excellent opportunity to view many of our wetland plants and do a bit of bird watching if you are of a mind.

June 2 (Tues). Richard J. Shaw Memorial Wildflower Walk. Time: 6:30 pm. Place: Green Canyon parking lot. Cost: Free. Join Michael Piep and other local botanists on a wildflower walk for the whole family. We will wander through grassy meadows, juniper stands, and Bigtooth maple groves. This walk is cosponsored by the Intermountain Herbarium and has been named in honor of the Late Dr. Shaw who was well versed in the lore of our local plants, and dearly missed. Barring a down-pour at the time of start or several inches of snow this event will not be rescheduled.

June 6 (Sat) Bear River Celebration. Time: 10-2 pm. Place: Willow-Park. Cost: Free. Visit our booth at this popular local celebration. We will have information and an activity about our local plants.

June 8-12 (Mon-Fri). Introduction to Plant Identification. Time: 10-12 pm. Place: Geology 301, USU Campus. Cost: $90 ($20 due at registration and is non-refundable). Registration begins May 15. Join the Intermountain Herbarium staff for 5 mornings of plant fun. We will cover how to recognize 15-20 of Northern Utah's most common plant families as well as some of the terminology and the flower/plant parts needed to identify our local plants. Space is extremely limited so register early!

June 30 (Tues) Potluck in Prov. Time: 7 pm. Place: Providence Canyon – look for our signs. Cost: Free. Join us as we have a (late) Summer Solstice potluck. We will provide homemade root beer and rolls. Bring your favorite picnic side dish or dessert to share. You are on your own for your main dish and utensils. - *Michael Piep*

Cedar City: The chapter plans a Native Plant Sale, Saturday morning, May 16th at the Southern Utah University Parking Lot across from the Centrum. CCNP Chapter members are invited to order their plants from Janett Warner at the Wildland Nursery. Order forms are available from Marguerite Smith @435-867-5487. A second list for late blooming stock will also be available at the next meeting. Plan to pick up your orders at 8 AM. Other plants will be available for sale to the public from 9 AM to 12 PM.

Kudos to Dr. Ron Martin for his fine picture presentation on wildflowers' of Southern Utah at our last meeting. Dr. Martin will offer two courses at SUU this spring and summer that include field trips to see native plants in our areas. - *Winnie Washburn*

Escalante: On Tuesday, 12 May, at 7 PM in the Interagency Center Bill Gray will give a program on "The amazing plants of SW Australia". Bill spent last September viewing and photographing the truly wonderful spring wildflowers of SW Australia, a region with a similar climate to that of southern California, and home to many plants found nowhere else.

On May 23rd the chapter will participate in the Escalante Heritage Festival. Janett Warner of Wildland Nursery will be on hand for a native plant sale at the high school. You can request specific plants from Janett (www.wild landnursery.com) if you contact her by early May. We would like to have a native plant walking tour of Escalante as part of the festival. Please let us know if you have a native plant garden you would like to share. Part of the Walking tour will be identifying deciduous trees that thrive in Escalante with Cindy Calbaum, Forester with Dixie National Forest.

Tuesday, 9 June, at 7PM, Interagency Center: "Basic Weed Identification and Control for the Escalante area" by Kevin Heaton, Garfield County Extension. Kevin will be discussing the three classes of Noxious weeds in the area that the state requires land owners to control.

Saturday, 27 June Field Trip: Wildflower Seed Collecting and propagating with Maria Ulloa, BLM botanist from Richfield. Look for more information closer to the date. - *Harriet Priska*

Fremont (Richfield Area): Peter Lassig, retired Master Gardener at Temple Square in Salt Lake City, is our featured speaker in May. His presentation is entitled "The Joy of Design with Native Systems" and will be given on May 11 in the Sevier County Administration Building Auditorium in Richfield at 7 PM. Mr. Lassig's largest xeric planting is the 4 acres of native prairie atop the LDS Church Conference Center in Salt Lake City. All UNPS members and the public are invited to attend.

Also on May 11, Wildland Nursery is having its Native Plant Day from 9 AM to 6 PM at the nursery in Joseph. The event will include native plants sales with 10% off for UNPS members. Light refreshments will be served as visitors tour the demonstration gardens. Peter Lassig will be available to answer questions and give suggestions.

Several of our members took an early spring camping trip to Cedar Pocket on the Virgin River south of St. George. The group enjoyed hiking and a bit of swimming. Many of the native plants were almost blooming, but the *Salvia dorri* were in full bloom as were the Mojave Aster. C.R. Wood delighted old and young alike with his cowboy poetry.

At the Natural Resources Fair/ Home & Garden Show in Richfield at the Sevier Valley Center, members distributed small pots of blue flax to interested attendees. The label on the pots advertised xeric plants and the Fremont Chapter, encouraging area residents to join our group.

Great Basin Natives is hosting Penstemon Days on June 5-6 in Holden. For more information, go to www.greatbasinnatives.com or call Merrill Johnson at 435-795-2303.

Please join us for "Celebrate the Wild" at Sam Stowe Canyon in Fremont Indian State Park on Saturday, June 13 from noon to 5 PM. Ron Parsons, Chairperson for the event, indicates there will be tours of our native plant garden, refreshments, activities for children, tips for landscaping and design, a hike and door prizes. - *Janet Nielson*

Manzanita (Kane Co.): Our first spring outing took place on April 18 as a small band of Kanabites traveled to Snow Canyon and Beaver Dam Wash. Despite the cool spring, a number of wildflowers and flowering shrubs were in peak bloom at Snow Canyon, including bird-cage evening primrose, lupine, Dorr's sage, Eaton's penstemon, and Fremont's pepperweed. The greatest variety was found in the state's lowest spot, the bottom of Beaver Dam Wash, where we found Beavertail cactus and Silver cholla in flower, as well as creosote bush, white and woolly bursage, Desert chicory, Pale tackstem, Gravel-ghost and many other Mojave species.

On Saturday, May 2, the group will travel to Toroweap on the North Rim of the Grand Canyon. Charlie Neumann of Willow Canyon Outdoor Store in Kanab has reserved two sites at the Tuweep campground for Saturday night, so people are welcome to stay for the weekend, or return back to Kanab Saturday afternoon. Please contact Charlie at oasis@kanab.net if you plan to camp out as space is limited and be sure to bring camping gear and food to share for a potluck cookout. Day trippers should bring adequate water, food, and appropriate sun protection. We will carpool and caravan from the Grand Staircase-Escalante NM visitor center parking lot at 8 AM on May 2 for the 75 mile excursion to Toroweap. The road to Toroweap is dirt and gravel most of the way and slow going (it takes about 2 hours) and is best for high clearance vehicles with good tires.

Merrill Johnson of Great Basin Natives will give a special Friday night presentation on "Replacing traditional landscapes with natives" for our May 8 meeting, at 7 PM in the Grand Staircase-Escalante Visitor Center. On Saturday, May 9, 9-11 AM, we will hold our annual spring plant sale on the grounds of the Kane County tourism office in downtown Kanab. Merrill will be on hand with a variety of native trees, shrubs, grasses, and wildflowers - all suited for our local climate - for sale. *—Walter Fertig*

Salt Lake: Monday, May 18, 7-9 PM: Malcolm McGregor, saxifrage expert from Scotland, will make a stop on his national book tour in Salt Lake City. He will give a presentation on "Saxifrages" in the Orangerie at Red Butte Garden, 300 Wakara Way, SLC. Come meet him and enjoy light refreshments at 7 PM, lecture starts at 8 PM. This event is co-sponsored by the Wasatch Rock Garden Society and Red Butte Garden. There is a$4 charge for WRGS and UNPS members, $6 for non-members.

May 29-31, San Rafael Swell: We will camp at the Wedge Overlook beginning Friday evening and spend Saturday and Sunday exploring the local flora and beauty of the Swell. We will have a potluck dinner Saturday evening so bring a dish to share. We will try to coordinate carpooling for those interested.

This is my last month as President of the Salt Lake Chapter. It has been a very successful 3 years and I wish to thank everyone who helped and participated in our chapter events. If you are interested in becoming the next chapter president, please contact me or someone on the State BOD for more information.– *Kipp Lee*

Southwestern (Washington Co.): The Southwestern (Bearclaw Poppy) Chapter's unofficial demonstration garden at the Springdale Town Hall (and our official meeting place) is doing and looking great! This garden was planned and spearheaded by our Program Chair Barbara Farnsworth several years ago, and was mostly planted and has been mostly tended by the VIPers, a Volunteer revegetation crew from Zion NP. This crew includes Barbara Farnsworth and Margaret Malm from the SW chapter and Jan Gisler and several other members of the Kanab Chapter; as well as a number of other eager local (and Kanab) VIPers. Barbara used our Chapter money to purchase 5 *Oenothera caespitosa* plants to replace some that fell victim to a problem with the watering system, and they were recently planted by Barbara, Margaret, and the rest of the VIPers surrounding the Redbud which we had planted in the "place of honor" out in front (and is presently blooming beautifully!) With Zion's 100th anniversary being celebrated this year, having the Springdale Town Hall also looking nifty is much appreciated as well as appropriate.

Spring has arrived in Zion National Park—to get on the email list for what is in bloom, contact me at kadok@infowest.com. - *Margaret Malm*

Utah Valley: We have started Plants and Preschoolers hikes every Thursday at 10 AM. Everyone is welcome. The hikes are short distances and everyone is welcome to explore as we go. We will be starting with Rock Canyon in Provo on April 30th, 2009. This summer we are likely to return to Cascade Springs, the Grotto in Payson Canyon, and the falls in Pleasant Grove, CUWCD garden, several sections of the Bonneville and Shoreline trails, and we also hope to visit Ann Kelsey at the Natural History Museum in Salt Lake. We love to try new places so give us a call and show us your favorite spot. If you are interested in joining us call Celeste Kennard at 801 377-5918 or email celeste@byu.edu

We are very happy to announce a new landscaping book: *Landscaping on the New Frontier*, *Waterwise Design for the Intermountain West* by Susan E. Meyer, Roger K. Kjelgren, Darrel G. Morrison, and William A. Varga, illustrations by Bettina Schultz. Please visit the USU press website http://www.usu.edu/usupress/ to look for this title.

Join us as we team up with the folks at CUWCD Central Utah Water Conservancy District 355 W. University Parkway Orem, Utah 84058 on Thursday, July 2 @ 6:30 PM for Utah Native Plants (Principle 3) with Kent Miller of Perennial Favorites. Register for the class at www.centralutahgardens.org or call 801-226-7100. – *Celeste Kennard*

Bulletin Board

Saturday, May 9, 10AM-3PM: Salt Lake Conservation District Purge Your Spurge and Native Plant Sale: Myrtle or Donkey-tail spurge (*Euphorbia myrsinites*) is an aggressive exotic perennial that has been widely planted as an ornamental in northern Utah, but which is becoming a problem by invading foothill and canyon habitats and displacing native species (the plant's white sap can also cause severe skin irritation in susceptible people). To help reduce the Myrtle spurge population in the Salt Lake area, the Salt Lake County Weed Program, Salt Lake Conservation District, REI, BLM, Bonneville Cooperative Weed Management Area and the Utah Native Plant Society are sponsoring a spurge exchange. Dig up and bag all of your Myrtle spurge (being sure to remove at least 4 inches of the rooting clump) and trade these in for one of 2 plant mixes containing Utah native plants specially selected to grow in the local area. The spurge swap will take place at REI at 3285 East 3300 South in Salt Lake City. For more information contact the Salt Lake Weed Control Program at 801-468-2861 or visit their website at www.weeds.slco.org.

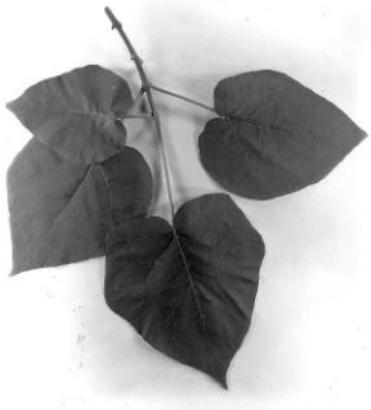
At the same time and place, the Salt Lake Conservation District will hold its first annual Native Plant Sale. The sale will feature over 60 species of native trees, shrubs, grasses and perennials. Plants are native to Utah, grown locally, and not taken from the wild. Each native is sold as a tubeling; trees and shrubs are 10 cubic inches and perennials are 7 cubic inches. Some of the native perennials include Pale evening-primrose, Sundancer daisy, Butterflyweed, Scarlet globemallow, Prince's plume and a wide variety of penstemons. Those who like to shop early may pre-order. For a list of plants and prices, visit the website, www.saltlakeconservation.org. A downloadable order form is available to prepay and reserve plants today! The Native Plant Sale is a part of the Salt Lake Conservation District's mission and provides funds to support local conservation efforts. For more info call Heather at 542.8208.– *Therese Meyer*

UNPS Tee Shirts available through Cache Chapter: Steve Ripple of the Cache Chapter has developed a new UNPS tee shirt featuring the lovely Utah endemic, Maguire's primrose (*Primula maguirei*), known only from the steep limestone cliffs of Logan Canyon (see image above). The shirts come in several sizes (regular 2X, 3X, children's) and are either chocolate, black, or dusky blue (so that the image shows through, thus no greens or reds). The shirts run between 15-20$ depending on the size. To reduce shipping costs, the Cache Chapter is asking for individual chapters to place group orders. If you are interested in helping UNPS and looking sporty while you are at it, contact your local chapter representative to place an order.

UNPS Mailbag: The Perils of *Paulownia*

Dear UNPS : I have noted on the web an extremely fast growing tree named Royal Empress or *Paulownia*, originally imported from Asia and reported to be invasive (at least in the East and South) in the US. Several arborists have recommended it because of its 12 foot per year growing ability. While interested, I am not eager to create a problem for my neighbors or community. What might be the experience of the Utah Native Plant Society with this import and does the Society have any recommendations? - *Scratching my head in Salt Lake City.*

Dear Head-scratcher: Questions about the Royal Paulownia come up every year; they are often advertised in newspaper inserts. I'm not aware of any specimens living in the Salt Lake area and they are probably only marginally hardy here. The claims that they are super fast growing are overstated; only in very favorable soil types and climates do they grow so fast. It also appears to prefer a more acid soil than Utah has to offer. I doubt it will be invasive in the Intermountain West. For more information, consult the USDA PLANTS database (http://plants. usda.gov).



Above: Paulownia tomentosa. *Photo by W.D. Brush, National Agricultural Library, USDA Forest Service, 1952.*

These trees should be considered temporary at best; a few in a new landscape might be acceptable, but only a few, because they are typically short-lived and prone to breaking limbs and may be hazardous. Certainly, much better choices are available and should be used in most landscape situations. The USU Extension's publication on "Selecting and Planting Landscape Trees" is an excellent resource for anyone shopping for trees and is available in booklet form at USU Extension offices in every UT county. It is also available online (Google "USU extension selecting landscape trees").

Note that this tree is in the Scrophulariaceae family - a cousin to penstemons! *-Maggie Wolf*

Highlights of the 5th Southwestern Rare Plant Conference

In late 2007 botanists in the southwestern United States began discussions about holding a region-wide rare plant conference modeled after the 4th Southwestern Rare Plant Conference, held in New Mexico in March 2004. It was widely acknowledged through the botanical grapevine that it ought to be Utah's turn to host the event. Mindy Wheeler, who was chair of the Utah Native Plant Society at the time, proposed that UNPS take the lead in organizing the event, slated for spring of 2009. UNPS already had experience with co-hosting the annual state rare plant meeting (in conjunction with Red Butte Garden), so how hard could a regional conference be?

Without going into gory detail, the months of developing an agenda, finding a venue, creating a website, signing up sponsors, sending out invitations to speakers and attendees, organizing field trips, hiring caterers, and completing hundreds of other tasks all just seemed to whisk by. On the evening of March 16, 2009, UNPS was proud to host the first event of the 5th Southwestern Rare Plant Conference, an informal mixer held at historic Fort Douglas on the campus of the University of Utah. Fortified by good food, fine spirits, and excellent company of old and new acquaintances, the organizers and participants of the conference were off to a good start.

The conference officially began the following morning. Noel Holmgren, curator emeritus of the New York Botanical Garden, gave the keynote address, in which he briefly outlined the history of the Garden's *Intermountain Flora* project and described patterns of species richness and endemism in the Great Basin, Colorado Plateau and the rest of the Southwest.

In all, there were 37 presentations given over the next three days and an additional 20 posters on the Wednesday night poster session and reception. Presentations covered a variety of topics, ranging from seedling ecology and rare plant biology to distributional modeling, impacts of climate change, plant biogeography, and fire ecology. There were too many presentations to summarize them all, but a few of the highlights included:

* Bob Sivinski of the New Mexico Division of Forestry described challenges in conserving remnant cienaga wetland communities in the southwest from the onslaught of civilization

* Duane Atwood of Brigham Young University discussed six new endemic vascular plants he has discovered while inventorying the Arizona Strip over the past 3 decades

* John Spence of Glen Canyon National Recreation Area talked about the high number of globally imperiled (G1 and G2) plant species in the southwest and the need for adopting a regional ranking and prioritization system to focus limited conservation resources on the species in most critical need of help

*Susan Meyer of the USFS Shrub Lab described the utility (and difficulties) of employing seed bank studies in elucidating the life histories and management needs of rare desert plant species

* Loreen Allphin of BYU discussed on-going biosystematic work teasing out cryptic speciation and hybridization in the mustard genera *Boechera* (aka *Arabis*) and *Draba*

* Crystal Krause of Northern Arizona University and Amy Croft of Utah State University described their graduate studies on predictive modeling of rare plants of the Colorado Plateau and Mojave Desert

* Bruce Barnes of Flora ID Northwest gave an interactive demonstration of his computerized plant identification software

* Rob Gillies, Utah state climatologist, described how climate models are predicting long-term increases in drought in the southwest and decreases in snowpack and spring runoff

* Mitch Power of the Utah Museum of Natural History, discussed the role of paleoecological studies in explaining vegetation patterns of the past and how these studies might help predict future changes in plant communities in response to climate change

* Steve Caicco of the Nevada office of the US Fish and Wildlife Service talked about the threat of climate change to edaphic endemics of the Great Basin, which may be unable to adapt to major environmental changes predicted for the future

* Brian Kurzel of the Colorado Natural Areas Program described efforts in Colorado to develop a Conservation Action Plan to prioritize species and geographic areas of the state in most need of protection

USFWS Cites Elaine York as a Recovery Champion

Elaine York, West Desert Regional Director for The Nature Conservancy, was presented with the US Fish and Wildlife Service's national "Recovery Champion" Award at the SW Rare Plant Conference on March 19th. The award was given in recognition of Elaine's efforts to create the 800 acre White Dome Nature Preserve at the south end of St. George. The White Dome area provides important habitat for the federally endangered Dwarf bear-claw poppy (*Arctomecon humilis*) and threatened Siler's pincushion cactus (*Pediocactus sileri*), as well numerous uncommon Mojave Desert plant and animal species. Steve Guertin, Director of the Service's Mountain-Prairie Region offered this praise: "Elaine has shown tremendous perseverance in her goal of ensuring long-term protection of southern Utah's threatened and endangered species. She is a highly effective facilitator and has brought together a diverse group of partners who are making the White Dome Nature Preserve a success. We are indebted to Elaine for her vision and enthusiasm".

This spring The Utah Nature Conservancy received a grant of $910,500 to purchase the final acres needed to complete the White Dome preserve.

Above: Conference Keynote speaker and Intermountain Flora *co-author Noel Holmgren proves that a grown man can still be excited about finding the first buttercup of spring, at least if that buttercup is Violet buttercup (*Ranunculus andersonii *var.* andersonii*), as seen on the field trip to Stansbury Island on 20 March, 2009. Photo by Desiree Beaudry.*

* Joan DeGiorgio of The Nature Conservancy talked about collaborative efforts in the Uinta Basin to identify species at risk from ongoing oil and gas development

* Mark Miller of the USGS in Kanab, UT and Jesse Breinholt of Utah Valley University gave updates on their respective research on the federally endangered Shivwits milkvetch in Washington County, Utah

* Steven Harrison of BYU discussed genetic studies being undertaken on two populations of the endangered Clay phacelia and related species in northern Utah

* Jason Alexander of Utah Valley University described new genetic research that is shedding light on the complex taxonomy of *Astragalus lentiginosus* and its many varieties

* Barbara Ertter of the University of California discussed the taxonomy of *Potentilla* and the need to resurrect *Drymocallis* as a separate genus.

In addition to talks and posters, UNPS sponsored a break-out session on the last full day of the conference to discuss development of a revised rare plant species list for Utah. Over 30 people attended the session to learn of the rating system being proposed by UNPS' rare plant committee (consisting of Duane Atwood, Ben Franklin, Robert Fitts, Rita Dodge, and myself). This system ranks the conservation priority of species using 7 criteria: overall global range (with special emphasis on Utah's contribution to that range), number of populations, number of individual plants, habitat specificity, intrinsic rarity (such as life history bottlenecks or loss of pollinators), threats, and population trend. The draft list of extremely high and high priority species were reviewed and changes made to the rankings based on input from knowledgeable participants in the audience. The final list is currently being revised and will be available later this summer.

The conference concluded on Friday with a field trip to Stansbury Island along the south side of the Great Salt Lake. Despite the unusually warm temperatures of mid-March (the weather gods or climate change cooperated with the conference and gave us 70 degree temperatures), relatively few plants were flowering, though trip attendees were treated to a display of Violet buttercup (*Ranunculus andersonii* var. *andersonii*).

All told, over 150 botanists and their spouses or groupees attended the week-long conference. UNPS finished in the black and profits will be used for the society's scholarship fund or for another worthy project. Attendees were treated to many stimulating talks, but perhaps more importantly had a chance to visit with old friends and make new ones.

Much of the success of the conference can be attributed to the hard work of the planning and program committees, both chaired by Mindy Wheeler, with the able assistance of Bill Gray, Ann Kelsey, Bill King, Therese and Larry Meyer, Robert and Susan Fitts, Loreen Allphin, Rita Dodge, and Leila Shultz. A number of volunteers from UNPS and Red Butte Garden helped with registration, food, and behind the scenes work, including Elise Erler, Tony Frates, Celeste Kennard, Kipp Lee, Bill Nelsen, Kody Wallace, Sue Budden, Pamela and Robert Hilbert, Allene Keller, Jena Lewinsohn, Marilyn Mead, and Bev Sudbury. Artist Lara Call Gastinger provided a beautiful painting of Dwarf bearclaw poppy for the conference program and souvenir mug (to see samples of her work, go to www.laracall gastinger.com). The following corporate and institutional sponsors assisted financially or by other means: The Nature Conservancy of Utah, The US Forest Service Rocky Mountain Research Station, University of Utah Department of Biology, the Flora of North America project, Providia, Utah Natural History Museum, Utah Botanical Center, Red Butte Garden and Arboretum, the state of Utah Department of Natural Resources, and Bio-West, Inc.

As a final memento of the conference, Susan Meyer has volunteered to edit a proceedings volume with full papers from the speakers and poster presenters. This book will be produced in pdf format and made available for download to the public on the internet. Funding is coming through the US Forest Service and the Shrub Lab. If all things go smoothly, the proceedings should be available by the end of the year. - *Walter Fertig*

Disturbance and the Establishment of Yellow Starthistle

[continued from page 1] of invasion while smaller-scale soil disturbances, as might be caused by more natural processes (e.g., animal burrowing, soil cracking from shrink-swell clays), facilitate the continued spread of this species after initial invasion. I also examined the interaction between elevated nitrogen levels and disturbance on starthistle invasion and reproductive output. Elevated soil nutrients often accompany soil disturbance and may have a synergistic interaction on the success of invasion by non-native species.

I conducted two separate experiments in two distinct settings: 1) larger-scale soil disturbances (2 m^2) subject to experimental seed addition at a site with low Yellow starthistle seed rain, minimal seed bank, and no neighboring starthistle patches; and 2) smaller-scale soil disturbances (0.05 m^2) without experimental seeding, but at a site with relatively high Yellow starthistle seed rain, an established seed bank, and potential influence from neighboring starthistle patches.

I expected Yellow starthistle to have an especially positive response to larger-scale soil disturbances compared to smaller-scale disturbances, with that response enhanced by the addition of nitrogen. I anticipated that larger-scale disturbances would serve as the initial point of entry for the invasion of this species, while smaller-scale disturbances would act as secondary points of entry facilitating the spread of Yellow starthistle from initial sites of invasion.

Methods

The study area was located on the grounds of the Lindquist Memorial Gardens of the Wasatch in South Ogden, Utah. Beyond the grounds actively being used by the garden are abandoned pastures dominated by the exotic perennial forage grass *Bromus inermis* and a hillslope dominated by native perennial forbs (*Balsamorhiza sagitatta, Hedysarum boreale,* and *Wyethia amplexicaulis*). My work was conducted both within a pasture not yet invaded by Yellow starthistle (Experiment 1 in Site I) and an immediately adjacent, invaded pasture and hillslope (Experiment 2 in Site II). These two sites were separated by approximately 50 m.

In the uninvaded pasture I identified a 20 x 30 m area to establish 1 x 2 m plots at 20 randomly-selected locations in May 2002. A complete factorial design analyzed the effect of two randomly assigned treatments: 1) soil disturbance (disturbed vs. undisturbed); and 2) nitrogen addition (nitrogen vs. water only). I disturbed plots by clipping vegetation at the soil surface, removing the clipped vegetation, and rototilling the soil to a depth of 15 cm. The nitrogen treatment added approximately 40 g of N to each plot. Each treatment combination was replicated 5 times at the level of whole plots. Within each plot, seeded and unseeded sub-plots (50 x 50 cm) were created and surrounded by a 25 cm buffer zone. Seeded portions were planted with 100 seeds per sub-plot. Unseeded sub-plots were used to estimate the establishment of Yellow starthistle from the existing seed bank or ambient seed rain. Approximately every two weeks after seeding, the number and developmental stage of starthistle plants (seedling, rosette, bolting, or flowering) were recorded for each sub-plot. All flowers produced were counted and subsequently removed from the plot to prevent colonization from unwanted seed rain in subsequent years. In the fall, a second germination event occurred, and the number of established seedlings on each sub-plot was recorded.

In Site II, I created relatively small soil disturbances approximately every 2.5 m along randomly placed transects. Plots were created during the mid-summer of 2000 to allow the accumulation of new seeds on freshly exposed soil during peak seed production, and were observed for two consecutive years (2001-02). I used a paired-plot design (disturbed and undisturbed) with circular, paired plots (25 cm in diameter or 0.05 m^2) separated by 25 cm. Plots were disturbed in similar fashion to those in Experiment 1, except I used a small hand pick-axe to disturb soil rather than a rototiller. On each plot I monitored colonization (# of spring and fall establishing seedlings) and reproductive output (# of starthistle plants).

Discussion

The response of Yellow starthistle to disturbance is very different in the two settings investigated here. Larger-scale disturbed plots in the setting of Site I had a significant, positive influence on spring establishment, survival to flowering, and fall establishment of starthistle compared to undisturbed plots. This result is similar to the response of Yellow starthistle to 1 m^2 plots in the study by Hierro et al. (2006). In contrast, no difference was observed in any measure of Yellow starthistle performance (spring establishment, survival to flowering, flower head production, fall establishment) between the smaller-scale disturbed and undisturbed plots in Site II.

My two experiments differ in several features that may have impact on the response of Yellow starthistle to disturbance: 1) disturbance size; 2) matrix community composition; 3) presence of starthistle in aboveground vegetation; and 4) availability of starthistle seeds. First, and most obviously, plot size differed between these two experiments by a factor of 40 (0.05 m^2 to 2 m^2). Disturbance plot size has been investgated as an important factor influencing colonization by plants and the invasion of non-native species. My results suggest that disturbance size was also important here, with much larger disturbances (2 m^2) more beneficial to starthistle establishment and reproductive output than smaller disturbances (0.05 m^2).

Second, in addition to disturbance size, the vegetation community that served as the matrix for experimental plots differed between the two experiments (*Bromus inermis* dominated Site I vs. *B. inermis* and native forb-dominated hillslope in Site II), and may impact the re-

sponse of Yellow starthistle to disturbance size. Given the consistent lack of difference in starthistle performance between disturbed and undisturbed plots in the smaller-scale experiment when analyzing plots in two drastically different plant communities, I would suggest the different results in Experiments 1 and 2 are likely due to differences in the matrix plant community in Sites I and II.

Third, another potentially influential factor related to community composition that differs between these two studies is the presence of Yellow starthistle, with patches absent in Site I, but common in Site II. In a separate study (Rieder 2005), I found that seedlings survive better when near another starthistle or when surrounded by a high cover of Yellow starthistle, which may reflect that conspecific facilitation is at work in these populations as may occur for other species of *Centaurea*. Thus, in the absence of facilitative effects from Yellow starthistle neighbors, disturbance may more strongly influence the performance of this species, as suggested by results from the larger-scale disturbance.

Finally, the two experiments differed in seeding methodology. The larger-scale plots were experimentally seeded, because the seed bank and yearly seed rain were expected to be low in Site I, while the smaller-scale plots relied on the existing seed bank and seed rain in Site II. Because the seed bank and seed rain were not quantified in Site II, I suspected propagule limitation might influence the results from the smaller-scale plots. While experimental seeding of larger-scale plots generated 16 seedlings/m^2, existing ambient seeds on smaller-scale plots generated 49 seedlings/m^2 in 2001 and 83 seedlings/m^2 in 2002, suggesting adequate propagule pressure in Site II compared to the experimentally-imposed propagule pressure in Site I.

I caution that the effect of nitrogen in Experiment 1 may not be representative of the response of Yellow starthistle to nitrogen. The addition of nitrogen was expected to have a positive, if not synergistic, effect with disturbance, but appeared to have no effect. By mid-summer, perennial vegetation on undisturbed plots receiving nitrogen was noticeably darker green in color than vegetation on undisturbed plots receiving only water, indicating successful application of nitrogen at least to deep-rooted, well-established plants. Quickly drying soils following experimental seed addition, however, may have reduced the availability of nitrogen to establishing Yellow star-thistle seedlings, thereby effectively removing the impact of nitrogen from the experiment.

Left: Aaron Rieder collecting data at the Ogden, UT study site. Grayish plants in foreground are Yellow starthistle skeletons. Photo by J.P. Rieder.

Summary

Given the ruderal traits of Yellow starthistle and evidence from previous work (Gelbard and Harrison 2005, Hierro et al. 2006), I expected that disturbance, even if small (0.05 m^2), would strongly stimulate the establishment and reproductive output of starthistle. This was not the case. Only the larger-scale disturbance plots positively influenced starthistle performance. These two experiments differ strongly in their settings: smaller vs. larger disturbance, grass-dominated vs. forb-dominated plant communities, starthistle neighbors present vs. no neighbors, and naturally available seeds vs. experimental addition of seeds. Given my results, it is unlikely that the differences in the matrix vegetation community or seed availability explain the difference in the response of Yellow starthistle to these two experiments. I suggest that disturbance size and the presence of starthistle neighbors may be important factors that interact to influence the response of this species to disturbance.

This work suggests that the role of disturbance varies given the phase of invasion. Taken together, my results suggest that larger-scale disturbance encourages initial invasion of Yellow starthistle, and once invasion occurs, smaller-scale disturbances are not essential for continued invasion.

References

Gelbard, J.L. and S. Harrison. 2005. Invasibility of roadless grasslands: an experimental study of yellow starthistle. *Ecological Applications* 15:1570-1580.

Hierro, J.L., D. Villarreal, O. Eren, J.M. Graham, and R.M. Callaway. 2006. Disturbance facilitates invasion: the effects are stronger abroad than at home. *American Naturalist* 168:144-156.

Rieder, J.P. 2005. Yellow starthistle in Utah: an investigation of *Centaurea solstitialis* invasion patterns, processes, and population dynamics. Ph.D. dissertation, Utah State University, Logan, UT.

High Mountain Work on the Colorado Plateau

Potential Impacts of Recreation on Rare Plants and Alpine Vegetation of the La Sals

By Barb Smith,
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In the desert country characteristic of the Colorado Plateau, the best place to work on hot summer days has to be the La Sal Mountains (although a raft on the Colorado River is also very nice….). The highest peaks in southeast Utah are also a popular place to recreate, and that was the impetus for a baseline study to monitor the impacts of recreation to alpine communities that we conducted last summer in the La Sal Mountains. With a grant from Canyonlands Natural History Association (CNHA), researchers from the local Moab district of the Manti-La Sal National Forest and the Rocky Mountain Research Station in Flagstaff AZ set up a study to answer the question: Is recreational use of the alpine portions of the La Sal Mountains impacting soil and vegetation resources?

The La Sal Mountains are a special part of the Colorado Plateau, supporting one of the few true alpine communities in the region. These values were formally recognized when the high summits and ridges of Mt. Mellenthin, Mt Peale (the highest peak at 12,721 feet in elevation) and Mt Tukuhnikivatz were designated as a USDA Forest Service Research Natural Area (RNA) in 1988. The main objective of an RNA is to preserve pristine representative habitat types. RNAs are part of a national network of areas set aside for research, education and maintenance of biological diversity. Forest Service management of RNAs emphasizes protection against serious environmental disruptions so that the areas can serve as a baseline for measuring long-term ecological changes.

The Mt. Peale RNA was established specifically to protect ecosystem structure and function in representative alpine and subalpine habitats. The area represents alpine herb communities, glacial features, and high mountain landforms. While there are 318 RNAs in the Intermountain, Rocky Mountain, and Great Plains regions of the Forest Service, there are only four in Bailey's Northern Canyonlands Ecological Section*. Outside of the Uinta Mountains, there is limited representation of alpine communities in Utah.

Above: La Sal daisy, Erigeron mancus*, is a rayless member of the sunflower family endemic to the La Sals of SE Utah. Photo by Barb Smith.*

In the Mt Peale RNA Establishment Record recreation was not identified as a specific threat to RNA values and ecosystem processes. Nonetheless, there was an objective to establish monitoring plots to assess the impacts of recreation use in the alpine environment. In recent years there has been increased demand for recreation special use permits in Moab and La Sal area, including greater interest in peak climbing. To fulfill its management obligations for the RNA, the Forest Service wanted to identify current conditions in the Mt Peale area. Trailing, trampling and other human impacts to alpine soils and vegetation have been well documented in the scientific literature, along with the long recovery times required in these harsh environments. Increasing recreational use and other factors such as drought and climate change have the potential to adversely impact the vegetation and soil condition of the alpine habitat.

The La Sal Mountains support a unique alpine vegetation community which contains several endemic plant species. One Forest Service Sensitive plant species, the La Sal daisy (*Erigeron mancus*), is found nowhere else in the world. There are also at least 10 other plant species known only from the La Sals in the state of Utah. These include *Podistera eastwoodiae*, *Oreoxis* [*Cymopterus*] *bakeri*, *Besseya alpina*, *Saxifraga bronchialis* and *Carex perglobosa*. Many of these species have a NatureServe state rank of imperiled or critically imperiled. The high talus slopes of the La Sals also support another unique alpine obligate, the La Sal subspecies of the American pika (*Onchotona princeps lasalensis*).

* Bailey ecoregions are geographic regions defined by similarities in vegetation, climate, soils, species composition, and other ecological factors. Robert Bailey developed a classification of 47 ecoregions covering the United States for the Forest Service in the 1980s.

Of the 2380 acres in the Mt. Peale RNA, alpine vegetation covers approximately 360 acres. Five broadly defined types of habitat have been identified in the RNA, three in the alpine zone and two in the forested, subalpine zone (100 acres). As part of our project, these were systematically sampled, focusing on vegetation and soil conditions. Most of the alpine vegetation is made up of well-developed alpine turf and alpine turf -rock community types. The majority of the area is dominated by talus and barren rock (2020 acres).

Noteworthy Findings

We found that the majority of the plots sampled were in a pristine condition. The impacts noted were largely related to movement or displacement of rocks on steep talus slopes. There were a few areas with user-created trails. However, we didn't get to all the areas we wanted to sample on the middle group of peaks, so we hope to get back up there this summer (when it is really hot in the Moab valley) and establish more transects around Mt Peale.

In addition, the field work revealed a relatively continuous series of *E. mancus* patches along the west ridge up to Mt. Laurel, from the talus field at 11,400 ft. to 11,900 ft just above treeline, as well as along the Middle Group crestline at 12,000 ft. Other than the formal description of the species and its geographical range, little is known about the population biology of this species. We observed that La Sal daisy can be abundant within its microhabitat niche on dry, windy ridgelines but less abundant to absent on nearby more mesic midslopes.

Our research crew also collected numerous plant specimens, including some new species for the area. Rock columbine, *Aquilegia scopulorum*, is a new record for the La Sals. Patterson sagewort, *Artemisia pattersonii*, is a new record for Utah. These were identified and curated at the Rocky Mountain Herbarium in Laramie, Wyoming.

Future Work

In addition to the recreation study, the researchers were looking at plants of the alpine community to compare to others areas where they have established alpine studies, including on the San Francisco Peaks in Arizona and the Rocky Mountains in Colorado. When the crew saw our interesting endemic La Sal daisy, Dr James Fowler of the Research Station became excited about the opportunity to do an elevational density gradient study as a way to monitor climate change impacts to alpine plants. With another Discovery Grant from CNHA, the research crew will be coming back to do more work on the La Sals this summer.

The work in 2009 will measure changes in density of La Sal daisy along an elevational transect on a ridge in the middle group. By measuring patch width along this elevational transect we can calculate patch size and (using our density measurements) we can then estimate population size for this area. We will also record all vascular plant species within each sampling frame along the transect, both to delineate species closely associated with *E. mancus* and to describe how plant species composition changes from treeline to crestline. This data set will then form a basis for detection of climate change effects with future resampling at 5-10 year intervals.

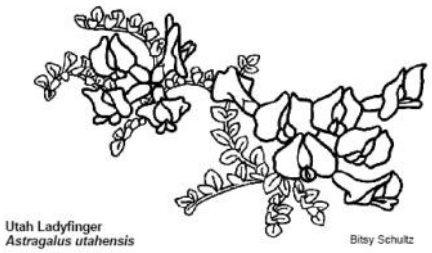
Rock columbine, Aquilegia scopulorum*, is a new record for the La Sals. Patterson sagewort,* Artemisia pattersonii*, is a new record for Utah. These were identified and curated at the Rocky Mountain Herbarium in Laramie, Wyoming.*

We also propose to conduct two small exploratory studies relating to future climate change. First, a survey to detect the Black rosy finch (*Leucosticte atrata*) along the same elevational transect from treeline to the Middle Group crestline. The black rosy finch is restricted to the alpine habitats in the summer. The LaSals are at the southern end of black rosy finch summer range and thus this population may be at risk with future warming climate.

The second exploratory survey involves the snow glade at treeline on the north base of Mt. Mellenthin. Climate models predict that mean annual temperature will increase and that precipitation patterns will change in future decades. Either of these can affect the amount of snowfall and the longevity of snow cover. Snow glades are defined by late lying snow (until mid-summer) which restricts conifer establishment. Under a reduced snowfall scenario this graminoid-dominated habitat may be converted to spruce-fir forest over time. We propose to inventory the vascular plant species present within the snow glade and survey possible future transect locations to detect vegetation shifts due to changes in snowmelt timing.

The Rocky Mountain Research Station is developing a network of alpine RNAs in the west to look at the effects of global climate change on ecotonal communities of vascular plants at tree limit elevations and above. Shifts in tree demography and changes in herbaceous plant community composition will be early indicators of a warming climate scenario. Jim Fowler, Ecologist with the Rocky Mountain Research Station in Flagstaff, is the Principle Investigator. Co-PIs are Barb Smith, Wildlife Biologist with the Manti-LaSal National Forest, and Bill Block, Program Manager for the Wildlife and Terrestrial Ecosystems Program.

With numerous peaks over 12,500 feet in elevation, the La Sal Mountains not only provide a stunning visual contrast to the canyonlands of the Colorado Plateau, but also support one of the few true alpine communities in the region. There is growing concern about the potential effects of global climate change on these isolated alpine ecosystems. The La Sal Mountains support many endemic plant species in a Research Natural Area with a management emphasis on research and protection of pristine conditions and biological diversity. It is a great place to work!



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