

Borealis

the newsletter of the



PO Box 141613, Anchorage, Alaska

February/March 2011

Join us at our Next Meetings!

Monday, February 7, 7:30 p.m.

(Campbell Creek Science Center)

Topic: "Determining the Floral Diversity of the Kodiak Archipelago"

Speaker: Stacy Studebaker

Field Botanist - Kodiak National Wildlife Refuge
Author of "Wildflowers and Other Plant Life of the Kodiak Archipelago - A Field Guide for the Flora of Kodiak and Southcentral Alaska"

Stacy has researched, documented, and photographed the flora of coastal Alaska since 1973 and has made her home on Kodiak since 1980. She will share her passion for photography and the native plants of Kodiak in her presentation that will cover some of the unique plant communities and habitats that the Kodiak Archipelago offers. She will also show us how she works in remote locations of the Kodiak National Wildlife Refuge documenting the floral diversity for the US Fish & Wildlife Service who manages the Kodiak National Wildlife Refuge.

Following her presentation, Stacy will have plenty of her new field guides on hand for a book signing.

Plant Family: Apiaceae/ Domestic Genera

Presenter: Beth Baker

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

Topic: "Climate Change and Changes To Vegetative Patterns in Alaska"

Speaker: Amy Miller

Amy is a U.S.Park Service Ecologist

Plant Family: Apiaceae/ Pastinaca & Heracleum

Presenter: Mary Hopson

CALLING FOR FIELD TRIPS

It's that time of year again - time to "Think Summer" - as in "Field Trips"!

It is time to start planning this summer's field trips so that all members can arrange their own summer plans accordingly, especially if trips require extra time or money, or a limit on how many can attend. Our outings are ALWAYS fun, no matter what size the group, or whatever the weather. There have been many memorable trips. Let's make this a memorable year.

On Page 6 you'll find the standard Field Trip Planning Worksheet and once again we're asking you to get all excited about taking a group of plant lovers to one of your favorite places to enjoy the summer bounty.

All members are encouraged to submit field trip proposals. Preliminary proposals for field trips should include the following:

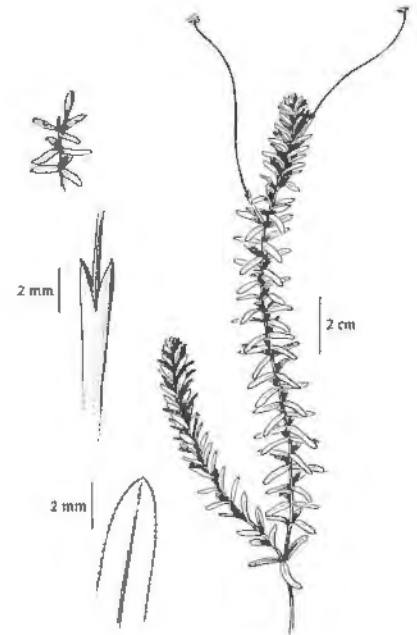
- 1) Your name and email address,
- 2) Title of the field trip,
- 3) Name(s) and contact information for all organizers,
- 4) A brief description of the field trip,
- 5) Preferred day(s) of the field trip,
- 6) Special needs,
- 7) Enrollment limit and
- 8) Tentative budget (e.g., travel and food items; estimated cost per participant).

It would be great if we could have the whole slate of summer activities lined up by the end of April!

Elodea canadensis: An Invasive Aquatic Plant in the Chena River System

by Alan Batten

An aquatic invasive plant, *Elodea canadensis* (also called common waterweed or Canadian waterweed), has been found in Chena Slough (aka Badger Slough) and the Chena River downstream from the slough in interior Alaska near Fairbanks. No one knows for sure how aggressively it is likely to spread in Alaskan waters, but thick beds of it have developed in several miles of Chena Slough over the last 10 years, and smaller populations have been found in the Chena River itself in town. It grows entirely submerged in water and roots in silts or organic muck on the bottom. It rarely flowers in northern waters and no flowers or any evidence of fruits or seeds have been seen in the Chena population. However, the stems readily break into pieces which wash downstream and take root in acceptable habitats. It survives quite well when frozen into ice and can be carried long distances that way. Its ideal habitat is lakes and slow-flowing streams with clear water and summer temperatures from 10-20° C (50-68° F). It is unlikely to grow in the turbid waters of the main stem of the Tanana River but could potentially establish itself in sloughs of the Tanana or at the mouths of clearwater tributaries if transported there by ice or boats. It is readily transported between drainages by man on boats and boating equipment, particularly propellers, jet units, trailers and aircraft pontoons. It is commonly used as an aquarium plant and it probably got into Chena Slough in the first place by someone dumping out an aquarium there. In the right habitats elodea grows so vigorously and aggressively that it clogs waterways and can make boat travel difficult. Thick beds of it can increase sedimentation and alter stream flow, which could impact spawning salmon in the Chena River or Arctic grayling in Chena Slough.



Elodea canadensis

Chena Slough was an active channel of the Tanana River when E. T. Barnette landed on its shores in 1901, establishing a trading post which became the town of Fairbanks. Since then, the building of the Alaska Highway, the Alaska Railroad extension out to Eielson Air Force Base and, finally, the Chena River Flood Control project has sealed off the head of the slough from the Tanana River so now the slough carries mostly groundwater seeping through the floodplain. Consequently, the channel is quite large relative to the amount of water it is carrying, and the water is shallow, slow-moving and clear. This habitat appears to be ideal for the growth of elodea and certain other aquatic plants.

This is the second report of *Elodea canadensis* in Alaskan waters. The first was in 1982 from Eyak Lake near Cordova, and that was also considered to probably be the result of aquarium dumping. No one has been monitoring that population, but it has apparently not spread or expanded.

Elodea is native to southern Canada and the northeastern United States. However, it has been moving around aided by boats, canal construction and other activities of humans for a couple of centuries at least, so its exact pre-contact range is unknown. It is now present in most of the lower 48 states and has made itself a nuisance in several of them. It has become such a problem that at least 10 states have laws prohibiting its sale. Elodea was introduced to western Europe in the 19th century and has spread eastward beyond Lake Baikal, crossing two major drainage divides in the process with a lot of help from people and their boats. It arrived in St. Petersburg, Russia in 1880 and had spread upstream 1000 miles and over a drainage divide to the Caspian Sea by 1895. It has also been introduced to Australia and New Zealand where it is causing great problems in slow-moving waterways.

Alaskans in general and users of waterways in particular (that's most of us isn't it?) need to be aware of this problem so that we don't inadvertently introduce elodea or other unwanted aquatic organisms into new watersheds. Currently we only know that this is a problem on the Chena River but there may be numerous streams in the Interior, the Matanuska-Susitna Valley and the Copper River Basin where elodea might grow well. The basic rule that we need to train ourselves to follow is not to put any detritus (animal, vegetable or mineral) clinging to our boats or other equipment into a

different water body than the one it came out of. Boats and other equipment should be inspected and cleaned at the end of each trip. For elodea this should be fairly simple since, as far as we know, we don't have seeds to worry about. It can only spread via sizable fragments (>2 cm?) of vegetation which should be clearly visible to anyone looking closely. As more and more exotic and potentially invasive plants (and animals!) move north we need to minimize the extent to which we help them move around. For information on responsible practices for boaters to avoid spreading aquatic organisms of any kind, see <http://www.protectyourwaters.net/>.

A website acting as a clearing house for information and activities in regard to the elodea infestations in interior Alaska has been set up by the Fairbanks Soil and Water Conservation District (http://www.fairbankssoilwater.org/resources_Chena_Slough_Invasive.html). It includes a link to a description, photographs and line drawings of what elodea looks like. Anyone finding new populations of elodea in interior Alaska can report it through this website. New populations of elodea (or any other weed) elsewhere in the state can be reported through the Alaska Natural Heritage Program AKEPIC (Alaska Exotic Plants Information Clearinghouse) website (<http://akweeds.uaa.alaska.edu/>).

For more information: 1) "Introduction to Common Native & Potential Invasive Freshwater Aquatic Plants in Alaska" which is available locally from the U.S. Fish and Wildlife Service or can be downloaded (7.5 mb) at <http://alaska.fws.gov/fisheries/invasive/reports.htm>.

UAF Herbarium Summer Field Work

In early July, herbarium curator Steffi Ickert-Bond, collection manager Jordan Metzgar and research affiliate Richard Bond traveled to Chukotka, Russia on an NPS and NSF funded Russian-American collecting expedition. Landing in the Chukotkan village of Provideniya, they were met by Russian collaborators from the Komarov Botanical Institute in St. Petersburg. Collections were made along the coastline near Novo Chaplino before traveling by whaleboat to Lorino. A tundra exploration was launched from the nearby village of Lavrentiya, with transportation provided by a tracked vehicle. The group traveled to the Chegitun River headwaters, with many collecting stops spanning windswept alpine ridges and marshy bottomlands. Several hundred plant specimens were collected in the three week trip and will be used for studying Beringian plant distributional patterns.



Tundra "tank" used for Chukotka expedition.



Jordan Metzgar collecting parsley ferns

Byron Glacier. At this site, *Cryptogramma sitchensis* was one of the few vascular plants growing mere feet from the glacier. Parsley ferns also prefer exposed rock outcrops, leading to collecting stops at windswept localities along Turnagain Arm and an avalanche chute near Hope. The samples collected will be used for morphological and molecular studies of *Cryptogramma*.

In the early summer, herbarium collection manager Jordan Metzgar, traveled through Southcentral Alaska collecting plant specimens for ongoing research on the post-glacial migration history and climate change sensitivity of the parsley ferns (*Cryptogramma* spp.). Jordan visited localities along Turnagain Arm, across the Kenai Peninsula and near Valdez. Parsley ferns are commonly found on recently deglaciated land, leading to dramatic collecting spots like



Zachary Meyers collecting plants in Lake Clark National Park.

Graduate student Zachary Meyers worked for the Southwest Alaska Network (SWAN) to document the native flora in Lake Clark National Park. Much of this remote, inaccessible park remains floristically unexplored and undocumented. SWAN's primary goal is to inventory and monitor various parks throughout the southwest area. Approximately 35-40 sites were established and inventoried across the park's alpine and boreal habitats. In addition, several species of lichens and vascular plants were identified as new to the park. Some environments, including lakes and alpine habitats, are more sensitive to disturbance and change. Local residents living in Port Alsworth for decades have noticed changes in climate, species distribution and glaciers. It is critical to continue monitoring and understanding the processes contributing to this change so the area may remain a rich natural resource for many generations to come.

Herbarium research professional Carolyn Parker taught a short class, *Introduction to Alaska's Flora*, and participated as field instructor in the class *Week in the Woods for Educators*; both were part of the UAF Summer Sessions. Carolyn also joined Stacy Studebaker for their sixth season of a botanical survey of Kodiak National Wildlife Refuge lands. They visited Sitkalidak Island, off the southeastern coast of Kodiak Island, and the vicinity of Old Harbor village. One highlighted find was three populations of the very rare plant *Cochlearia sessilifolia*, a small plant in the mustard family (Brassicaceae) that grows in the intertidal zone of sheltered bays. Tissue samples and specimens have been sent to Missouri Botanical Garden botanist Dr. Al-Shehbaz in an effort to reassess the taxonomic status of this species and its relationship to a close relative, *Cochlearia graenlandica*, found throughout coastal Alaska. A total of over 400 specimens were collected which will be processed and accessioned at the UA Museum Herbarium.

MYSTERY PLANT

Provided by Verna Pratt

This small plant is found throughout Alaska, but many people have never noticed it – partially because of its size (about 2 inches tall) and partially because of its locations. Usually it is found in an obscure shady spot like under a cool overhand of a large rock or tucked deep in a crevice between rocks. The small shiny dark green leaves are round to ovate and about 1/4" long. The small white 4-petaled flowers are numerous and produce very long narrow seed capsules that add one to two inches to its height. The leaves are quite tasty, having a slight reddish taste. Next time you are hiking in an alpine area look for it in a cool, damp nook. Answer on Page 6.

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ALASKA NATIVE PLANT SOCIETY

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Mini-Botany	Ken Johnson
Field Trips	Anjanette Steer

Newsletter ("Borealis")

Editor	Ginny Moore
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FAX:

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



Thank You!

To

Justin Fulkerson and Scott Christy who volunteered their time and expertise at our December and January meetings!

And To

Joe Flynn and Anjanette Steer for providing plant family presentations!

Apiaceae/Umbelliferae (Parsley) Family – Domestic Genera

The carrot family has many interesting species that we use as vegetables and herbs. Characterised by flowers in umbrella-like heads (e.g. cow parsley), and often having ribbed stalks that are hollow, this family includes such crops as carrots, parsnips, fennel, angelica, anise, dill, lovage, caraway, cumin, parsley, coriander and celery.

History

Many plants of the carrot family have been used since the stone ages. Neolithic burial sites in Europe often contain traces of herbs and spices such as caraway, dill and anise. These were probably used either to cleanse or perfume the body (as in later Egyptian and Roman times) or as ceremonial food offerings.

Roman food relied heavily on many species of the carrot family; they were particularly fond of cooking with fennel and lovage, and flavoured much of their food with a strong sauce made from fish oil and a relative of fennel called *Sylphium*.

Economic uses

This family has many important food or flavoring plants (e.g. Angelica, Anise, Carrot, Celery, Dill, Fennel, Parsley, Parsnip, Asafoetida Carrots and parsnips (*Pastinaca sativa*) are the only umbellifers of international repute as root crop. Different plant parts of umbellifers are used depending on the crop - stems, leaf stalks (petioles) and leaves may be used for food or flavoring as in Angelica (*A. archangelica*), Celery (*Apium graveolens*) and Lovage (*Levisticum officinale*), Chervil (*Anthriscus cerefolium*), Fennel (*Foeniculum vulgare*), and Parsley (*Petroselinum crispum*).

Several spices come from fruits or seeds, which contain essential oils. Examples include Anise (*Pimpinella anisum*), Caraway (*Carum carvi*), Coriander (*Coriandrum sativum*), Cumin (*Cuminum cyminum*) and Dill (*Anethum graveolens*) – one of the constituents of “gripe water” for babies. Several of these are used as flavoring for alcoholic beverages, especially anise.

Many umbellifers have medicinal uses, for gastrointestinal complaints, cardiovascular ailments, and as stimulants and sedatives etc.

Carrot (*Daucus carota sativus*)

The wild carrot (*Daucus carota*) is the progenitor of the domestic carrot and is believed to originate from the area now known as Afghanistan. The plant spread throughout the Mediterranean and Europe as a weed.

The Egyptians and Greeks were believed to first use the carrot leaves and seeds for medicinal purposes. The seed of the carrot is thought to have been in immigrants' sacks of seed or grain when they immigrated to the U.S.

The root is now commonly eaten as a popular vegetable, but the leaves, flowers, and seeds have long been used for medicinal purposes. Some of the uses of the carrot plant have been to treat epileptic seizures, as an aphrodisiac, as a contraceptive, to treat snakebites, and to treat colds, itches, and fevers.

Parsley (*Apium Petroselinum*)

Used most often today as a garnish, parsley is notoriously difficult to grow from seed - tradition says that parsley must go nine times to the Devil before it will germinate. When it does finally grow, it sends up thick green bushy shoots, as if celebrating its triumph over evil. Nevertheless, the ancients still were not too sure of its good intentions, and believed it would only grow well in a witch's garden. Hence is folkloric association with witchcraft.

Parsley possibly gets its dire reputation from Greek legend, where it was believed to have grown from the blood of the hero Archemus, following an unfortunate end when he was eaten by a huge snake. The Romans may have been the first to actually dare to eat parsley, rather than crowning their sports heroes with it, and using it in funeral rites as the Greeks did. But it has certainly been in use as a culinary and medicinal herb since ancient times.

Apiaceae/Umbelliferae Family – Pastinaca & Heracleum, the Wild Parsnips

Heracleum lanatum, commonly known as cow parsnip (pushki,) is the largest species of the Apiacea family in North America. The genus is named for Hercules, who is reputed to have used these plants for medicine. Early in each year, Native Americans peeled and ate the young sweet, aromatic leaf and flower stalks. Pushki is an aggressive competitor that loves disturbed soil of any kind. It is extremely hard to get rid of, once started in a garden. The thick roots need to be dug up in their entirety, because root fragments left behind will propagate new plants.

Then there are the skin burns. Pushki foliage contains chemicals called "furanocoumarins" which unite with the DNA in skin cells to make photosensitive compounds. When the skin is exposed to ultraviolet light (from sunshine), the skin "develops" just like photographic film, with effects ranging from red rashes to second-degree blisters several inches in diameter.

Many members of this family can produce skin rashes or blisters. Celery pickers and grocery workers, for example, can experience photosensitized skin, and there are even reports of severe sunburn after eating celery soup, followed by sun exposure or a tanning session.

It is interesting to ask if this phototoxicity has any adaptive value for the members of the carrot family? Is this toxicity, for example, a chemical defense against some kind of plant-eating animal (herbivore)? First, we should note that bears and moose eat young pushki plants, apparently without suffering any kind of sunburn effects. Indeed, in the Lower-48 pushki is considered a valuable forage species for deer, elk, moose, and livestock. A study in Glacier National Park found that pushki comprised 15% of grizzly bear diet, spring through fall. All this suggests that mammals, other than humans, are not bothered by any phototoxicity effects of pushki.

Nevertheless, you don't see many insects eating pushki. A fascinating study of a close cousin, wild parsnip (*Pastinaca sativa*), found that the furanocoumarins were potent deterrents for most insects, but one insect has evolved the ability to break down the furanocoumarins and eat wild parsnip. This insect - a caterpillar called the "parsnip webworm" (*Depressaria pastinacella*) - also eats pushki. If we ever need a biocontrol agent for pushki, parsnip webworm would be a good place to start.

Both parsnip webworm and wild parsnip populations are locked in an evolutionary arms race, where different wild parsnip populations have evolved different mixtures of furanocoumarins to fight off the webworms. Only certain genetic lines of webworms can survive on particular genetic lines of wild parsnips. No doubt, future mutations will arise in the webworms, which will allow them to break down more furanocoumarins and eat a wider variety of wild parsnips. And of course mutations will arise in the wild parsnips that will counter-act the genetically-improved webworms, and the cycle will be repeated.

If we can generalize from wild parsnips, it appears that the defensive value of furanocoumarins is all about using ultraviolet light to poison bugs. Generally, insects are the main threat to plants, and the fact that many species in this plant family have furanocoumarin compounds strongly indicates that insect defense is the primary function of these compounds. Human rashes and blisters thus appear to be an accidental by-product of the plant-insect arms race.

From U.S. Fish & Wildlife Service/Kenai National Refuge: Refuge Notebook June 2004 by Ed Berg

Ed Berg has been the ecologist at the Kenai National Wildlife Refuge since 1993.

Mystery Plant Answer

Cardamine bellidifolia
Mustard/Brassicaceae family

ALASKA NATIVE PLANT SOCIETY

2011 FIELD TRIP PLANNING WORKSHEET

Return this form to: Anjanette Steer by April 15.

E-mail: anj@ak.net, Tel: 1-907-745-5121

Mail: HC 03 Box 8490, Palmer, Alaska 99645

Leader: _____

Telephone: _____ FAX: _____ E-Mail: _____

Field Trip to: _____

Date: _____ Day of Week: _____ Time Allotted: _____

Meeting Time: _____ Meeting Place: _____

Driving Distance/Car Pooling, etc. _____

Reservations by (date): _____

Level of Difficulty _____ Minimum Age: _____

Description of Trip: _____

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:

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

STATUS New RENEWAL
CATEGORY

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| <input type="checkbox"/> | Full-time Student | \$12 |
| <input type="checkbox"/> | Senior Citizen | \$12 |
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Membership is on a calendar year basis.

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