OREGON FLORA Newsletter

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Spotlight on OFP volunteers

by Linda Hardison

The Oregon Flora Project has progressed to its current state due to efforts of the many volunteers who have contributed to its development. The various skills and backgrounds people have brought to the Project have enriched the products we are striving to create and, as reflected in the interviews below, our volunteers seem to benefit as well. To the many individuals who have donated thousands of hours, we extend our sincere thanks. The Oregon Flora Project could not exist without you!

Being the spouse of an OFP staff member seems to be a conduit to volunteerism as in the case of **Jeff Cook**, programming expert and husband of database manager Thea. Jeff began in May 2005 to help develop forms for the checklist database. "It seems there is a niche for me in database development—there are some tricks the staff is either unfamiliar with or lacking the time to implement, so I'm happy to be able to help," Jeff said. He began his career as a software engineer in 1984, working for various firms to customize and add functionality to software programs. Most recently Jeff has been implementing web displays for database information. Jeff's lack of background in botany has presented no problems in his work for the Oregon Flora Project; in contrast, his fresh perspective has often led to improved ways to express and link the checklist data. "When I have had instances of misunderstanding a botanical concept, Thea's straightened me out," he joked. "Plus, I've learned a

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Photo: Courtesy of Jeff Cook

Jeff Cook, OFP volunteer, on top of South Sister.

The authorship of *Mimulus cusickii*

by Wayland L. Ezell

Based on the International Code of Botanical Nomenclature, the correct authority—i.e., the author of the scientific name—for *Mimulus cusickii* is Volney Rattan, not C. V. Piper. The author has been listed as Piper since 1906, so why make a change now?

In the mid-1800s George Bentham proposed *Eunanus* as a new generic name for a group of dwarf monkeyflowers which includes the Cusick monkeyflower. E. L. Greene used this genus, but Asa Gray and other taxonomists placed all herbaceous monkeyflowers in genus *Mimulus*, using *Eunanus* as a section name (i.e., a taxonomic subdivision of a genus.)

Mimulus bigelovii var. *ovatus* was named by Asa Gray in his 1886 *Synoptical Flora of North America* (page 445) for a monkeyflower found from western Nevada, northward to the upper Columbia River. The following year, E. L. Greene described a new species, *Eunanus cusickii*, in the journal *Pittonia* (volume 1, pages 36-37) based on collections by William Cusick and Thomas Howell, specimens he considered to be different from *Mimulus bigelovii* A. Gray var. *ovatus* A. Gray. Greene stated, "The species is a most beautiful one, lacking the villous pubescence of *E. bigelovii* and otherwise different." He did consider his new species to be the same as Gray's variety "in part," meaning some of the collections cited by Gray were *E. cusickii*.

In the *Flora of the State of Washington* (page 508), Piper (1906) created the new combination, *Mimulus cusickii*. He agreed with Greene (1887) that the *cusickii* species was different, saying, "This species was included by Dr. Gray in *M. bigelovii* A. Gray, but it seems sufficiently distinct." Piper listed the type locality for *M. cusickii* as "Malheur River, Oregon. Collected by Cusick." This new combination came to be written as *Mimulus cusickii* (Greene) Piper in the *Gray Herbarium Index*, *Index Kewensis*, and all the regional floras and manuals before 1993. David Thompson was the first to list Rattan as the authority for *Mimulus cusickii* when he treated *Mimulus* for *The Jepson Manual* (1993). This change in authorship was necessary because of the discovery of an 1898 manual of botany written by Volney Rattan, a teacher of botany at the State Normal School in San Jose, California.

Joseph Monachino of the New York Botanical Garden published a paper in 1963 discussing Rattan's manual, which according to Monachino, includes thirty-four species names not listed in the *Gray Index* or *Index Kewensis*. A number of these names are new combinations of which Rattan is effectively the author, even though it is uncertain whether he intended to formally publish these changes as in a standard taxonomic

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little systematics along the way." Jeff feels that this is an exciting time to develop a flora with today's new computer technology. "It has been very rewarding to help develop the databases which make the Flora Project more effective. Internet technology will make this flora much more interactive and accessible than any previous flora, and I value knowing that my volunteer efforts will help botanists do their work more efficiently."

A familiar face around the herbarium, **Troy Maddux** moved to Corvallis from Albuquerque in July 2003. In college, botany courses lured him away from a zoology focus. "I find the dance between humans and plants intriguing. Taxonomy captures these interactions—it reflects both people's history with an organism through the names assigned to a plant as well as the relationships between that plant and its relatives." With his background as a botanist and database administrator at the University of New Mexico Biology department, Troy was interested in connecting with the botanical community at OSU. "Volunteering for the Oregon Flora Project was a way to become acquainted with the plants and botanists of Oregon," he said. "I've been very impressed with the way the Flora Project approaches volunteerism: there is training for each task, the expectations for volunteers are made clear, and there are opportunities to interact with interesting people." Troy's technical background has allowed him to contribute in many areas. He has performed quality control for the Atlas by comparing herbarium specimens to database records, verified the identification of photographs, and helped develop the morphology database for the multiple-entry key. He says of his volunteer experience, "It has repaid me very nicely in my work for the Oregon Department of Agriculture and as an instructor at Linn-Benton Community College. I've met nice people, become acquainted with lots of interesting plants, and been able to work on an incredible project."

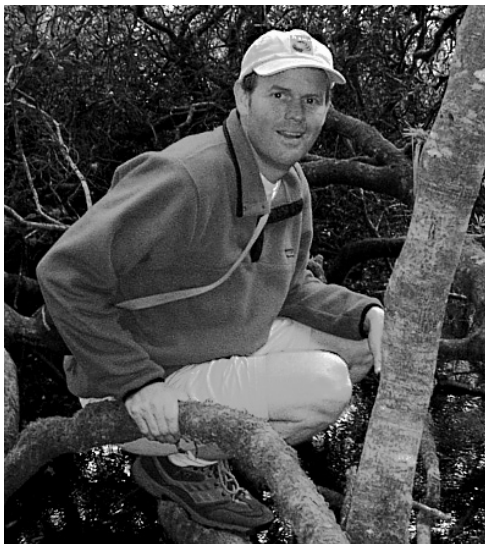

Photo: Courtesy of Troy Maddux

Troy Maddux, OFP volunteer, at Siltcoos Lake.

Don Roberts of Salem, has been an OFP volunteer since 2002. As an internist, he practiced medicine in Salem until the 1990s. Upon retirement, Don welcomed the opportunity to continue an interest in woodworking, "a solitary pursuit," but also wished to volunteer within a group. In 1995, Don attended a conference on native plants at which Scott Sundberg outlined the goals of the Oregon Flora Project, "a big project on the leading edge of several different facets of botany, as well as technology." Don's interest was piqued, and he sought more information about the Project and its progress from Salem participants. "My inquiries received glowing reports," Don said, "which made it all the more interesting to me. When I saw a request for volunteers, I applied, was interviewed, and happily I passed." Don has most recently assisted with the Photo Gallery by selecting and photographing a representative herbarium specimen of each taxon which was lacking a file photo of the living plant. How does Don describe his volunteer experience? "I've enjoyed working with people in all stages of their 'botanical lives'—from novices to emeritus faculty—who are contributing their expertise to this project. I have also developed skills using databases and imaging technology that I could not have done outside of this volunteer opportunity."

If you would like to join the volunteers who are contributing to Oregon's botanical heritage, contact Linda Hardison at hardisol@science.oregonstate.edu or (541) 737-4338.

Thanks to the following who have volunteered during 2005: Connie Battaile, Wilbur Bluhm, Dick Brainerd, Henrietta Chambers, Caitlin Coberly, Jeff Cook, Leila deLaubenfels, Jim Duncan, Jereme Frank, Bob Frenkel, Mary Garrard, Clay Gautier, Glenn & Barbara Halliday, Tanya Harvey, Rhoda Love, Tom Kaye, Kate Keck, Troy Maddux, Stephen Meyers, Lynda Moore, Keir Morse, Don Roberts, Charlene Simpson, Ruth M. Smith, Elize Stander, Tara Stark, Kuuipo Walsh, Barbara Wilson, and Don Zobel.

In memoriam: Julian Battaile, 1925-2005

by Linda Hardison

We extend our condolences to the Battaile family upon the August 24th death of Julian Battaile of Ashland. A true Renaissance man, Julian was a retired chemistry professor who shared with others his gifts of music, writing, cooking, and botany. He and wife Connie's support of the Flora Project included adopting a block in southwestern Klamath County, of which they developed an intimate knowledge. Over the past five years they submitted comprehensive species lists to the Atlas project, and collected and identified 670 taxa from the area. Julian's quiet graciousness will be deeply missed.

Erythronium oregonum logo and masthead designed by Tanya Harvey.

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Address correspondence to:
Linda Hardison
Department of Botany & Plant Pathology
Oregon State University, Cordley Hall 2082
Corvallis, OR 97331-2902
E-mail: hardisol@science.oregonstate.edu
(541) 737-4338; FAX (541) 737-3573
http://www.oregonflora.org

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A distant disjunction in Oregon's flora

by Kenton L. Chambers

In any book on the flora of a region, one expects to find a section discussing the "phytogeographic relationships" of the region's genera and species. In my younger days, I remember being amused by some of these presentations, because they seemed to come down mainly to the observation that, for example, some of the species had affinities with more northern floras, some with more eastern floras, and some with more southern floras. At least for Pacific Coast states such as Oregon and California, there was no mention of "more western floras," due to the obvious oceanic barrier. Today, however, the tracing of geographical affinities of species has become much more sophisticated and has been elevated to the science of "phylogeography"—the melding of phylogenetic cladograms with the plate-tectonic history of identifiable geofloristic regions. Some nifty computer algorithms have been designed to facilitate these studies, and I am sure that today's students of plant geography do not have the rather dismissive attitude towards it that I once had.

Morphological comparison of habit, flower, and fruit of Kellogia chinensis *(right) and* K. galioides *(left). Courtesy of Botanical Society of America,* American Journal of Botany.

One of the features of plant distribution that still bugs the proponents of phylogeography, however, is the propensity of some species for long-distance dispersal—that is, migration by jumps from one region to another rather than by smooth, step-by-step progression. These jumps may appear to be random, lacking any correlated pattern. It is rewarding to find, however, that some patterns in long-range dispersal do exist, and that they can be placed in a scientific (i.e. predictable) context. I earlier wrote in the *Newsletter* about the 2,400+ mile disjunction in the tarweed tribe of Asteraceae, between California and Hawaii. The resulting magnificent evolutionary radiation of the Hawaiian silversword alliance is known to have its ancestry in a now extinct hybrid tarweed of California. Its seeds were carried over the ocean by some anonymous bird around 5 million years ago. As more Hawaiian genera are given detailed molecular examination, similar examples continue to be found—in families Asteraceae, Caryophyllaceae, Lamiaceae, Campanulaceae, and others—some with ancestors from western North America and some from Asia. The age of these Hawaiian disjunctions may be truly remarkable. For example, in Campanulaceae, the evolution of a group of genera with flowers coadapted for pollination by the birds known as Hawaiian honeycreepers must have begun at least 20 million years ago. The island to which this ancient dispersal event occurred is now gone, eroded away to nothing but an underwater seamount.

I recently read a paper on plant molecular phylogeny which renewed the possibility that an Oregon species has affinities to a "more western flora," clear across the Pacific Ocean. The species in question is *Kelloggia galioides*, a familiar creeping, white-flowered herb of coniferous forests in central and eastern Oregon. It was named in 1874 by John Torrey, of New York, in honor of the pioneer California naturalist Albert Kellogg (1813-1887). A member of family Rubiaceae, the plant takes its specific name from its resemblance to *Galium* or bedstraw. The original specimens were collected near Walla Walla, probably on June 28, 1841, by W. D. Brackenridge of the U. S. Exploring Expedition commanded by Charles Wilkes. The publication of Brackenridge's discoveries was delayed more than 30 years by administrative bungling in Washington, D.C. Nonetheless, it is surprising that such a common species had not been collected by earlier botanical explorers such as Lewis, Douglas, Nuttall, Tolmie, or Frémont. The honoree, Dr. Kellogg, resided in San Francisco and was a founder of the first scientific society west of the Rockies, the California Academy of Sciences. His botanical travels, principally in the 1860s and 70s, included Alaska and much of central California.

As was pointed out by Lauramay Dempster (1975), it had been overlooked by most writers of California floras that a second species of *Kelloggia, K. chinensis* Franchet, was described in 1892 from southwestern China. This plant differs from *K. galioides* (see figure) in its hairy stems and leaves, more compact inflorescences, smaller flowers, and larger, toothed stipules. The study by Nie et al. (2005), referenced below, set out to determine whether the Chinese plant was closely related to *K. galioides,* or might in fact belong to a different genus. The DNA of three chloroplast genes was sequenced; that is, the "letters" of the DNA alphabet, A, T, C, and G, were listed in order for each gene. Fourteen other species of Rubiaceae were sequenced for comparison with the two kelloggias. Using the computer algorithm PAUP, a phylogenetic analysis of the gene similarities and differences produced a cladogram (tree) of relationship, and in this tree, the two *Kelloggia* species always stood together. Had they come on separate branches of the tree, mixed in among some of the other genera, we would be justified in saying that they are generically separate, but such was not the case.

Having determined that the two species are best classified as a single genus, the authors performed a phylogeographic analysis, to see whether the most likely origin of *Kelloggia* was in Asia or in North America. That is, where had the ancestor of the two species existed, and was the dispersal direction therefore west to east, or east to west? By this analysis, not only was the original home of the genus assigned to Asia, but the most likely time of divergence of the ancestors of *K. galioides* and *K chinensis* was dated at 5.41+/-2.32 million years ago—near the boundary between the Miocene and Pliocene epochs! Such a degree of accuracy, it must be understood, depends on the methods and assumptions used in studies like this one. Still, I hope that readers will be as impressed as I was with how today's genetic techniques can provide such a precise understanding of species relationships.

The authors point out that an ancestral divergence in late Miocene is too recent for the American species of *Kelloggia* to have

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migrated step-by-step from Asia over the Bering Land Bridge, and they favor long-distance dispersal as the more likely explanation of the disjunction. Dispersal by birds, for example, would be favored by the hooked bristles on the fruits, similar to those in the cousin genus *Galium.* It appears that elements of randomness and unpredictability will continue to arise in studies of plant distribution, whether we like it or not.

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Mimulus cusickii*, continued from front page*

Mimulus cusickii *(Greene) Rattan. Illustration by Jeanne R. Janish from Hitchcock, et al.,* Vascular Plants of the Pacific Northwest*. Courtesy of University of Washington Press.*

paper. His *West Coast Botany, an Analytical Key to the Flora of the Pacific Coast* was written for the educational use of his students, not as a means of proposing botanical novelties. However, the book has historical significance because Rattan took some species described earlier by Greene and transferred them to different genera. He made only indirect reference to Greene's publications.

In 1956, the International Code of Botanical Nomenclature mandated that new combinations published on and after 1 January 1953 must indicate the basionym (i.e., the specific epithet being transferred) together with its author and must indicate the date and place of publication. Indirect reference to the basionym is allowed, however, for new combinations made at an earlier date. Rattan's approach was indirect, at best, yet Monachino concluded that Rattan's new combinations were validly published according to the applicable rules. One of Rattan's new combinations was *Mimulus cusickii*, based on Greene's 1887 description of *Eunanus cusickii*, and his work has eight years priority over Piper's later publication of the same name.

Mimulus cusickii is centered in Central Oregon, on exposed sandy or rocky soil reaching the interior plateau of western Idaho, with limited distribution in northwestern Nevada (Washoe County) and northeastern California (Modoc County). Along the eastern slopes of the Oregon Cascades, it may be sympatric with *Mimulus nanus* Hook &. Arn., being distinguished by its mephitic odor, acuminate or cuspidate leaf tips, and weakly bilabiate corolla with nearly equal lobes. *Mimulus nanus*, on the other hand, has strongly bilabiate corollas with the upper lip erect and longer than the lower.

This story does not end with a change in authorship for Cusick's monkeyflower. The family status of the genus also is undergoing revision. Historically, *Mimulus* is placed in the family Scrophulariaceae; however, DNA sequence studies by Beardsley and Olmstead (2002) identified a clade that contains *Mimulus*, *Phryma*, and other genera. They assign this clade family rank, and because of priority, place *Mimulus* and the other included genera in family Phrymaceae, one that may be unfamiliar to western botanists. Until now, it has been a family with a single species, *Phryma leptostachya* L., lopseed, of eastern North America and east Asia.

Editor's note: Wayland Ezell was a former student of Kenton Chambers. Sadly, we have learned that Wayland died of cancer in February 2005.

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Project news

by Linda Hardison

The release of the Oregon Plant Atlas, featured in our last newsletter, has been a milestone for the Flora Project; however, it is by no means a stopping point for us. The summer of 2005 has been busy, with energy focused on two equally large projects: the Checklist and the Digital Field Guide.

Thanks to the efforts of Thea Cook, Katie Mitchell, and volunteer Jeff Cook (see *Spotlight on Volunteers*), restructuring of the database that houses OFP's synonymized checklist of plant names is almost complete. This makes data maintenance and updating much easier, and allows us to track the history and reasoning behind name changes. We are using this system daily to track checklist contributors' recommendations and to make updates, activities that are central to the entire Flora Project.

The Digital Field Guide (DFG) will provide the online presentation of *all* types of OFP data—photographs, localities, and technical information. The user will be able to select a desired subset of information and download it to a computer or device that does not have an Internet connection. This software is in the final stage of development.

The morphology database (a database of characters possessed by groups of plants and/or individual taxa) has seen phenomenal growth this summer. OSU students Stephen Meyers and Mandy Wood, and Linfield College intern Tara Stark have developed a data set of characters associated with Oregon plant

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Character illustrations for the Digital Field Guide by Rena Schlachter. Left: bulb, right: leaves alternate.

families. Hundreds of sketches have been prepared by Rena Schlachter to illustrate many of these characters (see examples above). This is the basis for the DFG's electronic key, which will allow users to identify an unknown plant to family. It also represents the beginning of data gathering for the final Flora.

The visual component of the Digital Field Guide will also prove stunning. Images of 4,000 herbarium specimens (thanks largely to the photographic efforts of volunteer Don Roberts) and over 1,800 color photographs will initially populate the Photo Gallery component of the DFG.

A new link for the Flora Project has been forged with OSU's Professional Science M.S. Program in Applied Systematics directed by Aaron Liston. In August, Michelle Buonopane, the first graduate of this program, presented her internship work on refinements to the Atlas mapping program as well as a business analysis of the Oregon Plant Atlas. Congratulations, Michelle!

This article summarizes the amazing progress that has occurred within the Oregon Flora Project in recent months. Equally amazing is the modest funding with which we have accomplished these advances, and what we have to sustain us in the near future. The Atlas, the Digital Field Guide, and the Checklist are valuable research tools that need financial support for further development and maintenance. Please consider what you—and your employer, if appropriate—can contribute to keep this resource freely available to the public. Donations are always welcomed, and will be especially appreciated during our upcoming fund-raising campaign this autumn and winter!

How can I contribute?

Donations to the Oregon Flora Project are a critical part of our operating budget. Your contributions help pay the salaries of our staff and students, as well as all newsletter expenses.

There are two ways to donate to the Oregon Flora Project: **(1)** with a check payable to the Oregon State University Foundation, attn: Oregon Flora Project; and **(2)** through the Friends of the Oregon Flora Project, with a check payable to the Native Plant Society of Oregon, attn: OFP.

Why two ways? Donations directly to the OSU Foundation alert donors of benefactor opportunities offered through OSU. Donations to NPSO bypass this connection, as all monies are transferred anonymously to the Flora Project. The support tendered by NPSO also serves as a strong endorsement of the OFP as we apply to foundations for support. In both cases, all funds go to the Flora Project, and your contributions are tax-deductible.

With your contribution, please let us know if you do *not* wish to have you name listed in our "Thanks" column, and if you would like to be added to our *Oregon Flora Newsletter* mailing list.

Mail your check to:
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Thanks

Photo: Dawna Halverson, the Oregon Stater

Scott Sundberg in the Herbarium, 2001.

Oregon Flora Project
Dept. of Botany & Plant Pathology
Oregon State University
2082 Cordley Hall
Corvallis, OR 97331-2902

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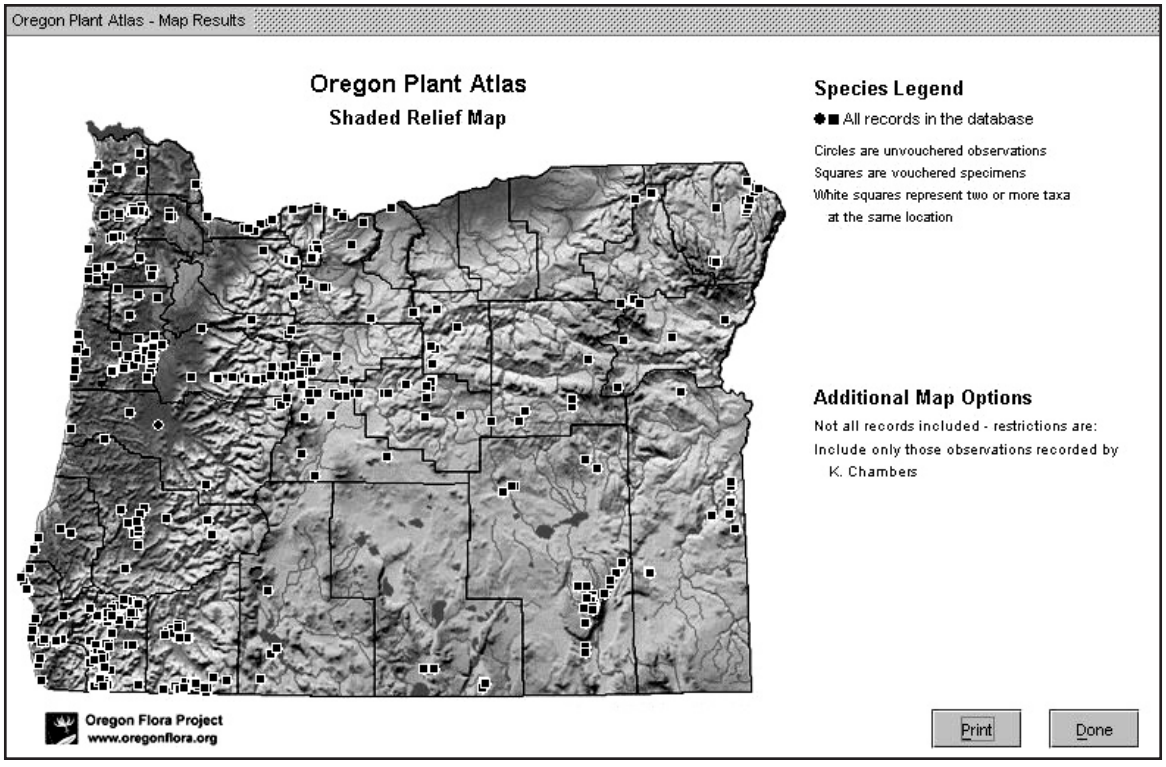

Professor Emeritus Kenton Chambers has botanized in virtually every Oregon county as revealed by an Oregon Plant Atlas (http://www.oregonflora.org/oregonplantatlas.html) map of his known collecting sites. Ken has been a full-time volunteer for the OFP for the past ten years and has collected nearly 6,500 botanical accessions to date. He celebrated his 76th birthday in September.