

# Aquilegia

Newsletter of the Colorado Native Plant Society

"... dedicated to the appreciation and conservation of the Colorado native flora."

Volume 34 Number 5 – Winter 2010



## RARE *BOTRYCHIUM CAMPESTRE* RE-DISCOVERED AT BONNY PRAIRIE NATURAL AREA

By Steve J. Popovich and Scott F. Smith

After not being observed in Colorado since 1997, prairie moonwort (*Botrychium campestre*) was re-located this spring at Bonny Prairie Natural Area. This plant is a member of the Adder's tongue family (Ophioglossaceae), an ancient group of plants distantly related to modern ferns. Moonworts are extremely interesting in that they produce only a single above-ground leaf per year that is divided dichotomously into a sterile, foliaceous part (trophophore) and a fertile, spore-bearing part (sporophore). Most of the plant is below ground, and it does not send up its leaf every year. When a leaf does emerge above ground, it is small and difficult to detect, and is often less than several inches tall. This species of moonwort quickly dies back to the ground after releasing spores, and is only identifiable for perhaps six weeks in the spring.



Mature and immature Prairie Moonworts

Photo by Scott Smith

Typically found in prairies of the Midwest and Canada, where it remains elusive and uncommon, this moonwort is known in Colorado only from a single small population on Bonny Prairie Natural Area at Bonny Reservoir, which is in Yuma County near the Kansas border. The natural area is a remnant of the little bluestem loess prairie that once covered thousands of square miles in Colorado, Kansas, and Nebraska. Most of the prairie has been plowed and grazed since pioneer settlement in the late 1800s. Only a few acres of the original prairie remain unaltered today, fragments of the rich natural history of Colorado.

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Efforts have been made off and on since the mid-1990's to monitor the population. Because the plant was not observed for numerous years and was feared extinct in Colorado, monitoring was ramped up in recent years. Visits over the last five years in a row revealed no plants, but a persistent team of moonwort enthusiasts would not give up, and several years ago devised a two-part strategy to maximize detection of plants. Firstly, they collected soil samples to be analyzed by Dr. Cindy Johnson at Gustavus Adolphus College in Minnesota, where she developed a method to detect moonworts below ground. And in 2007 she found them in the soil samples! That re-invigorated the team's quest and confirmed that they had been searching in the right location all along. Secondly, they worked with Brian Kurzel of the Colorado Natural Areas Program to have the site repeatedly watered in spring by fire trucks for two years. It was hoped that this would promote emergence and help offset eastern Colorado's droughty past.

With spirits high, Peter Root, Scott Smith, Linda Smith, Tom Bates, Stephanie Danyi, and Steve Popovich visited the site on May 18, 2010. In the searing sun and ever-present winds of Bonny, yet another year of monitoring efforts commenced. After about 20 minutes of tedious

searching on hands and knees among the dense thatch and grass tussocks, the first plant was found! An energetic jig followed by shouts of joyful expletives carried on the wind sent nearby fledging meadowlarks fleeing from their cover. Twelve moonworts were eventually found about 50 feet north of the soil sample area, ranging from 3/8 of an inch to 3 inches tall. Most were still very green, with only a few plants showing spore release. Perhaps the watering in previous years had worked to coax plants into emerging, or perhaps the team chanced upon pure luck, but either way, there was good cause for celebration! After 12 years of above-ground silence, which may be a drought strategy, Colorado's prairie moonwort is back. The trick is to help keep it back, and to have it release spores at least intermittently, to allow replenishment of the below-ground plant bank. The team will continue to monitor the site, and hopes to work with the Natural Areas Program to implement management practices to help maintain viability of one of Colorado's rarest plants.

*Steve Popovich is a member of the Northern Chapter and is Chair of the Field Studies Committee. Scott Smith is a member of the Denver Chapter.*

## JOIN THE ADOPT-A-RARE-PLANT PROGRAM TO HELP CONSERVE SOME OF OUR RAREST SPECIES

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*By Jenny Neale*

Have you ever wanted to hit the open road armed with only your map, a GPS, and a good description of a rare plant species? By joining the Adopt-a-Rare-Plant program in 2011, you will get your chance to help track down some of Colorado's rarest plants to aid in their conservation.

The Colorado Native Plant Society is teaming up with Denver Botanic Gardens and the Colorado Natural Heritage Program to revive an older Adopt-a-Rare-Plant program. The Colorado Natural Heritage Program tracks more than 500 plant species in Colorado. By doing so, they maintain information on the number of populations, number of individuals, threats to populations and other information on rare species. Through the Rare Plant Conservation Initiative, professional conservation biologists have been updating records on our rarest species, however additional data is needed on hundreds of other species to update their conservation status. Records for some species have become "Historic" which means no one has seen that population in more than 20

years! This is your opportunity to participate in conservation by helping to determine if these populations still exist. Your travels will help ensure that all agencies/organizations have up-to-date data on some of our rarest species.

How to get involved: Let us know you're interested (see below). We will contact you regarding training opportunities for the winter/early spring of 2011. Trainings, which will take place around the state, to ensure that you are comfortable identifying 'your' species. We will also make sure you are comfortable with the methods of finding and reporting on the populations you will visit. Once you choose a species, you will be provided with all necessary data. You will be given information for both a reference site as well as sites not visited in years. This way, you will be able to visit a known population of representative habitat so that you can become comfortable with both identifying the target

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species and the habitat before you head out to look for the unseen populations. Some of the historic sites will be easy to find and will simply involve the updating of numbers. Some of them however, will be more like a treasure hunt where finding the rare plant at the end of the road will be even more rewarding.

The data collected through this program will prove invaluable for updating records on some of our rarest species. Some of the species up for adoption include: Rocky Mountain blue columbine (*Aquilegia saximontana*), the Naturita milkvetch (*Astragalus naturitensis*), the Hoosier pass ipomopsis (*Ipomopsis globularis*), and Rothrock's townsend daisy (*Townsendia rothrockii*).

To join the program contact:

Jill Handwerk, Colorado Natural Heritage Program:  
jill.handwerk@colostate.edu  
Jenny Neale, CoNPS / Denver Botanic Gardens:  
nealejr@botanicgardens.org

*Jennifer Ramp Neal is Associate Director of Research & Conservation at the Denver Botanic Gardens. She was recently reelected an at-large member of the CoNPS Board of Directors.*

## COLORADO AND ANTARCTICA

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*By Bill Weber*

In 1928 there was a competition among the Boy Scouts of America. An Eagle Scout would be chosen to accompany Admiral Richard Byrd's third expedition, The U. S. Antarctic Expedition of 1939–1941. I was only ten years old but I envied Paul Siple, who collected the lichens on that trip. Since then, the Antarctic has always been in the back of my mind, and I have been slowly working my way down there by way of the rest of the world. My family and friends have been twisting my arm to spend some money on myself, so at ninety-one and counting, I am taking my daughter Heather with me on the next Antarctic Expedition of the American Museum of Natural History in February, 2011. We are both old birders, and she has accompanied me on trips to the Himalaya and the Galápagos Islands.

I have had some indirect experience with the Antarctic flora, having identified the collections made by my student Vera Komarkova on the peninsula. Vera's work on the ecdology of the Indian Peaks area show her to be have been one of the finest plant ecologists the United States has seen. I have also been corresponding with Ryszard Ochyra, the Polish bryologist who recently published a great book on the moss flora of Antarctica, and we are jointly publishing a paper on a tiny species of *Grimmia* that I collected in 1968. On the only clear day in three years I walked up the 14,500-foot summit of Mount Wilhelm in Papua New Guinea and collected a small moss specimen that has been filed in the herbarium, unidentified, for 40 years. Although a moss flora of Papua New Guinea has been under way for many years, it took a my friend Ryziek, with his specialty in the family Grimmiaceae, to put a name on it. This moss, *Grimmia incrassicapsulis*, has a most extraordinary distribution,

occurring otherwise only from much lower altitudes on the southern tips of New Zealand, Tierra del Fuego, and on the subantarctic island of South Georgia. This discovery opens up a new problem in historical plant geography.

How can such a moss have found two such different places to survive? Actually, the Antarctic flora must have roots in the past, and it is not only the mosses that provide the evidence.

The moss flora dominates the snow-free landscape of Antarctica, and it is of very great interest to us in Colorado! Many species are of course endemic to Antarctica, and that continent has few or no species in common with Australia or South Africa. But a number of species are bipolar, that is, they occur in Antarctica and in the northern hemisphere but are unknown or almost so from the intervening Andes of South America. And Colorado shares about 45 of these bipolar species with Antarctica! In fact, *Sanionia georgico-uncinata* of King George Island and the Antarctic Peninsula is common on the marshy shores of Summit Lake on Mount Evans and in scattered sites in the Arctic. The largest genus of Antarctic mosses is *Schistidium*, with 13 species. *Schistidium* is also the largest moss genus in Colorado, with 19 species, only one of which it shares with Antarctica.

There are only two vascular plants on the Antarctic continent, a dwarf species of *Deschampsia*, and a minute South American herb, *Colobanthus quitensis*, in the *Alsiniaceae*. Among the vascular plants of the southernmost tip of South America, Colorado has several species, most of them bipolar, in common with Tierra del

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Fuego: *Koenigia islandica*; our common *Anemone multifida* was first discovered there; *Osmorhiza chilensis*; *Carex maritima*; *Carex microglochin*; and *Carex capitata*. The genus *Psychrophila* (which includes the whiteflowered snow-bed species called *Caltha* in western North America) occurs there. Several species are found in Australia and New Zealand. In general, the flora of Tierra del Fuego is endemic South American, while the greater number of species recorded there are historically introduced weeds. The very small number of bipolar species of vascular plants is indicative of their being remnants of a more diverse flora in the past.

Until recently, the existence of bipolar species has often been attributed to long-distance dispersal by birds. Now it appears that these distribution patterns are more likely explained by once-continuous distribution patterns that have been disrupted by extinctions. This phenomenon, called vicariance, has been beautifully described by George Gibbs (2006) in his book on the biohistory of New Zealand. The unique example of the survival, and later evolution in place, of a genus, indicates the extreme antiquity of some moss genera. Their survival is a result of their genetic structures and methods by which they are able to escape the pressures of natural selection through great time periods. The scarcity of vicariads in the vascular plants may indicate their lack of such survival mechanisms. Their descendants survived by means of preadaptation to changing ecologies. An interesting connection Colorado has with Antarctica is that the first professional botanist to set foot south of Latitude 60 degrees South was Sir Joseph Dalton Hooker, surgeonbotanist to James Clark Ross' British expedition on the *Erebus* and *Terror* (1839–1843). He published five moss species in his *Flora Antarctica*. In the summer of 1877 Hooker spent five days in Colorado with his friend Asa Gray and discovered that Colorado has a significant

number of middle Asiatic mountain species. Hooker is considered the 'father' of the science of biogeography. Needless to say, I consider a visit to the Antarctic a fitting climax to my wonderful life as a plant taxonomist.

#### References

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- Dr. William A. Weber is professor emeritus and former curator of the University of Colorado Museum Herbarium. He is recognized as the preeminent authority on the flora of Colorado. His association with CoNPS goes back to its founding, and he served as its first president. .*

## SCHEDULED WORKSHOPS

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### ***Edible and Poisonous Plants of Colorado***

Tentative Date: Jan / Feb 2011

Presenter: Brian Elliott, Botanist, Elliott Environmental Consulting

Brian is the author of *Handbook of the Edible and Poisonous Plants of Western North America*, published July, 2009.

### ***Cacti of Colorado/Orchids of Colorado***

Date: Feb. 5 - 6, 2011

Presenter: Scott Smith, Botanist

This workshop will be split with the Saturday session covering the family Cactaceae in Colorado. Sunday's workshop will change gears and focus on the family Orchidaceae of Colorado.

### ***Ferns of Colorado***

Tentative Date: Spring 2011

Presenter: Scott Smith, Botanist

### ***Rushes of Colorado***

Tentative Date: Spring 2011

Presenter: Dr. Leo Bruederle and/or Guest Lecturer

COLORADO NATIVE PLANT SOCIETY  
**WORKSHOP REGISTRATION FORM**  
 2009 – 2010

NAME \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE: ( ) Home ( ) Work ( ) Cell \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

E-MAIL: \_\_\_\_\_

I am a member of CoNPS \_\_\_\_ Yes \_\_\_\_ No (If not, you must add the annual membership fee to your payment.)

*Please register me for the following workshops at \$25 per session.*

Workshop title _____	Session date _____	Fee \$ _____
Workshop title _____	Session date _____	Fee \$ _____
Workshop title _____	Session date _____	Fee \$ _____
Workshop title _____	Session date _____	Fee \$ _____
Workshop title _____	Session date _____	Fee \$ _____

Total registration fee \$ \_\_\_\_\_

Membership fee\* (if applicable) \$ \_\_\_\_\_

Total registration fee \$ \_\_\_\_\_

**\* MEMBERSHIP CLASS**  
*Dues cover a 12-month period.*

Individual (\$20.00)  
 Family / dual (\$30.00)  
 Senior (65+) (\$12.00)  
 Student (\$12.00)  
 Organization (\$30.00)  
 Supporting (\$50.00)  
 Lifetime (\$300.00)

**CHAPTER**      *You are free to affiliate with any chapter you choose and to attend the meetings of any chapter. Chapters do not have drawn map boundaries; the locations below indicate the usual meeting place of chapter meetings.*

Boulder     Metro-Denver     Northern  
 Plateau     Southeast

To encourage carpooling, are you willing to share your contact information with others in the same workshop?  
 \_\_\_\_\_ Yes      \_\_\_\_\_ No

**Mail registration form to: CoNPS, Linda Smith, 4057 Cottonwood Dr., Loveland CO, 80538**

# BOOK REVIEW

By Donald L. Hazlett

**Yoon, Carol Kaesuk Yoon. *Naming Nature: The Clash between Instinct and Science*. W. W. Norton & Company, New York, NY, 2009.**

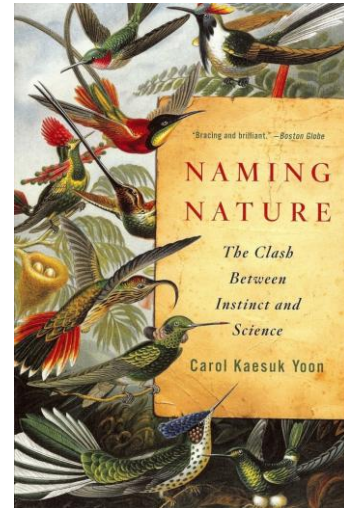
Every decade or so a book comes along that helps us better understand our biological connections with nature. Carol Kaesuk Yoon, who earned her degree in ecology and evolutionary biology from Cornell University, has written one of these rare books.

Yoon effectively summarizes the development of modern taxonomy. She begins at the hunter-and-gather stage and explains how Linnaeus formalized a binomial system of naming organisms. Yoon explains that a reason the binomial system of nomenclature was so well received, both then and now, is because it is based on instinctive, folk taxonomies used by primitive societies for centuries! She next lauds Darwin for creating the vision of how taxonomic classifications could eventually be based on “true” evolutionary relationships. Such an “omega” taxonomic system is now approaching, thanks in large part to molecular taxonomy. Yoon effectively summarizes various attempts biologists have made at classification, such as the use of numerical taxonomy and cladistics, prior to molecular work.

The intriguing aspect of Yoon’s tracing of the history of taxonomic classification is the role she attributes to human *umwelt*. *Umwelt* is a German word that means “the environment.” Animal behaviorists consider *umwelt* as “the perceived world”, that which is sensed by an animal. For example, we humans lack the *umwelt* of dogs that enables a keen sense of smell and the *umwelt* of bees that allows them to see ultraviolet. She convincingly argues that among the “hard wired” or genetically controlled human *umwelt* traits is one that allows us to classify natural objects. She provides evidence of genetic control of this *umwelt* with intriguing case studies of people who have lost their ability to classify nature! She also discusses the selective advantage of our *umwelt* or instinctive tendency to classify nature. There is survival value in knowing what plants can be eaten and which animals are dangerous.

In regard to taxonomy, her point is that human *umwelt* has long influenced our attempts to classify nature. Yoon states: “*Long before the umwelt ever birthed a science, it has served for countless millennia as something much more important: humanity’s best and most intimate connection to everything that lives.*” Our instinctive

connection with nature has sorted taxonomists into “lumpers” and “splitters”, each loyal to their brand of *umwelt*. The variable classification opinions held by taxonomists is the heart of the conflict referred to in the title of the book: do we organize nature based on our *umwelt* (nature) or based on objective data that indicates evolutionary relationships (science)?



Many are slow at replacing older, *umwelt*-ridden plant classification systems with new phylogenetic systems. However, if our goal is to arrange entities based on evolutionary relationships - a goal that would help taxonomy become an hypothesis-driven science - many of the proposed genus and family alignments in systematics must be accepted. I must admit, however, that when I see some new alignments, such as putting hackberry (*Celtis*) in the marijuana family (Cannabaceae), I respond with a human *umwelt*-driven comment: “Why, oh why? It sure looked like it was just fine in the Ulmaceae!”

A Colorado example of the conflict between nature (*umwelt*) and science (molecular taxonomy) is the classification of buffalo grass and blue grama. Most of us place these grasses in different genera: *Buchloe* and *Bouteloua*, respectively. Molecular data indicates these important steppe grasses as closely related, both in the *Bouteloua* genus. Again I ask myself if I should accept the data based on evolutionary relationships and call buffalo grass *Bouteloua dactyloides* or be true to my *umwelt* (tempered in this case with time and tradition) and maintain *Buchloe* as the buffalo grass genus? It is

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tempting and easy to maintain the *status quo*, nourish our *umwelt* and to reject this realignment. Some argue that because all DNA in both of these grasses has not yet been sequenced, it is acceptable for our *umwelt* to override molecular data. Can we reject scientific data simply because it is contrary to our *umwelt*? Another example presented by Yoon, from higher taxonomic ranks, is how molecular data has conflicted with our *umwelt* in regard to the phylogenetic placement of fungi as compared to plants and animals. Our *umwelt* tells us that since fungi grow out of the ground, they must be more like plants than animals – science tells us otherwise.

Other examples and aspects of *umwelt* are presented and discussed by Yoon. As a final example, she indicates that children can rapidly learn many new names for things. She argues that this is thanks to their young *umwelt*. If close to nature, children quickly learn plant and animal names. However, if a child is not close to nature, they may instead amaze adults by their ability to quickly learn dinosaur names, professional sports team names or roadside logos. In each case it is an *umwelt* or instinctive

ability to name things that is at work – especially among children.

I have not been able to summarize all of the well-presented arguments and aspects of the human *umwelt* presented by Yoon. She even connects human apathy toward biodiversity protection to *umwelt*! I try not to use oxymorons, but I make an exception here and will call her book an “instant classic”. I have put it on my book shelf next to the very few other books that have also adjusted my thinking about human nature: *The Naked Ape* by Desmond Morris, *Nature and Man's Fate* by Garrett Hardin and *Biophilia* by Edward O. Wilson. Yoon's book should be required reading for biologists and taxonomists, especially those that instinctively curse modern realignments of species entities into different genera or families.

*Don Hazlett is an Ethnobotany Research Associate with the Denver Botanic Gardens. He is currently engaged in a research to screen rare Colorado plants for alkaloids and to document plants sold at Hispanic “botánicas” (herb stores) in Colorado and in the Southwest.*

## CHAPTER ANNOUNCEMENTS

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### BOULDER CHAPTER

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*Boulder Chapter programs are held on the second Thursday of each month (September through April) from 7:00 p.m. to 9:00 p.m. All meetings, except as noted, are held at the Community Room at the Boulder REI Store at 1789 28<sup>th</sup> Street (between Canyon and Pearl). For more information, please email Chapter President Elizabeth Drozda-Freeman at [elizabeth.wildflower@gmail.com](mailto:elizabeth.wildflower@gmail.com) or call her at 303-586-1810. Please support zero waste: bring your own cup and plate.*

**December 9, 2010**

**Darwin's "abominable mystery" and the search for the first flowering plants**

Dr. Ned Friedman

303-492-3082 (office), [ned@colorado.edu](mailto:ned@colorado.edu)

The talk will cover recent advances in the fossil record of the oldest flowering plants, what the first flowering plants may have looked like, where they "lived," and how they reproduced (yes, there is sex in this story). Also, the latest on the new taxonomy (phylogeny) of flowering plants, and why, especially, Darwin was mystified and baffled by the evolutionary origin of flowering plants.

*Dr. Friedman is Professor of Ecology and Evolutionary Biology at the University of Colorado. He was elected a Fellow of the Linnean Society of London in 1995 and has given more than 100 invited lectures around the world, including a series of public lectures at Oxford University (England) on the evolutionary history of life (1999). Received the Pelton Award from the Botanical Society of America for sustained and imaginative contributions to the field of plant morphology (2004) – the highest international honor in the discipline of plant morphology. His research is focused on the evolution of plants – and has been featured in *Natural History Magazine*, *Smithsonian Magazine*, the *New York Times*, the *Christian Science Monitor*, the *London Daily Telegraph*, and other major public venues*

**January 13, 2011**

**CSU Extension and Boulder CoNPS Night!**

Joel A. Reich, Boulder County Horticulture Extension Agent, Colorado

Barbara Fahey, Boulder County Natural Resources Extension Agent, Colorado

Sharon Bokan is the Small Acreage Coordinator with CSU Extension, Boulder County

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*Joel and Barbara will address:*

*How CoNPS members can engage with the Native Plant Master Program*

Joel and Barbara will give an overview of what NPM is, where its roots lie, how the program has expanded rapidly over the last several years, and, most importantly, the opportunities for CoNPS members to share their expertise with a new, enthusiastic audience.

*Sharon Bokan will address:*

*Native Plants, Pastures and Disturbance*

When a disturbance such as a wildfire happens, the plant community in that area changes. In some cases, the native plants that were suppressed increase but it is also an opening for invasive plants to get a foothold. For many landowners, if there's a plant on their property that isn't a grass or it's a grass whose growth habit they don't like or their animals won't eat, it's a weed. In this presentation, we'll talk about how invasives take advantage of disturbance and how to discourage them. We'll also talk about native plants and their place in the pasture.

**Barbara Fahey** is a Natural Resources Extension Agent for Colorado State University Extension. She is the founder and State coordinator of the Colorado Native Plant Master™ Program. She is the former administrator of the Lookout Mountain Nature Center and has a passion for teaching others about Colorado's flora.

**Joel Reich** is the C.S.U. Extension Horticulture Agent for Boulder County. He manages the Boulder County Native Plant Master program, as well as providing a variety of educational and consulting services to members of the Green Industry and gardeners throughout the Front Range.

**Sharon Bokan** is the Small Acreage Coordinator with CSU Extension, Boulder County. As part of her work, she identifies "weeds" that clients bring in. At least 50% of the time these "weeds" end up being native plants. Sharon has the opportunity to talk to clients about controlling invasive noxious weeds and native plants.

**February 10, 2011**

**White Pine Blister Rust in High Mountain Ecosystems**

Anna W. Schoettle, Ph.D.

(970) 498-1333, aschoettle@fs.fed.us

Dr. Anna Schoettle will provide an overview of the ecology of these remarkable tree species and the factors that threaten them. Both species are currently threatened by a non-native pathogen (that causes the lethal disease white pine blister rust), mountain pine beetle and climate

change. Anna will describe how these factors interact in high mountain ecosystems and the program currently underway to proactively increase the resiliency and sustainability of limber pine and Rocky Mountain bristlecone pine populations and ecosystems of the Southern Rockies. Dr. Schoettle is a Research Plant Ecophysiologicalist at the Rocky Mountain Research Station.

**March 10, 2011**

**Sex and the single flower**

Patrice Morrow, Ph.D., Professor Emeritus of Ecology, Evolution and Behavior at the University of Minnesota, Twin Cities.

Dr. Morrow will discuss the evolution of interactions among sedentary plants which need to have pollen moved to another plant and the bribes they offer to mobile animals to move pollen to the right places.

Dr. Morrow has a doctorate from Stanford University, was a Fulbright Fellow in Australia, a Guggenheim Fellow at the University of Colorado at Boulder and is a Fellow of the American Association for the Advancement of Science. Her research examined the effects of herbivorous insects on Eucalyptus forest composition in Australia and the effects of plant community diversity on insect movement in Minnesota prairies. She taught Ecology, Plant/Animal Interactions and Environmental Biology for many years at the University of Minnesota. Mutually beneficial interactions such as pollination are among her favorite topics and the subject of this talk.

**April 14, 2011**

**Lichens: Diversity, Utility, and Their Inner World**

Scott Bates, Ph.D., CIRES Visiting Fellow, Fierer Laboratory, University of Colorado at Boulder  
303-492-2099 scott.thomas.bates@gmail.com

Lichens (lichenized fungi) are fascinating symbiotic "organisms", which have traditionally been thought of as a mutualistic relationship between a mycobiont (the fungus) and a photobiont (green or "blue-green" algae). Recent DNA research is showing, however, that the symbiosis may also include bacteria. This "lifestyle" has been very successful – so successful that lichens are known to survive in some of the most extreme environments on Earth (but they also do quite well in outer space). Locally, they may be familiar to you – living on trees or rock surfaces.

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With a wonderful variety in form and color, lichens are quite beautiful to behold, but they have also been used for many practical purposes – from ingredients of perfumes to “biomonitors” of air pollution and forest “health”. In this talk we will explore the exquisite beauty of lichen diversity as well as many interesting stories from the lichenological world. The talk will be presented by Dr. Scott Thomas Bates, who is currently a visiting fellow at the University of Colorado at Boulder, where he has been investigating lichen-associated bacteria. In his spare time, Scott continues to document the diversity of Southwestern fungi on the *Checklist of Arizona Fungi, Lichens, and Slime Molds website* ([www.azfungi.org/checklist](http://www.azfungi.org/checklist)).



Photo by Bob Henry

## METRO-DENVER CHAPTER

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Monthly meetings of the Metro-Denver Chapter are typically held on the fourth Tuesday of the month (September through May, except November). The chapter is changing its meeting location to the Denver Botanic Gardens for the 2010-2011 year. For more information, visit [www.conps.org](http://www.conps.org) or contact Jannette Wesley (303) 969-2131 (daytime) or (303) 985-5299 (evenings).

### Metro Denver Chapter Meetings 2010 - 2011

#### **November 30, 2010, 7 PM** **“History and Future of the USDA NRCS Plant Materials Program”**

Presenter: Christine Taliga, Plant Materials Specialist  
Location: Denver Botanic Gardens, Plant Society Building

Christine Taliga’s talk is about the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), Plant Materials Program, formerly known as the Soil Conservation Service. The talk will include an overview of some of current research efforts and review the history and the future outlook for the agency.

*Christine Taliga, received her B.S. in environmental science with a minor in botany from the University of Iowa. She began her career with NRCS and Conservation Districts in Iowa in 1991, where she has held various technical positions and was elected as Soil and Water Conservation Commissioner (1996-2001).*

*Her professional experience also includes consulting as restoration plant ecologist through which she conducted plant inventories, planned and implemented wetland mitigation plans, native restoration plans and monitoring protocols, as well as, prescribed burns for hire (the first such program in Iowa). She has also held appointments at the University of Iowa as research botanist, greenhouse manager and teaching assistant for several botany courses. She also served as treasurer and secretary for the Iowa Native Plant Society from 2005 to 2010.*

#### **January 25, 2011, 7:00 PM** **“The Historic Role of Fire in Forest and Grassland Ecosystems”**

Presenter: Tom L. Thompson, Forester  
Location: Denver Botanic Gardens, Plant Society Building

Tom L. Thompson is a forester and the past president of the Society of American Foresters. He will speak about the historic role of fire in ecosystems and particularly focus on the historic understanding and use of fire in managing forests and grasslands. He will discuss the challenges of using fire today, especially those caused by excessive fuel buildup, insect and disease mortality, shifts in climate, and interface with human development.

*Mr. Thompson recently retired as Deputy Chief of the U.S. Forest Service in Washington, D.C.; he also served Deputy Regional Forester in the Rocky Mtn. Region from 1989-2001. A native of Colorado, he was with the Forest Service for 37 years and is a graduate of Colorado State University.*

#### **February 22, 2011, 7 PM** **“Clear Cutting at Roxborough State Park: Monitoring Re-growth”**

Presenter: Vickey Trammel, Biologist  
Location: Denver Botanic Gardens, Plant Society Building  
Vickey Trammel will present the results of her 2 year field study at Roxborough State Park. She organized 20 volunteers to monitor 50 meter square plots on a two acre clear cut site. The park clear cut the site as part of a fuels mitigation effort. The citizen scientists watched each site to record their observations on the presence of plant species, percentage cover to soil temp, and to gather data on the soil moisture and soil temperature. Vickey will report on the research conducted on the site as well as her efforts to involve volunteers in this ongoing research project.

*Vickey Trammel is past president of the Metro Denver Chapter of the Colorado Native Plant Society. She recently retired from teaching biology at Arapahoe Community College.*

**March 22, 2011, 7 PM**  
**“Propagating Penstemons”**

Presenter: Bob McFarline, President of the American Penstemon Society

Location: Denver Botanic Gardens, Plant Society Building

There are over 275 recognized species of penstemon, and all of them are native to North America from Alaska down to Guatemala. A large majority of these plants are quite garden worthy and the list seems to grow annually. Most species are propagated from seed because it is so easy. However, most do quite well from cuttings. In fact, most of the hybrids must be propagated vegetatively in order for the plant characteristics to be accurately reproduced.

There are a large number of variables to consider when propagating different species of penstemon. The talk will cover the author's experience in treating the various items such as gathering seed in the wild, gathering seed in the garden, seed life, stratification, soaking seed, planting soil mixture, germination times, sunlight effect of seedlings, watering, relative ease of propagating by species, etc.

*Bob is retired from a long career in engineering and software management. He attended Stanford University and worked in California, Saudi Arabia and Colorado. He became interested in plants in general and Penstemon in particular after his retirement in 1992. He is a longtime member of the American Penstemon Society and is currently serving as President. He, along with Hugh MacMillan, is a founder of the Eriogonum Society which was established in 2009.*

**April 26, 2011, 7 PM**  
**Gardening with Native Plants**

Presenter: Susan Smith

Location: Denver Botanic Gardens, Plant Society Building

*Details forthcoming.*

**NEWSLETTER AVAILABLE  
BY E-MAIL**

Do you know that *Aquilegia* is available electronically? You could receive your issue of *Aquilegia* by e-mail. This saves the Society postage costs as well as paper and printing costs. Please request your change from paper with Eric Lane via e-mail at [ericmlane@yahoo.com](mailto:ericmlane@yahoo.com) or call him at 303-239-4182. Be sure to include your e-mail address.

## **NORTHERN COLORADO CHAPTER**

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*Except as noted, Chapter meetings are held on the first Wednesday of the month (October through April) at 7:00 PM, at the Gardens on Spring Creek, 2145 Centre Ave., Fort Collins. Prior to meetings, members are invited to meet at 5:30 PM for dinner with the speaker at Café Vino, 1200 S. College Avenue. If you would like to join us for dinner, please contact Chapter President Pam Smith at 970-223-3453 or [pamelas4824@earthlink.net](mailto:pamelas4824@earthlink.net).*

### **NORTHERN CHAPTER PROGRAMS**

**Wednesday, December 1, 2010, 7 PM**  
**“Effect of Climate Change on Grasshoppers of the Southern Rocky Mountains”**

Presenter: Dr. Cesar Nufio, Professional Research Associate, Univ. of Colorado Museum of Natural History

**Wednesday, January 5, 2010, 7 PM**  
**“Colorado Wildflowers”**

Presenters: Tim and Ann Henson

In the depth of winter, we need to remember how beautiful plants flower every year. This photography show covers most of the ecosystems across Colorado. We might say it's just a bunch of pretty pictures for your enjoyment!

*Tim and Ann Henson have been observing and caring for native plants of Colorado for more than 40 years. Ann worked in agriculture conducting weed control research. Tim taught biology and geology in the Longmont area. Now retired, Tim has taken his photography to new levels and watches birds. Ann spends time teaching in the Native Plant Master™ program and learning about lichens. They volunteer for CoNPS, Colorado Natural Areas Program, Wildlands Restoration Volunteers, and Rare Plant Monitoring.*

**Wednesday, February 2 - To Be Announced**

**Wednesday, March 02 2011, 7 PM**  
**Re-Discovery of *Haptanthus hazlettil*, and Alkaloid Study at Denver Botanic Gardens**

Presenter: Dr. Donald L. Hazlett, Ethnobotanist, New World Plants, Pierce CO

**Wednesday, April 6, 2011, 7 PM**  
**“Dirt for Dummies”**

Presenter: Dr. Kari Sever, Soil Scientist,

**May 2011, 7 PM**  
**Joint meeting with the Audubon Society - topic and date to be announced**

## PLATEAU CHAPTER

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Chapter activities are scheduled throughout the year. For more information, visit [www.conps.org](http://www.conps.org) or contact Chapter President Gay Austin at [austinaceae@frontier.net](mailto:austinaceae@frontier.net) or 970-641-6244

## SOUTHEAST CHAPTER

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Activities of the Southeast Chapter are scheduled throughout the year and include field trips and meetings. Regular chapter meetings (always with an educational focus) will begin in October in both Pueblo and Colorado Springs. Those wishing more information can e-mail us as [SEtrips@gmail.com](mailto:SEtrips@gmail.com) and we will add you to our distribution list.

Following is a report from the Southeast Chapter on their activities in support of the Society's dual mission of education and conservation.

**Educational mission.** -- The Southeast Chapter offered 18 successful field trips and classes during the 2010 growing season.

Field trips included ecosystems ranging from the "Birds and Botany" along Trout Creek, Teller County to the shortgrass prairie and canyons encountered in a "Descent to the Purgatory" in Otero County, and many habitats and species in between.

Classes included subjects such as "Essential Botany," our annual "Grass I.D. Workshop" (in cooperation with CSU Extension – Pueblo, and the NRCS), botanical photography, and "How to Use a Botanical Key."

The Southeast Chapter also helped support and promote the opening of the "Rare Imperiled Plants of Colorado" art exhibit presented by the Rocky Mountain Society of Botanical Artists. The exhibit is designed to educate the public and to encourage conservation of Colorado's rare botanic species and their habitats.

For information on future SE Chapter educational opportunities and field trips, please contact Ed Roland, [edwardrroland@gmail.com](mailto:edwardrroland@gmail.com).

**Conservation mission.** -- The Arkansas River valley is one of the top five hotspots for plant biodiversity in Colorado. In particular, the areas around Lake Pueblo Reservoir have four plant species that are endemic to Colorado: the Arkansas Valley Evening Primrose, *Oenothera harringtonia*, the Golden Blazing Star, *Nuttalia*

(*Mentzelia chrysantha*, the Pueblo Goldenweed, *Oenopsis puebloensis*, and the Round-leaf Four-o'clock, *Oxybaphus (Mirabilis) rotundifolia*. Other rare species include the dwarf milkweed, *Asclepias uncialis* and the Alpine Feverfew, *Parthenium (Bolophyta) tetraeuris*.

In collaboration with the state's Colorado Natural Areas Program – Resource Stewardship section, the southeast Chapter has embarked on two new conservation initiatives to monitor these rare plant species in their native habitats. We will be collecting information throughout the year from designated sites around Lake Pueblo State Park and its adjacent State Wildlife Areas.

In addition, along with the Wildlands Restoration Volunteers organization, we are also participating in restoration efforts in the Garden Park area near Canon City by collecting and processing native plant seeds. For more information on these SE Chapter conservation volunteer opportunities, please contact Michele Bobyn at [mbobyn@hotmail.com](mailto:mbobyn@hotmail.com).

*An untitled poem from the journal of Henry David Thoreau (September 1850) – Editor*

I saw a delicate flower had grown up two feet high  
Between the horses' path and the wheel-track,  
which Dakin's and Maynard's wagons had  
Passed over many a time.  
An inch more to the right or left hand had sealed its  
fate,  
Or an inch higher. And yet it lived and flourished  
As much as if it had a thousand acres  
Of untrodden space around it, and never  
Knew the danger it incurred.  
It did not borrow trouble nor invite an  
Evil fate by apprehending it,  
For though the distant market-wagon  
Every other day inevitably rolled  
This way, it just as inevitably rolled  
In those ruts. And the same  
Charioteer who steered the flower  
Upward guided the horse and cart aside from it.  
There were other flowers which you would say  
Incurred less danger, grew more out of the way,  
Which no cart rattled near, no walker daily passed,  
But at length one rambling deviously –  
For no rut restrained – plucked them,  
And then it appeared that they stood  
Directly in his way, though he had come  
From farther than the market-wagon.  
And then it appeared that this brave flower which  
grew between the wheel and horse did actually stand  
farther out of the way than that which stood in the wide  
prairie where the man of science plucked it.

*Henry David Thoreau, Journal (Bradford Torrey, ed.)  
The Writings of Henry David Thoreau  
The Riverside Press, 1906*



# 2010 PLANT CONSERVATION AWARDS

## COLORADO RARE PLANT CONSERVATION INITIATIVE

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The Colorado Rare Plant Conservation Initiative (RPCI) is a partnership of 23 federal and state agencies, private organizations-including the CO Native Plant Society, and academic institutions working together to conserve Colorado's most imperiled plants and their habitats. Last year, it completed the first-ever statewide Rare Plant Conservation Strategy to direct and coordinate plant conservation efforts in Colorado, and is now implementing the strategy.

In 2008, RPCI started annual Plant Conservation Awards to recognize/honor individuals who are making outstanding contributions towards protecting Colorado's imperiled plants. This year, the RPCI would like to recognize 5 individuals who have made outstanding contributions to rare plant conservation in Colorado:

### **Carol Till, Rocky Mountain Society of Botanical Artists, for**

- coordinating the traveling RARE Imperiled Plants of Colorado Art Exhibit in Denver, Steamboat Springs, Durango and Manitou Springs,
- working tirelessly to promote the conservation of our rare flora to the public and the artist community-a new audience and partner of the RPCI.
- working with the artists, museums, botanists and the local chapters of the CoNPS to spread the word about the importance of our imperiled plants through the exhibit, note cards, T-shirts, prints, and the RARE Imperiled Plants of Colorado catalogue (2009) with the Denver Botanic Gardens, and
- generously donating her time, artwork, and funding to help the RPCI cause.

### **Mo Ewing, Rare Plant Monitoring Steward, Volunteer, Denver Botanic Gardens and the Colorado Natural Areas Program.**

- CNAP and DBG have held 6 Rare Plant Monitoring Program trainings over the past 4 years, training over 50 people. Volunteers have donated more than 750 hours. This year we

would like to honor Mo Ewing, who contributed over 200 hours in 2010.

- Mo has conducted ecological niche modeling for Brandegees buckwheat (*Eriogonum brandegeei*) to help better understand the species' distribution and habitat requirements. He also conducted field work to ground-truth the model.
- Mo assisted CNAP with the monitoring of the Parachute penstemon (*Penstemon debilis*), collecting long-term data to help inform conservation action.
- Mo served as a volunteer steward of the Yanks Gulch ACEC and Natural Area in the Piceance Basin and has helped to update CNHP data based on field inventories.
- With the many threats facing sensitive species in Colorado (i.e., oil and gas exploration, development, climate change), the ability to increase our data collection provides exponential benefits to land managers.



*Mo Ewing receives award from Jennifer Ramp Neale*

*Photo by Bob Henry*



Photo by Bob Henry

**Gina Glenne, Ellen Mayo and Collin Ewing, U.S. Fish and Wildlife Service, Grand Junction**

This dynamic team of botanists is recognized for advancing plant conservation in Colorado by:

- establishing collaborative projects to study and protect Colorado's federally listed plants;
- acquiring funds for conservation research and action on our listed or proposed plants;
- developing, updating, and working to implement recovery plans for listed species;

- completing the listing proposal for the three imperiled plants in Colorado—Parachute penstemon (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), and Pagosa skyrocket (*Ipomopsis polyantha*) – all candidates for ESA protection for over 20 years; and
- working to reduce impacts of oil and gas development on imperiled plants of the West Slope, particularly in the Piceance Basin and Roan Plateau.

Awards were presented on Saturday, Sept. 11, 2010 at the CO Native Plant Society Annual Meeting in Denver.

## REQUEST FOR PROPOSALS THE JOHN W. MARR AND MYRNA P. STEINKAMP FUNDS

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The Colorado Native Plant Society supports research projects in plant biology from the John W. Marr and Myrna P. Steinkamp funds. These separate funds honor the late Dr. John Marr, Professor at the University of Colorado and the first President of the CONPS, and Myrna Steinkamp, a founding member of CONPS who worked on behalf of the Society for many years in a variety of capacities. Both funds were established to support research on the biology and natural history of Colorado native plants by means of small grants. The Steinkamp Fund targets rare species and those of conservation concern. Both field and laboratory studies are eligible for funding. Thanks to the generous contributions of many members and supporters, a total of nearly \$3,000 is

available, although individual awards will not exceed \$1,000. Recipients of the awards must agree to summarize their studies for publication in *Aquilegia*.

The Board of Directors is now soliciting proposals for a February 15, 2011 deadline. Information on guidelines and requirements for proposals may be obtained by visiting our web site at [http://www.conps.org/research\\_grants.html](http://www.conps.org/research_grants.html). If your questions are not answered by our web site, you may contact Board member Jan Loechell Turner by e-mail at [jturner@regis.edu](mailto:jturner@regis.edu) or by phone at 303-458-4262.

# AQUILEGIA

Newsletter of the Colorado Native Plant Society

*Aquilegia* is the newsletter of the Colorado Native Plant Society, and is available to members of the Society and to others with an interest in native plants. Four regular issues are published each year, plus a special issue for the annual Society meeting held in September

Announcements, news, articles, book reviews, poems, botanical illustrations, and other contributions should be sent to the editor at bh.prairieink@gmail.com, who can provide editorial guidelines.

All contributions are subject to editing for brevity and consistency, with final approval of material changes by the author.

Articles from *Aquilegia* may be used by other native plant societies or non-profit groups, if fully cited to author and attributed to *Aquilegia*.

Please direct questions or comments regarding the newsletter to the editor at bh.prairieink@gmail.com.

### Deadlines

Submissions to *Aquilegia* are accepted throughout the year, although deadlines for publication are:

- February 15 (Spring issue, published March 1)
- April 15 (Summer issue, published May 15)
- June 15 (Annual Meeting issue, published July 15)
- July 15 (Fall issue, published Aug. 15)
- October 15 (Winter issue, published November 15)

## MEMBERSHIP APPLICATION AND RENEWAL FORM

Name(s) .....

Address .....

City ..... State..... Zip .....

Phone \_\_\_ - \_\_\_ - \_\_\_ E-mail .....

### MEMBERSHIP CLASS

*Dues cover a 12-month period.*

- \_\_\_ Individual (\$20.00)
- \_\_\_ Family / dual (\$30.00)
- \_\_\_ Senior (65+) (\$12.00)
- \_\_\_ Student (\$12.00)
- \_\_\_ Organization (\$30.00)
- \_\_\_ Supporting (\$50.00)
- \_\_\_ Lifetime (\$300.00)

**CHAPTER**      *You are free to affiliate with any chapter you choose and to attend the meetings of any chapter. Chapters do not have drawn map boundaries; the locations below indicate the usual meeting place of chapter meetings.*

- Boulder       Metro-Denver       Northern
- Plateau       Southeast

### OPTIONAL E-MAIL DELIVERY OF *Aquilegia*

Many members prefer to receive the newsletter electronically via e-mail, and this saves the Society considerable printing and postage expense. If you would like to receive the newsletter by e-mail, please check this box and provide your e-mail address above.

- Please deliver *Aquilegia* electronically to the above e-mail address.

**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 to benefit the rare plants of Colorado

**Mail to: Eric Lane, P.O. Box 200, Fort Collins, CO 80522**

*Please make checks payable to "Colorado Native Plant Society"*

*Dues and contributions are tax-deductible.*



# Colorado Native Plant Society

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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 information.

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**CALENDAR 2010 - 2011**

**BOARD MEETINGS**

February 5 Board Meeting, location to be determined  
 April 23 Board Meeting, location to be determined  
 October 22 Board Meeting, location to be determined

**WORKSHOPS**

Jan / Feb Edible and Poisonous Plants of Colorado  
 February 5-6 Cacti of Colorado / Orchids of Colorado  
 Spring Ferns of Colorado  
 Spring Rushes of Colorado

**BOULDER CHAPTER**

December 9 Darwin's "abominable mystery" and the search for the first flowering plants  
 January 13 CSU Extension and Boulder CoNPS Night!  
 February 10 White Pine Blister Rust in High Mountain Ecosystems  
 March 10 Sex and the single flower  
 April 14 Lichens: Diversity, Utility, and Their Inner World

**METRO-DENVER CHAPTER**

November 30 History and Future of the NRCS Plant Materials Program  
 January 25 Historic Role of Fire in Forest and Grassland ecosystems  
 February 22 Clear Cutting at Roxborough State Park  
 March 22 Propagating Penstemons  
 April 26 Gardening with Native Plants

**NORTHERN CHAPTER**

December 1 Effect of Climate Change on Grasshoppers of the Southern Rocky Mountains  
 January 5 Colorado Wildflowers  
 February TBD Joint Meeting with the Audubon Society  
 March 2 Re-Discovery of *Haptanthus hazlettii*  
 April 6 Dirt for Dummies  
 May 4 To Be Announced