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Sage Notes

Idaho Native

Plant Society



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Dues—INPS membership dues are on a yearly cycle, due January first. Please keep up your membership; a renewal form is in this issue.

Gardening—Readers have asked for more news on native gardening. To get started, we'd like to hear from you about your own experiences. Please let us know what's working for you by answering a few questions on the insert in this issue and sending it to *Sage Notes* Editor Sarah Walker by April 15 (address and email are on the form). Thanks!

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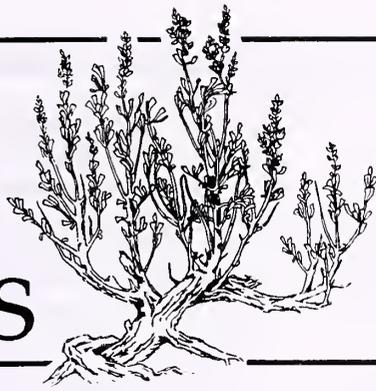
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Cover: Indian-valley sedge (*Carex aboriginum*) by Jeanne R. Janish. From *Vascular Plants of the Pacific Northwest*, by C.L. Hitchcock et al., 1961, Univ. of Wash. Press. Reprinted with permission.

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Sage Notes



...promoting interest in
Idaho's native flora.

Winter 2000 ❖ SAGE NOTES ❖ A Publication of the Idaho Native Plant Society Vol. 22 (1)

New INPS President Karl Holte: Now, How About a Vice President?

Karl Holte, Sah-Wah-Be Chapter member, has stepped forward to serve as INPS president. He was appointed by the Board of Directors to finish the term of president that is currently vacant (see p. 10).

Karl recently retired from Idaho State University, where he taught plant taxonomy and was curator of the Ray J. Davis Herbarium. He continues to teach spring/summer/fall flora. Karl's courses at ISU have encouraged many amateur and professional botanists. He is renowned for his approachability and interest in

students. He has served as president of the Idaho Chapter of The Nature Conservancy, Idaho Wildlife Federation, Citizens Environmental Council, Southeastern Idaho Rod and Gun Club, and the Idaho Orchid Society. He has taught field botany and natural history during the summers at Malheur Field Station in southeastern Oregon. Karl hopes someone will step forward to serve as vice president. The primary role of this officer is to organize the INPS annual state trip (two suggestions so far: Steens Mountain, or Leslie Gulch). Please contact him with your suggestions: <holtkarl@isu.edu> or (208) 236-3530, 236-3882, or at his home 232-6563. Welcome, Karl!

Louis F. Henderson (1853-1942), Early Northwest Botanist *Rhoda M. Love, Oregon Native Plant Society*

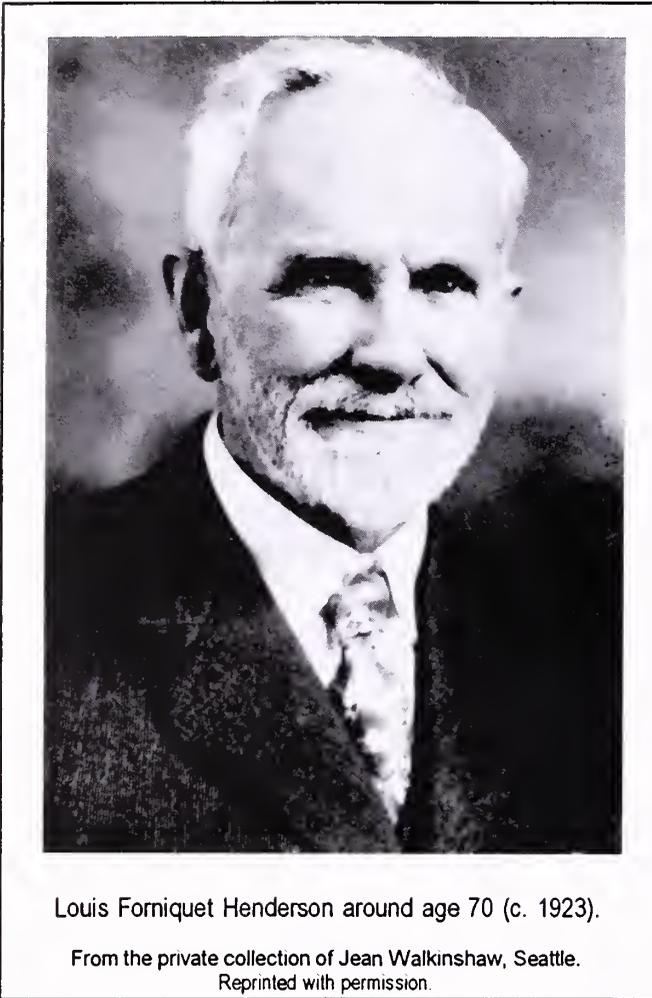
Ed. note: Although Louis Henderson and John Leiberg (Sage Notes 21(4) Fall, 1999) were contemporaries, and both collected in Idaho for Frederick Coville of the U.S. National Herbarium, they never met. They corresponded and exchanged specimens, and fortunately, duplicates of many of Henderson's specimens that burned in Moscow in 1906 were preserved in Leiberg's personal collection, which he gave to the University of Oregon before he died in 1913. Henderson organized and incorporated the Leiberg material into the UO collections when he became UO herbarium curator eleven years after Leiberg's untimely death.

Louis Henderson was one of the most important and active of our early resident northwest botanists. He collected plants in virtually every corner of the three northwestern states during 65 years in the field. He was the first American botanist to explore the Olympic Mountains of Washington, and the first to survey Idaho's Salmon River country. His tens of thousands of meticulously annotated specimens provide a detailed record of our changing plant communities. Henderson's life story is a fascinating one which demands a full-scale biography.

Louis Forniquet Henderson, grandson of a U.S. Senator, was born near Boston in 1853. His father was a New Orleans lawyer, and the Civil War caught the Henderson family in the south in 1861. Due to the unexpected start of hostilities, young Louis and his mother and older brother were forced to sustain themselves on an unproductive farm in Mississippi throughout the war. They survived and were reunited with his father only to be faced with a family tragedy. The father, an abolitionist, was brutally murdered by angry whites during a New Orleans race riot in 1866. Moving north, Henderson attended Cornell University, studying languages and botany. After graduation he moved west, first to California and then to Oregon. Henderson's mother also settled in Oregon, buying land near Hood River, where Henderson began his botanizing. From 1877 to 1889, he was a teacher at Portland High School. During this time he explored Washington and Oregon and began to build a large personal herbarium.

In 1883, after what his daughter called a "whirlwind love affair," Henderson and fellow-teacher Kate Robinson were married in Portland. Their two daughters, Margaret and Connie, were born in 1886 and 1888. In 1889 a bout of typhoid fever forced the botanist to resign his school position and move to Olympia, Washington to recuperate near the home of his brother. By 1890, he had recovered to the point where he was able to join the O'Neil expedition to explore the interior of the Olympic

plant physiology, histology, cryptogamic botany, forestry, and economic botany. Despite this heavy load, Henderson made as much time as possible for collecting. In addition to teaching, collecting, and curating the herbarium, he was expected to study scientific and agricultural subjects, hold farmers' institutes, and write bulletins on farm subjects. One of these that I believe would be of interest to land managers today is his 45-page illustrated paper, "Twelve of Idaho's Worst Weeds," in University of Idaho Agricultural Experiment Station Bulletin 14, 1898.



Louis Forniquet Henderson around age 70 (c. 1923).

From the private collection of Jean Walkinshaw, Seattle.
Reprinted with permission.

In 1895 Henderson took what he later described as "the longest botanical trip I have ever taken in my life." That summer, with funding from the U.S. Department of Agriculture, he undertook a botanical reconnaissance of central Idaho, an area then virtually unknown to science. As his assistant he chose student Charles Kirtley, a senior at the university. The trip was commissioned by Frederick V. Coville, Curator of the U. S. National Herbarium. A complete set of plants collected by Henderson on this extensive trip are filed at the National Herbarium, an important consideration, as many of Henderson's Idaho collections were later lost.

Henderson has described the 1895 trip with Kirtley at length in his 1932 autobiographical account, "Early Experiences of a Botanist in the Northwest," which was serialized in the Bulletin of the Native Plant Society of Oregon in 1981 and 1982. The two collected extensively from June 1 to the end of September, traveling with pack animals and a single saddle horse. They covered over a thousand miles, their itinerary including Salmon River, Lost River Mountains, Boise River, Soldier Mountains, Wood River, Ketchum, and other areas. The two men had encounters with rattlesnakes, range wars, threats of Indian uprisings, torrential rains, landslides, swollen rivers, a stage coach buried in mud, and the ubiquitous mosquitoes. They saw desolation due to mining, as well as rich, unspoiled country. On Birch Creek they helped move a ranch family into the hills to avoid Indians. Henderson's later comment was: "I botanized, Indians or no Indians."

Peninsula. In 1892 he accepted a position with the state of Washington to collect plants for the famous Chicago Columbian Exposition, and he and his family moved temporarily to Chicago to set up the state exhibit.

Leaving Chicago in 1893 at the age of 40, Henderson accepted a post as the first botany professor at the 3-year-old University of Idaho in Moscow. His title was Professor of Botany and Head of the Herbarium.

Henderson's teaching duties were onerous. There were only seven professors on the faculty, and during his early years the botanist taught eight classes a day. He was assigned such subjects as systematic botany,

While at Idaho, Henderson published four articles introducing new plant species to science. He named a new Indian paintbrush he found on the 1895 trip for Coville, calling it *Castilleja covilleana*, and writing, "I take pleasure in dedicating this unique species to Mr. Coville, botanist of the Agriculture Department at Washington, through whose instrumentality I was enabled to take the trip." He also named a nemophila for his student assistant, calling it *Nemophila kirtleyi*, and writing, "I take pleasure in dedicating this species to my young friend and companion of my 1895 trip, Charles Kirtley of Salmon Idaho."

His paper "New Plants from Idaho and from other Localities of the Northwest," was published in the

Bulletin of the Torrey Botanical Club in 1900. When he wrote this paper, Henderson and Kate were spending a sabbatical leave at Harvard University, which he later described as "the most enjoyable year I ever spent in my life." C. V. Piper of Washington State College was also on sabbatical at Harvard that year, and the Hendersons and the Pipers made a happy foursome enjoying concerts and museum tours.

Five years after this delightful interlude, disaster struck. On March 30, 1906, the University of Idaho Administration Building burned to the ground, destroying the herbarium. It has been estimated that as many as 85,000 specimens were consumed, including Henderson's personal collection of over 10,000 sheets, the result of nearly 30 years of collecting. Letters indicate that, heartbreakingly, at the precise time of the fire he was negotiating to sell his private herbarium to the Chicago Field Museum for \$1,000. In a letter to the museum he wrote:

"...as many as 85,000 specimens were consumed [by the fire], including Henderson's personal collection of over 10,000 sheets, the result of nearly 30 years of collecting."

To make this collection I have spent all my odd hours since leaving Cornell in '74 I have scoured the remote places of Idaho, Oregon and Washington, from the California line to British Columbia, and from the Ocean to Montana. I do not believe you could find a collection in this North West which contains so many rare and new plants.

Henderson later stated that with the collection went "notebooks, books, instruments, letters from prominent botanists all over the world and all my private papers." The destruction of both the collection and the field notebooks was a serious loss to northwest science; fortunately, however, due to Henderson's scrupulous exchanging of specimens, duplicates of many of the burned sheets exist in other herbaria. The loss was surely a crushing personal blow. His daughter Margaret recalled, "For a while it took the heart out of him and he would do no more collecting." At 52 years old Henderson said he lost "one of the joys of my life."

Disheartened, Henderson retired from teaching in 1908. Three years later, when his daughters had finished college, he moved to the 80-acre family homestead in Hood River, Oregon, bequeathed to him by his mother. There he planted a 40-acre apple orchard and attempted (never very successfully) to make a living as a commercial orchardist. Henderson remained on this ranch for 13 years; however, it is clear that he missed the botanical life. Fortunately, in 1924, at the age of 71, he was lured out of retirement

by Albert Sweetser, head of the Department of Botany at the University of Oregon, who offered him the curatorship of the herbarium in Eugene. Though a septuagenarian, Henderson was far from a frail man. Just nine days before his seventieth birthday, he swam across the undammed Columbia River from Hood River to the Washington side.

At the University of Oregon, Henderson once again threw himself into vigorous botanical activity, collecting, mounting, labeling and building up the herbarium, a regimen that would have taxed a person half his age. During his 15 years at Oregon he worked systematically throughout the state, covering such areas as the remote John Day country, the rugged southwest coast, the Alvord Desert and Steens Mountain, and isolated Hart Mountain. In 1932, he fulfilled a lifelong wish to botanize in Alaska and the

Yukon. A fellow botanist wrote of him, "He seems to have found the fountain of eternal youth in his love for plants."

Henderson retired from the University of Oregon in 1939 at the age of 86 and moved to Tacoma, Washington to live near his married daughter Margaret. She reported that even in his mid-80s he was physically active, hiking in the foothills of the Cascades and swimming and diving with his grandchildren. He died in

Tacoma on June 14, 1942, at the age of 88 years. His daughter wrote that his last year was peaceful and he simply "went to sleep at last."

At the time of his retirement, Louis Henderson probably knew the flora of the Northwest better than any living botanist. He left tens of thousands of sheets in herbaria throughout the country. He introduced countless new species to science. He published the names and descriptions of 64 taxa. Approximately 30 species were named for him, and 15 species and one variety bear his name today. One of these is Idaho's *Ribes hendersonii*, collected by the botanist in the Lost River Mountains on August 14, 1895 on the memorable trip with Kirtley. The species was named by C. L. Hitchcock in 1961, 66 years after its discovery and nearly 20 years after the collector's death.

[Author's note: this essay was taken from a book in preparation on northwest plant collectors edited by Arthur R. Kruckeberg and Rhoda Love. A longer sketch of Henderson's life will appear in Pacific Northwest Quarterly. I thank many individuals as well as the staffs of the University of Oregon Library and the University of Idaho Library for their assistance. R. L.]

Carex aboriginum (Indian-Valley sedge) Rediscovered

Curtis Bjork, Washington State University

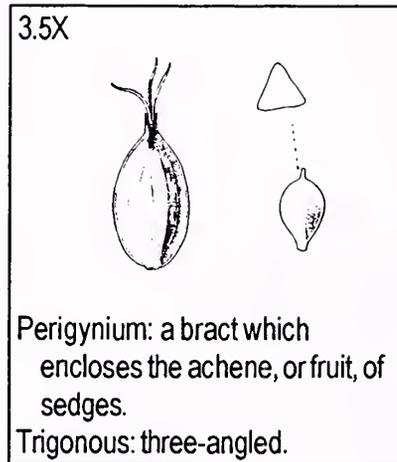
While prospecting for interesting plant specimens for the University of Idaho herbarium, I took a random side road off Highway 95 and saw a small meadow of vibrant green sedges following the course of an intermittent stream. The contrast of robust sedges in the surrounding gold and gray of the parched Weiser valley rangeland was visually outstanding, and I had to get out of the car for a closer look. Despite the desiccated soil, even in the streambed, there were sedges (*Carex sheldonii* and *Carex aboriginum*) and a spikerush (*Eleocharis bolanderi*) that showed no sign of drought stress.

Carex aboriginum is a dark green, leafy sedge that grows to about two and a half feet tall. The fruiting spikes ascend above the leaves, and the spikes are multicolored and very attractive. The perigynia are large, up to about 5.5 mm, and weakly inflated. Within each perigynium I opened, I found well-formed achenes, which are trigonous and sharp-angled.

Indian-Valley sedge was first collected in the Weiser valley by Marcus Jones on July 12, 1899, at Indian Valley near Salubria, and hasn't been collected since. That collection was the only

occurrence recorded at the Conservation Data Center, who had considered it to be globally extinct.

The rediscovered population is now the only one known, making it a very vulnerable species. At the time I found the plants, cattle were grazing the meadow. *C. aboriginum* seems to escape grazing, perhaps as poor forage. In all areas of the meadow where the sedge does not grow, cattle have obviously degraded the community through grazing and trampling. Non-native plants constitute much of the cover in the meadow, providing a further threat to the sedge. In my opinion, it is likely that without the cattle and invasive weeds, *C. aboriginum* would have more of the meadow to occupy. Beyond the protective canopy of the sedge, *C. aboriginum* seedlings may find it quite a struggle to survive. Most of the Weiser River Valley consists of lowlands converted to agriculture and uplands dominated by native shrubs and introduced annual grasses. There is very little other likely habitat for *C. aboriginum* in the area. It is my sincere hope that everything possible will be done to preserve this unique and spectacular sedge and the habitat it occupies.



As a result of this discovery, the status of *Carex aboriginum* has been changed from the "Taxa believed to be globally extinct" category to Global Priority 1 (see p. 7).

Announcing the Idaho Native Plant Society Web Site! idahonativeplants.org Valerie Geertson, Pahove Chapter

Currently, this web site is under construction, but you can view some important information. There is information about how to become a member and where to send your dues, how to sign up on the list server, the Rare Plant Conference, and results of past rare plant conferences. The results of the 2000 Conference will be posted as soon as they are finalized.

There are big plans for the web site. Big Plans! Future issues of *Sage Notes* will be posted, allowing for easy reference and dispersal of the educational and entertaining information contained therein. Links to other web sites will be posted, including other

native plant societies, government agencies, native plant gardening sites, and Idaho conservation groups to name just a few. The most ambitious idea is to feature photos and distribution information for each species on the Rare Plant List (the results of the conferences). Note, however, that it will not be possible to get specific locations of rare plants, only general information about their ranges and habitats.

If you have a link that you would like to have added, please send the URL (the web address) to Valerie Geertson at <valerie@InternetOutlet.net>; the links will be reviewed for accuracy and forwarded to our webmaster, Dan Ray. Any other suggestions are welcomed, be they minor corrections or grandiose ideas. This web site is meant to further the mission of the Society: to promote interest in native plants and plant communities, and to educate members and the public about the values of our native flora.

A Summary of the Results from the 16th Idaho Rare Plant Conference

Michael Mancuso, Conservation Data Center, Boise, ID

The annual Idaho Rare Plant Conference is an opportunity for botanists, agency resource managers, and other interested native plant enthusiasts to review and update the INPS Rare Plant List, and provide the leadership and direction needed to keep rare plant conservation in Idaho moving forward. The Idaho list is divided into three main groups. First are the Globally Rare categories comprised of species considered rare throughout their range. Second are the State Rare categories containing species rare in Idaho, but more common elsewhere. Then there is the Review category, reserved for species that need more information before we know whether or not they are legitimate conservation concerns in Idaho.

The list contains 270 vascular and 35 non-vascular plant species, including 111 in the Globally Rare and 194 in the State Rare categories. The Review category contains another 67 species. Discussions at the conference resulted in a status change for 15 species, a change to the Threat Priority rank for three species, nine species being dropped from the list, and three new species being added to the Review category. These changes once again demonstrate the dynamic nature of the Idaho list as new information becomes available. Results from the conference are outlined below.

Andreae heinemanii—This is a small, dark moss that is apparently not common anywhere in its range, which is largely to the north of Idaho. The recently found population south of Grangeville, Idaho, may represent the first collection for the state. It was added to the Review category because more information is needed to assess its status in the state.

Astragalus newberryi var. *castoreus* (Newberry's milkvetch)—Additional populations of this low-growing, but showy-flowered milkvetch were found in southwestern Owyhee County in 1999. For this reason, it was moved from the State Priority 1 to the State Sensitive category.

Botrychium campestre (prairie moonwort)—The first known Idaho population of this small, fern-like plant was recently discovered in the White Cloud Mountains of central Idaho. The change from the Review to the Global Priority 3 category was made now that its identification has been verified.

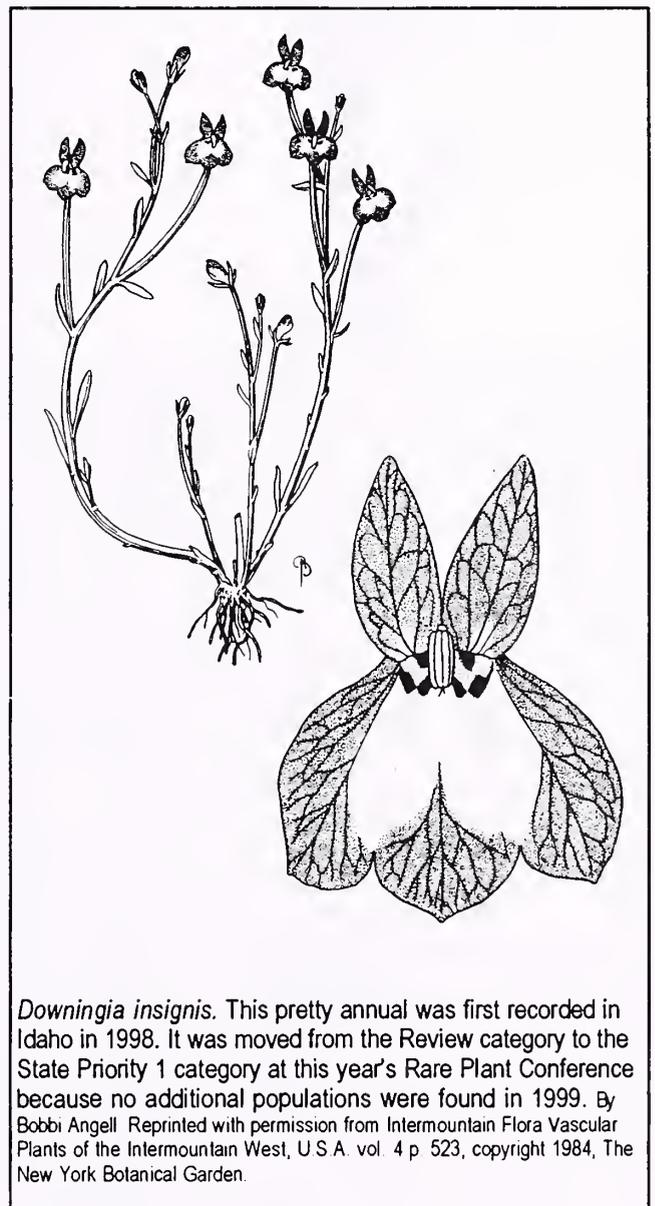
Carex aboriginum (Indian-valley sedge)—This species was thought to be extinct, but in 1999 a population was discovered south of Council, in Adams County. Because of this wonderful discovery, Indian-valley sedge was moved from the INPS's Taxa Believed to be Globally Extinct category to the Global Priority 1 category.

Cetraria sepincola—This small, brownish lichen is presently known from only a few Idaho occurrences;

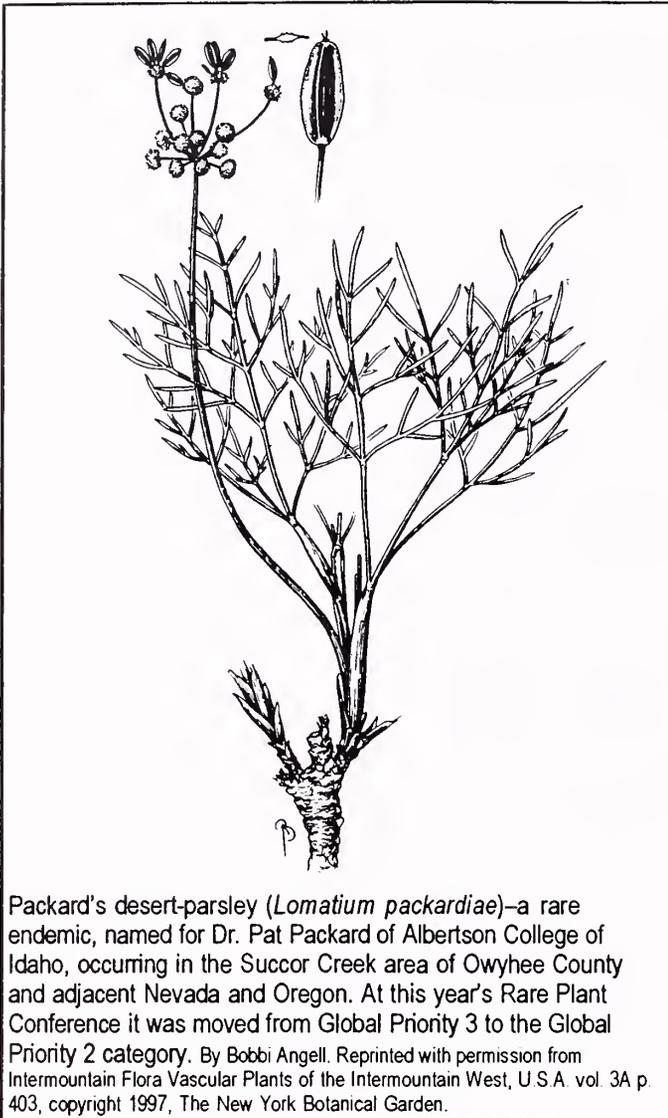
however it has a circumpolar distribution. To better reflect its rangewide standing, it was moved from the Global Priority 3 to the State Priority 1 category.

Cirsium brevifolium (Palouse thistle)—This Palouse region endemic was moved from the Review to the State Sensitive category. Habitat loss and degradation, along with seed predation from introduced biocontrol insects are the main threats facing this native, white-flowered thistle.

Crassula aquatica (pigmy-weed)—This is a diminutive, succulent-leaved member of the stonecrop family that has been recently documented in Idaho. Its conservation status in the state is



Downingia insignis. This pretty annual was first recorded in Idaho in 1998. It was moved from the Review category to the State Priority 1 category at this year's Rare Plant Conference because no additional populations were found in 1999. By Bobbi Angell Reprinted with permission from Intermountain Flora Vascular Plants of the Intermountain West, U.S.A. vol. 4 p 523, copyright 1984, The New York Botanical Garden.



Packard's desert-parsley (*Lomatium packardiae*)—a rare endemic, named for Dr. Pat Packard of Albertson College of Idaho, occurring in the Succor Creek area of Owyhee County and adjacent Nevada and Oregon. At this year's Rare Plant Conference it was moved from Global Priority 3 to the Global Priority 2 category. By Bobbi Angell. Reprinted with permission from Intermountain Flora Vascular Plants of the Intermountain West, U.S.A. vol. 3A p. 403, copyright 1997, The New York Botanical Garden.

unknown, so it was added to the Review category.

Cymopterus ibapensis (Ibapah wavewing)—This species was moved from the State Sensitive to the Review category because of the unclear relationship between plants identified as this taxon from rocky, high elevation sites in east-central Idaho and those from vernal pool and sagebrush habitats in the southwestern corner of the state. Distribution, abundance, and taxonomic questions raised by this unclear relationship need to be clarified to understand conservation concerns for this species.

Cyperus rivularis (shining flatsedge)—Recent riparian habitat studies along the Boise, Payette, and Snake rivers in southwestern Idaho have found this tufted annual to be more common than previously known. As a result, it was moved from the State Priority 1 to the State Monitor category.

Downingia insignis—Not known in Idaho until 1998, this pretty annual flower was added to the Review category at last year's conference. No additional populations were found this past year, and

it was moved to the State Priority 1 category.

Iris versicolor—Despite extensive fieldwork in northern Idaho wetland habitats over the years, this small iris remains only rarely reported in the state. As a result, it was moved from the Review to the State Sensitive category.

Leptodactylon pungens ssp. *hazeliae* (Hazel's prickly phlox)—In light of the number of known populations for this Hells Canyon area endemic, and the minimal threats it faces, it was moved from the Global Priority 1 to the Global Priority 2 category.

Lesquerella multiceps (western bladderpod)—This regional endemic is known from the Bear River Range in northeastern Utah, extreme southeastern Idaho, and adjacent Wyoming. Because there have been only a handful of collections in Idaho, it was moved from the Review to the Global Priority 3 category.

Lomatium packardiae (Packard's desert-parsley)—This species is known from only about 10 populations in northern Nevada, the Succor Creek area of western Owyhee County, Idaho, and adjacent Malheur County, Oregon. In recognition of this rangewide rarity, it was moved from the Global Priority 3 to the Global Priority 2 category.

Lupinus uncialis (inch-high lupine)—In Idaho,



Purple meadow-rue (*Thalictrum dasycarpum*) is a showy plant that has been collected only a few times in Idaho. At this year's Rare Plant Conference it was moved from the "Review" to the State Priority 1 category.

Global Priority 1—Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences).

Global Priority 2—Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences).

Global Priority 3—Rare or uncommon but not imperiled (typically 21 to 100 occurrences).

State Priority 1—Taxa in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate; these are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

State Priority 2—Taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continue.

State Sensitive—Taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2 but whose populations and habitats might be jeopardized without active management or removal of threats.

State Monitor—Taxa that are common within a limited range as well as those taxa which are uncommon but have no identifiable threats.

Possibly extirpated—Taxa which are known in Idaho only from historical (pre-1920) records or are considered extirpated from the state.

this smallest of lupines is known from southern Owyhee County. A few new populations were discovered this past year and its status changed from State Priority 2 to State Sensitive.

Orobanche pinorum (pine broomrape)—Known from scattered locations in northern Idaho woodlands. It was added to the Review category.

Thalictrum dasycarpum (purple meadow-rue)—Although this is a large and distinctive meadow-rue, it has been collected only a few times in Idaho. It is a widespread species, known in Idaho from the northern and southeastern parts of the state. It was moved from the Review to the State Priority 1 category.

Trifolium douglasii (Douglas' clover)—Most of the known Idaho collections for Douglas' clover were made prior to 1960. The loss and degradation of prairie, montane meadow, creekside, and open forest habitats has occurred throughout its range in western Idaho and adjacent parts of eastern Washington and northeastern Oregon. This was sufficient information to have it moved from the Review to the Global Priority 3 category.

Except for the few species listed as endangered or threatened under the federal Endangered Species Act, all rare plants in the three Global Priority categories receive a Threat Priority rank as part of their overall INPS rank. This one-twelve ranking system is based mostly on the magnitude and immediacy of threats, with one representing the highest threat rank, and 12 the lowest. The Threat Priority rank was increased from 5 to 2 for *Haplopappus liatrifolius* (Palouse goldenweed), decreased from 9 to 12 for *Chrysothamnus parryi* ssp. *montanus* (Centennial rabbitbrush), and decreased from 6 to 12 for *Eriogonum ochrocephalum* var. *calcareum*



River bulrush (*Scirpus fluviatilis*)—one of nine plants taken off the Rare Plant List at the Idaho Rare Plant Conference this year, because it is more common than previously thought.

(calcareous buckwheat).

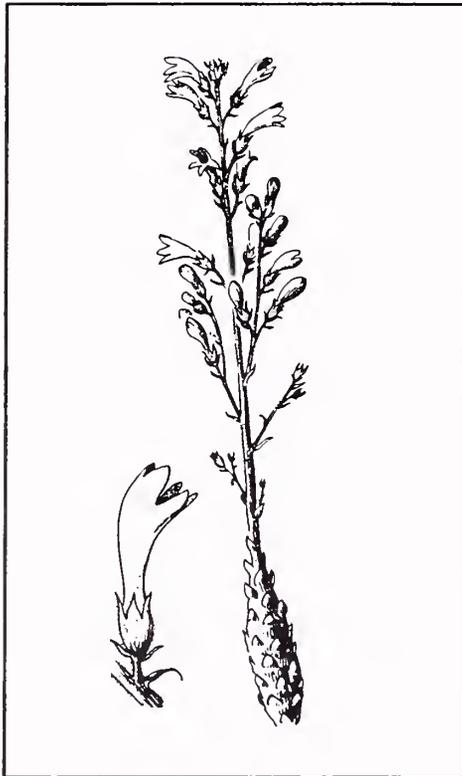
Eight of the nine species taken off the Rare Plant List were dropped because they were found to be too common, including, *Astragalus salmonis* (Trout Creek milkvetch), *Buxbaumia piperi* (Piper's bug-on-a-stick), *Chrysothamnus humilis* (dwarf rabbitbrush), *Platanthera orbiculata* (round-leaved rein-orchid), *Rhinanthus minor* (yellow rattle-box), *Scirpus fluviatilis* (river bulrush), *Symphoricarpos oreophilus* var. *parishii* (Parish's snowberry), and *Utriculata intermedia* (mountain bladderwort). *Equisetum scirpoides* (sedgeliike horsetail) was dropped because it is not known to occur in Idaho.

The names of two species on the list were updated to agree with the current taxonomic thinking in the available volumes of the "Flora of North America." What was formerly called *Asplenium viride* (green spleenwort) is now *Asplenium trichomanes-ramosum*, and the *Argemone munita* (armed prickly poppy) we have in Idaho now goes by the name *Argemone munita* ssp. *rotundata*. In addition, Idaho apparently has three varieties of *Pediocactus simpsonii* (Simpson's hedgehog cactus), not just the variety *robustior* as previously thought. As a result, this beautiful cactus will be referred to as simply *Pediocactus simpsonii* on the Rare Plant List.

Conservation of Spalding's Catchfly (*Silene spaldingii*) at Garden Creek Ranch (Hells Canyon, ID)

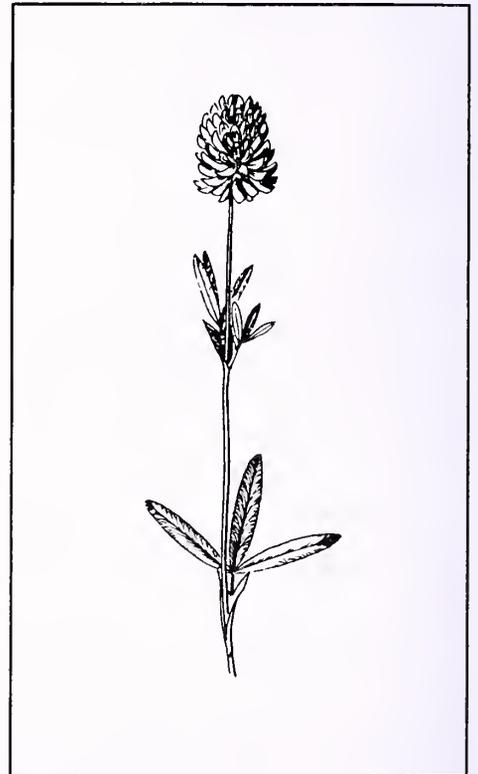
Janice Hill and Karen Gray, *The Nature Conservancy of Idaho*

The 14,000-acre Garden Creek Ranch, located in Hells Canyon south of Lewiston, is jointly owned and managed by The Nature Conservancy and the Bureau of Land Management to protect the high quality natural resources and overall biodiversity. Marked differences in elevation, aspect, and geology have created diverse habitats that support a wide array of plants, plant communities, and animals, many of which are rare and/or endemic. Some of the best remaining examples of Pacific Northwest Bunchgrass canyon grasslands, thirteen rare plants, and thirteen rare plant communities occur at the ranch. The primary threat to this ecosystem is the invasion of a number of aggressive, non-native plants. Weed control and restoration are very difficult due to the steep, inaccessible terrain. The management plan for the Ranch focuses on weed control with priority given to roadways, weed-free areas, satellite infestations, new invader weed species, and rare plant sites.



Pine broomrape (*Orobanche pinorum*) is known from scattered locations in northern Idaho forests. It was added to the "Review" category at the Rare Plant Conference this year.

Douglas' clover (*Trifolium douglasii*) was moved from the "Review" category to the "Global Priority 3" category at the Rare Plant Conference. There have not been many recent observations of it in Idaho, and its habitat—prairie, montane meadow, riparian areas—has declined.



The Ranch has the largest known population of the proposed threatened plant, Spalding's catchfly (*Silene spaldingii*), in Idaho. Currently, approximately 1,800 individual plants have been located. Conservation activities at six *S. spaldingii* sites in the Lower Corral Creek Study Area were initiated during the summer of 1999. The work consisted of: 1) mapping of *S. spaldingii* subpopulations and aggressive weed infestations, 2) establishment of permanent photo points, 3) establishment of a belt transect, 4) initial weed control, and 5) collection of data on individual *S. spaldingii* plants. The rare Palouse goldenweed (*Haplopappus liatrisiformis*) occurred with *S. spaldingii* at one site.

Maps of the spatial relationship between rare plant subpopulations and weed infestations provided baseline information to assess management activities and helped to determine appropriate weed control methods, i.e., hand pulling or herbicide wicking of infestations within rare plant subpopulations or herbicide spraying of infestations located at a safe distance from rare plants. The belt transect, which passed through a Spalding's catchfly subpopulation and infestations of yellow star-thistle (*Centaurea solstitialis*) and St. John's-wort (*Hypericum perforatum*), was established to monitor the effect of hand weeding and to obtain demographic information. Data collection on individual *S. spaldingii* plants included number of stems per plant, height of stems, number and stage of reproductive structures per stem, and herbivory.

Eleven aggressive weed species were present at the six sites. Yellow star-thistle and St. John's-wort were considered to be the worst of the weed threats. Large yellow star-thistle infestations surrounded many of the sites, and small satellite infestations occurred within many of the sites. Extensive infestations of St. John's-wort occurred within most of the sites. Other aggressive weeds present included annual bromes, Kentucky bluegrass (*Poa pratensis*), sulfur cinquefoil (*Potentilla recta*), teasel (*Dipsacus fullonum* ssp. *sylvestris*), Canada thistle (*Cirsium arvense*), hairy vetch (*Vicia villosa*), Scotch thistle (*Onopordium acanthium*), leafy spurge (*Euphorbia esula*), and ventenata (*Ventenata dubia*). Yellow star-thistle and St. John's-wort were hand pulled in and around the area of the transect and within one meter of all remaining *S. spaldingii* plants at one site. A leafy spurge infestation, located at a safe distance from rare plants, was sprayed at another site. Weed control will continue at these sites and be initiated at the remaining sites during the 2000 field season.

Herbivory by native ungulates (deer and elk) and insects on *S. spaldingii* was substantial. Sixty-two



percent of the total 453 stems monitored were grazed (the upper portion of the stem plus any reproductive structures present had been removed). None of these grazed stems produced significant regrowth during the remainder of the season. Thirty percent of *S. spaldingii* reproductive structures were damaged by insect herbivores. Seeds were often missing in capsules that exhibited insect herbivory. Seven percent of the monitored plants were completely missing by the end of the season. The cause of the disappearances is unknown; however, gopher activity was observed in the vicinity.

Reproductive effort of *S. spaldingii* was relatively high. Seventy-seven percent of the remaining, ungrazed stems bore reproductive structures, fertile stems produced an average of 8 flowers per stem, and a large number of seeds were produced in each capsule. Only 27% of the monitored *S. spaldingii* stems actually bore reproductive structures. This low percentage was due mainly to loss of reproductive structures to native ungulate herbivory.

Future conservation activities at these six sites will include annual weed control and monitoring. Other *S. spaldingii* sites will be included as time and resources permit.

Idaho Native Plant Society Board Meeting

Leonard Lake, INPS Secretary

The Board of Directors met on February 9, 2000 at 5:30 PM in Boise at the offices of Idaho Power Company. Attending: Kristin Fletcher, Past President; Leonard Lake, Secretary; Steve Rust, Treasurer; Juanita Lichthardt, White Pine Chapter; Sarah Walker, Newsletter Editor; Chris Murphy, Pahove Chapter; Michael Mancuso, Conservation Committee; Karl Holte, Sah-Wah-Be Chapter; Carol Blackburn, Wood River Chapter; Valerie Geertson, Conference Committee.

Treasurer's Report: Steve Rust provided a review of the society's finances. Steve suggested that a portion of the funds in checking could be placed in an interest-bearing account (CD). Currently approximately \$3,000.00 is available. Steve described three options: CD, income funds, and growth funds. There was discussion by the board on the various options including mutual funds and money market accounts.

Our funding follows a cycle of winter-generated funds as a result of the rare plant conference, with expenses through most of the year. The biggest expense is *Sage Notes* at approximately \$400.00 per issue. The upfront expenses for the rare plant conference have been covered for this year. The board discussed the known expenses that will come due during the year such as our mailing permit and post office box.

There was also discussion of using the income from the account in the future for a scholarship fund or for conservation projects. These ideas were tabled for further discussion and development.

Leonard moved and Juanita seconded that the treasurer move forward with setting up an interest account for no more than \$3,000.00 and no longer than one year, with the understanding that enough money remains in checking to cover our operational expenses for the year. The motion carried.

Website: Valerie provided a summary of the website for the Idaho Native Plant Society. It can be found at <idahonativeplants.org>.

The site contains the results of the Rare Plant Conference, chapters and membership information, links, and a list server. In the near future conservation issues will be highlighted along with articles from *Sage Notes*. Copyright language and disclaimer for the reprinted articles will be developed by the Editorial Board of *Sage Notes*.

Yearly fee for the server is \$35.00. The first two years have been paid.

Juanita moved and Karl seconded to authorize the payment of the yearly fee to maintain the website for the Idaho Native Plant Society. Motion carried.

Dues increase: There was a proposal to raise our state dues by \$5.00 and change the ratio between the parent society and the chapters. (It is now 75% to the state society and 25% to the chapters.) After discussion the board decided to drop the proposal, since dues should be raised in relation to increasing expenses or increasing programs and activities; both of which are relatively stable at this time. Steve agreed to review the bylaws concerning the ratio of dues between the parent society and the chapters to see if there is flexibility in the split.

Officers: Steve Rust agreed to remain the treasurer for another year. Leonard Lake agreed to remain the secretary for another year.

There was a discussion whether the following bylaw change, which staggers the election of officers and increases the term to two years, was approved by the membership during the last election:

Section 5. Term of Office

1. The officers shall be elected to a two-year term. The elections of officers shall be staggered so that two of the four officers are scheduled for election each year. Elections for president and treasurer shall be conducted in the same year, while elections for vice president and secretary would be in the following year.

Steve Rust agreed to review last year's election results.

Karl Holte volunteered for the office of president. Steve moved and Kristen seconded that the board appoint Karl to finish the term of president that is currently vacant. The motion carried with one member abstaining.

The meeting adjourned at 7:30 PM.

Native Plant Gardening Questionnaire

Please help us compile helpful information on native gardening for *Sage Notes* by telling us briefly of your experiences!

1. What native species have you had luck with, or are especially pleased with?
2. Tell us what you like best about these plants (fit my climate; attract birds; good for beginners; good for those who want a challenge; good ground-cover, etc.)
3. How does one acquire this plant without exploiting existing wild populations?
4. What aspect of growing natives would you like to see covered in *Sage Notes*? (attracting wildlife, drought-tolerant plants, etc.)
5. Check which best describes your gardening environment:
 Mild climate with long season
 Harsh climate, short season
 Below 3500' elevation Above 3500' elevation
Limiting factors drought heat frost other
6. Additional comments?

Please return by April 15

Sarah Walker, *Sage Notes* Editor, Peck, ID 83545, (208) 486-6231, or <dspeck@clearwater.net>

THANK YOU!

Membership/Renewal Form

Idaho Native Plant Society

(native plant gardening questionnaire on reverse)

The Idaho Native Plant Society (INPS) is dedicated to promoting interest in native plants and plant communities and to collecting and sharing information on all phases of the botany of native plants in Idaho, including educating the public to the values of the native flora and its habitats. Membership is open to anyone interested in our native flora.

Category	Annual Dues, payable Jan. 1
<input type="checkbox"/> Patron	\$ 30
<input type="checkbox"/> Individual	\$ 10
<input type="checkbox"/> Household *	\$ 15
<input type="checkbox"/> Student	\$ 7
<input type="checkbox"/> Senior Citizen	\$ 7

Please make check payable to INPS and mail dues to: Steve Rust, Treasurer, 1201 N. 24th, Boise, ID 83702, and all correspondence to INPS, Box 9451, Boise, ID 83707

Name _____

Address _____

City/State _____

Zip _____

Telephone _____

Email address _____

Is this a renewal _____ or a new membership _____ ?

Chapter affiliation? (check one)

Calypso (Coeur d'Alene; please include \$6 newsletter dues)

Kinnikinnick (Sandpoint)

Pahove (Boise)

Sah-Wah-Be (SE Idaho)

White Pine (Moscow)

Wood River (Ketchum-Sun Valley; please include \$7 chapter dues)

None. Those who do not live near a chapter are 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 wish to be involved in.

* Household memberships are allocated two votes

INPS Membership

IDAHO

Athol

Mark Mousseaux

Bayview

Ellen Franz

Bellevue

Tom & Anne McAuliffe

Boise

Kay Beall

Holly H. Beck

Bobbie Billings

Bert Bowler

Cate Brigden & Steve Rust

Alan Byrne & Tamara Tanaka

Marcia Cogswell

Nancy Cole

Cyndi Leavitt Coulter

Jerry Cross

Christopher Davidson

Kelley Davis

Ann DeBolt & Roger Rosentreter

Phil Delphey

Dale Donahue

Dorothy Douglas & Walter Buechler

Jeff Fereday & Kay Hummel

Dwight Ferguson

Robert Fitzsimmons

Amanda Gailbreath

Wilma Gluch

Walter Hankins

Anne Herndon

Jody & Jim Hull

Jill Jasper

Mabel & Robin Jones

Glenda King

Lynda Leppert

Dick Lingenfelter

Dwight Magnuson

Michael Mancuso

Angelia Martin

Mary Grunewald McGown

Agnes Miller

Maria Minicucci

Bob Moseley & Susan Bernatas

Chris Murphy

Lenora Oosterhuis

Dan Ray & Valerie Geertson

Rick Raymondi

Edna Rey-Visgirdas

Mark Rohrbach

Jeannette Ross von Alten

Paul Shaffer

Darcy D. Sharp

Mark Shumar

Monique Slipher

James Smith

Jay & Lynda Smithman

Dick & Joey Stillinger

Michael & Margie Twitchell

Donald N. Wells

Bonner's Ferry

Sally Grant

Margaret Mouat

Luise Peyton

Caldwell

Patricia Herbel

Careywood

Vicki Marron

Janet E. Benoit

Chubbuck

Carlene McDougal

Clark Fork

Konrad Dahlstrom & Joyce Pence

Cocolalla

Pat Brown

Phyllis & Walter Mott

Coeur d'Alene

Edward & Kristine Buchler

LeAnn Eno

Ralph & Peggy Faust

Rebecca Brown Thompson

Cottonwood

Mark Lowry

Council

Mering Hurd

Butch & Becky Snorgrass

Terry Tolbert

Deary

Merrill & Mary Conitz

Janice Hill

Driggs

Jeff Klausmann

Mike & Linda Merigliano

Penny Vasquez

Eagle

Robert Steele

Michael J. Wissenbach

Emmett

David Potter

Grangeville

Pat & Dave Green

Leonard & Marian Lake

Hagerman

Hagerman Fossil Beds Nat. Monu.

Hailey

Kim Hofelt

Lisa Horton

Diana Landis

Jo Ann Robbins

Hayden

Carolyn Cozzetto

Phil Hruskocy

Hayden Lake

Diane Christ

Hope

Dianna Copeland

Beverly Hall

Dorothy Modafferi

Mary Shackelford

Idaho Falls

Nancy Hampton

Gerald Jayne

Rose Lehman

Jerry & Robyn McCarthy

Kim Ragotzkie

Brian Schuetz

Indian Valley

Nancy Armitage

Inkom

Kathleen Lehman

Louise & Robert Shaw

Jerome

Lorna Irwin

Kamiah

Mrs. Lillian Pethtel

Kendrick

Dick & Roberta Bingham
Ken & Marjorie Wilken

Ketchum

Doreen Dorwood
Betsy Pomeroy
JoAnne Vassar
Wood River Land Trust

Kooskia

John Warofka

Lewiston

Kathy Elliot
Alfred LaPlante
Sandra Robins
Angela Sondenaa

Lowman

Penny Myers

McCall

Jim Crawford & Margo Conitz
Alma Hanson
Marilyn Olson

McCammon

Prof. Thomas R. Cox

Moscow

James & Judith Austin
Roger Blanchard
Ray & Erma Boyd
Elizabeth Brackney
Steve & Pam Brunfeld
Paul & Annette Brusven
Janet Campbell
Lynn Cantrell
Mary Fauci
Dennis & Connie Ferguson
Judy Ferguson
Lauren Fins
Malcolm Fumiss
Archie & Mary George
Laura Gephart & Peter Chilson
Liz Hall
Jeanie Harvey & Earl Druker
Mike & Janet Hays
Trish Heekin
Pat Hine & Jim Reece
Ray & Bettie Hoff
Fred & Jinny Johnson
Bob & Arlene Jonas
Loring & Veralee Jones
Greg & Megan Klemsrud
Ned Klopfenstein
Karen & Karl Launchbaugh

Sonja Lewis & Chuck Wellner
John & Elizabeth Marshall
Charlott Matinkus & Bruce Taylor
Paul McDaniel & Juanita Lichthardt
Larry McLaud
Frank Merickel
Nick Natale
Alan Poplawsky
Janet Silbernagel
Robert & Rosemary Skiles
Marge & Al Stage
Ellen Thiem
Jonalea Tonn
Katie Wilde

Nampa

Nancy Shaw

Naples

Helen H. Julian

Oakley

Miniam Louise Austin

Ola

Fred & Melly Zeillemaker

Peck

Sarah & Dick Walker

Pocatello

Jay & Phyllis Anderson
Joan Bergstrom
Audene Campbell
Drew Ceperty & Amy Morris
Jayne Chipman
Cleve Davis
Kristin Fletcher
Harry & Susan Giesbrecht
William Haight
Glenn Harvey
Geoff Hogander
Karl Holte
Deborah Jeppson
Jeff McCreary
Ruth Moorhead
Mel & Barbara Nicholls
Naida Olson
Priscilla Reis
David & Christy Smith

Ponderay

Nicole French
Pama Pierson
Pat Ramsey
Shirley Thomton

Post Falls

Laura & Bill Asbell
John Riley & Viki Leuba

Potlatch

Betty Southwick

Priest River

Betty Watts

Princeton

Gerry Queener

Rathdrum

Cynthia Langlitz
Vicki Peterson

Ririe

Shari Sellars

Sagle

Weslie & Joan Andres
Sylvia Chatbum
Fields W. Cobb, Jr.
Betsy Hammet
Charlotte Kerr
Nancy Low
Sherry Metz
Delano Pierce
Jeff Rich
Annette & James Runnalls
Patricia Stevens
Pat Van Volkenberg

Sandpoint

John & Valerie Albi
Gretchen Albrecht-Hellar
Eileen Atkisson & Lawrence Blakey
David & Marjorie Butts
Janice & Jack De Baun
Vema Mae Davis
Jim & Barbara Ann Ford
Phil & Michael Franklin
Marilyn George & Artis Harvey
Margie Gibson
Hazel Hall
Shirley Hardy
Harold Hartmann & Dalles Hilton
Mollee Hecht
Isabel Holliriegel
Shelley & Scott Johnson
Sue Kohut
Harold & Marilou Laws
Terri Maurice
Elizabeth Merrill
Steve Mullen & Carol Holmes
Cherie Murphy
Dian Nelson

Valle Novak
Betty Padgett
Barbara Pressler
Nancy Renk
Nancy & Jack Rose
Suzanne Sawyer
Patrick Torney
Robert & Gretchen Ward
Donald Welter
Joseph & Lois Wythe

Shoshone
Fred & Carol Blackburn

Sun Valley
Bill & Jeanne Cassell
Christine Gertschen
Florence Mackie

Twin Falls
Barbara Gentry

Viola
Kappy Brun
Reid & Nancy Miller
Pat & James Peek

Weiser
Betty Derig
Margaret Fuller

CALIFORNIA

Berkeley
Barbara Ertter

Cloverdale
Jack & Betty Guggolz

Del Mar
Ross & Leslie Hall

San Francisco
Strybing Arbor Society

S. Pasadena
Harry Spilman

COLORADO

Denver
Dorothy & Otis Rechard

GEORGIA

Douglasville
Wayne Owen

MAINE

Franklin
Anne & Bob Minnicucci

Yarmouth
Michael Thompson

MICHIGAN

Lansing
Patrick F. Fields

MISSOURI

St. Louis
Missouri Botanical Gardens Library

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Angela Evenden
Scott Mincemoyer
Peter F. Stickney

Noxon
Jill Davies

Whitefish
Karen Gray & Jay Shepherd

NEVADA

Ely
Alexia Cochrane

NEW YORK

Bronx
Noel & Patricia Holmgren

OREGON

Baker City
Clair Button

Columbia City
Christine & Yaghoub Ebrahimi

Corvallis
Kenton Chambers

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Rhoda & Glen Love

La Grande
Barbara E. Russell

Ontario
Jean Findley

Pendleton
Bruce Barnes

Roseburg
Jim Thompson

TENNESSEE

Greenback
Edward Clebsch

UTAH

Logan
Kim Pierson

Ogden
Teresa Prendusi

VIRGINIA

Arlington
Larry E. Morse

WASHINGTON

Albion
Sue & Steve Morrison

Asotin
Gayle Williams

Clarkston
Don Brigham

Colbert
Brian Miller

Colville
Heather Swartz

LaCrosse
Connie Horton

Palouse
Doug Flansberg
Douglas & Patricia Flansberg
Charlotte Omoto
Jim & Jan Roberts

Pullman
Karen Adams
Peggy Chevalier
Greg & Leann Douhan

Karen Hansen
Elizabeth Schwartz
Tom & Diane Weber
Bertie Weddell
James & Eileen Whipple

Spokane
Richard & Judith Gammon
David Noble

Rock Springs
James M. Glennon

Yellowstone National Park
Jennifer Whipple

Richland
Inez Austin
Karen Hinman

Laramie
Walter Fertig
Joy Handley

❖ Please forward corrections or additions to Steve Rust, INPS Treasurer, 1201 N. 24th Street, Boise, ID 83702 ❖

Chapter News

Calypso Chapter

Calypso's first meeting of the year will be March 1 to hear Tim Gerlitz of the Mycological Society speak on morel mushrooms, and to line up wildflower walks at Tubbs Hill and Q'Emelin Park, an activity for Arbor Day, and an August trip to Roman Nose. A Huff Lake trip is set for July 8.

At the fall meeting, Secretary Phil Hruskocy, Treasurer Janet Benoit, and Newsletter Editor Peggy Faust agreed to serve for another year. The chapter's "herbarium trunk," made with help from LeAnn Eno, Mark Mousseaux, and the Forest Service, is available for members to use for education programs. Peggy Faust presented the book she and her husband Ralph published, "Wildflowers of the Inland Northwest," and described how since moving to Idaho 20 years ago, they had applied their photography hobby to north Idaho's flora, taken botany classes at North Idaho College, and published their collection through the Museum of North Idaho. The book sells for \$15.95 and is available from the museum or from local bookstores.

The chapter newsletter, *Calypso Companion*, includes a notice from The Nature Conservancy (TNC). TNC is soliciting naturalists to teach classes in birding, botany, herpetology, and forest and wetland ecology, at the Conservancy's North Idaho preserves (Cougar Bay near Coeur d'Alene, Gamlin Lake near Sagle, Perkins Lake near Moyie Springs, and Moscow Mountain and Idler's Rest near Moscow). Instructors will be paid \$50 for each class taught. The classes are being offered as part of the Conservancy's North Idaho "Outdoor Exploration Program" to teach the next generation about the importance of our environment and its protection. Instructors are needed for science classes in the local schools, restoration projects with students from Anchor House (the local chapter of Idaho Youth Ranch), guided outdoor nature classes, and setting up interpretive signs and an outdoor classroom at Cougar Bay. For information contact The Nature Conservancy, 424

Sherman Ave., Suite 204, Coeur d'Alene, ID 83814, (208) 676-8176.

A proposed Forest Service interpretive project at Huff Lake, near Nordman, is attracting interest from members of Calypso Chapter as well as from the nearby Northeast Chapter of the Washington Native Plant Society and the Selkirk-Priest Basin Association. The seven-acre fen supports rare boreal species. There are plans to construct a floating dock for viewing the fen and a kiosk for interpretive signing as part of an effort to reduce trampling impacts to the peat mats. Member Dave Noble is doing a lot of the ground work for this project. For more information contact Priest Lake Ranger District biologist Tim Layser, (208) 443-6838, or botanist Diane Penny (208) 443-6847 or <dpenny/r1_ipnf@fs.fed.us>. Dave Noble can be reached at (509) 534-5558 or <dnoble@tincan.tincan.org>.

Kinnikinnick Chapter

New officers were elected at the November 1999 meeting: Valle Novak, president; John Albi, vice president; Sylvia M. Chatburn, secretary; and Patricia Stevens, treasurer. Michael and Phil Franklin continue as newsletter editors; Lois Wythe remains as arboretum coordinator; Pat Ramsey stays as membership coordinator, as do Pama Pearson as field trips coordinator, Gretchen Albrecht-Hellar as special events coordinator, and Isabel Hollriegel as hospitality coordinator.

A January meeting featured Dr. John Anderson's talk on The Kalispel People: The First to Discover and Utilize the Native Plants of North Idaho. He spoke about the native people of the Sandpoint area and the economic value of the blue camas (*Camassia quamash*) that once thrived in the moist meadowlands of eastern Washington, Idaho, and western Montana. The Kalispel lived in what is now Bonner County until 1887, when they were dispersed by the Sandpoint Treaty to reservations in Washington and Montana. The speaker read from his book "Nestelah's Journey" about a young Kalispel

woman known as Blue Flower, whose actions cause blue camas to disappear from a portion of the valley occupied by her people. Dr. Anderson told the group about the small Kalispel reservation near Usk, Washington (on the Pend Oreille River northwest of Sandpoint), where visitors are invited to attend the annual powwow.

In February members were treated to a video about the life of Juliette de Bairaclé Levy, a remarkable woman who has studied herbal medicine with nomadic peoples around the world.

The chapter would like to attract more members to the Arboretum Committee. Please contact Lois Wythe at (208) 263-8038 if you would like to help on this exciting project.

Pahove Chapter

Monthly meetings are planned for the third Thursdays of March, April, and May. A reminder with details concerning the times and locations of the meetings will be mailed to chapter members.

Upcoming events:

- In March, Chris Murphy will discuss the vegetation of 45 Ranch located in the southwest corner of the Owyhee Plateau.
- In April, Roger Rosentreter will show slides of rare and common mosses and lichens.
- In May, Michael Mancuso will discuss the flora of the Owyhee Front.

Sah-Wah-Be Chapter

The Sah-Wah-Be Chapter is quietly awaiting April, when we expect to meet for elections and trip-planning. E-mail Ruth (moorruth@isu.edu) with your suggestions for which eating establishment to try THIS year!

White Pine Chapter

Our chapter remains very active. We live in an area of diverse habitats that sustain a huge number of plant species. We are also fortunate to live near two universities where new knowledge about plants is generated. The officers will meet this winter to consider some special projects for our chapter. Some ideas are developing a web site, finding additional ways to circulate meeting announcements to reach a broader audience, and renewing our commitment to establishing native plants at the University of Idaho arboretum.

At a January meeting Dr. Linda Cook, Director of the University of Idaho Herbarium, gave a talk on "The Tragopogon Triangle—A Palouse Polyploid Complex." Usually considered a weed, this complex of five species has provided exciting insights into the ways and means of evolution in plants. One of the first and best examples of speciation (the process by



BLM ecologist Mark Lowry unearths the impressive roots of Macfarlane's four o'clock. See p. 16.

which new species are formed) through hybridization occurs right here on the Palouse.

A January field trip to Rose Creek Preserve, led by Bertie Weddell, got us out of the winter doldrums and ready for spring activities. Rose Creek Preserve contains both native riparian and native bunchgrass communities.

In February, Dr. Linda Wilson, a research support scientist at the University of Idaho, presented "Holistic Management of Invasive Plant Species." She has researched non-native hawkweed, spotted knapweed, yellow star-thistle, leafy spurge, and St. John's wort since the early 90s.

Upcoming events:

- March 23: Plant Diversity in the South West Australia Botanical Province—slide show by Nancy Miller at 7:30 PM at University of Idaho's College of Forestry, Wildlife, and Range Sciences, Room 213. Contact Sonja Lewis at (208) 882-3544.
- April 20: DNA, a Short and Simple Overview, by Dr. Steve Brunsfeld of the University of Idaho at 7:30 PM at UI's College of Forestry, Wildlife, and Range Sciences, Room 213. Contact Sonja Lewis at (208) 882-3544.

Wood River Chapter

Wood River Chapter is still accepting members. No activities are planned at this time. If anyone wants info on joining and local activities they can contact: Jo Ann Robbins at (208) 788-5585.

News and Notes

Are beetles inordinately fond of flowering plants?

When asked what he had learned about the Creator from studying evolution, the British biologist J. B. S. Haldane replied that He must have had “an inordinate fondness for beetles.” This famous quip reflects the remarkable diversity of the Order Coleoptera. With over 300,000 species, beetles have more species than any other known group of plants or animals. Recent studies by Brian Farrell at Harvard’s Museum of Comparative Zoology shed light on the connection between beetle diversity and the evolution of flowering plants. The ancestors of herbivorous beetles existed about 230 millions years ago, but these early beetle lineages, which fed on conifers and cycads, were not particularly diverse. The extraordinary diversity of beetles did not come about until after flowering plants appeared. The fact that beetles and flowering plants diversified at about the same time suggests that beetle diversity depends upon the diversity of flowering plants, but until recently evidence to support this hypothesis was lacking. To resolve this question, Farrell used data from paleontology, biogeography, genetics, and natural history to reconstruct the evolutionary history of plant-eating beetles. He produced DNA sequences from 115 species, representing all beetle subfamilies, and combined this information with data on 212 morphological characters. The resulting family trees show that beetles colonized angiosperms several times, and each time they experienced an adaptive radiation in which they evolved into many new and varied forms, such as leaf miners, leaf chewers, seed eaters, and root feeders. The newly evolved angiosperms were like unoccupied islands. When herbivorous beetles colonized each new “island,” they diversified in bursts of speciation (like Darwin’s famous finches on the Galapagos Islands). Each time an angiosperm-feeding group of beetles arose, it evolved into a host of new forms. Farrell’s work supports the contention that the reason there are so many beetles is because the evolution of flowering plants provided them with resources that they were able to exploit in myriad ways. His intriguing analysis leaves one wondering if perhaps it was really beetles’ inordinate fondness for flowering plants that led to their great diversity.

Maybe it should be called “*Miraculis*” *macfarlanei*.

At this year’s Rare Plant Conference, ecologist Mark Lowry of the BLM Cottonwood Field Office updated us on rescue efforts for a population of *Macfarlane’s* four o’clock (*Mirabilis macfarlanei*, the first plant in Idaho to be listed under the Endangered Species Act) that had been in a large landslide and associated access road construction on private land along Highway 95 between Riggins and White Bird (milepost 210.5). With help from Roger Rosentreter

and others, diggers risked the steep, unstable slide area to uncover 426 plants for transplanting—and survived new slides that came down while they were working. Arrangements had been made with the landowner, but confusion occurred, and an unexpected visit from Idaho County deputies was further complicated by Roger’s mischievous display of a damp burlap sack of hefty yam-sized roots accompanied by the comment, “I’ve got the goods.” Next came the arduous task of digging large holes to plant the rescued roots at the nearby Lucile Caves Research Natural Area. All were safely planted and watered, and their future seemed bright until a July 2 fireworks fire burned over a fourth of the new transplants, killing aboveground stems. Hopefully, mortality will be light, since the plants had started to die back for the year. We’re keeping our fingers crossed. Mark added that the population that was accidentally sprayed in 1997 (see *Sage Notes* Summer 1998, 20(3):17) is showing 80% survival. There are six populations of this threatened species along the Salmon River, and Mark, Brian Maier, and Wendy Velman collected over 5 lbs of seeds for the Berry Botanic Garden seed bank in Portland (see *Sage Notes* Spring 1999 21(2):12).

New Native Plants Journal produced in Idaho. The first issue of *Native Plants Journal* came out in January. This cooperative project between the University of Idaho Research Nursery and the USDA Forest Service provides a forum for dispersing practical information about the planting and growing of North American native plants for conservation, restoration, reforestation, landscaping, and highway corridors. The journal includes papers that are useful to, and understandable by, growers and planters of native plants and that contribute significantly to scientific literature. Check the web site <www.uidaho.edu/nativeplants> for current titles and abstracts of papers. The journal will be published twice a year, and a one-year subscription is \$30. Complimentary issues, while supplies last, are available from Kas Dumroese, Editor, *Native Plants Journal*, Forest Research Nursery, University of Idaho, Moscow, ID 83844-1137 or at the website.

Excellent new rare plant guide on the web. Check out the “Montana Rare Plant Field Guide” on the Montana Natural Heritage homepage at <<http://orion2.nris.state.mt.us/mtnhp/plants/>>. There are photos and line drawings, habitat descriptions, status lists, dot maps, and references for over 300 species. Information is updated quarterly. Also linked to this site is the newsletter of the Montana Natural Heritage Program, *Optimolocus*.

New book on range and biodiversity. The University of Oklahoma Press has published a new book, "The Western Range Revisited: Removing Livestock from Public Lands to Conserve Native Biodiversity," by University of Wyoming College of Law Professor Debra Donahue. Professor Donahue proposes a landscape-level strategy for conserving native biological diversity on federal rangelands, a strategy based chiefly on removing livestock from large tracts of arid BLM lands in 10 western states. Pahove member Roger Rosentreter is mentioned. Copies may be ordered from OU Press at (800) 627-7377 and <www.ou.edu/oupress>.

Lichen soup. Bryology Professor Janice Glime reports from Michigan Technological University: "One of my students told me his aunt has a recipe for rock tripe (*Umbilicaria*) soup. His story is that the Ojibway Indians used it as an emergency food in this area, and when the missionary Father Marquette needed food in the winter the Native Americans showed him this to use as food. My student has tried it as a soup with some cut up onions and a little salt and butter (on hand for an unsuccessful fishing trip) and claims it is quite good, having a mushroom taste. Maybe George Washington really did feed it to his troops at Valley Forge."

Lewis and Clark plants in Clarkston. The Port of Clarkston, WA, right across the river from Lewiston, ID, is planning to feature plants collected by the famous explorers. When the Corps of Discovery camped at the confluence of the Snake and Clearwater Rivers in 1805, they described the area as "open plains, no timber of any kind, a few hackberry bushes and willows excepted." The seven-acre park will be planted with many of the species reported by Lewis and Clark, with special emphasis on the Snake-Clearwater region.

Fire on the Mountain. The Bureau of Land Management is requesting public input on their proposed use of prescribed fire to reduce natural fuels concentrations in the Craig Mountain Cooperative Management Area south of Lewiston, ID. Comments are due by 31 March 2000. For a copy of the complete "Request for Public Input" notice, contact BLM, Cottonwood Field Office, Route 3, Box 181, Cottonwood, ID 83522, (208) 962-3245. Questions/concerns? Contact Janice Hill (janice@turbonet.com).

❖ Please send us news of your native gardening experiences on the questionnaire inside this issue—thanks. ❖

Sage Notes is published in February, May, September, and December by the Idaho Native Plant Society, incorporated since 1977, under the laws of the State of Idaho. Editor, Sarah Walker; Technical Editor, Bertie Weddell; Circulation Manager, Juanita Lichthardt; Contributing Editor, Karen Gray. **Newsletter ads:** personal ads \$2; commercial ads \$5 for 1/8 page, \$8 for 1/4 page, \$15 for 1/2 page, and \$25 for full page. Ads should be sent with payment. **Submissions:** members and others are invited to submit material for publication. Articles in any form, even hand-written, are welcome, as is art work. Please provide a phone number in case there are questions. Material will not be returned. Send submissions directly to the editor, Sarah Walker, PO Box 69, Peck, ID 83545, (208) 486-6231 or <dspeck@clearwater.net>. Submission deadlines are January 1, April 1, August 1, and November 1.

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The Idaho Native Plant Society (INPS) is dedicated to promoting interest in native plants and plant communities and to collecting and sharing information on all phases of the botany of native plants in Idaho, including educating the public to the values of the native flora and its habitats. In keeping with our mission, it is the intent of the INPS to educate its membership and the public about current conservation issues that affect Idaho's native flora and habitats. **Membership** is open to anyone interested in our native flora. Send dues to Steve Rust, Treasurer, 1201 N. 24th, Boise, ID 83702, and all **correspondence** to INPS, Box 9451, Boise, ID 83707

Category	Annual Dues, payable Jan. 1
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 None. Those who do not live near a chapter are 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 wish to be involved in.

* Household memberships are allocated two votes.

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Response to Native Plant Gardening Questionnaire: Response has been sparse but enthusiastic. The form is on our new website <idahonativeplants.org> and most replied that way. Feel free to keep sending in your information; this can be ongoing.

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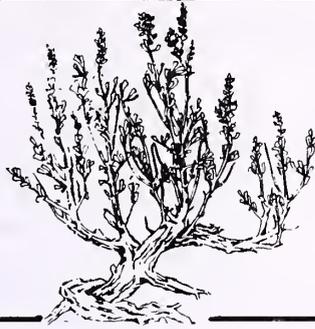
Errata:

INPS board meeting notes in last issue—omitted that Sarah Walker will retire as *Sage Notes* Editor after the Winter 2000 issue.

Idaho Rare Plant list in last issue—*Cirsium brevifolium* (G3/T5) was moved from the Review List to Global Priority 3 (not State Sensitive). This species is a Palouse/Canyon Grasslands endemic, and is threatened by weeds and bio-control insects.

Articles contributed to Sage Notes reflect the views of the authors and are not an official position of the Idaho Native Plant Society.

Sage Notes



...promoting interest in
Idaho's native flora.

Spring 2000 ❖ SAGE NOTES ❖ A Publication of the Idaho Native Plant Society Vol. 22 (2)

Exciting New Career for Bob Moseley

Dear Friends,

After nearly 12 years at the Idaho Conservation Data Center, I'm leaving and returning to a former employer, The Nature Conservancy. And, after 24 years exploring the ecology and botany of Idaho, I'm heading off to explore another exciting place for a while. March 28 will be my last day working for Idaho Fish and Game. Around April 7, I'll be headed across the Pacific to be a Senior Ecologist with the Conservancy's Yunnan Great Rivers Project in southern China. I spent a month in China last January working on the project and am excited to be able to continue. At first we'll be assisting the provincial government to design a system of biodiversity conservation areas for northwestern Yunnan. Then we'll work on developing more localized conservation plans for a couple of pilot areas identified during the first phase.

The project area encompasses the eastern end of the Himalayas in northwest Yunnan. It's traversed by three of the world's great rivers, the Yangtze, Mekong, and Salween, which cut three parallel canyons as they drop off the Tibetan Plateau. The canyons are often 8,000 to 10,000 feet deep. Sometimes more! Quite a few peaks are above 16,000 feet and several are above 20. Overlying this remarkable landscape is the most biologically diverse temperate ecosystem on earth, as well as seven ethnic minorities, most notably the Tibetans. It's the intersection of biodiversity and cultural diversity conservation that makes this project so exciting.

I always wondered what I'd do after working in Idaho for so long, exploring the best places in the state. It's probably not too surprising to most of you that I'd shift my attention as a conservation biologist from the Northern Rockies to the greatest mountain range in the world. And I'm jazzed!

I'll be splitting time between Idaho and Asia. My address stateside will be our Boise home: 904 E Washington, Boise, ID 83712, (208) 345-0595.

The project office in China is in the capital of Yunnan. When you get to eastern Asia look me up: Yunnan Representative Office, The Nature

Conservancy, 26th Floor Xin Hua Office Tower, 8 East Ren Min Road, Kunming, Yunnan 650051, Peoples Republic of China. Tel and Fax: (86) 871-318-2793

Effective more or less immediately, my new email address will be the easiest way to contact me, especially overseas (we have a direct Internet line into the office): <bobmoseley@hotmail.com>. Keep in touch!

Bob

Wild Bees and Floral Jewels

Vince Tepedino, Research Entomologist, USDA Agricultural Research Service Bee Biology and Systematics Laboratory, Logan, Utah

Ed note: After hearing Vince Tepedino's entertaining presentation "A Fine Romance: Native Bees and Rare Blossoms in the American Outback" at the Rare Plant Conference banquet, we got requests for an article by him in Sage Notes. The following is from Wings, Essays on Invertebrate Conservation, Spring 1997. Reprinted with permission from The Xerces Society.

The western United States is among the richest areas of bee diversity in the world. Flower patches from the Sonoran Desert to Sierran meadows buzz softly with the peans bees pay to flowers. Most of our wild, native bees are found in the arid regions west of the hundredth meridian: California has 1,500 species, Utah and Arizona more than 1,000 each, the Columbia Basin over 800, and Wyoming, that land of cool, dry summers and frigid winters, claims over 600 species. These insects are the chosen matchmakers for plants: they have evolved in intimate association with our flora. Indeed, bees have helped shape the flora and have, in turn, been shaped by it.

What do we mean by the somewhat suspect term "native bees?" We certainly do not mean honey bees, either domesticated or feral, which are native to Eurasia and Africa, and were first established in North America in 1622. Honey bees play little part in the

pollination of the rare plants bee scientists have studied. Nor should bees, which are vegetarian, be confused with their carnivorous, less hairy relatives, the wasps. The term “native bees” refers to the 3,000 to 5,000 species that are both indigenous and ubiquitous across unpaved areas of the United States.

Most native bees are solitary: they do not, like bumblebees or honey bees, live in annual colonies or perennial hives; there is no comb or honey. Because there are no workers, there is no division of labor and no aggressive defense of the nest. Solitary thus means mostly placid females acting alone in their own best interests. These bees visit flowers for food (pollen and nectar) and, while foraging, transfer pollen from one flower to another.

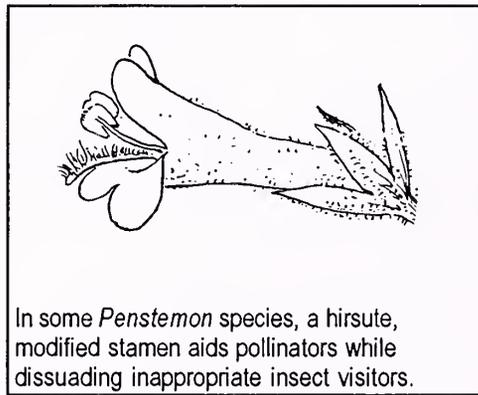
In 1983, former South Dakota rancher Claude Barr capped a lifetime of fascination and work with native plants of the Great Plains by publishing “Jewels of the Plains.” “Jewels” was Barr’s apt metaphor for the bright, showy flowers that many of our usually subdued plant neighbors display when the time arrives for them to reproduce. For humans, the heady odors and brilliant hues of wildflowers enliven springs and summers on the Great Plains. For native bees, the more traditional members of the grassland community, the seasonal reappearance of flowers acts as a cue to once again assume their ongoing role in the process of natural selection—that of winged lapidaries, fashioning floral gems into jewels.

The flowers that fascinated Barr have many relatives west of the Great Plains, some of which, if not more beautiful, are even more precious. From the Colorado Plateau to the Great and Columbia basins, to the deserts of the Southwest, there are about 150 plants so rare that they have merited special designation as threatened or endangered under the Endangered Species Act. In the Southwest, these include rare barrel cacti (*Pediocactus* and *Sclerocactus* species) that bend their stamens to form an arbor over brilliant green sweat bees that have plunged, nectar-bent, into the flower. Along riparian corridors in Utah and Colorado, orchids (*Spiranthes diluvialis*) paste packages of pollen called “pollinia” to the mouth parts of visiting bumblebees and anthophorid (miner) bees. In Nevada and Utah, small andrenid (digger) bees seek pollen from nectarless rare poppy flowers (*Arctomecon* species), and pack so much of it onto their hind legs that they look like they have been planted in yellow barrels. Blueviolet beardtongues (*Penstemon* species) in Nebraska and Colorado offer a hirsute, modified stamen that aids pollinators in exploiting the flowers, but also dissuades less trustworthy insect visitors from doing so. Four o’clock flowers (*Mirabilis macfarlanei*) in

Oregon and Idaho, beyond the distribution range of their usual moth pollinator, remain open and nectar-filled into the late morning to attract miner bees.

These plant species, and the others on the list of 150, are each limited to a few small, isolated, genetically impoverished populations on federal lands. Frequently they must compete for living space, and the attention of land managers, with mining, timber, livestock, and recreational interests. Because the danger of species extinction increases as the numbers of individuals and populations decline, conserving these plants requires careful management: human caused threats must be excluded or mitigated, and informed recovery plans must be designed and implemented that support growth in number of individuals and populations.

Recovery of any species begins with successful reproduction: extant populations cannot grow, extirpated populations cannot be restored, and new populations cannot be initiated in promising areas without a supply of new individuals. For rare plants, it is critical that these new individuals be the products of sexual



In some *Penstemon* species, a hirsute, modified stamen aids pollinators while dissuading inappropriate insect visitors.

reproduction, because only sexual reproduction yields individuals with new combinations of genes. Genetic enrichment of populations is all but mandatory if rare plants are to cope with the numerous environmental vagaries they are almost certain to face over long periods of time.

Because they are immobile, plants are hard pressed to produce genetically new individuals without enlisting outside aid. The scent and shape of their flowers do not serve to attract other plants. Nor do their showy blooms make better use of water or wind to move pollen. Instead, plants have flowers because their progenitors successfully reproduced by inveigling insects, birds, bats, and other animals to transport viable pollen (which contains the male zygotes) from the stamens of one flower to the female stigma of another. Not uncommonly, transfer must take place between flowers on different plants, i.e., cross-pollination, for seed-set to occur.

Over the past decade, I have been studying the reproductive biology and pollinators of rare plants in the West with several colleagues at the USDA Agricultural Research Service (ARS) Bee Biology and Systematics Laboratory and the Department of Biology at Utah State University. Our purpose has been threefold. First, we wanted to confirm that rare plants need pollinators. Some scientists have reasoned that automatic self fertilization should be a common development in rare species that produce relatively few flowers because they are less likely to attract high energy and nutrient demanding pollinators such as

bees. A second objective has been to identify important pollinators of species that require them, and to learn something of their biology. Finally, we wanted to inform land managers of the importance of pollinators of rare plants, and provide advice on how best to preserve them. The first two inquiries yielded disconcertingly uncomplicated answers: the flowers of all but a few of the 27 rare plant species we have studied must be pollinated by insects to reproduce sexually, and the insects usually responsible for pollination are native bees.

Our studies of rare plant pollination, and of the matchmaking bees that accomplish it, also reveal how conservation issues can become complex, and why managing communities or ecosystems rather than individual species is so important. Conserving endangered plants, and preserving the integrity of our native flora in general, will require not only removing direct threats to the plants, but will also require preservation of their pollinators.

For bees to be successful, they must, at the very least, have adequate nesting habitat and food, i.e., pollen and nectar. Additional requirements, such as water and leaves or other extraneous materials sometimes used in nest construction, must be readily available. The first complication of note is that there is no guarantee that acceptable nesting habitat of the bee is conterminous with the habitat of the rare plant it pollinates. Indeed, they may be distant. The remedy is straightforward: we must discover where the bees nest, and offer those sites the same protection we offer the plants.

A second complication is that some plants, like the rare poppies mentioned above, offer only pollen, while others, like the four o'clocks, are visited only for nectar. Bees need both. This means that bees visiting such "single resource" rare plants must have other contemporaneously blooming species that supply the missing food item. Clearly, we must have detailed information about the biology of all participants to ensure that such supplementary species are available, and we must be prepared to use that information in a broader, community approach to conservation.

An additional complication ensues when rare species, like the riparian orchid, are pollinated by social bees, such as bumblebees. A bumblebee colony is active for a much longer period than are solitary bees. Frequently, bumblebees fly for much of the blooming season. Thus, to have a healthy bumblebee colony in July, when the orchid flowers, means the bee colony must have adequate floral resources from the time of its inception in the spring. It is therefore necessary in some cases to include a temporal component in management plans: we must ensure that an acceptable sequence of flowers is available for the entire season.

I hope these few examples convey the many facets of the problem presented by species-centered

conservation efforts, and help establish the importance of a shift to community conservation. Pollination systems are among the best illustrators of this concept because of the clear interdependency of our living floral jewels and their winged lapidaries.

For information about The Xerces Society (membership includes a subscription to Wings) write to them at 4828 Southeast Hawthorne Boulevard, Portland, OR 97215.

Botanical Products Committee Formed *Kristin Fletcher, Co-Chair INPS Botanical Products Committee*

A quick trip to your local pharmacy or grocery store reveals the public's burgeoning interest in botanical medicines. From ginkgo to ginseng, arnica to astragalus, echinacea to elderberry, shelves are packed with "wildcrafted" native plants processed into medicines and supplements. Unfortunately, the collection of these species is seldom monitored, and long-term impacts are unclear. Evidence suggests, however, that the harvest of some of the most popular species is not sustainable at current levels.

Consequently, the U.S. Forest Service is coordinating a nationwide conservation assessment on purple coneflower (*Echinacea*, especially *E. angustifolia*). And, in 1999, Regions 1 and 4 of the Forest Service (which include Idaho) issued a three-year moratorium on the personal and commercial use/collection of the following: bitterroot (*Lewisia rediviva*), lady's slipper (all *Cypripedium*), lomatium (*Lomatium dissectum*), osha (all *Ligusticum*), sundew (all *Drosera*), and trillium or Beth root (*Trillium ovatum*).

This increasing concern prompted several participants at this year's Idaho Rare Plant Conference to urge INPS to form a special committee to investigate the status of our flora. Kristin Fletcher (1247 Gale Mt. Rd/Pocatello, Idaho 83204 or fletkris@isu.edu) and Christine Frisbee (2647 Kimberly Rd. East/Twin Falls, ID 83301-7976 or cfrisbee@fs.fed.us) agreed to co-chair the new Botanical Products Committee with the help of Theresa Prendusi, Mark Mousseaux, Chris Murphy, Kelley Mitchell, Marie Kerr, Mering Hurd, and Mabel Jones. We are currently researching the issue and will update INPS members in upcoming articles in *Sage Notes*. In addition, we intend to organize a symposium in conjunction with the Idaho Rare Plant Conference within the next 2 years. Interested INPS members are urged to get involved. A good website for INPS members is United Plant Savers, a national organization out of Oregon focused on the responsible collection of native plants: <www.plantsavers.org>.

Douglas' clover (*Trifolium douglasii*) Receives Formal Status in Idaho

Mike Hays, White Pine Chapter

East of Moscow a unique plant community is found in the Potlatch River drainage. An unusual riparian meadow with thin soils over basalt is host to many plant species that do not seem to belong there. Attention was brought to the meadow when the regional endemic, *Calochortus nitidus* (broad-fruit mariposa) was found there in 1993. Subsequent documentation and monitoring of that population revealed a plant community that seemed to belong more to the Palouse Prairie or canyon grassland to the west and south than to a riparian meadow in the mesic forest of the Clearwater National Forest. Eventually a large, attractive clover emerged as a member of this unique community, and *Trifolium douglasii* (Douglas' clover) was found on the Clearwater National Forest.

Investigating this species revealed very little information in the literature or from knowledgeable botanists. A herbarium check at the University of Idaho revealed 23 collections from Idaho. Two of these were from at Craig Mountain in 1993. The other 21 vouchers were evenly spread from 1900 to the 1950s and 14 of these were from Latah and Nez Perce Counties. Additional research and herbarium checks are certainly needed, but it was apparent that this regional endemic species had been overlooked and was in need of some formal designation and tracking.

At the 2000 Idaho Rare Plant Conference, Douglas' clover was removed from the Review list where it had been placed in 1999 and added to the Global Priority 3 list. In Washington it is listed as Sensitive, while in Oregon it is S1-Critically Imperiled. The Oregon Natural History Program gives the species a Priority 1 designation.



Douglas' clover (*Trifolium douglasii*)

Distribution

Hitchcock's "Flora of the Pacific Northwest" gives *T. douglasii*'s range as from Spokane County, Washington, to Baker County, Oregon, and adjacent Idaho. In Idaho it is currently known from Craig Mountain, Joseph Plains, and the Palouse Ranger District of the Clearwater National Forest. Other populations are probably known and will be reported now that the species is on the Global Priority 3 list. In Idaho, historic populations are known from Kootenai County south to Valley and Adams counties. There are even fewer populations in Washington where one extant and three historic occurrences are known.

The stronghold for Douglas' clover appears to be in northeast Oregon. There are approximately 10 locations on the La Grande District of the Wallowa-Whitman National Forest. Close by on the Umatilla/Union County line there is a large metapopulation of an estimated 30,000 stems spread over six miles².

Description

Douglas' clover is a nonrhizomatous perennial that generally stands 1 to 2 feet tall. The 3 leaflets are linear to oblong with finely toothed margins. The inflorescence of Douglas' clover consists of a terminal, globose to ovoid head that is about 3 cm thick and up to 5 cm long. The heads consist of 50 to 200 densely packed reddish-purple flowers, which stand erect or spreading, with the lowest often reflexed. The individual flowers are 14-20 mm long. The oblique calyx is distinctive, with the upper pair of teeth broader than the lower three and conspicuously curved downward. The sinuses between the lateral teeth are deeper than those of the upper pair.

Habitat

Douglas' clover usually occurs within the open Ponderosa pine to Douglas fir forests, which form an interface between the mesic forests in Idaho and the grasslands of eastern Washington and Oregon in moist meadows and along stream courses where moisture is abundant in spring and early summer. These sites are often very xeric (dry) late in the season.

The largest population on the Clearwater National Forest is found in a broken meadow with thin soils over a basalt substrate. Edaphic (soil) factors preclude significant tree growth, but occasional pines occur on raised microsites and along the meadow's margins. Some sporadic pockets of black cottonwood and aspen are present, while black hawthorn and willow patches are common along the stream and backwaters. Where soils are deep, dense pasture grasses dominate and species diversity is very low. In areas of thinner soils, unique plant communities may be found, consisting of some species that occur nowhere else on the forest. These species are either endemic, very uncommon, or represent habitats unusual for the Clearwater National Forest. Some of the noteworthy associate species are,

Broad-fruit mariposa	<i>Calochortus nitidus</i> (G3)*
Sticky goldenweed	<i>Haplopappus hirtus</i> var. <i>sonchifolius</i> (G3)
Leiberg's tauschia	<i>Tauschia tenuissima</i> (G3)
Hyacinth brodiaea	<i>Brodiaea hyacinthina</i>
Burke's larkspur	<i>Delphinium burkei</i>
Showy oniongrass	<i>Melica spectabilis</i>
Fox sedge	<i>Carex vulpinoidea</i>
Columbia sedge	<i>Carex aperta</i>
Fringed loosestrife	<i>Lysimachia ciliata</i>
Long-leaf evening-primrose	<i>Oenothera subacaulis</i>
Orange arnica	<i>Arnica fulgens</i>
Pepperwort	<i>Marsilea vestita</i>
Western mugwort	<i>Artemisia ludoviciana</i>
Water-plantain buttercup	<i>Ranunculus alismaefolius</i> var. <i>alismaefolius</i>
Common downingia	<i>Downingia elegans</i>
Prairie Junegrass	<i>Koeleria cristata</i>
Long-styled rush	<i>Juncus longistylus</i>
Baltic rush	<i>Juncus balticus</i> var. <i>balticus</i>
Pinewoods peavine	<i>Lathyrus bijugatus</i>
Mule's-ears	<i>Wyethia amplexicaulis</i>

* G3: globally rare or uncommon but not imperiled

On slopes adjacent to the meadow, bank monkeyflower (*Mimulus clivicola*) (State monitor) occurs. Some other more common associates include:

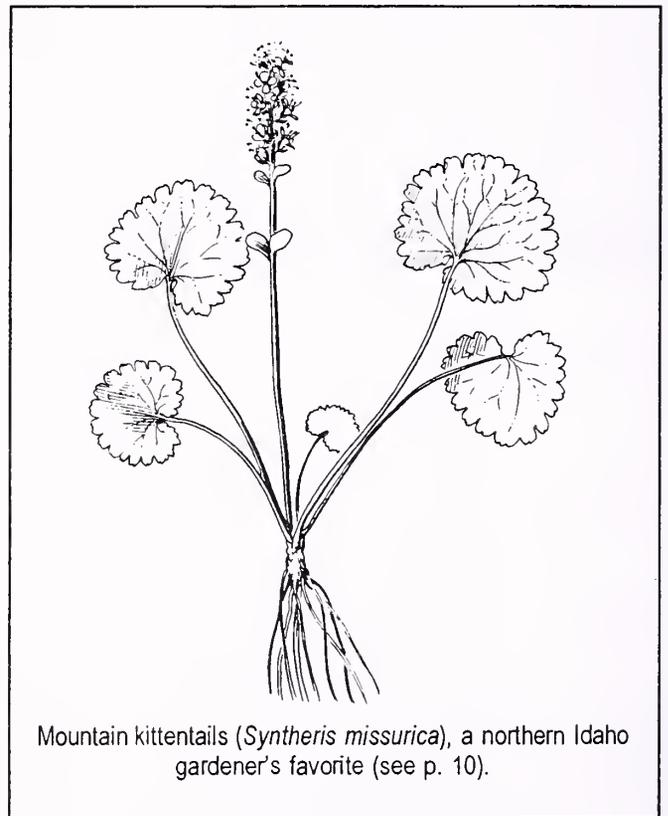
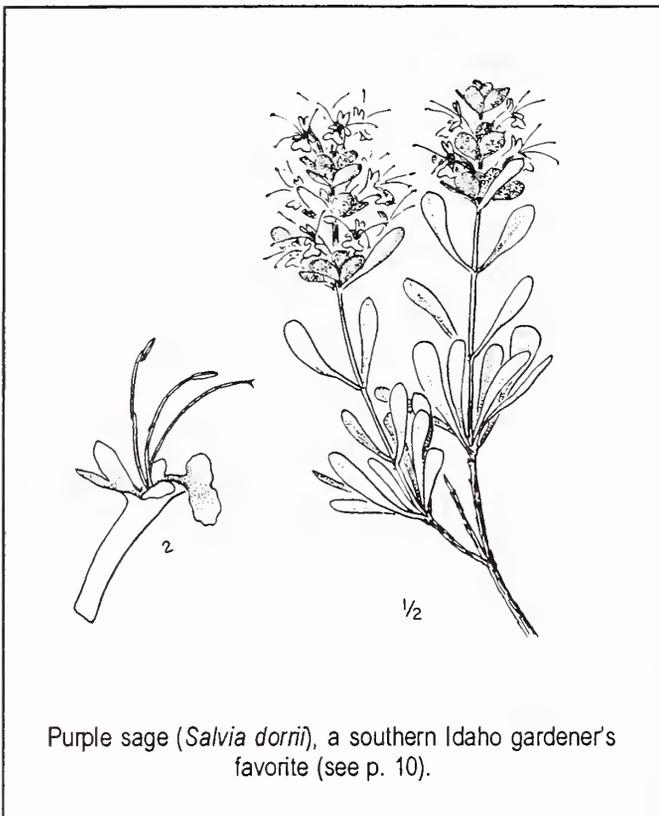
Yarrow	<i>Achillea millefolium</i>
Cinquefoil	<i>Potentilla gracilis</i>
American bistort	<i>Polygonum bistortoides</i>
Common camas	<i>Camassia quamash</i>
Red besseya	<i>Besseya rubra</i>
Marsh speedwell	<i>Veronica scutellata</i>
Nettle-leaf horse-mint	<i>Agastache urticifolia</i>
Gairdner's yampah	<i>Perideridia gairdneri</i>
Glaucous zigadenus	<i>Zigadenus venenosus</i>
Bog saxifrage	<i>Saxifraga oregana</i>
Old man's whiskers	<i>Geum triflorum</i>
Western blue flag	<i>Iris missouriensis</i>
Oregon checker-mallow	<i>Sidalcea orgeana</i>
California danthonia	<i>Danthonia californica</i>
Hood's sedge	<i>Carex hoodii</i>
Small-winged sedge	<i>Carex microptera</i>
Meadow sedge	<i>Carex praticola</i>
Thick-headed sedge	<i>Carex pachystachya</i>

This area is also interesting because three species of shooting star, *Dodecatheon pulchellum*, *D. cusickii*, and *D. conjugens* grow in close proximity. *D. pulchellum* blooms later and tends to prefer the stream margins; *D. cusickii* is more general in its distribution. *D. conjugens* is very rare at this site and is restricted to the margin between the forest and the meadow.

Threats

The threats to Douglas' clover have not been formally monitored: however, useful observations have been made. The Washington population was reduced by approximately half when a portion was cultivated. Plants exist only in natural meadow up to the edge of the cultivated field. Livestock graze the large Oregon populations. Concern about potential impacts on the species has resulted in alterations in management of the grazing allotment. Livestock are only allowed in the vicinity of the populations for a short time before being moved to other locations. The short-term impacts thus far seem to be minor and are not detrimental to the populations.

The Palouse populations are also grazed. One population on private ground is grazed heavily and consists of only a few (probably less than 25) plants along a stream. Few native species can be found. Another population is found on adjacent private property. The private portion of the meadow is severely grazed, while across the fence on Federal land a lush moist meadow community is found. Here the Douglas' clover population is very small due to the limited area, but the habitat is of high quality. The last population is scattered over a couple miles in a thin-soiled broken riparian meadow. Here the plants are sparse, but widely distributed. An estimated 100-300 plants may occur. The meadow is grazed; however, the best habitat has shallow and rocky soil, supporting only sparse pasture grasses. As a result Douglas' clover along with many other native meadow and prairie species form a unique and healthy plant community. Five years ago the rotation of livestock in this allotment was altered to allow cattle on this meadow only after mid-September. This was an attempt to allow another rare species, *Calochortus nitidus* (broad-fruit mariposa), to set seed before being trampled and possibly grazed by the livestock. Similarly, Douglas' clover is expected to benefit through increased seed recruitment. Continued observations and formal monitoring will shed more light on the response of this species to various forms of management and other disturbances.



Annie Alexander

Kristin Fletcher, Sah-Wah-Be Chapter

For centuries both men and women have struggled to understand the world around them. It is always hard and demanding work, but the efforts of many thoughtful women have too frequently languished in obscurity.

One of the most fascinating early naturalists is Annie Montague Alexander, born in 1867 to a wealthy family from the Hawaiian island of Maui. Annie was adventuresome as a child and loved to explore the family's sugar cane plantations and the tropical wilderness around her.

While a teenager, she moved with her family to Oakland, California, and quickly developed an interest in fossils, which she discovered in the hills nearby. Annie had an uncanny knack for finding them and, at age 33, she discovered the first of many living and fossilized plant and animal species previously unknown to science.

As a young woman she traveled hundreds of miles on foot in Africa with her father and spent many summers in Alaska researching bears. Over time she became alarmed by how fast native bird and mammal species were disappearing in California.

An independently wealthy woman, she then established and funded several great California museums: the Museum of Paleontology, the Museum of Vertebrate Zoology, and the University of California Herbarium in Berkeley. Her own immense plant and animal collections became the backbone of these early museums' displays.

In her early forties Annie met Louise Kellogg, and a lifelong friendship developed. Until Annie's death at 83, the two women were inseparable companions. They collected plant and animal specimens throughout the West, including Idaho, and sent them back to the museums.

Discomfort and struggle seemed to spur them on, and an aging Annie wrote, "I consider the sixties a very appropriate period in one's life to do field work—an out-of-doors quest that will always have . . . a certain charm and excitement."

Near the end of her long, full life she and Louise botanized for three months in Baja, camping and hiking throughout the rugged mountains and deserts. There, on December 29, she celebrated her 80th birthday still "a part of nature, footloose in the mountains" as she once said. She explored and collected for two more years before she died, leaving us her plant and animal specimens and her museums as a legacy of a passionate life well lived.

Attitudes of an Early Botanist: A Note on Charles Geyer (1809-1853)

Bertie Weddell, White Pine Chapter

The nineteenth century German botanist Charles Geyer was thoroughly sympathetic to manifest destiny, the idea that it was the responsibility of Euroamericans to expand westward across North America, taming the frontier and subjugating its aboriginal inhabitants as they went. "Ere long," he wrote,

the hardy scattered emigrants both in Oregon and California will consolidate a government and appear on the theatre of nations, independent of all others. They will, by their enterprise and unceasing civil conquests, overcome successfully the heroic indolence of their Mexican neighbors, regenerate their political and social institutions, and form, in connection with the mother country, on that coast, a great western empire; an outpost of civilization, which, in time, will be the doom for the reckless despotism in the Old World (Geyer 1846:201).

This vision clearly left no room for Native Americans, whom Geyer viewed with little sympathy. Some of Geyer's narratives are painful to read. He wrote of coming upon

a great number of men, women, and children. . . . [B]ut contrary to what I was used to, the tone in which I was spoken to, by two or three saucy-looking young men, especially by a half-blooded ferocious youngster, did not please me at all. When I asked for the road to Colville, he said he did not know, demanding in the same harsh voice sundry things, especially tobacco with every possible ill grace. At my refusal he changed his language to a still more offending manner. . . ; the rest not possessing the same boldness, joined in a kind of sneer peculiar to the Indian only (Geyer 1846:296, footnote).

The incident came to a close when Geyer showed the young men his pistol, which caused "the insolent half-breed" to change his behavior.

Geyer felt that the Nez Perce should have been more appreciative of missionary efforts to change their way of life.

By responding to the efforts of Mr. Spalding, and amassing property, it is unavoidable that the whole nation imbibes a degree of avarice, of which I justly accuse the Saptonas [Nez Perce]. Far from feeling grateful to the Mission and to their excellent teacher, they demand every thing gratuitously, and torment their instructor by that insolent haughtiness so peculiar to them (Geyer 1846:518, footnote).

As a botanist, Geyer was interested in how the Indians used native plants such as camas, biscuit root, and bitterroot. Yet he had little interest in seeing that way of life—based upon moving throughout a wide area to utilize these resources as they became available throughout the year—continue. He wrote that the Saptonas were

the only northerly tribe of the Indians, to my knowledge, with whom the missionaries have so far succeeded as to render, in eight years' tuition only, the greater part of the tribe independent of hunting, by cultivating the soil, and rearing cattle and sheep. . . . Undaunted by the haughtiness of his pupils, [Spalding] overcomes all obstacles. He . . . persevered in making the poor creature understand that he must acquire property, to become independent of his hunting, and that property must be realized by rearing domestic animals and tilling the land (Geyer 1846:517).

Evidently, Geyer had no inkling of the fact that the livestock grazing and cultivation he so enthusiastically endorsed would lead to profound changes in the flora that he so assiduously collected.

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Cherchez les Hommes (In Antennaria, Boys are a Minority)

Dr. Kenton L. Chambers, Professor Emeritus of Botany, Oregon State University, Corvallis, Oregon

From *Oregon Flora Newsletter*. Reprinted with permission.

Scan a murder mystery novel and you may find the wily French detective (Inspector Maigrait, no doubt) uttering that immortal phrase, *cherchez la femme* (look for the woman) to solve the crime. Putting a botanical spin on the mystery, let us consider the genus *Antennaria* (pussytoes, family Asteraceae), which I recently reviewed for the Oregon Vascular Plant Checklist. Containing 19 taxa in Oregon, this is the sixth largest genus of Asteraceae in the state, and in my experience it presents taxonomic ambiguities at least equal to any of the five larger ones (*Erigeron*, *Aster*, *Artemisia*, *Senecio*, and *Cirsium*). In pussytoes it is common to find populations composed entirely of pistillate

("female") plants; no staminate ("male") ones, and hence no pollen grains, are available for the plants' reproduction. There is a well known explanation for this—namely, apomixis (seed formation without fertilization, a form of cloning). However, this unusual process is intertwined with hybridization and polyploidy in *Antennaria*, creating genetically diverse populations which are extremely hard to classify.

Apomixis is well established in several other Asteraceae genera in Oregon, notably in *Crepis*, *Erigeron*, *Arnica*, and *Taraxacum*. Only in *Antennaria*, however is the process associated with the dioecious floral condition, i.e., with separate pistillate and staminate individuals. The presence or absence of

staminate plants in a population is therefore a relatively good indicator of the mode of reproduction. If males are present, the population is making seeds by sexual outcrossing; if there are no male plants, then the seeds contain embryos that are asexual copies (clones) of their pistillate parent. As explained below, it may be important to know the reproductive mode of particular pussytoes populations, if one is trying to assign species names to them. The taxonomy of the genus, in other words, is strongly dependent on knowledge of its breeding systems.

The taxonomic arrangement of *Antennaria* which we adopted for the checklist is mainly based on detailed studies by R. J. Bayer and G. L. Stebbins (1987 and 1993). It turns out that some pussytoes species are morphologically distinct, fully sexual, and offer no taxonomic problems. Examples are *Antennaria geyeri* (pinewoods pussytoes), a gray, leafy-stemmed and bushy, small-headed plant of the ponderosa-pine woods east of the Cascade Range; *A. suffrutescens* (shrubby pussytoes), a low-growing subshrub of the Siskiyou Mountains, with small, strongly bicolored leaves (green above, gray-woolly below); *A. racemosa* (slender pussytoes), a taller plant of montane coniferous forests whose leaves are broad-bladed, three-nerved, glabrous above and woolly below; and *A. dimorpha* (low pussytoes), a cushion-plant with short, single-headed flowering stems, characteristic of sandy or rocky soils in dry environments east of the Cascades. In all these species you can expect to find male and female plants growing together in approximately equal numbers.

There are several other Oregon *Antennaria* species, however, that are very difficult to tell apart. Either there is a complete blend of characteristics between taxa, or else the "key" differences are so minor that only a single subtle trait may distinguish one species from another. Included here is a group of widespread montane and Great Basin taxa with a mat-forming, stoloniferous habit: *A. rosea* (rosy pussytoes, sometimes included in *A. microphylla*), *A. media* (alpine pussytoes, = *A. alpina* var. *media*), *A. umbrinella* (umber pussytoes), *A. corymbosa* (flattop pussytoes), and *A. aromatica* (aromatic pussytoes). According to Bayer and Stebbins, the intergradation among these species results from a complex history of past hybridization. Hybrid plants, often having chromosome numbers that are four, six, or eight times the basic number, usually exist as female-dominated populations. The plants can make seeds

with or without pollination, so males are not needed, and they become rare or absent.

In studying numerous herbarium specimens of the five above-mentioned taxa, I had to make arbitrary judgments about what species names to use. For example, Bayer and Stebbins showed that *Antennaria rosea* is an asexual, female-only, hybrid-derived taxon; its ancestors include sexual forms of *A. microphylla*, *A. corymbosa*, *A. umbrinella*, and *A. aromatica*, among others. Therefore, *A. rosea* consists of numerous different hybrids which combine the

traits of two or more ancestral species! Additionally, it is our only species of this complex to have a large proportion of plants with a rosy-red tint on their involucre bracts. Related species range from pure white bracts (as in *A. microphylla*) to dusky brown or greenish ones (as in *A. umbrinella* and *A. media*). This allowed me to assign the name *A. rosea* to all collections having roseate involucre bracts—a single key character defines the species in this case.

In no collections having rosy-colored bracts did I find any male plants. However, I did find other collections (lacking male plants) whose involucre bracts were pure white (like *A. microphylla*) or were white with a dark-brown spot on the back (like *A. corymbosa*). Did the absence of male plants on the herbarium sheets mean that these

populations were female-only and apomictic? If they were, their classification should be as *A. rosea*, according to Bayer and Stebbins. I finally decided to call the brown-spotted ones *A. corymbosa* and the pure white ones (which often formed mixed collections with rosy-pink ones) *A. rosea*. This was an arbitrary decision, based on a lack of definitive evidence for apomixis.

Within the above species-complex, plants whose involucre bracts were dusky-brown or blackish could belong to any one of three species. I named them *A. umbrinella* if the bracts were blunt-tipped. Populations having acute-tipped brownish or blackish bracts were assigned to the widespread alpine species *A. media* if they lacked aromatic glandular hairs on their stems, and to the localized Willowa Mountains species *A. aromatica* if they possessed such hairs. All three of these species must be largely apomictic and female-only in Oregon, as male plants are seldom collected. However, according to Bayer and Stebbins, the name *A. aromatica* should apply only to sexually reproducing populations. The species has been so rarely collected in Oregon that we do not yet know its reproductive status here.



Umbur pussytoes
(*Antennaria umbrinella*)

To return to the title of this paper, in *Antennaria* it is important that we *cherchez les hommes*—look for the men! The puzzle of what species names to attach to plants of the *A. rosea* complex is much more easily solved if we know whether male plants were growing with the females. Nearly all our herbarium collections have only pistillate plants; rarely do collectors state on their labels whether staminate plants were present or absent. Let me recommend to all future collectors who prepare samples of *Antennaria*: please, “look for the men.” Search for staminate plants and include them in your collection, or state on your specimen label that no males were observed. Perhaps this will help remove some of the mystery from the taxonomy of Oregon pussytoes.

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Response to the Native Gardening Questionnaire

In a recent survey, we asked INPS members to respond to the following questions:

1. What native species have you had luck with, or are you especially pleased with?
2. Tell us what you like best about these plants.
3. How does one acquire these plants without exploiting wild populations?
4. What aspect of growing natives would you like to see covered in *Sage Notes*?

Replies to the first three questions are summarized in the chart that follows—please note that these are responses by INPS gardeners to an informal survey, not a list of species recommended by INPS. Replies to the fourth question provided ideas for future issues of *Sage Notes*.

Replies to the third question, acquiring native garden plants without exploiting wild populations, showed the ethical approach one would expect from members of a native plant society (see “Source” in the chart that follows). However, any article on native gardening should mention these considerations:

- Collect wisely without depleting native populations:
 - Follow INPS’ “1-in-20” rule (*Sage Notes* 21(1) Winter 1999): “. . . never collect more than one out of 20 plants. It means not collecting more than one plant until you have found at least twenty. Only if 20 are found should you consider collecting one plant. And 40 should be present before two are taken, and so on.” (This assumes only one person is collecting, on a one-time basis.)
 - Salvage plants from road or building construction
 - Know which plants never to collect (orchids, listed species)
- Ensure the plants’ pollinators are present and provide habitat within the general vicinity of your garden (read more about this in Vince Tepedino’s “Wild Bees and Floral Jewels” on p. 1).
- Collect seeds from the wild (instead of plants), following the 1-in-20 rule.
- Buy native plants propagated from seed collected in your local area.
- Use local stock—these plants are locally adapted and will not pollute local gene pools or introduce disease.
- The best way to save rare native plants is to leave them in their natural community when possible.

Nor should the positive aspects of native gardening go unmentioned:

- Once established, a native plant garden requires less water, and therefore uses less of the associated resources used in water treatment, delivery, etc.
- Native gardens provide wildlife habitat, particularly for birds.
- Native gardens provide educational opportunities.

Recommended references include: “Gardening with Native Plants of the Pacific Northwest” by Arthur Kruckeberg, University of Washington Press, 1997, and “Landscaping with Native Plants for the Inland Northwest” by Tonie Fitzgerald and Michael Terrell, a 45-page booklet with information on designing, landscaping, removing weeds, preparing soil, choosing grasses for unwatered areas, sources, and native plant collecting ethics. Available from Washington State University Cooperative Extension, 222 N. Havana, Spokane, WA 99202-4799, (509) 477-2048. \$5.50.

INPS Members' Favorites: Responses to Native Gardening Questionnaire

Responses from North Idaho

Common name	Scientific name	Comments	Sources
Douglas hawthorn	<i>Crataegus douglasii</i>	"The best: food for thermal cover, resting, & roosting, for wildlife."	Native plant nurseries.
Quaking aspen	<i>Populus tremuloides</i>	Excellent for wildlife.	Native plant nurseries.
Ponderosa pine	<i>Pinus ponderosa</i>	Excellent for wildlife.	Native plant nurseries.
Roses	<i>Rosa</i> spp.	Excellent for wildlife.	Native plant nurseries.
Cherry	<i>Prunus</i> spp.	Excellent for wildlife.	Native plant nurseries.
Serviceberry	<i>Amelanchier alnifolia</i>	Excellent for wildlife.	Native plant nurseries.
Snowberry	<i>Symphoricarpos albus</i>	Excellent for wildlife.	Native plant nurseries.
Creeping Oregon grape	<i>Berberis repens</i>	Early yellow flowers & glaucous berries; evergreen. Seems to spread slowly; shape is "low and mounding."	Native plant nurseries.
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	Good ground cover for north Idaho.	Nurseries
Bunchberry dogwood	<i>Cornus canadensis</i>	Good ground cover for north Idaho.	
Pearhip rose	<i>Rosa woodsii</i>		
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>		
Bluebunch wheatgrass	<i>Agropyron spicatum</i>		
Idaho fescue	<i>Festuca idahoensis</i>		
Golden currant	<i>Ribes aureum</i>	Highly rated in White Pine Chapter list.*	Wild-collected seed
Syringa	<i>Philadelphus lewisii</i>	Highly rated in White Pine Chapter list.*	Wild-collected seed
Ninebark	<i>Physocarpus malvaceus</i>	Highly rated in White Pine Chapter list.*	Wild-collected seed
Red columbine	<i>Aquilegia formosa</i>	Highly rated in White Pine Chapter list.*	Wild-collected seed
Canada violet	<i>Viola canadensis</i>	Nice, but aggressive.	Wild-collected seed
Mountain kittentails, Nuttall's violet	<i>Synthlipsis missurica, Viola nuttallii</i>	"The 2 best native forbs."	Wild-collected seed
Lupine	<i>Lupinus polyphyllus</i>	Highly rated in White Pine Chapter list.*	Wild-collected seed
Spiraea	<i>Spiraea</i> spp.		
Clematis	<i>Clematis</i> spp.		
Geranium	<i>Geranium</i> spp.		
Bedstraw	<i>Galium</i> spp.		
Chickweed	<i>Cerastium</i> spp.		
Common camas	<i>Camassia quamash</i>		
Hyacinth brodiaea	<i>Brodiaea hyacinthina</i>		
Oregon iris	<i>Iris tenax</i>		

INPS Members' Favorites: Responses to Native Gardening Questionnaire

Common name	Scientific name	Comments	Sources
Wild onion	<i>Allium</i> spp.		
Wild ginger	<i>Asarum caudatum</i>		
False Solomon's seal	<i>Smilacina</i> spp.		
Old man's whiskers	<i>Geum triflorum</i> var. <i>ciliatum</i>		
Prickly-headed poppy	<i>Papaver argemone</i>		
<i>Responses from South Idaho</i>			
Buffalo-grass	<i>Buchloe</i> spp.	Grows slowly & requires very little water.	Wind River Seed
Blue grama	<i>Bouteloua gracilis</i>	Grows slowly & requires very little water.	Wind River Seed
Indian ricegrass	<i>Oryzopsis hymenoides</i>	"My favorites so far."	Seeds
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	"My favorites so far."	Seeds
Sandberg's bluegrass	<i>Poa sandbergii</i>	"My favorites so far."	Seeds
Squirreltail	<i>Sitanion hystrix</i>	Native bunchgrasses: beautiful, easy, good for birds & insects.	Salvage (road maintenance) **
Idaho fescue	<i>Festuca idahoensis</i>	Native bunchgrasses: beautiful, easy, good for birds & insects.	Salvage
Large-fruited lomatium	<i>Lomatium macrocarpum</i>		Seeds
Evening-primrose	<i>Oenothera stngosa</i>	"Weedy" native - easy & showy.	
Yarrow	<i>Achillea millefolium</i>	"Weedy" native - easy & showy.	
Fringecup	<i>Lithophragma</i> spp.	"Weedy" native - easy & showy.	
Sunflower	<i>Helianthus annuus</i>	"Weedy" native - easy & showy.	
Pearly-everlasting	<i>Anaphalis margaritacea</i>	Small attractive groundcover, requires little water, reproduces well (needs lots of room).	INPS Plant Sale
Sagebrush	<i>Artemisia</i> spp.	Fun to watch grow from seed.	Seed collected in Boise foothills
Great basin wildrye	<i>Elymus cinereus</i>	Beautiful, tall grass.	Salvaged from road cut
Wild onion	<i>Allium</i> spp.	Easy to split/transplant.***	
Stoncrop	<i>Sedum</i> spp.	Easy to split/transplant.***	
Beardtongue	<i>Penstemon</i> spp.	Easy to split/transplant.*** Good self-seeder once established.	
Penstemon	<i>Penstemon cusickii</i> , <i>P. miser</i>	Showy, excellent possibilities as garden plants.	Seeds
Penstemon	<i>Penstemon speciosa</i> , <i>P. acuminatus</i>	Beautiful but short-lived.	Seeds
Clarkia	<i>Clarkia</i> spp.	Good self-seeder once established. Easily established from collected seed.	
Small-flowered blue-eyed Mary	<i>Collinsia parviflora</i>	Good self-seeder once established.	

INPS Members' Favorites: Responses to Native Gardening Questionnaire

Common name	Scientific name	Comments	Sources
Cleomella	<i>Cleomella</i> spp.	Good self-seeder once established.	
Biscuit-root	<i>Lomatium</i> spp.	Easily established from collected seed.	
Silky lupine	<i>Lupinus sericeus</i>	Easily established from collected seed (but other <i>Lupinus</i> spp. are not). Good self-seeder once established.	
Phacelia	<i>Phacelia</i>	Easily established from collected seed.	
Red-osier dogwood	<i>Cornus stolonifera</i>	Grows well, spreads, attracts birds; has red stems in winter.	Available commercially, or get a start from a rooting branch
Sphaeralcea	<i>Sphaeralcea munroana</i>	Showy flowers	Seeds
Daisy	<i>Townsendia florifer</i>	Short-lived but seeds around.	Seeds
Wild onion	<i>Allium acuminatum</i>		Seeds
Fern-leaf lomatium	<i>Lomatium dissectum</i>	Coming back nicely! Beautiful foliage.	Seeds
Skullcap	<i>Scutellaria antirrhinoides</i>	Started from seed but it becomes rhizomatous & can be easily divided in spring. Cute little thing.	Seeds
Pearhip rose	<i>Rosa woodsii</i>	Good for confined area; can take part shade.	Seeds
Sage	<i>Salvia dorrii</i>	Does well; nice shrublet.	
Smooth sumac	<i>Rhus trilobata</i>	Grows fast with little water.	Buffalo Berry Farm
Oregon sunshine	<i>Eriophyllum lanatum</i>	Very short-lived but seeds around.	Seeds

* "Native Plants of Northern Idaho for Landscaping and Restoration," a ten-page list of shrubs, trees, forbs, ferns and grasses, with helpful gardening information on each species. Available from White Pine Chapter, P.O. Box 8481, Moscow, ID 83843.

** "If salvaged within a week nearly all grass clumps may survive. Be sure to grab lots of the soil from which they were dislodged, for it contains the necessary mycorrhizal fungi as well as seeds of other 'surprise' spp. (native and exotic)."

*** If collecting from wild populations is done responsibly "it is better to use local material than risk bringing in something from a distant source. Once a person has plants established, they can serve as a local source for their own garden."

Anthriscus cacaulis (Bur Chervil)

Replacing Starthistle

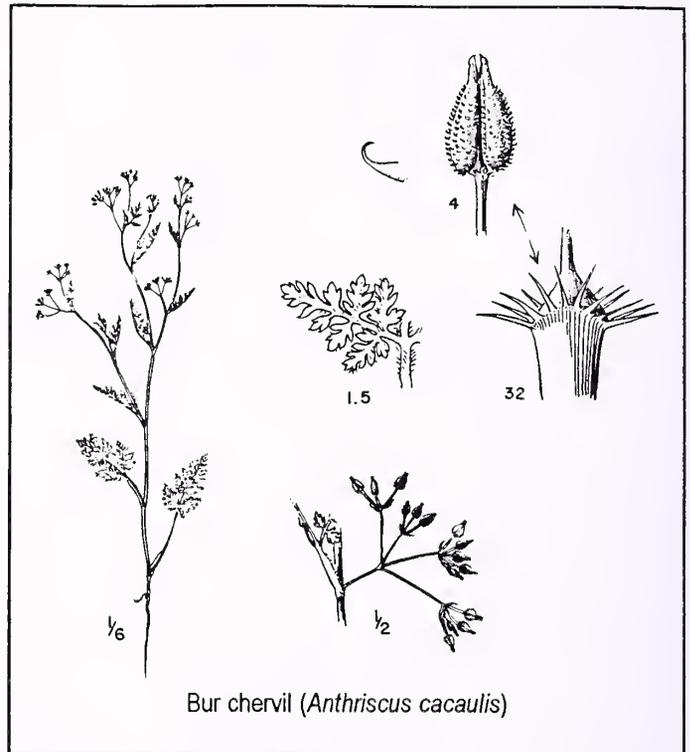
Dr. Richard R. Old, Weed Specialist, Pullman, Washington

When I first got started in this business, *Anthriscus cacaulis* was restricted to moist shady sites, generally under the hawthorns. The plants were never more than 6-8 inches tall and would hardly have been considered weedy, due to their extremely limited ecologic amplitude. In the past few years the population has exploded, primarily due to a shift in ecologic amplitude. The same species is now not only displacing yellow starthistle, it is doing so on shallow, rocky, south-facing slopes. Even more striking is the fact that on these open arid sites the plants are 2 feet tall! It has also become pernicious in more mesic to damp sites and now has one of the broadest ecologic amplitudes that I have ever seen a weed display.

My three possible scenarios are as follows:

1. It is the same species that we have had for many years but has undergone an adaptive genetic shift (completed its lag phase).
2. It is the same species as before, but we have a new introduction that is more aggressive, and has a broader ecologic amplitude.
3. It is a new species that has not yet been properly identified (this is a difficult genus taxonomically).

In any case, it is so widespread that eradication is not feasible and is such a recent problem that no



control methods have been developed. The head-to-head competition with yellowstar would be a fabulous ecological study.

Dr. Old can be reached at (509) 332-2989 or <rold@xidservices.com>.

Book Reviews

The Genus *Cypripedium*. Philip Cribb. Timber Press, Portland, 1997.

Review by Mike Hays, *White Pine Chapter*

Cypripediums – The grandest and most august of the Orchidaceae, one great race which is supreme alike in the open and under cover, deserves full treatment by itself.

- Reginald Farrer (1919) in "The English Rock Garden."

"The Genus *Cypripedium*" by Philip Cribb provides a wonderful overview of the 45 species of that genus currently recognized worldwide. The lady's slippers or moccasin flowers have been considered among the most beautiful and sought after orchids for centuries. The earliest records of growing these gems date back over 2,500 years to the time of Confucius in China. But Europeans brought modern interest to the forefront when the industrial revolution gave upper classes the time and resources to pursue such interests. The huge size of the slippers set them apart and fascinated growers and botanists

for generations. They are so loved, in fact, that the only member of the genus in Britain has been reduced to a single guarded plant.

This wonderful book offers detailed sections on orchid morphology, life history, cytology, phylogenetic relationships, biogeography, ecology, uses, conservation, and cultivation. An extensive taxonomy section includes an artificial key and detailed descriptions of all 45 species. The sections on life history and ecology are especially good, and the cultivation section gives a species-by-species discussion of growing requirements and suitability that makes the reader want to get started.

The visuals are abundant: 26 paintings, 98 photos, 51 drawings, and 22 distribution maps. The drawings by Eleanor Catherine are excellent with artistic, yet realistic habit illustrations and highly detailed representations of individual floral features. The paintings by assorted artists can only be described as 'stunning.' These alone are worth the price of the book. The photos are highly variable in quality, with most being very good. Some of the Chinese species are only known from the type locality, and the fact

that the book has been able to include photos of all of them is remarkable.

"The Genus *Cypripedium*" is well written. The style is both engaging to the professional botanist and captivating to the lay person. No comparable book on these important orchids exists at present.

The following is taken from the back sleeve: Philip Cribb is curator of the Orchid Herbarium at the Royal Botanic Gardens, Kew. He is the author of several books on orchids, including "The Genus *Paphiopedilum*" and, with co-author Ian Butterfield, "The Genus *Pleione*," both in this series. He has traveled widely in connection with his work and has studied *Cypripedium* in the wild on several trips to China in the past twenty years.

A Color Guidebook to Common Rocky Mountain Lichens. Larry St. Clair. M. L. Bean Life Science Museum, Brigham Young University, Provo, 1999. Review by Roger Rosentreter, Pahove Chapter

"A Color Guidebook to Common Rocky Mountain Lichens" includes a wide variety of species, from the small, microlichens of granite boulders to the large showy genera that hang from trees. Most lichen books either do not include color photos or cover only the larger macrolichens, simply omitting the small crustose, but often showy, saxicolous (on rocks) species. With this guidebook, the amateur enthusiasts can now picture-key their collections or simply gain familiarity with lichens from a variety of substrates and Rocky Mountain habitats. This is the first of its kind for North America. However, like wildflower books that encompass large geographic areas, this text does not contain all the species one might encounter in the field. Technical lichen floras will need to be consulted for more detailed identification. The photographs are those of Steven and the late Sylvia Sharnoff, who deserve much of the credit for making this book a winner. I would recommend that all biologists and outdoor enthusiasts who live in or visit the West obtain a copy. I believe it will introduce more students and amateurs to lichens than any other book published to date by a North American lichenologist. Considering the cost of reproducing color photos and the wide geographic coverage of this book, it is a very good value.

Given the general nature of the guidebook, it is perhaps inconsistent not to include any common names for these organisms. This would add appeal for the novice in particular. The identification keys are straightforward and well written, but lack important details and omit the mention of similar species that could be encountered within the Rocky Mountains. Some of the common showy species are not included. For example, the bright sulfur-green crustose lichen, *Acarospora chlorophana*, which covers canyon walls throughout the Rocky

Mountains, is omitted. In addition, there is no index to look for species which might be listed under another name. Serious lichen students will need to obtain additional technical lichen floras to satisfy their desire to name all the lichens they encounter. "A Color Guidebook to Common Rocky Mountain Lichens" is well organized and is similar in format to the recently published "Macrolichens of the Pacific Northwest" by Bruce McCune and Linda Geiser (reviewed in *Sage Notes* 20(2) Spring 1998 p. 13). In comparison, St. Clair's guidebook contains equally good information on the usefulness of lichens as indicators of air quality, but much less on habitat, ecology, and taxonomy. Notes on similar species and the morphological characteristics used to distinguish among them would have improved the usefulness of this book. In addition, southern Rocky Mountain species are better represented than are the northern Rocky Mountains. The geographic range of a species is discussed briefly under the category, "substrate/habitat," though the descriptions are very general. "Common Rocky Mountain Lichens" is in paperback format but is well bound, and its 6-by-nine inch size makes it a true field guidebook.

Desert Wildflowers of North America. Ronald J. Taylor. Mountain Press Publ. Co., Missoula, 1998. \$24.00.

Review by Dr. Art Kruckeberg, Washington Native Plant Society

From *Douglasia*, Newsletter of the Washington Native Plant Society, Vol. 23:3 & 4, Summer-Fall 1999. Reprinted with permission.

His last—and his finest—is this magnificent field guide to Desert Wildflowers of North America. Ron Taylor, professor of botany at Western Washington State University, will be remembered not only for his many outstanding attributes as a botanist (see eulogy in *Douglasia* of Fall 1999). It was his keen sense of what the flower-seeker in nature needs for guidance that is memorialized in the several field guides he crafted: "Weeds," "Sagebrush Country," and "Mountain Wildflowers" are three of his legacy . . . monuments to his devotion to giving plant lovers of all kinds textual and pictorial access to the rich plant diversity of the West. And his latest on desert wildflowers is the capstone of Ron's commitment to all of us wildflower devotees.

While the bulk of the book (282 pp.) is devoted to cataloging the rich desert flora, Ron introduces the biogeography and ecology of the deserts in scholarly, yet accessible prose; these are 22 pages of "must" reading for desert wildflower seekers. Open the book anywhere and find on the left page thorough descriptions of plants illustrated on the right-hand page. And the color photos, all Taylor's, are superb. Unlike most field guides, Taylor always provides keys for identification; in this one, we have a facile key to

plant families of the desert. Just following the key, one finds a valuable section, Plant Anatomy Illustrated, that is followed by a glossary of botanical terms.

So many desert wildflowers are yellow-flowered members of the sunflower family that Taylor acknowledges the oft-used epithet, "DYC" (darn yellow composites!). Indeed he legitimizes that useful epithet in a colorful justification of the term.

WNPS members will find the book useful for identifying the many plants of the Great Basin desert

that come into southeastern Washington. But WNPS naturalists can easily be tempted to visit other desert habitats in the West once they own this book. Nowadays it is so easy to go beyond state borders to explore other western floras. And Ron's last and finest work will open up that rich spring flora of the desert as no one else has done. So, Ron Taylor will be with us, not only in the desert, but most anywhere we botanize in the West.

Chapter News

Calypso Chapter

At the March meeting Tim Gerlitz of the North Idaho Mycological Society gave a talk on morels—where to look for them, how to avoid deadly look-alikes, and how to collect and store them. The April meeting featured a wonderful program on the creepy-crawlies and hoppers: snakes, skinks, lizards and relatives, frogs and toads. Our speaker was Jenny Taylor from the Forest Service. She brought a slide show and a handout.

Upcoming events:

- May 21: Q'emelin Trails, Post Falls. Meet in parking lot next to Gazebo west of Post Falls Park at 1:00 PM.
- July 8: Huff Lake field trip, Pend Oreille County, WA (five miles south of Nordman, ID). Meet at Priest River Ranger Station at 11:00 AM.
- August 5: Roman Nose Lakes. Jill Blake will lead. Meet at parking lot at lower lake at 10:00 AM.
- August 12: alternate date for Roman Nose Lakes.

Kinnikinnick Chapter

Work at the arboretum took off with an April "Arbor Day at the Arboretum" event. High school students and 4H members planted a larch grove. Chapter members transplanted trees from Gold Creek and made wire tree guards. A work list is prepared for volunteer help during the summer.

Upcoming events:

- May 20, meeting. Come and hear Valle Novak's "Landscaping with Wild and Native Plants." Bonner County Extension Office, 10:00 AM.

Sah-Wah-Be Chapter

Chapter members have an opportunity to participate in a long-term revegetation project at the Pocatello Zoo, beginning with identifying remnant native forbs and shrubs and pulling cheatgrass (remaining cheatgrass may be sprayed). Later, we

may be able to plant chosen natives. The site is a small portion of the zoo and is a realistic task if we tackle it with energy and several sets of hands over several years. Members are encouraged to get involved with the city's plan to remove several of the octogenarian cottonwood trees from the park/zoo area. Parts of the trees are hazardous (growing over softball bleachers, parking lots, etc.), but that doesn't necessarily justify cutting the whole tree down. Members are encouraged to go visit the trees and see for yourselves what the brouhaha is about and send your suggestions to the city.

Upcoming events:

- May 21. Field trip to see a surprise pond in the lava flow north of McCammon on property owned by the ISU biology department. Meet at 9:00 AM near the bison by the Idaho Museum of Natural History to carpool. First we will stop here and there, roam, or enjoy lunch. The second leg of the trip is on the Centennial Trail across the street and river from the hot pools at Lava Hot Springs. And after that...many opportunities! Call Ruth Moorhead (208) 233-5011.
- June 3. Meet at 9:00 AM near the bison to carpool to Formation Springs State Park north of Soda Springs. Kristin Fletcher hopes to have some helpers for this one. Call Kristin (208) 232-6736.
- June 18. Meet at 9:00 AM at the Fort Hall truck stop on I-15 for a re-run of last year's outing into the Fort Hall bottoms, organized by Cleve Davis. Call Cleve (208) 237-0246.
- July 15. Field trip to Mike Spence Canyon near Gilroy. More details later—call Ruth (208) 233-5011.
- August 5-6: From the Top of Targhee to the Fens of Driggs—a multi-stage adventure. Much planning to be done. More details later. Glenn's in charge: (208) 234-0537.
- September 9. Meet at 9:00 AM near the bison to carpool to St. Anthony Dunes. YES, we can find them! Yes, there will be something left to see there! NO, the hunters won't shoot us! More details later. Call Ruth (208) 233-5011.

- October 14. Long trip to Museum of the Rockies, Bozeman, Montana. Hey...sometimes to appreciate Idaho fully, we need to see what's next door as well! With luck, there will still be fall color to enjoy on the way. Call Ruth (208) 233-5011.
- January 13: Hogander's Haul up the trail to Robbers' Roost, looking for plants to identify by their WINTER characters! Details to be developed. Call Geoff (208) 232-3437.

Wood River Chapter

According to Carol Blackburn, our "member at large," the first wildflower in Blaine County was spotted near the upper end of Magic Reservoir on March 25—many Anderson's Buttercups, and a few very purple clumps of penstemon leaves, which resembled flowers when seen at a distance. The rest of the bloom can't be too far behind!

In order to be informed about local Wood River Chapter activities, contact Jo Ann Robbins at (208) 788-5585 days. Occasional field trips and activities are publicized to the active membership in the area.

White Pine Chapter

Expect to see the summer newsletter very soon. Some of the summer field trips are still in the final stages of planning. Please mark the following dates on your calendars and the details for June-August trips will be arriving soon.

Upcoming events:

- Saturday, May 20th field trip, Turnbull Wildlife Refuge (definite). Curtis Bjork, a graduate student at WSU, will be the trip leader for this field trip. We will look mostly at vernal pools which is Curtis' primary interest. We will also look at wildflowers and hopefully have a chance to discuss the formation of the channeled scablands, of which Turnbull is a part. Meet at 8:00 at the Palouse Empire Mall, just west of the old Treaty Grounds Brew Pub. There are bathrooms at Turnbull. Bring a lunch, beverages, warm clothing, rain clothes, boots, etc.
- Saturday, June 3: Field's Spring State Park (definite). Meet at the business incubator, Sweet Avenue and Highway 95 at 8:45 a.m. We hope to see four species of *Ribes* in bloom, take a short hike to an Idaho fescue grassland to view early spring wildflowers, and lunch at an overview of the Grand Ronde River. A short distance down Rattlesnake Grade we can view *Astragalus cusickii* – hopefully with its delightful pods. There is a small campground at the Park. Contact is Juanita Lichthardt, 882-4803.
- Saturday, July 22: Freeze-Out Ridge (planning).
- Weekend, August 19-20: U of I Clark Fork Field Campus, east of Sandpoint Idaho (definite). A full description of this exciting weekend trip will be in the summer newsletter as well as a reservation slip for accommodations, directions to the field campus and schedule of events. Contact is Merrill Conitz, 208-877-1626.

News and Notes

Native Plant Society of Oregon Meeting at Malheur June 23-25. The rare plant meeting will be held on Friday and several field trips are scheduled for Saturday. Dr. Barbara Ertter, Curator of Western American Botany, Jepson Herbarium, UC Berkeley, will speak on Friday evening on "Biogeography of Iran and the American West" and Saturday on "Floristic Surprises in North America." Register by sending \$5 to Stu Garrett, 1501 NE Med Center Drive, Bend, OR 97701. For accommodations and meals, contact the Malheur Field Station yourself, at: HC 72, Box 260, Princeton, OR 97721 (541) 493-2629 or <mf@burnsnet.com>.

A New National Geographic book on healing plants. "Nature's Medicine," by Joel Swerdlow, contains information on ancient and modern healing systems, the relationship of plants to medicinal drugs, plants that stimulate the human immune system, and specific biological functions and how healing plants affect them.

Southwest Exhibit at College of Idaho. This is a series of presentations and exhibits at Albertson College of Idaho's Orma Smith Museum of Natural History, called "An Enduring Presence: Cultural Continuity and Change Among Peoples of the Desert Southwest." For information, call archives at (208) 459-5230 or visit the Albertson College web site at <www.acofi.edu>.

Fall Mushroom Foray to Northern Idaho. The Palouse Mycological Association has put together a website announcing this year's North Idaho Mycological Association 2000 Foray in October. You can view the website at <http://www.nicon.org/nima/foray>. Please feel free to pass the information along to anyone who might be interested in attending or learning more.

Botrychium Symposium. Moonworts will be highlighted at this summer's Botanical Society of America's national meeting on August 8 at the Oregon Convention Center in Portland. See <<http://www.botany2000.org/>> for details.

Sage Notes is published in February, May, September, and December by the Idaho Native Plant Society, incorporated since 1977, under the laws of the State of Idaho. Editor, Sarah Walker; Technical Editor, Bertie Weddell; Production, Juanita Lichthardt; Circulation Manager, Ray Boyd; Contributing Editor, Karen Gray. Newsletter ads: - personal ads \$2; commercial ads \$5 for 1/8 page, \$8 for 1/4 page, \$15 for 1/2 page, and \$25 for full page. Ads should be sent with payment. Submissions: members and others are invited to submit material for publication. Articles in any form, even hand-written, are welcome, as is art work. Please provide a phone number in case there are questions. Material will not be returned. Send submissions directly to the editor, Sarah Walker, PO Box 69, Peck, ID 83545, (208) 486-6231 or <dspeck@clearwater.net>. Submission deadlines are January 1, April 1, August 1, and November 1.

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The Idaho Native Plant Society (INPS) is dedicated to promoting interest in native plants and plant communities and to collecting and sharing information on all phases of the botany of native plants in Idaho, including educating the public to the values of the native flora and its habitats. In keeping with our mission, it is the intent of the INPS to educate its membership and the public about current conservation issues that affect Idaho's native flora and habitats. **Membership** is open to anyone interested in our native flora. Send dues to Steve Rust, Treasurer, 1201 N. 24th, Boise, ID 83702, and all correspondence to INPS, Box 9451, Boise, ID 83707. Website address: IdahoNativePlants.org.

Category	Annual Dues, payable Jan. 1
<input type="checkbox"/> Patron	\$30
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 Calypso (Coeur d'Alene; please include \$6 newsletter dues)
 Kinnikinnick (Sandpoint)
 Pahove (Boise)
 Sah-Wah-Be (SE Idaho)
 White Pine (Moscow)
 Wood River (Ketchum-Sun Valley; please include \$7 chapter dues)
 None. Those who do not live near a chapter are 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 wish to be involved in.

* Household memberships are allocated two votes.

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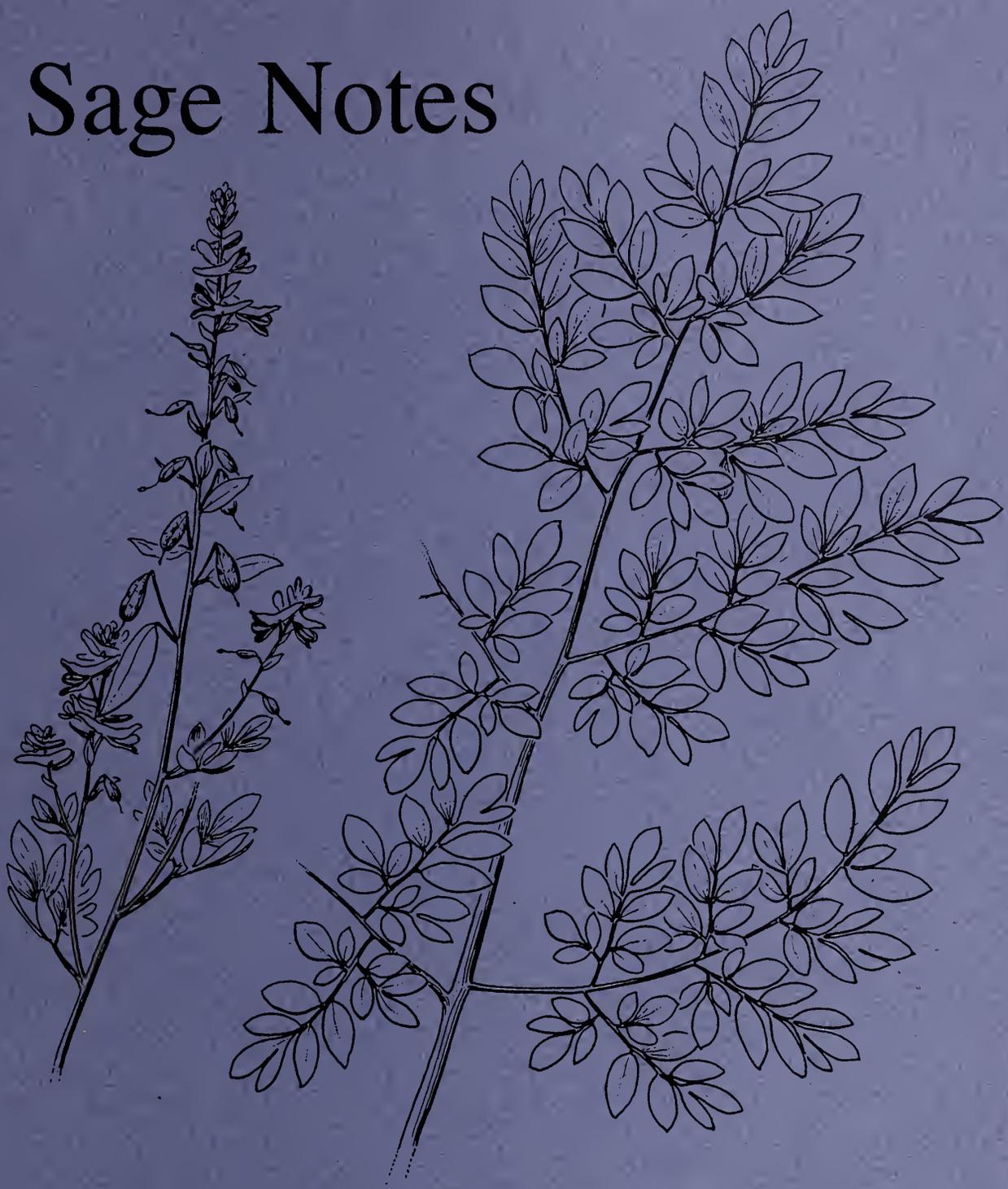
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INPS has a new website:
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Sage Notes



Idaho Native Plant Society

Summer 2000

Volume 22 (3)

Associate editors needed. Working on the *Sage Notes* editorial board is a wonderful opportunity to learn more about native plant conservation and newsletter production. The board works as a team to plan, solicit articles, proofread, and produce the newsletter. Members also contribute articles whenever possible. Over the years *Sage Notes* has come out about four times a year, sometimes along with *Sage Briefs*, a shorter newsletter about upcoming field trips or other alerts. This year we have started posting on the INPS website <idahonativeplants.org>.

If you know of an INPS member who would be interested in working on *Sage Notes*, please send suggestions to Editor Sarah Walker (address on back page).

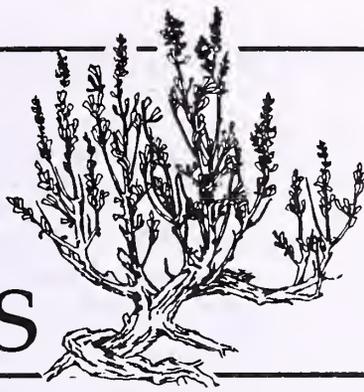
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Cover: Case's corydalis (*Corydalis caseana* ssp. *hastata*) by Jeanne R. Janish (see article on page 9).

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Sage Notes



*...promoting interest in
Idaho's native flora.*

Summer 2000 ❖ SAGE NOTES ❖ A Publication of the Idaho Native Plant Society Vol. 22 (3)

A while back (it's longer than we care to admit, the spring issue of 1999), we promised readers an article on land swaps. Well, the fact that the General Accounting Office recently released a highly critical assessment of Forest Service and BLM land exchanges makes this a good time to deliver the promised article. Here it is.

Land Swaps: A Closer Look *Bertie Weddell, White Pine Chapter*

In the best of all possible worlds, society would determine which lands and waters should be managed by public land management agencies and which should be managed privately. This would result in efficient and effective management of natural resources and at the same time would protect biological diversity. Areas that contained significant biological resources would be managed by public agencies dedicated to protecting those resources, while degraded areas would be devoted to economic activities. Management agencies would control large blocks of land, rather than dispersed fragments, so that impacts from resource extraction and development could be minimized.

If mistakes were made in assigning lands to these categories, the system would be fine-tuned. Public lands with relatively little biological importance would be transferred to private ownership, and biologically significant private lands would be transferred to public ownership. One way to do this would be through trades exchanging land in the first category for land in the second category. Land swaps could meet the needs of agencies that have limited funds for purchasing land or that are dealing with landowners who didn't want to sell their land outright.

This is the rationale behind land exchanges. There is certainly no doubt that existing patterns of land ownership are flawed. Historically, lands were allocated to federal agencies for a variety of reasons. Economics and politics were high on the list of considerations; biological uniqueness and integrity were not. To make matters worse, in the 1860s Congress gave every other square mile of land within the right-of-way to the Northern Pacific Railroad, to encourage westward development. This created a fragmented checkerboard of ownerships that has plagued management efforts ever since.

Although the idea underlying land exchanges seems logical, the process of trading public land for private creates a situation that is vulnerable to abuse. Any time private parties gain control of publicly-owned resources, the public stands to lose unless rigorous safeguards are in place to protect its interests. There are two potential problems here: what is traded and for how much. If inappropriate decisions are made about what is traded, the public loses valuable resources. If inappropriate decisions are made about the value of the traded resources, the public loses money.

Critics have long charged that both kinds of abuses are rampant and that land exchanges give away land to special interests and evade environmental laws. Furthermore, because appraisals remain secret until after an exchange is completed, agency personnel can be pressured by powerful constituents to make deals that serve special interests rather than the public.

In 1998 the *Seattle Post-Intelligencer* ran a series of articles detailing these criticisms, and California Democratic Representative George Miller asked the General Accounting Office (GAO) to review the land exchange programs of the Bureau of Land Management and the Forest Service. Accordingly, the GAO audited the agencies' land exchanges since 1989. (Congress passed legislation facilitating exchanges in 1988.)

Their recently released report is very critical of existing practices, for both of the reasons mentioned above: the highly questionable public benefits of many trades, and the egregious losses to taxpayers that result from undervaluation of public land and overvaluation of private land. (See accompanying box.)

Both the Forest Service and the BLM argue that land exchanges are an important tool allowing them to augment habitat for sensitive species and habitats and to consolidate their holdings by eliminating private

inholdings. Both agencies have attempted to institute some reforms. But the GAO concludes that the reforms do not go far enough, and that land exchanges are so fraught with problems that they may not be fixable. It suggests that straightforward land purchases are a far better way of accomplishing agency objectives.

Janine Blaeloch, director of the Western Land Exchange Project, agrees that land purchases are preferable to land exchanges. She points out, however, that federal agencies often rely on land swaps because they lack the funds necessary to buy lands outright. Although “there are substantial funds earmarked for land acquisition through the Land and Water Conservation Fund, . . . Congress appropriates those funds annually and most of that money is directed toward unrelated programs and congressional ‘pork’.” (*Seattle Post-Intelligencer* July 25, 2000). (More information about the Western Land Exchange Project can be obtained from <http://www.westlx.org/>.)

As is so often the case, when we look at one problem we find a more fundamental problem behind it. In this case, agencies’ reliance on land exchanges stems from Congress’ unwillingness to earmark Land and Water Conservation Funds for the purpose for which they were intended.

The “Results in Brief” section of the GAO’s report is quoted in its entirety below. The full report is available at <http://www.gao.gov/>.

United States General Accounting Office, June 2000. BLM and the Forest Service: Land Exchanges Need to Reflect Appropriate Value and Serve the Public Interest, Report to the Ranking Minority Member, Committee on Resources, House of Representatives

Results in Brief

The [Forest] Service and the Bureau [of Land Management] used land exchanges to acquire about 1,500 total square miles of land during fiscal years 1989 through 1999. The Service completed about 1,265 exchanges during this period, which were valued at over \$1 billion. Through these exchanges, the Service acquired a net total of about 950 square miles and generally acquired land that had lower per-acre values than the land it conveyed. The Bureau does not centrally track the number of exchanges it completes or their total dollar value; instead, the agency tracks transactions—two or more of which can occur in each exchange. The Bureau completed about 2,600 transactions in fiscal years 1989 through 1999, which resulted in the Bureau’s acquiring a net total of about 550 square miles.

The agencies did not ensure that the land being exchanged was appropriately valued or that exchanges served the public interest or met certain other exchange requirements. We found numerous problems with the exchanges we examined. In particular:

- The agencies have given more than fair market value for nonfederal land they acquired and accepted less than fair market value for federal land they conveyed because the appraisals used to estimate the lands’ values did not always meet federal standards.
- The agencies did not follow their requirements that help show that the public benefits of acquiring the nonfederal land in an exchange matched or exceeded the public benefits of retaining the federal land, raising doubts about whether these exchanges served the public interest. Furthermore, the Bureau did not always follow its regulations in preparing exchange initiation agreements.
- The Bureau—under the umbrella of its land exchange authority—sold federal land, deposited the sales proceeds into interest-bearing escrow accounts, and used these funds to acquire nonfederal land (or arranged with others to do so). Current law does not authorize the Bureau to retain or use proceeds from selling federal land; it instead requires the Bureau to deposit sale proceeds into the Treasury and to use appropriations to acquire nonfederal land. In using these funds and the interest earned on them to purchase land, the Bureau augmented its

appropriations. The Bureau also did not comply with its sale authority when it sold the land, and none of the funds retained in escrow accounts or used in this manner were tracked in the Bureau's financial management system.

Both agencies recently increased their management oversight of exchanges by (1) creating review teams composed of headquarters and field staff to examine proposed exchanges that are valued at \$500,000 or more and are considered to be controversial; (2) revising their policies and procedures that address exchanges; and (3) creating additional training for agency personnel involved in land exchanges. These efforts, if properly implemented, should improve how these programs are conducted. However, they do not address all land exchanges—including those valued at less than \$500,000, those not identified as being controversial, and those considered to be too close to completion to be stopped or altered. In addition, the Bureau's review team has not addressed the unauthorized selling and buying of land under its exchange program or the financial management of these funds. Furthermore, handbook revisions and enhanced training can clarify the agencies' land exchange policies and procedures, but they do not ensure that those policies or procedures are appropriate or followed.

At least some of the agencies' continuing problems may reflect inherent underlying difficulties associated with exchanging land compared with the more common buying and selling of land for cash. In land exchanges, a landowner must first find another landowner who is willing to trade, who owns a desirable parcel of land that can be valued at about the same amount as his/her parcel, and who wants to acquire the parcel being offered. More commonly, both landowners would simply sell the parcels they no longer want and use the cash to buy other parcels that they prefer. In this way, the value of both parcels is more easily established when they are sold in a competitive market, both parties have more flexibility in meeting their needs, and there is no requirement to equalize the values of the parcels. Difficulties in land exchanges are exacerbated when the properties are difficult to value—for example, because they have characteristics that make them unique or because the real-estate market is rapidly developing—as was the case in several exchanges we reviewed. Both agencies want to retain land exchanges as a means to acquire land, but in most circumstances, cash-based transactions would be simpler and less costly.

In view of the many problems in both agencies' land exchange programs and given the fundamental difficulties that underlie land exchanges when compared with cash-based transactions, we believe that the Congress may wish to consider directing the Service and the Bureau to discontinue their land exchange programs. Until such a fundamental action is taken and while the agencies continue to operate land exchange programs, we recommend that both agencies review and approve all proposed exchanges to ensure that they meet key statutory and regulatory requirements for land exchanges; that is, that they are appropriately valued, serve the public interest well, and meet other exchange requirements. We also recommend that the Bureau immediately discontinue selling and buying land under its land exchange program—a practice that is not authorized under current law—and conduct an audit of financial records associated with these sales and purchases.

In their comments on a draft of this report, both agencies concurred with the recommendations that were addressed to them and have taken steps to respond to them. However, both agencies disagreed with our suggestion for congressional consideration, believing that land exchanges are an essential and irreplaceable tool for adjusting federal land ownership. We believe that the agencies' program improvements cannot address the inherent difficulties associated with land-for-land exchanges and that the agencies' desire to continue exchanges is more than offset by their programs' continuing problems and exchanges' fundamental inefficiencies. We continue to believe that the Congress should consider directing the agencies to discontinue their land exchange programs because of the many problems identified and their inherent difficulties.

Converting Turfgrass to Native Vegetation in Moscow

John Byrne, Forester, Rocky Mountain Research Station, USDA Forest Service, Moscow

The landscaping around the Moscow Forestry Sciences Laboratory (of the USDA Forest Service, Rocky Mountain Research Station) isn't that different from most commercial city properties. Except for a few native plants in beds near the front of the building (initiated by Ray Boyd, a retired employee who is active in the White Pine Chapter), the lot is dominated by wide expanses of turfgrass with occasional trees, many of which are not native—such as Scotch pine (*Pinus sylvestris*), and crab apple (*Malus* spp.). The grass is watered intensively with a sprinkler system throughout the summer.

For several years I commented to any sympathetic listener about the waste of mining deep groundwater (the water source for Moscow) to keep our turfgrass green when the surrounding hills were browning up from lack of water. It seemed like a poor example to the public and additionally there had been a presidential directive (Clinton 1994) on using native vegetation on federal properties. Native plants could provide a more diverse habitat for birds and insects and might be more aesthetically pleasing than a sterile lawn. I wondered whether it would be possible to stop watering and create a landscape, like a piece of prairie, that was natural to our area.

I must admit that even though I work as a forester, and know the common vegetation of the local forests, I knew little about grasslands. Doing a little research on the pre-settlement vegetation, I found that the

Moscow area was predominately a grassland-shrub plant community (Daubenmire 1942, 1980; Franklin and Dyrness 1988). The dominant vegetation was probably short bunchgrasses, like Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Agropyron spicatum*), with scattered perennial flowering forbs. Small shrubs, such as snowberry (*Symphoricarpos albus*), Wood's rose (*Rosa woodsii*), and creeping Oregon grape (*Berberis repens*), either occurred as scattered individuals within the predominant grassland or as thickets. Tall shrubs, such as hawthorn (*Crataegus douglasii*) and willow (*Salix* spp.) were the main vegetation along stream courses. There were also examples of isolated forest-shrub plant communities growing as extensions of the main forest cover of the nearby mountains. The dominant tree cover was probably ponderosa pine (*Pinus ponderosa*), with an understory of shrubs—snowberry, ninebark (*Physocarpus malvaceus*), ocean spray (*Holodiscus discolor*), and serviceberry (*Amelanchier alnifolia*).

After my initial research, I felt we could convert part of our lawn area to native vegetation. I talked to a few others at the lab who might be supportive of the idea, including Jonalea Tonn and Dennis Ferguson, from the local White Pine Chapter of the Native Plant Society, and Bill Wykoff, who I knew had established some native plants in his garden. They all thought it was a good idea and suggested I present it at an all-staff meeting in February 1999. With some trepidation, I made the presentation and those present overwhelmingly supported the idea. A subsequent survey of the staff verified that most people favored the idea. Though a majority of folks thought lab personnel could plan the project, there were enough



BEFORE—Grounds of the Forestry Sciences Laboratory in Moscow prior to the addition of native landscaping.

in favor of outside help that I arranged for two University of Idaho landscape architecture students to plan the project, as part of a project assignment for one of their classes. And finally, best of all, most employees expressed a willingness to work on a volunteer (non-pay) basis on the project.

We gave the two students some general guidelines including (1) there should be no watering, except for initial establishment, (2) there should be native vegetation only, (3) turfgrass should be retained next to the buildings for fire safety, (4) a walking path should be a possibility, (5) removal of existing trees/shrubs should be minimized, and (6) work should be done by lab personnel in phases (we did not have a big budget). The two students, Katie Wilde and Toby Hagerott, presented their plans to lab personnel in early May 1999. We felt they gave us some good design concepts, and we helped them learn about native vegetation, a topic only minimally covered in their classes. In the end, we chose Katie's plan, with some modifications.

By June 1999, we had discussed costs with the lab administrative officer and secured funding for materials (about \$500 per phase), received approval from station management to proceed, and proposed a plan of work. We decided to start near the main building to avoid any conflict with a pending redesign of US Highway 95. This first phase included removing about 300 sq. ft. of turfgrass sod with a sod cutter, creating a path and patio area, and then planting a few ponderosa pines, Wood's roses, and two kinds of bunchgrass, Idaho fescue and bluebunch wheatgrass. We used lawn edging to separate the native vegetation from the turfgrass area next to the building and landscape fabric under the path and patio to reduce encroachment from unwanted plants.

The initial plan called for a simple path and patio made from wood chips, but we decided to make the area handicap accessible. To create the path and patio, we mixed gravel and dry cement, then tamped and watered it, letting it set up to a hard surface. Fortunately, we had use of a Bobcat for moving much of the dirt and gravel, and an operator, Ben Kopyscianski, who was supportive of the project. Others loaned their own trucks and rototillers. Many helped at various work parties, mostly done on their own time after work. I was glad to see this, not only because I couldn't have done the work by myself, but because their participation made it everybody's project.

We have greenhouse facilities and often grow trees from seed for various research projects. The four ponderosa pine trees initially planted were leftovers from such a project. We had never tried to grow grass before. We obtained a few ounces of grass seed from Loring Jones, a member of the White Pine chapter, and planted the seed in plastic tubes designed for growing tree seedlings. Within two weeks, there was excellent germination, and with regular watering and fertilizing, grass plugs were ready to outplant by mid-September. The plugs were planted about 8 inches apart, as per the recommendation of Kas Dumroese, University of Idaho research scientist and editor of the *Native Plants Journal*. We didn't expect much top growth that fall, only some root growth in preparation for good growth the next spring. We also planted three Wood's rose plants.

Early the next spring, we knew we had a weed problem. Kas Dumroese had recommended the use of a pre-emergent herbicide to keep weeds down. In a rush to get things done in the fall, I forgot Kas' recommendation, and we ended up with a rather



AFTER—Grounds of the Forestry Sciences Laboratory in Moscow, the lawn partially replaced by native vegetation.

persistent crop of annual bluegrass (*Poa* spp.). We couldn't spray it with herbicide for fear of killing the native grasses, so we pulled it by hand, several times on a bi-weekly basis, until it was under control and the native grasses provided competition. The bluegrass persisted at the base of the native grass clumps.

The bunchgrasses had excellent growth for the first year. We had some grazing by resident rabbits, but mostly they seemed to enjoy the cover provided by the grass, which reached 2-3 feet in height after sending up seed stalks. We augmented the grasses by interplanting several native forbs, including arrowleaf balsamroot (*Balsamorhiza sagittata*), prairie smoke (*Geum triflorum*), roundleaf alumroot (*Heuchera cylindrica*), and silky lupine (*Lupinus sericeus*). We've watered these forbs through the summer months. None have put on much growth, but hopefully they will come on stronger next year.

We began Phase 2 of the project in April 2000. The major effort for this phase was to connect the path and patio created in 1999 to the main building access doors and in the process vegetate a short, steep slope with native plants. We again started by removing sod from the area with a sod cutter. We dug into the hillside and created a series of steps with railroad ties and another path with slate stepping stones that were recycled from our Priest River Experimental Forest. The exposed cut faces of the



Serviceberry (*Amelanchier alnifolia*)

slope were covered with basalt rock obtained from several local sources. In addition, we planted another small area of the lawn with a clump of ponderosa pine trees, Idaho fescue, and bluebunch wheatgrass. We first killed the turfgrass with herbicide and after the grass died, rototilled the sod in preparation for planting.

The main plant we used for the steep slope near the steps was kinnikinnick (*Arctostaphylos* spp.). It is native in dry to mesic forests in the area, and will create a dense cover for erosion control on steep slopes. We made cuttings of kinnikinnick found around Moscow, dipped them in rooting hormone, and poked them into moist potting mix in plastic tubes. They were put in a box covered with clear plastic in the greenhouse, with heat tape to keep the roots warm, and misted twice a day for about six weeks. Then I moved them to a protected shelterhouse. About 60% of the cuttings rooted. I also dug some creeping Oregon grape from a roadside east of Moscow and potted them in potting mix. About 80% of them rooted well and put on new top growth, although it took several months. I started silky lupine plants in tubes from seed. In June, after all of the step and rock work was completed, we outplanted the kinnikinnick, interplanting with the creeping Oregon grape and silky lupine. Before planting, we applied a granular pre-emergent



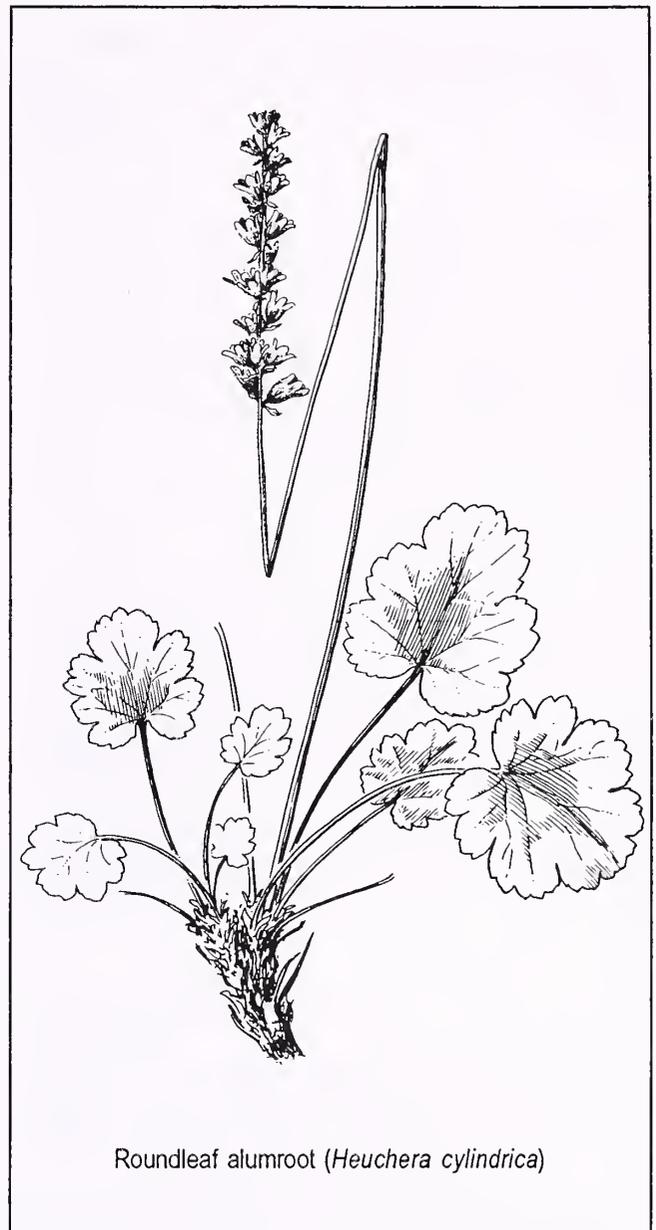
Ocean spray (*Holodiscus discolor*)

herbicide to help in the control of weeds. We are using the lawn sprinkler system for watering during the summer to help with establishment. Three ocean spray plants were planted on the slope near the building to help screen some air-conditioning units from the patio area.

We have heard two concerns from a few employees. First, they wonder who is going to take care of the area when the main supporters of the project leave. Second, they are concerned that the area will turn into a weed patch. My answer to both of these concerns is that if we establish the plantings properly and maintain them for a few years, there should be minimal weeds and less care required than an expanse of turfgrass that requires regular watering (and constant repair of the sprinkler system), mowing, fertilizing, and weed control.

Future plans will include covering a greater area of the hillside with prairie plants and shrubs. Instead of planting grass and forb plugs, we may attempt a larger planting by hydroseeding, after preparing the site by killing the grass with herbicide and rototilling. Also, when the highway project is completed, we may plant some wet area shrubs, like hawthorn and willow, in the ditch at the edge of the property. We will continue to add other native prairie forbs to the existing plantings and possibly add some species like longleaf phlox (*Phlox longifolia*) that would typically grow around basalt outcroppings. Additional paths will also be added.

Since the initial bed of native grass and forbs is located just off the main entrance to the Forestry Sciences Lab, we hope to erect signs in the near future to describe the project to the public. Besides use by employees, we feel that in time it could be used for environmental education. Please feel free to stop by the lab and view the project if you are in the Moscow area. We are located at 1221 South Main Street, just off Highway 95 in the southern part of town. Any comments on the project or ideas you might have about converting lawns to native vegetation would be appreciated; I can be contacted by email at jbyrne@fs.fed.us



Roundleaf alumroot (*Heuchera cylindrica*)

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Sources for native plants that we used

- Northplan Mountain Seed, Moscow, ID; recently sold to Sun Mountain Native Seed, Spokane, WA.
- Prairie Bloom Nursery, Pullman, WA (I believe they get most of their native plants from Plants of the Wild, Tekoa, WA, a wholesaler of native plants.)

Twenty Years after the Revolution: A Glimpse at the Biogeography, Botanical Science, and Land Use Practices in the Islamic Republic of Iran—A Lecture by Barbara Ertter

Valerie Geertson, *Pahove Chapter*

I recently had the pleasure of hearing Dr. Barbara Ertter speak at her alma mater, the College of Idaho, about her three-week tour of northern Iran last May. As you may know, Dr. Ertter is Curator of Western North American Flora at the University of California and Jepson Herbaria at UC Berkeley and a native Idahoan. She had the opportunity to visit Iran with a colleague as part of a scientific exchange. Or, as she put it, she was one of the “harmless botanists” invited to begin to re-establish a relationship between Iran and the United States.

What an adventure! She was asked to wear the “modest dress” style—the loose-fitting, long black robe, pants, and scarf that most of us typically think of showing only the face and hands—and sometimes she had to wear “the tent” as well (another long robe in addition to the modest dress). But, this didn’t bother her. She pointed out that even in the west, women have only recently been wearing less modest clothing.

She could travel freely and visited four universities. She went on as many field excursions as possible. And, of course, being a botanist, that was where she really wanted to be—outside, looking at plants.

And what interesting, beautiful plants! My favorite was a lovely *Delphinium* with white flowers; they looked like dolphins, which is the derivation of the genus name. I had certainly never noticed any of our western species looking like dolphins.

Another thing I learned is that Iran is home to the ancestors of some of our important horticultural and agricultural plants, such as the tulip, gladiolus, pistachio, peach, pear, and many kinds of apples. The wild stocks of these plants should therefore have value to us.

Dr. Ertter pointed out that Iran has been visited by transcontinental travelers for a long time, and the length and time of intense human occupation is obviously much greater there. They have had introduced species for hundreds of years. In such an area, how does one realistically discuss the values of native or introduced species? It is a different concept there and one that I have been twisting around since I heard her speak.

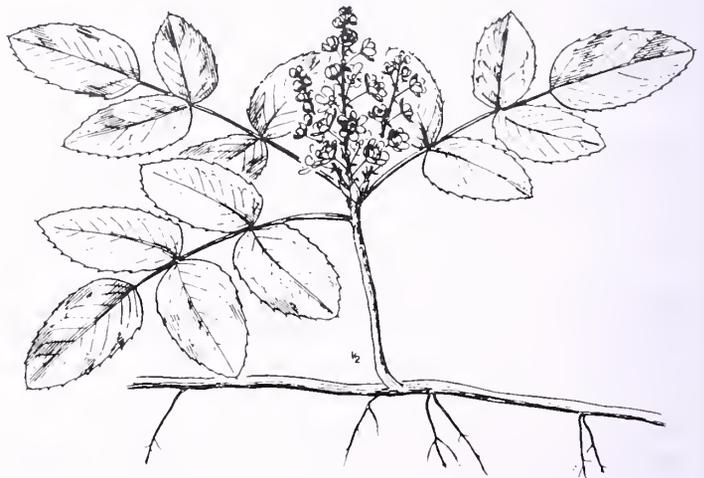
Some plants native to Iran have become weeds here. One example she discussed is *Bromus tectorum* (cheatgrass) which, of course, is a serious pest. It does not form dense monocultures there even in overgrazed areas, but it is common in somewhat disturbed areas. She also saw *Alyssum* and *Lactuca serriola* (prickly lettuce). Her Iranian colleagues on the field trip were somewhat fascinated by a mustard,

and they were trying to identify the genus. Dr. Ertter told them with confidence which genus and species they were looking at: *Lepidium perfoliatum* (clasping pepperweed). This must have been impressive. Unfortunately, Iran has some western species that have become weedy there, for example, the California poppy.

Dr. Ertter showed a series of landscape slides—alternating between Iran and the intermountain west, particularly the Great Basin. The resemblance was simply uncanny. The Great Basin slides looked like those in Intermountain Flora—wide, open valleys with meandering streams or flat playas ringed with rounded hills or steep mountains. The landscapes of Iran were very similar; the valleys were filled by low shrubs and an abundance of herbaceous species. I could not tell which was which until she gave the location. Biogeographic similarities explain the landscape similarities.

However, there is something missing from northern Iran as compared to southern Idaho. There are no coniferous forests. There is some evidence of conifer trees on ancient artworks, but, without archeological studies, it is unknown if any forests have existed in the area in recent history. This was rather chilling. The Iranian government is beginning “reforestation” projects with non-native species for industrial purposes.

Dr. Ertter learned and shared all of this and more from the three-week whirlwind trip. Certainly the right person made the journey.



Creeping Oregon grape (*Berberis repens*)

Corydalis caseana—Don't Look Too Closely

Sarah Walker, White Pine Chapter

"I saw this huge, weird plant down by the creek," the boy scout told me, holding up a limp leaf he'd collected near our campsite along Huckleberry Creek in the Selway-Bitterroot Wilderness. "What is it?" Abandoning my role as low-impact camping teacher (which includes "leave the flora alone") to take advantage of the "teachable moment," I explained that it was an unusually large plant called *Corydalis*, that it was related to bleeding hearts and Dutchman's breeches, and that it produced huge, tender, hollow shoots along the edges of mountain streams right in the froth of spring high water. I don't know how much of this he took in, but *corydalis*, or "fitweed," is indeed an eye-catcher.

Every spring I marvel at this incredible plant along the edges of Huckleberry and Rock Lake Creeks, where it grows in partial shade under alder, maple, cedar, and ferns. It also occurs in the middle of wide creeks like Boulder Creek, on rock bars. First come the pale clumps of hefty celery-like stalks, standing fast in the roar and madness of mountain currents. By the time high water has subsided enough so that I can safely cross the creeks (usually after July fourth), the stalks have started to produce delicate lacy leaves, each made up of hundreds of small, oval leaflets. The plants are glabrous and appear blue-green. Several plants in a group shade the rocks along the stream edge, providing damp, cool habitat for the mosses beneath. These plants are enormous! A single plant can be 6 feet tall and 4 feet wide. By the third week in July the plants are in full bloom, with a dozen spikes showing above the mass of foliage, each with 50-60 white, spurred flowers an inch long and arranged sideways on the stem. As I watched, the flowers were visited one after the other by bumblebees. As the flowers mature, they turn slightly pink. By the end of July, there are just a few flowers left at the top of the spike, with ripening fruits on the bottom. The fruits are explosive! Karen Gray recalls taking a close look at them, only to have seeds fly out and stick to her eyeglasses. With the first fall frosts, the tender leaves wilt and succumb—like lettuce, when the refrigerator is too cold.

I remember once on a Selway field trip when leaders Fred Johnson and Steve Brunfeld brought our caravan to a halt to appreciate the sheer biomass of this remarkable plant, towering over a small seep along the edge of the road.

There are two subspecies of *Corydalis caseana* in Idaho. *C. caseana* subsp. *hastata* occurs in northern Idaho, where it is endemic to the St. Joe and Clearwater River basins. It is considered globally rare, and its status is G3. *C. caseana* subsp. *cusickii* occurs in central Idaho, and is not considered rare.

Dr. Joan Maloof of Salisbury State University in Maryland has studied how *Corydalis* reproduces. She found that *Corydalis caseana* subsp. *brandegei* (found in Colorado) has two methods: "outcrossing" (the male pollen of one flower combines with the female part of a different flower) and also "pollinator mediated self-fertilization" (male and female parts of the same flower combine, but only after the flower is first visited by a pollinator). She concluded that *Corydalis caseana* subsp. *brandegei* depends on the long-tongued bumblebee (*Bombus appositus*) for reproduction, and that conservation plans for the plant must include the pollinator as well. She also observed that chipmunks and white-crowned sparrows eat *Corydalis* seeds, and thus they too depend on the long-tongued bumblebee. Dr. Maloof has written about the effect of "nectar robbers" on *Corydalis*. The robbers are short-tongued bumblebees who acquire nectar without pollinating the flower: they make holes in the spur of the flower instead of landing on the front of the flower and interacting with the flower's reproductive parts. She proposed that the robbers may have a beneficial effect by causing the "legitimate" pollinator, the long-tongued bumblebee, to cover more ground to obtain nectar—and as a result possibly increase gene flow distances.

I doubt the boy scouts would have found *Corydalis*' "reproductive strategy" as interesting as I did, but I bet they would have gotten a kick out of the explosive fruits!

Book Review

Flora of Steens Mountain. Donald Mansfield. Oregon State University Press, Corvallis, 1999. Review by Carol Prentice, Pahove Chapter.

Don Mansfield's "Flora of Steens Mountain" is a welcome addition to floras of the Intermountain Region. The Steens Mountain area isn't really near anywhere, unless you are familiar with Frenchglen or Fields, Oregon. The area lies south of Burns and north of, well, north of Nevada. Steens Mountain is a single 30-mile long fault-block mountain with an abrupt east face, rising one vertical mile above the Alvord Desert. It is the largest and tallest fault-block mountain in the northern Great Basin. This distinctive landform creates an island of alpine flora surrounded at the lowest elevations by the "deserts" of the Harney Basin and creates a rain shadow for the salt flats of the Alvord Desert. The resulting flora is a complex assemblage of plant communities that can be divided into no fewer than five vegetation zones. Once you find the Steens, you can drive the 66-mile Steens Mountain Loop Road and visit the alpine flora at the top, the highest point that one can drive to in Oregon.

This one-volume flora, sized to carry in the field, will save you a lot of luggage as the Steens are the meeting place of three regional floras, the "Flora of the Pacific Northwest," the "Intermountain Flora" (not all volumes are published), and the "Flora of California." The first clue that the Steens flora is really unusual is on the cover. What looks like a common bull thistle is really a unique narrow endemic thistle. The Steens have six endemic species and numerous disjuncts; 5% of the flora is considered rare. Other than juniper there is only one other conifer, Sierran white fir, which is found in only two isolated sites. Steens Mountain is one of the few places in North America where firs and pines are not the timber at timberline.

The book has three parts: the introduction, the key to the flora, and the appendices. The introduction is a must-read. It provides historic and biogeographic information and explains how to use the key. For the novice, proper plant collection, preservation, and label preparation are explained. The plant families are arranged alphabetically, a good idea for a field flora and for new students. Color photographs are found in the center section and referenced to the key. Within the species descriptions is a wealth of knowledge: key identification characters, specific habitats, geographic range of species and specific locations, and more.

Native American uses are given, but a word of caution—don't experiment unless you have a thorough knowledge of edible plants. Important appendix sections include a glossary, a wonderful group of illustrations of selected species referenced in the key, illustrations of scientific terms, and indices to scientific and common names. You may wish to tab some of these for easy reference (I have also learned to use a couple of book marks so I don't keep losing my page). I have put this valuable paperback volume in a protective book bag for extended service.

Prior to this thorough study, the flora of the area was not well documented and insufficiently published. You could say Dr. Mansfield did his work from the ground up—the vouchers for this flora now stuff the shelves of the Harold M. Tucker Herbarium at the Albertson College of Idaho. As Dr. Mansfield mentions, this flora (like most floras) is perhaps 90% finished. He continues to find new additions to the flora each year. Take him at his word, visit this spectacular desert to alpine country and you too will be able to contribute to the "Flora of Steens Mountain."

"Flora of Steens Mountain" is available for \$29.95 from OSU Press (<http://osu.orst.edu/dept/press>).

Chapter News

Pahove Chapter

Monthly chapter meetings were held in March, April, and May with presentations on the vegetation of the Owyhee Plateau, the ecology of exotic plant species, and endemic plants of Idaho by (respectively) Chris Murphy, Roger Rosentreter, and Michael Mancuso. At the May meeting Chris Murphy was elected to serve as chapter president. Steve Rust was re-elected to the post of secretary/treasurer.

Our June field trip to the South Fork Salmon River was a success, with much botanizing and good old socializing. Both the kids and adults learned new plants! On Saturday we hiked a mountain ridge through Douglas and grand fir forests. Then we zipped down to the Warm Lake area where we visited Tule Lake wetlands and its rare *Carex buxbaumii* population. We documented many beautiful sedges . . . and even saw wolf tracks! We had a nice campsite at Penny Springs and on Sunday hiked to an unbotanized hot spring through a burned mountain slope complete with many wildflower species. The hot spring was a warm and muddy elk wallow but interesting nonetheless.

On July 21-23 the chapter botanized Idaho's Basin and Range—the Pahsimeroi Valley and Lost River Range. In the evening shadow of Idaho's highest

peak, Mount Borah, lies a little-known and intriguing basin of contrasting spring-fed wetlands and drought-prone high desert. This environment of extreme temperatures and low moisture—from the hot and dry low sagebrush and shadscale of basins to windswept subalpine and alpine mountains—provided great opportunities for botanizing, as well as some challenging hiking. Rewards for all the traveling were plentiful: splendid views of adjacent peaks and vegetation patterning, the cool mountain breeze, and meadows of blooming wildflowers.

A trip to the Owyhee Mountains took place on August 12-13. This outing was co-sponsored by the Sierra Club as part of their campaign to protect the Owyhee region. We tried to beat the heat in southwest Idaho's high desert, "sky island" Owyhee Mountains. On Saturday we hiked in the mountains around Silver City, looking at native plants, birds, and their habitats. On Sunday we hiked Hayden Peak's wind-swept subalpine shrub steppe (a 3-4 mile one-way climb gaining over 2,000 feet to the 8,300 ft. summit, both on old jeep trails and off-trail). This trip occurred in part of the Cinnabar Mountain proposed Research Natural Area.

Regular monthly meetings are anticipated for the fall. Members are encouraged to attend. Please watch the mail for specific times and locations.

Calypso Chapter

This summer the chapter helped build an information kiosk and a viewing platform at Huff Lake, a delicate fen in northeastern Washington whose rare plants and floating mats are being trampled by travelers who stop to fish, look around, or take a break from the nearby highway. A group has formed to build raised walkways and develop educational materials to reduce foot traffic on the peat mats. INPS Calypso Chapter, the Northeast Chapter of the Washington Native Plant Society, and the Selkirk-Priest Basin Association, a conservation group, has contributed workers. Priest Lake Ranger District botanist Diane Penny has helped with planning and interpretive materials. The next job is to build more walkways, which will be wheelchair accessible. Huff Lake is home to rare species like round-leaved sundew (*Drosera rotundifolia*). Hats off to this collaborative effort! For more information, or to lend a hand, contact Diane Penny at (208) 443-6847 or <dpenny@fs.fed.us>.

Kinnikinnick Chapter

The chapter planned three field trips for the summer: to Gold Hill, Myrtle Creek, and Ross Creek Cedars.

North Idaho's three chapters—Kinnikinnick, Calypso, and White Pine—coordinated their field trips for joint adventures to Huff Lake, Roman Nose Lakes, and a visit to the new arboretum in Sandpoint.

White Pine Chapter

The chapter organized field trips to Field's Spring State Park, Freezeout Ridge, and an overnight to the Clark Fork Campus near Sandpoint (and rendezvous with Kinnikinnick and Calypso Chapters.). Secretary Karen Adams reports that the chapter hosts a native plants information table at the Moscow Farmer's Market.

News and Notes

Tremendous loss to Columbia Basin shrub steppe habitat. On June 27 a fire caused by a fatal car accident swept across the Hanford Nuclear Reservation, burning up most of the 77,000 acre Fitzner-Eberhardt Arid Lands Ecology Reserve (ALE) within its borders. The ALE was established in 1967 as a research natural area under the U.S. Fish and Wildlife Service to protect one of the largest ungrazed remnants of big sagebrush habitat left in the U.S. (see *Sage Notes* 19:3, pp. 9-10, "Life Amid Toxins, Tombs, and Bombs: Military Lands and Cemeteries as Refuges for Biodiversity"). The ALE and the surrounding nuclear reservation have been off-limits to grazing and agricultural practices since the 1940s and have been called a "biological treasure." Recent surveys conducted by The Nature Conservancy (TNC) discovered three plant species new to science: a bright yellow desert buckwheat (*Eriogonum* sp.), a milk-vetch (*Astragalus* sp.), and a bladderpod (*Lesquerella* sp.), as well as new populations of several rare plant species. TNC's report calls the Hanford site "a rich natural mosaic, including many relatively unaltered and increasingly uncommon native habitats. . . the quality, diversity and extent of these habitats is unequaled in the Columbia Basin. . . significant numbers of plant, bird, amphibian, reptile and insect species, many of which are rare or in decline, were found to be associated with or dependent on these habitats. From a conservation standpoint, the Hanford Site is a vital—and perhaps the single most important—link in preserving and sustaining the biodiversity of the Columbia Basin's shrub-steppe region."

Most of the sagebrush, bunchgrass, and rare plants burned up. Recovery is expected to be slow for sage because its small seeds depend on specific conditions to germinate. Grasses are expected to return from unburned root crowns and seeds in the soil bank. Little is known about recovery potential for the rare plants. There is concern for the microbiotic crust communities, and for the long-term impacts to the shrub-steppe ecosystem. Another threat is from hungry elk concentrating in the unburned riparian areas and trampling recovering native plants. In addition, 41 miles of new roads were created as part of the suppression efforts. The sad story is detailed in the Burned Area Emergency Rehabilitation (BAER) plan prepared by the Department of Interior (<http://www.hanford.gov/envmon/24-command-plan/app-1.pdf>). The BAER team hopes to allot nearly half of its \$600,000 budget to planting sage seedlings, controlling weeds, protecting rare plant habitat, and monitoring. Researchers want to study the disaster to learn about rare plant recovery after fire.

The ALE is included within the new Hanford Reach National Monument, established by President Clinton in June.

Biological control agent attacks native thistles. A seed-head weevil, *Rhinocyllus conicus*, was introduced as a biological control agent against musk thistle in the 1960s. It has since been discovered on many native thistles. In the Snake River Canyon, it was found infesting heads of the endemic Palouse thistle, *Cirsium brevifolium* (see *Sage Notes* 20:3, p. 10,

“Plant Protection Gone Awry”). This summer it was found near Headquarters, Idaho, on elk thistle, *Cirsium scariosum*. The weevil lays eggs in the unopened flower head.

Ecologists taken by surprise at Mt. St. Helens. After Mt. St. Helens erupted 20 years ago, ecologists like Jerry Franklin at the University of Washington predicted a textbook recovery: pioneering species like mosses and lichens would set the stage for subsequent forbs and trees, and disturbed areas like the “pyroclastic zone” would become recolonized from the outside edges in. Now, Franklin is quoted in a New York Times article (May 16, 2000) as saying “We knew very clearly what was going to happen afterward, and we were very clearly wrong.”

Scientists are saying that instead of succession, the significant factors in ecosystem recovery are chance and random survivors. In some places, vegetation was totally obliterated by events associated with the eruption. Flows of volcanic material, debris and mud obliterated all plants, and by the end of the first growing season after the eruption, hardly any plants had returned to these areas. In areas where plants survived, however, recovery was surprisingly rapid.

Biological legacies (organic materials and surviving organisms left behind after a disturbance) allowed recovery to proceed much more rapidly than scientists had expected. For instance, moles, pocket gophers, and ants lived through the blast in some areas because they were underground. Where snowpack afforded protection, plants were able to resprout after the eruption and emerge through deposits of several inches. Individual trees or clumps of vegetation acted as foci for regeneration. Roots of lupines that somehow floated on top of the 14-mile debris avalanche helped revegetate their destinations. Airborne lupine seeds that took hold and sprouted contributed carbon and nitrogen to areas sterilized by the blast. Grass seeds are being transported by elk herds. The new ponds that formed in the debris avalanche are providing habitat for large populations of salamanders. When these amphibians need to travel overland, they avoid desiccation by using gopher tunnels, which they access through holes left from elk footprints. Dr. Charlie Crisafulli, of the Forest Service Pacific NW Research Station, reported finding salamanders in most of the gopher tunnels they looked at.

Insights from Mount St. Helens about the role of biological legacies in ecosystem recovery can be used to develop practices that promote rather than impede regeneration after disturbance in highly modified lands. Vegetation that is left on a site enhances the potential for revegetation because it provides shade, moderates temperatures, and offers a source of animals and seeds to repopulate the disturbed patch. By leaving a few trees standing in the center of a cleared area, recovery can be speeded up

considerably, because birds visit these trees and deposit seeds beneath them. Green trees left on cutover sites act as refuges for forest invertebrates. Many of these have poor dispersal abilities, so if they are eliminated from a cutover patch, their chances of recolonizing it at a later date are low. If green trees are left, however, they can maintain populations in these biological legacies until the forest has returned. Thus the green trees that remain after a disturbance help to promote recovery. Forest cuts can be designed so that they maximize the potential for the regeneration of a harvested area by leaving standing green trees.

As scientists study the results of just 20 years of change within the impact zone of the eruption, they are constantly surprised. There are unanticipated large populations of rare species, like red-legged frogs, and species found in unexpected places, like rosy finches at low elevations. The lessons of Mt. St. Helens will change the way biologists look at how landscapes recover. - Eds.

Further reading

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Bearberry (*Arctostaphylos uva-ursi*)

Mr. Yuk Take Note. The Euphorbiaceae, or spurge family, is a fascinating group of plants. With around 8,000 species widely distributed throughout tropical and temperate regions, this large family includes many economically important herbs, shrubs, and trees. Cassava (which furnishes the food manioc as well as tapioca and arrowroot), rubber, and castor oil are produced by members of this family. Two genera of wild euphorbs occur in the Pacific Northwest: *Eremocarpus*, doveweed or turkey-mullein, and *Euphorbia*, the spurges. The Euphorbiaceae also includes some popular houseplants, such as poinsettias, crotons, and crown-of-thorns. Many members of this family are toxic. The South African genus *Toxicodendron* includes some of the world's most poisonous plants. Furthermore, many members of the Euphorbiaceae contain a highly allergenic milky latex that oozes from cut leaves or stems and penetrates skin readily. Recent studies by German biochemists have demonstrated that the sap of some euphorbs contains ingenol, a potent carcinogen. When they screened 22 houseplant cultivars for tumor-inducing activity, these scientists found that 20 of the cultivars did not exhibit cancer-promoting activity, but two of the less common cultivars did. So it would be prudent to handle both wild and cultivated members of this family with care.

Traveling exhibits available! The Natural Heritage Project, an educational outreach program of the Idaho Museum of Natural History, provides educational tools to teachers and citizens of Idaho about the nature, diversity, and conservation of Idaho's natural heritage. These are stand-alone installations suitable for public buildings, public libraries, community centers, museums, visitor centers, bank lobbies, and other places where people come and go. Each exhibit presents lively stories and colorful graphics along with an interactive computer kiosk and sectional bench seating. The exhibits have a flexible design to fit a variety of spaces, though they do need to be inside and have electricity. A staff member delivers and sets up the exhibit in each host facility. This interpreter is then available to orient the host about the exhibit, answer questions during an open house, or present an educational program. For information on scheduling a Natural Heritage Project traveling exhibit, call (208)-282-5842 or e-mail: rousdona@isu.edu.



Ocean spray (*Physocarpus malvaceus*)

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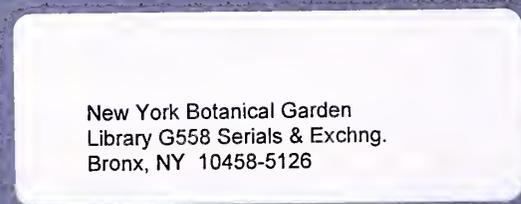
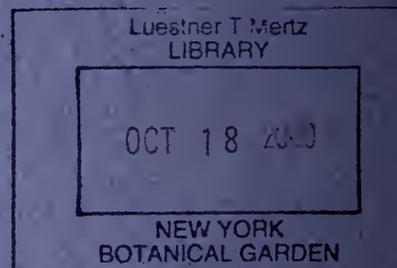
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