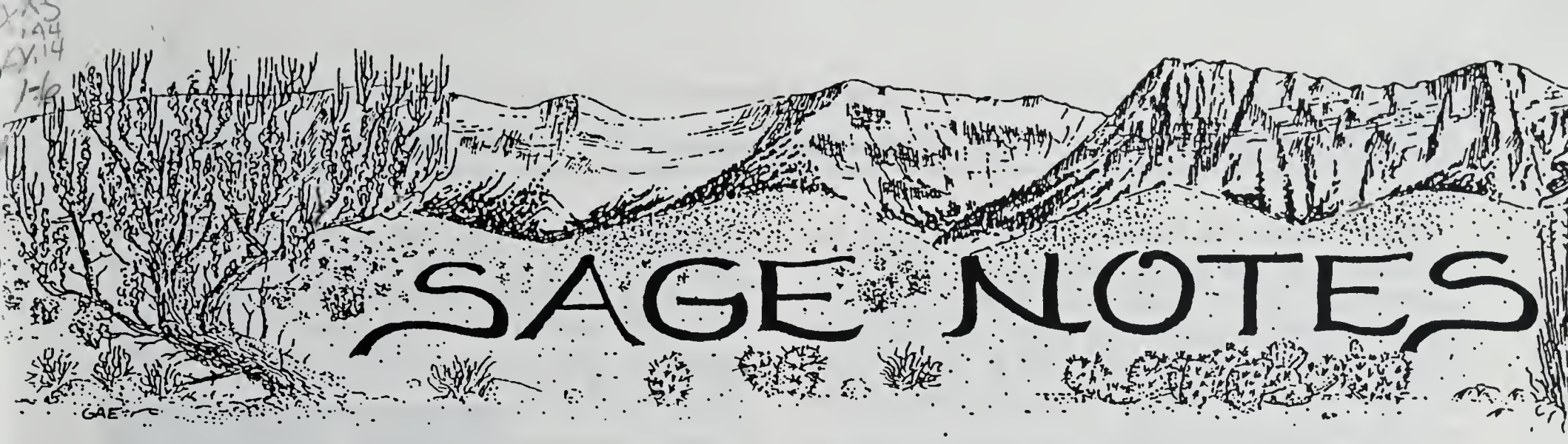


SAGE NOTES A Newsletter of the Idaho Native Plant Society Volume 14 No. 1 Jan-Feb

Issue Highlights

You'll notice some changes in SAGE NOTES. In addition to the new logo, I'm introducing some new columns. Please consider writing a submission for one. Don't assume there are other people in the state far more qualified than you to write in SAGE NOTES. This is a member newsletter. If you have something to share, DO IT!

Many thanks to **Kathy Geier-Hayes** who resigned as newsletter editor with the last issue. I'm sure we have all appreciated Kathy's fine work as editor for the past year and a half.

7th Annual Rare Plant Conference

Sensitive Plants of Idaho
Boise District Fire Office
Bureau of Land Management
3948 Development Avenue
Boise, ID 83705

Tuesday, February 12
8:30-9:00a Registration
9:00-5:00p Review of Federal Candidate Species

Wednesday, February 13
8:30a-5:00p Review of State Sensitive Species

Deadline for registration is 1 February 1991 and is $10. Registration fees after that date are $15. Fee includes a 1991 conference coffee cup and a rare plant booklet.

Make checks payable to INPS and mail to:
Nancy K. Cole; Rare Plant Conference Chair; c/o Idaho Power Company; Environmental Affairs Dept.; P.O. Box 70; Boise, ID 83707; (208) 383-2351

Rare Plant Conference Dinner

Tuesday, 12 February, is the night for an INPS dinner. Richard Inouye of Idaho State University will be the banquet speaker. As a Community Ecologist, he has been studying plant-animal interactions for many years. In this presentation, he will discuss the influence of arthropods and mammals on plant community structure.

Come at 6:30p to Louie's (620 W Idaho, North side of Idaho between 6th and Capital) and join other INPS members from around the state in the large banquet room. $9.00 for family style Italian dinner of pizza, chicken cacciatore, linguine, soup or salad, and bread. Prepay at the door. Drinks can be ordered from the bar.

State Officers

Once again, there is only one candidate for most of the offices. Please note the write-in option, not because these folks aren't great candidates, but because it might provide names for next year. Thanks to these folks who are willing to put a whole lot of extra time into making INPS work. -ed.

Susan Bernatas for President. Susan is active in the INPS, currently serving as president and as chair of the Conservation Committee, and having served as co-chair of the membership committee. She earned a BS from Keene State College in New Hampshire and an MS in Forest Resources from University of Idaho. She currently works for The Nature Conservancy.

Pam Brunsfeld for Secretary. Pam has been active in INPS, having served as an officer for the White Pine Chapter since its formation two years ago as secretary/treasurer and currently as vice president. She has also served on the state board as secretary. On child-rearing leave with three children (Courtney, 9; John, 7 and Nicholas, 2), she previously worked on endangered and threatened plant surveys and has assisted husband Steve with field work for Willows of East Central Idaho, Alpine Flora of East Central Idaho, and "Systematics and Evolution of Salix section longifoliae".

Karl Holte for Secretary. Dr. Karl Holte is a Professor of Botany at Idaho State University. He has taught botany for 26 years and field botany at the Malheur Field Station from 1972 to 1988. He has held the office of President in The Idaho Orchid Society, The Citizen's Environmental Council, the Nature Conservancy, and the Idaho Wildlife Federation. His research has included many environmental studies on plants for agencies and groups.

Kathy Geier-Hayes for Vice President. Kathy is a Research Forester with the Intermountain Research Station in Boise. She has been a member for four years and is presently the INPS state treasurer. She is also the Pahove Chapter treasurer and former editor of Sage Notes. She joined INPS because of her personal and professional interest in plants and enjoys the people and activities associated with INPS.

Pam Conley for Treasurer. Pam has been an INPS Pahove Chapter member for 2 years. She heads up the Poster Committee and has helped with the Rare Plant Conference. She has a B.S. in Botany from the University of Washington, which is where her interest in plants began. Being employed at the BLM Idaho State Office as a cartographic technician with the Geographic Coordinate Database Project has not gotten her out into the field with plants but she has worked on budget and accounting assignments which will come in handy for a Treasurer. She does get out with the native flora when she backpacks, rafts, mountain bikes and camps, all of which she tries to do often.

PLEASE

VOTE

TODAY

Feature Article
Indians and Plants

by Charlotte Erichsen-Brown (Reprinted from Wildflower Magazine, Summer 1990 6(3))

The men, women, and children who wandered across Beringia onto the North American continent had lived by gathering the fruit, seeds, roots and bark of the plants of Asia. While hunting game for food and clothing they had to learn which plants were safe to eat, what part to use to heal the wounded hunter, help the birth of a child or to prevent its arrival. Too many mouths to feed meant starvation for all. The women probably carried with them the seeds of their most valuable plants.

These first peoples spread out so that eventually they inhabited America from its southern tip to the arctic. Everywhere they lived they had to learn again, by trial and error (which often meant death), which plants they could eat and which were powerful medicine. The Olmec, Mayan, Inca and Aztec civilizations rose and fell. The medicinal plant gardens of the Aztec amazed the Spaniards when they first saw them. These gardens had been established in 1467 by Motecuzoma and were maintained primarily to provide the Aztec medical profession with raw material for medical formulas and experimentation. The Emperor's envoys had orders to seek out additional species wherever they went.

The Indian's knowledge of plant breeding, his patience and perseverance enabled him to develop good edible corn from wild grasses. He accomplished this by saving the kernels of his best cobs each year for planting next season. He did this over thousands of years. Today the Hopi have an ear of blue corn grown by saving only the blue kernels

of their mixed color cobs. The Peruvian Indians developed their wild cotton plants. Eventually they had a plant whose cotton they spun and wove into textiles. These are in museums all over the world.

In Arizona the Hohkam from about 300 B.C. until about 1400 A.D. grew corn, many kinds of beans, squash, melons and cotton in their fields. These were irrigated by canals dug with wood and stone tools from the Salt and Verde rivers. They traded their cotton and the textiles they wove from it over the well established trade routes across the continent.

The tribes who moved to the northeast took corn, beans and squash from the south with them. The Huron brought corn to its northern limit of development by carrying with them the most frost resistant plants. They did this also for the pecan nut tree whose nuts they ate and used for oil as well as for the mayapple *Podophyllum peltatum* whose yellow fruit they relished and whose poisonous root they used for suicide or medicine. They semicultivated the mayapple, raspberries, two kinds of strawberries, grapes, juneberries (*Amelanchier* species), and the milkweed *Asclepias syriaca* among other plants. They traded their surplus food for furs with the Algonquin who lived to the north by hunting and gathering wild foods.

The agricultural tribes gathered wild seeds as well. This was essential in order to have a large enough store of food in case their fields were burnt by wild or enemy fire or drought. Lamb's quarters, *Chenopodium album* seeds are found in archeological sites all over America. A.D. Yarnell reports of the Juntunen site in Michigan in a strata dated about 1320 A.D. "Perhaps the most interesting plant remains found, at least from a strictly botanical point of view, were the *Chenopodium* seeds. These are referable to two species *C. album* and *C. hybridum* L. var. *gigantospermum* according to my identifications. The most significant aspect of the occurrence of the seeds of *C. album* is that this species was thought to be naturalized from Europe...cache of four quarts of seeds recovered from a late archeological site (in Alberta)." In 1870 Dodge of the USDA wrote that "young and tender plants of lamb's quarters are collected by the Navahos, the Pueblo Indians of New Mexico, all the tribes of Arizona, the Diggers of California and the Utahs and boiled as herbs alone or with other food. Large quantities are also eaten raw. The seeds of this plant are gathered by many tribes, ground into flour after drying, and made into bread mush. They are very small, of a grey color, and not unpleasant when eaten raw...(the mush or bread) resembles buckwheat in color and taste and regarded as equally nutritious."

A plant used for fibre where it was abundant was the dogbane *Apocynum andorsaemifolium* (tech. editor's note: *A. cannabinum* was also frequently used). It is cut before the fruit has ripened. By twisting the stalk in opposite directions and pulling upon it the Potawatomi can determine just when the best fibre has matured to suit their purposes. The stalk is cut down and soaked in hot water so that it separates easily.

> *"The Mohawk made their armor by braiding narrow reeds with their thread so tightly that no arrow could penetrate it."*

A strand no thicker than 200 D.M.C. cotton will be many times stronger. Cordage was made by plaiting as many strands together as required. It made excellent nets for fishing. Warm cloaks were made by weaving turkey feathers with various threads. The Mohawk made their armor by braiding narrow reeds with their thread so tightly that no arrow could penetrate it. Champlain recalls how astounded the Indians were when gunshot went right through their armor and killed their warriors.

Alexander Mackenzie writes of the Dogrib tribe in the west: "The vessels in which they cook their victuals, narrow at the top and wide at the bottom, and of watape (this is the name given to the divided roots of the spruce, which the natives weave into a degree of compactness that renders it capable of containing a fluid) which is made to boil by putting a succession of red hot stones into it." The Hurons did the same with the stew in their pots made of birch bark. To hold their beans, cornmeal, meats, fish, soup or stew, the women made bowls of various sizes of birchbark if they lived near where the paper birch grew. Here they also made large chests to store the dried corn and fish. Indians who did not have access to birchbark used elm or other woods, cedar on the west coast. Baskets of many kinds were made of rushes tightly woven with thread.

The Northern Indians wore furs, the fur side next to their skin and the smooth side out. Wassenaer says of the New Netherlands that they used the bloodroot *Sanguinaria canadensis* to paint the fur so beautifully that from a distance it looked like lace. All Indians used the plant as a body and face paint and mixed it with other plants and minerals. It was used as a drug and as a dye plant. Alone it gives a yellowish orange but mixed with other plants it can dye porcupine quills a brilliant red.

Early European writers generally agreed that the Indian tribes could treat wounds and obtain a better recovery of their patients than the Europeans could. The French Commandant at Detroit, de la mothe Cadillac, reported in 1698 of the Potowatami and other Algonquin tribes

gathered there: "They are very good anatomists and so when they have an arm or bones broken they treat it very cleverly and with great skill and dexterity and experience shows that they can cure a wounded man better in a week than our surgeons can in a month."

The Indians knew that fetid matter held in the mouth and not swallowed but only spat out could not harm them. They thoroughly cleaned a wound by first sucking it with their mouths and ridding of all foul matter. Then they applied a bactericide which often was the gum of the pine tree. Cadawalladar Colden writing to Gronovious in 1744 says: "The Indians cure all sorts of wounds without digestion by the inner bark of *Pinus* no. 192 of the collection I sent you. They soak it so long in water as to make it soft and then apply it. If I be not misinform'd it is effectual even in gun shot wounds. The wound keeps of a fresh and ruddy colour until it unites without digesting."

"...The Indians cure all sorts of wounds without digestion by the inner bark of Pinus no. 192 of the collection I sent you."

The Indians of Virginia cleaned the wound as described after which they chewed smartweed *Polygonum hydropiper* in their mouths and squirted the juice onto the wound. Then they applied their herbs, either bruised or beaten into a salve with grease, binding it on with bark and silk grass. Tournefort in Paris found that a decoction of smartweed juice restrained the progress of gangrene.

Much of the Indian treatment of childbirth was better than that practiced in Europe where it was not unusual for both mother and child to die from infection due to unsanitary conditions. Our early cemeteries tell the same story. The Indian mother was kept on a special regime for weeks before delivery. She was given a tea made from the root of the blue cohosh *Caulophyllum thalictroides* and her delivery was usually easy and swift. The root possesses caulosaponine which provokes strong uterine contractions, intermittent and more successful, it is claimed, than those provoked by ergot, the plant fungus used by white physicians at that time.

Milkweed was used to prevent conception, a very important decision that Indian women had to make for the good of the tribe with the help of their mothers. A people wholly dependant on their land for survival could never allow too many children to be born. Rousseau reports from Quebec in 1845 that the Mohawk take a fistful of milkweed and three rhizomes of Jack-in-the-pulpit Arisaema atrorubens, dried and pulverized and soaked in a pint of water for 20 minutes. The woman drinks a cup once every hour. The sterility is, however, temporary.

The Jesuit Relations of 1637 says of the Hurons: "They kill themselves by eating certain venomous herbs that they know to be poison, which married women much more often use to avenge themselves for the bad treatment of their husbands, leaving them to reproach themselves for their death." Sigard tells of a Frenchman who ate a poisonous root, became very ill and would have died had not the Huron given him an emetic. This emetic was probably the bark scraped from branches of the elder *Sambucus racemosa*. The root eaten was almost certainly that of *Cicuta maculata* called the water hemlock and a native plant. I will refer to it as *Cicuta* because the word hemlock seems to create confusion. The root could also have been that of the mayapple as these were the two roots most often used by the Indians as poison. The Indian tribes knew very well that an emetic must be given before the patient goes into his first convulsions. When the sweet tasting, young root of *Cicuta* is eaten the tongue rolls in the mouth in such a way as not to allow anything to enter the esophagus. The French in Quebec did not understand this and many died as a result.

The Dene used *Cicuta* to relieve pain. For rheumatism or the pain of the instep after too strenuous snowshoeing they scratched the sore skin many times and made a liberal application of bruised *Cicuta* roots to it. White physicians in the 1850's recommended one grain of *Cicuta* extract three times a day to relieve neuralgia.

The Indians smoked many plants, including the seeds of *Cicuta*, before they smoked tobacco. Tobacco they smoked primarily to please the spirits upon whose goodwill they depended. Their pipes were hollow stone tubes and, later on, tiny pipe bowls. They drew the smoke slowly through their mouths and swallowing it exhaled it through their nostrils. Several plants produced a narcotic effect when smoked in this manner, e.g. *Lobelia inflata*, called Indian tobacco, and *Cicuta* seeds.

The pipe and its stem were sacred to the tribe and each tribe had its own ceremonial set. This was carried by its ambassadors and used as a safe conduct between tribes. Little of importance was agreed upon unless the pipe had been smoked in silence by all the parties to the business. When Champlain visited the tribes living on the north shore of Lake Ontario they were growing the mild *Nicotiana rustica* and trading it widely. After the Iroquois drove them from their fields and into exile the strong Brazilian tobacco *N. tabacum* was traded by the Europeans to their great advantage. Because of its strength and cost the Indians, who now could not do without it, mixed it with the plants they had smoked for so long. The main ones were the dried and powdered bark of the red willow *Cornus stolonifera*, the leaves, dried and broken up, of the Labrador tea, *Ledum groenlandicum*, those of the

bearberry *Arctostaphylos uva-ursi*, and those of the cranberry *Vaccinium oxycoccus*.

Before contact with Europeans the peoples of North America depended upon its flora and fauna and their land. I have mentioned here a very few of the ways they used these resources. I hope that this has whet your appetite to know more about this fascinating subject.

Charlotte Erichsen-Brown is the author of "Medicinal and Other Uses of North American Plants: A Historical Survey With Special Reference to the Eastern Indian Tribes".

Comments and Contacts

Mary McGown sent this information on a Native Plant Society of Oregon (NPSO) statement on revegetation and reclamation, adopted in June 1990. I'm printing it in its entirety (as borrowed from Douglasia, the Newsletter of the Washington Native Plant Society; Vol. XIV, No 4; Fall 1990) because it is an important issue, and one which I hazard many people are interested in. Mary is extremely interested in this issue, and encourages others interested to write her (see address under Pahove Chapter happenings). You're encouraged to use this column to communicate on this issue, or others. -ed.

"It is the policy of NPSO to encourage public agencies and private entities to re-establish native vegetation, where appropriate, in disturbed sites. Our reasons for this policy and suggested guidelines are outlined below.

We feel that significant earth-moving activities such as road-building and mining, recontouring of disturbed areas, reclamation of damaged lands, and creation of "mitigation ecosystems" should attempt to recreate the natural plant community as much as possible. Oregon's native plants serve as the base of the pyramid that forms the food chain for the rest of the ecosystem. In order to maintain our state's natural biodiversity it is necessary to maintain our native vegetation in an intact condition. Not only is it important to consider the particular species that comprise a given plant community, it is also essential to consider the relative abundance of those species and their geographical source.

We do not support revegetation with non-native species. Such exotic plants can only upset the balance that nature has achieved through thousands of generations of evolutionary development at a given site. In addition, escaped exotics are a major threat to the integrity of many of our native plants. It is inappropriate and unwise to aggravate this problem. In practically all situations, a native species is available which, over the long run, will serve at least as well as a non-native species.

We caution those using native species for revegetation to be sure that the supplier has propagated the native plant rather than obtained it from its undisturbed natural habitat. Collection of native species for transplantation to other areas has the potential to aggravate the problem. A list of native plant suppliers is available through the NPSO."

Rare Species Profile

***Thelypodium repandum* Rollins (Wavy Leaf Thelypody)**
by Caryl Elzinga

Thelypodium repandum, the Wavy Leaf Thelypody, a Federal Candidate species for listing (Category 2), is a biennial species endemic to the dry Challis volcanic soils of east-central Idaho. Referred to as the "Challis volcanics", these soils harbor a complex of endemic species known nowhere else. The wavy leaf thelypody is the rarest of the endemics, with location records at about 60 sites, many of which are historic. In spite of the large number of sites, the total estimated population of *T. repandum* is under 3000 individuals. Fifty sites, or approximately 87% of the known population areas, are on lands administered by the Salmon BLM.

Population sizes of these recorded populations range from one individual to 200. Some of the populations located several years ago no longer seem to exist, while new populations have appeared in areas that were surveyed previously with no success. General area of occurrence is in the Challis area on tributaries immediate to the Salmon River, from just south of Ellis to near Clayton. Several populations occur along the East Fork of the Salmon River and on tributaries of the East Fork.

Assessing the total population size of the species is complicated by its biennial life cycle. In the fall, a population area may be covered with hundreds of seedlings and rosettes, but a return visit the following spring may yield the sighting of only a few individuals. Only the second year plants will reproduce. In some years the plants are entirely absent from a population site, but often reappears on a following year. Little is known about the factors causing the population fluctuations, although some anecdotal information suggests that annual weather patterns such as late spring or early fall freezes and low or sporadic precipitation may be responsible. The species produces copious seed, but little is known about the viability of the seed or the germination requirements of the species. Individuals often appear in areas that had previously been surveyed and found to lack individuals, thus seed may remain viable in the soil for many years until conditions are conducive to growth. Habitat is not continuous, and the species ranges across approximately sixty miles of the Salmon River valley. Since lack of habitat suggests that

the extant populations are not isolates from a previous continuous population, seeds must be dispersed long distances in some manner, yet there are no specializations for wind or animal dispersion. Seeds may be eaten and transported by birds, but no avian use of the species has been observed. Rabbits or other rodents may also be responsible.

Thelypodium repandum grows on steep, unstable slopes of gravelly to cindery substrate derived from Challis volcanic and metamorphic rock. Substrate includes bentonite and rhyolitic weatherings. Occupied slopes are

Thelypodium repandum
illustration by Glenn Elzinga

generally south-facing, with sparse (5-25%) vegetative cover. Species associates include Enceliopsis nudicaulis, Chaenactis douglasii, Oryzopsis hymenoides, Artemisia tridentata ssp. wyomingensis, and Atriplex confertifolia.

The species is found on road cuts and fills, although these are often colonized from a parent population farther up slope. It is likely that the species evolved with adaptation to some slope instability, but the increase in instability and frequency of disturbance caused by man's activities may be more than the species can tolerate. Road building and material removal can increase slope instability, and there have been observations of apparent eradication of a population through removal of material from the bottom of an occupied slope.

Grazed plants have been observed. Populations found near the top or in the middle of slopes likely receive little use, but plants near the toe of the slope are often grazed. The species may be suffering from insect predation. In several populations, orange and black caterpillars have been observed on the inflorescences. In a few populations, most of the inflorescences had been stripped clean. The seed crop in those populations was likely reduced to near zero for that year. Man, in the form of botanists, may also function as herbivores. Occasional collections have been made in very small populations. Collection of one individual in a population of ten is a significant reduction in seed production.

Chapter News

Sah-wah-be Chapter: submitted by Joan Bergstrom.

Field Trip to Proposed Arboretum

Saw-wah-be Chapter has been involved with the proposed Arboretum at Idaho State University and the November field trip was a walk through the stage-one area. Our walk, led by Dr. Karl Holte, Professor of Botany at ISU, identified over 55 species of plants and shrubs. At the November regular meeting of the chapter, a "wish list" for additional plantings was gathered. Signs and some additional plantings were then added in November as well.

In January a ski/snowshoe trip on the South Fork of Mink Creek on January 12th brought a good turnout and a chance to see plants and trees in their winter garb.

On Tuesday, January 22, Jay Jones spoke on tree propagation at the regular chapter meeting.

February 26. Terri Ratzlaff, ISU graduate student in Biological Sciences will speak on the reseeding project on City Creek 1988 burn area west of Pocatello. Meeting at 7:30 P.M.

March 26. Dr. Jay Anderson, Professor in the Department of Biological Sciences will speak on fire recovery process in Yellowstone National Park. Meeting at 7:30 P.M.

White Pine Chapter: submitted by Pam Brunsfeld

Dawn Redwoods

February 27. Meeting at 7:30 P.M. at the College of Forestry, University of Idaho. Guest speaker Fred

Johnson will discuss **"Dawn Redwoods! A visit to a remote valley in China"**. Fred was in the fourth group of Caucasians to see this seldom visited valley in Hupeh Province. Dawn-redwood *(Metasequoia)* was described as a fossil genus in 1941 before it was discovered living in China in 1946. Dawn-redwoods flourished in Idaho some 10 to 15 million years ago. Thanks to careful preservation of the gene-pool, this handsome tree is now a fairly common ornamental- cold-hardy even in the warmer parts of Idaho. Slides will take us down the Yangtze by boat, then over spectacular mountains on a two-day trip to "water-fir" valley. Here thousands of dawn-redwoods remain- and here they have been, perhaps, for over 100 million years. An added attraction will be glimpses of Flying Dragon Cave- 363 feet high; those of the Idaho group were the first foreigners to see this remarkable cave.

Pahove Chapter:

Calendar Submitted by Nancy Cole

February 21. Meeting at 7:30p in Room 218, Science and Ed Bldg., BSU. "Myccorhizal Relationships in Big Sagebrush" by Marcia Wicklow-Howard (BSU).

March 7. Meeting at 7:30p in Room 109, Science and Ed. Bldg., BSU. "Cacti and Succulents of the Islands in the Gulf of California" by Alfred Lane. Sponsored jointly by Sigma Xi and the Pahove Chapter.

Group Tackles Water Conservation in the Treasure Valley

Submitted by Mary McGown

Late last year an ad hoc group interested in water conservation began meeting to discuss how water conservation measures could be introduced in the Boise area. Members of the Pahove Chapter were instrumental in forming the group and have been involved in all of the meetings.

Last year the Boise Water Corporation (BWC) asked the Public Utilities Commission (PUC) for a rate increase. Bev Barker, a consumer affairs specialist from the PUC, contacted Pahove to see if the group was interested in commenting on the rate request. Mary McGown responded with a letter including information about the xeriscape garden tour the chapter held last June, about our members' interest in the use of native plants in landscaping, and about xeriscaping in general. Ms. Barker then called together the individuals and groups that had expressed some interest in the BWC rate case.

The group decided that its members had a larger interest in water conservation that went well beyond the BWC rate case. Most of the people attending the meetings have been involved with the "green industry." Several irrigation designers and suppliers have attended, as have nurserymen and a native seed supplier, landscape architects, city of Boise planners and parks personnel, the BWC, the BSU horticulture program, and others. All who attended expressed a commitment to educating the public about water conservation. The broad mission statement extends the education efforts to the Treasure Valley area of SW Idaho.

At the first meeting, some persons expressed doubt that people are truly interested in water conservation as there is no crisis in water supply and rates are quite low. Much of BWC's rate request was due to a water delivery problem, especially during July and August when water demand cannot be met by the existing system. Since at least 50% of residential water use is for landscaping and other outdoor uses, it reinforced the positions of those of us who are especially interested in wise water use in our landscapes. Further, since the group began meeting, the PUC granted the BWC a partial rate increase along with a mandate to develop a comprehensive water conservation program.

The importance of this nascent movement to other parts of the state is at least twofold. First, the PUC has indicated its requirement for the BWC to develop a comprehensive water conservation program will serve as a model when other water utilities come to the PUC in the future, seeking a rate increase. Second, if a comprehensive program is developed and people change their ways, the information should be easily usable in other communities around the state concerned with wise use of our water resources. And, it gives members of the Idaho Native Plant Society an important role to play in educating landscape professionals and the public about the values of native plants. *(For more information, contact Mary at 1824 N. 19th St.; Boise; 83702-0707)*

Gardening with Natives

There are many INPS members that are using native species in landscaping their yards and there is a growing interest in native species for revegetation. This column will provide a forum for native species profiles (use, care, culture), yard profiles, hints, ideas, tools, seed and plant sources. Any submissions? -ed.

Kristen Fletcher (Big Wood Chapter) is developing an INPS information package on use and availability of native species for landscaping and revegetation in Idaho. If you have information to share with Kristen, mail to: P.O. Box 2018; Ketchum, Idaho; 83340.

Noxious Weed Profiles

Several folks expressed in interest in having a column on noxious weeds, and I think it's likely that many members

of INPS would want to read one (and perhaps submit articles for it). People interested in native plants can provide the first line of defense, as it were, against weed infestation. Keep your eyes open for new sites of noxious weeds. Hopefully this column will provide more information on what to look for, and what to do about infestations you find. Until later, here's a few interesting weed tidbits. -ed.

Purple Loosestrife on the Loose

The Washington State Legislature has appropriated $1,000,000 to kill purple loosestrife, *Lythrum salicaria*, and banned its sale or use. It is spreading widely and choking wetlands across the U.S. Keep your eyes open for this attractive but aggressive plant in Idaho. There will be more information in upcoming issues.

Exotic Plant Vandal on the California Coast

A vigilant park service maintenance worker has organized a volunteer crew to undo the work of a vandal who, for the past 11 years, has been planting *Arctotheca calendula* (South African capeweed) throughout an 80-km stretch of public lands from San Francisco's Golden Gate Park to Point Reyes National Seashore. This hearty, alien groundcover spreads by runners and adapts to heavy traffic by hikers, horses and mountain bikes by growing tighter and closer to the ground.

The perpetrator of these plantings has been identified, and surveillance has documented his planting habits and led to discovery of a "garden" in which he grows aliens for his plantings. These include artichoke thistle, narcissus and water hyacinth in addition to South African capeweed. National Park Service officials, however, seem unmoved by the threat of this activity, and have been slow to determine what constitutes evidence of vandalism. The vandal's targeting of public lands appears to stem from a strong resentment towards the government, possibly due to past tax problems. Whatever his motive, the effects of his behavior will take thousands of hours to correct.

Good Stuff

Books

Sources of Native Seeds and Plants. Soil and Water Conservation Society. 1987. 36pp. $3.00 from SWCS, 7515 N.E. Ankeny Rd., Ankeny, IA 50021-9764. Includes addresses and telephone numbers of nearly 250 growers and suppliers of native vegetation.

The National Wildflower Research Center's Wildflower Handbook. 1989. Staff of the National Wildflower Research Center. Austin: Texas Monthly Press. 320 pp. paperback; $9.95. This book is a guide to landscaping with native plants. Information includes seed collecting, wildflower mixes, sources for native plants, listings of conservation and restoration groups, and an extensive bibliography.

The Wildflower Gardener's Guide: Pacific NW, Rocky Mountain and Western Canada Edition. Henry W. Art. 1990. 160 pages, paper; $12.95 from Storey/Garden Way Publishing; Schoolhouse Road; Pownal, VT 05261. Information on culture, propagation and companion planting for 33 beautiful and easily grown species.

Conferences

Northwest Scientific Association 64th Annual Meeting. March 20-22; Boise State University; Boise, Idaho. Registration: Professional- $25.00; Student- $10.00 before March 1. Information available from Robert Rychert; Biology Department; Boise State University; 1910 University Drive; Boise, Idaho 83725.

Rare Plant Conference INPS. See details this issue of SAGE NOTES.

Wetlands Conference. February 20-21. Contact Idaho Department of Water Resources, 327-7900, for more information.

Wildlands Shrub Symposium. May 30-31. Contact Continuing Education, BSU, at 385-3706.

Desert Conference XIII. April 25-28 at the Malheur Field Station near Burns, OR. This year's theme is "Spreading the Word", and is planned to inform and inspire participants to bring natural values and the plight of desert wildlands to a broader audience. For information call 503-245-3658 or write Desert Conference; Box 15115, Portland, OR 97215.

Conservation Corner

Aquarius Proposed Research Natural Area

The Aquarius pRNA has been featured several times on the pages of SAGE NOTES. The INPS has been actively advocating for this area, which is threatened with the construction of the Dworshak Access Road. The timber industry, after losing two appeals of the Clearwater National Forest's decision to reject the proposed road, has moved the issue into the political arena. The Clearwater Resource Coalition (timber interests) is planning to seek special legislation in Congress ordering the Forest Service to build the road.

It is critical that INPS members become involved in this issue by writing legislators. Please read the following information and then take the time to write in support of this important natural area. The postcard is included for those who haven't the time to write (you'll need to put it in

an envelope). A personal letter, however, is much more effective. -ed

BACKGROUND

From the perspective of people interested in the native flora of Idaho, this area is one of the most valuable and interesting places in the state. The area is also, however, of interest to the timber industry because of a proposed road through the pRNA which would reduce hauling costs to Dworshak Reservoir.

Aquarius pRNA is located along the North Fork of the Clearwater River at the upper end of Dworshak Reservoir. The area was originally proposed as a RNA in 1972. Because of the unusually warm, high precipitation climate of the area, a number of endemic species and species disjunct from the west side of the Cascades survive in the Aquarius area. Bob Moseley and Chuck Wellner, in a 1991 draft establishment report, summarize the extraordinary features of this area:

1. Best remaining red alder habitats not inundated by Dworshak reservoir, including the largest stand east of the Cascade-Sierras.
2. High diversity of ferns, with about half of the species native to Idaho present.
3. Plethora of regional endemic and coastal disjunct plants, whose distributions span the entire range of habitats in the pRNA.
4. Sixteen plant taxa on the Regional Forester's Northern Region Sensitive Species List.
5. Presence of a rare saprophytic moss not previously reported from Idaho.
6. Two species of lichens that show coastal affinities.
7. Presence of VanDyke's salamander, a coastal disjunct species.
8. Two undescribed species of earthworms, occurring in different genera.
9. Presence of three undescribed species of beetles.
10. Uncommon aquatic insects.
11. Best undisturbed stands of western redcedar/maidenhair fern habitat type, an association that normally occurs in small patches.
12. Best remaining river terrace habitats for the rare western redcedar/shield fern association, most of which was inundated by Dworshak Reservoir.
13. Inclusion of almost 2 miles of the North Fork of the Clearwater River, the last free-flowing, unroaded stretch from its mouth almost to the headwaters.
14. Listed in the Northern Rocky Mountain Cedar Grove Inventory. Includes a sizeable area of old growth in country of dwindling supplies of old growth.

The original decision made by the District Ranger rejected the proposed road. This decision has survived appeal to the Forest Supervisor and to the Regional Forester. Proponents of the road intend to introduce legislation into Congress that would mandate construction of the road.

WHAT CAN INPS MEMBERS DO

The Society continues to advocate for this area, but far more effective than a single letter from the president representing INPS generally is a barrage of letters from individual members. Such a response demonstrates clearly to a legislator that there are warm, voting bodies out there who appreciate the biodiversity values of this unique area. Take a few minutes. Write a letter. Make a telephone call. Do both! Write a letter and get friends with similar interests to sign with you.

A key person in this issue is Representative Larry LaRocco. While some of our legislators have already made a predictable stand on this issue, Larry LaRocco has said that he wants to explore the issue further before taking a position. Letters should also be targeted for Senators Steve Symms and Larry Craig, Representative Richard Stallings and Governor Andrus.

ADDRESSES

Congressmen Stallings and LaRocco: The House of Representatives; The Capitol; Washington, DC 20515. Congressmen Craig and Symms: The Senate; The Capitol; Washington, DC 20510. Governor Cecil Andrus: The Governor's Office; The Statehouse; Boise, ID 83703.

Dear Representative LaRocco,

I am a member of the Idaho Native Plant Society and am deeply interested in conserving Idaho's natural heritage. The Aquarius Research Natural Area in the Clearwater National Forest is one of the most unique and valuable botanical areas in Idaho. I understand that the timber industry wishes to build a road through this natural area to reduce hauling costs to Dworshak Reservior. I want you to know that I am opposed to such a road because I believe that it would compromise and lessen the important biodiversity values of this area. I ask you to recognize and support the integrity and expertise of the Forest Service in their decision to deny the road.

Sincerely,

Housekeeping

The Idaho Native Plant Society (INPS) is a statewide non-profit organization of people with a common interest in Idaho's native plants. The Society seeks to foster the understanding and appreciation of our native flora and to preserve this rich resource for future generations.

Membership is open to anyone interested in our native flora. Contributions to our Society, are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
___ Sustaining	$30	15
___ Individual	$ 8	4
___ Household*	$10	5
___ Student	$ 6	3
___ Senior Citizen	$ 6	3

Name: _____
Address: _____
City/State: _____
Zip Code: _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Sah-wah-be (SE Idaho)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.

*Household memberships are allocated two votes.

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 1 March 1991.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Chris Lorain-Ebrahemi, Secretary--Pam Brunsfeld, Treasurer--Kathy Geier-Hayes.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Mary McGown, Vice President--Nancy Cole, Secretary--Linda Williams, Treasurer--Kathy Geier-Hayes.

Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: President--Ruth Moorhead, Vice President--Jim Glennon, Secretary--Joan Bergstrom, Treasurer--Harry Giesbrecht.

White Pine Chapter: President--Ed Tisdale, Vice President--Pam Brunsfeld, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707

March/April 1991 SAGE NOTES A Publication of the Idaho Native Plant Society Vol 14(2)

Election Results

Approximately 30% of the membership voted in this year's election. The Articles of Incorporation Amendment was accepted 100 to 0. Results: President--Susan Bernatas, 94 votes; Vice President--Kathy Geier-Hayes, 102 votes; Secretary--Pam Brunsfield, 60 votes; Treasurer--Pam Conley, 103 votes. Write in candidates for various offices were: Ruth Moorhead, Mary McGown, Chris Lorain, Nancy Cole and Chuck Wellner. Thanks to ballot counters Mering Hurd and Nancy Shaw. Thanks to all those who were willing to run for office.

Feature Article: Native Shrub Transplant Program in the National Guard Orchard Training Area *by Dana Quinney*

The Orchard Training Area (OTA) is approximately 135,000 acres of desert southeast of Boise, north of the Snake River Canyon; it has been used for military training since the early 1950s. In 1979, the Snake River Birds of Prey Area was established, including all of the OTA within its boundaries. One of the thorniest management problems in the OTA is destruction of native shrub habitat by range fires. During the past dozen years, over half the shrub habitat of the training area has been lost to fires. Most of the fires were summer lightning strikes, but some were caused by National Guard training. The most important shrubs of the training area are big sagebrush (*Artemisia tridentata*) and winterfat (*Ceratoides lanata*). Neither species usually survives fire, nor do they sprout from the crown or roots after burning. Seeds in the soil are usually killed as well.

After a fire, exotic annuals, especially Russian thistle (*Salsola iberica*), cheatgrass (*Bromus tectorum*), and bur-buttercup (*Ranunculus testiculatus*) dominate, providing severe competition to native shrubs and to seedlings (if seeding of native shrubs occurs naturally from nearby unburned stands). Therefore, once a shrub stand in the OTA is lost to fire, it becomes a stand of exotic annuals, and seldom becomes a shrub stand again.

In fall 1988 and 1989, big sagebrush and winterfat seed were collected in the OTA. The Guard contracted with the U.S. Forest Service Lucky Peak Nursery to plant the seed and grow several thousand big sagebrush and winterfat seedlings for transplanting into the OTA.

In March 1990, a crew of Idaho Army National Guard soldiers planted 6,000 big sagebrush and 4,000 winterfat seedlings (plus 700 silver sagebrush [*Artemisia cana*], seed source S. Idaho) in the OTA on sites where these shrubs had formerly existed and had been destroyed by wildfire. In November 1990, 6,000 more native shrubs were transplanted to the OTA, and several thousand more will be planted in 1991. From now on, native shrub planting in the OTA will be a regular spring and fall activity.

Every year, monitoring plots will be established on the new transplant sites, and seedling counts will be done. Older sites and control sites will also be monitored.

The monitoring will enable us to answer many questions about the transplanted seedlings and the transplant sites, including: 1) What is the survival/mortality rate of the transplanted seedlings? 2) Did the disturbance of clearing microsites for planting cause a lasting difference in the ratio of annual to perennial vegetation on the transplant sites? 3) Did the planting disturbance produce a difference in the amount of bare ground vs. ground cover? If

so, how many years did this difference persist? 4) Do the transplant sites receive different amounts of livestock use compared to adjacent non-transplant sites? 5) Did the effects of transplanting activity cause the sites to support different numbers and/or species of small mammals? 6) What is the rate of recruitment of shrubs on the transplant sites, as the seedlings mature and reseed the plots? 7) How does this compare with the rate of natural shrub recruitment, if any, on adjacent non-transplant plots? 8) What are the characteristics of a promising potential transplant site? 9) Is seedling survival different in fall plantings from spring plantings? 10) Do perennial grasses re-establish in transplant sites at different rates than they re-establish in burned non-transplant sites?

The OTA native shrub re-establishment program is one of the only programs in the West where the ecotype of the native shrubs being planted is the same as those that grow there naturally. It is also one of the few programs where historic documentation is used to determine the planting sites for each of the native species. (For example, a 1900 photograph by Israel Russell helped establish the site choice for one of the 1990 planting sites.) Now, as the end of February approaches and the prairie falcons hunt for ground squirrels in the desert, spring sagebrush planting on the OTA is about to begin.

Annual Field Trip: Field Trip to Hagerman Valley *by Christine Lorain-Ebrahimi*

This year's INPS annual event will be a field trip to HAGERMAN VALLEY on May 4th and 5th. We anticipate an enjoyable trip for one and all, involving a number of interesting and diverse activities. Although we are still working out some of the details, this is the proposed schedule of events and is subject to change:

Friday p.m. early arrivals meet at Miracle Hot Springs Campground (reservations are made)

Saturday a.m. 9:00 - Group meeting (information packet); visit Malad Gorge or Fish & Game Revegetation Plots

Lunch - Malad Gorge State Park

Saturday p.m.- Visit Minnie Miller (1000 Springs) Nature Conservancy Preserve. Return to camp - hot tubs or individual outings

Saturday evening - ca. 6:00 - BBQ Dinner and Potluck (Hagerman Senior Citizen Center) INPS Business Meeting. Dritch Bowler, Speaker.

Sunday a.m. - Fossil Beds Natural National Monument (conduct a plant inventory). Break camp

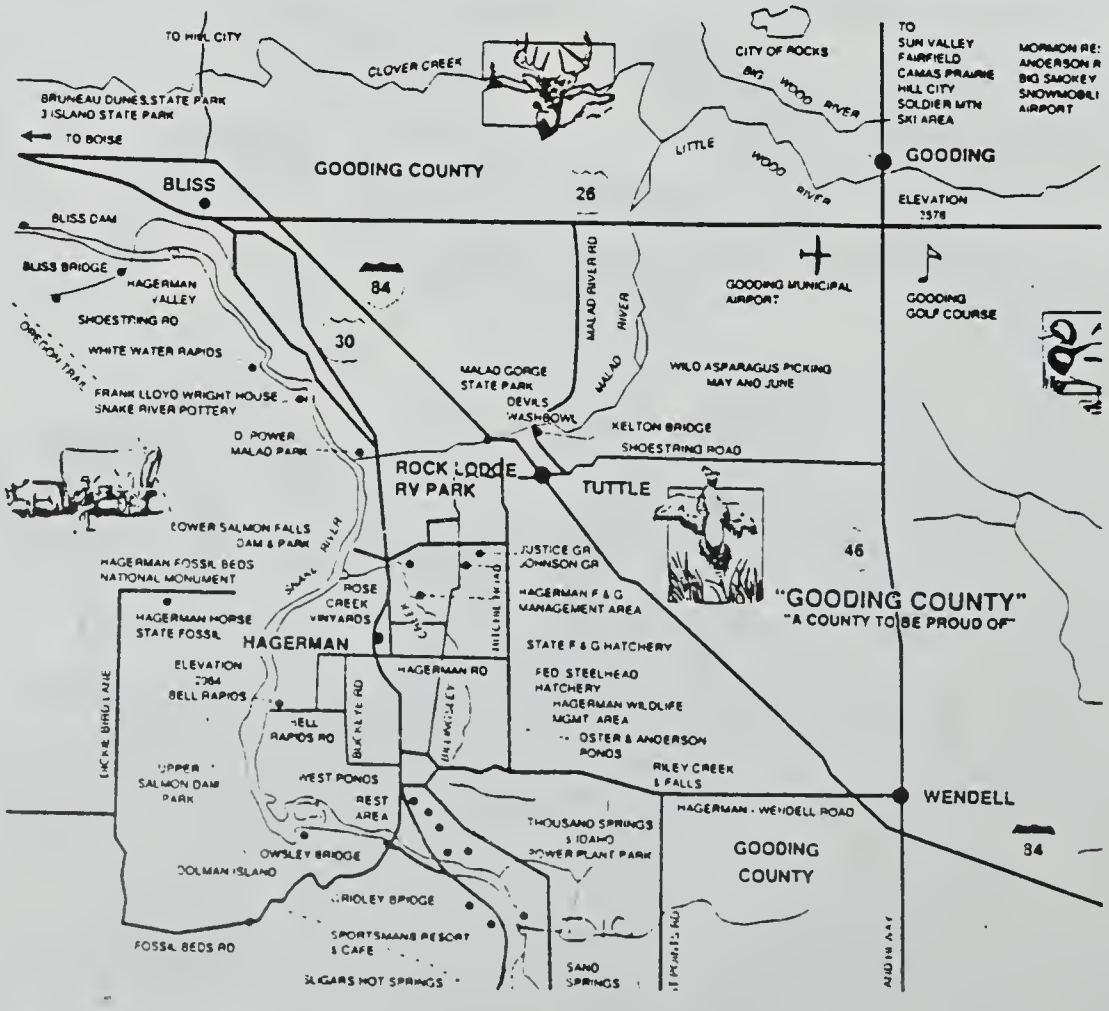
Sunday p.m. - Optional trip to Box Canyon (tentatively scheduled)

An information packet with a complete schedule of activities, as well as maps of the area and a few other "things to see" will be presented at the group meeting Saturday morning. We may also have to charge a $5.00 registration fee to help cover the organizational costs of this event. The scheduled camping facilities at Miracle Hot Springs include 10 RV hook-ups, tent sites, and hot tubs. The cost will be $5/night for RV sites, $3/night for tents, and $2.50/person for hot tubs (normally $3.50). We have rented the entire campground so there should be plenty of room for everyone. A discount rate is possible depending on how many people attend. You may wish to reserve one of the RV sites by calling Miracle Hot Springs Campground at 543-6002.

On Saturday, we plan to meet at 9:00 and divide into 2 separate groups with Saturday morning visits to either Malad Gorge State Park or some Fish & Game Revegetation Plots. The revegetation plots provide an interesting look into the difficulties of revegetating dryland sites. A representative from the Fish & Game department will discuss how they have utilized both native and introduced species in this project. Malad Gorge State Park has a fascinating geological history and a number of waterfalls. Other items of interest include a Birds of Prey release site, a rare buckwheat, historical sites with remnants of the Oregon Trail, and very nice lunch facilities. We will all meet at the park for lunch and have a chance to exchange notes about our morning outings.

Saturday afternoon we plan a trip to Minnie Miller Nature Conservancy Preserve that includes a portion of the 1000 Springs. We plan to complete the scheduled activities between 3 or 4 o'clock to allow everyone time to enjoy the hot tubs, head out on their own to visit other sites, or prepare for the potluck.

Saturday evening we plan to have a Potluck/outdoor BBQ and an evening speaker at the Hagerman Senior Citizen Center. We have rented the center, which has facilities to refrigerate or heat up dishes. Please plan to bring some sort of side dish, salad, or dessert for the potluck. We only plan to use the oven and



refrigerator facilities, so BRING EVERYTHING YOU NEED including utensils, plates, drinks, glasses, etc. We will provide the BBQ facilities, so bring whatever you wish to cook as your main course (steaks, hamburger, fish...). Dritch Bowler, narrator for the PBS Idaho Centenial Series "Proceeding on through a Beautiful Country", will be our speaker.

On Sunday morning we plan to get going around 9:00 with a visit to Hagerman Fossil Beds National Monument. Apparently, this area is quite interesting botanically and geologically. An interpreter will be available for a tour of the area. We have been informed that they are in need of a plant inventory and we hope to supply them with one during our visit.

We should be completing our morning tour by lunch so that those people who wish to leave can do so. If others are interested in an additional trip, we hope to visit Box Canyon Sunday afternoon. This activity is still tentative and was not confirmed by the time the newsletter went to press.

Our scheduled leaders include botanists Nancy Cole and Katlin Craig (Idaho Power), Cindy and Lou Lunte (Minnie Miller Preserve Managers), and possibly Lyle Lewis (Shoshone BLM), Ruth Moorhead (Pres. Sah-Wah-Be Chapter), Bob Moseley (ID Natural Heritage Program), and Linda Smithman (Pahove Chapter). We appear to be swimming in botanical knowledge!

Since this is rather early in the spring, please remember to come prepared for the weather! The old swimsuit will be handy for the hot pools, binoculars are recommended to see some of the birds of prey at Malad Gorge, and be prepared for a possible encounter with poison ivy and ticks. Don't forget all your camping gear and, of course, your FOOD.

Finally, I'd like to express my heartfelt thanks to my organizational committee, Mary McGown, Kristin Fletcher, and Ruth Moorhead for their help in making this all possible!

Rare Plant Conference *By Nancy Cole*

February 12th and 13th found 55 professional and lay botanists gathered together in Boise to discuss new information about Idaho's rare plants at the 7th Annual Rare Plant Conference. The Idaho Native Plant Society has hosted the conference since 1990. This year's meeting had several highlights including a discussion by Yvonne Ferrell, Director, Idaho Dept. Parks and Recreation, describing the state's progress toward recognizing rare plant species (See article in **SAGE NOTES**, Vol.13, no.6). For the first time INPS provided an information sheet for each federal candidate and listed species complete with distribution maps and habitat information. Hopefully, the sheets will provide a quick reference for current information about rare plants as well as a source for anecdotal information. In future years INPS will provide similar information for state listed species. In addition to the information booklet, participants received a first edition Rare Plant coffee mug featuring wavy-leaved thelypody (*Thelypodium repandum*).

Results from the INPS 1991 Rare Plant Conference

Category	Changes in 1991
Federal list	9 up in listing priority
(51 total)	2 down in listing priority
	1 addition*
State Priority 1	3 additions*
(40 total)	1 from Sensitive
	4 from Review
State Priority 2	4 additions*
(48 total)	2 from Sensitive
	11 from Review
State Sensitive	3 additions*
(70 total)	4 from Monitor
	9 from Review
	1 to Priority 1
	2 to Priority 2
	3 dropped•
State Monitor	3 from Sensitive
(53 total)	1 from Review
	4 to Sensitive
State Review	2 additions*
(56 total)	4 to Priority 1
	11 to Priority 2
	9 to Sensitive
	1 to Monitor
	10 dropped•

*species previously unknown in Idaho
•species found to be common

The amount of information known about rare plants in Idaho is growing rapidly and as you can see from the results above, the information is enabling conference participants to better evaluate the status of many rare species.

No report on the meeting would be complete without a warm

thank you to the folks who helped put the meeting together. The 1991 Rare Plant Conference Committee included Susan Bernatas, Nancy Cole, Michael Mancuso, Bob Moseley, and Carol Prentice. Mering Hurd prepared the snacks that were heartily consumed during breaks. Pam Conley organized the Conference Banquet. Willie Gluch, Agnes Miller and Mary McGowen kept the registration table in proper order. Idaho Power Company provided photocopy services for the initial mailing. Thanks go to the eight people who served as moderators and scribes: Bob Parenti, Bob Steele, Linda Smithman, Pat Packard, Carol Prentice, Cindy Lunte, Jill Roche-Blake and Caryl Elzinga.

From the President *by Susan Bernatas*

Yes, spring is here; the signs are everywhere. Crocuses are up, maples are flowering, botanists are bursting with activity and excitement with trying to finish up last season's reports, checking the phenology of the lower elevation plants, and planning the season's fieldwork.

INPS is alive with activity also. Eighteen months ago, INPS had a membership of 90 people located largely in Boise. Today there are 5 chapters and 300 members. We welcome our newest chapter, Calypso, located in Coeur d'Alene.

INPS has a very active membership and a dedicated and energetic Board of Directors. Educating the public on Idaho's flora is INPS' primary goal. We do this through a wide variety of activities- something for everyone, as you can see in these pages of SAGE NOTES. I would like to highlight two areas that INPS is involved in: rare plant conservation and xeriscaping.

INPS is very active in rare plant education with the Rare Plant Conference, Conservation Committee, and the Rare Plant Book Committee. These committees are very effective, but we need your help with these activities. If you are interested in adopting a plant, writing letters to comment on agency plans and project activities, or working with one of these committees, please write to the INPS address.

Most of the requests that INPS receives is for information on xeriscaping or landscaping with native plants. Several chapters are very involved with this topic and have had field trips to native gardens, and started to collect information on this subject. Forming a xeriscaping committee or committees will be one of the topics at the Annual Meeting. If you have information on gardening with natives or xeriscaping, or if you would like information on this subject, please write or be ready with your ideas at the Annual Meeting. Consider writing a paragraph on you trials and tribulations in landscaping with natives for SAGE NOTES.

I hope many of you can attend the Annual Meeting, May 4 and 5 and Annual Conservation Field Trip June 22.

Editor's Notes

The next issue of SAGE NOTES will focus on the use of native plants in xeriscaping, landscaping and revegetation. Members who are active in this area are especially encouraged to submit articles for the next issue. Information on species selection, methods, tools, successes and failures is welcomed. I'll use the COMMENTS AND CONTACTS column to include short bits of information, so you can share your knowledge without feeling obligated to write an entire article.

Deadline for submissions is May 1 for articles that I need to type and May 10 for submission that come already typed on disk. If you submit late, I'll do my best to get it in, but it may get delayed to the next issue. I appreciate those who submitted for this issue, especially those who sent their submissions on computer disk! But if you don't have access to a computer, don't think you can't submit an article. I'm happy to type them if you give me a little time. Handwritten submissions are fine.

So get writing! Share what you know with your fellow members. Those of you submitting early and submitting via a disk (any format or wordprocessor) will be especially appreciated.

Comments and Contacts: Idaho Centennial Trail Work Begins *-by Mary McGown*

The Idaho State Centennial Trail was designated officially by the Idaho Parks and Recreation Board on June 2, 1990. The Idaho Trails Council (ITC) has agreed to coordinate volunteer efforts and to coordinate with land managing agencies to help maintain and sign the trail and to raise funds for the trail.

Four trail related tasks have been identified by the ITC. Individuals and groups are encouraged to participate in the tasks at the local level, or to add ideas to the list of proposed local activities. The tasks are as follows: 1) Leadership: local steering committee participants; 2) Trail work; 3) Fund raising and financial support; 4) Public Education.

For more information on volunteering, or to make a contribution, contact the Idaho Trails Council; P.O. Box 1629; Sun Valley, ID 83353.

Short Takes: Mysterious Mima Mounds: Seismic Source? *(Reprinted from Douglasia Vol. XIV, No.3, Summer 1990.)*

(Mima mounds are often visible on an aerial photo, appearing like polkadots on the landscape. On the ground, mima mounds usually support different vegetation than the surrounding area. -ed)

A fluke observation involving a doghouse and an eruption of Mount St. Helens may solve a geologic mystery that has puzzled scientists for more than 150 years.

Mima mounds - rounded piles of soil standing as high as 3 meters - appear clustered in diverse spots around the world and "may have generated a greater variety of hypotheses than any other geologic feature," says Charles G. Higgins of the University of California, Davis. In the past, scientists have attributed these mounds to factors ranging from burrowing gophers to plant roots. But a serendipitous series of events

leads geologist Andrew Berg to propose earthquakes as the cause.

While constructing a doghouse in 1980, Berg happened to hammer on a piece of plywood covered by a fine coat of volcanic ash from the Mount St. Helens eruption that spring. Berg, who works for the U.S. Bureau of Mines in Spokane noticed that the pounding produced a pattern of bumps in the ash that looked suspiciously like minature versions of the Mima mounds common near his home. In his off hours, Berg repeated the experiment under more controlled conditions. He observed that the vibrations from several hammer blows sorted the material, causing soft sediments to form mounds separated by coarser-grained material - a feature characteristic of some Mima mounds.

Berg thinks the experimental mounds arise because vibrational waves traveling through the plywood interfere with each other, causing certain locations to vibrate heavily while others remain still. A similar interference pattern of earthquake waves, he reasons, could create Mima mounds in areas where a thin layer of loose soil rests on a flat section of rock or hard soil. Because repeated hammer blows to the plywood did not erase the mounds, Berg believes they are stable once formed and would not fall apart during repeated earthquakes.

The hammer experiment does not prove the earthqake hypothesis, Berg noted in the March *Geology*. Nonetheless, he calls the evidence "extremely compelling." His theory would explain why Mima mounds form in may earthquake-prone areas around the world that have markedly different climates.

Illustration by Glenn Elzinga

Rare Species Profile: Physaria didymocarpa var. lyrata *-by Caryl Elzinga*

The Salmon twin bladderpod (*Physaria didymocarpa* var. *lyrata*) is a rare variety of the more widespread variety *didymocarpa*. It is known from only four sites, all within 30 miles of Salmon, Idaho, and all on lands administered by the Bureau of Land Management, Salmon District. Its distribution is puzzling; the steep loose scree substrate that is its habitat seems common throughout the area, but even after intensive surveys, no additional populations have been found.

The variety was described in 1964. For many years, it was thought that the only population was the type population on Williams Creek, a tributary to the Salmon River, South of Salmon. Three new populations were found in the mid-1980's on tributaries to the Lemhi River, south of Salmon.

The rosette plant bears bright yellow flowers in mid-May, but the most striking characteristic is the large inflated bilocular pods. The 2cm pods are larger than the more common variety. There are also genetic differences: the Salmon variety is a hexaploid with three times the chromosomes of the common variety.

The Salmon twin bladderpod provides special management challenges. All populations are located along roads, with potential threats to populations from road maintenance. There are mineral values at two of the population sites, with resulting existing and potential conflict. Currently, the variety is managed by the BLM under a Conservation Agreement with U.S. Fish and Wildlife Service.

Actions outlined in that agreement include monitoring of the population, assessment of threats at each population site, and the development of enhancement strategies for the plant. This summer, the BLM is funding an ecological and demographic study of the plant through its challenge cost share program, in order to better understand the requirements and dynamics of the populations.

State News

Potential Petition for Listing of Three Species

A majority of the 55 INPS members gathered at the 7th Annual Rare Plant Conference voted to petition the U.S. Fish and Wildlife Service to emergency list three species. Two of the species, Aase's onion (*Allium aaseae*) and Mulford's milkvetch (*Astragalus mulfordiae*) occur on the Boise foothills and are threatened by development and mining. The third species is the Salmon twin bladderpod (*Physaria didymocarpa* var. *lyrata*), a rare variety known from only four sites near Salmon, Idaho (see **Rare Plant Profile**).

Idaho Rare Plant Book *-by Susan Bernatas*

The Idaho Native Plant Society has embarked on one of its most exciting and ambitious projects, a rare plant book. The goal of the rare plant book is to educate the public on Idaho's rare plants. We hope that with education comes understanding and protection.

The book will be in a magazine format with information on

approximately 100 selected rare plants. The plants will be arranged by habitat (alpine, forest, shrublands, etc). A photo and written description will introduce each habitat. Each plant will have a line drawing or color photo. Text will include information on the plant's distribution, protection status, historical information, who discovered the plant and when, and other interesting stories about the plant. The introduction will include a general description of Idaho's flora, information on what to do if you find a rare plant, and the status of rare plant protection in Idaho.

The Rare Plant Book committee consists of Bob Moseley (co-author of **Alpine Wildflowers of the Rocky Mountains**) as writer; Diane Ronayne (editor of **Idaho Wildlife**), editor; Mike Mancuso, technical organization; Mering Hurd, slide file; Beth Workman, design; Kathy Geier-Hayes, fundraising; Susan Bernatas, Committee Chair. If you are interested in helping out on this project, please write to the Rare Plant Book Committee, c/o the INPS address.

INPS Conservation Committee *-by Susan Bernatas*

The goal of the INPS Conservation Committee is simply the conservation of Idaho's flora. Doing this has involved many different projects and substantial membership participation. For example, INPS assisted the Forest Service in fencing a Research Natural Area (RNA) near Arco, has initiated a book on Idaho's rare plants, worked with the Idaho Department of Park and Recreation (ID P&R) to develop a Plant Species of Special Concern Program within the Department, is planning a trip to a RNA near Council, and in conjection with the Pahove Chapter, is working on the conservation of the rare plants in the Boise Foothills. Many of these projects have been featured in SAGE NOTES.

Another project that is being initiated is commenting on federal and state agencies Envronmental Assessments that may affect Idaho's sensitive plant species. During the last week of March, Duane Atwood, Botanist for Region 4 of the Forest Service (southern Idaho) and Roger Rosentreter, State Botanist for the Idaho Bureau of Land Management, gave presentations on the policy and procedures their respective agency must follow in considering threatened, endangered, and sensitive plants.

If your interested in becoming involved in the conservation of Idaho's flora write to Conservation Committee at the INPS address.

State Board Meeting *-by Pam Brunsfield*

(Many of the items discussed have been reported on in depth in the last and current issue of SAGE NOTES. These items have been summarized by the editor)

The following is a condensed version of the approved minutes from the January 12, 1991 State Board meeting.

The meeting began around 8:00 a.m. PST, 9:00 a.m. MST after those involved in the conference call were contacted. Those participating were Susan Bernatas, Pam Brunsfeld, Kathy Geier-Hayes, Caryl Elzinga, Ed Tisdale, Mary McGown, Ruth Moorehead, and Kristin Fletcher.

Minutes from the November 10, 1990 meeting were approved and Kathy reported a current balance of $1624.36.

The chapters then summarized their winter activites.

(Discussion of nominations for state offices and the Rare Plant Conference- see results this issue. -ed)

Next order of business was the dues schedule. After much discussion it was decided that we would keep the reimbursement to the local chapters at an across-the-board 25% for all dues categories. This would allow the following amounts to be kept at the local level: $1.50, student and senior; $2.00, individual; $2.50, family; and $7.50, sustaining.

(Discussion and reports on the new INPS brochure- to be printed soon- the Rocky Comfort Flat site, the Annual field trip to Hagerman Valley and the Rare Plant Book Committee- see this issue. -ed)

Susan then summarized the recent history of ruling on the Aquarius area - the Forest Service had finalized their "no-road" ruling and so the forest industry is taking it to Congress, hoping to get a ruling in their favor. After much discussion it was decided that in the newsletter we would describe the history of the area, encourage letter writing to Rep. Larry LaRocco expressing our concerns, include congressional phone numbers, and also include a preprinted letter to Congressman LaRocco. *(Appeared in the last issue. Hope you all wrote. -ed)*

Susan then described information she has received showing interest in starting new chapters throughout the state. She has heard from people in Idaho Falls, Grangeville and Coeur d'Alene. It was decided that if an area can come up with ten members they can form a chapter. There was some discussion on the possibility of offering dual affiliation to members who would like to belong to two chapters.

Kristin then reported she was interested in working on a "Native Plant Package" that would list the requirements for growing different native species. She encouraged information from everyone. There was further discussion on using the newsletter for further information on native plant gardening, and perhaps highlighting people's yards, or species that do well in the native garden.

Next meeting will be Saturday, March 2. Meeting adjourned. *(These minutes will be approved at the next board meeting and then published. -ed)*

Chapter News

Big Wood Chapter *-Submitted by Kristin Fletcher*

May 28. "Sagebrush communities and their environments" with Dr. Roger Rosentreter. Meet at Hill City about 10:30. This field trip will tie in to the arrival of some of the participants of the Wetlands Conference (held in Sun Valley May 29-31), who will be journeying over from Boise and will be stopping enroute with Roger. We will view many varieties of sagebrush and other plants along old railroad right of ways and near Magic Reservior.

Mid June. "Water: Where it comes from, where it goes, how we use it". This may turn into a mini-conference about this important issue, but at a minimum, we will hear a talk by Kelly Weston, owner of Native Landscapes, on planting with natives and reducing water use in our home landscaping environment. Meeting will be followed by a visit to Florence Mackie's fascinating yard filled with many varieties of *Penstemon* and other local natives she's grown over the last several years.

End of July. "The ecology and rare plant communities of the Kane Lake Basin". Bob Moseley will lead this field trip into the unique Kane Lake Basin where we will learn about six rare plant species, four of which are only known in Idaho at this location.

July 31. "Seed Collecting and Wildflower Identification" with Bill McDorman, owner of High Altitude Gardens and Seed Trust.

Big Wood Chapter also elected officers: Kristin Fletcher, President; Francis Naser, VP; Carol Blackburn, Secretary/Treasurer.

Calypso Chapter *-from the Calypso newsletter*

The name Calypso was chosen at a February organizational meeting. Officers elected are Pam Gontz, President; Tina Gospodnetich, VP; Bob Shackelford, Secretary; Jill Blake, Treasurer; Peggy and Ralph Faust as Refreshment Chairpersons and Pat Coleman, Newsletter Editor.

April 19. Chapter Meeting; 7:30-9:00p. Kootenai Cty Ext. Office Meeting Room.

April 28. Field trip led by Calypso Chapter to O'emlin Trails, Post Falls, Idaho. Led by Jill Blake and Bob Shackelford. Area on the south side of the Spokane River near the South Park.

May 10. Chapter Meeting; Kootenai Ext. Meeting Room.

May 11. Day trip to Skyline Drive, combined with White Pine Chapter (see WP Chapter notes for more info). Meet at the rest area south of the Latah-Benewah City boundary line on Hwy 95.

June 15. Field trip to Coal/Graham Creeks, led by Jill Blake.

July 20. Field trip to Roman Nose Peak, Bonner City. Led by Steve Brunsfield and Pam Gontz.

Pahove Chapter *--Submitted by Nancy Cole*

March 21. Bruneau Dunes State Park--Mario Delisio will present information about this unique Idaho park. Mr. Delisio has written a book about the wonders of BDSP that will be for sale at the meeting.

April 18. The use of hybrid poplar as a source of pulp fiber in the Columbia Basin. Don Patterson, forester for Boise Cascade will describe a new project initiated by Boise Cascade.

May 16. Methods to replicate native wetland plant communities in constructed wetlands. Rob Tiedemann, Ecological Designs Associates.

April 6. Rare plants in Boise Foothills, *Part 1.* Aaseae's onion (*Allium aaseae*), a candidate for federal threatened and endangered status, is being consumed by new housing developments in the Boise foothills. Come help count and map the populations in the vicinity of Military Reserve, one of several areas identified for development. Meet at the Community Center parking lot in Military Reserve Park at 9am and plan to spend most of the morning. Bring water, snacks. Maps will be provided.

April 24. 7:30p. Susan Bernatas will be giving a talk on "Managing for rare elements of Biological Diversity". Co-sponsered with The Desert Group. Contact Susan Bernatas 334-1457 for more details.

April 27. Bike Botanize and Bird on the Boise River Greenbelt; 9:00a-noon; INPS, Audubon, and Sports Exchange. We will be exploring the plants and birds found along the Boise River Greenbelt on bikes or roller skates. Trip leaders: Susan Bernatas and Matt McCay, President of the Golden Eagles Audubon Chapter. Meet at Municipal Park on Walnut Street. Bring water, a snack, and binoculars. A $1.00 donation is suggested for plant education. Contact 334-1457.

May 11. Rare plants in Boise Foothills, *Part 2.* Two other federal candidate species grow at Military Reserve. Pahove members will join Friends of Military Reserve in mapping and counting Mulford's milkvetch (*Astragalus mulfordiae*) and *Lepidium papilliferum* (no common name yet). Meet at the Community Center parking lot in Military Reserve Park at 9am, plan to spend most of the morning. Bring water, snacks. Maps will be provided.

May 18. Field trip to view the wetlands constructed at Spring Meadow Housing development along the Boise River led by Rob Tiedemann. Meet at the Shakespeare Festival Outdoor Theatre, Park Center Blvd. at 10am.

June 23. Day hike on Cuddy Mountain led by David Towner, Pahove member. A good follow-up field trip to the State Conservation Field Trip, Cuddy Mtn has been proposed for timber harvest, but it is the last remaining roadless area in southwestern Idaho. Dave swears it is one of the greatest places on earth and he's willing to prove it. Details will be provided in the May newsletter.

July 13. Joint Field trip with Sah-wa-be Chapter to City of the Rocks, near Oakley. Sah-wa-be plans to camp at Mt. Harrison on Saturday night. Details in the May newsletter.

Sah-wah-be Chapter: *-submitted by Joan Bergstrom.*

April 23. Donna Looze will speak about the Portneuf River Greenbelt Project, 7:30p. Call Nancy Nation 237-1216.

April 27. Join botany students for annual trek to Hagerman Valley via Malad Gorge, an all day trip led by Dr. Karl Holte (233-3079). Bring food and beverages to last 'til night. Prepare for ceramics store, winery, convenience-store stops. Meet at parking lot of ISU Biology Building, Memorial Drive at 7:00a.

May 11. Meet at Idaho Museum of Natural History parking lot, Pocatello, at 9:00a for a trip to The Nature Conservancy Preserve at Formation Springs (north of Soda Springs).

May 28. Brown-bag picnic dinner at Cherry Springs, south of Pocatello on Mink Creek Road (meet there at 6:30p); talk by Jim Klott on collecting for BLM's Malad herbarium.

June 1. Scott Mountain Plant walk at 9:00a. Meet at Museum parking lot.

June 8. Jensen Creek drainage, south side of Palisades Reservoir. Meet at Museum parking lot at 7:00a. Dr. Karl Holte leads this trip nearly every year. Fabulous mountainside displays. Take swim-suits, food and beverages for all day; prepare for ice cream stop.

White Pine Chapter: *-submitted by Pam Brunsfeld*

May 11. A day-trip to Skyline Drive for viewing a variety of forest and Palouse prairie habitats and wildflowers. Ed Tisdale and Steve Brunsfeld will be our trusty leaders through this beautiful nearby wonderland. Bring lunch and water and rendezvous at the Moscow Rosauers parking lot at 9 a.m. The newly-formed Coeur d'Alene Calypso chapter will join us for this trip. We will be making a plant species inventory for the Friends of McCroskey State Park Association. There is a primitive campsite available for overnighters.

Idaho's Big Trees: Gigantic Junipers *-by Fred Johnson, former Director, Idaho Big Tree Program*

Idaho has four species of native junipers, another of those genera that are known far and wide as "cedars". One species, *Juniperus communis* (common juniper) is credited with always being a shrub in Idaho. Perhaps, but we do have records of tree-like common junipers from northern Idaho. Whether these are aberrant natives, or escapes from cultivation we know not.

This brings us to the three species of Idaho tree junipers. Most widespread is *Juniperus scopulorum*- Rocky Mountain juniper. It ranges through south-central and eastern Idaho, with small northern incursions around Pend Oreille Lake and in the northern Kootenai Valley. The largest known in Idaho WAS at Big Juniper Kapuka in Blaine County. But, in 1989, Eric Mattson and Shawn Muldoon topped the old record with a 192 point tree on Williams Creek in Franklin County. How big? Diameter 50.8 inches but only 26 feet tall with a crown spread of 28 feet. The National record tree has 292 points, in Utah.

Back in 1985, Steve Brunsfeld measured a new Idaho record for western juniper, *Juniperus occidentalis*, near Silver City in the Owyhee Mountains. This beauty is our largest known juniper and tips the point scale at 273 points. It's some 5.5 feet in diameter and 57 feet tall, with a crown spread of 48 feet. The Nation's largest, located in the Sierra Nevada of California, is over twice that diameter and adds up to 581 points! But wait, there's some cheatin' going on here. A reliable taxonomist has recognized two varieties of this juniper. Since the USFS Checklist of US Trees does not recognize these varieties, the California tree, part of the southern variety, is not considered separate from ours, the northern variety. So maybe one day, with proper varietal recognition, the Owyhee tree may be a National record.

Lastly, there's Utah juniper, primarily a south-central species in Idaho. On Trapper Creek, in Cassia County, Bob Steele measured a tree in 1973 that remains one of the oldest standing records for Idaho trees. This tree was just over 5 feet in diameter, maybe now a tad larger. It's only 30 feet high with a crown spread of 24 feet to add to its 97 points. Scientific name? Well, take your choice: most contemporary books list it as *Juniperus osteosperma*, traditionalists (especially in Utah) stick with *Juniperus utahensis*, while recent taxonomic work relegates it to *Juniperus californica* variety *utahensis*. And all the while, it has kept its common name of Utah juniper. Who says scientific names are more stable?

If you're interested in a copy of the latest list of Idaho big trees, send a SASE to: Idaho Big Tree Program; College of Forestry; Univeristy of Idaho; Moscow, Idaho; 83843

Good Stuff

Books

Wildflower Handbook. National Wildflower Research Center; 2600 FM 973 North; Austin, TX 78725-4201. $9.95 plus $3.00 postage and handling.

Gardening with Native Plants of the Pacific Northwest. Arthur R. Kruckelberg. $22.00 paper.

The Sagebrush Ocean- A Natural History of the Great Basin. Text and Photographs by Stephen Trimble. 248pp. University of Nevada Press. $35.00 hardcover.

New England Wildflower Society Seed List. Send $1.00 and a SASE to Seeds, New England Wildflower Society, Garden in the Woods, Hemenway Road, Framingham, MA 01701. Includes offerings of over 150 varieties of wildflowers and ferns.

Weed Handbook Series 1-30. Available for $3.50 from Wyoming Weed and Pest Control; Box 728; Douglas, WY 82633. (307)358-2775.

Conferences

Desert Conference XIII. April 25-28 at the Malheur Field Station near Burns, OR. This year's theme is "Spreading the Word", and is planned to inform and inspire participants to bring natural values and the plight of desert wildlands to a broader audience. For information call 503-245-3658 or write Desert Conference; Box 15115, Portland, OR 97215.

Land and Water Fund Forum. Stewart Udall - author, lawyer, former Secretary of the Interior, and one of America's foremost conservationists - will be the featured speaker at an April 26, 1991 forum sponsored by the Land and Water (LAW) Fund. The special forum will take place in the Boise City Council chambers from 11:00a to 1:00p. LAW Fund provides no-cost legal and scientific services "to help level the playing field" in environmental decision making, particularly when citizens face well-financed industry or government experts. Contact Dick Juengling, director of LAW Fund's Boise office at 342-7024; P.O. Box 1612, Boise, 83701.

Employment

Idaho Falls BLM. Temporary Botanist wanted for summer of 1991 in the Big Butte Resource area. The work will be primarily an inventory of sensitive plant species and assisting in the training of the range inventory crew. Contact Russ McFarling at 524-7531 or write BLM; 940 Lincoln Road; Idaho Falls, ID; 83401.

Targhee National Forest in SE Idaho will be hiring an ecologist/botanist this spring. The person will be responsible for managing the Forest plant program. Initially the emphasis of the position will be the sensitive plant program. If interested, contact Hal Gibbs or Bryant Christiansen, 624-3141.

Conservation Corner: Field Trip to the Proposed Rocky Comfort Flat Research Natural Area *-by Ed Tisdale*

Rocky Comfort Flat is located near the western edge of Adams County, Idaho, just east of the Snake River canyon on the Payette National Forest. It includes a plateau-like peninsula and parts of the canyon of two streams, Bear Creek and Crooked River. Elevations in the area range from 4900 feet on the plateau to a thousand feet lower in the canyon bottoms. The high degree of topographic and soils variability in the area, combined with its critical location on the border between the sagebrush-grass and Pacific Northwest bunchgrass regions, results in an unusual amount of biological diversity within this 1100 acre site.

Sixteen mapable vegetation types have been recongnized on the area, providing a rich source of material for investigation of these types and of the ecological factors responsible for their presence. The most important community, however, and the one for which the area was primarily selected, is the stiff sagebrush/Sandberg bluegrass (*Artemisia rigida/Poa sandbergii*) type which occupies the major part of the plateau. This community is of critical interest and value at both state and national levels. Stiff sagebrush vegetation occupies a very limited area in Idaho and this is the only sizeable example in good ecological condition that has been found after extensive searches. In addition, the stiff sagebrush type found at Rocky Comfort Flat is a high elevation, moister variant of the stiff sage type, differing in important respects from the low elevation, drier type found extensively in central Washington and Oregon. This high elevation type is confined to a small area in western Idaho and adjacent Oregon, and studies by several interested groups have concluded that the Rocky Comfort Flat stand is the best example of the type that exists. One rare plant species, Tolmie's onion (*Allium tolmiei* var. *platyphyllum*) occurs at the Rocky Comfort site and is endemic to Adams County.

This is a rare community and one that is in real risk of being lost. The stiff sagebrush/Sandberg bluegrass type is found only on very shallow soils underlain by basalt; the vegetation is low growing and sparse, with considerable amounts of bare ground exposed. As a result, the type is very vulnerable to grazing and trampling by large animals, especially in the spring period when its grass cover is most attractive to them. Stiff sagebrush itself is one of the last species of its community to be affected in the process of ecological deteriorations. Hence, depleted stands may appear normal at first glance, until closer observation reveals the scarcity of native grasses and broad-leafed herbs, and the abundance of weedy species and evidence of soil erosion. The ecological condition of the Rocky Comfort site has diminished since it was first studied in the mid 1980's. The area is in the Payette National Forest Plan as a proposed Research Natural Area in order to protect its unique values for research and education.

The Rocky Comfort Site has been selected as the site for this year's Conservation field trip. Access to Rocky Comfort Flat is by Highway 95 to Council. Plan to meet at the Council Ranger Station by 11am (mountain time) on Saturday, June 22. We will then drive west on the Bear-Cuprum road about 25 miles to Laffenty Forest Service Campground. (This campground is not large, but we can double up on most spaces, and overflow camping is available nearby. Water (one pump) and wood are available. Here we will have lunch, and leave about 1pm on a short drive to the Rocky Comfort Flat access point. This involves going through locked gates on private property and requires us to go as a group with Payette National Forest personnel. The site is then reached by about a mile of easy walking.

The road from Council to Laffenty campground is suitable for most any type of vehicle. Pickups or cars will be better for the trip from camp to the Rocky Comfort Flat site, and we can cooperate on transportation for this part.

On Sunday, June 23, an optional trip to see higher elevation sites on nearby Cuddy Mountain will be arranged if road conditions are suitable. Another option for adventurous types going south would be a return trip via Kleinschmidt Grade to Hell's Canyon and back to Highway 95 at Cambridge. Trailers or large motor homes not advised! For those returning north, there are interesting sites near Lucille and Slate Creek (McFarlene's Four O'Clock, canyon grassland and Lucille Cave).

We hope that members from all over the state will come on this trip to an interesting and little known bit of Idaho landscape. It is a chance to see some unique vegetation, and to become better acquainted with each other.

Housekeeping

The purpose of the Idaho Native Plant Society (INPS) is to promote interest in native plants and to collect and diseminate information on all phases of the botany of native plants in Idaho, including educating the public to the value of the native flora and its habitats.

Membership is open to anyone interested in our native flora. Contributions to our Society are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
__ Sustaining	$30	15
__ Individual	$ 8	4
__ Household*	$10	5
__ Student	$ 6	3
__ Senior Citizen	$ 6	3

Name: _____
Address: _____
City/State: _____
Zip Code: _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Calypso (Coeur d'Alene)
__ Sah-wah-be (SE Idaho)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.
*Household memberships are allocated two votes.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 1 March 1991.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Chris Lorain-Ebrahemi, Secretary--Pam Brunsfeld, Treasurer--Kathy Geier-Hayes.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

Calypso Chapter, 911 Pine Avenue, Coeur d'Alene, ID, 83814: President--Pam Gontz, Vice President--Tina Gospodnetich, Secretary--Bob Shackelford, Treasurer--Jill Blake.

Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Mary McGown, Vice President--Nancy Cole, Secretary--Linda Williams, Treasurer--Kathy Geier-Hayes.

Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: President--Ruth Moorhead, Vice President--Jim Glennon, Secretary--Joan Bergstrom, Treasurer--Harry Giesbrecht.

White Pine Chapter: President--Ed Tisdale, Vice President--Pam Brunsfeld, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.

June/July 1991 SAGE NOTES A Publication of the Idaho Native Plant Society Vol 14(3)

Native Landscaping for the Dry Times Ahead

by Kelly Weston, Hailey

Good gardens are living sculptures crafted with loving care from stone, soil and plants. A high desert garden is like a sculpture made of the hardest granite, difficult to carve, fine-grained and enduring.

To create a garden in harmony with its surroundings, one must work from the natural patterns, understanding the limits of water, sun and temperature. Plants that have adapted to our environment are both exceptionally cold hardy and very drought tolerant. Water loving plants exist only in narrow bands along streams and rivers or at higher altitudes. On the flood plains and hillsides wildflowers grow and flower quickly in the spring, grasses flourish, then become dormant in the late summer, and shrubs and trees send down long roots to pull up water from deep below the surface. Out of this dry and harsh environment comes an unsurpassed natural landscape: fields of wildflowers, golden hillsides of grass, and the blue-green of sage; quiet groves of aspen and river banks alive with red, yellow and orange dogwood and willow. Our goal with native landscaping is to bring this beauty into the more intimate setting of a garden without destroying the integrity of the natural composition.

In addition to the obvious beauty of a desert garden, there are practical reasons for creating a garden that is drought tolerant. Water is a precious resource and when drought hits, as it has for the last several years, we are forced to draw heavily upon the underground aquifers which replenish slowly. During the summer months, when days are hot and dry, the irrigation of existing landscapes doubles water use in my area, the Wood River Valley. According to Steve Hasen, Superintendent of the Ketchum Sewer and Water Department, the Ketchum water district used a total of 126 million gallons of water in July of 1988, up from a low of 51 million gallons in January when no irrigation took place. This 69 million gallon increase was almost entirely due to landscape irrigation and even this represented only a portion of the water used throughout the valley for irrigation. While water conservation is not something you hear much about, rapid development will probably make conservation a necessity in the future. Landscape watering will almost certainly be one of the first areas to be cut back. A properly designed drought tolerant garden will use up to 40% less water than the average landscape and needs less maintenance. More importantly, it will survive virtually unchanged through periods of water shortages when a normal garden may wither and die.

To discover the joy of creating your own drought tolerant garden, begin first with a detailed design. Group plants by the amount of water they will need, as well as their appearance and function. Look for natural variations in exposure, runoff, or light that might benefit specific plants. For example, place water loving plants in a sheltered north side of a house, or in a

Sambucus cerulea
by Agnes Miller

drainage pattern where water accumulates in the spring, or after a rain. These plants may then take advantage of natural runoff during part of their growing season, thus needing less irrigation overall. Because some irrigation is almost always necessary in order to get plants established and keep them healthy, locating them ahead of time allows one to design the sprinkler system around the needs of each variety. Drip heads or soaker hoses can then be placed to irrigate large trees and shrubs individually and rotating heads located to sprinkle the grass.

Before planting, prepare your soil by adding compost or well rotted and weedfree manure. Soils high in organic matter hold moisture better than those with low levels. Furthermore, healthy soils promote healthy plants which are more able to withstand drought conditions. Be sure to check your drainage. Many drought tolerant plants demand good drainage, so if your drainage is poor you may have to add some crushed rock, gravel or sand.

When it comes to picking the plants, select varieties that are drought tolerant. There are a great number of native or naturalized plants that are beautiful and do well in drier conditions. These include many of our most beautiful wildflowers, native shrubs and trees. The same is true for grass. While most of us love a green lawn to relax on, limiting this space and using grasses that need less irrigation will save more water than any other single factor. Kentucky bluegrass (including mixes) is frequently used, and is one of the most water intensive of all grasses, requiring 18 gallons of water per square foot per growing season. Other grasses, such as hard fescue, will create a beautiful lawn and use much less water, while Fairway crested wheatgrass or Canadian bluegrass (both non-natives) can be used successfully to cover large areas as a ground cover.

Once the garden is in place, it is important to irrigate efficiently. During our dry hot summers, more than 50% of water from overhead sprinklers is lost to evaporation. Drip or soaker systems use a fraction of the water of overhead systems and supply an even flow of water directly to the roots. Where large areas must be covered and overhead sprinkling is advantageous, low pressure rotating heads work well and use less water. Monitoring soil moisture content so that water is applied only when necessary and watering early before the heat of the day further reduce water loss. Where wind is not a big problem, even greater water savings can be achieved through use of a mulch such as straw, compost or shredded leaves.

Examples of drought tolerant landscapes are scarce but some inspiring successes do exist. My favorite is Florence Mulder Mackie's garden in Ketchum (see story this issue). The front lawn is a fescue grass, beautifully green and soft but requiring substantially less water than the bluegrass lawns all around her. Surrounding the house, shrubs such as potentilla, alpine currant, Rocky Mountain juniper and fernbush mix with wild penstemons and buckwheats. Beneath the aspens, kinnickinnick provides an evergreen carpet. Altogether it is a stunning composition of color throughout the spring, summer and fall. By most standards, Florence has a good sized landscape, but by carefully controlling the amount of water applied she has avoided most of the weed problems that often makes wildflower gardens difficult, and last year maintained the garden herself, hiring a friend one day a week to help with mowing, pruning and other heavy work.

Many of us live in the West, and in Idaho in particular, because here we can still feel the power of the land in its natural state virtually untouched by human beings, vast and beautifully diverse. For those of us who love gardens and gardening, it is important that our gardens reflect this love. Drought tolerant gardens can make this wish a reality. We have the opportunity to let the spirit of this beautiful land surround our homes.

(The author is owner of Native Landscapes, Hailey, and specializes in design, installation and maintenance of native, rock, Oriental and other gardens.)

Rocky Comfort Flat Conservation Field Trip

As detailed in the last newsletter, this year's field trip will be to Rocky Comfort Flat proposed Research Natural Area. Meet at the Forest Service compound in Council at 11AM on June 22. Camping is available at the Lafferty Campground located 23 miles NW of Council on the Hornet Ridge Road. Cuddy Mountain field trip will leave from there at 9AM on Sunday.

Assumptions, Facts - and Lack of Facts - About Seeds

by Willis J. Heron

(reprinted with permission from Douglasia, a newsletter of the Washington NPS, Vol XV(1), Winter 1991, which reprinted this article from Kelseya, newsletter of the Montana NPS.)

Growing natives from seed is often an exercise in frustration, because requirements are frequently unknown and vary widely from species to species. Most agricultural and garden crops are developed from species that germinate readily when placed in a suitable situation. These species have non-dormant mature seeds that begin growing when the right levels of temperature, water, oxygen and light are present.

Think of seed as a miniature living plant in a resting stage. This resting stage is maintained when the seed is dry and can usually be extended by cold or frozen storage. Seeds of many of our natives have special adaptations beyond the simple resting stage. Seed dormancy is a term covering several situations that singularly or in combination frustrate attempts to germinate them at all.

Some Common Dormancies

1) Immature seed: A situation when the embryo is not fully developed even though the fruit is fully ripe. A period of after-ripening at temperatures above freezing is necessary. Freezing or drying immature seed stops the after-ripening process although it will resume when suitable conditions are provided.

2) Hormone dormancy: Sometimes a natural chemical is present that inhibits germination. These hormones are easily washed out by soaking in water and changing the water often.

3) Hard seed coat: *Juniperus* and *Crateagus* seed coats, for example, physically retard germination. A combination of temperature variation and microbe action over time will weaken the hard seed coat.

4) Impermeable seed coat: An uncommon form of dormancy that is distinctive from the hard seed coat in that it prevents passage of gasses and water. Natural deterioration of the seed coat over time or physically opening the seed is required. Commercial producers of honey locust (*Robinia*) weaken the seed coat by sanding or soaking in sulfuric acid.

Stratification

Stratification of seeds means any treatment that provides a moist and above-freezing situation for the required time. Time and temperature are important, and vary from species to species. Warm stratification is in the 50 to 70°F range, while cold stratification is from above freezing to 40°F, such as in a refrigerator.

Freezing seed only prolongs storage and has no other value during stratification. In nature seeds do freeze, but it is not a known requirement for germination. Many chemicals and hormones have been tried in lieu of stratification but since the problem is not a lack of hormones, for example, the introduction of surplus ones have no effect. There are no known "magic dips" to satisfy stratification requirements.

The common sense approach is to simply let nature do her thing and sow the seeds in late summer or fall. The human thing to do is to take shortcuts so we don't have to water and weed an empty bed or plan too far ahead. We may also have a reluctance to give our seed back to the whims of nature, preferring to possessively keep an eye on it in storage or plan to do the sowing indoors.

Germination Needs of Common Species

Rocky Mountain Juniper has a very hard seed coat plus embryo dormancy. It has been produced in some nurseries by spring sowing fresh seed, weeding and watering the beds all season (with no expectation of germination that year) and finally getting germination after the first and second winters have passed. To save ground and first season's labor cost, an alternate method of burying the entire seed lot in one spot for a year before retrieval and fall sowing is successful but saves no time. Seed burial needs to be done in rot resistant containers like plastic window screen or nylon bags (panty hose) about one foot deep in soil that will drain and also get regular watering during the summer, such as a corner of the garden. Burying the seed apparently softens the seed coat and satisfies both the warm and cold stratification requirements of Rocky Mountain juniper. Seed buried for one year has been recovered and given additional cold stratification in a refrigerator until sown in a greenhouse. Both cold and warm stratification are necessary, and a period of the warm stratification has to precede the last cold stratification. Warm stratification can be accomplished in other ways if the seed can be prevented from drying our for several consecutive months, but burying is fairly foolproof provided you stake the location and don't forget where the seed is.

American plum has a stony seed coat that actually does not offer much resistance to germination and is also completely permeable to water and gasses. In fact, none of the *Prunus* spp. are truly hard seeded. The American plum does have embryo dormancy that requires a period of after-ripening. Keeping a bag of plum seed in a container of wet sphagnum moss at room temperature satisfies the warm and cold stratification requirement. Operationally, this treated seed is usually fall sown because ideal germination temperatures are quite low and occur before practical spring sowing gets started.

Several natives do not have dormancy. Cottonwood has a non-dormant mature seed that was thought to be viable for only a few days. Attempts to store or stratify this type of seed is usually self defeating. It has been found that cottonwood seed can be frozen for some time, but the thawed seed imbibes water so fast that it fatally ruptures itself if put directly in water rather than a high humidity situation.

I have collected Rocky Mountain maple seed in September, put it in the back of the toilet for two days, buried it in the flower bed over winter, and retrieved and planted the already germinating seed in early April.

When planning to produce a native from seed, don't overlook the easy solutions just because of general lack of information. In fact, in many cases the hard part may be the right timing to collect mature seed before wind, wildlife or rain beat you out. Information on time of seed maturation is also very limited, so the whole process from flowering may have to be monitored on a regular basis to determine a collection time. Seeds that become dry at maturity can be cleaned by screening or winnowing but it's not necessary to have perfectly clean seed. Seeds with pulp or fleshy parts should be cleaned by crushing and washing in water or by the very careful use of the kitchen blender. When washing pulp from seed don't waste effort to save the seeds that float since they are not filled; the good seed will sink.

For further reading: *Seeds of Woody Plants in the United States*, Forest Service, USDA Agriculture Handbook #450.

INPS Treasurer's Report

prepared by Kathy Geier-Hayes, past Treasurer

Balance 31 December 1990	$1234.14
Receipts:	
Dues	$1000.30
Fundraisers	$ 395.07
Rare Plant Conference	$ 359.00
	$1754.37
Expenses:	
Newsletter	$ 532.70
Post Office Box	$ 39.00
Membership	$ 56.89
Fundraisers	$ 280.11
Chapter reimbursements	$ 355.00
Misc	$ 172.68
Conference calls	$ 201.28
Rare Plant Conference	$ 291.87
	$1929.53
Balance 8 April 1991	$1058.98

Guidelines for Acquiring Native Plants

Kristin Fletcher, Ketchum

The utilization of native plants in the home landscape, either individually or in the creation of an entirely native garden, can be an exciting and rewarding endeavor. Within a few feet of your door, you can enjoy watching some of your favorite wild plants grow and bloom, filling your yard with color and fragrance and providing needed habitat for native birds and animals. In addition, because they are indigenous to our area, with its harsh climate and scant rainfall, designing with native flora presents an ecological approach to our own home environments.

Until recently, it was very difficult to acquire native plants other than to dig them from the wild or collect seeds or cuttings. With our growing awareness of the fragility of their habitat, we have begun to question these practices. It is now generally accepted that whole plants should never be dug up, except in cases where an area will be destroyed by road or dam building or some other activity where the habitat will be irreparably damaged.

Collecting seeds or cuttings is another way to obtain plants but these efforts must never threaten populations. Look around. Is there many of the species nearby? Are they healthy? Is there stress to their environment, possibly weakening them over time? Use discretion and be sure to leave plenty of seeds and new shoots to ensure a healthy population.

By far, the most responsible sources for native plants are the many excellent nurseries and seed companies which have sprung up in the last 10 years or so. Keep your eyes open in this area too, as some companies are more reputable than others. A company should be willing to state that their stock is nursery-grown and not dug from the wild. Be sure to inquire as to their seed sources. Many companies specify as to country, national or provincial forest, as well as elevation gathered.

The Use of Native Drought Tolerant Plants

Florence Mulder Mackie, Sun Valley

After 12 years of trial and error gardening, I am convinced of the need for infrequent deep watering, or for some plants, no added watering. Most of the land surrounding my house has been favorable for this- gentle northwest facing slopes with deep good soil and hills behind providing below surface moisture. Much of the grass behind the house is undisturbed Idaho fescue which grows best without additional water and needs only to be cut at the end of the summer.

Fortunately we started gardening without a sprinkling system, and when we did have one installed, it was with part soaker hose that seeped water slowly. We soon realized that we needed to water the trees and shrubs for a longer period than the 1 hour setting and less frequently than some of the other areas. We installed an over-ride for the soaker systems watering the trees behind the house and watered them once a week for 4-6 hours. Thus those plants were never forced to produce shallow spreading roots.

One mistake made was to start watering the front lawn and adjacent trees and shrubs daily. The sprinklers gave a fine light spray so it was very shallow watering and the trees developed shallow spreading roots. The front lawn is now full of aspen shoots. There are no aspen shoots in the unwatered grass behind the house and very few within the aspen areas that have always had deep watering. Two years ago a computer control was installed so that each outlet can be set for the frequency of watering desired and for the length of time needed for deep watering.

We learned that with deeper infrequent watering: 1) plants develop deep root systems and thus are sturdier; 2) plants don't sucker excessively; 3) weed growth is greatly reduced when there is little surface water; 4) water consumption is reduced; 5) many native plants only grow well with reduced water.

Two outlets supply all of the water for the area behind the house except for a sprinkler for the small flower garden and a soaker for the vegetable garden. These water trees and shrubs (10 large evergreens, 8 smaller evergreens, 3 areas of large aspen and other deciduous trees and shrubs) once a week for 4-6 hours. One system has 550' of soaker hose set up with Y's off of a solid hose so that it's not a continuous stretch of soaker hose. The other is part soaker hose and part drip system. The soaker hoses could be laid under the surface but I keep them exposed to see how much water plants are getting.

Many native or drought resistant plants will grow well only with little or no additional water. This is particularly true of

buckwheats (*Eriogonum*) and some of the penstemons. Others, such as snowbrush (*Ceanothus velutinus*), I have been able to grow only where there is a natural underground seepage with no additional water.

In growing cultivated plants needing water with the native plants that will not tolerate regular watering, I place the natives behind the forward facing sprinklers, or in beds using soaker hoses, farthest from the hoses.

Most drought resistant plants have long roots even when small and so need to be planted when small. In the scree areas sloping down to the driveway, very little soil covers the soft stone. Most of the shrubs were planted as tublings and they have been able to force their roots down into the stone. The steeper areas, of course, require a fine sprinkling system and more frequent watering.

Growth Requirements for a Few Native Species

	Deep soil	Shallow soil	Soaker hose	Light sprinkler	Underground moisture	Needs good drainage
Arctostaphylos uva-ursa(1)	Yes	Yes	Yes	Yes	Yes (near surface)	Yes
Ceanothus velutinus	Yes	No	No	No	Yes	Yes
Chaemaebatiaria millefolium (2)	Yes	Yes	Yes	Yes	Yes	Yes
Juniperus communis	Yes	Somewhat	Yes	Yes	Maybe	Yes
Berberis repens (Mahonia)	Yes	Somewhat	Yes	Yes	Yes	Yes
Potentilla fruiticosa	Yes	Yes	Yes	Yes	Maybe	Maybe
Rhus triloba	Yes	Remain Small	Yes	Yes	Best	Yes
Pushia tridentata (2)	Yes	Yes	if limited	if limited	Yes	Yes
Cercocarpus ledifolius (3)	Yes	No	Yes	if limited	Yes	Yes

1) One of the few natives benefitting from fertilizer if on poor soil.
2) Prefers no added water
3) Tolerates stony soils.

Native plants are less likely to invade the garden and lawn. This is particularly true when bunchgrasses are used as lawns. Bunchgrasses have the big advantage of not spreading into adjacent areas, needing less water and less frequent mowing. The disadvantage is that when it is watered, spreading grasses tend to invade it. For that reason, I guard against watering the native Idaho sheep fescue in the back part of the yard. Cutting back the frequency of watering the hard Idaho fescue in the front lawn to once or twice a week has lessened that problem in the front lawn.

The areas requiring the most study for planting were those steep southwest facing slopes above the driveway, partly natural but accentuated by the road cut. Our "study" mostly was an observation of native plants growing in similar situations. Then we ordered tublings of plants (50 or 100 each). We lost may learning where and how to grow them. Only one snowbrush (*Ceanothus velutinus*) was left when I rescued it from watering systems and planted it in an area of deep soil with underground spring run-off. It is thriving.

The above chart contains observations of those tublings to date, but I'm still learning.

Plants for a Native Garden

Kristin Fletcher, Ketchum

Interest has been growing in using native plants which are native to Idaho in the home garden, partly because of the need to conserve water, but also because of the aesthetics of many of the natives we have come to enjoy during our seasonal outings with nature.

When selecting plants for the home garden, keep in mind the habitat in which they would occur naturally. Do they need a hot, dry, gravelly site, or a loamy cool moist one? Are they sun-lovers or prefer a shadier spot? Or do you see them in a variety of habitats, suggesting that they are adaptable? For beginners to native plant gardening who would like to enjoy success with their first attempts, I would suggest choosing plants which are widely adaptable and/or fit into a typical suburban watering schedule.

Some native trees which are commonly used and enjoy the extra moisture provided in more traditional landscapes are Colorado blue spruce (*Picea pungens*), quaking aspen (*Populus tremuloides*) and Douglas fir (*Pseudotsuga menziesii*).

Among the shrubs, red osier dogwood (*Cornus stolonifera*) is always a favorite for its bright red bark which adds color to the winter landscape. Golden currant (*Ribes aureum*) is noted for its early lobed leaves followed by small bright yellow flower clusters. Edible fruits follow, making it a favorite of wildlife. Another good choice is the potentilla (*Potentilla fruticosa*), its delicate bright yellow flowers blooming almost all summer long. Many cultivars are available, thus expanding your choice of bloom color and size.

One of our loveliest mountain flowers, the Colorado blue columbine (*Aquilegia coerulea*), is a delicate plant and its graceful blue and white flowers attract hummingbirds. The native gaillardia (*Gaillardia aristata*) adds bright splashes of color to the garden with its red and yellow flowers which bloom from mid to late summer. This native species is not nearly as invasive as the more commonly used horticultural variety.

This brief list represents a few of the species which can easily be added as individual plants into the average home landscape with a good chance of success. Some gardeners, however, may wish to convert an area of their garden to feature more drought tolerant species. Perhaps the curl leaf mountain mahogany (*Cercocarpus ledifolius*), with its evergreen leathery leaves, rough bark and gnarled form could lend an Oriental look to a special spot. Chokecherry (*Prunus virginiana*), with its beautiful clusters of fragrant white flowers, followed by tart red berries, entirely suitable for making memorable syrups and jams, is an excellent choice for both human and wildlife species.

Native plants can be grouped for effect. The classic western sagebrush (*Artemisia tridentata tridentata*), the late summer blooming rabbitbrush (*Chrysothamnus nauseosus*), the graceful fountain shaped Great Basin wild rye (*Elymus cinereus*), and the intricately branching bitterbrush (*Purshia tridentata*) with its small pale yellow flowers, could provide the backdrop for sulphur buckwheat (*Eriogonum umbellatum*) with a dash of scarlet gilia (*Gilia aggregata*) added to create a colorful, aromatic area welcoming to native birds and animals.

If you are fortunate enough to have a moist, north facing area, a high water table, or free flowing water, and wish to create a native garden for moisture-lovers, consider Rocky Mountain maple (*Acer glabrum*) for its attractive leaves and good fall color, or the tall clumping water birch (*Betula occidentalis*) with its deep reddish bark. The blue elderberry's (*Sambucus cerulea*) large flat clusters of creamy flowers are followed by tart, but tasty, blue black berries, making it a wildlife favorite. A sprinkling of sticky geranium (*Geranium viscosissimum*) with its pinky-lilac flowers rising above deeply lobed foliage is very attractive in the dappled shade of the quaking aspen.

All these species are commonly available from nursery and seed companies specializing in our bio-regional flora. You may find you want to add to your native garden design species which are more specific in their habitat requirements than those listed above. Give them a try and don't be discouraged if some fail. If you really like a species, try it again in a little different area. Over-watering and poor drainage are the most common difficulties encountered in growing most of the more drought resistant Idaho natives. Many of them do not appreciate a soil made too rich by the use of fertilizer, either. Keeping a record of what, when, where and how is helpful in determining the reasons for successes and failures. Experiment and learn from your experiences. Whether you choose to add a few plants to your garden over time, devote an entire area to the re-creation of a native habitat, or wish to try some of the more difficult species, your life and environment will be enriched by your efforts.

David Douglas of the Pacific Northwest

Michael Mancuso, Boise

The 1820's. Imagine being one of the first botanical explorers of the Pacific Northwest. Rivers and Indian trails your highway, foraging for dinner or perhaps bartering food from the Indians, wool blankets and pine boughs your motel room. David Douglas lived just such a resourceful and intrepid life for over a decade. Although he never quite stepped foot in present day Idaho, Douglas was the first European to encounter and describe many species important in our flora. His name is commemorated in numerous scientific and common plant names, such as the Douglas-fir.

Born in Scotland in 1799, David Douglas developed a love of natural history early in his life. He apprenticed as a gardener and honed his naturalist skills in the Scottish highlands, including forays with William Hooker, one of the greatest 19th century scientists. At age 24, Douglas was contracted by the Horticultural Society of London to collect plants in China. But soured diplomatic relations between England and China canceled the trip. Instead Douglas sailed to the eastern United States to collect fruit trees and other plants. The trip was successful, and on July 26th, 1824 he left for a second trip across the ocean, but this time to the great northwestern part of the continent, arriving at the mouth of the Columbia River April 17, 1825. By the end of 1825, Douglas figured he had travelled 2105 miles botanizing, in 1826, just shy of 4000 miles. He explored large portions of the Columbia River drainage in present day Washington and Oregon, including as far upstream as Kettle Falls, the Okanogan, Willamette, Snake and Umpqua Rivers, and the Blue Mountains.

In his journals, Douglas comments on the great beauty of the landscape, and was often humbled by its splendor. But his travels also brought great physical and mental hardship and deprivation. On New Years Day 1826, a journal entry reads, "Commencing a year in such a far removed corner of the earth, where I am destitute of civilized society...I am now here, and God only knows where I may be next. In all probability, if a change does not take place, I will shortly be consigned to the tomb." A November 11th, 1826 journal entry provides testament to his fortitude and temperament: "...travelled thirty-three miles, drenched and bleached with rain and sleet, chilled with a piercing north wind, and to finish the day experienced the cooling, comfortless consolation of lying down wet without supper or fire. On such occasions I am very liable to become fretful."

Hunger often went hand in hand with Douglas's explorations, and some days he walked over 30 miles with no food. Sometimes hunger was so acute that he resorted to eating the seeds and berries he had worked so hard to acquire. More than once he lost parts of his collections to raging river waters. He routinely faced many other life-threatening situations, from unfriendly Natives to avalanches.

As opportunity allowed, Douglas shipped his discoveries back to England, so that by the time he returned home many of his finds had preceded him there. At age 28, after being gone for over three years, Douglas was famous upon returning to England. But it seems he just did not fit in well with London society. At least one biographer speculates Douglas may have done better in London society if he had someone to love, but no

love letters have ever been found in all his correspondence, for "he gave his heart to plants only." Recollecting Douglas's stay in England a few years later, his friend William Hooker wrote, "His temper became more sensitive than ever and himself restless and dissatisfied, so that his best friends could not but wish, as he himself did, that he were again occupied in the honourable task of exploring North West America."

Douglas left England October 31, 1829 for another hitch to the Pacific Northwest; he never returned home. He continued his botanical exploration of the area including excursions north into British Columbia and south to California. In October of 1833 he left for the Sandwich Islands (Hawaiian Islands). He botanized and explored there, even climbing Mt. Kea, Mt. Loa and the active volcano of Kileaua in one month. At one point, he agreed to meet with an American chaplin to show him some of the island wonders. Enroute to this rendezvous disaster struck. Douglas was found inside a bullock pit, used to trap wild cattle, gored to death by a trapped bull. Hints of doubt linger whether his death was accidental or not. On August 4, 1834, David Douglas was buried near Honolulu, but his legacy remains in many of the plants we enjoy and depend on today.

Comments and Contacts:

Good Guides Kay Hummel, Boise

Taylor's Guide to Water-Saving Gardening (1990, Houghton Mifflin Co.) is an excellent pictorial encyclopedia of drought tolerant plants. While this book includes both horticultural hybrids and natives, its inspiring 300-plus photographs, cultivation tips and growth requirements will help you plunge into low water yard design with far less fear. Plants are categorized by five classes of drought tolerance, from "extremely" (less than 14" water per year) to "slightly" drought tolerant. Each plant also is typed by hardiness zone and whether it dies back during the winter or is effective year-round. This guide won't satisfy all questions about unthirsty native plants but is well-worth $16.95 if you are redesigning your yard or would like to convince neighbors that a low water landscape does not limit them to only gravel, sand and cactus!

Another helpful visual guide is the catalog published annually by **Plants of the Southwest**; 930 Baca St.; Santa Fe, NM 87501; (505) 983-1548. This catalog skillfully describes plant habits, employs a useful coding for water and sunlight requirements and delineates whether their tree and flower offerings are introduced or native plants. It also includes sections on ancient American vegetables, modern native vegetables, cover crops and herbs. Photographs are not as extensive as the Taylor's Guide but are imaginative and residentially oriented. The catalog also has some fine line drawings of native grasses. Since I try to buy "local", I've never purchased more than a couple samples from this outfit, but I've learned a great deal from their catalog.

Seed Companies Kristin Fletcher, Ketchum

Listed below are a few of my favorite bio-regional seed and nursery companies which I have worked with over the past few years. All of them sell retail (and some wholesale). Please remember that most of these companies are small and family-owned. It would be courteous to include a dollar in your request for information to cover printing and postage. Enjoy!

Bitteroot Native Growers
c/o Karen Pratt
1810 W. State Suite 307
Boise, Idaho 83702
344-3257

A wonderful company specializing in native trees, shrubs and wildflowers, some in large containers. Revegetation consultant.

High Altitude Gardens
Box 4619
Ketchum, Idaho 83340
726-3221

A beautiful and informative catalog offers native flower and grass seeds, specialty wildflower mixes, vegetable and herb seeds.

Native Seed Foundation
Star Route
Moyie Springs, Idaho 83845
267-7938

Works to "acquire and distribute..propagate and preserve the plants and seeds of the native flora".

Northplan
P.O. Box 9107
Moscow, Idaho 83843
882-8040

Native wildflower, shrub, tree and grass seed; custom harvesting; send large SASE for seed list.

Plants of the Southwest
930 Baca St.
Sante Fe, NM 87501
505-983-1548

Out of our bioregion, but beautiful photos of natives used in landscapes; good information on arid gardening. A fine expression of thoughtful living and the need to conserve all of our natural resources.

The Flora of North America Project

The Flora of North America Project is a collaborative, bi-national effort of more than 20 major botanical institutions to compile the first comprehensive description of all plants growing spontaneously in the United States and Canada. About 17,000 species of vascular plants grow in this area, and of the native genera, 38% are found only in North America.

In addition to the twelve volumes of the Flora published by Oxford University Press (the first scheduled to appear in late 1991), all the information will be contained in a computerized data base called TROPICOS. The data base will be continuously updated and maintained as a permanent resource.

It will allow users to access the information in a variety of ways, providing answers to such questions as, "What spring-flowering plant species with yellow flowers and simple leaves occur in the grasslands of Nebraska?"

The Flora will be useful not only for theoretical work in plant studies, but also for general reference in biology, conservation, wildlife management, forestry, horticulture, environmental sciences and agriculture. As the single authoritative reference, the Flora will fill a crucially important need in providing thorough and reliable information for identifying endangered species.

The Missouri Botanical Garden serves as the organizational center for the Flora of North America.

From The Editor

Thanks to those who submitted articles for this month's SageNotes. The Wood River Chapter deserves a round of applause for their efforts. I know this is an interesting subject to many of you, so I was surprised that more people didn't write in. To encourage future submissions, I'm going to continue the thematic approach, and present those themes to you now so that as you run across things you think are worth sharing you can send them to me. The several months advanced warning may also get some of you thinking about writing an article!

August issue. Weeds: extent, species, eradication methods, cause of invasion. Submissions are due by July 9. Submissions on disk appreciated.

October issue. Uses of Native Plants: revegetation, habitat, attracting animals and birds to the garden, edible (send recipes!), craft uses, dyes. This will be a second chance for those who thought about writing an article on xeriscaping.

December issue. Biodiversity: what is it, how can it be enhanced, is it important, the biodiversity of Idaho.

February issue. Wetland and Riparian: description of Idaho wetland and riparian habitats, agency management of these systems, methods to enhance recovery.

April issue. Rare Plants: report of the annual conference, meaning of rarity, areas of Idaho endemics.

Chapter News

Sah-Wah-Be Chapter

13 July, 8:00A at the Museum parking lot. Repeat of last year's City of the Rocks, Mount Harrison campout trip, lead by Ruth Moorhead. Joint field trip with Pahove Chapter.

9, 10 August. Two day trip to Montpelier area. Camp at St. Charles Canyon.

24 September. Charlie Sellers (522-1137) will speak on planting native seeds.

Sah-Wah-Be Chapter is in need of officers. Currently Harry Giesbrecht is the sole chapter officer, serving as treasurer. Anyone interested in volunteering as president, vice president or secretary, please contact Harry at 232-1648 or Susan Bernatas at 334-1457.

Wood River Chapter

27 July. Ecology and rare plant communities of the Kane Lake Basin. Bob Moseley will lead this field trip to a unique area containing 6 rare plant species, 4 of which are only known in Idaho at this spot. The hike is a moderately strenuous three miles to the lake.

31 July. Seed collecting and wildflower identification by Bill McDorman of High Altitude Gardens and Seed Trust. Field trip to nearby sites.

For more information on these trips, and to confirm dates, please contact Francis (726-4684) or Carol (788-4276)

Pahove Chapter

23 June. Day hike on Cuddy Mountain lead by David Towner. A good follow-up field trip to the State Conservation Field Trip, Cuddy Mt. has been proposed for timber harvest, but it is the last remaining roadless area in southwestern Idaho. Dave swears it is one of the greatest places on earth and he's willing to prove it. Contact Dave Towner at 345-9535.

13 July. Joint field trip with Sah-Wah-Be Chapter.

Calypso Chapter

20 July. Field trip to Roman Nose Peak near Bonner City, lead by Steve Brunsfeld and Pam Gontz.

10 August. Field trip to Priest Lake/ Bottle Lake RNA lead by Bob Shackelford and Jill Blake.

Good Stuff

Books

Drought Tolerant Planting Bibliography, compiled by Beatrice M. Beck. 1990. 67 pages. Available from Rancho Santa Anna Botanic Garden; 1500 N College Ave; Claremont, CA 91711. $14 spiral bound.

Collecting, Processing and Germinating Seeds of Wildland Plants by James A. Young and Cheryl Young. Timber Press, Portland, OR. 1986. 236 pgs. Includes information on collection (seed maturity, moisture content, methods), post-harvest handling (cleaning, seed storage), germination testing and enhancement, and specifics for many genera of trees and shrubs and families of forbs and grasses.

Sound Gardening: Gardening with an Eye on Water Quality. A series of fact sheets prepared by Washington State University and the King County Cooperative Extension. Covers pest management, watering, erosion, soil, fertility, lawn care. Write WSU/King Co. Cooperative Extension; 612 Smith Tower; Seattle, WA 98104.

Growing and Propagating Wildflowers by Harry Phillips. 330 pages of information on nursery production, blooming dates, plant rescues, and an extensive bibliography. Available

for $14.95 from Horticultural Publishing Company; (312) 782-5505.

Seed Propagation Techniques ($1.00), **Notes on Native Grasses** ($1.50) and **Notes on Growing California Wildflowers** ($2.50) are three pamphlets available from Larner Seeds; PO Box 407; Bolinas, CA 94924. Catalog which emphasizes "the gardener as mini-restorer of native plant communities" is also available.

The New Seed Starters Handbook by Nancy Bubel. Covers starting more than 200 plants from seed; mostly domesticated species, but good information on techniques. $14.95.

Enduring Seeds: Native American Agriculture and Wild Plant Conservation by Gary Nabhan. Plant genetic resource conservation efforts by native peoples and plant scientists in North and Central America. $17.95.

Gardening by Mail: a Sourcebook by Barbara J. Barton. 320 page paperback covering more than 12,000 seed, nursery and gardening supply companies. Identifies companies dealing in native species. Available for $18.50 from Tusker Press, P.O. Box 1338; Sebastopol, CA 95473; (707) 829-9189.

Easy Gardening with Drought-resistant Plants. 1968. By Arno and Irene Nehrling; Dover Publications, NY.

Natural Landscaping- Designing with Native Plant Communities by John Dieckelmann and Robert Schuster. McGraw-Hill; NY NY; 1982. Landscaping with native plants to create beautiful areas that require little water, fertilizer, gasoline or upkeep. Available from Horticultural Publishing Company (312) 782-5505.

The New Wildflowers and How to Grow Them by Edwin Steffek. ISBS-Timber Press; Beaverton, OR; 1983.

Nature's Design. A Practical Guide to Natural Landscaping by Carol Smyser. Professional techniques for landscaping using native species. Available for $22.95 from Horticultural Publishing Company, (312) 782-5505.

Medicinal Plants of the Mountain West and **Medicinal Plants of the Desert Southwest** both by Michael Moore. Contains information on identification, location, use, and cultivation of medicinal native plants. Available for $11.95 from High Altitude Gardens.

Native Plants, Early Peoples by Jeff Hart. Describes early uses of native plants by Native Americans, primarily in the Montana area. $7.95 from High Altitude Gardens.

Cadillac Desert: The American West and Its Disappearing Water by Marc Reisner. Viking Penguin Inc. 1986. $22.95.

Down by the River: The Impact of Federal Water Projects and Policies on Biological Diversity by Constance Hunt. Island Press. 1990. $34.95 cloth, $22.95 paper. Covers the economic effects and ecological damage of federal projects on four waterways: the Columbia, the Colorado, the Missouri and the Mississippi.

Conferences, Courses, Symposia

Malheur Field Station is offering many courses throughout the summer. Most of these are 3 to 10 days long, and includes Vegetation Ecology, Ethnobotany, Botany of Steens Mountains, Botany of Hart Mountain and Aquatic plants. Contact Lucile Hously; H.C. 72 Box 260; Princeton, OR 97721; (503) 493-2629.

The **Cascade Native Landscape Center** held a conference in Portland in February on "Designing, Maintaining and Restoring the Native Landscape III". Unknown if any proceedings were published, but more information may be available from Mark Wilson (503-222-0134) or Tami Katz (503-236-0395).

Groups

The National Council of State Garden Clubs conducts "Operation Wildflower". Many **SageNotes** readers are probably aware of this group's efforts, but those that aren't should know about the work of this group to plant wildflowers along roadsides and to promote xeriscaping. 21 roadside plantings were completed in Idaho in 1989 *(If any of you know more, write in to next issues's Contacts and Comments -ed).* Contact La Verne Collard; P.O. Box 860; Pocasset, MA 02559; (508) 563-3629.

Society for Ecological Restoration is a group that invites "anyone involved in- or interested in- any aspect of restoration, from the scientific and technical to the political, economic and philosophical" to join. The group publishes a journal "Restoration and Management Notes" and holds annual conferences. Students can join for $20, individuals for $30. SER; 1207 Seminole Highway; Madison, WI 53711. *(I have a number of flyers for this group if anyone would like more information. -ed)*

National Xeriscape Council, Inc publishes a bi-monthly newsletter on water conserving landscapes. 940 E fifty-first St; Austin, Texas; 78751-2241.

Employment

Temporary position for botanist/data entry with Idaho Power Company. July 1 to December 31, 1991, in Boise. $8.67/hr. Pc-based data entry for 2-3 months, identification and curation of plant speciments for 3-4 months. Send resume to Allan Ansell, Idaho Power Company, Department of Environmental Affairs, P.O. Box 70, Boise, 83707.

Seed Companies

Wildseed, Inc. 1101 Campo Rosa Rd; P.O. Box 308; Eagle Lake, Texas; 77434. 1-800-848-0078.

Native Plants Inc. Nursery Division; 417 Wakara Way; Salt Lake City, Utah; 84108.

Aspen Nursery, Inc. 0905 Hwy 133; Carbondale, Colorado; 81623.

Weddle Native Gardens. 3589 G Road; Palisade, Colorado; 81526.

Housekeeping

The purpose of the Idaho Native Plant Society (INPS) is to promote interest in native plants and to collect and diseminate information on all phases of the botany of native plants in Idaho, including educating the public to the value of the native flora and its habitats.

Membership is open to anyone interested in our native flora. Contributions to our Society, are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
__ Sustaining	$30	15
__ Individual	$ 8	4
__ Household*	$10	5
__ Student	$ 6	3
__ Senior Citizen	$ 6	3

Name: _____
Address: _____
City/State: _____
Zip Code: _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Calypso (Coeur d'Alene)
__ Sah-wah-be (SE Idaho)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.

*Household memberships are allocated two votes.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 9 July 1991.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Kathey Geier-Hayes, Secretary--Pam Brunsfeld, Treasurer--Pam Conley.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

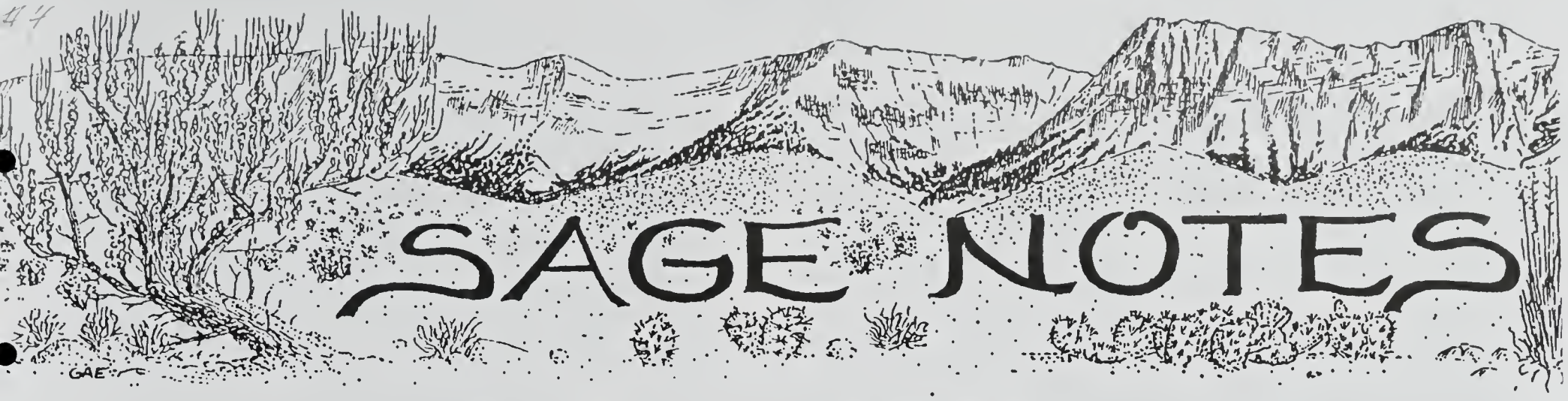
Calypso Chapter, 911 Pine Avenue, Coeur d'Alene, ID, 83814: President--Pam Gontz, Vice President--Tina Gospodnetich, Secretary--Bob Shackelford, Treasurer--Jill Blake.

Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Mary McGown, Vice President--Nancy Cole, Secretary--Linda Williams, Treasurer--Kathy Geier-Hayes.

Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: Treasurer--Harry Giesbrecht.

White Pine Chapter: President--Ed Tisdale, Vice President--Pam Brunsfeld, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.



August/September 1991 SAGE NOTES A Publication of the Idaho Native Plant Society Vol 14(4)

Wood River Chapter Sponsors Weed Meeting

by Kristin Fletcher, Ketchum

The Wood River Chapter/Idaho Native Plant Society sponsored "Weeds", a community meeting on June 26. Concerned citizens, city and county officials, and professionals in the field met and engaged in a lively, round-table discussion of the problems and possible solutions of noxious weeds.

Kelley Weston's (Native Landscapes, Hailey) presentation on Montana's continuing experience with massive knapweed infestation provided the backdrop and lent a sense of urgency to the group.

One thing became readily apparent during talks and slides by John Cennarusa (Blaine Co. Weed Control Officer) and Lew Pence (Wood River Resource Area Project Coordinator): Blaine County has a problem which needs to be addressed. Although much of their presentations concerned the three varieties of knapweed, interesting information was presented concerning puncture vine, thistles, butter and eggs, and other noxious weeds.

We learned that control of these plants will require a long-term commitment and an integrated approach including mechanical (cultivations, picking flower heads, etc), biological (release of specific beneficial insects, bacteria, fungi, etc.) and chemical (spraying herbicides). Experts in these fields already exist in our area. What is needed is a coordinated effort and a public educated to its importance. Many ideas were offered to accomplish these ends.

Members Francis and Ralph Naser and Clark Heglar reported on current efforts with Ketchum City Administrator Jim Jaquet to monitor knapweed in the Ketchum area.

The general consensus at the end of the evening was that the Wood River Chapter should organize another meeting as soon as practical involving citizens, public officials, and state and federal agency personnel to explore the possibility of creating a county-wide task force. This group would serve as the organizing body for future efforts at educating the public, surveying existing infestations and coordinating control efforts.

Earl Jones, of Gem State Spraying, kindly video-taped the entire meeting and will make copies available to the Community Library and the 6th St. Environmental Center, both in Ketchum.

Beautiful Plant is a Significant Threat

by Nancy Cole, Boise

Take a ride through the west side of Boise at this time of year and you'll be treated to a spectacular view of brilliant pink-purple flowers lining canal banks, roadside ditches and ponds. This vision of loveliness is purple loosestrife, *Lythrum salicaria*, one of the most aggressive wetland weeds in Idaho.

Purple loosestrife was introduced into the United States in the early 1800's, probably as ship ballast (Thompson et al. 1987). Introductions have also commonly occurred through horticulture and beekeeping...purple loosestrife makes wonderful honey! Once the species was established in the eastern US, it rapidly spread across the continent into all contiguous states north of the 35th parallel, except Montana, (Thompson 1987). The largest infestations occur in the northeastern and northcentral US and adjacent Canada. Herbarium records at the Snake River Plains Herbarium at Boise State University indicate loosestrife was growing in northern Idaho by 1933. Idaho Department of Agriculture reports show purple loosestrife was growing in 13 counties in 1989 (see figure, page 3).

In Idaho, as well as most other states in the northern US, purple loosestrife is on the Noxious Weed List. What, you may ask, is a noxious weed and how did something as attractive as purple loosestrife come to be classified as one?

A noxious weed is defined by the State of Idaho as a species that has the potential to cause injury to public health, crops, livestock, land or other property. Purple loosestrife is an aggressive invader of wetlands. One plant can produce hundreds of thousands of seeds (Shamsi and Whitehead 1974; Skinner and Hollenhorst 1989) that retain viability of more than 90% for at least three years (Rawinski 1982). In addition, plants can be established from adventitious shoots of spreading rootstocks (Thompson et al. 1987) and from broken stems (Wilcox et al. 1988; Thompson 1989). These characteristics

imbue a tenacity and rate of spread that can lead to the nearly complete dominance of wetland vegetation and exclusion of native plant species. The effect of a purple loosestrife invasion on wildlife can be detrimental. Research based primarily in Minnesota and New York State indicated that muskrat will not utilize purple loosestrife as a source of food or nesting material (Skinner and Hollenhorst 1989). Water fowl may be impacted more than other wildlife. Frequently, purple loosestrife supplants traditional food plants and stands can become so dense as to reduce opportunities for nesting and brooding (Rawinski and Malecki 1984). Not all wildlife species, however, are negatively affected. White-tailed deer have been known to graze the flowers and young shoots of loosestrife (Skinner and Hollenhorst 1989) and red-winged blackbirds selected loosestrife over cattails for nest sites at the Montezuma Wildlife Refuge in central New York (Rawinski and Malecki 1984).

The national focus on the intrinsic and extrinsic values of wetlands has resulted in recognition of the potential impact of purple loosestrife on these values. Washington, Minnesota, Wisconsin and New York, the states in the US with perhaps the worst loosestrife infestations, all have aggressive control programs in place. All of them approach control under the auspices of Integrated Pest Management, a program combining chemical, physical and biological control mechanisms. Physical methods of control include pulling, digging and cutting or mowing, methods most feasible when populations are small. In all cases, every piece of stem and root must be removed from the affected site to prevent spread or reestablishment. Chemical control can be achieved with glyphosate, the principal ingredient in Rodeo", an herbicide approved for use near water (Henderson 1990). Control is most successful if the herbicide is applied from June to August. Applications made in August achieved nearly 100% control (Malecki and Rawinski 1985). Spot treatment works best for control of small populations and when applied carefully to individual plants will not affect desirable plant species. Treatment can be achieved by spraying whole plants, or painting cut stems after removing the cut stems from the site. Aerial application has been used on extensive populations, but such methods generally result in a complete kill of all vegetation and can enhance germination of loosestrife in the seedbank and create habitat for invasion of more weeds. Research on natural pests of loosestrife has yielded three European insect species that may provide a means of control. Thorough screening for effectiveness and host plant specificity (among other things) precedes experimental release. Evaluation is currently underway at several locations in the US and, if all goes well, the use of insects as a control could begin by 1993.

What can you do?

1. Report populations of purple loosestrife to the Idaho State Department of Agriculture or to your county weed supervisor--they'll be listed in your local phone book.
2. Control loosestrife (and other noxious weeds) on your property using the method that suits you best, and encourage your neighbors to do the same. Keep in mind the seedbank at the site probably will produce new plants for several years to come. Thus, repeated visits to the site will be necessary regardless of the method of control.
3. Write to seed distributors that still sell purple loosestrife and let them know purple loosestrife can be a serious threat to the quality of wetlands. Mention that loosestrife is on the Noxious Weed List for Idaho. By Idaho law it is illegal to sell plants or seeds of any species on the noxious weed list in Idaho...you could be doing the distributor a favor!

Literature Cited

Henderson, R. 1990. Recommendations for eradicating purple loosestrife and an update on biological control. WI Dept. Nat. Resources. Memorandum, File Ref. # 8100. January 10, 1990.

Rawinski, T.J. 1982. The ecology and management of purple loosestrife (*Lythrum salicaria* L.) in central New York. M.S. Thesis, NY Cooperative Research Unit, Cornell Univ., Ithaca, New York, 88p.

Rawinski, T.J. and R.A. Malecki. 1984. Ecological relationships among purple loosestrife, cattail, and wildlife at

NOXIOUS WEEDS OF IDAHO

Jointed goatgrass	*Aegilops cylindrica*
Camelthorn	*Alhagi camelorum*
White-top	*Cardaria draba*
Mush or nodding thistle	*Carduus nutans*
Diffuse knapweed	*Centaurea diffusa*
Spotted knapweed	*Centaurea maculosa*
Russian knapweed	*Centaurea repens*
Yellow star thistle	*Centaurea solstitialis*
Rush skeletonweed	*Chondrilla juncea*
Canada thistle	*Cirsium arvense*
Poison hemlock	*Conium maculatum*
Field bindweed	*Convolvulus arvensis*
Common crupina	*Crupina vulgaris*
Wild carrot/Queen Anne's Lace	*Daucus carota*
Leafy spurge	*Euphorbia esula*
Skeletonleaf bursafe	*Franseria discolor*
Henband	*Hyoscyamus niger*
Dyers woad	*Isatis tinctoria*
Perennial pepperweed	*Lepidium latifolium*
Dalmation toad flax	*Linaria dalmatica*
Yellow toad flax	*Linaria vulgaris*
Loosestrife	*Lythrum salicaria*
Scotch thistle	*Onopordon acanthium*
Austrian field cress	*Rorippa austriaca*
Tansy ragwort	*Senecio jacobaea*
Silver-leaf nightshade	*Solanum elaeagnifolium*
Buffalo bur	*Solanum rostratum*
Perennial sowthistle	*Sonchus arvensis*
Austrian pea or Swainsonpea	*Swainsona salsula*
Puncture vine	*Tribulus terrestris*
Syrian bean caper	*Zygophyllum fabago*

the Montezuma National Wildlife Refuge. New York Fish and Game Journal. 31(1):81-87.

Shamsi, S.R.A. and F.H. Whitehead. 1974. Comparative eco-physiology of *Epilobium hirsutum* L. and *Lythrum salicaria* L. I. General biology, distribution, and germination. J. Ecol. 62(1): 279-290.

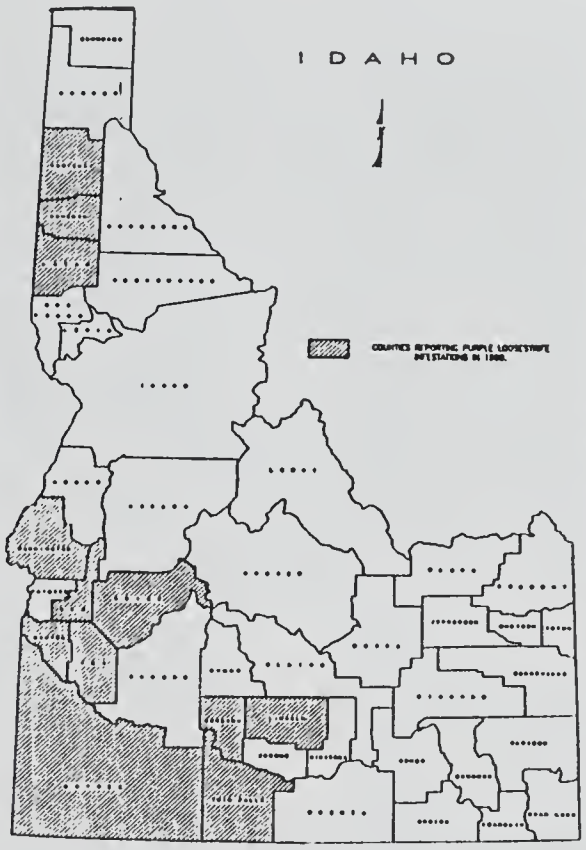
Skinner, L.C. and T.P. Hollenhorst II. 1989. Incidence, spread and control studies of purple loosestrife (*Lythrum salicaria* L.) in Hennepin Parks. Minnesota Dept. Natural Resources Management. December 1989.

Thompson, D.Q. 1989. Control of purple loosestrife. Fish and Wildl. Leaflet 13.4.11. USFWS.

Thompson, D.Q., R.L. Stuckey, and E.B. Thompson. 1987. Spread, impact, and control of purple loosestrife (*Lythrum salicaria*) in North American wetlands. U.S. Fish Wildl. Service. Res. 2. 55 pp.

Wilcox, D.A., M.K. Seeling, and K.R. Edwards. 1989. Ecology and management potential for purple loosestrife (*Lythrum salicaria*) pp.: 120-129. IN: L.K. Thomas (ed.), Ecology and management of exotic species on wildland communities. George Wright Soc. and U.S. Natl. Park Service. Hancock, MI.

(Nancy has an extensive bibliography on purple loosestrife and its control.)



Sulfur Cinquefoil- an Introduced Weed to Equal Knapweed and Spurge by 2020??

by Peter M. Rice, from Kelseya 4(2), Winter 1991.

Sulfur cinquefoil (*Potentilla recta* L.) is native to Eurasia, an origin similar to spotted knapweed and leafy spurge. Sulfur cinquefoil had become a well established weed by the 1950s in eastern Canada, the northeast United States and the Great Lakes region, and scattered populations had been recorded in southern British Columbia. The first confirmed Montana collections in the herbaria at Montana State University and the University of Montana were made in 1962 (Missoula County) and 1965 (Lake County). A recent re-examination of cinquefoils at the University of Montana herbarium resulted in designating an unidentified specimen collected in 1956 as a sulfur cinquefoil. This particular plant was collected in a field adjacent to the Missoula County Fairgrounds, a typical locale for a possible first state record of an introduced weed. Sulfur cinquefoil is now common and widespread at least in western Montana. Since the mid-1980s large acreages dominated by sulfur cinquefoil have been observed in western Montana, suggesting an increasingly rapid expansion of a successful weed.

Spotted knapweed and leafy spurge were discovered in Montana many decades earlier than sulfur cinquefoil. The first UM Herbarium specimen of leafy spurge dates back to 1930 and the first spotted knapweed specimen to at least 1937. Concern is being expressed by an increasing number of field botanists, agriculturalists and range personnel that sulfur cinquefoil, although a later arrival, may be on its way to becoming a rangeland and roadside weed problem of a magnitude similar to that of spotted knapweed and leafy spurge.

A computerized literature search confirmed that there is very little information on the biology, ecology or management of this plant. Werner and Soule have compiled most of the scattered information on sulfur cinquefoil, but most of these observations were made under the moist climatic conditions of eastern North America.

A rough description of the niche of this plant can be composed from the published information and casual observations made in Montana. Sulfur cinquefoil can establish in open grasslands, shrubby areas and forest margins, but not under dense forest canopies. Roadsides, waste places and abandoned fields are particularly susceptible. It is most successful on coarse-textured soils and dry sites at low and mid elevations, and moderately moist sites at low elevations. Its habitat requirements appear to be similar to those of spotted knapweed on some sites in western Montana. It is unpalatable to most livestock, possibly because of a high tannin content.

As an introduced Eurasian plant species, sulfur cinquefoil is pre-adapted to the semi-arid climatic conditions of Montana, but has escaped the insect and disease organisms that coevolved in its native habitat. The USDA evaluated sulfur cinquefoil for insects and diseases in the eastern United States prior to 1960. There are no reports of insects or higher plant parasites, but three fungal species have been observed. Biocontrol options have not been observed. Trials conducted by Dr. Peter Fay (MSU) on the Jarecki Ranch near Polson have evaluated such herbicides as Tordon 22K, 2,4-D and others, some of which appear to give excellent one-year control. Occasional mowing does not provide control, and may actually stimulate development of heavy roots which act as storage organs that initiate new shoot development. Regular plowing, seeding and cultivation control sulfur cinquefoil in crop fields.

Sulfur cinquefoil is a perennial belonging to the rose family. It reproduces by seed (actually a type of fruit called an achene). It flowers throughout the growing season so that mature seeds and flower buds may be found on the same plant. Seed production up to 1650 seeds/plant/year and densities of 25 plants per square yard have been measured. New shoots form from a woody root (caudex). The plant can persist by peripheral enlargement of the root, forming a ring-shaped clump as the center of the root mass ages and dies. Plants as old as

25-30 years have been found in Michigan. It may be a climax species on some sites.

Prior to flowering, sulfur cinquefoil has an appearance similar to marijuana. The leaves are composed of 5-7 leaflets attached in a palmate pattern to a central leafstalk which is attached to an upright stem. The leaflets are toothed about halfway to the midvein. There are numerous leaves along the length of the stem and few leaves attached to the stem's base. The length of the leafstalk and size of the leaflets decrease up the stem until the leaves are directly attached to the stem near its top. The stems are usually single to several, upright, 12-28 inches tall, and with few branches. The stem arises from a persistent woody root (caudex) which is erect and simple to having a few slender branches. Although this rootstock is persistent and may exhibit some lateral growth, there are no rhizomes. The inflorescence is a many-flowered open cyme elevated above most of the leaves. Five pale to sulfur yellow petals are equal to or slightly longer than the five subtending green sepals and five additional small bracts. The individual flowers are .6-1" wide and shaped like an open flaring cup. There are 25-30 stamens and numerous pistils. The seeds (achenes) are small (1/20th inch long), slightly flattened, brownish-purple, and covered with elongated netlike veins. Quarter-inch-long slender pointed hairs project outward at right angles to the stem and leafstalks; these are often underlain by shorter hairs spreading at different angles more or less parallel to the stem.

Northwest Cinquefoil	Sulfur Cinquefoil
1. Well developed rhizomes	1. Woody caudex
2. Pubescenee spreading	2. Pubeseence at right angle to leaf petiole and stalk
3. Few stem leaves, mostly basal leaves	3. Numerous stem leaves, fewer basal leaves
4. Flowers bright yellow	4. Flowers paler yellow or sulfur yellow
5. About 20 stamens	5. 25 or more stamens
6. Seed coat smooth	6. Seed coat reticulate (netlike pattern)
7. Leaflet serrations sometimes deep	7. Leaflet serrations halfway to midvein
8. Tomentose (wooly) underleaf	8. Hirsute-hispid hairs on both sides of leaf
9. Leaves more green	9. Leaves more yellowish

There are 27 species of cinquefoils found in Montana. Most of these are morphologically distinct, but the introduced sulfur cinquefoil can be confused with northwest cinquefoil (*Potentilla gracilis* Dougl.) which is a common and widespread native species. There are four varieties of northwest cinquefoil recognized in western Montana by some taxonomy experts (Lackschewitz, 1986): Elmers cinquefoil, fanshaped cinquefoil, and two varieties both called soft cinquefoil. The above list of confusing characteristics is suggested to help separate sulfur cinquefoil from the varieties comprising the species *Potentilla gracilis*. The value of these contrasting characteristics, of course, depends on the growth stage of the plant. I have listed them in approximate order as to their utility in field identification, but several specimens should be examined for as many of these characters as possible because of the variability of these species.

References

Dorn, R.D. 1984. Vascular Plants of Montana. Montana West Publishing; Cheyenne, WY. 276 pp.

Lackschewitz, K. 1986. Plants of West-Central Montana. USDA Forest Service General Technical Report INT-217.

Salt Loving Halogeton

by Lois M. Cox in Sego Lily 12(9) November, 1989

Utah has 11 million acres of so-called desert land. This amounts to about 21 percent of the state. Most of Utah's salt desert is publicly owned, which means that all of us have a stake in what happens to it. Scientists at USU's Ecology Center are trying to find out more about the nature of these lands.

One project, led by Dr. Neil West, has centered in Curlew Valley, an area about 20 miles southwest of Snowville, Utah. The saltiness of the soil there is caused primarily by the presence of large quantities (several thousand parts per million) of sodium, potassium and calcium chlorides, sulfates, carbonates, and bicarbonates. The main plants growing in the bottom of Curley Valley are shadscale, greasewood, saltsage, gray molly, winterfat and halogeton.

Winterfat and gray molly, which are nutritious and well-liked by domestic and wild animals, are least able to compete. For example, winterfat seeds must germinate within a year, or have a slim chance of ever germinating at all. Germination has to occur in the spring, immediately after the snow melt has removed much of the salt from the top few inches of soil. If the salt isn't removed, the seedling will die because its salt tolerance is very low for 3-4 months.

On the other hand, halogeton may produce either or both of two kinds of seed at the rate of 75 seed/inch of stem.* One, black in color, appears late in the growing season. These seeds have the same time requirements (within one year) for germinating as do the winterfat seeds. But many halogeton plants insure their propagation by developing a second seed crop. These are brown and remain viable almost

Curlyleaf Dock

Curlyleaf Dock (*Rumex crispus*), often considered a weed, is very high in easily absorbed iron, and has been used as a treatment for anemia for centuries. It also contains high levels of vitamins C and A and calcium and phosphorous.

indefinitely (at least 10 years). They thus can germinate in whichever year provides favorable conditions.

The anatomy and physiology of the mature plants show the same pattern. Winterfat and gray molly are gradually being crowded out of the salt deserts because all of their growth is soft and palatable. Shadscale and greasewood, however, are spiny enough to prevent better than one-half of each year's new growth from being grazed. In addition, halogeton as well as greasewood not only survive on unusually salty soil, they prosper most when the salt concentration is 5800 parts per million, or higher.

Halogeton has a further advantage because its seedlings can tolerate salt levels that would be fatal to most other young plants. Even when dead, halogeton contributes to continued success. The dead plants return large quantities of sodium to upper soil levels. The area's low precipitation levels then allow most of this salt to accumulate year by year until seeds from other plants simply can't germinate.

USU's ecological studies of Utah's salt deserts are giving new insights into the precarious balance that exists between such land and its plants. They are also calling attention to the major disruption of that balance that could follow any relatively minor changes in precipitation pattern.

*Note: One of the first observations of seed ecology of Halogeton was the discovery of black and brown seeds (Tisdale and Zappettini, 1953). Black seeds were found to be highly germinable immediately after seed cast while brown seeds were almost entirely dormant in laboratory trials.

Black seeds of Halogeton placed on moist filter paper absorb water so rapidly that the ovary wall may rupture and expel the embryo within an hour. The embryos of black seeds uncoil at once and frequently can be planted within 9-10 hours. The embryos of brown seeds only swell slightly when placed on moist filter paper and appear unable to penetrate the protective ovary walls. Excised embryos from brown seeds rarely uncoil within 48 hours. When they uncoil, a green pigment appears in the cotyledons. The embryos of black seeds contain chlorophyll before emergence.

Yellow Star Thistle

Grass seed contaminated with approximately 45 yellow starthistle seeds per pound was used in an October 1988 forest fire rehabilitation of 6000 acres along the Hell's Canyon breaks. Seed was applied by helijet at a rate of 15 lbs/acre. In 1989, density of starthistle varied from 5 to 105 plants per acre. Thirty-five Forest Service employees pulled and bagged starthistle heads in attempts to control the infestation. Costs for control in 1989 were $37,500.

Influence of Livestock Grazing on Weed Establishment and Spread

by John Lacey, Extension Range Mngmt Specialist, MSU, Bozeman. Reprinted from Knapweed 4(3); October 1990.

Since about 1850, grazing of domestic livestock and spread of plants introduced from other continents have modified the condition of Montana's rangelands. Farming practices, fire suppression and cyclic weather patterns have also contributed to changes that reduced forage yield and quality, degraded wildlife habitat and impaired the value of range for watershed and recreational uses. During the past 50 years, the rapid increase in exotic weeds on rangeland may have triggered the most significant changes. Five major points regarding the influence of livestock on weeds can be made:

1) The success of exotic weeds makes re-evaluation of the closed community concept necessary. Scientists no longer accept that established stands of native vegetation (closed community) fully utilize the habitat and are rarely invaded by new plant species without severe climatic fluctuations, fire or biological disturbance. Exotic species have become an important part of the total vegetational component. They occupy nearly one-eighth of Montana's range and grazable woodland.

2) Climatic fluctuations, livestock grazing and trampling, rodent and insect activities, fire and off-road vehicles open plant communities to weed invasion. Initial weed establishment and spread are enhanced by disturbance. However, once weeds are introduced into a plant community, the best adapted species will eventually dominate the community. Whether that species is introduced or native, or whether the range is in good or excellent condition is moot.

3) The two basic approaches to using livestock for weed control either change normal animal behavior patterns or select alternative livestock species. An example of management to increase grazing use of the weedy plants contrary to animal preferences is using short duration high intensity grazing to lessen selectivity. The second strategy chooses animals that selectively graze the weedy plants. Grazing sheep and/or goats to control forbs and shrubs is an example.

4) Livestock must be kept from spreading noxious weeds. Cattle retain seeds for 7-10 days in the digestive tract and sheep retain seeds from 6-9 days. Confine animals grazing weeds during the seed ripe stage for 9-10 days before moving them to weed free areas. Monitor vehicles, horses and dogs, clothing, grain, seed and hay and take necessary steps to ensure that normal management activities are not enhancing weed seed dispersal.

5) The effects of manipulating grazing management strategies to impact weed populations have not been satisfactorily evaluated. Results from trial and error efforts suggest that use of selective grazing to control weeds may be more of an art than a science. The potential is promising. Allocating additional research funds to evaluate and develop techniques of

using livestock to control range weeds is justified.

Noxious Weeds and Native Plants

by Cindy and Ben Roche. (Reprinted from Douglasia, a newsletter of the Washington NPS; Volume XIV(2); Spring, 1990.)

None of the species listed on the Washington State Noxious Weed List are native to this state, but many are of concern to people interested in Washington's native flora. Although weeds have been described as plants that grow predominately in places disturbed by humans, they pose two threats to native plant communities. First, a number of exotic species are exhibiting an ability to invade "undisturbed" or "naturally disturbed" native plant communities. Second, the amount of land in the category "undisturbed by humans" is continually shrinking. In at least some situations, exotic species seem sufficiently competitive to prevent or retard the reestablishment of natives.

The full potential of these invading species is not known, but it appears that each has a definable ecologic amplitude. The range of environmental conditions that a species finds favorable for growth limits its potential for spread and thus delimits the areas of concern for its invasion. For example, the habitats invaded by purple lythrum (*Lythrum salicaria*) and rush skeletonweed (*Chondrilla juncea*) are mutually exclusive. Purple lythrum aggressively invades wetlands, replacing cattails, bulrushes and other native emergent or shoreline vegetation. Rush skeletonweed has spread throughout the shallow soils of the channeled scablands and the sandy gravelly soils of glacial outwash.

A study in 1987 of the ecologic amplitude of several *Centaurea* species (diffuse and spotted knapweed, and yellow starthistle) found that they did not invade equally all rangeland habitats in eastern Washington.

Diffuse knapweed

Diffuse knapweed (*Centaurea diffusa*) was the most abundant of the knapweeds, growing in all 20 eastern Washington counties, infesting over 428,000 acres. Ninety percent of the infestation was in the six counties north and west of the irrigated Columbia Basin: Stevens, Ferry, Okanogan, Chelan, Kittitas, Yakima. Diffuse knapweed has a wide ecologic amplitude including the shrub steppe, natural grassland, and dry forest steppe types. It is especially abundant on the sandy loam soils associated with ponderosa pine/ bitterbrush and bitterbrush/ bunchgrass. It appears to be less competitive on very shallow or coarse-textured sandy soils, and tolerates neither shade nor poorly drained soil. Although most abundant on areas disturbed by grazing vehicle traffic and previous farming activities, diffuse knapweed has been invading two Natural Area Preserves, set aside as the best remaining examples of eastern Washington bitterbrush/ bluebunch wheatgrass habitat.

Spotted knapweed

Over 25,000 acres of spotted knapweed (*C. maculosa*) were reported from 19 counties. Ninety-two percent was reported from three northeastern Washington counties: Spokane, Pend Oreille, and Stevens. Spotted knapweed is competitive on disturbed forest and timbered range sites. The largest infestations were on gravelly loam soils derived from till or outwash on the Spokane glacial lobe. Habitat types included ponderosa pine/ bunchgrass types, ponderosa pine/ snowberry, and Douglas-fir/ snowberry, most of which had been cleared for pasture or farmland. Spotted knapweed has the potential to spread to disturbed areas in the forests of the Cascades, the Okanogan Highlands and the Blue Mountains. Spotted knapweed was not found in the droughty bitterbrush habitat types. Like diffuse knapweed, spotted knapweed does not tolerate dense shade or poorly drained soils.

Yellow starthistle

Sixteen counties in eastern Washington reported yellow starthistle (*C. solstitialis*), with 93% of the 133,000 acres in the 5 southeastern ones: Walla Walla, Columbia, Garfield, Asotin and Whitman. The distribution of yellow starthistle overlapped the southern half of the *Agropyron-Festuca* zone mapped by Daubenmire in "Steppe Vegetation of Washington". Yellow starthistle was most competitive on deep silt loam soils on south-facing slopes of natural grasslands (bluebunch wheatgrass/ Idaho fescue). It also occurred in bluebunch wheatgrass/ Sandberg bluegrass habitat types on the Breaks of the Snake River, but was more restricted to moister sites, deeper soils, swales or draws.

Conclusions

Diffuse and spotted knapweed and yellow starthistle are by no means limited to the habitats summarized above. Disturbance of the soil and vegetation favors weed establishment, allowing persistence of weeds where they would not have been able to compete with established native vegetation.

Just as the study of vegetation is limited by knowledge of the flora, interpretation is limited by autecological and

EDITOR'S NOTE

Note that the due date for submissions for the next issue is 20 September. The staff will try with this issue to make up for lost time and get back on a regular publishing schedule.

environmental understanding. Thus, if our native plants are to be preserved we must move from taxonomy to ecology and accept that to preserve the natives we must understand the exotics.

Chapter News

White Pine Chapter

28 September. This is the combined fall business meeting and last outdoor event. The trip up the Clearwater to the Newman plantation should be a pleasant one, and Spalding Park is as warm a place as we can find for our evening meeting. The Newman hardwood plantation is a unique collection of some 100 hardwood tree species, mostly native to the eastern U.S., which the Newmans have grown over the past 25 years. Most of these species have not been grown elsewhere in this region, and the whole enterprise amazed forestry experts when they first became aware of its existence a few years ago. Meet in the Forest Service Intermountain Station Lab on S. Main, Moscow, at 1:00p. Bring potluck dish, drink and table service. Leader: Ray Boyd.

Calypso Chapter

13 September. Chapter meeting at the Kootenai Extension Office. 7:30p.

15 September. Field trip to old growth area in Eagle, and Settler's Grove in Shoshone Co. Led by Rick and Naomi Barth.

Wood River Chapter

14 September. "A Lichenable Field Trip" with the irrepressible Dr. Roger Rosentreter. Don't let the "Dr." mislead you: Roger can pull out more fascinating information about lichens (as well as other plants we'll see along the way) than you can imagine. For more information call 726-4684 or 788-9530.

Good Stuff

BOOKS

Mooney, H.A. and J.A. Drake. 1986. **Ecology of Biological Invasions of North America and Hawaii.** Springer-Verlag; New York. *(Recommended by Roger Rosentreter)*

Common Weeds of the United States. Dover Publications; New York. 463 pgs.

R.J. Taylor. 1990. **Northwest Weeds: The Ugly and Beautiful Villians of Fields, Gardens and Roadsides.** Mountain Press; P.O. Box 2399; Missoula, MT. 111 pgs. $11.95.

Lorenzi, Harri. 1987. **Weeds of the United States and Their Control.** Van Nostrand Reinhold Co; New York.

Leafy Spurge

In 1876, leafy spurge (*Euphorbia esula*) was collected in New York and described as a rare plant. The first collection known is from Massachusetts in 1827. Currently leafy spurge infests almost 2.5 million acres in North America.

Leafy spurge can reduce cattle carrying capacity by 50-75%. Nearly 50 percent of the loss is the result of a decrease in grass production because of competition. There is an additional loss because cattle prefer not to graze in areas infested with the plant. In the early 1980's, Montana was annually spending 2.5 million for chemical control, and and estimated $1.4 million was lost annually in forage production. In North Dakota, leafy spurge was estimated to cause over $7 million annually in lost forage, and control costs were approximately $6 million each year.

B.F. Roche and C. Talbott Roche. 1989. **Range Weeds Revisited.** Symposia proceedings of the 1989 Pacific NW Range Management Shortcourse. Washington State University; Pullman, WA. 85 pgs. *Available from WSU for $10.00. Contains four to five articles on each cheatgrass, knapweeds, leafy spurge and rush skeletonweed.*

Whitson, T.D., ed. 1987. **Weeds and Poisonous Plants of Wyoming and Utah.** Cooperative Extension Service; College of Agriculture; University of Wyoming. *Color illustrations and verbal description of many weeds (both native and exotic). Arranged by family. Spiral bound.*

Whitson, T.D., ed. 1991. **Weeds of the West.** Pioneer of Jackson Hole; Jackson, WY. 630 pgs. *An expanded version of the above. Soft Cover. Nice color illustration, most species with a large full page full individual photo and two close-ups.*

PUBLICATIONS AND ARTICLES

The newsletter **Knapweed** is published by the Washington Interagency Knapweed Committee. Write to Ben F. Roche, Editor; Department of Natural Resource Sciences; Washington State University; Pullman, WA 99164-6410. The newletter is not limited to knapweed reports and includes new research on biological controls and innovative methods.

Coblentz, B.E. 1990. Exotic organisms: a dilemma for conservation biology. Conservation Biology 4(3): 261-265.

Soule, M.E. 1990. The onslaught of alien species, and other challenges in the coming decades. Conservation Biology 4(3): 233-239.

Weiss, S.B. and D.D. Murphy. 1990. A control strategy for invasive species. Endangered Species UPDATE 7(3&4): 6.

Westman, W.E. 1990. Park management of exotic plant species: problems and issues. Conservation Biology 4(3): 251-259.

The July **Natural Areas Journal** (Volume 11, no 3) was devoted to exotic species control. Articles focused on biocontrol and purple loosestrife.

Housekeeping

The purpose of the Idaho Native Plant Society (INPS) is to promote interest in native plants and to collect and diseminate information on all phases of the botany of native plants in Idaho, including educating the public to the value of the native flora and its habitats.

Membership is open to anyone interested in our native flora. Contributions to our Society, are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
___ Sustaining	$30	15
___ Individual	$ 8	4
___ Household*	$10	5
___ Student	$ 6	3
___ Senior Citizen	$ 6	3

Name: _____
Address: _____
City/State: _____
Zip Code; _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Calypso (Coeur d'Alene)
__ Sah-wah-be (SE Idaho)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.

*Household memberships are allocated two votes.

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 20 September 1991.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Kathey Geier-Hayes, Secretary--Pam Brunsfeld, Treasurer--Pam Conley.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

Calypso Chapter, 911 Pine Avenue, Coeur d'Alene, ID, 83814: President--Pam Gontz, Vice President--Tina Gospodnetich, Secretary--Bob Shackelford, Treasurer--Jill Blake.

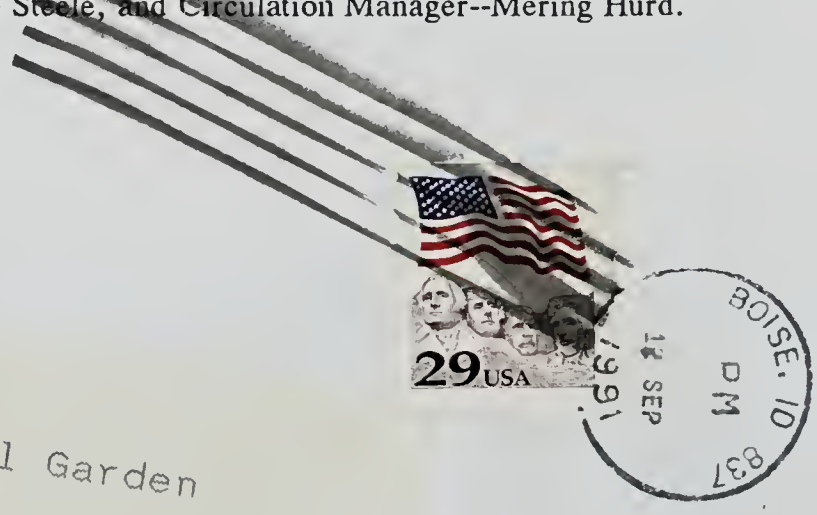
Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Mary McGown, Vice President--Nancy Cole, Secretary--Linda Williams, Treasurer--Kathy Geier-Hayes.

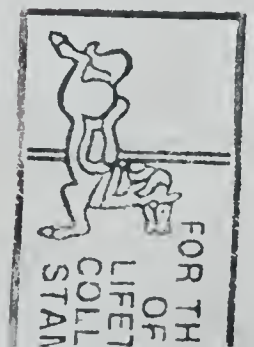
Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: Treasurer--Harry Giesbrecht.

White Pine Chapter: President--Ed Tisdale, Vice President--Pam Brunsfeld, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707





October/November 1991 SAGE NOTES A Publication of the Idaho Native Plant Society Vol 14(5)

Rare Plant Conference

The Idaho Native Plant Society's annual Rare Plant Conference will be held February 12 and 13, 1992 in Boise. This is an opportunity for botanists and individuals interested in Idaho's rare flora to meet and discuss issues critical to the management of rare plants in Idaho. The meeting provides a forum through which to set species status (the rarity status the species deserves), identify problems and set priorities. All are welcomed. More details will be forthcoming in the next newletter.

A Milestone in the Preservation of Idaho's Biological Diversity!!!!!!

-Bob Moseley

On June 13, 1991, the Aquarius area of the Clearwater National Forest was designated as a Research Natural Area (RNA) by Forest Service Chief Dale Robertson. This seemingly simple act culminated nearly twenty years of intense effort by a small, but dedicated group of conservationists to preserve the single most biologically-rich piece of the Idaho landscape.

Although the origin of the place name has been obscured with time, the area of the North Fork of the Clearwater River canyon, around the mouths of Beaver and Isabella creeks, has been known simply as Aquarius for most of this century. The center of much logging activity in the past, the area is probably most famous as the staging area for the great log drives down the Clearwater River to the Lewiston mill. At about the same time that the log drives were terminated by the inundation of Dworshak Reservoir in the early 1970's, the extraordinary biological significance of the region began to surface.

Much of the credit for discovering this biological mother lode goes to Fred Johnson, a Forest Ecologist from the University of Idaho. The presence of red alder in Idaho, a ubiquitous tree west of the Cascade crest, was not widely acknowledged prior to 1960. Inventories conducted by Fred in the 1960's revealed that the best stands of this disjunct species in Idaho, were in the lower sections of the North Fork canyon. His graduate student, Bob Steele, was the first to comprehensively document the ecological significance of the area. Bob found that red alder was only an indicator of the ecological uniqueness of the North Fork canyon, as he discovered a large number of coastal disjunct and endemic plants and unique biotic communities in the area. About two-thirds of his study area was flooded in the early 1970's and now lies under Dworshak Reservoir. Subsequent studies of the remaining area, Aquarius, have further documented the ecological uniqueness of this extraordinary landscape.

A potential natural area to preserve a remaining, undisturbed portion of this unique ecosystem was first suggested by Fred Johnson in 1970, and in 1973, Chuck Wellner formally proposed a 5,550-acre Aquarius RNA to the Clearwater National Forest. The story of what ensued in the twenty years between proposal and establishment fills volumes. For those interested in a story of agency stonewalling of the highest order, all the details are outlined in the "Establishment Record" for the RNA authored by Chuck Wellner and myself. One of the more sensational vignettes during those twenty years is the infamous statement by Senator Symms at a public meeting in Lewiston. The meeting was called to discuss the construction of the industry-proposed Dworshak Access Road, a road that would have ecologically castrated the RNA. With a tiny rare plant, the bank monkeyflower, holding up construction he stated that if he had a hoe, he would get to work ridding the area of this federal

candidate. Although most of the history is more mundane, it is clear that the dogged persistence by a small group of scientists, including many from the Forest Service, kept the Aquarius proposal alive in the intervening years.

Although the final configuration of the RNA established this year is only 3,900 acres, Aquarius is widely recognized by scientists as the most unique biological area in the Northern Rocky Mountains. Unfortunately, it is all that remains of an ecosystem that was once more common, most of it now lying beneath the 57- mile long Dworshak Reservoir.

So, what is it that makes a biologist's jaw drop upon entering Aquarius? Essentially, Aquarius is a coastal refugium, that is, a "refuge" for a high concentration of communities and species that have biogeographic affinity with coastal forest environments west of the Cascades. Yet, Aquarius retains certain Rocky Mountain elements that make it totally unique.

How do we know this section of the North Fork canyon is a biological refuge? Paleobotanical evidence from the Clarkia fossil beds, a few miles north of Aquarius, indicates that during the Miocene (about 15 million years ago) the vegetation of the region was covered with a rich forest of conifers and hardwoods. The evolutionary successors of these species today occur in climates considerably warmer and moister than are currently found in northern Idaho, such as eastern North America and southern China. As the Cascade Range gradually rose during the Pliocene and Pleistocene, the climate of Idaho gradually became drier. Species adapted to the warm, wet climate were relegated to the low-elevation canyons of the Clearwater River basin. It is the only area in the Northern Rockies that has the unique combination of high precipitation and high mean annual temperature. Aquarius, from the Latin roots meaning "water bearer", is a surprisingly apt name for the area.

Biological inventories of Aquarius are still ongoing. Our current knowledge of the area's biota, however, include a diversity of unusual species and communities unequaled by any area of similar size in Idaho, and possibly the Rocky Mountains. The table above, right, summarizes this extraordinary diversity.

A major objective of RNAs is to maintain and preserve a full array of biotic communities, along with their full compliment of plant and animal species and natural processes, in as near an undisturbed condition as possible. Additional objectives of the Aquarius RNA include (1) to provide an undisturbed example of this refugium for study and interpretation of biological history that might aid in predicting biological responses and changes to climatic change, and (2) to provide a protected baseline study area for determining short-term and long-term ecological changes.

With these objectives in mind, the Idaho Natural

Summary of Biodiveristy

- Best remaining Idaho red alder habitats not inundated by Dworshak Reservoir, including the largest stand east of the Cascade-Sierra axis.
- High diversity of ferns; at 24 species, about half of the species native to Idaho.
- An abundance of regional endemic and disjunct plants (40+ species), whose distributions span the entire range of habitats within the RNA.
- Nine plants on the Forest Service's Sensitive Species List.
- A population of the regional endemic Coeur d'Alene salamander, a Forest Service Sensitive Species.
- Two undescribed species of earthworms, occurring in different genera, both of which are disjunct locations from the main distribution of these genera west of the Cascades.
- Populations of a newly described and an undescribed species of tiny, moss-eating beetles.
- Best remaining, undisturbed examples of the river terrace habitat for the unique western redcedar/shield-fern community. With a dazzling diversity of ferns in the understory, this forest community occurs as old-growth stands.
- Most extensive stands in the Northern Rockies of the western redcedar/maidenhair fern community, an association that normally occurs in small patches.In Aquarius, this community also occurs as old-growth forest.
- Uncommon aquatic insects collected in two small tributaries of the North Fork.
- A rare saprophytic moss not previously reported from Idaho.
- An unusually rich assemblage of lichens.Forty species have been cataloged so far, with half being coastal disjuncts.Five species had not previously been known from Idaho.
- Inclusion of almost two miles of the North Fork of the Clearwater River, the last free-flowing, unroaded stretch from its mouth almost to the headwaters.

And in all cases the inventory is incomplete...stay tuned!

Heritage Program and the Forest Service initiated a cooperative project in 1991 to establish an ecological baseline in Aquarius. Ecologists from the Heritage Program established permanent monitoring plots throughout the RNA to characterize the unique plant communities and gather initial information on rare plant populations. Next year, baseline data will be collected on small mammal populations in old-growth forests of the RNA. Knowledge gained from successive remeasurement of these plots will be of great value in determining characteristics, limitations, and trends of the present vegetation and, hence, is of consequence to present and future management of northern Rocky Mountain Forests.

Pahove Chapter Joins Timber Sale Appeal

-David Towner, Pahove Chapter

The Pahove Chapter Board of Directors has decided to join 10 other organizations in appealing the Payette National Forest's proposed Grade/Dukes Timber Sale in the Cuddy Mountain Roadless Area at the southern end of Hells Canyon. The primary appellant is the Idaho Wildlife Federation, and other appellants include: Golden Eagle Chapter of the National Audubon Society; Ada County Fish and Game League, Idaho Environmental Council, Region III Idaho Wildlife Council, Neighbors of Cuddy Mountain, Weiser Irrigation District, Oregon Wildlife Federation, and the Hells Canyon Preservation Council. The Idaho Conservation League has filed a separate appeal of this decision. The Grade/Dukes project has generated more public interest, comment and controversy that any previous timber sale in Southwest Idaho (the Payette Forest received 867 letters commenting on the draft and final EIS's). The diversity of organizations represented in this coalition attests to the many significant values associated with this portion of the Hells Canyon Complex. The Grade/Dukes Timber Sale is a precedent-setting project in that it would be the first entry into a designated roadless area for timber harvest by the Payette National Forest. The reasons for Pahove's interest and involvement include what we regard as deficiencies in identifying and protecting Sensitive plants, old-growth forests, and biodiversity...all issues that affect the overall botanical resources of the area.

The proposed Grade/Dukes Timber Sale occupies approximately 4600 acres, most of which is within the Cuddy Mountain Roadless Area (CMRA). The proposed project area ranges in elevation from approximately 3600 ft to 7300 ft and spans the Dukes Creek, Grade Creek, and the East Fork of Brownlee Creek drainages. These drainages originate on the west side of the summit of Cuddy Mountain (7867 ft) and drain into Brownlee Reservoir (2077 ft) 3-4 miles to the west. In addition to the Grade/Dukes Timber Sale, the Forest Plan Activity Schedule lists three additional sales in the CMRA. If all four sales were carried out as planned, 17,100 acres would be eliminated from future wilderness consideration.

Because of its geographic location, significant elevation range, alternating north and south facing slopes, and basaltic soil types, the west side of Cuddy Mountain supports a variety of plant communities and habitats, including nearly pristine *Artemisia rigida/Poa secunda* (stiff sagebrush/Sandberg's bluegrass) communities not well protected or widely represented elsewhere in Idaho. Because it is roadless, un-logged, and lightly to moderately grazed, the native plant communities of this area are diverse and relatively healthy. The Hells Canyon reach of the Snake River is recognized for its numerous endemic plant species. Dukes Creek is especially noteworthy for its spectacular stands of old-growth ponderosa pine, perhaps the finest such example remaining in southwestern Idaho or eastern Oregon. According to the EIS, "Eighty percent of the timber stands in Grade Creek and Dukes Creek is old-growth and mature forest." The Cuddy Mountain Roadless Area is the last remaining timbered roadless area in southwestern Idaho, and the largest remaining old-growth forest on the west side of the Payette National Forest. The Dukes Creek drainage was identified and recommended by Chuck Wellner for designation as a Research Natural Area, but the Payette Forest chose not to implement that recommendation.

Associated with the Stiff sage/Sandberg's bluegrass communities are significant populations of *Allium tolmiei* var. *platyphyllum* (Tolmie's onion) and *Mimulus clivicola* (bank monkeyflower), both Sensitive species on the Payette. The area also

contains habitat for several other Sensitive species. In addition to its botanical resources the project area supports a population of flammulated owls (an old-growth-dependent Sensitive species); it is considered to be critical wildlife habitat for numerous game and non-game wildlife species; it is directly above Brownlee Reservoir (a popular fishery in both Idaho and Oregon); and it occupies an ecologically significant position in the Snake River Breaks portion of the Hells Canyon Complex. There is an increasing national awareness of the extreme ecological value of old-growth forest habitats, and their associated biodiversity. Many old-growth forests are now scattered remnants of formerly extensive ecosystems acting as refugia for dependent species. The west side of Cuddy Mountain offers the opportunity to save a significant area of old-growth forest in an area where little remains. The Pahove Chapter believes that many questions concerning the old-growth forests on the west side of the Payette Forest must be asked and answered before timber sales such as Grade/Dukes proceed. We also encourage the Payette to amend the Forest Plan to increase the current Standards and Guidelines old-growth retention requirement of 2.5%.

The responsibilities of the Forest Service to ensure that their actions do not contribute to trends toward the endangerment of any plant or animal species, even in a local area, are very clear. In accordance with Forest Service policy (as identified in Section 2670 of the Forest Service Manual and in the Region 4 Sensitive Plant Handbook), botanical surveys should be done early in project planning, populations of Sensitive Plants identified and mapped, population viability demonstrated, and projects modified to eliminate or minimize adverse impacts. These essential measures were not adequately observed in the planning of the Grade/Dukes project.

In the case of the Grade/Dukes project,the Payette Forest did not send a response to Pahove's Freedom of Information Act Request for records of botanical field work until after the Record of Decision had been signed. Because the work was not done early in the project planning process as NEPA requires, the results were not available to decision makers before project commitments were made, and the public was deprived of the opportunity to make informed comments on them.

The Statement of Reasons submitted with the Notice of Appeal documents numerous omissions, policy violations, and violations of NEPA requirements associated with the failure of the Payette Forest to fulfill its responsibilities to protect sensitive plant and old-growth resources. By joining in this appeal, Pahove demonstrates its willingness to take the necessary steps to ensure that native plants receive appropriate consideration in resource allocation and land management decisions affecting our public lands.

Bombing the Big Open

-by Brian Goller, Idaho Committee for High Desert

The cool breeze and nearly 6000 ft. elevation keep the sun from being too intense. Fluffy white clouds contrast with the clear blue sky. The ground sweeps away to a far horizon in seemingly unbroken waves of verdant green. Far away snow capped mountain ranges point skyward.

Binocular-aided vision picks out a distant herd of antelope. On another hill, a mile away, a bighorn ewe and her land cavort. On the flanks of Lambert Table a dozen or so bighorns calmly graze. At my feet the rocky ground is covered with blooming wildflowers, barrel cactus, and in places, concentration of chips from a variety of exotic stones, leftovers of ancient craftsmen's work.

Gazing out across the rolling landscape who would guess that the chasm of Deep Creek intervenes? The only hint from here of canyon convolutions is a broken dark line partly visible in the otherwise unbroken green sward. The expanse of the rolling tableland is so immense and line of site distance so great that it renders oneself very small in a big world. Some refer to it as the "Big Open" and anyone who has experienced it knows why.

It is Memorial Day, 1991, and I am standing on the Dickshooter Plateau in the heart of the Owyhee Canyonlands wilderness.

Like a sonic blast from above, Governor Andrus has proposed this area, lying between Deep Creek and Battle Creek canyons and north of the Owyhee River, to be a bombing range. The Governor refers to his proposal as "Big Springs".

Two years ago, the U.S. Air Force proposed an expansion of the existing Saylor Creek bombing range to include most of Owyhee County. That proposal was withdrawn after intense public scrutiny revealed serious planning flaws such as the failure of the Air Force to demonstrate that they really needed a new bombing range. In the interim, the Air Force has threatened to close the Mountain Home air base. The governor's response to these threats has been to take upon himself and the state of Idaho the responsibility for establishing a new bombing range. The governor's choice would impact some of the best of Idaho's desert wilderness, a remote canyon and plateau country which contains candidate wild rivers, a premier bighorn sheep population, important

archaeological sites and a healthy natural ecosystem which supports an abundance of wildlife.

Since the area designated in the governor's proposal is almost entirely Federal BLM land, the exchange of state land for BLM land or some other arrangement giving Idaho jurisdiction or right-of-way is key to its success. The State Land Board recently gave its approval to go ahead with the development of a conceptual plan for how such a land exchange could take place.

Regulations governing the use of Federal lands by the National Guard have been liberal in the past, treating the Guard as a State entity and avoiding congressional land withdrawal which is required for the Federal military. The apparent strategy of the current effort is to skirt a congressional land withdrawal by having the Idaho Air Guard pose as the owner of the range. Under the governor's proposal, the Idaho National Guard would manage the range with the Air Force using it under rent, lease, or purchase agreement.

This strategy was questioned by the national director of the Bureau of Land Management, Cy Jamison, in testimony before the House National Parks and Public Lands subcommittee on January 3, 1990: "the National Guard requirements for and impacts on the lands are becoming more like those of the Federal military...there appears to be more integration of Federal and National Guard personnel on the same exercise. It is not appropriate for these joint National Guard/Federal exercises to be conducted on National Guard authorizations," Jamison said.

Late in August, the State BLM office issued a document expressing its view of the Governor's proposal and the process so far. Many were wondering what the BLM's role in this process would be and why the agency had been so quiet thus far.

The BLM document points out that the wilderness study areas can only be released for other uses through public law passed by Congress. It urges the Air Force to consider other site alternatives in order for a training range to established within a reasonable time frame. The document summarizes the rich resource values and concerns regarding the proposed Big Springs site. Included are two comparison sites of identical size with summaries of the scarce resource values at those locations. Both comparison sites are just east of and adjacent to the existing Saylor Creek bombing range. Both comparison sites are rated as low in ecological diversity, with livestock grazing being the predominant use. There are no mineral sites, no cultural resources, no wilderness study areas, no potential wild and scenic rivers, no areas of critical environmental concern, no recreation values and very little private property.

Even an Air Force rocket scientist could figure out that the number of livestock permittees is the critical difference for Governor Andrus. The BLM comparison sites would affect ten or thirteen public land ranchers, compared to two ranchers in the Governor's proposed area. But at the

scoping hearings we heard representatives of the cattle industry testify that cows and jets get along just fine. They said there would be no need to retire the grazing permits if the Air Force got its range in the proposed Big Springs area.

Governor Andrus is working outside any public process other than the State Land Board meetings to accomplish as quickly as possible the land exchange necessary to complete his proposal.

The Air Force has delayed release of its draft EIS until October, 1991. If you have not yet requested a copy, contact: Lt. Colonel Tom Bartol; Director of Environmental Programs; AFRCE-BMS/DEV; Building 520, Room 131; Norton AFB, CA 92409-6884.

Elk Creek Exclosure Research Natural Area

-Boise National Forest

The 108 acre Elk Creek Exclosure Research Natural Area is an excellent example of sage-grassland communities on granitic soils of the Idaho Batholith. This livestock exclosure was one of six "Old Boise" or "Renner" exclosures constructed between 1927 and 1931 on low and mid-elevation rangelands of the Boise River Watershed for the purpose of comparing the effects of livestock use and exclusion on erosion rates and secondary succession. Additional exclosures were later constructed at high elevations. This investigation, conducted by a young range scientist named Fred Renner, was one of several initiated on the Boise National Forest in the 1920's in response to widespread and severe erosion, deterioration of vegetative cover and soils, and severe flooding and siltation problems on the Boise River resulting from unrestricted livestock grazing in the late 19th and early 20th centuries.

Exclosure sites were selected to represent typical plant communities of the watershed and various grazing intensities. The Elk Creek site was selected as representative of medium elevation bunchgrass ranges heavily used by sheep and cattle. No gullies had formed at the time of fence construction, but sheet erosion was widespread.

The Elk Creek Exclosure is located at an elevation of 4,200 feet. Aspects vary: average slope is 37%. Soil is a light sandy, clay loam derived from granite. The area contains two major plant communities. The sagebrush type is limited mostly to ridges and north slopes as the exclosure is at the lower elevational limit for this type. This mountain big sagebrush/ mountain snowberry/ bluebunch wheatgrass (*Artemisia tridentata* ssp. *vaseyana/ Symphoriocarpos oreophilus/ Agropyron spicatum*) habitat type occupies approximately 28 acres. The remainder of the tract is covered by an arrowleaf balsamroot/ Idaho Fescue (*Balsamorhiza sagittata/ Agropyron spicatum/ Festuca idahoensis*) community type. This type is a seral community on what probably is mountain big sagebrush/ mountain snowberry/ bluebunch wheatgrass habitat type. A total of approximately 75 native and exotic plant species occur within the exclosure.

Natural vegetation occurring on paired plots within and outside each of the "Renner Exclosures", including Elk Creek, was assessed almost annually until World War II. After the War, vegetation was sampled every 4 or 5 years up to the late 50's. Plots were also evaluated in 1972, 1977, and 1978. Studies involved detailed vegetation mapping and analysis.

At least two additional studies were conducted at or near Elk Creek and the other Renner exclosures. In the 1930's, Liter Spence of the University of Idaho in cooperation with the Intermountain Research Station, excavated, described and compared root systems of species in native plant communities with those of weedy, largely annual plant communities on disturbed sites. Results were used to evaluate the relative abilities of these species and communities to provide soil stabilization. Another study, developed in response to a demand for plant materials for erosion control, involved establishment of more than 50 native and introduced range grasses and forbs in a small area of the Elk Creek Exclosure in about 1940. These plots have been evaluated periodically through 1991 and provide valuable information on the longevity and relative competitiveness of these species on granitic soils.

Few areas in range country have been protected from grazing for as many years as the Elk Creek Exclosure. As a result of decreased stocking and improved management since 1930, successional changes have occurred on both sides of the fence. The exclosure area provides excellent opportunities for education and scientific research not only because of the age of the exclosure, but because we have nearly 50 years of detailed records on vegetation changes within and outside the exclosure. Annette Voth, a University of Idaho graduate student, reinventoried the Renner exclosures in the late 1970's with the objectives of summarizing 46 years of vegetation data and making recommendations concerning the value of maintaining each exclosure. She encouraged maintenance of the fences and further research, stating

that "continuing investigation into the patterns of succession could form the basis for better management of rangeland through increased understanding of ecological processes".

Extensive vegetation data has also been collected from the other Renner Exclosures, providing valuable information on such topics as bitterbrush recover in cheatgrass areas, cheatgrass ecology, natural recovery of native bunchgrasses and forbs. These exclosures have no official protective designation and the fences are beginning to deteriorate.

Currently the Elk Creek Exclosure fence is in some disrepair and the gate is being left open to allow the cows to get out of the exclosure. Although the Boise National Forest Plan indicates that the fence is to be maintained, other priorities have precluded fence upkeep. If you are interested in the RNA, or assisting with a fencing effort, please contact the Boise National Forest; 1750 Front St.; Boise, ID 83702.

New Weed Report--Bryony (Bryonia alba)

-Nancy Cole, Pahove Chapter

Bryony, a member of the cucumber family (Cucurbitaceae) is destroying the black hawthorn woodlands of the streams of the Palouse Prairie. So says Richard Old, weed identification specialist at the University of Idaho. This "kudzu of the Palouse" kills the trees and associated understory by climbing over the canopy and blocking most of the light that normally penetrates to the woodland floor. It is impacting native riparian communities in a landscape where much of the native vegetation fell to the plow many years ago.

Not a lot is known about the biology of bryony; because it is primarily a weed of deciduous forests, little research has been performed. A student at Washington State University studied the biology and ecology of the plant in Whitman County, Washington (Engle 1988). But weed science professionals, those who spend their entire lives with *planta exotica*, principally study agricultural pests. Today, we do know the species is primarily transmitted by fruit-eating birds. Unlike wild mock cucumber (*Echinocystis lobata*), the fruits of bryony are smooth skinned berries, perhaps more resembling grapes than the prickly fruit of their cousin (see figure from **Weeds of Utah**). If you find "wild grapes" while wandering the countryside you will be able to tell the two plants apart most easily by their stems...grapes are woody, perennial vines while bryony is exclusively herbaceous. Other clues to identity: the black berries of bryony are milky colored inside and the plant smells bad, like rancid meat-- not characteristics we normally associate with grapes. Birds flock to the hawthorn to forage and simply include bryony berries in their gastronomical pursuits. Since so many species of birds spend much of their time in riparian zones, its not surprising that bryony is principally a pest of wooded habitats. One repercussion of this distribution strategy is that the bryony has never been recognized as a serious pest to agriculture (for some reason it doesn't seem to have invaded orchards and vineyards yet) thus the

reason for so little information. Another repercussion is that control can be very difficult, birds often travel great distances, spreading the seed far and wide. So how widely distributed is this species? Well, it certainly is not restricted to woodlands of the Palouse. Dr. Old reports the species is presently known from eastern Washington, northern and southeastern Idaho, northern Utah and western Montana. It first showed up in Idaho in 1978 and in 14 years it has gone from a rarely seen species to one of the plants most commonly submitted to Dr. Old for a "weed ID". Why is the weed not reported from southwestern Idaho? Well, it was reported from Boise once, several years ago....the landowners disposed of the plant and no other traces have been found. Chances are that the plant does occur in the region, it just hasn't been rediscovered yet. Or has it? A little bit of eco-sleuthing has turned up evidence in Gem County. Susan Halbert, an aphid specialist at the Southwest Research/Extension Experiment Station in Parma, recently found an aphid-borne virus, called zuccinni yellow mosaic, on cucumber and squash crops in the area that spends part of its life on perennial cucurbits. Wild mock cucumber is the only native member of the Cucurbitaceae known to occur in the area and it is an annual vine. Susan's information suggests a perennial cucurbit is in the area. Its just a matter of time before the mystery is solved. Meanwhile, keep an eye out for this pest. If it shows up in your yard, pull that baby out by the roots. The plants don't reproduce asexually, so a little bit of labor (it has a BIG root) will suffice for control. You can send your bird-delivered gift (a new definition for 'air mail'?) to Dr. Old or your nearest county weed supervisor for identification and help him or her keep track of sightings by including information about where and when it was collected! AND if you are interested in learning more about the plant, look for a copy of Weeds of Utah and read Jodi Engle's thesis.

Literature Cited

Engle, J. 1988. **The spread and effect of the vine Bryonia alba in Whitman County, WA**. Thesis. Washington State University, Pullman.

Holmgren, A. and B. Andersen. 1976. **Weeds of Utah**. Special Report No. 21. Utah State University Agriculture Experiment Station, Logan.

The topic for the next issue of **SageNotes** is biodiversity. All submissions must be received by November 28. Articles highlighting special, diverse places in Idaho are especially encouraged. Thanks to all who submitted for this issue.

Insects on Hypericum ssp. in Idaho

by Susan Halbert, Parma Research and Extension Center, University of Idaho

The introduced weed, St. Johnswort or klamath weed (*Hypericum perforatum* L.), is now largely suppressed in Idaho by chrysomelid beetles *Chrysolina quadrigemina* and *C. hyperici Forster and the buprestid beetle* Agrilis hyperici Creutzer (Campbell and McCaffry, 1990). The genus *Hypericum* also includes three Pacific northwestern native species, all of which may be in Idaho. These are *H. anagalloides* C.& S., *H. formosum* H.B.K. and *H. majus* (Gray) Britt. (Hitchcock and Conquist 1973). It is not known whether the beetles attack the native plants.

In addition to the beetles, University of Idaho graduate student Clint Campbell discovered colonies of aphids feeding just below the soil surface on roots of *H. perforatum*. These aphids proved to be an undescribed species of *Nearctaphis*. As its name suggests, *Nearctaphis* is native to North America, and, until the pest species *N. bakeri* (Cowen) was introduced into Europe, the genus was not found in the old world. Thus, an undescribed, apparently native North American aphid was found for the first time on an introduced weed! I am guessing that the aphid was originally associated wtih one of the native *Hypericum* species and was not found because the plants are rather rare, and their roots are not often scrutinized for aphids.

Entomologists at the University of Idaho would be very interested in information about arthropods associated with native *Hypericum* species. I am particularly interested in aphids. Any insects discovered can be preserved in 70% ethanol and sent either to me at the Southwest Idaho Research & Extension Center; 29603 U of I Lane; Parma, Idaho 83660, or to Dr. Joseph P. McCaffrey at the Department of Plant, Soil & Entomological Sciences at the University of Idaho main campus in Moscow, Idaho 83843. We thank you all in advance for your help!

Literature Cited

Campbell, C.L. and J.P. McCaffrey. 1990. Survey of potential arthropod parasitoids and predators of *Chrysolina* spp. (Coleoptera: Chrysomelidae) associated with St. Johnswort in northern Idaho. **Pan-Pacific Entomologist** 66:217-226.

Hitchcock, C.L. and A. Cronquist. 1973. **Flora of the Pacific Northwest**. Seatle and London: University of Washington Press.

Chapter News

Calypso Chapter

-from the Calypso Companion

November 8: Pam Gontz presented a program on "Alpine Communities of the Beartooth Plateau". Pam has attended an alpine wildflower course in the Beartooths the last four summers, and has taken two llama packing trips into the area. The presentation included the alpine ecosystem and the vegetation found in alpine communities.
December 13: Chapter Meeting at the Kootenai Extension Office; 7:00p.

Pahove Chapter

-submitted by Dave Towner

Dukes Creek Field Trip Report

On June 23, 1991 the Pahove Chapter of the Idaho Native Plant Society conducted a field trip into Dukes Creek, a tributary of the Snake River which drains a portion of the west side of Cuddy Mountain at the southern end of Hell's Canyon. Dukes Creek originates near the base of Cuddy Point at about 6600 ft. in elevation, and flows northwesterly for approximately six miles before joining the Snake River immediately above Brownlee Dam at an elevation of 2070 ft.

The trip was organized by David Towner, with assistance from Roger Comer of Weiser. Thirteen people participated, including professional botanists.

The Dukes Creek area had not been botanically surveyed before this summer, and is the site of the Payette Forest's proposed Grade/Dukes Timber sale. The issues associated with the proposed timber sale are addressed in a separate position statement (available from Pahove), and have contributed to increasing interest among members of the Pahove Chapter in the botanical resources of the area and in the Payette National Forest's land management practices. Ultimately, this interest has led to Pahove's involvement in the appeal of this project *(see story this issue)*.

The botanists present (and those of us who spent the previous day on the Rocky Comfort Flat field trip) immediately recognized a significant and nearly pristine *Artemisia rigida/Poa secunda* (stiff sagebrush/Sandberg's bluegrass) habitat type on Payette Forest land and adjoining deeded land between Dukes and Grade Creeks near the proposed project boundary, and extending for some distance down slope to the west. The protection of an extensive and relatively undisturbed example of this habitat type is the primary objective in proposing the Rocky Comfort Flat Research Natural Area *(see last issue of Sage Notes)*. The stiff sagebrush/Sandberg's bluegrass community is rare in Idaho and has high biodiversity value due to its limited distribution. The importance of stiff sagebrush sites in Idaho, and the lack of adequate protection to the stiff sagebrush habitat type at Rocky Comfort Flat makes it imperative that other stiff sagebrush sites receive maximum possible protection. It is especially important to protect those sites that are in excellent condition, such as those in the Dukes Creek area.

Tolmie's onion, *Allium tolmiei* var. *platyphyllum* was found in association with the stiff sagebrush habitat type on Payette National Forest land along the divide between Dukes and Grade Creeks. The *platyphyllum* variety encountered here (and identified by Chris Lorain) has apparently been inadvertently omitted from the Payette's Sensitive species list. (The *persimile* variety which is listed as a Sensitive species by the Payette is more abundant than *platyphyllum*). These rare plants occur within 0.4 mi. of the project boundary of the proposed Grade/Dukes Timber sale, and within 0.5 mi. of a proposed new access road. Because they occur adjacent to an existing 4WD road which would connect to the proposed new roads, adverse impacts to this population would be expected. We later learned that other populations were found in separate field work performed in preparing the Payette Forest's biological evaluation for the Grade/Dukes Timber Sale. During those surveys populations of *Mimulus clivicola* (bank monkeyflower) were also identified.

The Hells Canyon reach of the Snake River is noted for its relative concentration of endemic plant species. Some of these are relatively common within their limited distribution, including two seen on this trip: *Astragalus cusickii*, a milkvetch with dramatically inflated seed pods, found at lower elevations in shale soils; and *Ribes cereum* var. *colubrinum* (wax current), found in the old-growth forest within the timber sale boundary.

The Payette National Forest does not currently recognize a formal definition of old-growth forest, and has not inventoried or mapped old-growth distribution within the project area. Experienced people on the trip noted that much of the project area had many old-growth characteristics. The piliated woodpeckers seemed to agree, we observed an active nest site, and ample evidence of their foraging.

Housekeeping

The purpose of the Idaho Native Plant Society (INPS) is to promote interest in native plants and to collect and disseminate information on all phases of the botany of native plants in Idaho, including educating the public to the value of the native flora and its habitats.

Membership is open to anyone interested in our native flora. Contributions to our Society, are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
__ Sustaining	$30	15
__ Individual	$ 8	4
__ Household*	$10	5
__ Student	$ 6	3
__ Senior Citizen	$ 6	3

Name: _____
Address:_____
City/State:_____
Zip Code: _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Calypso (Coeur d'Alene)
__ Sah-wah-be (SE Idaho)
__ Upper Valley Chapter (Idaho Falls)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.

*Household memberships are allocated two votes.

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00. Newsletter ads should be camera ready and accompanied by payment.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 28 November 1991.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Kathy Geier-Hayes, Secretary--Pam Brunsfeld, Treasurer--Pam Conley.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

Calypso Chapter, 911 Pine Avenue, Coeur d'Alene, ID, 83814: President--Pam Gontz, Vice President--Tina Gospodnetich, Secretary--Bob Shackelford, Treasurer--Jill Blake.

Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Michael Mancuso, Vice President--Gale Green, Secretary--Laura Bond, Treasurer--Sheri Lesch.

Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: Treasurer--Harry Giesbrecht.

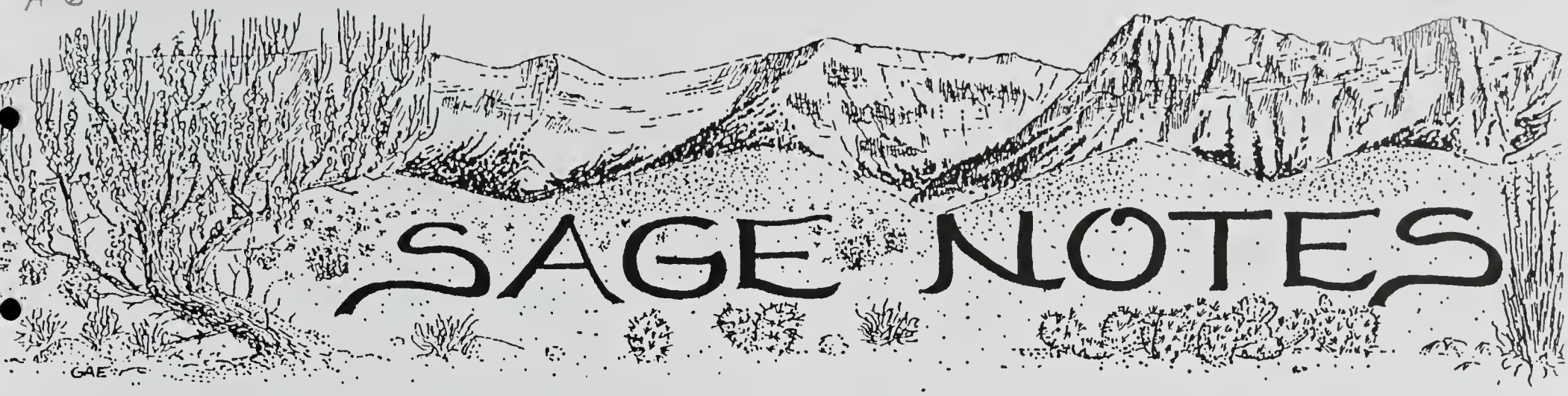
Upper Valley Chapter, President--Sylvia F. Reichel, Vice President--Jeanne Anderson, Secretary--Rebecca Cheek, Treasurer--Allen J. Thiel, Jr.

White Pine Chapter: President--Ed Tisdale, Vice President--Pam Brunsfeld, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707

Bulk Rate
U.S. Postage
PAID
Permit No. 171



Dec. 1991, Jan. 1992 ** SAGE NOTES ** A Publication of the Idaho Native Plant Society ** Vol 14(6)

Rare Plant Conference

This year's Rare Plant Conference will be held on February 11-12 at the Boise Interagency Fire Center near the Boise District BLM office. All INPS members and interested individuals are welcomed. The purpose of the conference is to assess the status of Idaho's candidate and sensitive species. The conference is an excellent opportunity to learn about Idaho's rare plants. Individuals with information concerning specific species are especially ecouraged to attend. Your information is important in this assessment process.

The annual Rare Plant Conference Banquet will be held at Loius, 620 W. Idaho. The evening will begin with a no-host bar at 6:30, dinner between 7:00 and 7:30 and a presentation by Dr. R.J. Nascali (University of Idaho) after dinner. You don't have to attend the conference to come to this social!

Officers Wanted!

Yes, it is time again to nominate members for the offices of President, Vice-President, Secretary and Treasurer. Please submit your candidate to the INPS address c/o the Nomination Committee. You can nominate yourself or another member for any position. Be sure to ask the person **first** before you nominate them!

Botany Symposium

In honor of William Judson Boone, the founder of Albertson College of Idaho at Caldwell (AC), the College will host a special session of the 1992 Idaho Academy of Sciences (IAS) on **Idaho Botany**. The Boone Symposium on Idaho Botany will feature Dr. Pat Packard (AC) on the origins of Idaho's flora, Dr. Doug Henderson (U of I) on the flora of East Central Idaho, Dr. Ron Hartman (U of WY) on the Flora of the Rocky Mountains project, Dr. Barbara Ertter (Jepson Herbarium, U.C. Berkeley) on identifying floristic regions of Idaho, Dr. Karl Holte (ISU) on Ray. J. Davis and the preparation of the first Flora of Idaho, and Bob Moseley (IDF&G) on the Conservation Data Center. Dr. Arthur Cronquist of the New York Botanical Gardens will be giving the keynote address at the IAS Annual Banquet. The special session is scheduled for 27 March at 1:30p at Albertson College of Idaho in Caldwell.

Papers on topics related to Idaho Floristics are being solicited for a paper session at the Annual IAS meeting to be held 26-28 March. Abstracts should be sent to Dr. Eric Yensen or Dr. Don Mansfield; Dept of Bio; Albertson College of Idaho; 2112 Cleveland Blvd; Caldwell, ID 83605 by March 7. Additional information can be obtained from Don Mansfield at 459-5287.

MacFarlane's Four O'Clock
Idaho's only listed plant species
Drawing by Agnes Miller

Idaho Natural Areas Conference

-by Susan Bernatas, INPS President

I didn't know these types of places existed! I've really learned lots! Long overdue!

These were some of the comments heard at the Idaho Natural Areas Conference held in Boise October 29-30. The conference goal was to discuss the range of natural area designation (Research Natural Area, Area of Critical Environmental Concern, Special Interest Areas and Rangeland Reference Areas). The conference was well attended (160+) by people representing BLM, FS, USFWS, National Park Service, Idaho Dept of Fish and Game and numerous other state and federal agences, as well as professional organizations and interested laypeople.

Talks ranged from definition of natural areas to management and monitoring of designated areas. Chuck Wellner, retired Assistant Station Director for the Intermountain Research Station reviewed the history of Research Natural Area establishment in Idaho. Other agency coordinators talked about establishing or designating areas within lands administered by their agencies. Also discussed was the role of natural areas in the preservation of biodiversity. Several of these presentations will appear in upcoming SAGENOTES. (*See article on Summit Creek in this issue*).

I would like to thank the many agencies, corporations and individual sponsors that made this conference possible: U.S. Forest Service (Boise National Forest, Intermountain Research Station, Regions 1 and 4) , Bureau of Land Management, Chris Davidson of Boise, Harmon Travel, Idaho Botanical Gardens, Idaho Department of Parks and Recreation, Idaho Farm Bureau, Idaho Foundation for Parks and Lands, Idaho Power Company, Rocky Mountain Elk Foundation, Society of American Foresters, Society for Range Management. I would also like to thank those folks that went out of their way to make the conference a success: John Barringer, Pam Conley, Bobby Fuller, Kathy Geier-Hayes, Bob Giles, Julie Hilty, Mehring Hurd, Bob Moseley, Nancy Shaw, and numerous Boise Foresty Sciences Lab staff.

Panhandle Peatlands, Pristine Outposts for some of our most Prized Plants

-by Robert Bursik, Botanist, Idaho Conservation Data Center, Idaho Fish and Game, Panhandle Region

Peatlands (bogs and fens) are unique wetlands in which the overall rate of photosynthesis exceeds the rate of microbial respiration. Hence, there is a net gain of plant material over time, resulting in the accumulation of peat soils. Peat soils consist of dead plant materials (particularly of sphagnum mosses and sedges) in various stages of decay. Plants growing in peatlands are rooted in this usually saturated, organic substrate. Several environmental factors lead to the development of a peatland in a given poorly-drained depression, rather than, for instance, a marsh. The water table within peatlands is always at, near or slightly above the peat surface. Waters draining into peatland basins from adjacent uplands tend to be of exceptionally low cation (calcium, magnesium, etc.) concentration and low (acidic) pH. This is in contrast to the more nutrient-rich waters that drain into marshes or swamps. In temperate latitudes, basins in which peatlands form also tend to have exceptionally poor frost drainage, making them considerably colder than adjacent uplands. Only species such as sphagnum mosses and many sedge species (family Cyperaceae) are specifically adapted to these cold, saturated, low nutrient, and low pH (acidic) conditions and are able to thrive in peatland habitats.

The Idaho panhandle contains the greatest concentration of low elevation peatlands in the state, particularly in the Priest River Valley, north of the town of Priest River. Most of these peatlands formed during the Pleistocene when continental galciers descended from the north, reaching their southernmost limit somewhere near Coeur d' Alene. The continental glaciers receded from the Priest River Valley a mere 11,000 years ago.

In their wake, the continental ice sheets left scattered depressions (e.g. kettle holes, poorly drained outwash channels, etc) in the major river valleys of the Panhandle. Some of these depressions featured the appropriate suite of environmental conditions to lead to the formation of peatlands.

The most unique feature of our Idaho Panhandle peatlands are the floating or quaking mats on the margins of, or within peatland lake basins. Floating mats are generally dominated by sphagnum mosses growing on peat which is supported by a dense network of sedge rhizomes, particularly *Carex lasiocarpa* (hairy sedge). Research has found that sphagnum mosses have the unique ability to selectively absorb and "lock up" cations of calcium and magnesium (important buffers in aquatic systems) while at the same time releasing hydrogen ions, thus increaseing the acidic conditions which are more suitable to their own survival.

Several species of vascular plants are specific to these floating mat habitats. Included in this group are the sundews (*Drosera anglica* and *D. rotundifolia*), which possess the ultimate adaptation to the harsh peatland environment; they are

carnivorous. These plants supplement their nitrogen supply by trapping and digesting small animals (mostly insects). The unknowing critters are attracted by sugary secretions on the glandular leaf traps only to become entrapped and ultimately digested by hydrolytic enzymes secreted by specialized glands in the leaves.

Several species specific to these floating sphagnum mat habitats are considered sensitive in Idaho by the Idaho Conservation Data Center and by the Idaho Native Plant Society. These include *Rhynchospora alba* (white beakrush), *Scheuchzeria palustris* (scheuchzeria), *Cicuta bulbifera* (bulb-bearing water hemlock), *Lycopodium inundatum* (bog clubmoss) and *Vaccinium oxycoccos* (bog cranberry).

Without exception, these sensitive peatland species are considered boreal disjuncts in Idaho. Their main range of distribution is in the region of boreal forest more than 150 miles to the north in Canada. In the boreal forest, these species have a more or less continuous distribution on a landscape that is blessed with immense poorly-drained depressions that have developed into peatlands during the last 10,000 years. This again is thanks to prolonged, intense continental glaciation of the area during the Pleistocene. The southernmost distributions of these boreal disjunct species into the western temperate coniferous forest biome are in the scattered islands of peatland habitat that dot the northern Rocky Mountain landscape.

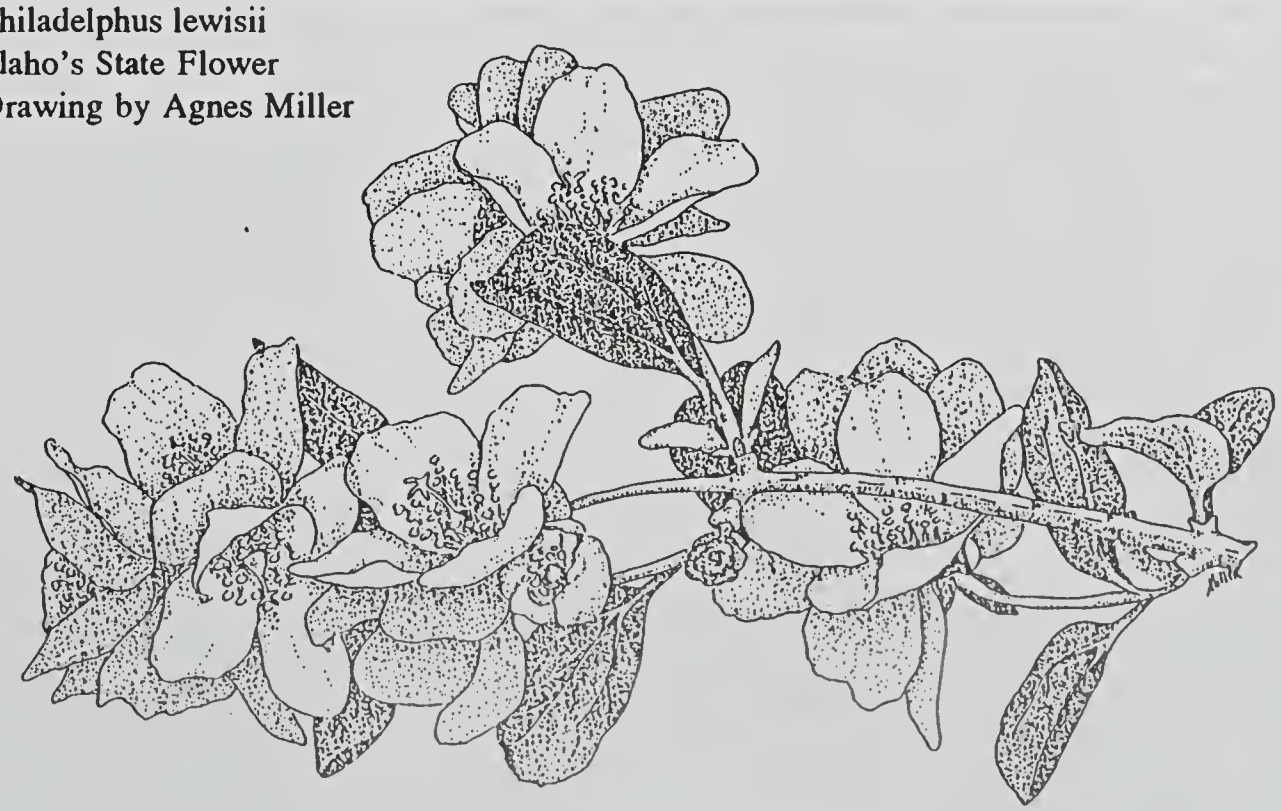
Given the unique physical and climatic conditions found in the Idaho Panhandle compared with conditions found in boreal regions, these disjunct populations may well have been subject to different selective pressures than populations of the same species in boreal regions. This means that genetic divergence of these fringe populations from the boreal populations is probable. In the face of potential warming of the global climate, these disjuct populations, adapted to slightly warmer conditions may prove to be the saviors of these species.

There are several "crown jewels" among our Idaho Panhandle peatlands. Among these would be Kaniksu Marsh, one of our oldest Research Natural Areas, which occurs in an old oxbow of the Priest River, approximately five miles south of the southern end of Priest Lake. The central, floating sphagnum mat of Kaniksu Marsh covers several acres and is surrounded by a "moat" on all sides. The moat ranges in width from perhaps 20 feet to more than 200 feet and is generally rather shallow, although in wider portions it attains a depth of more than nine feet. This peatland contains one of the densest concentrations of sensitive plant species found anywhere in the state, ten altogether. It also contains, without a doubt, the greatest diversity of carnivorous plants found in one site in the state. Both sundew species occur here, as well as three species of *Utricularia* (bladderpods); *U. vulgaris, U. minor* and *U. intermedia*.

Chase Lake, which is located three miles southeast of Coolin on the southeast corner of Priest Lake, is also a rare plant haven. It contains eleven sensitive plant species, although it only has four carnivorous plant species. *Carex chordorrizha* (string-root sedge) was first discovered here in 1988, and is known from nowhere else in the state. Chase Lake covers approximately 200 acres and contains floating sphagnum mats on the north and east ends. These floating mats grade into grounded (non-floating) peat mats and finally into a mosaic of other wetland types which are representative of nearly all the wetland diversity found in Idaho: shrub-scrub (carr), coniferous swamps, and cattail and tule marshes. Additionally, at least 14 different species of truly aquatic species have been collected from Chase Lake. The aquatic vegetation of Chase Lake includes one of the nicest stands of white waterlilies (*Nymphaea odorata*) in the state (try to forget that it is probably introduced when you are enjoying its wonderful fragrance and beauty), and one of few populations of water bulrush (*Scirpus subterminalis*) in Idaho, a recent addition to the sensitive plant list of the Idaho Native Plant Society and the Idaho Conservation Data Center.

From a biodiversity perspective, the importance of these peatlands cannot be overemphasized. More than 25 sensitive plant species in Idaho are restricted to peatland habitats. Nearly 20% of the vascular plant species found in the Panhandle peatlands are boreal disjuncts that barely trickle into Idaho from the north. Another 50% of the vascular species are boreal

Philadelphus lewisii
Idaho's State Flower
Drawing by Agnes Miller



species whose distribution is more or less continuous from the boreal forest south into the northwestern Rocky Mountains of the U.S. The Panhandle populations of all of these boreal species, disjunct and otherwise, are nonetheless "fringe populations" near the southern limits of their occurrence. Therefore, the populations of boreal peatland species on the Idaho Panhandle represent "beds of evolution" whose significance is great in light of global environmental threats such as climate change.

From an Idaho biodiversity perspective, similar peatland habitats are few south of the Panhandle. Three exceptional peatlands with floristic attributes similar to the Panhandle peatlands, including high numbers of boreal disjuncts and Idaho sensitive plant species, are Lily Lake RNA in the Ponderosa Pine State Park, near McCall; Tule Lake, near Warm Lake on the Boise National Forest; and Robinson Lake, in the western portion of Yellowstone National Park in Idaho. Overall, peatlands cover only a fraction of a percent of Idaho's landscape, but they contribute greatly to the overall biodiversity of the state. Besides that, they make a gleam in this botanist's eye shine a little more brightly.

Wetlands of Idaho: Examples of Monitoring Biodiversity at Four Levels of Organization

-Bob Moseley, Conservation Data Center, IF&G

This is the text of a presentation Bob gave at a symposium in Boise entitled Idaho Rivers: Working for Everyone on January 24-25, 1992 sponsored by Idaho Rivers United. The session during which this paper was presented was: Measuring River Health Through Aquatic Biodiversity: Theories, Techniques, and Case Studies.

INTRODUCTION

Biological diversity (biodiversity) means different things to different people and no definition has been put forth that is useful in an operational sense. I would like to use the approach of Reed Noss (Conservation Biology 4:355-364, 1990), whereby he characterizes biodiversity by identifying major components at four levels of organization (Figure 1).

The three primary attributes of an ecosystem -- composition, structure, and function -- all determine the biodiversity of an area. Composition has to do with the identity and variety of elements at the four levels. Structure refers to the physical organization or pattern of a system, while function involves ecological and evolutionary processes, including gene flow, disturbances, and nutrient cycling.

Using Noss' hierarchical approach, I'd like to review four examples of conservation projects taking place in wetlands or riverine settings in Idaho. Each example represents the measurement or monitoring of biodiversity at one of the four levels, and including one or all of the three ecosystem attributes.

GENETIC

Pacific dogwood (*Cornus nuttallii*) is a small tree that is quite spectacular when it flowers and, although it is not restricted to wetlands, it is an important component of riverine vegetation in Idaho and elsewhere. The only population of Pacific dogwood east of the Cascades axis is along the lower Selway and Lochsa rivers, and downriver a ways below their confluence on the Middle Fork of the Clearwater River. The assumption early on, and recent research has borne this out, was that this population represents a unique genotype and is, therefore, worthy of conservation concern. The Forest Service and the Idaho Native Plant Society both recognize this species as rare and sensitive in Idaho.

In 1987, Steve Brunsfeld, of the University of Idaho, discovered that the population was in severe decline. This set into motion a whole series of studies to document and identify the cause of the decline, assess population viability, and develop conservation strategies to save this genotype. Nearly all have been funded by the Forest Service, and coordinated by myself at the Conservation Data Center. These studies include:

Genetic Studies (1987 - Ongoing): Steve Brunsfeld, University of Idaho - A preliminary assessment of the genetic structure of the population indicates that the Idaho plants are different than coastal populations and that there is surprisingly high genetic diversity within the Idaho population.

Mortality Assessment and Photo Documentation (1988): Fred Johnson, University of Idaho - reread 20-year-old transects; found that 98% of the plants along those transects were dead or affected by disease(s).

Pathological Studies (1988-90): Catherine Bertagnolli and Arthur Partridge, University of Idaho - found that a suite of diseases and insects were affecting the population, all apparently native.

Seed Collection for ex situ Conservation (1990): Christine Lorain, Conservation Data Center - systematic collection of seeds from throughout population for off-site (ex situ) storage

FIGURE 1

Levels	Attributes: Structural	Compositional	Functional
Landscape	* Landscape patterns	* Landscape types	* Landscape processes and disturbances, land use trends
Community	* Pysiognomy, habitat structure	* Communities, Ecosystems	* Interspecific interactions, ecosystem processes
Population	* Population Structure	* Species, Populations	* Demographic processes, life histories
Individual	* Genetic Structure	* Genes	* Genetic processes

in case of extirpation from Idaho.

Seed Storage and Development of Reintroduction Technology (1990): Ed Guerrant, Berry Botanical Garden, Portland - Long-term seed storage along with germination and seedling propagation studies.

Long-term Population and Community Monitoring (1991): Juanita Lichthardt, Conservation Data Center - initiated monitoring of population demography and dynamics, along with structure and composition of habitats.

From these studies we may be able to identify population-, community-, landscape-, and/or biosphere-level processes that are operating to cause this decline, and develop ecological models to aid in recovery of the genotype. For instance, Bertagnolli and Partridge speculated that the extreme buildup of numerous disease and insect infestations may be a result of the decade of drought. Is this related to global problems such as greenhouse warming? Johnson documented that many of the dogwood habitats that were predominantly brushfields in the late 1960's are being invaded by coniferous trees. Is this leading to increased stress in the population and what is the role of human fire suppression in this process?

So, looking at the Noss diagram again, although we are primarily interested in the conservation of a genotype, we're also looking at the structural, compositional, and functional attributes of the higher levels of the hierarchy -- the population, community, and landscape levels.

SPECIES

Let's move up one level in the diagram, where the primary focus is on the conservation of a species, in this case a threatened plant endemic to eastcentral Idaho, the alkali primrose (*Primula alcalina*). This species occurs in meadows at the headwaters of three spring-fed creeks. The only other historically known population was from Monida, Montana, and is considered extirpated. This is a federal category 2 candidate for listing under the Endangered Species Act and the U.S. Fish and Wildlife Service is currently preparing a listing package to list this species as Threatened.

Alkali primrose occurs on several private ownerships, as well as land managed by the BLM, Targhee National Forest, and Idaho Fish and Game. All three agencies are cooperating on development of conservation strategies for this species, along with the Fish and Wildlife Service.

After initial inventories between 1988 and 1990, it was determined that this species was rare and threatened enough to warrant a monitoring and research effort. In 1991, with funding from the BLM, biologists from Oregon State University and the Conservation Data Center began a long-term monitoring project to collect information on population structure and demographic processes. Next year the Targhee NF, BLM, and Conservation Data Center are cooperating on the preparation of a management plan for one of the population and the BLM hopes to begin research on habitat relationships, especially on soils and groundwater hydrology.

Help is needed to acquire a sample of Erythronium nudopetalum (E. grandiflorum var. nudipetalum (Applegate) C.L. Hitchcock) for a cytotaxonomic survey of the genus. Living material- seeds, or preferably bulbs- can be sent to: Brian Mathew, Herbarium, Royal Botanical Gardens, Kew, Richmond, Surrey, TW9 3AE, England. Label the material "plants of scientific interest, no commercial value".

COMMUNITIES

My next example is from the panhandle where series of past and proposed studies focus on the compositional, structural, and functional attributes of a community of high biodiversity value.

During the Pleistocene, the continental ice sheet extended as far south in Idaho as Coeur d'Alene, creating three big glacial trenches, the Purcell Trench, Priest River valley, and Moyie River valley. As the ice sheets retreated from these trenches, they left areas where bogs developed. These wetland communities are at the very southern edge of their distribution here in Idaho, being more common in boreal regions of the continent. The flora of these communities dramatically illustrates this pattern, with many species at their southern limit in this part of the western United States, such as bog clubmoss (*Lycopodium inundatum*) and bog cranberry (*Vaccinium oxycoccos*). As many as a dozen plant and animal species that are rare in Idaho, can occur in a single bog. These wetlands represent important elements of the state's biological heritage. (*See article on these wetlands, this issue.*)

Hager Lake, located in the Priest River valley, is one of the most studied wetland ecosystems in northern Idaho. It sits in a small, glacial kettle with no outlet and virtually no inlets; all water and nutrients come from precipitation. Past attempts to drain the adjacent wetlands failed because of this.

Several investigators have analyzed pollen spectra from peat deposits to reconstruct post-glacial vegetation of the region. In 1956, John Rumley conducted a quantitative analysis of the aquatic and wetland communities as part of a comprehensive study of the plant ecology of the area. Although it was probably not his intention at the time, Rumley's data has become an important baseline from which we can measure nearly four decades of change in the system.

Recent studies at Hager Lake have revealed that the community composition and water chemistry has changed dramatically in 40 years. Rob Bursik studied the flora as part of his graduate research at the University of Idaho (Rob's now with the Conservation Data Center) and Fred Rabe, University of Idaho, studied the water chemistry of the lake as part of a larger acid rain research project.

Let's compare results of these studies. Rumley reported *Carex leptalea, Ranunculus uncinatus*, and the aquatic species *Potamogeton amplifolius* and *Ranunculus aquatilis* in his checklist of the flora of the area. Bursik found no populations of these species during intensive searches in 1987 and 1988. Rumley noted that water shield (*Brasenia schreberi*) had 34%

coverage and 100% frequency in his plots in the outer littoral zone of Hager Lake. In 1991, Bursik found only five plants.

Surface water chemistry changes are equally striking. Rumley noted the calcium concentration (hardness) to be 11.6 mg/l and magnesium ion concentration to be 2.44 mg/l while Rabe et al. found hardness to be 8.0 mg/l and magnesium ion concentration to be 0.5 mg/l.

Are these changes due to local causes (e.g., recreational trampling, cranberry picking, logging of adjacent slopes, etc.) or are they indications of disturbing global trends (e.g., acid precipitation, global warming, ozone depletion)...or are they natural fluctuations? The Conservation Data Center is working with the Forest Service to secure funding for two studies that, in combination, will hopefully answer some of these questions.

The first study will look at short-term (40-year) changes in the system. We would like to quantitatively reanalyze the vegetation and further analyze water chemistry data from Hager Lake, using Rumley's 1956 data as the baseline. John Rumley recently retired from Montana State University, and we hope to get his help in the reanalysis. The second study would take a much longer-term look at vegetative changes at Hager Lake since communities began to invade the area after the ice-sheets retreated 10,000+ years ago. Working with Peter Merhinger, Washington State University, we would core the peat deposits around the lake and analyze plant macrofossils and pollen to look at vegetative changes that have taken place in the bog during the Holocene (last +/-10,000 years).

With short- and long-term vegetation trend data from these two studies we hope develop models of composition and structure changes in bogs under fluctuating climates.

LANDSCAPE

For my final example I'd like to focus on measuring change in landscape-level patterns and processes, using the wonderful narrow-leaf cottonwood riparian forests along the South Fork of the Snake River, east of Idaho Falls. This forest is the largest remaining stands of cottonwoods in the Rockies and is extremely important to the maintenance of regional biodiversity.

Some very subtle yet insidious changes are taking place in this seemingly healthy riparian forest and other cottonwood forests on rivers in Idaho with upstream dams. The Boise River is another example.

Cottonwoods regenerate only if seeds fall on a mineral substrate, and in many of these communities that microhabitat generally becomes available only after scouring by spring floods. Studies on several large rivers in western North America have revealed that the recruitment of young cottonwoods into these communities drops to almost nil after construction of upstream dams that capture spring runoff. As this scenario progresses, structural and compositional diversity of plants and animals in these cottonwood communities is greatly reduced. A recent trend analysis of cottonwood vegetation along the South Fork of the Snake by the University of Idaho, using aerial photography from three time periods, revealed a similar situation.

A study was recently initiated by Mike Merigliano, a Ph.D. candidate at the University of Montana, to gather information on pre- and post-dam landscape-level processes that are operating along the South Fork. With funding from the BLM, The Nature Conservancy, Trout Unlimited, and University of Montana, he will employ a number of methods to measure biological and physical changes along about a 30-mile stretch of the river. Using age-class data from existing cottonwood stands and repeat photography from turn-of-the-century USGS photos he will be able to document specific changes in vegetative structure and composition. Historical river flow data, comparison of historical and present-day stream channel profiles, and correlations of groundwater depth and riparian communities will be used to analyze the influence of changes in fluvial processes on community structure and composition.

With these data, Mike can develop ecosystem recovery models that hopefully will be used to mitigate the deleterious effects of regulated flows on this important riparian system. The bigger message in all this is that the web of life on this planet is complex and that everything really is connected. The extinction or near-extinction of salmon stocks in the Snake River drainage has the same root cause as the degradation of upper-basin riparian forests. They are symptoms of the same illness.

All four projects have only recently been initiated, but I hope these, and others like them that are assessing and monitoring aquatic and wetland diversity, will provide resource managers with technologies necessary to adopt management that sustains Idaho's natural heritage.

Suction Trapping Records of Myzus lythri, an Aphid Infesting Purple Loosestrife

-by Susan Halbert[1], Richard Old[2] and Keith Pike[3]

Myzus lythri is an aphid which infests purple loosestrife (*Lythrum salicaria*) during the summer. It may also infest some *Epilobium* spp. from time to time, but its major host is loosestrife. Dense colonies of these green aphids are found in the flower stalks.

Aphid colonies produce winged aphids in respons to crowding during the summer. A generation of winged migrants that colonize winter hosts (usually woody plants) is produced in the fall. In the case of *M. lythri*, the winter hosts are cherry trees and possibly other *Prunus* spp.

University of Idaho entomologists at Parma have been monitoring aphid flight activity by operating aphid suction traps throughout the agricultural regions of Idaho since 1985. The traps consist of 26 foot vertical sections of irrigation pipe with a fan in the bottom. Aphids are sucked into the 1ft diameter opening at the top and funnelled by means of a screen cone into a collecting jar at the base, just above the fan. Samples are collected weekly throughout the growing season.

Based upon species composition of the samples and comparison of trap collections and field populations for certain

pest species, we believe that collections reflect aphid flight activity within a 20 to 50 mile radius of the traps. Thus, *M. lythri* collected in a suction trap probably indicate the presence of loosestrife within 50 miles.

The distribution map for purple loosestrife published in the August/September, 1991 **SAGENOTES** prompted us to check on trapping records for *M. lythri*. In fact, trapping records are quite consistent with known abundance of purple loosestrife (Table 1.)

Teble 1. Numbers of *Myzus lythri* collected in Idaho suction traps compared to reported infestations of purple loosestrife (*Lythrum salicaria*).

Trapping Location	County	1985	1986	1987	1988	1989	1990	1991	Total	Weed Records
Bonners Ferry	Boundary	-- *	--	--	9	1	4	14	28	Not reported
Moscow	Latah	0	5	2	11	0	4	4	26	Reported in county
Lewiston	Nez Perce	--	--	--	11	2	10	3	26	Reported in neighboring county
Craigmont	Lewis	--	--	--	4	0	1	0	5	Reported within 50 miles
Parma	Canyon	730	222	479	899	312	165	209	3,016	Very abundant
Wilder	Canyon	206	70	--	--	--	--	--	276	throughout
Caldwell	Canyon	--	--	200	102	34	13	--	349	the county
Mountain Home	Elmore	--	--	10	13	5	7	--	35	Reported in neighboring counties
Kimberly	Twin Falls	2	0	2	10	1	1	7	23	Reported in county
Burley	Cassia	--	--	2	--	6	14	0	22	Reported in neighboring county
Picabo	Blaine	--	--	--	14	1	2	5	22	Reported in neighboring county
INEL	Butte	--	--	1	0	0	1	0	2	Not reported
Aberdeen	Bingham	0	0	2	1	1	0	0	4	Not reported
Shelley	Bingham	0	0	0	2	0	--	--	2	Not reported
American Falls	Power	--	0	1	1	0	0	--	2	Not reported
Rockland	Power	1	0	0	1	0	0	0	2	Not reported
Arbon Valley	Oneida	1	0	2	0	0	0	0	3	Not reported
Holbrook	Oneida	--	--	1	1	0	0	--	2	Not reported
Preston	Franklin	0	2	6	16	1	1	0	26	Not reported
Soda Springs	Caribou	--	0	1	1	3	1	0	6	Not reported
Ririe	Bonneville	--	0	1	3	0	--	3	7	Reported in neighboring county
Tetonia	Teton	--	0	0	3	0	0	0	3	Reported in neighboring county

* Trap not operating.

Traps in Canyon County have collected many more *M. lythri* than traps located elsewhere. This is consistent with abundance of purple loosestrife in the area. Elevated levels of collection in northern Idaho and the magic Valley reflect recent expansion of loosestrife into these areas. A recent report of purple loosestrife in Madison County probably explains those collected at Ririe, which is just on the Bonneville side of the county line. The background levels of one per year or less may reflect emigration from ornamental loosestrife in home gardens or small populations of *M. lythri* on *Epilobium* ssp.

Trapping records suggest that unreported populations of purple loosestrife may be in Boundary, Nez Perce, Elmore, Cassia, Blaine and Franklin counties. Collections in a trap at Logan Utah in 1988 also indicate that infestations of the weed may be present along Idaho's southern border. Some populations of purple loosestrife in these areas may be intentional ornamental plantings. In this case, a public information campaign would be advisable.

In Canyon County, purple loosestrife is extremely abundant, and the aphid is much more abundant in trap collections than it is elsewhere in the state. We expect that if loosestrife populations increase dramatically in other areas, this will be reflected in increased collections of *M. lythri*.

To our knowledge, this is the first time insect survey records have been used to document the range expansion of an introduced weed. Aphid collection data have potential for use in this regard because most aphids have very narrow host ranges.

[1] Parma R/E Center, University of Idaho
[2] Weed Diagnostic Laboratory, University of Idaho
[3] Irrigated Agriculture Research and Extension Center, Washington State University
We thank F. Edward Northam (Weed Diagnostic Laboratory, University of Idaho) for helpful comments.

Summit Creek RNA/ACEC : a Case History

- Lyle Lewis, BLM, Shoshone District (*This paper was presented at the Idaho Natural Areas Conference.*)

As one of the Bureau of Land Management's first efforts at riparian improvement, Summit Creek was fenced in 1976 to exclude livestock as part of a fisheries habitat improvement project. Summit Creek is a spring-fed stream at the top of a watershed where little or no flooding occurs.

By 1980, fairly dramatic changes had occurred. Those changes are what we know and expect to happen when livestock are excluded, but at that time those changes were new and unique to most people. Some of the changes included narrowing and deepening of the channel and an improvement in fisheries in terms of numbers and total biomass of fish.

In 1987 the exclosed area was designated as an RAN/ACEC partly because of the valuable fisheries resource and partly because of the presence of the alkali primrose (*Primula alcalina*), a category 1 candidate and BLM sensitive species. That same year I concluded from retakes of pre-fencing photographs that the riparian area had not yet met its full

potential. Reconnaisance of the area showed may of the species in the riparian zone were actually upland species such as thickspike wheatgrass. I felt that part of the problem was less productive soils because of high salt concentrations in soil surface layers.

Compaction by livestock decreases pore size within the soil profile, creating micropores. Smaller pores have more adhesive and cohesive forces and can therefore draw the water up higher in the soil profile by capillary action than a similar soil that has not been heavily impacted by livestock. Normally, there are small amounts of salt that are deposited in soil surface horizons by evapotranspiration of plants. A soil that has been compacted has not only the force of evapotranspiration, but also capillarity and evaporation. This results in higher amounts of salt present in soil surface hoizons than is normal.

In addition, there presently exists a hummocky condition in much of the associated riparian zones. These hummocks have persisted through the life of the project (15 yrs). My proposal was to use beavers as natural dam builders to flood this riparian area to wash out the salts and reduce hummocking. I thought that if we could accomplish this we would have a more productive soil and a corresponding vegetation change toward a more climax seral stage.

At the same time I was working on this project I was also doing some aspen improvement work in a nearby area by top-killing clones of aspen, so I got volunteers and BLM crews to haul the fallen aspen to Summit Creek to provide dam building material and food for beavers that we later trapped and released into the area.

Unfortunately, for a variety of reasons, the beaver didn't stay where they were needed. One of the reasons I felt they weren't staying was because of inadequate cover, so the next winter and spring we planted willows along the stream to entice any resident beaver or future transplants to colonize the upper reaches of the stream.

About that time, the District Botanist began to express concern that if my project was successful, the flooding caused by beaver could destroy part of the alkali primrose population. We agreed it best to abandon my study, at least until the botanist knew enough about the plant that we could be relatively sure that flooding wouldn't endanger the population.

Since then studies have been initiated on the alkali primrose to determine what effect grazing is having on the three populations. The Summit Creek population is very important for monitoring purposes as it is the only one that isn't being grazed.

In 1988 the Intermountain Research Station became interested in the RNA/ACEC area to evaluate small mammal and breeding bird biomass and diversity in grazed and ungrazed riparian areas and breeding bird biomass and diversity in beaver influenced riparian areas vs. non-influenced riparian areas that were ungrazed.

In the first study on grazing effects, they found greater biomass outside the exclosure than inside, primarily because birds such as long-billed curlews used the heavily grazed area exclusively. Conversely, they found small mammal diversity much greater in the ungrazed areas than in grazed areas. In the second study, they found much greater biomass and diversity of breeding birds in beaver influenced riparian zones than in those not influenced by beaver.

The purpose here is not so much to give research results as it is to illustrate the amount of research and monitoring that has taken place in an area that originally received special management mainly because of its fisheries resource. When Summit Creek was originally fenced and designated as an RNA/ACEC, there was no way to predict all the research benefits that have already been realized and will be ongoing for some time.

Monitoring can be extremely simple or extremely complex. In most cases, the BLM will do well to do what I call "integrity monitoring", that is, to periodically look at the area to ensure that the purpose for which the area was designated is not compromised. This will make sure the area's unique features are preserved and available for research. Money and manpower constraints in the Bureau often make even this level of monitoring very difficult. Any level of monitoring over and above this will usually be up to outside entiities.

The Summit Creek story illustrates the value and challenges of RNA/ACECs. They can be used as controls for monitoring other similar areas, or for monitoring changes within the area. I think it also points out that a lot of the values associated with RNA/ACECs are not the instant success stories that are easy to sell to managers or the public, because the benefits will more often than not be long-term. What has happened at Summit Creek shows that most of the time the benefits of RNA/ACECs lie somewhere in the unforeseen future, answering questions yet to be asked.

Recommended Reading

-Roger Rosentreter

Gast et al. 1991. ***Blue Mts Forest Health Report, New Perspectives in Forest Health.*** *Pacific Northwest Research Station. Portland, OR.*

This is a landmark report by the research branch of the USFS which looks at forest health issues. This book discusses not just the symptoms but also the causes of forest health. Insects, root rot, and mistletoe are increasing in our National Forests and the causes are reviewed. The role of fire, the need for woodpeckers and beneficial insects such as ants, the role of woody debris in the forest, and fungi as the functional roots of trees (mycorrhizae) are all discussed. These factors are tied into the need to manage our National Forests for biological and structural diversity. This report even has a section on rebuilding structural diversity in forest stands. This physical diversity is important for many of the lesser known forest forbs and epipyhtes. This book is free which is always a good "selling" point, so I encourage you to get a copy and read the portions that interest you.

Durning and Brough 1991. ***Taking Stock: Animal Farming and the Environment.*** *Worldwatch Paper # 103, $5.00, From Worldwatch Institute, 1776 Massachusetts Ave. N.W. Washington, D.C. 20036-1904.*

This small book (46 pages) is written from a world perspective and looks at how animal husbandry has changed from a wise use that included recycling of house hold and small farming leftovers and grazing of fallow fields, to the current factory-style feedlots. It is important reading for those who are interested in the global environment. How does Idaho's livestock industry and your personal consumer choices compare to the world perspective?

Jacobs, L. 1991. ***Waste of the West: Public Lands Ranching.*** *author published Box 5784, Tucson, Arizona 85703. $28.*

This is a big book with over 600 pages. It is a cross between a coffee table book to look at and read occasionally and an encyclopedia of information on the subject. There is a no doubt about what the author thinks about the grazing situation on our public lands. He supports his thoughts with numerous statistics and photographs.

Member News

INPS Member, **Chuck Wellner**, was selected by the Natural Areas Association for the 1991 George B. Fell Award. The award recognizes over 56 years of dedication to natural area identification, establishment and management. Chuch retired 18 years ago from the Forest Service, but has continued to be active in the Idaho Natural Areas Coordinating Committee. At the age of 80, Chuck continues to tirelessly labor to protect representative and special places in Idaho. Congratulations!

INPS member, **Angela Evenden**, has been elected to the Board of the Natural Areas Association. Angie has recently moved to a new position in the Missoula Forestry Sciences Laboratory into a position designed to achieve close coordination between research and management.

Chapter News: White Pine Chapter

23 January at 7:30p. Maria Mantas will present a slide show "Plants of Northwestern Montana" in rm 213 College of Forestry at the University of Idaho. Maria uses a special technique in her photography that involves the use of two strobes to illuminate the subject. This allows her to use a small aperture opening on her camera, resulting in an increased depth of field which is especially effective on small subjects that require magnification. The result is a dramatic effect that enhances minute details of the subject. Maria is a botanist for the Flathead National Forest in NW Montana and is currently a graduate student in Forestry Resources at UofI studying giant helleborine (*Epipactis gigantea*), an orchid listed as Sensitive by the USFS.

5 March at 7:30p. Steve Brunsfeld will speak on "The Botany of the Lewis and Clark Expedition" in rm 213, College of Forestry. Steve will recount the "voyage of discovery" with special emphasis on the personalities, discoveries and lasting legacy of the expedition. Steve is an Assistant Professor in the College of Forestry at UofI and co-teaches the summer session course "On the Trail of Lewis and Clark" with Carlos Schwantes. The course retraces the route of Lewis and Clark through Idaho.

Good Stuff

North American Horticulture, 2nd Edition. Published in 1991 by the American Horticultural Society, the 368 page book is a reference for conservation organizations, horticultural periodicals, the U.S. Fish and Wildlife Endangered Species Program, garden centers, related scientific organizations. It is available from MacMillan Publishing Company; Front and Brown St.; Riverside, NJ 08075-1197 for $75.00.

An **Information Package on Xeriscaping** has been compiled by Mary McGown of the Pahove Chapter. Send Mary $1.00 and a large stamped ($0.54) self-addressed envelop to c/o Xeriscape at the INPS mailbox.

Information on Idaho's 200+ proposed and established natural areas were compiled into the **Idaho Natural Areas Directory** from Idaho Fish and Game's Conservation Data Center's database. The Directory highlights the physical and biological features that the areas were chosen to represent. Thanks to Julie Hilty and Bob Mosely of the CDC and Chuck Wellner of the Idaho Natural Areas Coordinating Committee, the directory was available for the first Idaho Natural Areas Conference. Copies are available for $7.50 plus $2.00 postage from INPS address c/o Idaho Natural Areas Directory.

The new **Water Management Council** held its official kickoff on December 9, 1991. This organization promotes water conservation in the Treasure Valley area. The meeting featured Doug Welsh, President of the National Xeriscape Council, who presented "A Discussion on Xeriscape". More information on this organization is available from Bill Dial, 322-4505.

The **Idaho Natural Areas** video and multi-image slide show are available for loan or purchase. The three projector slide/tape production and video are available as a loaner by contacting Susan Bernatas at the INPS address or by calling Bob or Julie at the Conservation Data Center at 208-334-3402. There is only a mall charge for postage and insurance. If you would like to purchase a copy, contact Katy or Gary at Mountain Visions in Boise at 336-2992.

Museum of Natural History monthly workdays are scheduled for 1 February and 7 March. Contact Bill Clark (375-8605) or Erik Yensen (459-5331) for information on how you can help.

Housekeeping

The purpose of the Idaho Native Plant Society (INPS) is to promote interest in native plants and to collect and disseminate information on all phases of the botany of native plants in Idaho, including educating the public to the value of the native flora and its habitats.

Membership is open to anyone interested in our native flora. Contributions to our Society, are tax deductible. Send dues and all correspondence to I.N.P.S., Box 9451, Boise, ID 83707.

Please include me as an Idaho Native Plant Society member.

	Full Year Jan-Dec 31	Half Year July 1-Dec 31
__ Sustaining	$30	15
__ Individual	$ 8	4
__ Household*	$10	5
__ Student	$ 6	3
__ Senior Citizen	$ 6	3

Name: _____
Address: _____
City/State: _____
Zip Code: _____ Telephone: _____
Chapter affiliation?
__ Pahove (Boise)
__ White Pine (Moscow)
__ Calypso (Coeur d'Alene)
__ Sah-wah-be (SE Idaho)
__ Upper Valley Chapter (Idaho Falls)
__ Wood River (Ketchum-Sun Valley)
(include $7 chapter dues)
__ None. Those who do not live near a chapter center are especially encouraged to join. We can put you in touch with other members in your area, and can coordinate with you on any state level activities you may with to be involved in. New chapters may be forming in eastern and northern Idaho.

*Household memberships are allocated two votes.

SAGE NOTES is published bimonthly by the Idaho Native Plant Society, incorporated since 1977 under the laws of the State of Idaho. Newsletter ads are $2.00 for personal ads; Commercial advertisements: 1/8 page $5.00, 1/4 page $8.00, 1/2 page $15.00, and full page $25.00. Newsletter ads should be camera ready and accompanied by payment.

MATERIALS FOR PUBLICATION: Members and others are invited to submit material for publication in Sage Notes. Text should be in typed form or if possible on 5 1/4 inch floppy discs for an IBM computer in WordPerfect, Multimate or ascii file format. Illustrations and even good quality photos may be reduced and incorporated into the newsletter. Provide a phone number in case the editors have questions on your materials. Send submissions directly to the newsletter editor: Caryl Elzinga; P.O. Box 182; Carmen, Idaho 83462. **Due date for material for the next newsletter is 1 February 1992.**

OFFICERS

State Officers, P.O. Box 9541, Boise, ID, 83707: President--Susan Bernatas, Vice President--Kathy Geier-Hayes, Secretary--Pam Brunsfeld, Treasurer--Pam Conley.

Big Wood Chapter, P.O. Box 4154, Ketchum, ID, 83340: President--Kristin Fletcher, Vice President--Frances Naser, Secretary/Treasurer--Carol Blackburn.

Calypso Chapter, 911 Pine Avenue, Coeur d'Alene, ID, 83814: President--Pam Gontz, Vice President--Tina Gospodnetich, Secretary--Bob Shackelford, Treasurer--Jill Blake.

Pahove Chapter, P.O. Box 9451, Boise, ID, 83707: President--Michael Mancuso, Vice President--Gale Green, Secretary--Laura Bond, Treasurer--Sheri Lesch.

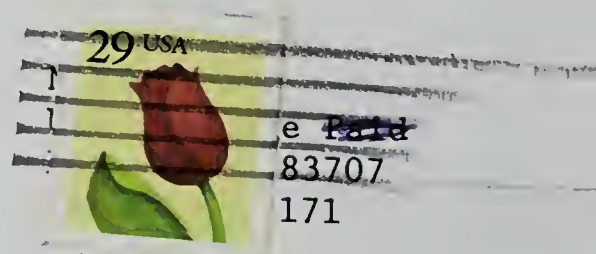
Sah-Wah-Be Chapter, 603 Willard Ave, Pocatello, ID, 83201: Treasurer--Harry Giesbrecht.

Upper Valley Chapter, President--Sylvia F. Reichel, Vice President--Jeanne Anderson, Secretary--Rebecca Cheek, Treasurer--Allen J. Thiel, Jr.

White Pine Chapter, P.O. Box 8481, Moscow, ID, 83843: President--Pam Brunsfeld, Vice President--Loring Jones, Secretary/Treasurer--Mark Krueger.

Newsletter Staff: Newsletter Editor--Caryl Elzinga, Technical Editor--Bob Steele, and Circulation Manager--Mering Hurd.

Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707



New York Botanical Garden
Library
Bronx, NY 10458-5126