

Borealis

the newsletter of the



PO Box 141613, Anchorage, Alaska

March 2004

Join us at our NEXT meetings!

Campbell Creek Center

Monday, March 1st, 7:30 p.m.

Topic: "Pollination Ecology of Alaska"

Speaker: Matt Carlson
Natural Heritage Program

Monday, April 5th, 7:30 p.m.

Topic: "Plant/Herbivore Interactions"

Speaker: Don Spalinger
University of Alaska, Anchorage

Plant Family Study

"Saxafrage Family"

March Presenter: Cara Wardlaw-Bailey

April Presenter: Ken Johnson

**Don't miss out on future issues, seed
exchange and field trip schedules.**

RENEW TODAY!!

Who Was Eric Hultén?

By Ginny Moore

Every botanist who has spent any time in Alaska has certainly heard of Eric Hultén. The first place we go for botanical descriptions of Alaskan plants is to "Hultén", or more formally, his *Flora of Alaska and Neighboring Territories*, written in 1968 and still the most definitive source available to us. But who was Hultén? A Google search on the internet was amazingly useless. There is a bit of information in the prefaces to the Flora, but you sometimes must read between the lines. Unfortunately Hultén's autobiography, *Men roligt hard et varit* ["But it has been fun"], published in 1973 in his 80th year, has never been translated from Swedish, although those who have read it claim that it illuminates his gift of storytelling, a gift he shared with Linnaeus. A little sleuthing produced a eulogy¹ written by Áskell Löve, a protégé and fellow botanist, and some first-hand stories from Alaskan botanists Dave Murray and Les Viereck who actually met the man.

We think of Eric Hultén as a botanist – one who collected plants from many Arctic regions and organized his research to author four monumental floral manuals and atlases. Every bit as important to the world of science were the contributions he made in the field of phytogeography (the study of the geographical distribution of plants). You know those little maps in the *Flora* that show distribution ranges for each species? They provided Hultén with the basis for a major theory of polar plant evolution. And then there's *Beringia*, the area bridging Siberia and Alaska. Did you know that Eric Hultén coined the term "Beringia" in 1937?

Hultén, the Man

Born in Sweden in 1894, Oskar Eric Gunnar Hultén was the "agnostic son of an impoverished Lutheran clergyman" who collected not only plants, but also stamps and ethnological objects from his early teens.

It was not until after the age of 37, when he became curator of the herbarium at the University of Lund, that he found his true niche in academia. Before that he was periodically employed as a museum assistant in Stockholm, an editor of an encyclopedia, and as the secretary of the Swedish Association for the Protection of Nature. He became director of the Botanical Division of the Swedish Museum of Natural History (the Riksmuseet) in 1945 and this gave him the opportunity to pursue his research without teaching responsibilities.

In 1920, Hultén married Elsie Vought, a Ph.D. and college teacher who accompanied him on many of his travels. They had a son, Pontus who became a world renowned artist, museum director and author, and a daughter, Maj, a medical doctor in England.

Hultén loved to travel! Although his most important expeditions were circumpolar research-related, he also visited Central America, Africa, eastern Asia and Hawaii! A true Northerner!

In 1976 the great traveler "became bound to a wheelchair in a nursing hospital away from family and friends because of a stroke that deprived him of his ability to walk and read, but left his speech and memory intact."¹ He died in 1981.

Hultén, the Botanist

As Hultén explains in the Preface to his *Flora of Alaska*² his true life work began with an expedition to Kamchatka in 1920-22. He spent three summers studying the flora of that area, which led to publication of *Flora of Kamchatka* in 1930. Les Vierek remembers Hultén's tales of those years when he and his wife were shipwrecked at a time so soon after the Bolshevik Revolution that there was still fighting going on in the Russian Far East.

During those trips Hultén "became intrigued by the relationships of plant distribution in the regions around the North Pacific – and conscious that [his] range accounts seemed to run aground on the Aleutian Islands."² To remedy this situation, in 1932 he hired a small fishing boat to take him from Unalaska to Attu and back with as many landings as time and weather would permit. Later trips aboard Coast Guard cutters took him to other islands, and by 1937 *A Flora of the Aleutian Islands* was published. Four more summers of fieldwork allowed him to publish a ten-volume monographic, *Flora of Alaska and Yukon*. And finally in 1968, came *Flora of Alaska and Neighboring Territories* which Löve claims is

one of the two most outstanding local flora manuals ever published.

Hultén, The Phytogeographer

A major contribution to our understanding of the origin, history and biogeography of present-day arctic flora was made by Eric Hultén in *Outline of the History of Arctic and Boreal Biota during the Quaternary Period*, published in 1937 as his doctoral dissertation. This is one dissertation that is still read and reread 66 years later, for in it he developed a concept of plant survival exemplified by *Beringia* a name he is credited with coining.

Beringia

Hultén drew on geological evidence as well as his own *phytogeographical* evidence, to propose that most of Northeast Russia and Northwest America (Alaska and the Yukon) remained ice-free during Quaternary glaciations and served as a massive northern *refugium* for arctic and boreal plants.³ Hultén called this region *Beringia* and defined it as the area between the Lena River in Northeast Russia, and the Mackenzie River in Northwest America, and between the Arctic Ocean in the north and southern Alaska and the middle Kuriles in the south. This region served as a land-bridge between Eurasia and North America throughout the Tertiary until it was severed by the formation of the Bering Strait. There is now excellent fossil, molecular and phytogeographical evidence to support Hultén's proposal that Beringia was a major northern refugium for arctic plants throughout the Quaternary.

Hultén Musings

Dave Murray, Herbarium Curator Emeritus at the University of Alaska Museum, says he first met Hultén when he was a graduate student at the University of Colorado in Boulder in 1965. Dave had just amassed a botanical collection from a part of SW Yukon not well known. When Hultén visited, he spent some time studying the entire collection so he could use the information in his *Flora of Alaska and Neighboring Territories*, which he was then bringing to a conclusion. In 1981, Dave was able to work on Hultén's collection when he took a sabbatical trip to herbaria in Russia and Northern Europe. Unfortunately, Hultén had died just weeks before his arrival.

Dave relates that Hultén had a small dog that accompanied him everywhere. Hultén organized monthly luncheons where every *body* from the Phanerogamic Botany Dept. at the Riksmuseet, (including Hultén's dog), would go for traditional

pea soup and pancakes. Not everyone appreciated the presence of the dog!

After WWII there were many displaced people in Europe looking for a means of economic survival. Hultén managed to hire some of these people at the Riksmuseet, and that they provided the labor pool that allowed him to produce so many detailed distribution maps. There were a couple of those people still on the staff when Dave visited in 1981.

Dr. Les Viereck, now retired from the Institute of Northern Forestry in Fairbanks, was lucky enough to meet Hultén and spend a couple of days with him in the field at Eagle Summit north of Fairbanks. He and his wife also visited Hultén in his home in Stockholm and Les spent a week

working in his herbarium, and was as his guest at a Swedish Royal Academy meeting. He too was impressed by Hultén's broad-reaching interests and storytelling capabilities.

Perhaps that autobiography will yet be translated into English and those of us who weren't fortunate enough to be around "when giants walked the earth" will be able to appreciate Eric Hultén, the man.

¹ Löve, Åskell "Eric Hultén 1894-1981 In Memoriam"; Arctic and Alpine Research 1981

² Hultén, Eric "Flora of Alaska and Neighboring Territories"; Stanford University Press 1968

³ Abbott, Richard J. & Brochmann, Christian (2003) History and evolution of the arctic flora: in the footsteps of Eric Hultén. Molecular Ecology 12 (2), 299-313.

Noxious and Invasive Plant Management in Alaska

Get Involved!

- **Be on the lookout for invasive plants.** Note invasions of new plants or new invasions of known "weeds". Call 907-474-2423 to report sightings.
- **Landscape with native plants or non-invasive ornamentals.** Gardeners may be tempted to use beautiful plants that are terrible pests once they escape into the wild. The Cooperative Extension Service has a listing of native plants that grow in your area in the publication - A Key to Flower Growing in Alaska.
- **Learn to identify noxious and invasive plants.** Take samples of questionable plants to the local Cooperative Extension Service offices.
- **Avoid collecting plants you do not know and don't grow them.** Clean your car and recreational vehicle including tire treads, hiking boots, running shoes, and other gear before entering native areas. Seeds and spores can hitchhike on muddy hiking boots, running shoes, backpacks and farm and garden equipment.
- **Volunteer** to assist land managers in removing invasive plants and restoring native plant communities. There are removal programs in many communities. You can even volunteer in national parks.
- **Spread the word.** Lobby your legislators. Express your concerns about the need to manage and control invasive species to your elected representatives and urge them to ensure that the State's quarantine and response programs are state-of-the-art. Share this information with a friend!

For web sites on what you can do, visit:

<http://www.cnipm.org>

<http://www.invasivespecies.gov/community/whatyou.shtml>.

For Further Information Contact:

Alaska Committee for Noxious and
Invasive Plants Management (CNIPM)

P. O. Box 75-8155

Fairbanks, Alaska 99775-8155

Attn: Michele Hebert, Land Resources Agent

The Saxifrage Family:

Parnassia Genus

Presenter: Cara Wardlaw-Bailey

There are three species of *Parnassia* in Alaska. Their name is derived from Mount Parnassus in Greece, where they also occur. This genus is different from the rest of the Saxifrage family in that it has an ovate seed capsule. It also has alternating fertile and non-fertile ("*staminodia*") stamens. The staminodia, which produce nectar but no pollen, aid in attracting insects for pollination. The stamens, which mature before the stigma is fully developed and receptive, ripen and dehisce successively, promoting a longer period for cross-pollination.

Parnassia palustris is the most common species seen. It is showy and can be found throughout most of Alaska except the Aleutian chain and Southeast Alaska, and is a circumpolar plant. It is commonly called "Grass of Parnassus" or "Bog Star", and can be seen in wet meadows, bogs and roadside ditches.

The 5 broad white petals have 5-9 nerves (vertical lines) and are twice as long as the sepals. The 8-10" stem has one small bract about a third of the way up its stem, and the flowers (3/4" to 1") are at the top. The rosette of short-stemmed leaves looks very much like violet leaves.

P. kotzebuei can be found throughout Alaska and the northern part of North American and barely reaching across the Bering Land Bridge. It is commonly called "Small Grass of Parnassus" and is found in wet meadows, along streams, and in damp tundra. It looks much like a very small *P. palustris* except that the small flowers (1/2") have 5 narrow petals with only 3 nerves. The sepals and petals are the same length and there is no bract on the flowering stem.



Parnassia palustris
Cara Wardlaw-Bailey

P. fimbriata can be found in the northern Rocky Mountains, British Columbia, Yukon Territory, SE Alaska, and eastern Southcentral Alaska. Its common name is "Fringed Grass of Parnassus", and can be seen in wet alpine meadows and slow moving streams from middle to sub-alpine elevations.

It is a small (15-30 cm tall), hairless perennial with broad kidney-shaped leaves with smooth margins. The flowering stem has a single small leaf at the midpoint and a single flower at the tip. The 5 white petals are fringed with hairs and the two green and almost completely fused carpels. There are 5 fertile stamens that alternate with 5 sterile, toothed staminodes.

GLOSSARY

Nerve: a simple or unbranched vein or slender rib

Petiolate: with a petiole, or leaf blade

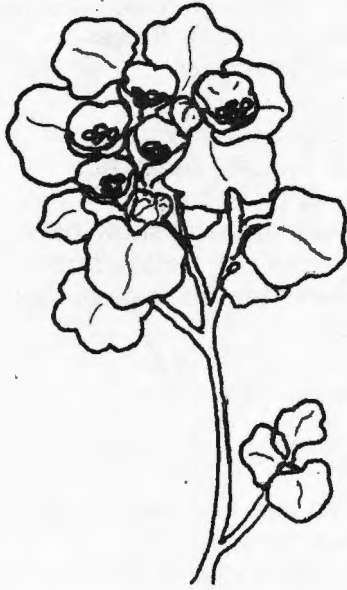
Reniform: kidney shaped, usually attached at the center of the incurved side

Staminodium (pl. staminodia): a sterile stamen or any structure lacking an anther but corresponding to a stamen.

Presenter: Ken Johnson

The *Chrysosplenium* genus is different than other genera in the Saxifrage family in two respects: flower parts are in multiples of 4, and the flowers have no petals.

There are just 2 species in Alaska. Both species spread by stolons or rhizomes. The plants are 2-4" tall, basal leaves have long petioles, and flowers are in cup-like bracts atop a cluster of smaller leaves.



Chrysosplenium tetrandrum
Drawing by Cara Wardlaw-Bailey

Chrysosplenium tetrandrum has 4 rounded sepals and 4 stamens. It is usually glabrous and yellowish-green in color. Leaves are reniform and shallowly lobed. It is found along streams or in moist sites through Alaska except Southeast, and is a circumpolar plant. Its

common name is "Northern Water Carpet" and its most obvious characteristics are its red, glossy maturing seeds in the yellow cups.

Chrysosplenium wrightii has 4 reniform sepals (often with a purplish tint) and 8 stamens. Leaves are reniform and shallowly lobed, darker green (often tinged with purple) and usually hairy. Distribution is limited mostly to Alaska although it can also be found in the Yukon Territory and extreme Eastern Russia. In Alaska, it is found on wet scree slopes in the Alaska Range, the Aleutian Chain, Arctic coastal areas, Seward Peninsula and most of the islands in the Bering Sea.

The common name accepted by most people is "Bering Sea Water Carpet". Despite the petal-less flowers, this is an impressive small plant. The yellow cupped bracts often edged with red or maroon and housing bright red seeds are very eye-catching and a delight to see!



MYSTERY PLANT

This month's mystery plant is one of Verna's favorites – but she does have many favorites! Perhaps one reason this is so special is because it isn't seen that often, as it is a plant of limited distribution. It can be found growing on alpine tundra in the Brooks Range and in a few scattered areas including NE Yukon territory, Denali Park, Eagle Summit, Seward Peninsula and St. Michaels (across Norton Sound from the Seward Peninsula). Leaves are narrow, oblanceolate, and hairy. The 4-5" hairy stems have one head of pink to lavender (mauve) flowers. Disk flowers are loose and bright yellow, and the ray flowers very many and narrow. Involucral bracts are glandular, hairy and purplish.

(Answer on Page 8)

Drawing by Cara Wardlaw-Bailey



FROM WHAT WE GATHER

Antioxidants of the North

Researchers Roseann Leiner, Rudy Candler, and Pat Holloway at the Agricultural and Forestry Experiment Station, University of Alaska Fairbanks, are conducting a study of the antioxidant properties of wild and domesticated berries and vegetable crops in Alaska.

Antioxidants are chemicals that protect key cell components by neutralizing the damaging effects of free radicals, which are natural byproducts of cell metabolism. The presence of more free radicals than antioxidants can cause cell damage that is linked to age-related diseases such as cancers. The presence of more antioxidants than free radicals can confer health benefits.

Using modern analytical instruments, the AFES study aims to identify antioxidant compounds in such Alaska plants as wild blueberries, lingonberries, and rosehips; cultivated strawberries, red and black currants, and raspberries; and cabbage, lettuce, mustard greens, and carrots. The project involves field cultivation at the AFES Fairbanks and Palmer farms, collection of wild berries throughout the state, and analysis at the Palmer Research Center laboratory.

Agroborealis Vol 35 No. 2 Winter 2003
Agricultural and Forestry Experiment Station, University of Alaska Fairbanks; www.uaf.edu/snras

White Bark Helps in Winter Adaptation

During winter bark color appears to play an important role in the thermal dynamics of cambium of deciduous trees. A recent study suggests that selection for trees with lower risk of sunscald injury during winter is the reason for dominance of white-barked deciduous trees in northern latitudes. In comparison with light-colored bark, dark colored bark was associated with increased cambium temperatures, suggesting sunscald injury may be important selective mechanism in light colored bark for trees in northern boreal forests.

Karels, Tim J., Boonstra, Rudy
Reducing solar heat gain during winter: The role of white bark in northern deciduous trees
ARCTIC VOL. 56, NO. 2 (JUNE 2003) P. 168-174

Daylight for Alpines

The length and intensity of light during a day, particularly as its fluctuations affect the growth, maturity and behavior of an organism. New studies show how photoperiod affects reproductive patterns in many alpine species. Some are affected by both photoperiod and temperature for flower development. Some are insensitive to both – they flower shortly after release from dormancy no matter what climate conditions. Most species currently flower around the longest day of the year.

Given predictions and the recent evidence of enhanced late winter snowfalls, climatic change may lead not only to warmer temperatures but also to increased snow-pack at higher elevation. A snowmelt delayed until late July could inhibit flowering for species that require longer photoperiods.

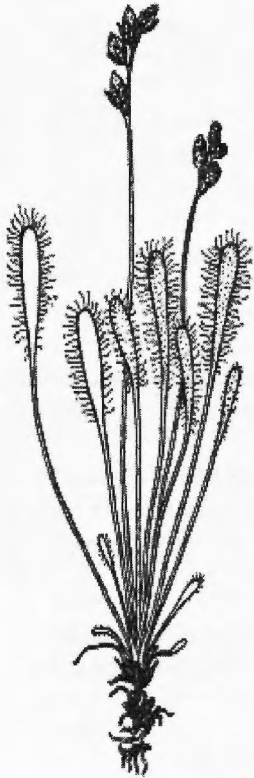
Keller, Franziska, Körner, Christian
The Role of Photoperiodism in Alpine Plant Development
Arctic, Antarctic, and Alpine Research 2003 35: 361-368

Climate and Growth in the Boreal Forest

Although boreal tree growth sometimes increases with climate warming and treeline is advancing in some regions, recent studies at the Bonanza Creek Long Term Ecological Research site (BNZ LTER) and elsewhere show that the effects of warming on the boreal forest will probably be more negative than positive. Ninety-five percent of the Alaska boreal forest consists of stands dominated by three tree species, black spruce (55%), white spruce (25%), and birch (14%). For all three species, at least some sites hold evidence of decreased radial growth from warming temperatures. In work by Glenn Juday and Valerie Barber, hundreds of tree disks and cores were collected from black and white spruce and birch throughout interior Alaska to determine climate sensitivity, future growth scenarios under a warming climate, and potential for carbon credits and storage. Doctoral candidate Martin Wilmking has also collected over one thousand cores from treeline white spruce in the Brooks and Alaska ranges.

Doreen Fitzgerald with Valerie Barber
Agroborealis Vol 35 No. 2 Winter 2003
Agricultural and Forestry Experiment Station, University of Alaska Fairbanks; www.uaf.edu/snras

United Plant Savers, a non-profit education corporation dedicated to preserving native medicinal plants has sponsored a book featuring species that are at risk or potentially endangered. The following feature on Sundews is in this book. For more information, contact them at www.plantsavers.org or PO Box 420, East Barre, VT 05649.



Appreciating sundews requires humility. You must sink to hands and knees, shrinking ego and opening eyes to the wonder of a miniature plant that thrives in the acidic nutrient poor conditions of a sphagnum bog.

On a sunny day, you will discover Drosera's jewels: dewy drops with ruby centers extend from each leaf and shimmer like diamonds. Perhaps you'll notice an unfortunate fly that mired its feet in the superglue strength dew. Sundew patiently awaits the insect's struggle to cease; the presence of protein signals leaves to close and digest the airborne expressed meal.

I've been fascinated with and appreciative of sundews ever since our first meeting. I feel fortunate to live in the midst of their American stronghold, yet even in the last frontier of Alaska, "progress" marches, bringing new roads, bog drainage, and disruption of native habitat. The tinyness of sundews and their intimate relationship to sphagnum bogs places them at severe risk to both overzealous foragers and wetland developers. In Germany, Drosera is threatened with extinction and harvest is strictly prohibited.¹ In the United States, only 3-5% of carnivorous plant habitat is estimated to remain. My fervent wish is that as appreciation grows for this fascinating healing herb, more efforts will be expended to expand preservation of its native habitat, to practice sustainable foraging, and to promote cultivation.

Botanical Features

Droseraceae, the sundew family, comprises 4 genera of carnivorous herbs; these plants attract, capture, kill and digest flies, gnats and moths. The largest genus, Drosera (from the Greek for "dewy") is of a worldwide distribution and includes about 8 dozen (mostly perennial) species. American natives include *Drosera rotundifolia*, *D. anglica*, *D. brevifolia*, *D. capillaris*, *D. filiformis*, *D. intermedia*, and *D. linearis*.²

The circumboreal *D. rotundifolia*, commonly called round-leaved sundew, is of amazing adaptability, extending in range from northern Florida to Alaska's Arctic Circle. This diminutive herb has a basal rosette of round leaves fringed with dewy insect-trapping hairs.

Botanist Lewis Clark writes: "Like small green frying-pans, the leaves contain chlorophyll for sun-chemistry, but the sparse roots pick up from their watery surroundings very deficient amounts of minerals, and compounds of nitrogen and phosphorous. Hence the plant must make up this deficiency, and this is only possible in its wet habitat by a supplement of insect fare."³

Though sundews can live without insect protein, those with access to an entomologic feedings product more robust plants and higher quantity of seed. Clark further explains how the modified leaf-hairs are gland-bearing filaments that secrete, and are enclosed by, chlorophyll derivatives of ruby-red fluid.

"The colour is attractive to small crawling and flying insects, which are at once trapped. Then the tentacles bend inward, the leaf-edges curl, and the insect's juices are soon assimilated by digestive enzymes. Finally the leaf flattens, the chitinous husks of the insects blow away, and the glistening beads again appear."

In the late 1800s, Charles Darwin studied sundew in depth (his *Insectivorous Plants* includes more than three hundred pages devoted to Drosera). Darwin found that raindrops and inorganic materials had negligible response on sundew, but if the leaf was touched by a protein material (like a fly) the tentacles were rapidly stimulated.



Sundew's white to pinkish flowers (petals may vary from 4 to 6 though 5 are most common) are borne on a stalk 2 to 8 inches high. Flowers, which open singly, may number from 5 to 25 per stalk. Drosera's French name, "rose du soleil", as well as its English name, "sundew", refer to the flower's fondness for blue sky days; in cloudy and cool weather the buds remain patiently closed. Other common names range from "daily dew" and "moor grass" to "red-rot" and "youth root".

Historical Background

Sundew was regarded as a remedy for "consumption of the lungs" in the 16th century. However Gerarde warned of its "biting nature" and ballyhooed diet as preferred consumption treatment. Other writers like Geoffroi promoted Drosera infusions for asthma and lung ulcerations. The *Medicinal Flora* of Rafinesque recommended sundew juice to remove warts and corns. Schenk and Valentin recognized Drosera's value in coughs, bronchitis, and pulmonary disease. ⁵

Kwakiutl men are reported to have made a complex love charm with Drosera and other herbs to make women fall in love with them. Interestingly, when flower essence practitioner Jane Bell prepared Sundew Flower Essence* (after waiting patiently for four years for sundew to flower!), she reported feeling oneness with Divine Love through the process. "I had the concept before of being one with God, but the attunement with sundew gave me the all encompassing experience of it. There was no separation between me and the Beloved. The image I had was of looking at a luminous Buddha-like figure and it was looking back at me with the same eyes of wonder and heart of Divine Love." Sundew flower essence, says Jane, fosters "the unification of personal and higher selves, our humanity and divinity. Our divinity is no less than oneness with Spirit. There is no separation." ⁶ Whether our approach is via a sundew love charm or Sundew Flower Essence or simply sitting and observing the sundew in the bog, we can marvel at life's interrelationships and our oneness with all life.

*Those interested in additional information on Sundew Flower Essence may contact the Alaska Flower Essence Project, P. O. Box 1369, Homer, Alaska 99603; or on the web at www.alaskanessences.com.

Propagation and Cultivation, if known

Though tropical species of Drosera flourish year round, dry climate species tend to be tuberous, dying back in drought conditions and reappearing in the wet. American natives like Drosera rotundifolia survive cold by shedding leaves and forming hibernacula, tight budlike clusters as their winter residence. The Botanique nursery, one of several sources for sundew plants, recommends "...a soil mix of 1/3 sand and 2/3 peat moss as a bog garden or container mix. When planting, keep the small crown above the soil surface and firm the soil gently around the plants

to reduce splash from rain. Water transplants well and keep moist but not continuously flooded."¹⁴ If planting from seed, sprinkle on soil surface. Seeds germinate best after exposure to cold (stratification).

When cultivating carnivorous plants, avoid fertilizers and overfeeding. The plants are acclimated to nutrient poor conditions. As supplementary fare, they will trap small fruit flies and other small insects, luring them with nectar gland secretions, capturing them with adhesives, and digesting them with their enzymes. Sundews are one of the easier carnivorous plants to raise, are self-pollinating, and will generally spread after several seasons. Terrariums are recommended. Those desiring in depth information on cultivation, and on terrariums for raising carnivorous plants may contact:

Seed and Plant Sources:

Botanique Nursery, 387 Pitcher Plant Lane, Standardsville, VA 22973; www.botaniqu.com; specializes in nursery-propagated carnivorous plants

California Carnivores, 7020 Trenton-Healdsburg Road, Forestville, CA 95436; www.californiacarnivores.com; sells a 26 page growing guide and catalog for \$3; has wide variety of Drosera species for sale

Information on a carnivorous plant seed bank and additional growing tips is accessible on the internet at www.carnivorousplants.org

Conclusion

Dr Earle Sweet D.C. M.H. describes sundew as "a very noble but rare plant."¹⁵ In the mainland United States (and much of the world), sundews face untold challenges in remaining on the planet. Wherever we live, it is up to us to collectively work to keep this noble herb a native herb, and not a casualty in that thing called progress.

References

1. N.G.Bisset. *Herbal Drugs and Phytopharmaceuticals*. Stuttgart: CRC Press and Medpharm Scientific Publishers, 1994.
2. Hortus Third, staff of the L. H. Bailey Hortorium. Cornell University, New York: Macmillan Publishers, 1976
3. Lewis J. Clark, *Wild Flowers of the Pacific Northwest from Alaska to Northern California*. Sidney, British Columbia: Gray's Publishing, 1976.
4. Ibid
5. Charles F. Millsbaugh, *American Medicinal Plants*. New York: Dover Publications Inc., 1974.
6. Jane Bell, personal communication, February 25, 1998
7. Robyn Klein, personal communication, February 6, 1998
8. Simon Y. Mills, personal communication, February 11, 1998
9. David Winston, personal communication, February 16, 1998
10. Anne-Clement Hill, personal communication, February 20 1998
11. Anita Hales, personal communication, February 13 1998
12. David Winston, personal communication, February 16, 1998
13. Michael Moore, *Medicinal Plants of the Pacific West*. Santa Fe: Red Crane Books, 1993.
14. Botanique Nursery, care sheets, <http://www.botaniqu.com>
15. Dr. Earl Sweet, personal communication, February 18, 1998

Russian Knapweed (*Centaurea repens*)

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Cooperative Extension. 1995-2004.
Home Page: www.ext.colostate.edu.

Quick Facts:

- Russian knapweed is a creeping perennial that reproduces from seed and vegetative root buds.
- Russian knapweed emerges in early spring, bolts in May to June, and flowers through the summer into fall.
- Russian knapweed is toxic to horses.
- The key to Russian knapweed control is to stress the weed and cause it to expend nutrient stores in its root system.
- The best management plan includes cultural controls combined with mechanical and/or chemical control techniques.

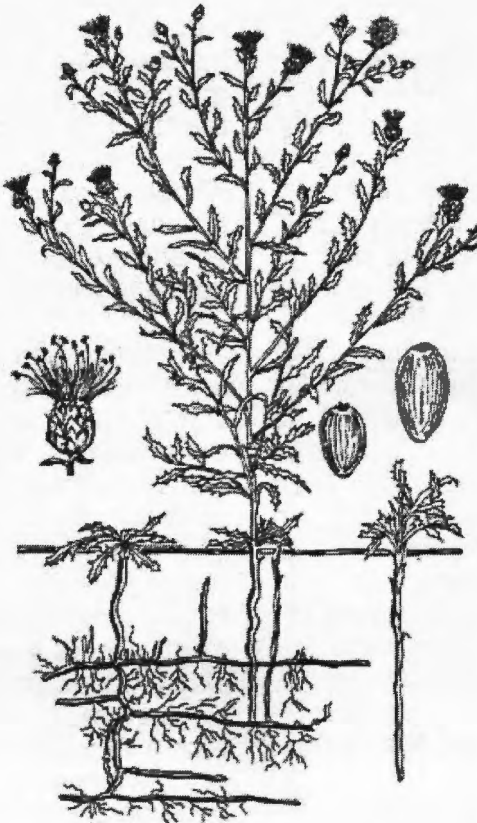
Description

Russian knapweed (*Acroptilon repens*) is a creeping, herbaceous perennial of foreign origin that reproduces from seed and vegetative root buds. Shoots, or stems, are erect, 18 to 36 inches tall, with many branches. Lower leaves are 2 to 4 inches long and deeply lobed. Upper leaves are smaller, generally with smooth margins, but can be slightly lobed. Shoots and leaves are covered with dense gray hairs.

The solitary, urn-shaped flower heads occur on shoot tips and generally are 1/4 to 1/2 inch in diameter with smooth papery bracts. Flowers can be pink, lavender or white. Russian knapweed has vertical and horizontal roots that have a brown to black, scaly appearance, especially apparent near the crown.

The weed forms dense, single species stands over time due to competition and allelopathy (biochemicals it produces that inhibit the growth of other plants). Russian knapweed is toxic to horses.

Russian knapweed typically invades degraded areas, dominating the plant community and desirable plants (e.g. perennial grasses). Seeding competitive, perennial grass species (cultural control) after Russian knapweed has been stressed by other control measures (set-up treatments) is essential. Set-up treatments may include chemical or mechanical methods.



Biology and Occurrence

Russian knapweed emerges in early spring, bolts in May to June (elevation dependent) and flowers through the summer into fall. It produces seeds sparingly, approximately 50 to 500 per shoot.

Seeds are viable for two to three years in soil. Its primary method of reproduction is from vegetative propagation, with seed of secondary importance. Roots from a recently established plant expand rapidly and may cover up to 12 square yards in two growing seasons.

Russian knapweed is native to southern Ukraine, southeast Russia, Iran, Kazakhstan and Mongolia. It grows on clay, sandy or rocky prairies and sunny meadows; on saline

soils; or clay, rocky or sandy shores of lakes and rivers; and on rocky and clay slopes of hills and bottomlands. It is a weed of cultivated land, dry pastures and degraded noncropland (waste places) in its native land. Russian knapweed grows in most western states.

Management

Like other creeping perennials, the key to Russian knapweed control is to stress the weed and cause it to expend nutrient stores in its root system. An integrated management plan should be developed that places continual stress on the weed. Currently, the best management plan includes cultural control combined with mechanical and/or chemical control techniques. A single control strategy, such as mowing or a herbicide, usually is not sufficient.

Oxeye Daisy (*Chrysanthemum leucanthemum*)

Although a beautiful flower long admired by gardeners, song-writers and poets, oxeye daisy (*Chrysanthemum leucanthemum*) is an invasive weed which is becoming an increasing problem. Oxeye daisy has recently been added to the statewide noxious weed list. We must understand the biology and ecology of this plant so it can be properly managed in this state as it continues to spread.

Identification and Biology

Oxeye daisy is a perennial member of the Asteraceae family, the same family as sunflower (*Helianthus annuus*). Oxeye daisy looks like the typical daisy. Flower heads are borne individually on the tops of long slender stems. Flowers are 1.5 to 2 inches across, with yellow centers, and 20 to 30 white petals radiating from the center (Figure 1). The petals are slightly notched at the tip. Stems grow 1 to 3 feet tall and are smooth, frequently grooved and sometimes branch near the top. Leaves progressively decrease in size upward on the stem. Basal and lower leaves are lance-shaped with "toothed" margins and petioles that may be as long as the leaves. The upper leaves are alternately arranged, narrow and often clasp the stem. Seeds are brown to black in color, $\frac{1}{16}$ of an inch long, and have 8 to 10 white ridges down the side (Figure 2). The plant has branched rhizomes and strong adventitious roots. Scentless chamomile (*Matricaria maritima*) and Shasta daisy (*Chrysanthemum maximum*) look very similar to oxeye daisy. However, chamomile is an annual plant with smaller flowers and much more finely dissected leaves. Shasta daisy usually grows 6 to 12 inches taller than oxeye daisy and has larger flower heads.

Oxeye daisy flowers in June through August. The plant is a prolific seed producer; a single, healthy, robust plant produces up to 26,000 seeds. Reproduction occurs primarily through seed dispersal and germination, although spreading rootstalks contribute to its propagation. Seeds may be viable ten days after the flower blossoms and are dispersed close to the parent plant. Germination occurs throughout the growing season, but most new seedlings emerge in spring. Seeds that do not germinate in the spring may remain viable for many years. One study found 82 percent of seeds were viable after 6 years and 1 percent were still viable after 39 years.

History and Distribution

Oxeye daisy was introduced to the United States from Europe as a contaminant in seed and as an ornamental. It quickly escaped cultivation and has since become a common weed. Common names include white daisy, field daisy, marguerite, poorland flower and moon-penny. Besides being planted for its beauty, oxeye daisy was cultivated for home remedies to cure whooping cough, asthma and other coughs. A tea made from its leaves was sometimes used as an antispasmodic. Today many people enjoy the young leaves of oxeye daisy in salads.

Oxeye daisy is widely distributed across the British Isles and Europe. It is found in most states, but is less common in the southern United States. It is common in the northeast and the Great Plains and is the most prevalent roadside weed in the Pacific Northwest.

Management

Because oxeye daisy is such a showy, pretty plant, proper management is often neglected. It is often an ingredient in wildflower seed mixes so consumers should read the label carefully to be sure oxeye daisy is not present. In addition, landowners often avoid mowing the plant because it looks so pretty on their lawn or in their gardens. Therefore, education and awareness are critical for adequate management. Perennial plants require depletion of nutrient reserves in the root system, prevention of seed production and prevention of dispersal.

Mechanical Options

Mow as soon as flowers appear to reduce seed production. Mowing may have to be repeated during a long growing season because mowing may stimulate shoot production and subsequent flowering. Root systems are shallow and the plant can be dug up and removed. Be sure to remove the entire root system, though, as remaining roots may produce new shoots. Hand removal will have to be continued for several years because seeds may remain viable in the soil for a long time.

ANNUAL MEMBERSHIP APPLICATION/RENEWAL

The Alaska Native Plant Society was organized in 1982 by an enthusiastic group of amateur and professional botanists. It is a non-profit educational organization with the goal of uniting all persons interested in the flora of Alaska. Membership is open to any interested individual or organization. If you wish to join us, please indicate the category of membership you desire, fill in the form below and mail it with the appropriate remittance to:

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P.O. Box 141613,
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MYSTERY PLANT ANSWER

Erigeron hyperboreus

Asteraceae/Aster Family



**SUMMER FIELD TRIPS
ARE FUN AND EDUCATIONAL!!**

Help us plan an exciting summer field trip schedule. Tell us your favorite places to go to look for plants and maybe even volunteer to organize a trip. You don't have to be an expert to organize a trip – you just have to have some time to see that it happens – and the experts will be there too!

Contact Anjanette Steer at
Or anj@ak.net

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Newsletter ("*Borealis*")

Editor Ginny Moore

Borealis is published bi-monthly October through May. Articles may be sent to Ginny Moore, Anchorage, AK 99516. Phone or FAX: or E-mail: mooretg@alaska.net



**To Program Speakers: Sandra Talbot
(January) and Ed Berg (February)
To Plant Family Presenters: Verna
Pratt and Anjanette Steer**

YOU MAKE IT HAPPEN!



UPCOMING PLANT EVENTS

March 1

Alaska Native Plant Society: 7:30 p.m., Campbell Creek Science Center off 68th and Lake Otis

April 5

Alaska Native Plant Society Monthly Meeting: 7:30 p.m., Campbell Creek Science Center.

April 19th Alaska Rock Garden April Meeting 2:00PM Recluse Gardens, Wasilla

Rhonda will give a demonstration on how to plant Alpines into the Rock Garden and how to plant a Hyper-Tufa. Jeff will give a demonstration in the construction of the Rock garden and some basics on constructing a Water Feature. Open to the public, at no charge. You do have to bring a rock to Jeff though and consider an invitation to join the Rock Garden Society

Saturday, May 10th, Northway Mall ARGS Plant Show.

Saturday, May 17th, Plant Sale, Old Harbor Road, Anchorage

Sunday, May 18th, AK. Botanical Garden, Spring Cleanup

June 27th Alaska Rock Garden Event: Alpines of Patagonia Loussac Library , 6:30 PM

Presentation by Dr. David Hale. David Hale is a avid Rock Gardener from the coast of Oregon. A frequent world traveler, he and his wife has conducted 16 trips to the Patagonia region. These experiences will bring a wealth of information on this region to our club as the Rock garden Society has recently launched plans to conduct a seed expedition to this area in 2005.

He has also agreed to be a featured speaker at the Anchorage Botanical Garden Fair.

Weekend, of June 28th, 29th Anchorage Botanical Garden Fair

**Alaska Native Plant Society
P.O. Box 141613
Anchorage, AK 99514**



Renew your membership!

Don't miss next month's Field Trip Schedules!