The Bulletin of the NATIVE PLANT SOCIETY OF OREGON

Vol. XIV No. 2 February 1981

ANNUAL MEETING

Look for an announcement in next months Bulletin. Tentative plans are to have the meeting hosted by the Mid Columbia Chapter some Saturday in May, (a beautiful part of the State at a beautiful time of the year.)

CHAPTER CALENDARS

PORTLAND CHAPTER

Meeting: Mon. Feb. 9, 7:00 p.m., Central Library, 801 S.W. 10th, Portland. Some Wild Plants of the Kangaroo Country, Frederick Dragger, speaker. Since retirement, Mr. Dragger has spent a great deal of time traveling and photographing wild flowers. His slide presentation with a lap dissolve unit makes this an especially interesting and beautiful program.

Workshops: All meet 10:00 a.m. in Central Library. Convene in the big meeting room.
Sat. Feb. 7 -- Members' Slides. Bring in a few of your unidentified subjects for diagnosis by a panel of plant pundits. Or test the panelists with some of your known favorites.
Sat. Feb. 14 -- Ferns of Oregon with Roger Yerke. Our knowledgeable fern master will present a lively and instructive program on getting to know our pteridophytes.
Sat. Feb. 21 -- Some Plants We Don't See Every Day with George Lewis.
Sat. Feb. 28 -- Alpine Plants with Keith Chamberlain.

Field Trip: Sat March 7 -- Forest Park. Leader undesignated. Meet in Macleay Park parking lot on NW Cornel Road at 9:30 a.m.

HIGH DESERT CHAPTER

Meeting: Tues. Feb. 3, 7:30 p.m., Room B-10, Bend High School. Techniques Used in Wildflower Photography. All interested persons are invited to attend.

SISKIYOU CHAPTER

Meetings: Thurs. Feb. 5, 7:30, Room 171, Science Bldg, SOSC, Ashland. The Physiology of Flowering, Dr. Ronald Nitsos, Assoc. Professor of Biology, SOSC, speaker
Thur. Mar. 5. same time and place. Wildflowers: Your Favoirte Fotos. Frank Lang and Vern Crawford will complete last years' photo workshop by enjoying your photos. Bring a few of your favorites to share. This is also our annual business meeting: election of officers.

THE JIG IS UP!!

This will be your last issue of the Bulletin if you have not paid your dues.

NOMINATIONS FOR NEXT YEARS NPSO OFFICIERS

Due to an oversight by your NPSO president the Nomination Annoucement is a month late. In order to stay on schedule and keep with the society By Laws we will add any new names with a brief biography submitted by any group of five or more paid members to the ballot which will be published in the March Bulletin. The ballot will consist of all the nominees and their biographies.

The nominating committee of Janet Hohn, Chairman, Annie Kowalishen, Virginia Crosby and Charlene Holzwarth have submitted the following slate of nominees.

President: David Wagner -- Curator the University of Oregon Hervarium, President of the Emerald Chapter, NPSO. Very active, Professional Botanist, co-author of Rare, Threatened and Endangered Vascular Plants of Oregon, member of the Natural Heritage Advisory Council.

Vice President: Annie Kowalishen -- Member of the Portland Chapter, Chairperson of the NPSO Endangered Plant Committee, Chairperson of the Western Native Plant Society.

Secretary: Paula Vincent -- Part-time Botany student and previous professional secretary, conducted a rare plant survey for the Fremont National Forest, Member of the Siskiyou Chapter.

Treasurer: John Christy -- Former chapter treasurer, a B.S. in general science, worked as a Botanist for BLM and Nature Conservancy, very interested in mosses, a member of the Emerald Chapter.

Board of Directors:

Veva Stansell -- Former Board Member, did a study on Darlingtonia for the U.S. Fish and Wildlife Service, a very knowledgeable botanist of the Oregon Coast, member of the Siskiyou Chapter.

Cynthia Roberts -- Forestry technician with BLM and Forest Service, a very active member for 4 1/2 years in the Siskiyou Chapter.

Stuart Garrett -- Former Portland member and botany major in college, now a practicing physician, working on a plant list for the Metolius River Preserve, founding member of the High Desert Chapter.

Mary Falconer -- Current NPSO membership Chairman, former President of the Mid-Willamette chapter. Active in the Orchid Society, self taught botanist interested in the locating and photographing native orchids. Charter member of the Mid-Willamette Chapter

I would like to thank the nominating committee for the great job they did in putting together this fine slate of nominees on such short notice. Thanks also to the nominees for their willingness to serve.

F.A. Lang
NPSO, President

1980 NOTICE OF REVIEW FOR T & E PLANTS

The U.S. Fish and Wildlife Service has published the long-awaited Notice of Review for vascular plants of the United States which are candidates for Threatened or Endangered status under the Endangered Species Act of 1973.

There are approximately 3,000 plant species for the Nation currently under review. All plant species listed in the new Notice, which updates three previous Notices, are candidates for Endangered or Threatened status and as such must be considered in environmental planning.

The public is invited to comment on the Notice and is encouraged to provide additional or new information on any of the candidate species. Comments are welcome in the Portland Office or Washington, D.C. Office of Endangered Species.

Copies of the 1980 Notice of Review, published December 15, are available from:

U.S. Fish and Wildlife Service
Endangered Species Office
Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, OR 97232

HIGH DESERT CHAPTER IS ACTIVE

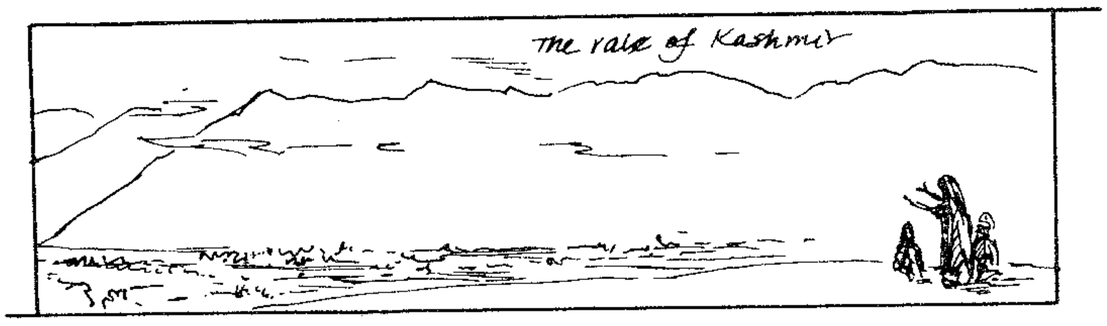
Endangered Plants were the topic for the January 6th meeting of the High Desert Chapter (Central Oregon Area). Joyce Bork shared her slides and knowledge with the fifteen members present.

Plans are being made to assist The Nature Conservancy in completing a plant list for the recently acquired Metolius River Preserve--an interesting area of spruce forest, fen and riparian habitats. Members also palnt to assist the Deschutes National Forest in developing a brochure on local endangered palnts.

Interested persons are invited to attend the Chapter's monthly meetings which are held the first Tuesday of each month at 7:30p.m. in Room B-10 of Bend High School. February's meeting will be devoted to techniques and equipment used in wildflower photography.

JOIN THE HIMACHAL PRADESH/KASHMIR BOTANICAL EXPEDITION

$100 of your cost of attending this exciting trip will go directly to NPSO. So plan to join the group May 5-29 1981. The program in India will be hosted by an Indian Botanist who will accompany the group during the entire trip. Four days will be spend in Delhi with a tour of the city included. Ten days botanical trekking in the Himachal Pradesh, with porters, tents, cook & kitchen help, all meals, and sherpas, will follow. At the return of the trek, we will go further north to Srinagar and explore the region and gardens of Kashmir. Our program will reach an end in Delhi after the flight from Srinagar. A day's rest at Janpath, then the group will board the plane for the return flight. An optional two-day visit to the Taj Mahal, red fort, and Bharatpur Bird Sanctuary.
Land Cost: $1450
Airfare: $1250 (east coast slightly less. Subject to change).
For information, contact Folkways International Trekking, Inc. 14903 S.E. Linden Lane, Milwaukie, OR 97222. telephone (503) 653-5882.



LUPINUS TRACYI REPORTED

Two Curry and Josephine County Lupinus collections made by Lilla Leach have been identified as the rare Lupinus tracyi, previously known only from California. Species annotations of the two collections were made in December by Dr. David Dunn, Lupinus authority and curator of the herbarium at the University of Missouri-Columbia.

Lupinus tracyi Eastwood is characterized as an herbaceous, glabrous perennial, having 6-7 leaflets and whitish, 10mm. flowers in terminal racemes. The banner is shorter than the wing petals, the keel lacks bristles along its upper edges, and the whitish fruits appear shaggy. Its habitat has only been briefly described as openings in or edges of forests.

The collections were made between Game Lake and Snow Camp (Curry Co.), and along Dry Ridge on the Free and Easy Trail, ca. 4,500 ft. (Josephine Co.) It has yet to be confirmed whether there populations are extant. They are certainly worthy topics of search and futher investigation in the coming field season.

Bonnie Heidel and Janet Hohn,
Botanists
Endangered Species Office
U.S. Fish and Wildlife Service
Portland

A BOTANIST VIEWS THE "SPECIES PROBLEM"

The term "species", and the concept it stands for, have been important to the science of biology since long before anyone bothered to call it a "science". Yet even today, discussions among biologists on so simple a question as, "what is a species?", invariably get bogged down in confusion and argument. The layperson, who is an outsider to the sophisticated debates of the biologists, might be surprised to learn of these disagreements over the term "species". Practising taxonomists, on the other hand, are acutely aware that the "species" described in our floras and manuals are by no means conceptually similar from genus to genus (nor from book to book!). Perhaps this brief discussion by a botanical taxonomist will make clear some of the factors involved in the problem, and will get more people interested in working towards a solution.

It seems to me to be quite significant that modern science inherited the concept of "species" from the languages and folk-taxonomies of prescientific human cultures. It is a common sense observation that the large, familiar organisms (especially animals) which humans have observed and domesticated since time immemorial are of recognizably different "kinds" (species). We suppose that in each species, the members have the same interrelationships as do members of a human family or tribe. That is, males and females of each species mate among themselves to produce offspring, as do their offspring in turn, generation after generation. "Like begets like"--what could be simpler? Goats are one species and sheep are another, simply because goats and sheep can't and won't interbreed.

This prescientific notion of species worked well in its day, just like the notion of a flat earth worked fine for the needs of mankind for a very long time. But I believe it is a serious error for present-day biologists simply to dress this ancient concept in modern clothes and try to make it universally applicable. By this, I mean that a concept which worked well for goats and sheep, for horses and cows, and even (though less well) for dogs and wolves, may not be suitable for oaks and dandelions, for mushrooms and lichens, and for diatoms and bacteria. It is no accident that the examples I just quoted are generally (in common parlance) called "plants" -- because I want to emphasize that it is often very difficult to fit plants into zoologically defined categories. One cause of the "species problem", I think, is that zoologists mostly insist that only animals are valid models for defining the biological species concept (n.b.: mankind is itself a species of animal, so we have a bias on this point). If plants don't fit the concept, they say, then too bad for the botanists (not "too bad for the concept").

I don't wish to debate here whether the "biological species concept" of the zoologists (using the criterion of interbreeding, mentioned above) works as well as expected in the animal kingdom. Even some zoologists dispute that it does. Instead let me suggest several reasons why such a concept is not workable for many kinds of plants. There are three main points to be made, all of which concern the methods of reproduction that occur among plants:

(1) Many plants avoid animal-like sexual reproduction; instead, they produce offspring asexually (by cloning) or by self-fertilization.

(2) Many plants are promiscuous in their reproduction and will cross-fertilize (hybridize) with related species wherever and whenever the opportunity exists.

(3) Many plants have rearranged their genetic information, through chromosomal mutations or multiplications, so that individuals which look alike and live in the same habitats may be almost totally incapable of interbreeding.

Dandelions (genus Taraxacum) are a textbook example of asexual plants. The common, weedy types are sexually sterile and make seeds by cellular processes that completely circumvent fertilization. Certain non-weedy dandelions, on the other hand, are sexually fertile, while still others can alternate between sexual and asexual phases. Purely asexual reproduction, as well as mixed breeding behaviors, are common throughout the "plant kingdom," from bacteria and fungi, through mosses and ferns, to even the most advanced seed plants. In Oregon we have good cases of asexual groups in the genera Antennaria, Arnica, Crepis, Poa, and Potentilla, while self-fertilizing complexes occur in Amsinckia, Festuca, Limnathes, Montia, Oenothera, and Polygonum, among others. In eastern North America, asexual types are notoriously abundant in Crataegus, Hieracium, and Rubus.

We can also easily document numerous examples of plant breeding behavior that involves hybridization of quite dissimilar "species". Oregon's flora, while not exceptionally rich with such hybrids, nonetheless provides case studies in the genera Abies, Arctostaphylos, Balsamorhiza, Artemisia, Aster, Ceanothus, Hieracium, Iris, Sidalcea, and Spiraea, for example. Elsewhere in North America, famous hybrid swarms occur in Aquilegia, Atriplex, Baptisia, Helianthus, Juniperus, Phlox, Purshia, Quercus, Salix, Salvia, Tradescantia, Viola, and so on, ad infinitum.

Proving the third kind of phenomenon I listed, which is the absence of interbreeding between closely similar individuals, often requires detailed genetic research. But from many well studied cases, we can confidently assert that plants which have a similar morphology (and thus seem to be part of the same "species") may often be intersterile or may produce genetically aberrant offspring after cross-fertilization (the botanical equivalents of the mule). Conspicuous examples occur in the families Onagraceae (genera Oenothera and Clarkia), Poaceae (genus Elymus), Polemoniaceae (genus Gilia), and Asteraceae (genera Holocarpha and Lasthenia), and in literally scores of genera in which multiplication of chromosomes by "polyploidy" is frequent. Oregon's examples of genera whose taxonomy is afflicted by such genetic complexities include Artemisia, Aster, Castilleja, Dodecatheon, Lupinus, Montia, Penstemon, Phacelia, Polypodium, Polystichum, and Vaccinium, to name only a few.

It would not be accurate to claim that botanists themselves agree on a particular "species concept" which will work in all the difficult genera just mentioned, and in all the hundreds not mentioned. Far from it; in fact, species concepts differ considerably from one taxonomist to another. There is a feeling among some taxonomists (myself included) that it is not even necessary, scientifically speaking, to have a single species concept that is uniformly applicable to all plants.

The search for a universal species concept may have become a quest for the Holy Grail. It woild be best to abandon that quest, and consider instead the proposition that many different kinds of "species" may exist. More accurately, we should ask (1) what are the kinds of plant groupings which evolution produces, and (2) which of these natural groupings should we attach the label "species" to. In effect, this is what botanical taxonomists regularly must do anyway, whenever the plants they are studying show the kinds of reproductive and genetic pattern I described above.

For better scientific communication, we should develop a set of terms defining all the different kinds of plant groupings that we will choose to call "species." Much work needs to be done, and it will be difficult to get agreement among biologists on these terms and definitions. At present, we can continue to make do with our standard morphological species concept, based principally on the observed similarities and continuities in form and structure among related plants. This approach is already in use by the vast majority of practising plant taxonomists. It is ambiguous and imprecise, but it provides practical and useful classifications. A completely "scientific" species classification for plants lies quite far in the future.

Kenton L. Chambers
Botany Department
Oregon State University

PLANT FAMILY PROFILES
By Herm Fitz

The Betulaceae - BIRCH FAMILY

Although the Betulaceae is a rather small family (about 170 species in 6 genera), representatives are widespread and abundant throughout the north temperate zone, and some species extend into tropical mountains and into the southern hemisphere in the Andes Mountains of South America. We have only three of these genera in Oregon. The Western Hazel (*Corylus cornuta*) is widespread in woods chiefly west of the Cascades. Three species of Birch (*Betula*) can be found here and there: Swamp Birch (*B. glandulosa*) thrives along stream banks, around marshes, lakes or bogs, or on alpine slopes mostly east of the Cascade Crest; Western Birch (*B. occidentalis*), also chiefly east of the Cascades, may grow along streams or in moist spots in forests; Paper Birch (*B. papyrifera*), whose bark was used by Indians to make canoes and artistic items, extends from the north into moist woods and lower elevation mountain slopes of northeastern Oregon. Four species of Alder (*Alnus*) are found along stream banks, at the margins of ponds and lakes, or on moist slopes in the mountains: Red Alder (*A. rubra*) at lower elevations west of the Cascades; White Alder (*A. rhombifolia*), on both sides of the Cascades; Mountain Alder (*A. incana*), from lowland foothills to well up in the mountains (Cascades, Blue Mountains, and Siskiyous); and Thin-leaved Alder (*A. sinuata*) at or near timberline mainly in the Cascades and Blue Mountains.

This family consists of trees and shrubs. The leaves are simple, alternate, and deciduous, with characteristic pinnate veins and serrate (toothed) margins. Male and female flowers are separate from each other, but on the same plant; the plants are thus "monoecious." These small and inconspicuous flowers appear in early spring, generally before the leaves, and are pollinated by the wind while branches are still bare. Groups of male flowers are in characteristic pendulous catkins, or aments; groups of female flowers are borne on a stiff axis, often held erect. Flowers are subtended by small bracts, and the perianth (sepals and petals) is represented by 0 to 4 scale-like segments. [Note: It may even surprise you that these inconspicuous, colorless, scentless, nectarless structures are actually flowers, but, though they are a far cry from the Trillium, stamens and pistils are present, and seeds are produced - they therefore qualify.] It takes a hand lens to see the actual arrangement: With each bract of the catkin, male flowers occur singly and without a perianth (*Corylus*) or in groups of 3 or 6 with a perianth (*Betula, Alnus*). In *Corylus* each flower has 8 stamens, and that's it. Male *Betula* flowers each have 2 stamens; male *Alnus* flowers each have 2 or 4 stamens. The female flowers are very difficult to dissect and observe, but each has a bicarpellate inferior ovary associated with each bract, and the perianth is either present (*Corylus*) or absent (*Betula, Alnus*). The female catkin matures to a cone-like structure with numerous tiny winged or wingless nutlets, either persistent and scattering the fruits (*Alnus*), or deciduous as a whole with the ripened nutlets (*Betula*). In the Hazel, a large nut develops within papery bracts; the cultivated filbert is a close relative and familiar example.

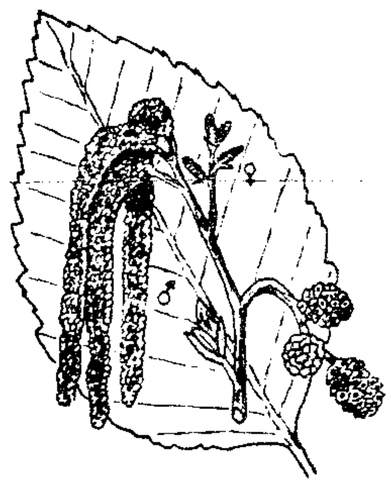
Now we may write the floral formula, in this case a different one for each sex:

Male flower: $Ca^{0,2,3,\text{ or }4}\ Co^{0}\ S^{2,4,\text{ or }8}\ P^{0}$

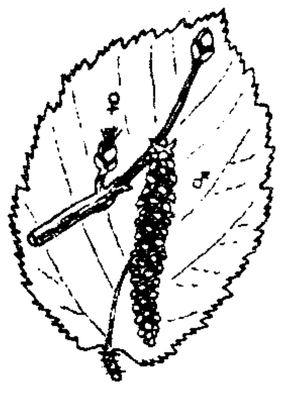
Female flower: $Ca^{0\text{ or }4}\ Co^{0}\ S^{0}\ P^{(2)}$

This may seem a bit overwhelming, but if you carefully dissect the catkins under magnification, you will see and verify these structures.

In spring, when you discover a monoecious tree or shrub with catkins, with simple, alternate leaves that show serrate margins and pinnate veins, and if the fruit is developing into a woody cone-like structure or a large nut enclosed by papery bracts - you can be certain that it is a member of the Betulaceae - the Birch Family.



Leaf and flowers of Red Alder (*Alnus rubra*). Note the distinct pinnate veins, the clustered male catkins, the erect female catkin and last year's "cones."



Leaf and flowers of Western Hazel (*Corylus cornuta*). Note the doubly serrate margins, the single male catkin, and the single, bud-like female catkin with small protruding (purple in nature) stigmas.

SHARE IT WITH US

Reading the journals of early plant explorers permits us the exciting speculation, if we are fortunate enough to go into the same meadows and mountains they have described -- could this be the very slope where Douglas or Clark or Henderson collected a new species?

Not all such discoveries are "before our time". The type locality is of record, but the field notes or journal (does anyone keep a real jouranl any more?) of recent years are not much in print. The following article by Floyd W. McMullen printed in the bulletin of Berry Botanic Garden (Fall,1989), includes first-hand knowledge of Corydalis aquae-gelidae, which is on the rare, threatened and endangered list compiled by the Oregon Task Force.

LetFloyd's story be a good example: those who were involved in or know the circumstances of such first-sightings should be recording them (and letting the NPSO Bulletin share the knowledge).

Louise R. Godfrey

A RARE NATIVE

Corydalis aquae-gelidae was planted in June of this year in the Garden. It bloomed and is still alive. It is early to say if the Garden stream location can meet the exacting needs of the Cold Water Corydalis. Seeds have been sent to several locations, including England. I am not aware of this plan's successful cultivation anywhere to date.

C. aquae-gelidae is a handsome plant of blue-green ferny foliage. It has a branched raceme with up to 40 rosy blooms on the main raceme. Its beauty certainly puts it near the top of the genus. The real puzzle: why the late recognition of it as a distinct species?

The earliest evidence of its "discovery" was a 1942 report of C. cusickii from Tanner Creek. Later visits to Tanner Creek, in the Columbia Gorge, turned up only C. scouleri. What is believed to be C. aquae-gelidae has now been reported from a Tanner Creek tributary.

The official description of C. aquae-gelidae was the result of a three-man team trip to the Clackamas River in 1946: Warren Wilson, a "youngish" botanist and rather recent migrant to the Northwest; Stanley Anderson, who probably had crammed more northwest plant lore into his head than any other man alive at that time; and I, whose main qualification was enthusiasm.

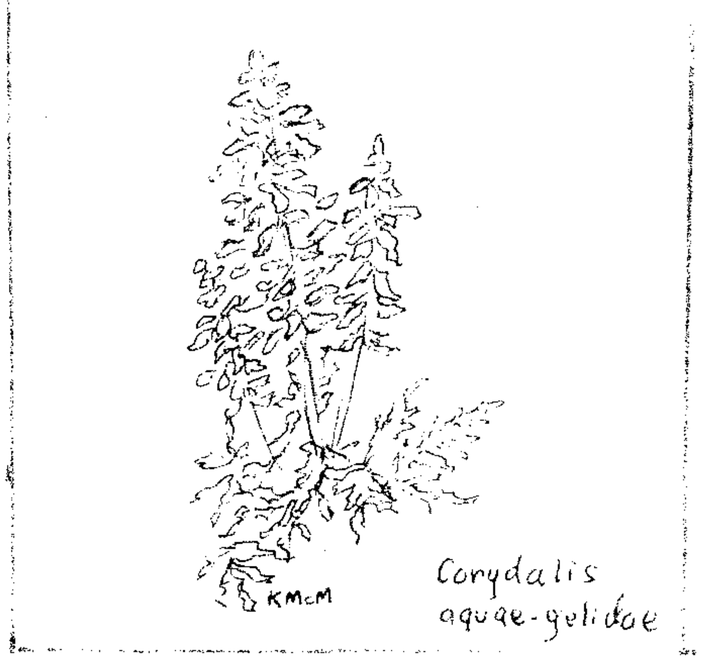
A gravel bar about a half mile upstream from the Collawash River junction was our discovery situation and is the type location for C. aquae-gelidae. A few plants were at the early bloom stage and prompted Warren's question. What were we seeing? Enthusiastically I replied we were seeing a corydalis, obviously not C. scouleri, therefore C. cusickii. Stanley quickly demonstrated that enthusiasm is a poor second to knowledge. The nearest C. cusickii was probably in Blue Mountains. Also our palnts did not fit his concept of C. cusickii. Warren prepared herbarium material which he took to Morton E. Peck at Willamette University. Professor Peck later named and published the new species as C. aquae-gelidae.

Ron Burnett of the Mazamas and the Native Plant Society has recently catalogued the efforts of many persons and all the localities where C. aquae-gelidae is known to grow. Unfortunately the type location is not on the list. It was washed out in the big flood of 1964.

C. aquae-gelidae is now officially listed as Endangered. This is a direct result of the work done by Ron, Jean Siddall and others working on the Rare and Endangered Species project.

Floyd W. McMullen

(Drawing by Kathleen McMullen)



NEW MEMBERS

SISKIYOU CHAPTER

Bengt H. Hamner

SUSTAINING MEMBER

Irving & Cynthia Lord

The Editors
Native Plant Society of Oregon
Department of Biology
Southern Oregon State College
Ashland, Oregon 97520

NATIVE PLANT SOCIETY OF OREGON

President:	Dr. Frank Lang, Southern Oregon State College, Ashland, OR 97520 Phone 482-6341
Vice President:	Dr. Herb Armentrout, 20060 SE Hiway 224, Clackamas 97015 Phone 658-2751
Secretary:	Mary Jane Fredricks, 4436 NW Barnes Road, Portland 97210 Phone 228-4891
Treasurer:	Russ Graham, 4030 Eagle Crest Road N.W., Salem, Oregon 97304
Board of Directors:	Dave Garcia, George Lewis, Dave Wagner, Ruth Hasen, Herm Fitz, Karl Urban
NPSO Bulletin Editors:	Vern Crawford and Dr. Frank Lang

CHAPTER PRESIDENTS

Blue Mountain:	Harry Oswald, Box 459, Pendleton, 97801 Phone 276-1241
Emerald:	Dr. Dave Wagner, 3315 Onyx St. Eugene, 97405 Phone 683-2609
High Desert:	Joyce Bork, 60817 Alta, Bend 97701 Phone 389-5657
Mid-Columbia:	Keith Chamberlain, Box 151, Mosier, 97040 Phone 478-3314
Portland:	Ann Whitmyer, 6566 SW Terri Ct. #16, Portland, 97225 Phone 244-9264
Siskiyou:	Joan Seevers, 725 Leonard, Ashland, 97520 Phone 482-5492
Willamette Valley:	Tony Sobolik, 2120 Pioneer Road, Dallas, 97338 Phone 623-2630

For change of address or information on membership, contact your nearest chapter or Mary Falconer, 1920 Engle Ave., NW, Salem 97304
Contributions to the NPSO Bulletin or non-delivery notice should be sent to: The Editors, Native Plant Society of Oregon, Department of Biology, Southern Oregon State College, Ashland, Or 97520

The NPSO Bulletin is published monthly by the Native Plant Society of Oregon incorporated under the laws of the State of Oregon. Your are invited to join. Membership includes Bulletin subscription. Dues are student $5.00, regular member $7.50, Sustaining member $25.00, Patron $100.00, Life member $500.00. Others are welcome to use material from the NPSO Bulletin. Courtesy pleads, however, that credit be given to the author and to the Bulletin.