

Aquilegia

Newsletter of the Colorado Native Plant Society



“... dedicated to the appreciation and conservation of the Colorado native flora”

Updated generic keys of Poaceae for Southern Rocky Mountain Region, Part 3: *Festuca* L.

by Neil Snow

This is the third of three articles that provides updated dichotomous keys to some ecologically common and species-rich genera of grasses from the Southern Rocky Mountain Region (Snow 2007).

The treatment of *Festuca* by Darbyshire and Pavlick (2007) in *Flora of North America* (Vol. 24) recognizes some species that were, in the opinion of the authors, typically either overlooked or lumped into other taxa. Based on my experience with species recognition (Snow 1997a, Snow et al. 2003), the *FNA* treatment may have split species excessively, given the authors' use of “combinations of overlapping characters” (op. cit., p. 390), as well as the unconventional incorporation of sclerenchyma patterns in the leaf tissues as a component of species recognition. However, since the authors produced their treatment in the context of variation occurring throughout North America, their treatment cannot be dismissed without critical examination. New or resurrected in *FNA* for our region are *Festuca calligera* (Piper) Rydb., *F. earlei* Rydb., *F. trachyphlla* (Hack.) Krajina, *F. subulata* Trin., and *F. hallii* (Vasey) Piper. One species previously recognized for our area, *F. ovina* L. (Sheep fescue), is now considered absent from our area (Darbyshire and Pavlick, 2007).

The following key of *Festuca* for taxa from the Southern Rocky Mountain region is based on information contained in the treatment of *Flora of North America* and specimens housed mostly at the UNC Herbarium in Greeley (GREE). The range of variation for some characters reported in *FNA* may fall beyond the range found in our region. However, my previous experience with

grasses (e.g., Snow 1997b) suggests that relatively little variation therein will fall substantially outside the range of material from our area. The one likely exception may be the geographically widespread *F. rubra*, of which subspp. *commutata* and *rubra* are recognized for our area. The key uses vegetative characters when possible first, followed by reproductive characters. This key may not work if none of the spikelets have developed to full size prior to anthesis.

Of all the characters indicated in the *FNA* key, the presence of “short rhizomes” (for *F. earlei* and *F. hallii*) can be the most difficult to ascertain. Indeed, few of the specimens at GREE fit this description, although *F. earlei* is not uncommon in our region in CO and northern NM, and *F. hallii* is reported to occur in Albany Co., WY, and Jackson Co., CO.

Finally, it bears noting that two species treated variously in *Festuca* or *Lolium* have been transferred into *Schedonorus* as *S. arundinaceus* (Schreb.) Dumort. and *S. pratensis* (Huds.) P. Beauv. in *FNA* Vol. 24.

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Key to Species of *Festuca*

1. Culms generally less than 50 cm tall.....	2
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2. Short rhizomes often present (do not confuse with extravaginal tillers arising through the bases of older leaf sheaths); ovary apex at least sparsely hairy.....	3
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3. Ovary apex pubescent; spikelets 4.5-7 mm; lower glume 1.5-3 mm; lemma 3-4.5 mm; anthers 0.6-1.4 mm.....	<i>F. earlei</i> Rydb.
3. Ovary apex sparsely pubescent; spikelets 6.5-9.5 mm; lower glume 5-9.5 mm; lemma 5.5-9 mm; anthers 4-6 mm.....	<i>F. hallii</i> (Vasey) Piper
4. Ovary apex sparsely to densely pubescent.....	5
4. Ovary apex glabrous.....	9
5. Anthers usually < 1.7 mm.....	<i>F. minutiflora</i> Rydb.
5. Anthers > 1.7 mm.....	6
6. Anthers ≤ 2.5 mm.....	7
6. Anthers > 2.5 mm.....	8
7. Spikelets 5-5.8 mm long; lower glume 3.5-5 mm; florets 2, rarely 3; lemma awns 1.5-3 mm.....	<i>F. dasyclada</i> Hack. ex Beal
7. Spikelets 6-12 mm long; lower glume 1.8- 4 mm; florets 3-5, rarely 2 or 6; lemma awns (2.5)5-15(20) mm.....	<i>F. subulata</i> Trin. (in part)
8. Ovary apex densely pubescent; spikelets (6)8-16 mm; lemmas 5.5-9 mm, awns absent to 2(3) mm.....	<i>F. arizonica</i> Vasey
8. Ovary apex sparsely pubescent; spikelets (6)7-9(11) mm; lemmas 3.8-6 mm, awns 1-2.5 mm.....	<i>F. calligera</i> (Piper) Rydb.
9. Anthers usually ≤ 1.7 mm.....	10
9. Anthers ≥ 1.8 mm.....	12
10. Culms shortly but densely hairy beneath inflorescence.....	<i>F. baffiniensis</i> Polunin
10. Culms glabrous to scabrous beneath inflorescence.....	11
11. Plants generally less than 20 cm; lemma awns 2-3.2 mm; anthers 0.5-1.3 mm.....	<i>F. brachyphylla</i> Schult. ex Schult. & Schult. f. (see FNA for varieties)
11. Plants frequently over 20 cm; lemma awns (0.4)1-2.5; anthers (0.8)1.2-1.7(2) mm.....	<i>F. saximontana</i> Rydb. (see FNA for varieties)
12 (9). Sheaths closed in lower third; ligule 0.5-1.2 mm; lemma 3.8-6.5 mm, awns 0.5-3 mm; anthers 1.8-3.4 mm.....	<i>F. trachyphylla</i> (Hack.) Krajina
12. Sheaths closed in lower half; ligule 0.2-0.6 mm; lemma 5-8.5(10) mm, awns (1.5)3-6(7) mm; anthers 2.4-4.5 mm.....	<i>F. idahoensis</i> Elmer
13. Rhizomes generally present; sheaths generally closed about ¾ of their length.....	<i>F. rubra</i> L. subsp. <i>rubra</i>
13. Rhizomes absent, intravaginal tillers at base sometimes present (<i>F. sororia</i>).....	14
14. Ligule 2-5(9) mm.....	<i>F. thurberi</i> Vasey
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15. Leaf blades flat, greater than 3 mm wide; intravaginal tillers often arising from base of sheaths.....	16
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16. Lemmas unawned or awns to 2 mm long; Archuleta and Mineral counties, CO and northcentral New Mexico.....	<i>F. sororia</i> Piper
16. Lemmas (2.5)5-15(20) mm long (Rio Blanco Co., Co.).....	<i>F. subulata</i> Trin.
17. Ovary apex glabrous.....	18
17. Ovary apex sparsely to densely hairy.....	19
18. Leaf sheaths closed in lower 1/3; ligule 0.5-1.2 mm; lemma awns 0.5-3 mm; Eurasian; infrequent in southern CO and northern NM.....	<i>F. trachyphylla</i>
18. Leaf sheaths closed in lower ½; ligule 0.2-0.6 mm; lemma awns (0.5)3-6(7) mm; abundant locally in the foothills and above (mostly absent from eastern plains).....	<i>F. idahoensis</i>

19. Ovary apex densely pubescent.....*F. arizonica*
19. Ovary apex sparsely pubescent.....20
20. Florets (2)4-6; upper glume 2.8-5 mm; lemma 3.8-6 mm, awns 1-2.5 mm; anthers 2.2-3.5 mm; scattered in grasslands and montane forests from 2500-3400 m from central WY sporadically through CO and NM.....*F. calligera* (Piper) Rydb.
20. Florets 4-6; upper glume 6.2-9.5 mm; lemma 5.5-9 mm, awns 0-1.3 mm; anthers 4-6 mm.....*F. hallii*

ACKNOWLEDGMENTS

Many specimens of *Festuca* at GREE were recent gifts from the Rocky Mountain Herbarium (RM), University of Wyoming. Thanks go to Dr. Ron Hartman, curator of RM, who has donated thousands of Colorado duplicates to herbaria in Colorado. Support to work on Poaceae in the summer of 2007 was provided by the National Science Foundation (DBI-0237149) to N. Snow.

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Festuca dasyclada
 USDA-NRCS PLANTS Database / Hitchcock,
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 Publication No. 200. Washington, DC.

New Plant Species in Colorado and a Call to Action

by Neil Snow and Steve L. O’Kane, Jr.

Floristic exploration in Colorado continues to add species to the Colorado flora that are either range extensions from neighboring areas, newly discovered disjuncts, or more importantly, species entirely new to science.

It seems amazing that four new species were described in 2006-07 as a result of the *Flora of North America* project and the now-completed *Four Corners Flora*. (Look for it in the coming year or so). All four of these species belong to the Mustard Family (Brassicaceae). Remarkably, all four new species appear to be endemic to Colorado. Brassicaceae have more endemic species in Colorado (23) than any other plant family. Additional survey work is needed to better understand the habitat, distribution, and conservation requirements of these species.

Descurainia kenheilli was described by Dr. Ihsan Al-Shehbaz (Missouri Botanical Garden). This diminutive, fall-flowering, and exceedingly rare tansy mustard was collected by Ken Heil (San Juan College, New Mexico) while doing fieldwork for the *Four Corners Flora*. The plant occurs in the alpine tundra at Stony Pass near Silverton. A survey in September of 2007 failed to find additional individuals or populations of this species.

Draba malpighiacea was described by Al-Shehbaz and Dr. Michael Windham (Duke University), while examining specimens of *Draba* for a treatment of the genus for the *Flora of North America*. (The volume containing Brassicaceae should be available at the end of this year). This new species is found at elevations above about 9600 feet in Hinsdale, La Plata, and

Montezuma counties. Several of the collections were obtained as a result of fieldwork for the *Four Corners Flora*.

Physaria scrotiformis was described by Steve O’Kane and is restricted to nearly barren exposures of the Leadville Limestone on West Silver Mesa in La Plata County. He has been studying the genus *Physaria* (bladderpod – which now includes most of the species formerly included in *Lesquerella*) for the past twelve years. O’Kane noticed that in several states this commonly low-elevation,



Lesquerella gooddingii
USDA-NRCS PLANTS Database

desert genus has evolved relatively rare and localized alpine species in Nevada, Utah, Idaho, Montana, and Wyoming. In Colorado an example was known from the Mosquito Range (*Physaria alpina*). No such endemic alpine species was known, however, from the San Juan Mountains of southwestern Colorado. Science, however, enables us to make predictions: Given that members of *Physaria* surround the San Juan Mountains, there should be an alpine species if suitable habitat is present. Suitable habitat for *Physaria* almost always means barren, wind-swept limestone. Is there any of this present in the San Juans? Not much. All potential limestone habitat was surveyed during the

course of investigations for the *Flora of the Four Corners*. It was not until the final year of fieldwork for that project that a slab of alpine limestone was examined near Durango. And guess what? There was the new species! Ain’t science grand?

Dr. James Reveal (now retired but active at Cornell University) and O’Kane described *Physaria pulvinata*, which occurs in gray shale outcrops in Dolores and San Miguel counties. The discovery of this species entails one of those strange coincidences that occur in science. As

O’Kane was preparing a conservation report on *Physaria (Lesquerella) parvula* (a northwestern-Colorado and northeastern-Utah endemic), he discovered that some specimens from southwestern Colorado were identified as this species. The specimens from the University of Colorado were mailed to Iowa, where he examined them. Upon looking at them, O’Kane immediately remarked “this is a new species.” Here’s the amazing part: at that moment Reveal called O’Kane on the telephone to ask about a possible new species that he had collected in southwestern Colorado. After Reveal described the new find, O’Kane said “You’re not going to believe this, but I have three specimens of what you’re talking about on my desk right now!” The rest is history. Reveal and O’Kane described the species as new to science.

Other plant taxa occurring in Colorado and newly described during the past decade or so include *Boechera glareosa*, *B. villosa*, *Cryptantha gypsophila*, *Mentzelia rhizomata*, *M. multicaulis* var. *uintahensis*, *Navarettia saximontana*, and *Physaria vicina*. Combining these with the four

new species of mustards, it is evident that on average more than one new plant taxon per year, new both to science and Colorado, is being discovered each year. Yet how many people in the Centennial State, including those who would consider themselves nature enthusiasts, are aware of this?

A call to action:

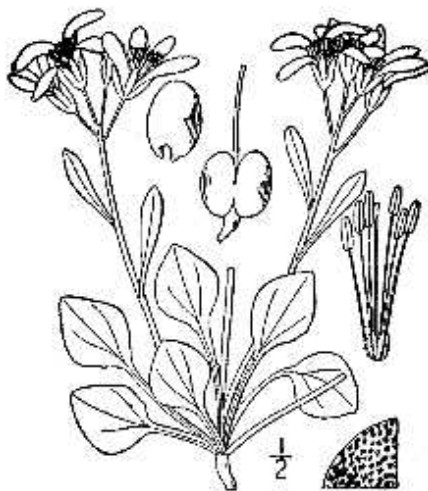
(1) Colorado is still not thoroughly explored botanically. Professional and amateur botanists have a lot to do. Go to seldom visited or unvisited areas, collect well-documented specimens (location, latitude, longitude, elevation, ecological setting, habitat, date), and deposit your specimens with a recognized herbarium. If you do not know how to make professional-quality specimens, consult your local herbarium, plant expert, or do an internet search on "herbarium specimens." Keep in mind: The more remote the area, the greater the likelihood a botanist has not been there. Such hard-to-reach areas typically include regions distant from trailheads, areas that generally require horses or four-wheel drive vehicles to access, and some of the larger private ranches. Areas with unusual geologic substrates (e.g., limestone, dolomite, gypsum, volcanic tuff) or ecological properties (e.g., fens) will often harbor new discoveries.

(2) Why have the plant discoveries of the past decade received little if any coverage by state newspapers and media outlets? As native plant aficionados, are we partially responsible for the lack of coverage? Should the *Colorado Native Plant Society* consider forming a committee whose sole mission would be to alert state and local media sources about important new discoveries, and designate a spokesperson from the Society who contacts media outlets in this regard? These are important considerations, since broader reporting of

such discoveries in the media might enhance public support of native plant-related topics, conservation measures, and perhaps even augment membership levels in the CONPS. One such article was recently published by Snow in *The Durango Herald* after the features editor welcomed the unsolicited contribution [www.durangoherald.com/asp-bin/article_generation.asp?article_type=earth&article_path=/earth/08/earth080306_2.htm].

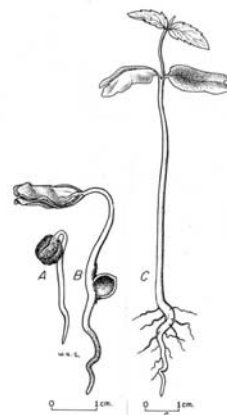
In our view the Colorado Native Plant Society has a wonderful opportunity to further its mission simply by contacting media sources and conveying to them interesting, local botanical news.

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Physaria didymocarpa
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 2: 156.

Celtis laevigata
W.H.L. @ USDA-NRCS PLANTS Database



Announcing the 5th Annual Colorado Rare Plant Symposium

September 5, 2008; 8:00 am-4:00 pm
Holiday Inn Express
Montrose, Colorado

Help decide the future of rare plant work in Colorado! Join members of the Colorado Rare Plant Technical Committee (RPTC) for the 5th Annual Colorado Rare Plant Symposium. The RPTC is an ad hoc group of agency and NGO botanists that has been working for years to advance rare plant efforts in the state. Your personal knowledge of Colorado field botany makes your contribution to this effort critical. This one-day workshop will be held in collaboration with the Colorado Native Plant Society's Annual Meeting (Sept. 5-7). The RPTC will provide a photo review of globally imperiled (G2) species known predominantly from southwestern Colorado for discussion of their current status and potential threats, as well as present highlights from last year's symposium. The symposium is open to any one with an interest in the rare plants of Colorado. Contact Jill Handwerk for more information at (970) 491-5857 or jill.handwerk@colostate.edu. We hope to see you there!

CONSERVATION CORNER

Native Alternatives to Invasive Ornamentals

by Sarada Krishnan

The biological diversity of our planet is being depleted rapidly due to the direct and indirect impacts of humans. The primary factors contributing to the loss of species are habitat loss, introduced species, over-exploitation, and pollution. Introduced species are those that have been accidentally or intentionally introduced into an environment in which they did not evolve. In their new environment, because there are no natural enemies to limit their reproduction and proliferation, these species usually spread vigorously.

In Colorado, noxious weeds have displaced at least 10% of our native plant species and severely degraded important wildlife habitats of more than 85% of our wildlife species. The Colorado Noxious Weed Act defines a noxious weed as a non-indigenous (non-native) plant species meeting one of the following criteria, designated by a local advisory board:

1. aggressively invades or is detrimental to economic crops or native plant communities;
2. is poisonous to livestock;
3. is a carrier of detrimental insects, diseases, or parasites;
4. detrimentally affects, either directly or indirectly, the environmentally sound management of natural and agricultural ecosystems.

The Colorado Noxious Weed Act categorizes the state noxious weed list into three lists:

List A plants have limited distribution and abundance and hence all populations can be eradicated. Wherever detected, these species should be eradicated statewide.

List B includes species that have firmly established with discrete statewide distributions. The spread of these species are designated to be stopped by eradication, containment and suppression.

List C plants are widespread and established. For these species, control is recommended, but not required since coordinated action is not yet possible

Though not all exotic species are invasive, there are some invasive ornamentals that continue to overtake vast areas of land across Colorado. Some of these species have unwittingly escaped into natural areas from our gardens. Some of the ways in which home gardeners can help in the control of noxious weeds is by planting native alternatives to these invasive ornamentals. The table below lists some of the List A and B species that were intro-

duced as ornamentals, but have become invasive, as well as native plants that can be planted as alternatives.

The Horticulture and Restoration Committee of the Colorado Native Plant Society has developed a list of plant species to avoid for Landscaping, Revegetation, and Restoration. This list also provides a listing of native alternatives, which can be found at the CONPS website at the following link: http://www.conps.org/pdf/Horticulture%20&%20Restoration/species_avoid.pdf.

Another useful reference is the booklet published by the Colorado Weed Management Association titled *Garden Smart Colorado: A Guide to Non-Invasive Plants for Your Garden*.

Sarada Krishnan is the Chair of the Conservation Committee for CONPS and is the Director of Horticulture at the Denver Botanic Gardens. 



Saponaria officinalis
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown.
1913. An illustrated flora of the northern United States, Canada
and the British Possessions. Vol. 2: 73.

Invasive Ornamental Species			
Scientific Name	Common Name	Colorado Noxious Weed Act Listing	Native Alternatives
<i>Euphorbia cyparissias</i>	Cypress Spurge	List A	<i>Eriogonum umbellatum</i> (Sulphur Flower); <i>Calylophus serrulatus</i> (Sundrops)
<i>Euphorbia myrsinites</i>	Myrtle Spurge	List A	<i>Arctostaphylos uva-ursi</i> (Kinnickinnick); <i>Mahonia repens</i> (Creeping Mahonia); <i>Eriogonum umbellatum</i> (Sulphur Flower)
<i>Hieracium aurantiacum</i>	Orange Hawkweed	List A	<i>Erysimum capitatum</i> , (Wallflower); <i>Sphaeralcea coccinea</i> (Globemallow)
<i>Lythrum salicaria</i>	Purple Loosestrife	List A	<i>Epilobium angustifolium</i> (Fireweed); <i>Liatris punctata</i> (Spotted Gayfeather); <i>Monarda fistulosa</i> (Beebalm); <i>Penstemon strictus</i> (Rocky Mountain Penstemon)
<i>Salvia aethiopis</i>	Mediterranean Sage	List A	<i>Antennaria</i> spp. (Pussytoes); <i>Artemisia</i> spp. (Native Sage)
<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy	List B	<i>Achillea lanulosa</i> (Native Yarrow); <i>Erigeron speciosus</i> (Showy Daisy)
<i>Clematis orientalis</i>	Chinese Clematis	List B	<i>Clematis ligusticifolia</i> ; (Native Clematis); <i>Humulus lupulus</i> (Native Hops Vine)
<i>Elaeagnus angustifolia</i>	Russian Olive	List B	<i>Shepherdia argentea</i> (Silver Buffaloberry); <i>Sorbus scopulina</i> (Greene's Mountain Ash)
<i>Linaria dalmatica</i> and <i>L. vulgaris</i>	Dalmatian Toadflax and Yellow Toadflax	List B	<i>Thermopsis</i> spp. (Golden Banner); <i>Aquilegia chrysantha</i> (Yellow Columbine); <i>Erysimum asperum</i> (Wallflower)
<i>Hesperis matronalis</i>	Dames Rocket	List B	<i>Aquilegia caerulea</i> (Blue Columbine); <i>Campanula rotundifolia</i> (Harebells); <i>Penstemon secundiflorus</i> (Sidebells Penstemon)
<i>Matricaria perforata</i>	Scentless Chamomile	List B	<i>Achillea lanulosa</i> (Native Yarrow); <i>Anaphalis margaritacea</i> (Pearly Everlasting)
<i>Saponaria officinalis</i>	Bouncing Bet	List B	<i>Penstemon strictus</i> (Rocky Mountain Penstemon); <i>Cleome serrulata</i> (Rocky Mountain Beeplant); <i>Geranium caespitosum</i> (Wild Geranium)
<i>Tamarix</i> spp. (including <i>T. chinensis</i> , <i>T. parviflora</i> , <i>T. ramosissima</i>)	Saltcedar	List B	<i>Ribes cereum</i> (Wax Currant); <i>Amorpha fruticosa</i> (Leadplant); <i>Oreobatus deliciosus</i> (Boulder Raspberry)
<i>Tanacetum vulgare</i>	Common Tansy	List B	<i>Chrysothamnus nauseosus</i> (Rabbitbrush); <i>Potentilla fruticosa</i> (Shrubby Cinquefoil)
<i>Verbascum blattaria</i>	Moth Mullein	List B	<i>Eriogonum umbellatum</i> (Sulphur Flower); <i>Calylophus serrulatus</i> (Sudrops); <i>Thermopsis</i> spp. (Golden Banner)

WHO'S IN THAT NAME?

William Weber

by Al Schneider

Throughout 2008, *Aquilegia* will publish "A Discussion with Dr. William Weber." If you have further questions, contact Al Schneider at webmaster@conps.org. Dr. Weber will answer your questions on the CONPS website Botanical News page.

Dr. Weber, please tell us about your philosophy of plant classification, that is, lumping plants under one name or splitting them into a number of species.

I have to ask some questions of those who ask about lumping and splitting:

1. Do you not like scientific names and would rather we have a standard set of common names? This is obviously impossible; we would become isolated. The Scandinavian countries have lots of amateurs because of their devotion to their patron saint, Linnaeus, and their relatively small floras (we have possibly twice as many flowering plants in Boulder County than they have in Norway, and they are all publishing lists of common names, old or newly created for the vascular plants, mosses, lichens, and fungi! The Russians have common names, and so do other countries whose amateurs do not use English. We cannot have a supreme court to decide what the right name for a plant is. There are the International Rules of Botanical Nomenclature. The scientific method, not international law, is operative.

2. Do you just not like to have to learn so many names? When I was inducted into the Linnean Society of London, William T. Stearn (Botanical Latin) told me, "I don't like all of these small genera. It is impossible for me to keep track of them." He did not use a computer, I am sure.

3. How many plants have you seriously studied? Have you examined submicroscopically seeds, trichomes, pollen grains, cross sections of leaves? How much traveling have you done? Have you seriously studied an entire flora of even a small area?

4. How good is your English vocabulary? Do you know the English meanings of the Latin or Greek words used in naming and describing plants? Or are your adjectives limited to "cool" and "awesome"? A good vocabulary, knowledge of grammar, and spelling, is useful [for understanding and using scientific names].

If you are not put off by these questions, we can go on to the two words, "splitter" and "lumper". My life spans almost a century now, and I grew up accepting the nomenclature of the few botanists who had provided the manuals that I used: M. L. Fernald (*Gray's Manual*) and Abel Joel Grout (*Mosses with a Hand Lens*). I knew nothing about evolution or chromosomes (they were spiremes then). I went through all of graduate school accepting the



Pulsatilla patens
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 2: 102.

species and genera that they and my professors used.

I will never forget that, when I came to Colorado, I was still naive. Our earliest spring flower, *Pulsatilla*, I was still calling *Anemone*, although it was like no other *Anemone* in North America and had a coterie of Eurasian relatives that are "universally" (except here) called by that name. When Professor Edna Johnson saw that I was listing *Anemone patens* in the Boulder flora as *Anemone*, she said "My, you are a lumper, aren't you?" I had never been exposed to a large dose of Rydberg, and I had a lot to unlearn.

Splitting and lumping were in the air those days, but it had mostly to do with the species. There were lots of new ones to be discovered. The western collectors like Greene and Jones were madly trying to outdo each other in finding them, and sometimes they cut the lines a bit too closely and described as new the products of normal variability. Splitters complicated things for the practitioners, and many of these "species" were found to be insignificant. However, the collectors did observe things about them. Askeell Löve, realizing this, used to tell me, "It is better to split than to lump, because if you sink these names into synonymy you may be losing information." This is certainly true. However, the historical "splitting" of the early days is not significant now, because collectors are better trained in the scientific method, and special creation is not part of the serious botanist's creed.

Most of the criticism I get about my "splitting" comes with my concepts of the genus. First of all, actually I have pub-

lished very few names of new genera. I was sometimes told to leave the genera to the specialists, but I find that this was because the critics believed I was isolated and not in the real world and did not see the whole picture. There certainly is a sort of caste system among the specialists vis-a-vis the generalist. However, I find that if one publishes ones treatise in FNA, as I did with the helianthoid Asteraceae, one's genera become acceptable.

Because of the waves of new information systems that began with the discovery of polyploidy and were succeeded by numerical taxonomy, chemotaxonomy, cladistics, and DNA, the higher categories (genus and above) are becoming more controversial. In fact, a major battle is now being joined between those for whom the new concepts demanded by one or more of these disciplines dictate one outcome for the specialist and another for the generalist, and are being seen to lose sight of the fact that many aspects of classification are being ignored.

The disciplines that cladistics and DNA seem to ignore are the barriers to hybridization. Different chromosome numbers can inhibit crossing; habitat preferences, historical geography, specificity of pollinators, and other factors deeply discussed by Dobzhansky, Mayr, and Stebbins, are being ignored. A deeper understanding of the plant, other than morphology, must be considered. The amateur has to understand that there are features that are known to the specialist that the amateur cannot possibly verify with the tools available. Lichens, for example, in many instances, cannot be recognized in the field as genera because their definitive characteristics are the structures of the

ascus, the spores, the spermatia, or certain specific chemicals.

This is a confusing time for amateurs and many working professionals, such as gardeners, foresters, and ecologists, because the understanding of the genera (and families, if you think about the Scrophulariaceae!) is in a state of flux, and some compromise will ultimately have to be made to make our science acceptable to the family of people who must use plant classifications on a daily basis. I do not know what this will be, if it ever occurs.

Now let's think of some of the genera we have in Colorado. In a relatively small segment of the world's flowering plant genera, I'd like you to think about whether it is useful or not to think in terms of the

ably have had a long evolutionary history. They are genera to me. Take the genus *Prunus*. Almost everyone knows how different the following generic segregates are: *Padus* (Choke Cherry), *Amygdalus* (Apricot), *Cerasus* (Cherry). How can *Pentaphylloides*, *Argentina*, and *Drymocallis* all fit into the monster genus *Potentilla*? Then there are the gentians: *Gentiana*, the huge plants of the Alps that are the types of the genus; the fringed gentians *Gentianopsis* (bottle gentians), *Pneumonanthe* (little gentians), *Gentianella* (Arctic gentian), *Gentianodes* (Lapland gentian), *Comastoma* and Siberian gentian (*Chondrophylla*). And what about the huge genus *Euphorbia*, which has saguaro-like trees in Africa and

Asia. And, in the Asteraceae, the little weed of the garden, the only true *Senecio*, a monster genus that needs to be broken up, since it has distinctive "subgenera" in Europe and Asia, as well as in North America. Not to ignore *Sonchus*, another garden weed that has a number of trees in the Canary Islands, these recently separated into the genus *Taeckholmia*.

I believe that the FNA treatments will be just as troubling

and disturbing to amateurs and professionals as mine. The score is not in yet, but I believe I am winning. Nevertheless, the taxonomic system is going to continue to be a changing and perhaps improving one for a long time to come.

Bill is revising his Colorado Floras and welcomes comments on past editions. Send to bill.weber@colorado.edu.



Potentilla glandulosa

Bob Moseley @ USDA-NRCS PLANTS Database / USDA NRCS. 1992. Western wetland flora: Field office guide to plant species. West Region, Sacramento.

generic segregates (what are now being called subgenera) whose names I accept although I did not myself propose them. Consider the Rosaceae; there are other families that demonstrate the same thing. *Rubus* is one example. Here is a monster genus that is held together simply because of the raspberry-like fruits. It includes the thorny shrub, but also the herbaceous *Cylactis* (Arctic Raspberry), *Rubacer* (Thimbleberry), *Oreobatus* (Boulder Raspberry), and *Chamaerhodos* (Cloudberry). These are genera that prob-

Chapter News and Announcements

Boulder Chapter

Boulder Chapter meetings are typically held on the second Thursday of each month (Autumn through Spring) at 7:00pm. Meet at the Community Room in the center of the REI Store at 1789 28th Street, between Canyon and Pearl, in Boulder. We are delighted that Pam Sherman and Cathren Smith have agreed to become the new Boulder Chapter Co-Presidents. Pam will host the monthly meetings and answer some of the mail. Cathren will be a program creator for the Chapter meetings in 2008-2009. For more information, visit www.conps.org or contact Chapter Co-President Pam Sherman at pamsher123@msn.com. Help make 2008 zero waste and bring your own cup and plate.

Metro-Denver Chapter

Monthly meetings of the Metro-Denver Chapter are typically held on the fourth Tuesday of the month (October through May) at 7:00pm. Meet in the Waring House, just south of the main entrance to the Denver Botanic Garden. For more information, visit www.conps.org or contact Chapter Co-Presidents Megan Bowes and Vickey Trammell at vickey4conps@hotmail.com or 303-795-5843.

Northern Colorado Chapter

Northern Chapter meetings are typically held the first Wednesday of the month (Oct- April) at 7:00pm. Meet at the Gardens on Spring Creek, 2145 Centre Ave., Fort Collins Prior to meetings, members meet at 5:30pm for dinner with the speaker at Café Vino, 1200 S College Ave. Please join us. For more information, visit www.conps.org or contact Chapter President Denise Culver at 970-491-2998 or Denise.Culver@colostate.edu.

Southeast Chapter

Activities for the Southeast Chapter are scheduled throughout the year and are often held in Colorado Springs at the Beidleman Environmental Center on Caramillo Street, north of Uintah, off Chestnut. For more information, visit www.conps.org; or contact Liz Klein at 719-635-5927 or eliza-klein@gmail.com, Elsie Pope at 719-596-4901, or Doris Drisgill at 719-578-1091 or 719-322-3902. The Chapter is recruiting for the office of President.

July 13 **Curley Peak and Chute Park Field Trip**
Aug 16 **Fourmile Creek**

Plateau Chapter

Chapter activities are scheduled throughout the year. For more information, visit www.conps.org or contact Chapter President Jeanne Wenger at 970-256-9227 or stweandjaw@acsol.net. The Chapter is recruiting for the office of President.

June 14 **Pinyon Mesa Field Trip**
June 28 **Sheep Mountain Field Trip**
July TBA **Draba Field Trip**
Aug 9 & 10 **Rough Creek Iron Fen Field Trip**
Aug 23 **Grand Mesa Fens**

San Luis Valley Chapter

Chapter activities are scheduled throughout the year. For more information, visit www.conps.org or contact Chapter President Cindy (Chinle) Beaver at 719-256-5291 or beaver@fairpoint.net

June 28 **Wolf Creak Pass Field Trip**
July 27 **Alamosa Canyon and Summitville Field Trip**
Aug 16 **Sedges Educational Program**

Southwest Chapter

The Southwest Chapter explores, preserves, and enjoys the flora of the Four Corners area through activities that are scheduled throughout the year. We welcome new ideas for field trips, activities, and programs, and we especially welcome new members from Colorado, New Mexico, Arizona, and Utah. For more information, visit www.conps.org or contact Chapter President Al Schneider at 970-882-4647 or webmaster@conps.org. The Southwest Chapter is sponsoring numerous field trips throughout summer and fall. See www.conps.org/southwest.html for details. All trips are free and open to everyone.

June 14 **Hershey Ranch, Pagosa Spgs. Field Trip**
June 21 **Turkey Creek near Pagosa Field Trip**
June 20-21 **Intro to Wildflower Id. Workshop**
June 28 **Black Canyon of the Gunnison N.P. Field Trip**
June 28 **Wolf Creek Pass Field Trip**
July 12 **Williams Creek Research Natural Area Field Trip**
July 19 **Common Grasses of San Juans Field Trip**
July 26 **Pass Creek Trail, Coal Bank Pass**
Aug 18 **Mesa Verde National Park Field Trip**

Book Reviews

Garden Smart Colorado: A Guide to Non-Invasive Plants for Your Garden. Shonle, Irene, et al. Centennial, CO: Colorado Weed Management Association, 2007. \$1.00.

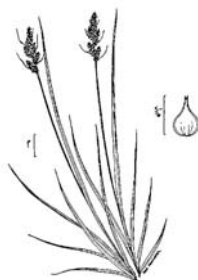
Reviewed by Jan Loechell Turner

Featuring 15 plants on the Colorado noxious weed list, *Garden Smart Colorado* is a colorful booklet providing the gardener with alternatives to invasive garden plants. Each two page spread discusses a noxious weed, such as Russian-olive, and provides native and horticultural substitutes.

Myrtle spurge (*Euphorbia myrsinites*) is a featured weed from the Colorado Noxious Weed List “A” (List A species are designated by the Commissioner of the Colorado Department of Agriculture for eradication). The common and scientific name of the plant, a color photo, and information about threats posed by the weed are followed by photos and descriptions of native and cultivated plants that could be used instead. As native alternatives to myrtle spurge, Kinnickinnick (*Arctostaphylos uva-ursi*) is recommended for high elevation gardens and creeping mahonia (*Mahonia repens*) for lower elevations. Creeping sedum (*Sedum* spp.) and white horehound (*Marrubium rotundifolium*) are proposed as the high and lower elevation cultivated options. Icons indicate whether the plants are invasive, whether they are Colorado natives, their sun/shade requirements, and water needs. Each entry concludes with a list of additional recommended plants.

The cover illustration is by Mary Ann Bonnell, who gave a humorous and informative presentation at the 2007 CONPS Annual Meeting. A good feature is the inclusion of an index by common name. Other items that should be considered for future editions of this guide are a reference to CONPS and its web address for access to the online list, *Suggested Native Plants for Horticultural Use on the Front Range of Colorado*, a bibliography including recommended books and web sites for more information, and scientific names in the index.

Jan Loechell Turner is the Co-President of CONPS and an Associate Professor at Regis University Library.



Grasses of Colorado. Robert B. Shaw. Hard Cover. Pages: 662. Illustrations: 12 b/w photos, 345 line drawings, 345 maps, 3 tbls. Suggested price \$75.

Reviewed by Pat Murphy

When you want a complete flora, you would like it to have a key, plant descriptions, line drawings, distribution maps, habitat preferences, and useful, interesting comments... while being waterproof and weightless. *Grasses of Colorado* has it all, except the waterproof and weightless features. At 2.2 pounds this may be a little heavy for the fanny pack, but easy to keep in the car, and quite light compared to Harrington or the *Intermountain Flora* (Volume 6) weighing in at four pounds. There are a lot of grasses in Colorado's diverse terrain, and it is nice to have them so well presented in one book.

Robert Shaw is currently a professor at Texas A&M, but spent many years at Colorado State University. He has compiled a real “keeper,” which he acknowledges has been built on a long history of previous works that have helped us to “see” the grasses. The introductory information is superb and includes a discussion of the importance of grasses, the physiography and ecoregions of Colorado, and an excellent discussion of grass anatomy and plant structure with line drawings. I have already listed the completeness of the actual contents of the flora, but there is also a glossary of terms and an index that lets you find species using either the old or new nomenclature. Isn't that nice!

We will surely carry this book at CONPS, so you may be able to look it over at book sale events. Of course I haven't had a chance to test the key, but the time for that has arrived. So, back to the weight issue — at only 0.11 ounce per species, this book will always be with me, at least in the car. Oh, and the waterproof issue — it should fit in a gallon size ziplock, no problem.

Carex vulpinoidea
USDA-NRCS
PLANTS
Database / USDA
NRCS. Wetland
flora: Field office
illustrated guide to
plant species.
USDA Natural
Resources
Conservation
Service.

Pat Murphy is a botanist/plant ecologist and is President of Ecotone Corporation and member of the CONPS Sales Committee.

Society News and Announcements

CONPS FIELD STUDIES

The Colorado Native Plant Society annually collaborates with various agencies, academic institutions, and other partners in field studies to promote the conservation and management of Colorado's rare plants. The Field Studies committee sponsors plant inventories and other studies by CONPS members or authorized non-members or groups. The Committee maintains records of species identified and makes plant lists available to members, as well as other interested individuals, as a means of furthering knowledge and appreciation of our native Colorado flora. You are invited to participate in conducting field studies such as performing general plant inventories in rare habitats, counting or monitoring rare plants at known sites, assisting graduate students in collecting field data about rare plants they are studying, or performing focused field surveys for a particular target species or plant community.

Field trips are lead either by a CONPS coordinator or other person conducting the study. Trips are typically one or two days in length, and may require overnight stays. Field sites can be anywhere in Colorado.

Field studies are a rewarding and hands-on way to view Colorado's rare plants in their habitats, and your help contributes to the understanding of their ecology, distribution, and conservation needs.

To help defray travel costs, CONPS funds are available to those who participate and request this assistance. In 2008, a \$50 stipend can be awarded to travelers for each day in the field. An additional \$50 can be awarded for preparation of a field studies report that may be used in the CONPS newsletter and on our web site. The report should briefly discuss the experiences of the attendees and general field findings. There is a limit of four \$50 stipends for enthusiastic individuals and one \$50 stipend for a report per trip. There are a limited number of openings (usually 5-15) for each trip and you must contact the trip leader to participate. Typically, accommodations and meals are not provided for participants on Field Studies trips; however, you will get details about these when you sign-up.

For information about the Field Studies Committee, please contact Steve Popovich (Field Studies Chair) at sjpopovich@fs.fed.us or (970) 295-6641. We hope to hear from you!

CONPS 2008 Field Studies Trips

We are planning a healthy 2008 Field Studies program, with trips on both east and west slopes. Trip details can be found on the Field Studies web page at http://www.conps.org/field_studies.html or contact Steve Popovich.

June 20-22 **Pollination biology for *Penstemon degeneri***
June 27-29 **(Degener's beardtongue)**
July 4-6 Join Carol English on her on-going thesis
July 11-13 research near Canyon City.
July 18-20

July 10-11 **Survey for *Penstemon penlandii* (Penland's**
Penstemon)
Join Denver Botanic Gardens and Colorado
Natural Areas staff near Kremmling.

August 2 **Wetlands Inventory in Mount Zirkel Wilderness**
Join Forest Service Botanists and Colorado
Natural Heritage Program Staff near
Steamboat Springs.

VOLUNTEERS NEEDED

WHEN: Thursday to Monday, June 26-30, or ANY PORTION of this five days that works for you.

OVERVIEW: The 25,000 acre Arapaho National Wildlife Refuge, near Walden, Colorado, protects critical wildlife habitat along 27.4 miles of the Illinois River. The refuge is gorgeous, with abundant elk, moose, birds, and a spectacular panorama of surrounding mountains. WRV has been traveling to the refuge for five years, doing river restoration and working on a boardwalk. Volunteers will construct up to 500 feet of boardwalk near the Illinois River. This adds to the 850 feet of boardwalk and a 50 foot bridge we constructed over the past three years. Our work will re-establish public access, especially for persons with disabilities, while protecting the river's riparian habitat. Number of Volunteers: 25. Minimum Age: 16 with adult.

TO SIGN-UP OR GET MORE INFO: Please visit WRV's website at www.wlrv.org, and click on "Projects." You can also send email to info@wlrv.org or call 303-543-1411.

Society News and Announcements

WANTED: YOUR HELP!

Do you want to volunteer for CONPS, but are just not sure how you can help? Here are some ideas for projects you can do at your own pace. These are tasks that can make a difference for our Society.

Indexer - Someone is needed to compile a title and author index for *Aquilegia* starting from the first issue to the most recent.

Historian - If you enjoy historical research, you may enjoy investigating and documenting the early history of CONPS and its founders.

Membership list help - We need someone to add expiration dates to the members mailing list.

Digitizer - Do you have a scanner or are you willing to learn how to use one? You could help create a digital archives of *Aquilegia* by scanning past issues of the newsletter.

Native gardener column - If you are a native gardener, please consider writing or coordinating a column about gardening with native plants. Ideally, articles should be submitted four times annually and need be no longer than 500 words.

Marketing - Would you like to get the word out about CONPS? Your help marketing would be appreciated.

Superhero(ine) - Would you like to lead a hike, give a talk, run a plant sale, offer a pot luck or garden tour, donate digital photographs, work on publications, write an article, or serve on a marketing and fund-raising committee? There is always a need for help.

Is there another project you would like to work on that could help the Society? Please contact us with your ideas and your energy. You could be our superhero(ine)!

VOLUNTEERS NEEDED FOR ANNUAL MEETING IN MONTROSE!

Please consider volunteering to help at our Annual Meeting, which is being held in Montrose from 5-7 September 2008. We need volunteers to help with registration, the silent auction, and refreshments. Volunteers are also needed to: solicit local merchants for donations, help with the book sale, contact local plant nurseries for native plants to decorate and be auctioned off, and help with media.



DONATIONS NEEDED

Do you have old issues of *Aquilegia* that you would be willing to donate for our archives; we are especially interested in obtaining the following issues to complete a set: Vol. 26 No. 4, 6; Vol. 28 No. 1-3, 5-6; and Vol. 31 No. 4. Please contact us with a list of issues that you would be willing to contribute. We are also interested in compiling handouts from past workshops. Digital images and other photographs are being solicited. We are particularly interested in those images of historical importance to CONPS, such as people and events; images of unusual native plants, plant communities, and plant-animal interactions are also of interest.

Landscape photos of yards with native plants are especially needed by the Education/Outreach Committee. Please contact Megan Bowes at bowesm@boulder.colorado.gov or at (303) 561-4883 if you have photos you would like to donate.

Do you have donations for the silent auction at the CONPS Annual meeting? Books, artwork, potted native plants, and native seeds are all needed.

Please contact Linda Smith, conpsoffice@aol.com to volunteer or contribute donations.

THANKS!

Thank you to Ann Cooper for her generous donation of an 18" VGA computer monitor. CONPS appreciates donations and currently needs equipment including computers, printers, monitors, or scanners. If you are interested in donating equipment to CONPS, please contact Jan and Charlie Turner at turner@rabbit-brushpublishing.com or (720) 497-1093.

WEB NEWS

Check the web site "Botanical News" page for interesting botanical research, books, jobs, conferences, etc. The page is updated daily. The newest addition to the web site is the "Calendar" which lists all chapter and all Society meetings, field trips, and programs. Check the web site for information about the Annual Meeting hosted by the Plateau Chapter, which will be held in Montrose in September. You will be able to register and pay online for the Annual Meeting. Finally, on the "Board" page you will now find a "Summary of the Board Minutes."

Welcome New Members

Kent R Aikin	Jonathan Coop	Selma Kristel	Katie Northrup
Claudette Anderson	Lisa Dinardo	Lara Kueppers	Robin Price
Stacey Anderson	Cynthia Dorrell	Marion Laughlin	Jean Reeder
Penny Archdale-Howard	Sally Dunphy	J Peter & Lila Laux	Lee & Lenny Rose
John Bender	Mary Susan Eldredge	Deron Lawrence	Susan Rose
Elena Berman	Collin Ewing	Karen Lehrer	Thomas & Debra Ryon
Peggy Blenden	Keith Fox & Janine Fitzgerald	Jared Leveille	Kathie Satterfield
Hazel Bond	Carla Fox	Cyndi Long	Elizabeth R Schmidt
Mary Ann Bonnell	Ben Grady	Angela Lortie	Chris Schoenfelder
Emily Booth	Charles & Ruth Guarino	Richard Ludwig	Robert Schorr
Stephen Bort	Alan Hahn	Neil McLane	Sonia Scott
William Gleason & Maureen Briggs	Tracy Harrison	Lisa Melanson	Krissa Skogen
Roy Whitacre & Jack Burks	Linda Hellow	Linda Messier	Susan Smith
Ramona J Butz	Bob Henry	Martha Mims	Helen Spence
Anya Byers	Paulette Hill	Sakae Miyahara	Erika Stice
Jennifer Cappa	Marji Hoff	Lynn Morales	Kenneth J Sytsma
Jim Carroll	Priscilla Kimble	Gladys & Patrick Murphy	Anne Vervaeet
Mike Smolen & Lynn Carroll	Tony Knight	Deborah Nevins & Associates Inc	S J Walker
Connie Colter	Constance Kolker	Katie M Nichols	Judy A Whitaker
	Janis Koscielniak	Ernest O Norris	

CALL FOR WORKSHOPS

Do you have an interest in a particular plant species, group of species, or genus? You can share your knowledge in a workshop for the Society. We are currently looking for topics and presenters for the **2008-2009 Workshop Program**. So many of our members are very knowledgeable and can provide wonderful learning experiences for other members. Workshops are designed for plant enthusiasts at all levels, from novice to expert.

Helping others expand their plant horizons while learning, discussing, socializing, eating, and more learning is fun! Choose a Saturday and Sunday for your presentation. We will find a location and support the setup for your workshop. Workshops can be arranged on east or west slopes. If you would like to conduct a program, please contact Ann Henson at 2henson@kwabena.us or (303) 772-8962.

Aquilegia

Newsletter of the Colorado Native Plant Society

Aquilegia is published four or more times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society and to others with an interest in native plants. Articles for *Aquilegia* may be used by other native plant societies or non-profit groups, if fully cited to author and attributed to *Aquilegia*.

Articles from 500 to 2000 words in length are welcome. Previously published articles submitted for reprinting require permission. Digital photographs or line drawings are also solicited. Please include author's name and address, although anonymity may be requested. Articles must be submitted electronically as Word documents. Articles and other contributions may be edited.

Please direct all contributions to the newsletter to:

Leo P. Bruederle, Editor
leo.bruederle@cudenver.edu
 Department of Biology
 University of Colorado Denver

Please direct all questions or comments regarding layout, printing and distribution to:

Kim Regier
kimberly.regier@cudenver.edu
 Department of Biology

Colorado Native Plant Society

The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is composed of plant enthusiasts both professional and non-professional.

Please join us in helping to encourage interest in enjoying and protecting Colorado's native plants. The Society sponsors field trips, workshops, and other activities through local chapters and statewide. Contact the Society, a chapter representative, or committee chair for more infor-



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Rare Plant Monograph

Eleanor VonBargen
303-756-1400

MEMBERSHIP APPLICATION AND RENEWAL FORM

Name(s) _____

Address _____

City _____ State _____ Zip _____

Phone _____ E-mail _____

Chapter: _____ Boulder _____ Metro-Denver _____ Northern _____ Plateau

_____ San Luis Valley _____ Southeast _____ Southwest

DONATION

\$_____ General Fund

Endowments in support of small grants-in-aid of research:

\$_____ John Marr Fund: research on the biology and natural history of Colorado native plants.

\$_____ Myrna P. Steinkamp Memorial Fund: research and other activities that will benefit the rare plants of Colorado.

Mail to: Eric Lane, PO Box 200, Ft. Collins, CO 80522

DUES AND CONTRIBUTIONS ARE TAX-DEDUCTIBLE

CALENDAR 2008

SOCIETY FIELD TRIPS

June 28	Wolf Creek Pass to San Luis Valley Floor
June 28	Two Buttes
July 11	Mount Goliath Natural Area
July 12	Fens of South Park
August 2	Rocky Mountain National Park
August 9	Geneva Basin Iron Fen
August 16-17	Rough Creek Iron Fen

July 19	9:00 AM	TBA
Sept 5	6:00 PM	Montrose
Nov. 15	9:00 AM	TBA

See <http://www.conps.org/conps.html> for details.

SOCIETY WORKSHOPS

June 27, 28, 29 Carex

BOARD MEETINGS

TIME SENSITIVE MATERIAL



P.O. Box 200
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