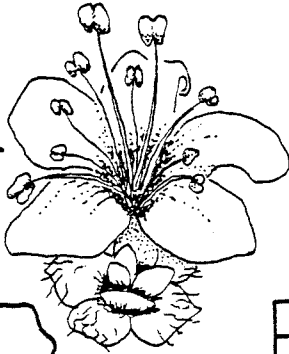


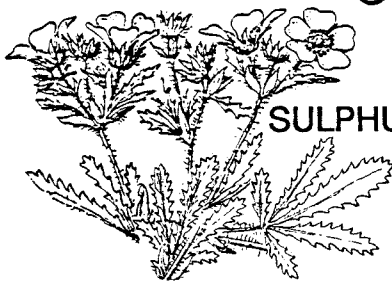
Kelseya uniflora



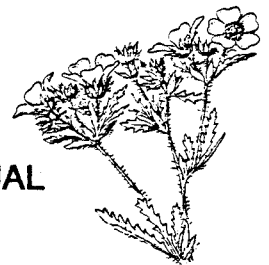
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Vol 4, No 2
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Newsletter of the Montana Native Plant Society



SULPHUR CINQUEFOIL - AN INTRODUCED WEED TO EQUAL Knapweed and Spurge by 2020?



- Peter M Rice

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

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

A computerized literature search confirmed that there is very little information on the biology, ecology or

management of this plant. Werner and Soule (1972) have compiled most of the scattered information on sulfur cinquefoil, but most of these observations were made under the moist climatic conditions of eastern North America.

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

As an introduced Eurasian plant species sulfur cinquefoil is pre-adapted to the semi-arid climatic conditions of Montana, but has escaped the insect and disease organisms that coevolved in its native habitat. The USDA evaluated sulfur cinquefoil for insects and diseases in the eastern United States prior to 1960. There are no reports of insects or higher plant parasites, but three fungal species have been observed. Biocontrol options have not been explored. Trials conducted by Dr Pete Fay (MSU) on the Jarecki Ranch near Polson have evaluated such herbicides as Tordon 22K, 2,4-D and others, some of which appear to give excellent one-year

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In October, the Board of Directors met to discuss some important plans for coming months, including our annual meeting next spring in Kalispell, fund-raising activities, our budget, and our role in conservation issues. At these meetings we discuss issues that affect you. Board meetings are open to all members and are announced in KELSEYA. The next one is scheduled for March 2 in Missoula. Please come, bring your ideas, and volunteer to do a small part. Right now we particularly need people interested in education/outreach activities, and someone to plan a statewide field trip and/or program in addition to those already sponsored by local chapters.

But I don't know the plants!

Planning an activity does not mean you have to be the trip leader or resident "expert." Other members will be happy to help you find an appropriate leader or lead the trip themselves, if you bring them the idea and coordinate the details. Contact your local Chapter President or Angie Evenden (see back page). We particularly need programs in parts of the state without local chapters.

Keeping the channels open...

Let's get an exchange of ideas going. Most of the articles featured in KELSEYA are volunteered by readers, without being solicited by the editor. This is an important function of MNPS--the most interesting and pertinent information comes from your personal and professional experiences with Montana plants. If you're not interested in writing a full-blown article, but just have an interesting anecdote or a gripe you want to share, drop a line to Editor Jan Nixon (let her know if she can print your letter). And Jan is now able to handle your submissions on floppy disks, in WordPerfect 4.2, 5.0 or 5.1, as well as typed material. Please remember to include a 1-2 line "bio" with your longer articles.

Also, the question frequently comes up as to whether we want write-ups on field trips if you've missed the first newsletter

following the trip. The answer is YES! Information about where you've been and what you've seen helps give others ideas about trips they're planning and stimulates interest and enthusiasm in field trips all over the state.

Herbarium needs our support

At this time, no decision has been made on the hiring of a curator to replace Kathy Ahlenslager at the University of Montana Herbarium. Kathy vacated her half-time position there this past summer to take a job in Washington. If you have used the UM herbarium, anticipate using it, or would just like to know that it is properly cared for, you can send your comments to: Dr Donald Jenni, Department of Biological Sciences, University of Montana, Missoula 59812.

There has been renewed appreciation of the W C Booth Herbarium at Montana State after it was closed for an extended time. That herbarium now has a permanent curator, Dr Matt Lavin, in addition to Professor Emeritus Dr John Rumely, and half-time manager Cathy Siebert.

Not so fast...

I must acknowledge the great job Wayne Phillips has done for MNPS. Wayne has now given up his position as Secretary, ostensibly so that others can "have a chance." Those of you who know Wayne will attest to his knowledge of, and enthusiasm for Montana's flora. We will miss Wayne's humor, innovative ideas, and precise notetaking at Board meetings. However, he is still around and after a respite we hope to have him back on the Board. Thanks Wayne!

At its October meeting, the Board of Directors confirmed Dana Field to fill the Secretary's position - thanks also, Dana, for being willing to take on this important position.

As you read this there is not much time left to make your charitable donations for 1990. **Remember your favorite non-profit organizations this holiday season!**

- JL

ANNOUNCEMENTS

MARK YOUR CALENDAR NOW...!

The 1991 MNPS Annual Meeting will feature **Native Plant Landscaping and Revegetation** as a theme. This year's annual meeting will be held in Glacier National Park on May 3-4-5. If you would like to display a poster or exhibit (and both chapters and individuals are encouraged to do so) related to revegetation or native plant landscaping, call Kathy Ake after 7 pm at 755-7693 to reserve a space. Full details about meeting plans will be in the Spring KELSEYA.

WE WANNA KNOW YOUR EARLYBIRDS

No, birdwatchers, don't grab for your binoculars - the **earlybirds** we're talking about are the earliest **flowers** you observe in your area. For instance, in the Bozeman area, I consistently find biscuitroot (*Lomatium cous*) blooming on open, gravelly, south-facing hillsides, earlier than almost any of the other spring "firsts," once as early as Valentine's Day, but always by the Spring Equinox. So I thought it would be fun and interesting to compile some reports about what your earliest spring flowers are for the next issue of KELSEYA. Please send me your observations,

including the name, habitat, dates usually observed - and anything else you think our readers would be interested in.

Please type up a paragraph or three and mail to me by March 10, 1991: KELSEYA, P O Box 992, Bozeman 59771. - JN

NATIVE PLANT POSTER PROPOSED BY VoF CHAPTER

Since MNPS's beginnings, the Valley of the Flowers Chapter has had a notion: to one day produce artwork and gifts that would celebrate Montana's beautiful native flora. The items would be sold, and also might be offered as incentives to those considering membership in MNPS. We believe that if high quality standards are maintained, the items will be in great demand; they could even become "collector's items" if produced annually. Additionally, they would be good advertising for MNPS, and educational tools about the special flora of our state. After some discussion, it seems wise for our new organization to produce a single item (a poster or calendar). We feel that it is important to test the market and volunteer waters (as **both** would be necessary if we were to make a go of such an expensive undertaking).

As luck would have it, I was fortunate to meet an exceptional artist - Pam Harbaugh - and she enthusiastically has offered her talented hand to what could be MNPS's first annual POSTER. Last October the Board of Directors met Pam and was treated to a showing of her watercolors. They then discussed the logistics of producing a full-color poster by the

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THE FORM OF LEAVES

- Peter Lesica

Most of us recognize different plants by their flowers, and we pay less attention to the now-so-showy but equally variable leaves. We all know that the myriad shapes, sizes and colors of flowers function as attractants to insect or animal pollinators, assuring cross-fertilization without wasting pollen. But why are leaves so variable? Leaves serve to capture carbon (in the form of CO_2) and light. They are also the principal site of photosynthesis where light energy converts CO_2 and water into carbohydrates used in growth. A plant's environment plays a major role in dictating what leaf shape will best fulfill these functions. Many observed trends in leaf size and shape can be explained in terms of trade-offs between efficiency of water use, photosynthesis and CO_2 absorption. Understanding the relationship between environment and function can be helpful in explaining why leaves are shaped the way they are.

Large areas provide more resistance to surface air movement. As a result, broader leaves will have higher temperatures and thus higher rates of water evaporation from tissues.

Consequently, plants from dry, warm or sunny habitats tend to have smaller, narrower leaves than those from shadier, moister sites. For example, yellow prairie violet (*Viola nuttallii*) and western violet (*V. adunca*), species of relatively dry, open habitats, have smaller narrower leaves than our common deep forest species: pioneer violet (*V. glabella*), Canada violet (*V. canadensis*) and round-leaved violet (*V. orbiculata*). The leaves of showy

aster (*Aster conspicuus*), our most common forest aster, are broader and larger than those of common meadow or grassland species such as smooth aster (*A. laevis*), mountain aster (*A. occidentalis*) and western meadow aster (*A. campestris*). Our common woodland pussytoes - field pussytoes (*Antennaria neglecta*) and raceme pussytoes (*A. racemosa*) - have relatively large, spoon-shaped leaves while those of rosy pussytoes (*A. microphylla*) and umber pussytoes (*A. umbrinella*), common dry grassland species, are smaller and narrower.

Large leaves, if they are deeply dissected, behave as a collection of small leaves. Thus the same trade-offs that affect leaf size also affect the degree of lobing or dissection. In addition, areas of tissue on the leaf margins between the veins are the most prone to desiccation. In dry environments these regions of the leaf become too costly to maintain and may be eliminated by natural selection, resulting in lobed or toothed margins. Like small leaves, lobed leaf margins are more pronounced in dry, sunny

habitats. For example, thimbleberry (*Rubus parviflorus*), with broad shallowly lobed leaves, generally occurs in cooler and shadier habitats than raspberry (*R. idaeus*) which has divided leaves. Our two woodland clematises, *Clematis columbiana* and *C. ligusticifolia*, have leaves that are less dissected than the two prairie species, *C. hirsutissima* and *C. tenuiloba*. Sierra sanicle (*Sanicula graveolens*) has highly dissected leaves and is found in open habitats, while black snakeroot (*S. marilandica*), with less lobing, occurs in woodlands and riparian forests. Not only are plants with lobed leaves more common in dry or sunny habitats, but leaves on the shady side of trees or shrubs are often more deeply lobed than those on the sunny side.

Interestingly, plants with small, narrow leaves are also common in environments with waterlogged or nutrient-poor soils. In these habitats the efficiency of the roots in acquiring nutrients and water can be inhibited, making the production and maintenance of large leaves too costly. Bog blueberry (*Vaccinium occidentale*) has smaller, narrower leaves than our common upland huckleberry (*V. globulare*). The species of water-hemlock found in bogs, *Cicuta bulbifera*, has much narrower leaflets than those of common water-hemlock (*C. douglasii*), which occurs in less waterlogged environments.

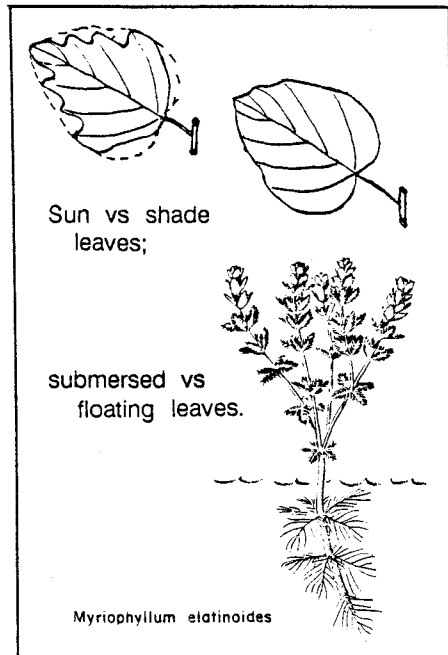
Until now I have compared species from the same genus, but the same trends can be observed between floras of different habitats. For example, as you walk from a Douglas fir forest into a grassland, more of the common species have small or divided leaves. These trends are also found between regional floras; lobed leaves are more common in trees of temperate forests than those of the humid tropical lowlands.

It is more difficult for plants to obtain sufficient CO_2 from water than from air. One solution to this problem is to increase the area over which the gas is absorbed in relation to the volume of tissue being supported. Thus, in aquatic plants, the submersed leaves are often long and narrow or highly divided. Common aquatic species such as water-milfoil (*Myriophyllum spicatum*) and bladderwort (*Utricularia*) have highly dissected leaves. Furthermore, many species of pondweed (*Potamogeton*) have narrow submersed leaves and broader floating leaves.

None of these trends are absolute, and exceptions to all of them can be found. Furthermore, many factors such as thickness, evergreenness and defense against herbivores have not been considered. I have also ignored the important factor of genetic constraints: roses always have divided leaves, whether they occur in forests or grasslands. Nonetheless, the above generalizations are robust enough to explain a good deal of the variation in leaf form that we see around us. Perhaps next time you stop to admire a flower, you'll think about the leaves as well.

Suggested reading:

- Bailey, I W and E W Sinnott, 1916. The climatic distribution of certain types of leaves. *American Journal of Botany* 3: 24-39.
- Givinish, T, 1979. On the adaptive significance of leaf form. IN: O T Solbrig, S Jain, G B Johnson and P H Raven (eds.), *Topics in plant population biology*. Columbia University Press, New York.
- _____, 1987. Comparative studies in leaf form: assessing the relative roles of selective pressures and phylogenetic constraints. *New Phytologist* 106 (Supplement) 131-160.
- Talbert, C M and A E Holch, 1937. A study of the lobing of sun and shade leaves. *Ecology* 38: 655-658.



MEETINGS

THURSDAY, JANUARY 3, KELSEY CHAPTER: 7 pm at the Lewis & Clark Library meeting room in Helena. Michael Hiel, landscape designer with Shades of Green Nursery, will discuss landscaping and gardening with native plants. A business meeting will follow the presentation - all Kelsey Chapter members are encouraged to attend!

THURSDAY, JANUARY 3, VALLEY OF THE FLOWERS CHAPTER: Please note, there will be no meeting this month.

THURSDAY, JANUARY 10, CLARK FORK CHAPTER: 7:30 pm, Room 307, Natural Science (Botany) Bldg, UM Campus. John Pierce will present a slide show created over 30 years ago by Kenneth D Swan, a US Forest Service photographer, "The Blossoming Desert."

WEDNESDAY, JANUARY 16, FLATHEAD CHAPTER: 7 pm, Fish, Wildlife & Parks Bldg, Kalispell. Greg Morley from Swan Lake will present a stimulating talk on his recent canoe trip afloat the Hanbury and Thelon Rivers in Canada's Northwest Territories.

THURSDAY, JANUARY 31, CLARK FORK CHAPTER HERBARIUM NIGHT: 7:30 pm, Room 303, Natural Science (Botany) Bldg, UM Campus. "Spruces, Firs and Pines: an Introduction to Montana Conifers" with Diane Pavak, Roberta Walsh and Dara Newman of UM's Division of Biological Sciences.

THURSDAY, FEBRUARY 7, VALLEY OF THE FLOWERS CHAPTER: 7:30 pm in the Loft area, Plant Growth Center, S 11th Av, MSU Campus. Rich Stout, Associate Professor of Plant Pathology at MSU, will discuss "How Plants Talk to Each Other."

THURSDAY, FEBRUARY 14, CLARK FORK CHAPTER: 7:30 pm, Room 307, Natural Science (Botany) Bldg, UM Campus. Forest Service Researcher Anne Bradley and UM Botany Professor James Habeck will give a slide presentation entitled "Ecotrekking in Belize and Costa Rica."

WEDNESDAY, FEBRUARY 20, FLATHEAD CHAPTER: 7 pm at the Fish, Wildlife & Parks Bldg, Kalispell. Dr Dee Strickler from Columbia Falls will show slides of newly observed, colorful wildflowers.

SATURDAY, FEBRUARY 23, FLATHEAD CHAPTER: See Field Trip section.

THURSDAY, FEBRUARY 28, CLARK FORK CHAPTER HERBARIUM NIGHT: 7:30 pm, Room 303, Natural Science (Botany) Bldg, UM Campus. "Pinedrops to Candysticks: Saprophytic Plants in the Heath Family," with Peter Stickney of the US Forest Service's Forestry Sciences Laboratory.

SATURDAY, MARCH 2, MNPS BOARD OF DIRECTORS: The 1991 winter meeting of the MNPS Board will be held at the home of Peter Lesica, 201 S 4th West in Missoula, starting at 10 am. Take the Orange Street exit from I-90, cross the bridge and make a left on South 4th West. Bring a sack lunch. Everyone is welcome.

THURSDAY, MARCH 7, VALLEY OF THE FLOWERS CHAPTER: 7:30 pm in the Loft area of the Plant Growth Center, S 11th Av, MSU Campus. Dr John Rumely, Professor Emeritus of Botany at MSU, will present Part I of "How to Recognize Trees and Shrubs in Winter Condition." Part II is a field trip on Saturday, March 9.

THURSDAY, MARCH 14, CLARK FORK CHAPTER: 7:30 pm, Room 307, Natural Science Bldg, UM Campus. Rick Schneider and Peter Lesica from the UM Herbarium will relate "Spine-Tingling Tales of Cacti."

WEDNESDAY, MARCH 20, FLATHEAD CHAPTER: 7 pm, Fish, Wildlife and Parks Bldg, Kalispell. Angie Evenden, botanist with

the US Forest Service Region One office in Missoula will discuss the Forest Service's Natural Research Areas programs.

THURSDAY, MARCH 28, CLARK FORK CHAPTER HERBARIUM NIGHT: 7:30 pm, Room 303, Natural Science Bldg, UM Campus. "Rays and Disks: an Introduction to the Sunflower Family," by Peter Lesica.

AND PLANNING AHEAD...

4TH ANNUAL MNPS SPRING MEETING

Hosted by the Flathead Chapter, this year's meeting will be held in Glacier National Park, Friday through Sunday, May 3-4-5, 1991. Please see additional note on Page 2, this issue, and look for full details in the Spring KELSEYA.



FIELD TRIPS

SATURDAY, FEBRUARY 23, SLIP-AND-SLIDE ANNUAL TREE/SHRUB TWIG IDENTIFICATION SKI OUTING: Anne Morley and other Flathead Chapter enthusiasts will host an exciting ski outing in a rural Kalispell area. This is a great opportunity to learn the identity of many native woody plants during the winter. For more details, call Anne at 886-2242.

SATURDAY, MARCH 9, 'RECOGNIZING TREES AND SHRUBS IN WINTER CONDITION': This is the "hands on" portion of Valley of the Flowers Chapter's repeat of a popular trip, ably guided by Dr John Rumely. Meet at the K-Mart parking lot in Bozeman at 9 am, and bring lunch. The site we visit will depend on snowpack and accessibility the day of the trip; wear sturdy boots and dress for the weather!



FIELD TRIP REPORTS

LEE METCALF WILDLIFE REFUGE

On June 23, Sheila Morrison led a group of more than 20 locals and MNPS members through the Lee Metcalf Wildlife Refuge near Stevensville. The group took the north nature trail, and with Sheila's species list in hand, identified the riverbottom plants. Most notable were the sedums, scarlet gilia, death camas and pinedrops. Sheila talked about the medicinal and food values of the shrubs and plants, also.

- Anne Garde

FIRE LOOKOUT ON STARK MOUNTAIN

Members visited Virginia Vincent at her lookout west of Missoula on July 14. Virginia knows her mountaintop well, and showed us where to find most of the plants on her species list, including *Penstemon ellipticus* and *P. albertinus*, three different *Antennarias*, *Phyllodoce empetriformis*, *Eriogonum flavum* and *E. umbellatum*, and the lovely *Hedysarum occidentale*. Anne Garde

CORRECTION

The report on the Pine Butte Preserve statewide trip which appeared in the Fall 1990 KELSEYA incorrectly identified one of the parents of the hybrid population of lady's-slipper orchids near Gibson Reservoir: they are *Cypripedium calceolus* with *C. montanum*, not with *C. passerinum*. Thanks to Wayne Phillips for catching this error.

- JN

4TH ANNUAL FLATHEAD/CLARK FORK CANOE TRIP

September 8, over 20 met at Sportsman's Bridge on the Flathead River, and we set off in eight canoes and four kayaks to explore Jenner's Slough. Species observed included *Potamogeton richardsonii*, *Ceratophyllum demersum*, *Elodea canadensis*, *Myriophyllum spicatum*, and the insectivorous *Utricularia vulgaris*.

- Anne Garde



CHAPTER ACTIVITIES

FLATHEAD CHAPTER

At our November 14 meeting in Kalispell, Bill West, Assistant Manager of the National Bison Range, gave an enlightening talk on one of Montana's newest plant threats, purple loosestrife (*Lythrum salicaria* L.). Bill related how this attractive garden plant has spread from a few sites in eastern North America to many western riparian wetlands and the impact it has on wildlife in the West. By displacing desirable vegetation that provides foraging, nesting and protective habitat, the plant diminishes the reproductive success of a number of animal inhabitants.

Bill also discussed the plant's biology, various methods currently used to manage established growths, and the possibility of reducing further potential spread by discouraging vendors from selling the plant as a garden ornamental. For additional information contact Bill West, Assistant Manager, National Bison Range, 132 Bison Range Rd, Moiese, MT 59824.



ANNOUNCEMENTS

BIODIVERSITY OF THE ROCKY MOUNTAINS

This symposium, March 12-15, 1991, at Colorado State University, Fort Collins CO, will address a critical yet unfilled need in the greater Rocky Mountain area: what is known and what is being done in terms of research, management and education on Rocky Mountain biodiversity issues. At this meeting, leading experts in biotic diversity issues will have an opportunity to exchange and discuss research findings, management approaches and needs. Sponsors include the US Fish & Wildlife Service, USDA Forest Service, National Park Service, Fort Collins Audubon Society, The Nature Conservancy and the College of Forestry and Natural Resources at CSU. Meeting registration fee is \$50; for more information contact: Biodiversity Symposium, Office of Conference Services, Colorado State University, Ft Collins CO, 80523.

NATIVE PLANT PROTECTION AT THE MONTANA LEGISLATURE

In January 1991, 150 legislators will gather in Helena to set policy and budgets for Montana for the next two years. During the session, they will be voting on several proposals that could further protect native plants.

Although native wildlife receives much protection in the state, there is no similar protection for native plants. Currently the Montana Audubon Legislative Fund is the only organization in Helena working on legislation that protects native plants. The Audubon Fund, the lobbying arm of Audubon in Montana, hires a lobbyist and an intern for the session. Audubon has been working with members of MNPS to develop the two main pieces of legislation we will introduce to further protect plants. They are:

* A horticulture-related act that would prohibit the introduction of horticultural species that threaten native vegetation. This act will give the Department of Agriculture (DOA) direction to list as "noxious weeds" plants that threaten native vegetation. A good example of such a plant is purple loosestrife (*Lythrum salicaria*). Loosestrife (see KELSEYA Vol 2, No 3, Spring 1989) will out-compete cattails and other wetland vegetation. It has been found in garden stores in Kalispell and Great Falls. The act Audubon will introduce will give the DOA clear authority to list and regulate the sale and commercial distribution of such species.

* An act to prohibit the commercial trafficking of rare native plants. This act would (1) provide a mechanism to list plants on a "rare plant" list, and (2) prohibit the commercialization of plants on that list unless they are propagated by commercial growers in a way that does not harm the native populations.

More and more, individuals look toward native plants for landscaping materials. Rare plant species are very vulnerable if harvested for commercial purposes, and other states have already seen problems with rare plant commercialization.

Many rare plants can be grown commercially. This act will be designed in a way to allow commercial growers to grow the plants, but not in a way that destroys native populations (commercial growers could not take all the seeds off wild plants, for example).

In addition to the above-mentioned proposals, Audubon will be working on several other pieces of legislation that will directly or indirectly affect our native plant communities. Those acts include:

* Fostering good forest management on private and state lands to protect environmental values and long-term productivity of Montana's forests.

* Seeking funding for important environmental programs, such as the Montana Natural Heritage Program which inventories rare wildlife, plants and communities.

* ORV interests are going to try to get a portion of the gas tax to fund improving trails for their use. We will ensure that the money used by this program can also be used for the following items: mitigation of impacts by poor ORV use, any signing or fencing needed to keep ORVs in designated areas, any research or monitoring needed to protect fragile areas, etc.

The Montana Audubon Legislative Fund will be the main lobbyist on much of this legislation. If you believe in our agenda, we are asking interested members of the Native Plant Society to contribute financially to our lobbying effort. We invite your personal support for Audubon's effort because we feel that our agenda speaks directly to many of your concerns and goals for the upcoming legislature. Contributing to Audubon's lobbying effort can also keep you in touch with the legislature. If you contribute \$25 or more to our lobbying effort, you will receive five legislative bulletins during the session - bulletins that will keep you better informed.

Contributions should be mailed to the Montana Audubon Legislative Fund, P O Box 595, Helena MT 59624. If you have any questions about our lobbying effort, please call Janet Ellis at the Montana Audubon office, 443-3949. Thanks for your interest and concern.

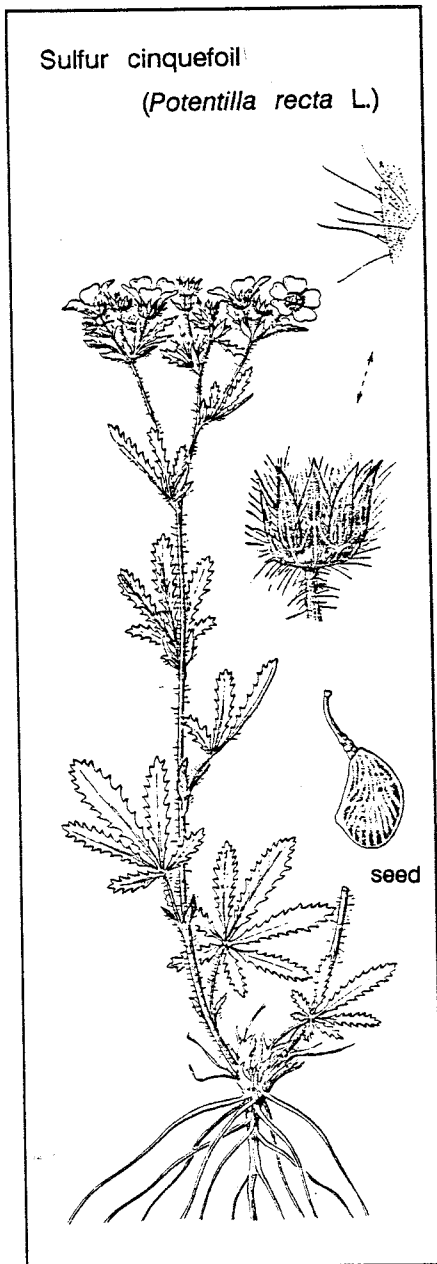
- Janet Ellis, Audubon Fund Lobbyist



SULFUR CINQUEFOIL, continued from Page One

control. Occasional mowing does not provide control, and may actually stimulate development of heavy roots which act as storage organs that initiate new shoot development. Regular plowing, seeding and cultivation control sulfur cinquefoil in crop fields.

Sulfur cinquefoil is a perennial belonging to the Rose Family. It reproduces by seed (actually a type of fruit called an achene). It flowers throughout the growing season so that mature seeds and flower buds may be found on the same plant. Seed production up to 1,650 seeds/plant/year and densities of 25 plants per square yard have been measured. New shoots form from a woody root (caudex). The plant can persist by peripheral enlargement of the root, forming a ring-shaped clump as the center of the root mass ages and dies. Plants as old as 25-30 years have been found in Michigan. It may be a climax species on some sites. Prior to flowering sulfur cinquefoil has an appearance similar to marijuana. The leaves are composed of 5-7 leaflets attached in a palmate pattern to a central leafstalk which is attached to an upright stem. The leaflets are toothed about halfway to the midvein. There are numerous leaves along the length of the stem and few leaves attached to the stem's base. The length of the leafstalk and size of the leaflets decrease up the stem until the leaves are directly attached to the stem near its top. The stems are usually single to several, upright, 12-28 inches tall, and with few branches. The stem arises from a persistent woody root (caudex) which is erect and simple to having a few slender branches. Although this rootstock is persistent and may exhibit some lateral growth, there are no rhizomes. The inflorescence is a many-flowered open cyme elevated above most of the leaves. Five pale to sulfur yellow petals are equal to or slightly longer than the five subtending green sepals and five additional small bracts.



The individual flowers are .6-1" wide and shaped like an open flaring cup. There are 25-30 stamens and numerous pistils. The seeds (achenes) are small (1/20th inch long), slightly flattened, brownish-purple, and covered with elongated netlike veins. Quarter-inch-long slender pointed hairs project outward at right angles to the stem and leafstalks; these are often underlain by shorter hairs spreading at different angles more or less parallel to the stem.

Separating Sulfur Cinquefoil from Northwest Cinquefoil

There are 27 species of cinquefoils (*Potentilla*) found in Montana (Dorn, 1984). Most of these are morphologically distinct, but the introduced sulfur cinquefoil can be confused with northwest cinquefoil (*Potentilla gracilis* Dougl.) which is a common and widespread native species. There are four varieties of northwest cinquefoil recognized in western Montana by some taxonomy experts (Lackschewitz, 1986): Elmers cinquefoil, fan-shaped cinquefoil, and two varieties both called soft cinquefoil. The following list of contrasting characteristics is suggested to help separate sulfur cinquefoil from the varieties comprising the species *Potentilla gracilis*. The value of these contrasting characteristics, of course, depends on the growth stage of the plant. I have listed them in approximate order as to their possible utility in field identification, but several specimens should be examined for as many of these characters as possible because of the variability of these species.

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

References:

- Dorn, R. D., 1984, *Vascular Plants of Montana*, Mountain West Publishing, Cheyenne WY, 276 pp.
Lackschewitz, K., 1986, *Plants of West-Central Montana*, USDA Forest Service General Technical Report INT-217.

Peter M Rice is Professor of Botany in the Division of Biological Sciences at the University of Montana, Missoula.



HORTICULTURE SCHOLARSHIP OFFERED

The Montana Florist Association has established a scholarship consisting of one \$1,000 or two \$500 awards. The recipient may be a student or MFA member who is pursuing an education in horticulture or a related field, and must be a resident of Montana. Scholarship applications may be picked up at local MFA-member florist shops. Applications must be submitted by February 15 and winners will be selected and notified by June 15, 1991.



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 you

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 EXPIRES: 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

PLEASE WELCOME THESE NEW MEMBERS:**MONTANA****GALLATIN GATEWAY**

Doug Rand

HELENA

Peter Achuff
Archie Harper
Richard Thielges

McLEOD

Thomas McNamee

MISSOULA

Matthew Ogden
Rich Schneider
Jane Taylor

SHELBY

Roberta Demarest

WHITEFISH

Kathleen Hansen

CALIFORNIA**BERKELEY**

Anthony & Diana Meadow

**NATURE CONSERVANCY, continued from Page 8:**

*Bob Anderson, a graduate student at the University of Montana, has been doing the actual planning and on-the-ground implementation of the [Oxbow hydrologic] study. He braved the horrors of mosquitoes the size of small birds, spending the entire day up to his neck in stagnant water in order to map the flow of water into and through the preserve.

*Anne Morley is a local Swan Lake resident who has always kept an eye on the preserve for us and served as a local volunteer steward. She was kind enough to volunteer to help Bob monitor groundwater wells and river levels throughout the year. Her secret? Industrial strength 'Bug Dope in a Drum'.

At the same awards ceremony, ASARCO, Inc was honored for its participation in the Oxbow water monitoring study, as was Bud Griffith, ranch manager of the 107,000-acre Flying D Ranch near Gallatin Gateway, MT. The Flying D has recently granted TNC a conservation easement over the ranch.

MNPS POSTER, continued from Page Two:

1991 Annual Meeting. As you may imagine, even with Pam's generosity, printing and distributing a poster will be an expensive and time-consuming effort. That is, if only a few MNPSers are responsible for all the details. However, if other Plant Society members each donate a little time and effort, it should be a relatively easy and fun project.

The Board has given tentative approval to the idea, and has created a "Poster Committee" which will investigate further the details of production and distribution. **We need your help!** Are you interested in serving on the Committee (expenses of communication will be paid by MNPS)? Are you willing to assist with some of the details of printing and/or selling the posters in your area? Do you know of a person/business with skills/ equipment/money/sales location who might be willing to donate them (or give a discount) to MNPS for this project? Do you have any suggestions about what you'd like to have incorporated into a poster that will represent MNPS...and hopefully will adorn **your** wall?

Please write me at 127 W Main #G, Bozeman MT 59715 or call me at 994-3703 days with wuestions, or if you can extend some help or advice. You won't be asked to contribute more than you're willing. Creating such a beautiful artwork should be fun and satisfying, if we all work together. Thanks!!

- Renee' Cook

MONTANA NATIVE PLANT SOCIETY

KELSEYA Editor

P O Box 992

Bozeman MT 59771-0992

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PLEASE NOTE:

If your label reads x2/90, your membership expires 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?

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Montana Native
Plant Society



printed on recycled paper

Peter Lesica
P O Box 8944
Missoula MT 59807

I
CF
x2/91

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 chapter, or may be made to the general fund.

Your yearly membership fee includes a subscription to KELSEYA, 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 Spring issue is MARCH 10; please include meeting/ field trip notices through late June. The Spring issue of KELSEYA will be mailed the third week of March.

NATURE CONSERVANCY STEWARDSHIP AWARDS GO TO MNPSers

At its third Annual Meeting last November, the Montana Nature Conservancy awarded its prestigious Montana Stewardship Award, and recognized several other outstanding stewardship achievements. The following is excerpted from the TMNC's newsletter - our thanks to Linda Wood for sharing this with us just as their newsletter was being prepared for mailing.

"This year our 1990 Montana Stewardship Award was presented to Peter Lesica. Peter has been providing botanical and ecological expertise to the Montana Field Office for close to a decade. Without exaggeration, he is the foremost rare plant ecologist in the state. Over the years Peter has supported us with rare species and

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community inventories, preserve designs, and general input on conservation biology. As of late he has been concentrating more on stewardship issues and landscape ecology. It is safe to say we wouldn't be where we are today without Peter's help.

"Elly Jones was honored for the work she is doing on a bird banding study at Swan River Oxbow. Elly came to us several years ago with the idea of conducting bird banding surveys at the preserve. She has since developed the project into one of only 40 sites nationwide in a monitoring network coordinated by the Institute for Bird Populations of Inverness, California....

- continued on Page 7