Kelseya uniflora

Kelseya

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Newsletter of the Montana Native Plant Society

HAS SALT TOLERANCE PRE-ADAPTED INLAND SALTGRASS FOR METAL TOLERANCE?

- R. A. Prodgers

Distichlis spicata (L.) Green var *stricta* (Torr.) Beetle, commonly known as inland saltgrass, is a perennial, shallow-rooted, warm-season grass that grows from hard scaly rhizomes. Palatability is low, but because it is often associated with waterways in otherwise dry prairies, it does get some use as livestock forage.

Inland saltgrass is most commonly found on moist saline soils in the Great Plains. In eastern Montana, you are likely to find saltgrass communities along the floodplain of intermittent brackish streams. Wet sites immediately adjacent to water may have *Scirpus americanus*, *Triglochin maritima*, or perhaps some *Puccinellia* species. As the floodplain grades into upland prairie, saltgrass may be an associate of common prairie grasses. Here it can increase if the area is heavily grazed, since many other species are preferred by livestock. Occasionally saltgrass will extend as a band along vehicle trails leading from streams through uplands. Saltgrass can sometimes be found in badlands and other special habitats where it is rarely abundant.

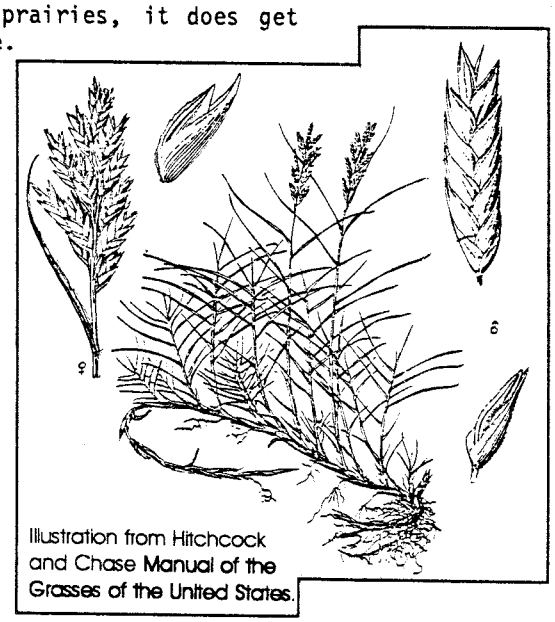

Illustration from Hitchcock and Chase Manual of the Grasses of the United States.

As the name implies, saltgrass is associated with saline soils. Soil salinity can be measured by electrical conductivity (EC), since more electrolytes result in higher conductivity. Inland saltgrass can tolerate an average soil EC of 66 mmhos/cm (Ungar 1969), which is very high since a soil with an EC of 16 mmhos/cm is considered very saline. However, where saltgrass is a component of mixed grass prairie communities, the EC may be only 2 mmhos/cm. In short, saltgrass can do well on very salty soils where it has little competition from other species. It can grow on better sites, but it is at a competitive disadvantage.

Saltgrass can also tolerate sodic soils, in which sodium cations are abundant relative to calcium and magnesium. I have sampled soil of saltgrass communities in eastern Montana where the sodium adsorption ratio (SAR) was over 60 - very high indeed, since soils with SARs of 15 are considered sodic. Soil pHs of saltgrass communities commonly range from 7 to 10 (Poole 1980), which is on the alkaline side.

Inland saltgrass maintains high osmotic pressure in cell sap and has very efficient membranes that allow it to extract water from the matrix of saline soils. Saltgrass has also adapted to salty soils by excluding salts from critical sites in the plant. Some rather complicated cellular processes may also be involved.

Inland saltgrass also occurs on some metal-contaminated sites in the Butte-Anaconda area. One site is along Silver Bow Creek near Ramsay, where it grows in stream-deposited tailings. The soil is an entisol (a young and undeveloped soil) that is seasonally quite moist. Texture is very fine sandy loam. Near-surface horizons are acidic, but pH increases in the deeper, poorly aerated horizons. This soil is slightly saline and, in some horizons, borderline sodic. The upper half-meter of soil has extremely high concentrations of copper, zinc and manganese. Copper concentrations, for example, are over a hundred times higher than "normal" soils.

Saltgrass also occurs near the Anaconda smelter, where it grows in conjunction with *Elymus cinereus* and to a lesser extent *Tetradymia canescens*, horsebrush. A grass more common than saltgrass near the smelter is *Muhlenbergia asperifolia*, which is vegetatively similar to saltgrass. The soil here is a mollisol derived from frost-worked travertine.

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FROM THE PRESIDENT

Annual Meeting

The Fourth Annual State Conference held at West Glacier on May 3-5 was an unqualified success! The Flathead Chapter put forth an exceptional effort in hosting this fine event -- many thanks to all who contributed to its success. Over a hundred people participated in the meeting and field trip events. Highlights of the conference included a special presentation by keynote speaker Dr Arthur Kruckeberg on "Gardening with Native Plants." Friday evening, Rachel Potter provided tours of the new native plant nursery at Glacier Park. Native plants are being grown for revegetation projects on disturbed sites within the Park.

Other speakers shared their experiences, thoughts and insights through panel discussions and workshops. Pat Burke and others presented thoughtful commentary on the ethics of manipulating our landscape. John Pierce helped lead discussions on revegetation projects around Montana, including a project he is spearheading in Missoula - restoration of native grassland communities in the John Toole Park along the Clark Fork River. Saturday evening's speaker, Jerry De Santo, shared some of his gardening experiences in the Northern Rockies.

The silent auction was a big success this year, which - combined with donations for youth camp scholarships - brought in over $950. Many thanks to all chapters and individuals who donated to this effort!

New Officers

Annual meeting time each year brings about a change in leadership for our organization. This spring, elections for the offices of President and Treasurer were held. Roxa French was again elected to a two-year term as Treasurer (many thanks, Roxa, for your continued interest and support). Anne Bradley was elected as President, but then was promptly offered a position in San Francisco. Anne accepted the position with the USDA Forest Service Regional Office in California, working with Regional Botanist Jim Shevock on the Fish, Wildlife and Plants Staff. We will miss you, Anne, and wish you well in your new endeavors!

With Anne's departure, I moved from the Vice-President slot to President, and will serve in this role for the next two years. At the May State Board Meeting, Linda Iverson was appointed by the Board as Vice-President. This move leaves the Eastern Montana Director-At-Large position vacant, and the Board is looking for a volunteer to fill it.

We now have a new Field Trips/Program chair -- Teri Divoky of the Flathead Chapter has graciously volunteered to serve in this role. She has slated a July '92 (and henceforth biennial) trip to Pine Butte Preserve and a February '92 overnight "Plants in Winter Condition" trip in Glacier NP. Please contact Teri if you have new ideas and suggestions.

To outgoing president Juanita Lichthardt, I wish to extend thanks on behalf of the state organization for all your enthusiasm and hard work during the past year. Juanita is now located in Moscow, ID, where she is doing botanical work for the Idaho Natural Heritage Program and USDA Forest Service. As past president, she will continue to serve on the State board of MNPS.

Committees and Activities

The state chapter has several standing committees (see back cover of newsletter). Committee meetings were held at the state conference in May, and reports will be available in a future issue of KELSEYA. I encourage all of you to consider becoming active in committee activities and chapter projects. As a society, we have many opportunities to contribute to learning about and protecting native plants and habitats in our wonderful state. Please feel free to contact me or any other Board member if you are interested in becoming more involved, or have new ideas to contribute.

- Angie Evenden

<<<<<<<<<<<<<<<CONSERVATION BULLETS>>>>>>>>>>>>>>>

[This is the first installment of a column which will appear in each issue, one of the results of the Conservation Committee bull session at last May's Annual Meeting. Please feel free to send KELSEYA items to include, with an emphasis on issues of more than local significance. See Page 8 for deadline information for the next issue.]

LOLO-KOOTENAI ACCORDS

The controversial Lolo-Kootenai Accords are in Congressional Committee, and if approved will go before the full US House and Senate. An article in the May 30 *Missoula Independent* gives pro and con arguments [see your local library for back issues of the paper]. Write to the Congressional delegation (Baucus, Burns, Marlenee and Williams) to express support or opposition.

FINE-TUNING NEPA

Procedures for implementing the National Environmental Policy Act are being "fine-tuned" by the US Forest Service. Information about the revisions can be obtained from the information officer at the Supervisor's Office of your nearest National Forest. Comments should be mailed by June 28.

ROCKY MTN DIRECTORY OF ENVIRONMENTAL GROUPS

Planning is now underway for the preparation of a publication listing all citizen groups, government agencies and environmental education programs concerned with environmental issues in Montana, Wyoming, Idaho and Colorado.

Under the auspices of EcoNet, a computer based communication and information sharing system designed to facilitate collaboration among environmentally-concerned organizations and individuals throughout the world, the project will create both a hard-copy publication and a database accessible by anyone with a modem and an EcoNet account.

In order to contribute to the overall usefulness of the directory for Rocky Mountain state environmental groups, your assistance is requested. If you know of a group that should be included in the directory, please send the name and address of a contact person to: Lynn Tennefos, Project Director, 10300 O'Brien Creek Rd, Missoula MT 59801, or call (406) 543-3559.

Questionnaires will be sent in July to all potential groups, agencies and programs. If you are interested in more information about EcoNet, also contact Lynn.

EPA'S WETLANDS PROTECTION HOTLINE

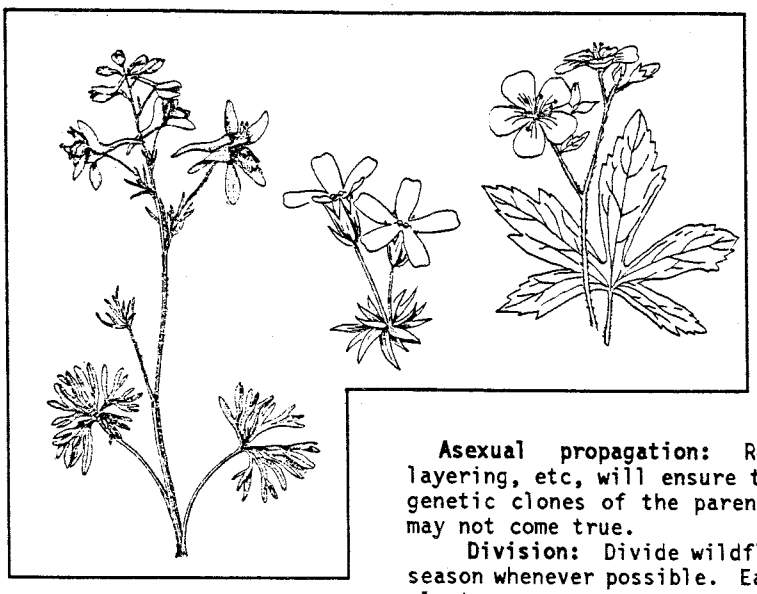
The Environmental Protection Agency has set up a toll-free telephone service that is responsive to public interest, questions and requests for information about the values and functions of wetlands and options for their protection. The Hotline also acts as a central point of contact for the Wetlands Division within EPA's Office of Wetlands, Oceans and Watersheds [OWOW, one of the better governmental acronyms] to provide a wide range of verbaland publications on wetlands protection efforts involving EPA as well as other public and private programs.

The Hotline operates Monday-Friday (not including Federal holidays), 9 am-5:30 pm Eastern Time. Call 1-800-832-7828.

The Hotline is staffed by Information Specialists with a broad range of knowledge about regulatory, programmatic and policy issues. In addition, the Hotline maintains an extensive contact list to provide referrals to callers when necessary, as well as providing information on the availability of wetlands-related publications and documents.

TIPS FOR WILDFLOWER CULTIVATION

- Carol J Morris



Starting a wildflower garden challenges even long-time flower gardeners, but once established, a native plant garden gives a charming and carefree landscape to Montana's country - and city - homes. Here are some tips to help you get underway.

Garden Climate

Temperature should approximate that of the native habitat. Take full advantage of slopes, crevices, trees and shrubs to provide shelter and shade. A stone wall or large boulder can both shelter and warm sunloving plants, if placed to allow full sunlight on one side of the garden, full shade on the other.

Light

Select shade plants (such as forest dwellers) for shady areas; sun plants for sunny ones.

Soil

Adequate drainage is critical. Soil must be porous but contain enough humus to prevent leaching of nutrients and loss of moisture. Peat, loam, leafmould and sand are a good mix, and some grit (broken-up rock - limestone or granite - depending on pH desired) is necessary if rockery plants are to prosper. A top dressing of grit may leach essential trace minerals into the soil. Increase the sand component if the basic garden soil is clay.

Fertilizer

Most commercial fertilizers overfeed wildflower gardens. It is more appropriate to use bone meal, manure tea, or other slow-release nutrients.

Moisture and Humidity

Wild plants, like domestic ones, suffer from drought. Intensely drying winter cold can wreak havoc on dried-out roots. Particularly sensitive are seedlins or rooted cuttings set out too late in fall or too early in spring to have developed deep root systems. Most plants need abundant moisture when they come into growth in spring. During hot summer days, an overhead spray helps prevent desiccation of foliage by keeping air moist. Plant only drought-resistant specimens such as sedums, potentilla and cacti in arid garden regions.

By contrast, a swampy area invites a bog garden, which requires slow-moving water and a deep, humus-rich soil (lime-free for many bog plants, though a few prefer alkalinity).

Propagation

Seed, cuttings, or plant divisions all produce new plants:

Seed: Seeds collected from the wild germinate erratically. Some require a deep-freeze sleep for weeks or months. Vernalization, a stratification of seed into layers as a preliminary to germination, is accomplished in nature by exposure to frost. To vernalize, mix seeds with moist sand in a plastic bag and give the packet several days of alternate freezing and warming. Better yet, plant seeds in a pot and freeze it. Plastic pots work better than clay because they hold moisture. Use a sterilized soil mix. Some seed germinates in light, some in dark, so cover the seed thinly and put a lid on part of the flat. Be patient; some growers keep rare alpines in seed flats for three springs - slow germination indeed!

Asexual propagation: Root and leaf cuttings, layering, etc, will ensure that the new plants will be genetic clones of the parent plant, whereas seedlings may not come true.

Division: Divide wildflowers during their dormant season whenever possible. Each crown is a potential new plant.

Digging wild plants: Whether separating plants in your garden or digging them from the wild, this should be done ONLY WHEN ECOLOGICALLY SOUND TO DO SO! Before you divide or dig, first prepare your planting area. Carry some water along when you go to the dig site.

(a) In the wild, cut out only a piece of a clump, wherever possible. Otherwise, lift entire clump with a generous ball of soil, sluicing the roots in water, if available. Then divide the clump, placing the parent plant back in its original site, watering it and tamping it in firmly. Insert new plant into a plastic bag to carry it home, keeping it in the shade. Early spring is prime digging time in Montana; dig in either spring or fall in more temperate zones.

(b) Cut tough clumps with a shovel, but tease apart by hand those clumps you can manage, to prevent root damage and shock.

(c) Divide plants with basal offsets by hand, separating offsets from parent plants with least disturbance possible.

(d) Dig as deep as possible for plants with single taproots. Replant these pronto, being careful not to destroy fine side rootlets that feed the plant.

(e) Bring home some native soil if you can, to mix into transplant areas.

(f) Replant the specimen carefully into the prepared garden site, setting the plant in a little deeper than its original site, and water well. Pick off blooms, buds, seeds or fruit.

(g) Cover or shade transplants until established in new location.

Don't cultivate the soil after plants are established. Just pull encroaching weeds. Wildflower gardens, once flourishing, require very little care.

Let your gardening friends know when you'll be dividing your perennial wildflowers or saving seeds, and share the joy.

Carol Morris of Missoula is a freelance writer who is a frequent (and welcome!) contributor to KELSEYA. She has been published in a number of magazines around the Pacific Northwest, and is Secretary of the Clark Fork Chapter.

CALENDAR

MEETINGS

TUESDAY, JULY 9, VALLEY OF THE FLOWERS CHAPTER: 6 pm til dark, Kirk Hill Nature Area on S 19th Rd, Bozeman. Annual "Knapweed Pullout" which is a joint project of VoF Chapter, Sacajawea Audubon and Museum of the Rockies. This is an ongoing project aimed at getting rid of the spotted knapweed infestation along the trails of Kirk Hill. Bring a digging tool (screwdriver works well) and gloves if you want them; ice cold lemonade will be provided. We need your help!

See VOLUNTEER DAY EVERY FRIDAY in the "FIELD TRIP" section.

THURSDAY, AUGUST 8, KELSEY CHAPTER: 7 PM, Lewis & Clark Public Library, Last Chance Gulch, Helena. Speaker will be Jim Searles, author of *The Garden of Joy*, discussing wildflowers of the Helena area.

THURSDAY, SEPTEMBER 12, CLARK FORK CHAPTER: 7:30 pm, Room 307, Natural Science Bldg, UM Campus. Local naturalist Will Kerling will speak on "Culinary Herbs of Western Montana."

THURSDAY, OCTOBER 3, VALLEY OF THE FLOWERS CHAPTER: 7:30 pm, Plant Growth Center, on S 11th Av, MSU Campus. Bring 10-12 slides of your summer activities/flower finds to share.

THURSDAY, OCTOBER 10, CLARK FORK CHAPTER: 7:30 pm, Room 307, Natural Science Bldg, UM Campus. Missoula videographer Blue Tanttari will show a video she recently made for the Missoula County Conservation District entitled "Montana Weeds: Spotted Knapweed and Leafy Spurge."

FIELD TRIPS

VOLUNTEER DAY EVERY FRIDAY IN THE GLACIER NATIONAL PARK NATIVE PLANT NURSERY: Due to the great enthusiasm and volumes of work we've accomplished during the last two MNPS Volunteer Days in Glacier's nursery, we've decided to make every Friday a volunteer day. So - whether you're a local or on a vacation passing through - come work for a few hours or all day. We'll be doing an assortment of projects including potting up rooted cuttings, thinning, repotting, mixing media, and yes, weeding. If you let us (Rachel Potter, 888-5441 ext 317) know you're coming ahead of time, we may be able to arrange for you to join a crew collecting seed or on a field planting project. Call ahead if you can, but we'll plan on having projects every Friday, 8:30-4:30, through September. Call for October dates. The nursery is located at Park headquarters in West Glacier. Follow the signs. Many, many thanks to all our past and future volunteers!

SUNDAY, JUNE 30, CLARK FORK CHAPTER: Visit the rich alpine landscape of St Mary's Peak in the Bitterroot Range with Nature Conservancy botanist Steve Shelley. Due to its unusual flora, St Mary's is being designated a Forest Service Research Natural Area. Be prepared for a moderately strenuous hike with an elevation gain of approximately 2000 feet. Pack a lunch and be sure to bring your raincoat in case of a thunderstorm. Meet at 10 am at the Y store on Hwy 93 outside of Stevensville. Call Steve at 542-0620 for more info. Call Willis Heron (549-9744) if you need a ride.

SUNDAY, JULY 7, ALPINE FLOWERS OF THE LINE CREEK PLATEAU: [Previously announced for June 30] Joint trip with Montana Wilderness Assn. Explore the Line Creek Plateau, eastern-most area of the Beartooth Mountains, with Jan Nixon. We'll discuss how wind, water and topography combine to create different plant communities, and identify the flowers that inhabit those communities. Line Creek Plateau has been proposed for wilderness designation, a protection it richly deserves. Group size is limited, please make reservations no later than Tuesday, July 2: write P O Box 992, Bozeman MT 59771, or for info call Jan at 587-0120 days.

SATURDAY, JULY 13, JEWEL BASIN: This Flathead Chapter hike is a perennial favorite because of its beautiful alpine flower displays. Meet at the Jewel Basin parking lot at 9 am. Bring lunch and water. Call Pattie Brown (837-5018) for more details.

THURSDAY, JULY 11, MID-SUMMER WILDFLOWERS OF KIRK HILL: Third nature walk in the Museum of the Rockies' summer evening series. Learn more about the wildflowers and ecology of Kirk Hill with Jan Nixon. Call the Museum's Education Dept, 994-5282, for reservations (small fee).

SATURDAY, JULY 20, SUNDEWS AT SHOO-FLY: Sundews are one of three kinds of carnivorous plants in Montana, and they are only found in bogs and fens. Get a look at them with John Pierce when he visits Shoo-Fly Meadows northeast of Missoula. Meet at 9 am at John's house, 737 Locust in Missoula (corner of Locust and Jackson) in the lower Rattlesnake. Bring a lunch and some waterproof foot gear. Mosquitoes will probably be in evidence. For more info call John at 542-2640.

SATURDAY, AUGUST 3, MT SIYEH: A very strenuous climb (not technical but some Class 2 & 3) to one of the highest peaks in Glacier National Park, 10,014 ft Mount Siyeh. Beginning near 6,000' at Siyeh Creek, the route starts in forest, leads to gorgeous subalpine meadows around 7,000', then climbs steeply through cliffs and up scree slopes studded with dwarf alpine plants...to an amazing view from the peak. This trip depends on favorable weather. Bring lunch and lots of water. Meet at the Logan Pass Visitors' Center at 9 am. Call Sam Culotta at 837-4298 for more information.

SATURDAY, AUGUST 10, NINEPIPE NATIONAL WILDLIFE REFUGE: A combined effort with Flathead Audubon members to help bird and native plant populations by reducing competition from the invasive, introduced *Lythrum salicaria* (purple loosestrife). Meet at the Bread Board Bakery in Bigfork at 9 am to carpool. Call Pattie Brown, 837-5018, for more information.

SATURDAY, AUGUST 17, SACAJAWEA PEAK: Join Matt Lavin for a scramble up to the Bridger Range's Sacajawea Peak for a look at late summer subalpine and alpine flowers. Meet at 9;30 am at the Fairy Lake campground, west off State Hwy 86, north of Battle Ridge Pass (good place to camp the night before, also). Bring lunch, water, rain gear - and good footwear is a must! Call Matt at 994-2032(w) or 587-7432(h), Bozeman, for more info.

SATURDAY, AUGUST 24, FLATHEAD AREA GARDEN TOURS: The gardens of Joe Schletz and Dick Yeo will be in their full summer display for this trip, with late season blooms and abundant seed structures in evidence. Call Dick Yeo at 756-8440 for meeting time and place.

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CALENDAR

FIELD TRIPS, continued

SATURDAY, SEPTEMBER 7, 4TH ANNUAL LOGAN PASS SEED COLLECTING DAY: Help Rachel Potter collect seeds to restore the subalpine meadows around recent construction zones in Glacier Park. Learn about past and on-going revegetation efforts at the Pass. Meet at 9 am at Glacier Park headquarters, or at 10:15 am at Logan Pass. Call Rachel for more details (888-5441wk, 892-2445hm).

SATURDAY, SEPTEMBER 14, FIFTH ANNUAL MNPS CANOE/ KAYAK TRIP: Jointly hosted by the Clark Fork and Flathead Chapters. This year we'll float a smooth but fairly fast section of the lower Flathead River above Dixon, and search for the small annuals that inhabit gravel bars and wait until late summer to bloom. Meet at 10 am at the Moiese post office (small store at the west entrance to the National Bison Range) and bring a lunch. For more information or if you have extra room in your canoe, call Willis Heron (549-9744).

SATURDAY, SEPTEMBER 28, IS THERE LIFE AFTER FROST AT KIRK HILL? Join Jan Nixon from 1-4 pm to explore the ecology of the Kirk Hill Nature Area and learn more about how our native vegetation prepares for winter. Trip is limited to 14 people; please make reservations with Bonnie at the Museum of the Rockies' Education Department, 994-5282 (small fee).

MONTANA'S 1991 LEGISLATURE - WHAT WAS ACCOMPLISHED?

- Janet Ellis, lobbyist for the Montana Audubon Legislative Fund

The 1991 Montana Legislature has ended. Audubon [the MT Audubon Legislative Fund] entered the 1991 Legislature with high hopes about the wonderful things we could accomplish for the environment. While important gains were made, the session saw many critical reforms defeated. This report details what happened in the area of exotic plants/weeds and forest protection.

Exotic Plants

We are particularly proud of the passage of HB 840, an Audubon-initiated bill that will give the Montana Dept of Agriculture (DOA) direction to list as "noxious weeds" plants that threaten native vegetation. HB 840 also gives the DOA clear authority to regulate the sale and commercial distribution of such species. A good example of a plant in need of regulation is purple loosestrife (Lythrum salicaria). Loosestrife will out-compete cattails and other wetland vegetation. [See the Spring 1989 KELSEYA]

The only potential problem with HB 840 is the definition of "native plant." Native plants are defined as "a plant endemic to the state of Montana." "Endemic" means "indigenous" in this definition: a dictionary definition and **not** a botanical one. Endemic is obviously a poor choice of terms. If the definition proves to be a problem, it will be changed at the 1993 Legislature. The sponsor of the bill was unwilling to change the definition - primarily because the Senate Agriculture Committee was interested in killing the bill. We decided that it was more important to pass the bill and fix the problem later than to have it killed.

With the passage of HB 840, the DOA will undergo a "rulemaking" process to determine how horticultural species are to be listed and regulated. If you want to help set up those rules, contact the Dept of Agriculture, 6th and Roberts, Helena 59620. The program will only be effective if the rules set up to administer the program are adequate.

Forest Protection

Audubon worked on 15 pieces of legislation affecting forest protection. We advocate wise use of our forest resources by supporting protection of wildlife, wildlife habitat, water quality and efforts to reform the way timber is taxed. We also support legislation requiring mandatory Best Management Practices (BMPs) to protect forest resources during timber harvest.

Audubon was instrumental in putting together the most positive note on forest practices: from drafting the initial bill to working out a compromise with the timber industry. That bill (HB 731) requires loggers to practice certain BMPs aimed at protecting fragile riparian areas. This is the first time loggers have been mandated to follow practices on private lands that are designed to protect the environment. The protection in HB 731 only applies to streams, lakes and wetlands - an important step toward protecting forests, riparian areas and water quality.

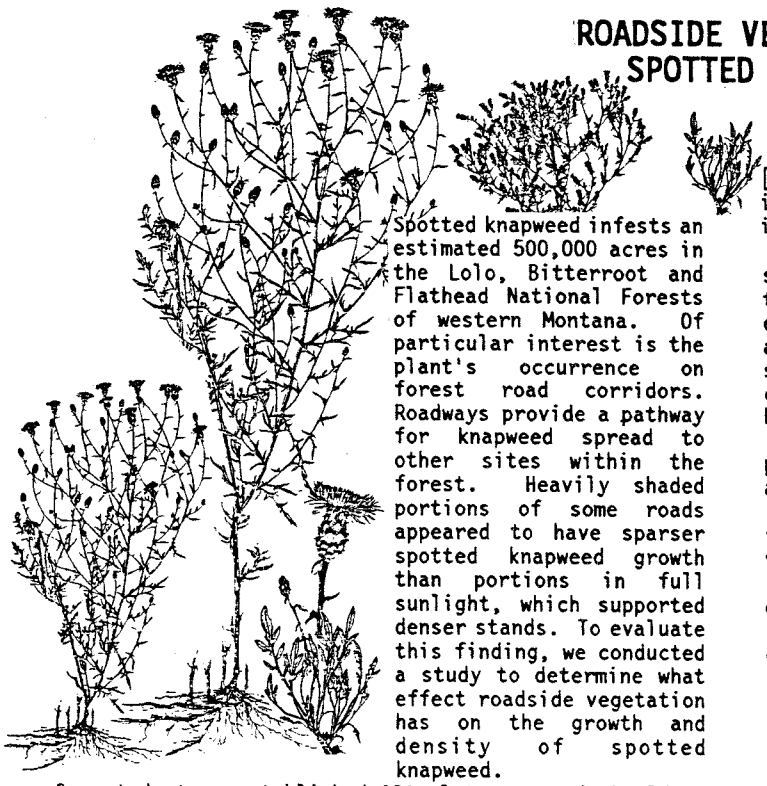
A second positive note regarding forest protection is the passage of HB 340, which revises the way that timber is taxed. Our current tax system actually encourages landowners to harvest trees. With the passage of HB 340, Montana's tax system will not encourage tree harvest - a much better environmental policy.

There were two comprehensive forest practices bills introduced this session. Both died in Committee. The reasons for their demise are numerous, although timing was a major part of the problem: the bills were introduced late, there was a lot of work needed to make them workable, and there just wasn't enough time due to legislative deadlines. Audubon will be working on comprehensive forest practices legislation over the next two years.

If you want to know more about the issues Audubon was involved with during the 1991 Montana Legislature, you can order Audubon's **1991 Montana Legislature Final Report**. This report gives you an idea how the 1991 Legislature fared from Audubon's perspective. It lists the bills that we testified on (all 104!) and discusses the outcome for each issue area (from agriculture to wildlife). It also tells you how your legislator voted on key Audubon issues. Send $1 with your request to cover postage and handling: Montana Audubon Legislative Fund, P O Box 595, Helena MT 59624.

The center page in this issue is an identification sheet on the Sulfur Cinquefoil (*Potentilla recta*), an introduced weed whose invasive powers appear to rival spotted knapweed. Based on Peter Rice's article in the Winter 1991 KELSEYA, this sheet is done as a pullout - take it along in your pack when hiking, and if you spot any of this species, please notify your County Weed Office and/or Peter Rice, Division of Biological Sciences, University of Montana, Missoula, MT 59812-1002. Help us catch this one before it starts!

ROADSIDE VEGETATION COVER AFFECTS SPOTTED KNAPWEED DENSITY



- B. John Losensky

Spotted knapweed infests an estimated 500,000 acres in the Lolo, Bitterroot and Flathead National Forests of western Montana. Of particular interest is the plant's occurrence on forest road corridors. Roadways provide a pathway for knapweed spread to other sites within the forest. Heavily shaded portions of some roads appeared to have sparser spotted knapweed growth than portions in full sunlight, which supported denser stands. To evaluate this finding, we conducted a study to determine what effect roadside vegetation has on the growth and density of spotted knapweed.

Our study team established 121 plots on road shoulders located in a variety of habitat types in the three Forests. All the roads possessed similar characteristics, such as limited grass cover, a well-established spotted knapweed stand and roadside vegetation that provided a diversity of shade regimes on the road surface.

We estimated spotted knapweed coverage visually, recording results as coverage classes ranging from <1% to 95+%. We recorded the average height of the spotted knapweed, the aspect of the slope traversed by the road, the crown closure of the trees and shrubs shading the plot, the habitat type on the slope adjacent to the plot, and the amount of time the plot was in direct sunlight. We used these parameters to formulate a table of expected knapweed coverage classes on roads, based on the aspect of the site [direction the slope faces]. The risk of knapweed infestation in the area is predictable when the cover class is known.

The results of our study and field observations of spotted knapweed development on other sites suggest that the most limiting environmental factor for spotted knapweed establishment is available full sunlight. Ponderosa pine and the warm portion of Douglas-fir habitat types favor spotted knapweed, particularly after disturbance from road construction or site preparation. Even on these sites, however, moderate to heavy shade slowed weed development.

Based on these findings, several road management practices have been developed for use in areas of both low and high knapweed infestation risk. These include:

(1) Use a seed mixture for all revegetation work that includes a fast, early-growing species to provide dense vegetation cover on disturbed sites.

(2) Initiate a "clean" equipment program to reduce spread of weed seed on high risk areas.

(3) Where possible, use gravel from weed-free sources for construction.

(4) Where practical, retain shade on road surfaces by limiting roadside clearing and harvest cutting.

(5) Survey newly constructed roads and remove all new knapweed plants annually as part of road maintenance. An "adopt-a-road" volunteer program may be useful in implementing this.

(6) Consider road closures to control weeds in high risk communities.

(7) Expand the present concept of road maintenance to include treatment with fertilizer and seed to gain a vigorous plant community that can resist noxious weed invasion.

(8) Introduce biological control agents into present infestations.

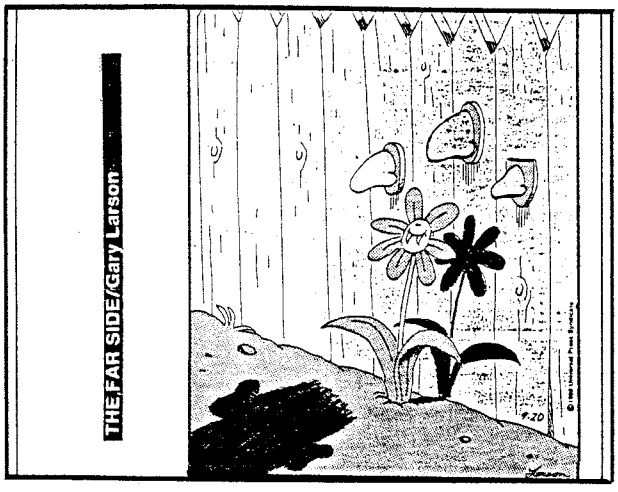
B. John Losensky is Forest Ecologist for the Lolo National Forest, Montana. Reprinted from **Knapweed 5(1): 2-3**, publication of the Washington Interagency Knapweed Committee.

FIELD TRIP REPORTS

MILLER CREEK SHOOTING STARS: Plant ecologist Keith Boggs met on April 21 with several Clark Fork members to observe the annual spring bumper crop of shooting stars on the hills around Miller Creek in Missoula. But spring was late this year, and the spectacular display of *Dodecatheons* hadn't begun yet. "We were about a week early," Keith reported. But other flowers were blooming and a good time was had by all.

COLUMBIA MOUNTAIN TRAIL, MAY 5: A big crew (over 30?) came on this Sunday hike, led by Pete Lesica as part of the MNPS Annual Meeting. We were also happy to have Art Kruckeberg along, the delightful guest speaker at the meeting. It was early in the season for the Glacier Park area but many flowers were in bloom on sunny, moss-covered ledges: *Disporum trachycarpum*, *Castilleja hispida*, *Lithophragma glabra* and *Dodecatheon conjugens*.
We noted as well that 26 of the tree, shrub and plant species we saw were included in a list Dr Kruckeberg had distributed on plants worthy of consideration in native gardening.

MOUNT JUMBO - OVER THE TOP: On May 18, Anne Garde and several others from Clark Fork chapter met at the south end of Missoula's Mt Jumbo, hiked across the top of the mountain and down at the north end - a wildflower "crawl" that took all day. We saw (and certainly identified correctly...just ask us!) over 36 species of wildflowers in bloom, including four *Lomatiums*, *Castilleja hispida* and *C. palescens*, *Lithospermum ruderale* and *Mertensia oblongifolia*. *Hydrophyllum capitatum* was a pleasant surprise, discovered in a shaded gully.



*MONTANA NATIVE PLANT SOCIETY *** MEMBERSHIP APPLICATION/RENEWAL*

Date_____ New_____ Renewal _____

NAME_____ ADDRESS_____

CITY/STATE/ZIP_____PHONE_____

STATEWIDE MEMBERSHIP WITH CHAPTER AFFILIATION

___ $12 I. Individual
___ 16 II. Family
___ 28 III. Business/Organization
___ 4 IV. Yearly chapter dues for Lifetime Members

MEMBER-AT-LARGE (Statewide membership only)

___ $ 8 I. Individual
___ 12 II. Family
___ 25 III. Business/Organization
___ 150 IV. Lifetime member (one-time payment)

AREAS COVERED BY CHAPTERS:

CLARK FORK CHAPTER - Lake, Mineral, Missoula, Powell and Ravalli Counties
FLATHEAD CHAPTER - Flathead and Lake Counties plus Glacier National Park
KELSEY CHAPTER - Lewis & Clark and Jefferson Counties
VALLEY OF THE FLOWERS CHAPTER - Gallatin, Park, Madison and Sweet Grass Counties plus Yellowstone National Park

All MNPS chapters welcome members from areas other than those counties indicated - we've listed the counties just to give you some idea of what part of the state is served by each chapter. More chapters are in the planning stages for other areas; watch for announcements of meetings in your area. Ten paid members are required for a chapter to be eligible for acceptance in MNPS.

- -

Membership in the MONTANA NATIVE PLANT SOCIETY is on a calendar-year basis, March 1 through the end of February of the following year. New-member applications processed before the end of June each year will expire the following February; those processed after the first of July will expire in February of the year after. Membership renewal notices are included in the Winter and Spring issues of KELSEYA. Anyone who has not renewed by the time the Summer edition of KELSEYA is ready to mail will be dropped from the mailing list/MNPS roster.

Your mailing label tells your

CLASS OF MEMBERSHIP (I, II, III, IV - see above)
CHAPTER AFFILIATION, if any (CF = Clark Fork; F = Flathead; K = Kelsey; VoF = Valley of the Flowers)
DATE YOUR MEMBERSHIP E PIRES: If your label reads "x2/91" your membership expires February 28, 1991...please send in your renewal today! New memberships received since July 1, 1990, are good through 2/29/92, and your label should read "x2/92." Please drop us a note if any information on your label is incorrect.

MAKE CHECKS PAYABLE TO:
MONTANA NATIVE PLANT SOCIETY

MAIL TO: Montana Native Plant Society
P O Box 992
Bozeman MT 59771-0992

SALTGRASS METAL TOLERANCE, continued from Page One

Texture is very fine sandy loam with flagstones; pH is 7.0-7.6. This site received heavy metal deposits and sulfur dioxide fumigation common than saltgrass near from the smelter dating roughly from 1900 to 1980. The pH is slightly alkaline and the soil is non-saline and certainly non-sodic, due to the calcium-rich parent material. Copper and zinc concentrations in the soil are very high.

Based on analysis of saltgrass foliage and soils from these sites, *D. spicata* appears largely to exclude metals from the foliage. For example, the upper half-meter of soil at the streambank-tailings site had a total copper concentration of 8,600 ppm (600 ppm extractable copper), whereas saltgrass foliage there contained only 130 ppm copper. Inflorescences contained higher concentrations than foliage.

One wonders whether the mechanisms that allow saltgrass to survive in salt-stress environments have pre-adapted it for metal-contaminated sites. The circumstantial evidence is rather convincing.

References:

Poole, B. 1980. Biota of the Northern Rockies: a Review of *Distichlis spicata*. **Proceedings, Montana Academy of Science 39: 89-96.**

Ungar, I. 1969. Plant communities of saline soils at Lincoln, NE. **American Midland Naturalist 78: 98-120.**

T-SHIRTS AVAILABLE

The Flathead Chapter has a few T-shirts left after the Annual Meeting [it's not too early to be thinking **Christmas presents**] which have Anne Morley's attractive drawing of a fairy-slipper orchid. These are available in adult sizes M, L and XL, in silver or aqua color, short sleeve, 100% cotton.

Cost is $11.00 + $3.00 shipping/handling each. All profits go to the Flathead Chapter. Be sure to state size and color preference. Order from:

Anne Morley
P O Box 147
Swan Lake MT 59911
(406) 886-2242

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KELSEYA Editor
P O Box 992
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PLEASE NOTE:
If your label reads x2/91, your membership expired the end of February. If your label reads COMP2, this is your LAST FREE ISSUE. We don't want to lose you ... won't you send us your check today?

Peter Lesica
P O Box 8944
Missoula MT 59807

I
CF
x2/92

printed on recycled paper

MONTANA NATIVE PLANT SOCIETY

The Montana Native Plant Society is a 501-C-3 (non-profit) corporation chartered for the purpose of learning more about plants native to our state and their habitats, and to share that knowledge. Contributions to MNPS are tax deductible, and may be designated for a specific project or chap-ter, or may be made to the general fund.

Your yearly membership fee includes a subscription to KELSEYA, the newsletter of MNPS, which is published quarterly. We welcome your articles, clippings, field trip reports, meeting notices, book reviews, cartoons or drawings - almost anything, in fact, that relates to our native plants or the Society. **Please include a one- or two-line "bio" sketch with each article.**

Drawings should be done in black ink with a fine-point pen. If you send clippings, please note the source, volume/issue and date. We especially need short (one to three paragraph) items which can be tucked in anywhere.

Changes of address and inquiries about membership or MNPS should be sent to MNPS, PO Box 992, Bozeman, MT 59771-0992. All newsletter material should be mailed to Jan Nixon at the same address.

Advertising space is available in each issue at $5/column inch. Ads must be camera-ready, and must meet the guidelines set by the Board of Directors for suitable subject matter: that is, be related in some way to plants or the interests of MNPS members.

Deadline for the Fall issue is SEPTEMBER 10; please include meeting/ field trip notices through late December. The Fall issue of KELSEYA will be mailed the fourth week of September.

IF YOU MOVE, PLEASE SEND US YOUR NEW ADDRESS!

BOARD OF DIRECTORS

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PLEASE WELCOME THESE NEW MEMBERS:

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NOT-SO-RARE PLANT SEARCH

Sulfur cinquefoil, a new weed, is outcompeting native plants & reducing biological diversity in the Northern Rockies (see Kelseya, Winter 1991). Peter Rice is searching for sulfur cinquefoil sites in Montana & adjoining states. Especially outside of Missoula & Ravalli Counties, & in forest habitat types in any county. You can help increase our knowlegde of the distribution, ecology, and management of this noxious weed by sending him:

1. General locale, including county, of the sulfur cinquefoil infestation.
2. Township, Range, Section, 1/4 Section if known.

and/or 3. Map copy or sketch to help him locate the site.

4. Who to contact if permission is necessary for him to visit the infested site.

Sulfur cinquefoil is sometimes confused with northwest cinquefoil, our most common & variable native cinquefoil. Hairs on northwest cinquefoil are short relative to stem diameter & are either spreading at multiple angles or appressed flat to the surface. Sulfur cinquefoil hairs are long relative to stem diameter & project outward at right angles. Sticky cinquefoil (Potentilla glandulosa Lindl.), a second widespread native, has pinnately compound leaves & exudes a sticky resin.

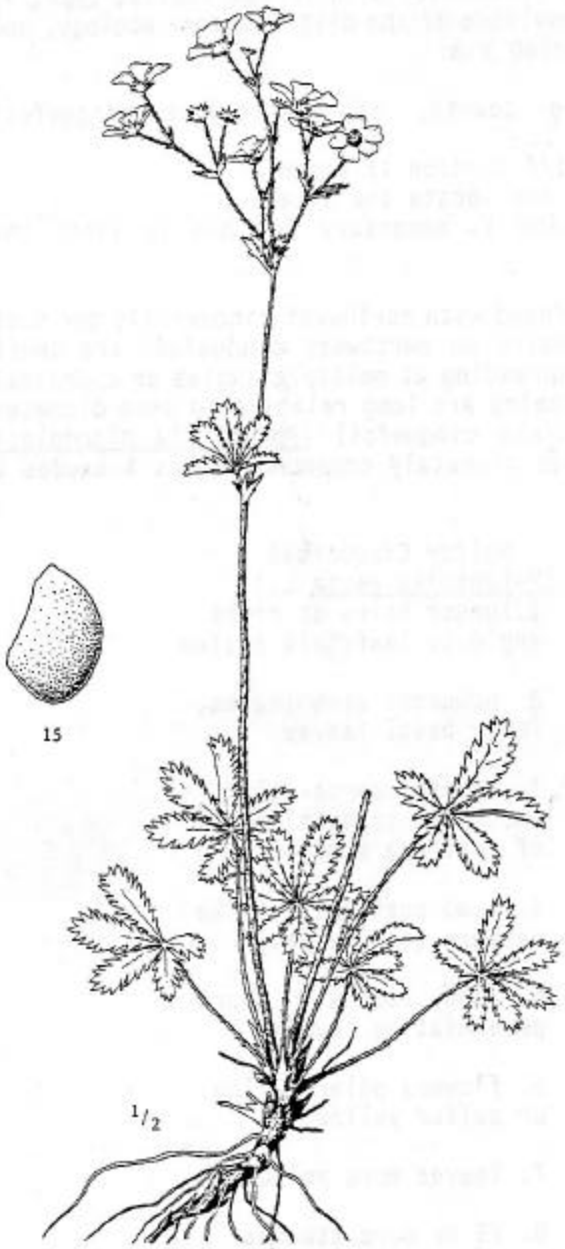
Northwest Cinquefoil (Potentilla gracilis Dougl.)	Sulfur Cinquefoil (Potentilla recta L.)
1. short spreading hairs	1. longer hairs at right angle to leafstalk & stem
2. few stem leaves, mostly basal leaves	2. numerous stem leaves, fewer basal leaves
3. most with a dense woolly (tomentose) underleaf	3. sparse coarse-stiff pubesence so both sides of leaf are similar.
4. seed coat smooth	4. seed coat has netlike pattern (reticulate)
5. well developed rhizomes	5. woody root with short perenniating caudex
6. flowers brighter yellow	6. flowers paler yellow or sulfur yellow
7. leaves more green to gray	7. leaves more yellowish
8. about 20 stamens	8. 25 or more stamens
9. leaflet serrations sometimes deep	9. leaflet serrations 1/2 way to midvein

If identification is uncertain please include some specimens with roots and seeds if possible.

Peter M. Rice (406) 243-2671
Biological Sciences, University of Montana, Missoula, MT 59812

NORTHWEST CINQUEFOIL

Potentilla gracilis Dougl.



SULFUR CINQUEFOIL

Potentilla recta L.