Sego Lily

Newsletter of the Utah Native Plant Society

May 2007 Volume 30 Number 3

Kaiparowits milkvetch (*Astragalus malacoides*) can be recognized by its pinkish-purple pea-like flowers and slipper-shaped fruits. It is restricted to the Kaiparowits Plateau, Circle Cliffs, and Henry Mountains of southern Utah. Kaiparowits milkvetch is one of the signature plants of the Grand Staircase-Escalante National Monument, created by President Clinton under the Antiquities Act in 1996. Not well known as a biogeographer, Clinton nonetheless noted in his monument proclamation that "...the blending of warm and cold desert floras, along with the high number of endemic species, places this area in the heart of perhaps the richest floristic region in the Intermountain west." For more about the flora and vegetation of the Grand Staircase-Escalante National Monument, see the article beginning on page 6. Illustration by Kaye Thorne.

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UNPS Spring Conference in Kanab and Grand Staircase area—May 18-20. See page 7 for details and to RSVP

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Utah Native Plant Society

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Sego Lily Editor: Walter Fertig (walt@kanab.net). Articles, photos, and illustrations from members are welcome and encouraged. The deadline for the July 2007 Sego Lily is 15 June 2007.

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 Garvin (356-5108), or write to UNPS, PO Box 520041, Salt Lake City, UT, 84152-0041 or email unps@unps.org

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Chapter News

Cache: We contributed 200 dollars for the creation of a Native Plant Garden for CAPSA - Community Abuse Prevention Services Agency, a non-profit organization dedicated to helping victims of domestic violence and sexual assault. The garden will provide a place for relaxation and peace for clients. We will also provide labeling of plants and occasional volunteers for maintenance at the garden.

The Annual Spring Wildflower Walk is scheduled for May 15th, at 6PM, at the Green Canyon Parking Lot (approximately 1600 East and 1900 North in North Logan). Knowledgeable botanists will be there to show off our spring wildflowers and provide some stories about the native plants (and some non-indigenous ones) of Northern Utah. Contact springhike@saabra.org or call 435-752-2732 for more information.

Alternascapes 2007, sponsored by Master Gardeners of Cache Valley and the Utah Native Plant Society, will be held on June 23, from 4:00 to 8:00 PM. This is a self guided tour of Native Plant and Waterwise gardens in Cache Valley. At least five gardens are planned to be on the tour this year. Hosts and garden owners will be at each venue to answer questions, discuss waterwise gardening techniques, and to tell stories about their gardens. Tickets are available at the Cache County Extension Office (435-752-6263) in Logan (next to the historic courthouse—back entrance) or at the Cache Valley Gardeners Market Information Booth - Saturdays starting May 12 at the corner of 200 East, and 100 South, Logan. Send inquiries to alternascapes@saabra.org or call 435-753-1130 (We could also use help with the tour). – *Steve Ripple*

Escalante (Garfield County): For the April monthly meeting, the Escalante Chapter hosted a talk by Kristin Legg, Bryce Canyon National Park's Chief of Resources and Research. Kristin spoke about the native plants that call Bryce Canyon home. Back in March the chapter substituted a work day out on Escalante's Main Street for a regular meeting. Almost 20 people volunteered their time to prune, deadhead, and remove trash from the planters and strips along Main Street. – *Allysia Angus*

Fremont (Richfield area): On March 15, the UNPS state board voted to accept the Fremont Chapter as the newest chapter of the society. At least 10 members have enrolled in the new chapter centered in Richfield. Rebecca Harms and Ron Parsons were elected as co-chairs, Jean Wood as secretary, and Janet Nielson as Treasurer. Thanks go to BLM botanist Maria Ulloa for helping get the chapter started.

Manzanita (Kane County): At our March meeting, Carolyn Shelton gave a lively presentation on writing and illustrating one's own personal nature journal. In April, Dorde Woodruff came to town and regaled the group with the story of her 40 year + research on an unusual light-flowered population of Small-flower fishhook

cactus (*Sclerocactus parviflorus*) from the Cottonwood Road area of Grand Staircase-Escalante National Monument. Saturday, April 28 will be our annual spring wildflower sale with Great Basin Natives and Wildland Nursery again on hand with their wares. The sale will be on the lawn of the Kane County Office of Tourism at 78 South, 100 East from 9 AM to noon.

Doug Reynolds will speak about conservation of landscapes vs. restoration at our special Friday, May 18 meeting that coincides with the UNPS spring board meeting and a weekend of field trips open to all UNPS members. See page 7 for full details
– *Walter Fertig*

Salt Lake: Our April meeting featured Amber Richman of the USDA-APHIS-PPQ. She discussed how insect biocontrols are being used to fight several invasive plant species in Utah. These insects undergo years of testing and research before being released into certain areas of the state. The insects can often be host specific, such as the tamarisk beetle from Kazakhstan, and rid areas of their preferred food within one to several years.

On Saturday May 12th, the Salt Lake Chapter will be holding a native plant sale at REI on 3285 East 3300 South from 9am-4pm. Great Basin Natives will be bringing in native trees, shrubs, and perennials in various sizes. If you would like to volunteer for this event, please contact Kipp Lee at kipp_lee@comcast.net or Liz Schubert at liz@utahrox.com.

If you have a native plant garden that you would like to show off, we are in the process of arranging a Native Plant Garden Tour. If you are interested please contact Kipp or Liz.

Our monthly meetings have ended for the season. We will begin the first Wednesday of the month in September. – *Kipp Lee*

Utah Valley (Utah Co): Every Tuesday at 3:30 PM our chapter is working with students at Wasatch Elementary (1040N 900E, in Provo) on the Heritage Garden. Call Bitsy Schultz for more information 423-2603.

Every Thursday Morning at 10 AM our Plants and Preschoolers group has resumed. We go on short walks tailored to young children, but everyone is welcome. Come join us, as these walks have been very fun and full of exploration. We hike trails throughout Utah County. Call Celeste Kennard (801) 377-5918 or email her at celeste.p.kennard@gmail.com for details or to suggest a trail.

Saturday May 12th at 9 AM we will be going on a Field Trip to the Shoreline Trail. We will most likely be accessing the Trail from Rock Canyon unless the blooming of a speices of flower calls us to another location. R.S.V.P. to Celeste Kennard (contact info above) for details. – *Celeste Kennard*

Utah Valley Chapter Field Trip: come see most of Utah's amazing cacti at one place, including the rare and endangered species. Jeff Mitchell has collected seeds and grown them all. He has done all the work get permits to grow the protected ones. Time: May 12, 1 PM; cacti bloom in the full sun. Place: Jeff Mitchell's house: 1923 N 280 W, Orem, UT. Contact: Robert Fitts, 801-796-8631. – *Robert Fitts*

Upcoming Events

28 April 2007: TNC Field Trip to see Dwarf bearclaw poppy: Join The Nature Conservancy on a wildflower walk near St. George, Utah. Led by rare plant expert Dr. Renée Van Buren, we will see the dwarf bearclaw poppy, found in Washington County and nowhere else on Earth. Date: Saturday, April 28, 2007. Time: 8:00 a.m. to noon. Place: directions given upon RSVP. RSVP: (801) 531-0999 or to hnedreberg@tnc.org by close of business on Tuesday, April 24. Event is free of charge. Since the trip is limited to 20 people, pre-registration is required.

Intermountain Herbarium Summer Workshops: The Intermountain Herbarium at Utah State University is pleased to announce the following workshops:

Introduction to Mushroom Identification This very popular yearly workshop introduces beginners to the wide, wonderful and fascinating world of macrofungi (mushrooms). Held over two days, the first evening is devoted to facts, fiction, and all things fungal, while day two is a day long adventure in the field finding and discussing the mushrooms of Logan Canyon. When: Friday May 18 (6:30 pm) and Saturday May 19 (9:00 am). Where: Intermountain Herbarium on the campus of Utah State University. Cost: $30 for UNPS members ($35 otherwise). Registration ends May 11, and the limited space fills up very quickly! Instructor: Michael Piep, Assistant Curator of the herbarium and Bridgerland Mushroom Society President.

Willow Identification Join the herbarium and Al Winward (USDA Forest Service – retired) on a day long adventure learning to identify native willows (*Salix* sp.) in beautiful Logan Canyon. A key will be provided, but field characteristics will be emphasized. When: Saturday June 9. Where: Intermountain Herbarium on the campus of Utah State University. Cost: $20. For more information contact the Intermountain Herbarium or see http://herbarium.usu.edu/.

Spurge Purge a Success

The myrtle spurge weed exchange at REI went fabulously on April 14. The weather was perfect and lots of people had heard about the event through the diligent efforts of many organizers (even notices to individual homeowners in some East Bench neighborhoods). We had 177 participants who collectively brought in well over a ton of spurge (and a few Dalmatian toadflax, Dyer's Woad, and even some creeping Jenny!). The native plants we handed out in exchange for the spurge were excellent, thanks to Janett Warner and her fellow growers, and the information packets we were giving out to participants were super and will continue to educate and inform. All the organizers deserve a round of applause! – *Therese Meyer*

Conservation Groups Respond to USFWS Reversal on Listing Graham's Penstemon

In January 2006, the US Fish and Wildlife Service (USFWS) proposed to add Graham's penstemon to the endangered species list. Instead of finalizing protections, in December 2006 the Service suddenly reversed course and claimed that threats were no longer present. In response, citizens in Utah and Colorado have warned the Secretary of Interior and the Director of the Service that a lawsuit will follow unless USFWS protects this rare wildflower in the next two months.

"The claim that new scientific information underpins the decision to withdraw listing of Graham's penstemon as Threatened is inaccurate," stated Dr. Vincent Tepedino. "No such evidence exists." Dr. Tepedino, a recently retired Utah State University professor, attempted to investigate the penstemon's pollination biology, but found almost no flowering plants and no seed production during 2004 and 2005. He is a coauthor to the Lewinsohn et al. (2005) report cited in the Service's December rule.

This reversal was similar to many others made by the Service in recent years. On March 23rd, the Inspector General for the Department of Interior issued a report detailing chronic interference in Endangered Species decision making by political appointee Julie MacDonald. The report stated, "we confirmed that MacDonald has been heavily involved with editing, commenting on, and reshaping the Endangered Species Program's scientific reports from the field. MacDonald admitted that her degree is in civil engineering and that she has no formal educational background in natural sciences, such as biology". House Natural Resources Committee Chair Nick Rahall (D-WV) has pledged to hold hearings investigating political interference and suppression of science in Endangered Species decisions made by the Service. The Endangered Species Act specifically requires that endangered species listing decisions be based solely on the best available science.

"The scientific integrity of the country's Endangered Species program is at stake now," said Erin Robertson, Senior Staff Biologist for Center for Native Ecosystems. "Secretary Kempthorne must ensure that threatened wildflowers like Graham's penstemon have a real shot at avoiding extinction."

Graham's penstemon, a member of the snapdragon family with brilliant lavender-pink flowers, only inhabits oil shale outcrops in the Uinta Basin of northeastern Utah and adjacent Colorado. The penstemon was first considered for Endangered Species Act protection in 1975, when the Smithsonian drafted the first list of plants to be protected under the Act. After nearly 30 years without action, and with threats mounting, conservation groups formally petitioned the Service to protect the penstemon in 2002.

Above: Graham's penstemon photo by Susan Meyer from Center for Native Ecosystems website.

"This is one of the rarest and most threatened plant species in Utah," said Tony Frates with the Utah Native Plant Society. "The failure to list this species in 2006 was a result of politics rather than science."

The Service admitted in the December reversal that 88% of the penstemon's populations are in areas where active oil and gas exploration is already taking place. It also acknowledged that all three of the formal scientific reviewers of the Service's January 2006 proposal to protect the penstemon "felt that our proposed rule justified listing" (71 Fed. Reg. 76026 (Dec. 19, 2006)).

The January 2006 listing proposal cited the following threats: "Habitat destruction and degradation as a consequence of energy development throughout the species' range pose a serious threat to long-term viability. Habitat loss and fragmentation also will exacerbate threats arising from very low natural population numbers and restricted distribution; natural phenomena such as drought and wildlife grazing; livestock grazing; and horticultural collection" (71 Fed. Reg. 3164 (Jan. 19, 2006)).

"Graham's penstemon is very rare in Colorado," said Dave Anderson with the Colorado Native Plant Society, "and it is threatened by oil and gas drilling. We believe it deserves a fair chance, and that its merits as an Endangered Species should be reevaluated."

The Endangered Species Act requires that citizens provide notice to the government 60 days before they intend to sue regarding violations of the Act. The Notice of Intent to Sue was filed on April 5, 2007 by Center for Native Ecosystems, Utah Native Plant Society, Colorado Native Plant Society, and Southern Utah Wilderness Alliance. The Interior Department could avoid a lawsuit by reinstating the proposal to protect the penstemon and moving forward with finalizing the protections.

- Erin Robertson

New and Improved Utah Plant Atlas Now On-Line

In the early 1980s Beverley Albee, Leila Shultz, Sherel Goodrich, and colleagues undertook an effort to map the distribution of most of the vascular plant species of Utah. Seven years and 400,000 herbarium specimens later, *Atlas of the Vascular Plants of Utah* was published as a hardcover book by the Utah Museum of Natural History in 1988. This landmark publication contained distribution maps of 2438 plant species depicted on a base map of shaded topographic relief and county boundaries. Long out of print, a digital version of the atlas has been hosted by Utah State University for more than a decade.

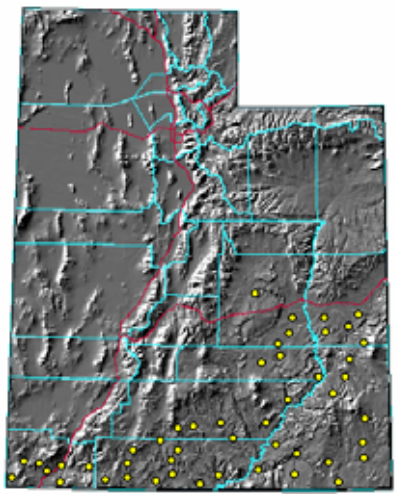
Unfortunately, the original atlas from the 1980s has become dated as new distribution records and new species have accumulated over the past 20 years. Several years ago, Leila Shultz, Douglas Ramsey, and Wanda Lindquist of Utah State University recognized the need to overhaul the static printed version of the atlas with an interactive, web-based version that could be more readily updated and take advantage of advances in GIS technology. The result of their efforts is now available with the release of the *Digital Atlas of the Vascular Plants of Utah* (http://earth.gis.usu.edu/plants/index.html).

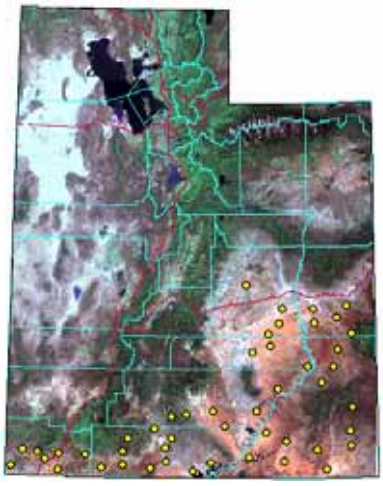
The revised atlas includes 419 new species that were not depicted in the original version (these are mostly rare species or taxa discovered or described in Utah since 1988). Nearly 500 taxonomic name changes have been made (relevant synonyms are used in the master checklist to aid those unfamiliar with many of the changes). In addition, over 8400 new locations have been added from herbarium specimens collected since 1988 and from the archives of the Utah Conservation Data Center.

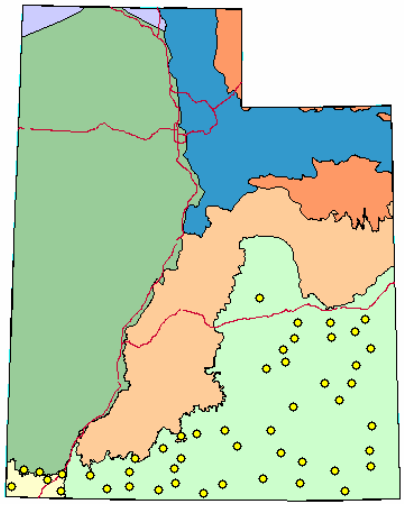
But the best part of the revised atlas is the many new bells and whistles. Instead of just a base map of shaded relief, the atlas user can now substitute other layers, such as a satellite mosaic, TNC ecoregions, or a plain background of county lines (see examples at right for *Dimorphocarpa* [*Dithyrea*] *wislizeni).* Each location point on the map is now linked to a live database that provides additional information on the source of the record and often its Township and Range. The authors have also provided an annotated checklist of Utah species by each of the state's seven ecoregions (as defined by The Nature Conservancy).

The digital atlas will be kept revised as new location records become available, so unlike a printed book, it will always stay up-to-date. The atlas should remain a valuable reference for anyone interested in the distribution of Utah's flora for many years to come. – *Walter Fertig*

*Below: Shaded relief (top), satellite mosaic (middle), and TNC ecoregion (bottom) maps depicting the distribution of Spectacle-pod (*Dimorphocarpa wislizeni*) in Utah from the new* Digital Atlas of the Vascular Plants of Utah.







Flora and Vegetation of Grand Staircase-Escalante National Monument

By Walter Fertig

Grand Staircase-Escalante National Monument (GSENM) was established in September 1996 when President William J. Clinton invoked the Antiquities Act to protect nearly 2 million acres of remote canyons and slickrock mesas in Kane and Garfield counties, Utah. In addition to spectacular scenery, the new monument contained a rich trove of geological, archaeological, paleontological, biological, and historic wonders that were to be managed as an outdoor laboratory to further scientific research. The lands comprising the monument were primarily administered by the federal Bureau of Land Management (BLM) and Utah state trust lands (swapped to BLM in 1999). In an unusual precedent, Secretary of Interior Bruce Babbitt kept the new monument under the jurisdiction of BLM rather than turning it over to the National Park Service. GSENM became the flagship of the BLM's new National Landscape Conservation System, an effort by the bureau to modify its historic role from promoting mining, livestock, and extractive industries on the "lands no one wanted" to being more conservation-minded stewards of important scientific and recreational areas.

In the proclamation creating the monument, President Clinton devoted an entire paragraph to extolling the botanical and ecological values of the region. Indeed, GSENM has the highest plant species richness of any protected area in Utah (exceeding even Zion National Park) and is second only to Grand Canyon National Park in the Colorado Plateau ecoregion. Much of the species diversity of the monument can be attributed to its location near the boundary of three major centers of plant speciation: Colorado Plateau, Mohave Desert, and Utah High Plateaus. In addition, GSENM's size and elevational breadth capture a wide array of vegetation types, ranging from desert shrublands to montane coniferous forests and riparian woodlands.

Floristic Diversity

At a scientific conference celebrating the first anniversary of the monument in 1997, Leila Shultz of Utah State University predicted that on-going floristic and ecological research would ultimately bring the GSENM flora to about 1100 taxa. Since then, 233 new vascular plant species have been discovered within the monument, bringing the current flora to 1002 taxa. An additional 100-200 species are known from the vicinity of the monument in Kane and Garfield counties, and may still be found in GSENM.

Above: Stella's evening-primrose (Oenothera caespitosa *var*. stellae) *and Kodachrome bladderpod (*Physaria [Lesquerella] tumulosa), *two Utah endemics from the Paria River Member of the Carmel Formation, south of Cannonville on GSENM. Stan Welsh named the new variety of evening-primrose after his wife, Stella in 2003. Photo by W. Fertig.*

The vast majority of species documented in GSENM were collected by Stan Welsh, Duane Atwood, and colleagues from Brigham Young University during floristic surveys for the proposed Kaiparowits power plant in the early 1970s and again from 1992-93 and 1997-2002*. Over the years, however, the monument area has attracted many other botanical luminaries, including Marcus E. Jones, Ellen Powell Thompson, Alice Eastwood, John T. Howell, Basset Maguire, Walter Cottam, B.F. Harrison, Dwight Ripley, Rupert Barneby, Noel Holmgren, James Reveal, and Arthur Cronquist, who all added significant collections, including nearly three dozen type specimens from GSENM and vicinity. Since 2001, Welsh and Atwood have described at least five new taxa that were first recognized during their surveys of the monument (Lori's columbine, Stella's evening-primrose, Murdock's evening-primrose, White chia, and Smoky Mountain globemallow).

GSENM contains about 26% of the entire flora of Utah and 46% of the flora of the Colorado Plateau section of the state. Nearly 75% of the monument's 1002 species belong to just 16 plant families, led by the sunflower family (Asteraceae, 179 taxa), grass family (Poaceae, 119 taxa), pea family (Fabaceae, 82 taxa), and mustard family (Brassicaceae, 57 taxa).

* Since the BYU study ended in 2002, 43 additional plant taxa have been added to the monument flora by Laura and Walter Fertig, Peter Lesica, Elaine Kneller, Max Licher, Anne Walka, Sean Stewart, and others. The two latest additions (Ripgut brome and Canada bluegrass) came in June 2006 during a field trip to Calf Creek Falls by the Manzanita and Escalante chapters of UNPS.

Although often ecologically dominant, trees and shrubs account for only 14% of the monument's plant species. Herbaceous species (a.k.a. 'wildflowers') are the dominant growth form with 695 species. Just over 200 species of wildflowers are annuals that complete their entire life cycle in one year and are often only prevalent during years of sufficient winter or spring precipitation. About 15% of the monument flora is comprised of perennial and annual grasses and grass-like plants (sedges and rushes).

Biogeography

GSENM resides entirely within the Colorado Plateau physiographic province, a broad regional uplift centered on the Four Corners region of Utah, Colorado, New Mexico, and Arizona. The Colorado Plateau has a unique flora adapted to the region's aridic continental climate, canyon and mesa topography, and layer-cake geology of Mesozoic and early Tertiary marine, lacustrine, or ancient coastal sandstones, limestones, and shales. Due to the variety of habitats and isolation provided by wide rivers and deep canyons, the Colorado Plateau is regarded as one of 12 major centers for the evolution of new plant species in western North America. The plateau region has the highest concentration of endemic plant species in the intermountain west and the highest species richness of any ecoregion in Utah. Approximately 18% of the flora of the monument (178 species) consists of plant species that are restricted to the Colorado Plateau.

The lower stairs of the Grand Staircase near Kanab (Chocolate and Vermilion cliffs) have been described as the "Dixie Corridor" connecting the floras of the Colorado Plateau and the Mohave Desert of southwestern Utah and southern Nevada. The Dixie Corridor lies at the northern edge of the distribution of many Mohave or Sonoran desert species, including Whipple's cholla, Mexican manzanita, and Turbinella live oak. In addition, the Dixie Corridor has an unusually high concentration of local endemics restricted to Navajo sand dunes (Welsh's milkweed, Escarpment milkvetch), Moenkopi clay flats (Kane breadroot, Meager camissonia, Atwood's pretty phacelia), and Chinle badlands (Gumbo milkvetch, Murdock's evening-primrose, Kanab thelypody). Many of these local endemics are listed as Threatened, Endangered, or BLM Sensitive and are rare or absent from other portions of the monument.

At higher elevations of the Skutumpah Plateau, White Cliffs, and slopes of Canaan and Boulder mountains, the Colorado Plateau flora is augmented by Rocky Mountain species more typical of the Utah High Plateaus ecoregion. This mountainous spine also acts as an effective barrier to the desert flora of the Great Basin region. Over 40 plant species are endemic to the Utah High Plateaus, many of which have recently been documented for the Grand Staircase region. These include MacDougal's aletes, Zion draba, Panguitch buckwheat, Canaan daisy, Zion daisy, Paria breadroot, and Smooth penstemon.

The number of species in the monument flora has increased by nearly 10% with the establishment of 96 non-native species. The majority of these taxa were introduced inadvertently, but a small percentage have escaped from agriculture (Smooth brome, Orchard grass), restoration projects (Prostrate summer-cypress, Burnet), or home gardens (Peppermint). Six GSENM non-native species are listed as Utah state noxious weeds (Whitetop, Russian knapweed, Bindweed, Quackgrass, Scotch thistle, and Johnson grass).

Explore Grand Staircase-Escalante National Monument during 2007 UNPS Spring Conference in Kanab

The Manzanita (Kane County) Chapter will be hosting the UNPS state board meeting and a general membership event over the weekend of May 18-20. Things will kick off with our monthly chapter meeting at 7 PM on a special night (Friday, May 18) in the public meeting room of the Grand Staircase-Escalante NM visitor center (between Walker's truck stop and Holiday Inn on US Hwy 89 east of downtown Kanab). Our speaker will be Doug Reynolds, retired ecology professor from the Greater Cedar City area who will discuss some of the pitfalls of restoration work and why it is better to conserve lands rather than try to re-create them afterwards. This meeting is free and open to the public and will be followed by a potluck dessert social. On Saturday morning, Walter Fertig of the Kane County chapter will lead a field trip to explore several interesting plant communities along Hwy 89 on GSENM. The trip will leave from the GSENM visitor center parking lot at 8 AM and will return at ca 2 PM. The UNPS Board meeting will be held on Saturday afternoon at the Village cafeteria at Best Friends Animal Sanctuary from 3-5 PM. This will be followed by a potluck social at 6:30 PM hosted by the Kane County Chapter at a private residence at Best Friends. Open to all members and guests. On Sunday, the Kane County chapter will sponsor a morning field trip to Lick Wash off the Skutumpah Road to see many of GSENM's Zion disjuncts. This trip will leave from the monument visitor center parking lot at 8 AM and will conclude by 1 PM. **Those participating in the field trips and potluck are asked to RSVP at walt@kanab.net.** – *Walter Fertig*.

Vegetation

The vegetation of GSENM can be subdivided into five major zones that roughly correspond with elevation, parent material, and precipitation or proximity to perennial water sources. Low elevation upland sites on fine-textured clay or sandy soils with annual precipitation less than 7 inches are vegetated by dry desert shrub and grasslands dominated by members of the goosefoot family (Chenopodiaceae). Desert shrub stands are especially well-developed along the lower slopes and mesas of the Kaiparowits Plateau. Shadscale tends to be the most prevalent species in shrub stands on well-drained alkaline clay sites, while Mat saltbush predominates on clay barrens of the Tropic Shale near the Paria River. Sandy or stony loams with a shallow subterranean hardpan (formed of leached calcium carbonate hardened into a stony layer impervious to water) support stands of Blackbrush (a member of the rose family). Fourwing saltbush mixed with Green mormontea, Sand sagebrush, Purple sage, and Indian ricegrass replace other vegetation on deep sandy soils. Finally, Greasewood dominates in poorly drained alkaline clay soils with a high water table. Unfortunately all of these community types are becoming infested with aggressive, annual exotics (especially Red brome, Cheatgrass, Halogeton, and Mediterranean barley) which make the stands more prone to fire (formerly a rare event). Livestock grazing has also reduced the cover of edible shrubs and native perennial grasses in favor of less palatable subshrubs (especially Broom snakeweed) and warm season grasses (Blue grama and Galleta) and more annual exotics.

Vegetation dominated by Big sagebrush or other sagebrush species replaces desert shrub at higher elevation sites with annual precipitation over 7 inches. Sagebrush stands are characterized by a sparse to dense shrub canopy of *Artemisia* interspersed with other shrubs, biological soil crusts, perennial or annual grasses, and forbs. Basin big sagebrush is the typical form along washes and valley bottoms and in sites with rich, sandy-loam soils. Wyoming big sagebrush is also frequent, especially in clay-rich or gravelly sites and Mountain big sage occurs sparsely at higher elevations on the Skutumpah Terrace. Historically the grass understory of sagebrush communities consisted of a mix of cool season (Needle-and-thread, Indian ricegrass, Muttongrass) and warm season (Blue grama, Galleta) perennial bunchgrasses, but grazing and droughty climates have shifted the balance to less palatable warm season species as well as annual weeds and unpalatable subshrubs like Broom snakeweed. Because sagebrush does not resprout or accumulate a long-lived seedbank, fire can eliminate or reduce sagebrush stands in favor of perennial or exotic annual grasslands.

*Above: Golden mariposa (*Calochortus aureus*) from GSENM by W. Fertig.*

Rocky sandstone slopes and tablelands tend to be dominated by pygmy woodlands of Two-needle pinyon and Utah juniper. Pinyon-juniper woods cover over 770,000 acres of GSENM, making it the monument's most widespread vegetation type. Based on historic records, pinyon- juniper woodlands appear to be expanding over the past century. This "invasion" can be attributed to reduced fire frequencies due to removal of fine fuels by grazing, cessation of Indian-caused wildfires, warming climates, and recovery of woodlands from extensive cutting for fuel and building material following white settlement in the 1880s. Historically, these woodlands probably had a more open appearance but have become denser and woodier from prolonged fire exclusion, making the woods more prone to major fire. Pygmy forests are often replaced by Gambel oak woodlands on sandy benches with high fire frequencies (oaks will readily resprout) or on slopes with deep snow accumulation or frequent landslides.

Forests of Ponderosa pine and Douglas-fir prevail on the highest mesa tops or in deep, shady canyons of the monument. In the past, Ponderosa pine forests typically had an open, savanna-like understory dominated by Greenleaf manzanita and bunchgrasses adapted to acidic soils produced from the abundant needle duff. These open conditions were maintained by periodic, low-intensity ground fires that eliminated other trees and woody vegetation but did not harm the mature, thick-barked pines. Fire suppression has made these stands denser and more susceptible to outbreaks of Mountain pine beetles or catastrophic crown fires. Mountain brush communities of Utah serviceberry, Mountain snowberry, and Chokecherry often replace pine forests on moister slopes, while brushy stands of Alder-leaf mountain mahogany, Cliffrose, and Greenleaf manzanita prevail on rockier or less fertile sites. Moist sites with deep, loamy soils associated with springs or with a

Above: Lori's columbine (Aquilegia loriae) was *described as new to science in 2001 by Stan Welsh and Duane Atwood based on a collection from Lick Wash on GSENM. The latin name commemorates Lori Armstrong, former BLM botanist from Richfield, Utah. Illustration by Elaine Kneller McMullen.*

high water table support Aspen forests in scattered sites on Fiftymile Mountain. Aspen is a clonal species with individual tree boles surviving for 100-150 years and new sprouts forming from root suckers. Regeneration can be hampered by heavy grazing by deer, elk, or livestock or by competition from shade-tolerant conifers if periodic disturbances (such as fire, wind-throw, or disease) do not create the open-canopy conditions favored by aspen sprouts.

The most species-rich plant communities are associated with rivers, streams, springs, or ephemeral wetlands. The main stem of the Escalante River and its more northerly tributaries are characterized by deep, shady canyons and perennial flows that support riparian woodlands and shrublands dominated by Fremont cottonwood, Narrowleaf cottonwood, Coyote willow, Box-elder, and Water birch with a rich understory of herbaceous species. Flooding events frequently reshape the stream channels, scour existing sand and gravel bars, and deposit new sediments. These disturbances can leave the river systems vulnerable to invasion by non-native species, especially Tamarisk and Russian olive. Streams in the Kaiparowits Plateau and Paria, Kanab Creek, and lower Escalante drainages have been especially hard-hit by tamarisk and Russian olive. De-watering and changes in grazing management have also favored replacement of native willows and cottonwoods with less palatable shrubs and herbaceous plants, such as Copperweed, Rubber rabbitbrush, and Baltic rush.

Desert springs and seeps occur sporadically across the monument, especially along contacts between porous sandstones and less permeable shales. Large springs are often mini-oases of Fremont cottonwood and Coyote willow, while smaller seeps on alkaline soils are often dominated by Baltic rush, Scratchgrass, Threesquare bulrush, or Desert saltgrass. Protected seeps associated with shady alcoves or cliffs that maintain cool temperatures support especially lush hanging garden vegetation of Maidenhair fern, Helleborine orchid, Alcove columbine, panicgrass, Golden sedge, and nearly 40 other species.

One of the more unusual wetland communities of the monument are sand seeps associated with sandy swales carved from sandstone bedrock. Sand springs originate from melted snow or precipitation of the current season, rather than from perennial water sources, and so are present only in wet years, such as 2005. When present, the sand springs support communities dominated by uncommon annual or biennial forbs and graminoids, including Hairy mimetanthe, Cottonbatting cudweed, Religious daisy, and Minute rush. On GSENM, sand seeps are most prevalent in deep Navajo blowsands topping the Vermilion Cliffs east of Johnson Canyon, but also occur frequently in the Sand Hills near Coral Pink Sand Dunes just west of the monument.

The flora and vegetation of GSENM contribute significantly to the region's natural beauty and its importance as habitat for wildlife and humans seeking recreation, adventure, or solitude. More importantly, the monument's native plant species have intrinsic value, especially those restricted to GSENM or unprotected elsewhere. These botanical riches were specifically protected in the Presidential proclamation of 1996 and GSENM's 2000 management plan. But protections are only as strong as their enforcement. Budget cuts, political pressure, and shifts in BLM priorities have since undermined GSENM's stated management objectives. It is up to everyone who cares about these lands and their botanical denizens to make sure that the promise of the monument proclamation to future generations is kept.

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Utah's noxious weed law reflects "Old West" attitude

Does "all or nuthin'" really work?

By Maggie Wolf,
UNPS Horticulture Committee Chair

Just like the scene of an old cowboy movie, when the grizzled bad guy points his six shooter at our conscientious hero and drawls "Yer either fer us, or ageen' us," Utah's Noxious Weed law oversimplifies a difficult choice. Once declared "noxious" at state or county level, weeds in public and private land must be controlled by county weed supervisors who often face funding limits. The decision to declare a weed noxious is up to the county's legislative body. Legislators may or may not know how damaging weeds can be. They usually realize that weed control costs taxpayer money and that weed control enforcement often causes political backfire - two things legislators tend to avoid.

"Weed control has traditionally been an agricultural concern," explains Ralph Whitesides, Weed Specialist at Utah State University Extension and a key member of the Utah Weed Control Association's Strategic Plan Steering Committee. This committee met in February 2004 and meets again April 18, 2007.

"Our strategic plan is intended to broaden cooperation and partnerships among agriculture, BLM, Parks, and other agencies," Whitesides explains. Because weeds spread across political boundaries, cooperation among many agencies is critical to success. Still, current law relies on county governments to decide whether or not to take action against weeds that threaten local areas.

"Our [2004] plan also said we would review the Utah Noxious Weed Law," Whitesides notes. "I would really like to see a more tiered approach in our law. That might allow emergency actions funded at the state level to control weeds immediately, rather than waiting until the problem is so widespread we can't do anything about it." County agencies are often under-funded, so when a "new" weed is noticed, it may take more than a year to fund control efforts. Even then, if an adjacent county allows the weed to continue spreading, efforts may be wasted.

Whitesides cites the example of purple loosestrife, an escaped ornamental plant that grows best in wet areas. "It took a long time to get purple loosestrife on the [Utah Noxious Weed] list. Maybe if immediate action had been taken, it wouldn't be as widespread as it is now," he says.

Other states, like Colorado, categorize weed threats at different levels. Weeds may be on "List A"; these weeds must be eradicated wherever detected statewide. "List B" weeds must be eradicated, contained, or suppressed in parts of the state where designated by the commissioner. Weeds on "List C" are widespread and well-established; their control is recommended but not required throughout the state. Local governing agencies may, however, require control of List C weeds within their areas.

*Above: Scotch thistle (*Onopordum acanthium*) from Connecticut Botanical Society*

In Salt Lake County, increasing concern over *Euphorbia myrsinites* has illuminated the limitations of Utah's noxious weed law. Shall our county legislators dedicate tax money for immediate action? Create an unfunded mandate? Or ignore the matter completely? If our law allowed for more incremental weed controls, such simple decisions might become much less difficult.

Utah's Noxious Weed List
18 species are officially designated as noxious for the state of Utah

Bermuda grass (*Cynodon dactylon*)*
Canada thistle (*Cirsium arvense*)
Diffuse knapweed (*Centaurea diffusa*)
Dyer's woad (*Isatis tinctoria*)
Field bindweed (*Convolvulus arvensis*)
Whitetop or Hoary cress (*Cardaria draba*)
Johnson grass (*Sorghum halepense*)
Leafy spurge (*Euphorbia esula*)
Medusahead (*Taeniatherum caput-medusae)*
Musk thistle (*Carduus nutans*)
Perennial pepperweed (*Lepidium latifolium*)
Purple loosestrife (*Lythrum salicaria*)
Quackgrass (*Elymus repens*)
Russian knapweed (*Centaurea repens*)
Scotch thistle (*Onopordum acanthium*)
Spotted knapweed (*Centaurea maculosa*)
Squarrose knapweed (*Centaurea squarrosa*)
Yellow star-thistle (*Centaurea solstitialis*)

* Except for Washington County.

Utah Plant Families:
The Dogwood Family (Cornaceae)

By Walter Fertig

With a name like "dogwood" it is only natural to assume that members of the Cornaceae either bear some resemblance, or are undeniably attractive to our canine companions. In truth, the word dogwood is a corruption of a Scandinavian term "dag", meaning skewer. The hard woody stems of dogwood are excellent for roasting game over a fire or use in basketry or wicker. Indeed, the Latin name for the dogwoods, *Cornus*, translates as "horn" in reference to the hardness of the plant's wood, which has often been used as a substitute for metal in the manufacture of weaving shuttles, bobbins, and farming implements.

The dogwoods are a relatively small family, with about 100 species distributed widely across the northern hemisphere, extending into the mountains of South America and rarely into the tropics. About half of all known species in the family belong to the genus *Cornus*, although taxonomic splitters have suggested dividing this group into as many as eight separate genera.

Utah is home to only one native dogwood, the Red-osier (*Cornus sericea* or *Swida sericea*). Red-osier dogwood gets its common name from the bright red stems (osier is French for long, willow-like shoot) that are especially obvious when the leaves have shed in winter. In this condition the shrub's bark can resemble that of willows with which it shares an affinity for wet soils and damp streamsides. In summer, Red-osier dogwood is easily recognized by its oval to elliptic leaves with prominent veins that gently curve to follow the smooth margins of the blade. Dogwoods are among the few tree or shrub species in the west with opposite leaves (occurring in pairs on opposing sides of a stem, rather than singly in a zig-zag fashion) that are neither lobed nor divided.

The most reliable way to identify a dogwood in leaf is to break the leaf stalk or petiole and slowly pull each half apart to reveal the stringy white pith inside. The pith is part of the network of fibers that give the stem rigidity and flexibility. Dogwood pith is unusual in its elasticity, allowing it to be pulled like cotton candy batter, though it is less edible and less brightly colored.

Like most dogwoods, Red-osier has inconspicuous white flowers with four or occasionally five petals borne in a flat-topped umbrella-like cyme. Flowering dogwood (*Cornus florida*) and Kousa (*C. kousa*) differ in having four large, petal-like, bracts enfolding the inflorescence to create the illusion of a single enormous flower. Neither of these species is native to Utah, though both are occasionally grown as ornamentals, especially in northern counties. Bunchberry (*Cornus canadensis*) has similar flowers but is a low-growing herb instead of a tree or shrub. Additional anatomical differences have prompted some taxonomists to segregate the herbaceous dogwoods into the genus *Chamaepericlymenum*. Unfortunately for those who enjoy the challenge of tongue-twisting Latin names, this group is not found in Utah (though they occur sporadically in the Rockies and across boreal Alaska and Canada).

*Above: Bunchberry (*Cornus canadensis*) is an attractive, herbaceous member of the Cornaceae clan with the characteristic petal-like floral bracts of many, though not all, dogwood species. Bunchberry is not native to Utah, but does occur widely across northern Canada, Alaska, the northern Rockies, and the eastern US. Photo by W. Fertig from near Juneau, Alaska.*

Dogwoods produce showy red or white fleshy fruits that are often as attractive as the flowers. Technically, the fruits are drupes (like cherries) with a single, hard seed inside. Dogwood fruits are an important food source for songbirds and grouse.

Red-osier was one of several plants referred to as "kinnikinik" (meaning "that which is mixed" in Algonquian) for its use by American Indians as a tobacco substitute. The inner bark of young stems was split and scraped into threads and toasted over a fire before being mixed with real tobacco. Though he never admitted to trying it, edible plant aficionado H.D. Harrington noted that Red-osier "is said to be aromatic and pungent, giving a narcotic effect approaching stupefaction". He recommended its use only in moderation.

Perhaps it is fortunate that we have adopted the term "dogwood" over the more linguistically pure "dagwood" for these handsome and useful shrubs. Certainly, the image of a buffoonish cartoon character noted for sleeping on the job and crashing into the postman does not befit the dogwood clan. More importantly, the word dogwood allows for the clever botanical joke, always worth repeating: How do you tell a dogwood? By its bark, of course!

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