ERIOGONUM SOCIETY NEWSLETTER VOLUME 2, NO. 1 JANUARY 2010



Eriogonum lobbii on Mt. Rose west of Reno, Nevada Photo by Steve Caicco in August 2006.

Time to Register for our First Annual Meeting in Reno, Nevada on June 10-13, 2010

Plans are well underway for holding our first annual meeting in Reno from June 10-13, 2010. The meeting will consist of field trips, a day and a half workshop on how to identify eriogonum species by Dr. James Reveal, fellowship, swapping stories and information about eriogonums.

The seminar hopefully will be held at the University of Nevada on the north side of Reno and will start after dinner on Thursday evening, June 10 and conclude Friday afternoon, June 11. We are in the process of finalizing these arrangements. This will be a hands on type workshop and attendees are encouraged to bring eriogonum plant material to be used for study. Those of you traveling by car should stop long the way and collect plant material. Please collect fresh specimens of Eriogonum as you travel to Reno; gather enough for up to 25 people. Please bring any unidentified, mounted specimens or images of the genus you wish to have identified. It is recommended that you bring camera equipment to take pictures. If you wish to take close-ups of the flowers, a 105 mm macros lens is strongly recommended. Those who use laptops may wish to bring them to the Saturday session as numerous images of Eriogonum are available on the web.

Two days of field trips are being planned by local members John Weiser and Steve Caicco on Saturday and Sunday. Steve is planning a trip south of Reno to see two rare and endangered eriogonum species, E. ovalifolium var. williamsiae and Eriogonum diatomaceum. The first is in a geothermal environment at Steamboat Hot Springs and the second in a diatomite formation further south at Churchill Narrows. After that we will continue up into the Pine Nut Mountains to see other species for the rest of the day.

John reports that there is a very good site just a few miles north of Reno with six species growing in a very small area including E. umbellatum, E. ovalifolium, E. strictum, E. caespitosum, I. sphaerocephalum and, E. robustum. He has another site west of Reno and above the town of Verdi in riparian meadows surrounded by stands of Jeffery's pines with E. douglasii and a number of other relatively scarce other wildflower species.

Both of these trips will provide us with good fellowship and ample time to test our new identification skills and enjoy the outdoor areas near Reno.

Registration for the meeting will be \$90/per member and the registration form may be found on our website at, www.eriogonum.org. Simply log on to the website and click on "2010 Annual Meeting Registration" in the box on the left hand side of the page. This fee will include Dr. Reveal's expenses, a lunch on Friday at the seminar and a group dinner on Saturday evening. All other expenses are on the account of the attendee.

There are a wealth of hotels in the Reno area and you may choose between motels close to the University or the more glamorus spots downtown. You will need good walking shoes, a good hand lens (10x or 14x) and other assorted gear for hiking. Paper and pens for taking notes and a course notes prepared by Dr. Reveal will be provided.

The American Penstemon Society Annual Meeting will be held the prior weekend, June 4-7, 2010 in Craig, Colorado. Since many of our society are also members of APS, many are planning to attend both meetings. If you do this, it will allow a good two days to botanize across Utah and Nevada to Reno. Bob Pennington has volunteered to provide plant locations on a couple of the routes between NW Colorado and Reno. When he has completed these we will post them on the website under "2010 Annual Meeting". If you have relevant information on plant locations between the two areas Bob would love to hear from you and include your information. His website is aguafrianr@aol.com.



Dr. James Reveal

Biography of Dr. James Reveal

It is fitting that the first meeting of our Society should be held in Reno, Nevada, where Jim Reveal himself began in March of 1941. After only a few months in Nevada, his family moved to coastal California where his father, Jack, was assigned the task of heading the war effort in the use of redwood timber. After the Second World War, the family moved, first to the Shasta National Forest, and then again, in 1948, to the Stanislaus National Forest and the tiny Sierra Nevada town of Pinecrest on the Sonora Pass Highway where his father was a district ranger.

He attended a one-room school with the same teacher from 1950 until 1955 and then entered Sonora Union High School some thirty miles away; thus, his school day lasted from seven in the morning until five in the afternoon, the bus ride being over an hour each way. Establishment of the Dodge Ridge ski resort in the early 1950s meant that he and his brother, Jon, were required to ski as their mother, Arlene, was the accountant for the resort. Likewise, starting in 1950 Jim began to work for a high Sierra packer and spent the decade working around horses and guiding pack trips into the Emigrant Basin.

Graduation from high school in the spring of 1959 saw him entering college in the fall, having spent the summer working for the Forest Service on the Toiyabe National Forest. At Utah State University he majored in

forestry with an emphasis on fire suppression. That lasted for two years where he changed his major to botany and began work on *Eriogonum* under the mentorship of Arthur H. Holmgren. Thanks to the support of John Thomas Howell of the California Academy of Science, Arthur Cronquist of the New York Botanical Garden, and George J. Goodman of the University of Oklahoma, he began a revision of *Eriogonum*, taking time out to prepare a checklist of the Intermountain Flora as a senior thesis in 1963.

After earning his master's degree at Utah State in 1965, Jim went to Brigham Young University where he worked with Stanley L. Welsh (botany) and LeRoy R. Hafen (western American history) on a doctoral degree. Importantly he traveled throughout the West with Noel Holmgren collecting plants for the Intermountain Flora project and their doctoral studies. The fall semester of 1966-1967 was spent on a pre-doctoral fellowship at the Smithsonian Institution in Washington, D.C., which allowed him to study numerous critical specimens of *Eriogonum*. In 1968 he spent the summer on the Nevada Test Site working with Janice C. Beatley, an ecologist, on the flora of that area. As a result, he found several new species confined to that part of Nevada.

Following graduation in 1969, Jim accepted an assistant professor position at the University of Maryland, where he was able to concentrate on the flora of the Intermountain West and *Eriogonum* and its near relatives. Funding by the National Science Foundation and other federal agencies allowed him to devote his first ten years at Maryland on these projects. A change in deans forced him to concentrate on the flora of Maryland. During the next ten years he traveled mainly to England studying the colonial flora of Maryland (1680-1725) culminating, in 1989-1990, in a year and half stay at The Natural History Museum in London concentrating on the American plants named by Carl Linnaeus (1753-1778) and beginning a detailed study of vascular plant family nomenclature.

Another change of deans allowed Jim to return to his work on the Intermountain Flora and *Eriogonum*, and to begin a series of studies on related genera. His final decade at Maryland also allowed him to concentrate on the history of scientific (especially botanical) explorations and discoveries in the West and to examine in detail the scientific names applied to plant groups above the rank of genus. After thirty years at Maryland he retired and Jim and his wife, Rose Broome, moved to Montrose, Colorado, where they continued to work on botany.

From 1999 until 2007 Jim concentrated on the eriogonoid members of the knotweed family, *Polygonaceae*. He and Rose traveled widely, collecting throughout the West, and even found a number of new species in western Colorado. From 2003 to 2005 they also visited much of the Pacific Northwest and the Great Plains visiting sites where Meriwether Lewis and William Clark collected plants from 1804-1806, thanks to an American Treasurers grant to the Academy of Natural Sciences in Philadelphia.

In 2007, Jim returned to academia, accepting an adjunct professorship at Cornell University. There he continues to work on the eriogonoid genera, botanical nomenclature, history, and to study other genera, notably *Dodecatheon* (shooting star), and *Potentilla* (cinquefoil) and related genera. He is also teaching and advising graduate students. A treatment of *Eriogonum* and allied genera found in North America north of Mexico was published in 2005, following a 2004 summary of the nomenclature. The last volume of the Intermountain Flora will be finished in 2010 and will included a treatment of *Polygonaceae* for that part of the West. Altogether, Jim has published some 450 scientific papers and books, and nearly 60 works for the world-wide-web. A summary of his professional career may be seen at, http://www.plantsystematics.org/reveal/pbio/WWW/cvjlr.html.



Eriogonum atrorubens in the Valley of the Monks in the Sierra Madre of Chuhuahua in Sept. 2009. Photo by Loraine Yeatts

Notes on Eriogonum. V.

James L. Reveal

L. H. Bailey Hortorium. Department of Plant Biology, 412 Mann Library Building, Cornell University Ithaca, NY 14853-4301

Previously in these *Notes* the general morphological features were discussed that defines the subg. *Eriogonoideae*, as traditionally circumscribed, and the habit, duration, leaves and involucres. The perianth was discussed the last issue and in this one we will concentrate on stamens, pistils, fruits and pollination. Individual terms are defined in the gloss ary. The primary purpose of a flower is to present the male and female reproductive structures in such a manner as to encourage the production of viable fruit via cross-pollination. *Eriogonum* is one of those exceptional groups that promotes the exchange of pollen from one plant to the stigma of another plant, but will undergo self-pollination to assure the production of a viable fruit. The pollination strategies are varied, taking advantage of both the nature of the plants themselves and visitors that might be attracted to the flowers.

There are nine stamens in *Eriogonum* and most other genera of *Eriogoneae*. These are arranged in two whorls, an inner one of six stamens and an outer one of three stamens. While nine is a consistent number in *Eriogonum*, in *Chorizanthe* the number can vary considerable from three to nine, but with most species having three, six or nine. It is believed that when stamens are lost, those of the outer whorl are lost first (resulting in six in a single whorl) with three derived from the six with the extant stamens alternating with the inner tepals.

A stamen is composed of a filament and an anther. An anther is composed of two pollen sacs (or thecae) that contain numerous pollen grains. The base of the anther is attached directly onto an elongate, slender filament. The length of the stamens, in flowers that produce male and female reproductive parts and thus are functionally bisexual (synoecious), tend to be the length of the tepals at anthesis (or flowering). Thus, when flowers are closed at night, anthers are either position just beyond the tepals or are partially protected by the tepals. In polygamodioecious plants, that is plants that have both stamens and pistils but one is functional while the other is aborted, stamen length tends to position the anther just beyond the tepals when the flower is closed, or anthers are wholly protected by the tepals and in fact are often a considerable distance below the apices of the tepals.

Filaments many be variously hairy (mainly pilose) or glabrous basally with the hairs rarely extending more than the lower third of the filament. The filaments are usually a creamy-white in color. The filaments are inserted onto the perianth tube at the base of the pistil in most of the eriogonoids, but in *Chorizanthe* filaments may be inserted on the floral tube itself and even, albeit rarely, can be observed fused into a staminal tube.

The anthers vary from oblong to oval in shape and are some shade of yellow, red (including maroon) or white. The anthers are always short, rarely more than 3 mm long and occasionally less than a millimeter in length. Pollen is released by longitudinal slits on the exposed side of the anther sacs.

The pistil consists of a three-chambered ovary and three styles each topped by a capitate stigma, and yet there is only a single ovule due to abortion. The ovule, the female reproductive part of a plant, in Eriogonoideae is said to be orthotropous which means that ovule is straight with the micropyle at the apex. A micropyle is the minute opening in the wall of the ovule through which the pollen tube enters the ovule. A pollen tube results when the pollen grain germinates and produces a long, slender tube that grows down the style from the stigma to the ovule. Inside the pollen tube are two sperm cells, one of which joins with the egg cell of the ovule to produce an embryo, while the other fuses with two other cells in the ovule to produce endosperm or cells rich in nutrients to maintain a new plant. Endosperm is triploid, meaning that it has three sets of chromosomes, one from the male and two from the female. For more information and diagrams see this Wikipedia site.

The fruit type found in *Eriogonoideae* is termed an achene. In general the term achene is applied to any small, single-seeded, dry, one-walled fruit. Although the ornamentation associated with the fruits of *Polygonaceae* can be rather diverse (see <a href="http://nt.ars-

grin.gov/sbmlweb/OnlineResources/SeedsFruits/rpt SeedsFruitsFamData.cfm?thisFamily=Polygonaceae ">this site), in the traditional members of *Eriogonoideae* this is limited to a few, large achenes that are distinctly ribbed near the apex or even winged (i.e., *Eriogonum* subg. *Pterogonum*). Otherwise most achenes can be characterized a small, brownish to black or infrequently yellowish, glabrous, sparsely hairy (on the beak) or tomentose, and lenticular or trigonous in shape. The achenes are less than a centimeter in length with most falling between 2.5 and 6 mm in length. For a detailed review of all fruit types, see

Richard W. Spjut's online treatment.

Pollination in *Eriogonum* is complex in the sense that most flowers are protandrous, that is the anthers mature and release pollen before the stigma of the same flower is receptive. On day one the bent-over filaments straighten and as the flower opens the tepals and stamens spread outwardly and away from the centrally positioned ovary. Typically the six inner stamens mature at this time but it often seems as if there is a mixture of the two series. If pollen is gathered, and the pollinator goes to another plant, cross-pollination is accomplished, but if pollen is placed on a receptive stigma on another flower of the same plant, flower-to-flower selfpollination has occurred. Much of the pollen of the initial six anthers is shed the first day.

On the second day, the remaining stamens unfold and they, along with the original six and the tepals, are spread outwardly and well away from the pistil as the flower opens. At that time, the stigmas unroll and become more or less erect on the pistil; simultaneously the stigmas become receptive, glistening in the morning light. Pollination may or may not occur during the course of the day. However, that second night, as the flower closes, the anthers, still containing some pollen grains, come in direct contact with the still receptive stigmas, and same-flower, self-pollination is accomplished. In short, a fruit will be produced one way or the other. (See this site for images of pollen and a potential pollinator.

RANDOM NOTES Bob McFarlane

2010 MEMBERSHIP DUES ARE DUE

Please don't forget to send in your 2010 membership dues. So far we only have three members out of 61 that have paid for the upcoming year.

PLEA FOR NEWSLETTER ARTICLES

We need your help in providing articles of interest to out newsletter. Members are very interested in all things eriogonum. Your favorite plant, eriogonum locations, photos, cultivation and germination information and tips, thesis study areas, research, questions, suggestions are all welcome and needed. If we are to continue as a viable organization we need your input. Please help. Thanks.

SEED EXCHANGE OPEN UNTIL MARCH 1

Ginny Maffitt has reported that she will be keeping the seed exchange open until March 1, so it is not too late to submit your order. Please contact her for details at www.maffitt@verizon.net.

NEW MEMBER SEEKS HELP IN CULTIVATION

Doug Dion, a new member from Iowa City, Iowa writes, " I live in Iowa City, Zone 5A. We have very sandy area in the back of our house, a 3' x 30' or so strip between the house and a patio, full sun, and right under an eave so that while it gets some snow every once in a while it is very dry. I'd like to try eriogonum in that area. Do you have any suggestions? Please send your ideas to Doug at www.douglas-dion@uiowa.edu.

CHECK OUT OUR NEW FACEBOOK PAGE

Hugh MacMillan has just established a page for us on Facebook at,

http://www.facebook.com/pages/Eriogonum-Society/256683544544?v=info. Check it out. We are hopeful that it will provide still another way to publicize our society.

MEMBERSHIP APPLICATION FORM

Address_____

E-mail Address_____

Phone

Please send annual dues (January 1 thru December 31) of \$10. to Bob McFarlane at 5609 S. Locust St., Greenwood Village, CO 80111.