Borealis

The Newsletter of the Alaska Native Plant Society

PO Box 141613, Anchorage, Alaska — October - November 2024

Join us at our Next Meetings!

Monday, Oct 7, 7:00 PM

Via Zoom and at the Campbell Creek Science Center

6-7 pm - Potluck & Native Seed Donation Drop-off
7-9 pm - 2024 Plant Photo Sharing - Members share their favorite native plant photos

Monday, Nov 4, 7:00 PM

Via Zoom; in person mtg is TBD

Main Topic: "Lingonberries"
Speaker: Patricia Holloway

Aquatics: Ceratophpyllaceae (Hornwort) Family – Ceratophyllum
Speaker: Glenn Brown

Medicinal Plants: ***Rosa acicularis***
Speaker: Debbie Hinchey

In-Person Meetings
Campbell Creek Science Center
5600 Science Center Dr, Anchorage, AK 99507

Virtual Meeting Link: Join via Zoom
Meeting ID: 947 5146 9324
Passcode: 812931

For the latest information about ANPS events and field trips, go to www.aknps.org/ or find us on Facebook.

Monthly Meetings Begin Again!

Our first fall meeting is for *Your 2024 Plant Photos*!

Members are invited to share up to 10 photos from 2024 and discuss them for a few minutes during the meeting.

4 Ways to Share 10 Photos!

- Upload them to the October 2024 AKNPS Photo Album (please include plant location/ID)
- Submit them via email with same details as above, at least a couple days prior to meeting
- Create a slide show and share remotely via Zoom
- Bring a thumb drive to the in-person meeting (arrive by 6:45)

Attending in person? Join early for our potluck.

Arrive around 6 PM and bring a dish that you are willing to share with members. Please bring your own drinking cup and eating utensils and we will provide some beverages.

Donate Native Seeds: Every year AKNPS volunteers collect native plant seeds and package them for our annual native seed distribution program. We're eager for your seed donations! Donated seed must be in bulk paper envelopes or small seed packets that are clearly marked with common and scientific name and year collected. If you have Alaska native plant seeds to donate for our annual native seed distribution program, you can drop them off at our in-person meeting.

D. epilobii gall on fireweed (yellow arrow).

Fireweed Galls

By Ramsey Sullivan

My family and friends no longer ask me how I am doing, but instead open with, "what did you see while you were last gall-ivanting about," knowing that it's a sure way to get me talking, and where I'd be taking the conversation anyways. That's because galls are my obsession. I read about them, write about them, and plan trips just so I can find them. I look for them at the grocery store; in art; as I walk along a trail; and while I forage in the spring for spruce tips and summer for fireweed blossoms. It's why you're reading this, and since we're in the Year of the Fireweed, let's start there.

Fireweed, *Chamaenerion angustifolium*, is well known for its aesthetics, usefulness, and important ecological roles; it's less known, however, for its galls. A gall is a growth on a plant made of plant tissue but caused by another organism. The inducer lives out a portion of its lifecycle in the gall, receiving the benefits of food and shelter at the cost of the host plant. In fact, galls are so specific to the inducer that, in many cases, identification of the inducer can be made from gall characteristics and host identification. Under normal conditions, most galls cause little harm to their hosts. In some cases, they become pests of economic significance.

Fireweed print from HappyAK with *D. epilobii* galls (yellow arrows).

According to, Plant Parasites of Europe, there are eight known galls that affect fireweed across its Holarctic distribution. In Alaska, I have documented four of these galls (Figure 1). Most prolific are those induced by *Dasineura epilobii*, the fireweed bud gall midge. Common and often mistaken for a normal bud, the galls are easily overlooked and even unknowingly incorporated in works of art featuring fireweed. Pictured on the left is an image of the pattern from my wife's headband bought from a local company featuring a fireweed pattern with the plants unmistakably host to bud galls! The enlarged galled buds are typically as wide, or wider, than they are long. Galled buds will not bloom, but may open slightly.

The fireweed bud gall midge is multivoltine, having many generations a year, thus ensuring you'll likely encounter its galls. If you observe a fireweed long enough you may even see a minute midge visiting the small, undeveloped flower buds of her host.

Dissected *D. epilobii* gall showing larvae (yellow arrows).

After she lays her eggs on the buds, her larvae hatch, enter the bud, and start feeding on the developing tissues. While gall formation is poorly understood, it is known that many arthropod gall formers have feeding patterns and chemical secretions (hormones and genetic material such as RNA) that are unique to their species. With these tools, the *D. epilobii* larvae target the undifferentiated cells of their host and give them new instructions to grow a shelter and steady food supply. The last generation of *D. epilobii* for the season overwinters in the soil to pupate and emerge as adults in sync with the budding of the next year's fireweed.

However, these parasites have parasites of their own. There are several species of parasitic wasps, from across different families, that target the bud gall midge (Figure 2). This relationship helps to keep the midge population from overrunning the fireweed. In many galling systems, the parasitic wasps have parasites of their own known as hyperparasites!

Galls are also targeted by other organisms that are either interested in consuming the gall tissues or the gall inducer. In one case I reared over nine different organisms including several wasps, flies, midges, moths, and springtails from one moth induced fireweed stem gall. This highlights the complex ecological relationships that can form around plant galls. Additionally, empty galls can serve as opportunistic habitat for mites, springtails, spiders, and other organisms.

Fireweed bud gall midge (*D. epilobii*), right, and a parasitic wasp (Subfamily Platygastrinae), left, in oviposition on a developing fireweed bud.

The sedentary and encapsulating nature of galls lends gall rearing as a highly successful and rewarding endeavor for citizen scientists. Through thorough documentation, patience, and specimen preservation citizen scientists have made great strides in revealing previously unknown galls and ecological relationships! Much of this work can be shared broadly with experts through platforms such as iNaturalist. In doing so myself, some of my observations have been used in recent and upcoming scientific, peer-reviewed publications. Even just a photograph of a gall and noting its host plant, location, and a date observed is enough to catalyze a new discovery. The biannual Gall Week bioblitz hosted on iNaturalist utilizes this format. There's a lot to still be learned about Alaskan flora, including the well-known and beloved fireweed. If you think you may have caught the gall bug like me, then consider sharing the growths, bumps, folds, and other oddities you notice on plants while out exploring.

Figure 1. Galls I have observed on fireweed in AK (left to right): Fireweed bud gall midge (Confirmed: *Dasineura epilobii*); Psylloid induced leaf fold gall (likely *Craspedolepta sp.*); Moth induced stem gall (Likely *Mompha sp.*); Fireweed weevil stem gall (likely *Auleutes epilobii*) [unconfirmed ID].

Figure 2. Parasitic wasps I have observed on *Dasineura epilobii* galls spring/summer 2024 (left to right): Chalcidoid wasp sp. A (Superfamily Chalcidoidea) in oviposition; Platygastrid wasps sp. A (Subfamily Platygastrinae); Chalcidoid wasp sp. B (Superfamily Chalcidoidea) in oviposition; Chalcidoid wasp sp. C (Superfamily Chalcidoidea).

Ramsey Sullivan has worked over 10 seasons across seven parks for the National Park Service and serves as an administrator and contributor for the website, Gallformers.org. All photographs are original.

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Ellis WN 2001-2024. Plant parasites of Europe: leafminers, galls and fungi. https://bladmineerders.nl (consulted September 15, 2024)
Gagné, Raymond J, and Mathias Jaschhof. A Catalog of the Cecidomyiidae (Diptera) of the World. 5th ed., 2021. https://www.ars.usda.gov/ARSUserFiles/80420580/Gagne_Jaschhof_2021_World_Cat_5th_Ed.pdf.
"Gallformers Contributors." www.gallformers.org, www.gallformers.org/. Accessed September 2024.
Lin Hunter, Danielle E, Gregory J Newman, and Meena M Balgopal. "What's in a Name? The Paradox of Citizen Science and Community Science." Frontiers in Ecology and the Environment 21, no. 5 (June 2023): 244–50. https://doi.org/10.1002/fee.2635.
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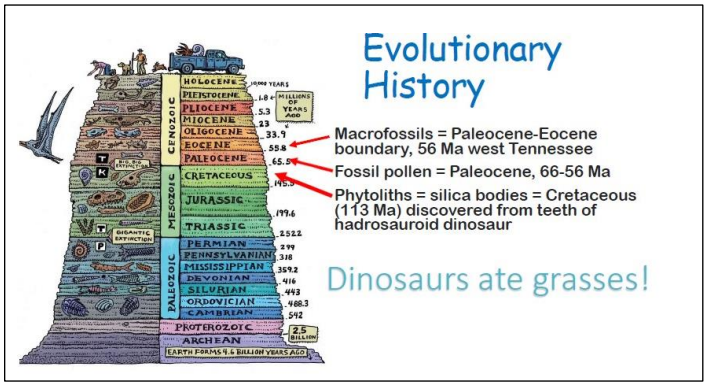
Redfern, Margaret. Plant Galls. E-Book. Vol. 117. Colins New Naturalist Library. HarpersCollins Publisher Inc.,
2011. Russo, Ron. Plant Galls of the Western United States. Princeton Field Guides. Princeton: Princeton
University Press, 2021.
Sanver, Dilek, and Bradford A. Hawkins. "Galls as Habitats: The Inquiline Communities of Insect Galls." Basic and Applied Ecology 1, no. 1 (January 2000): 3–11. https://doi.org/10.1078/1439-1791-00001.

It was worth waiting for… A class on grass!

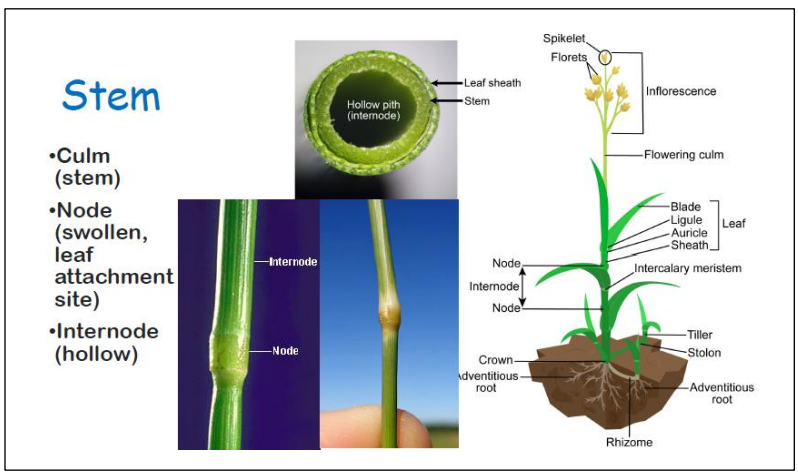


Years ago, a grass class was planned. We had a teacher, had rented a UAA classroom, had a full roster of students with a wait list, and then covid hit and it was cancelled. The desire for a class did not wane over the years. Instead, the desire for one only increased with time.

Meanwhile, by our great fortune, during this time a retired university Botany instructor moved to Alaska. Her name… Cindy Johnson. She had taught classes on grasses and was willing to teach a class for ANPS. Being new to the state she readily admitted not knowing all the Alaskan grasses. Her class would cover the basic anatomy of grasses with its own nomenclature in addition to a bit of evolution, biogeography, and ecology. Again, the class filled quickly with a waitlist. Justin Fulkerson from the UAA herbarium gave us specimens of grasses to dissect. In addition, he gifted us some sedges and rushes so we could see the unique characteristics that separated them from the grasses. BLM gave us the use of their large classroom at Campbell Creek Science Center. It was perfect as that spacious room allowed us to spread out all the specimens of grasses on a large number of tables. Daniella Brazella from BLM, who has helped so much with the CCSC gardens including metal signs to ID the plants, set up the PowerPoint for Cindy, made copies of grass keys for each student, and helped with the cleanup at days end. Students worked in groups of 3 at other large tables. Microscopes were set out at another table. Coffee, tea, and snacks at the back of the room kept us energized for the learning.

The nomenclature could have been daunting but Cindy's excellent PowerPoint images made all those plant parts understandable. The hands on with 10x eye pieces and the microscopes reinforced identifying these parts. Cindy supplied forceps and rulers for each student to allow better visualization and understanding of the parts. With each section Cindy passed out a relevant handout—"Anatomy of a Grass", "General characteristics of the Poaceae family", "A Glossary of botanical terms used in the Poaceae", "How to tell grasses, sedges, and rushes apart", and an extensive table of grasses in the Anchorage Bowl. All these resources will be so useful for review. (One wonders, did the mere $25 fee for this class cover the cost of the forceps, rulers, and all those handouts?)

Dennis Ronsse, who was a student in the class, also added to our education by putting together, with his ingenious cataloging system, a list of all the Alaskan grasses listed in Skinner's book, all those in the Anchorage Coastal Wildlife Refuge, and in the Chugach State Park. (He must have done data entry in a prior lifetime.)



Now on walks my visual search engine no longer focuses on the flowers. Instead, my gaze is focused on all those lovely grasses. How could I have ignored them so long? After Cindy's excellent class I will ignore them no longer.

- Beth Baker, Educational Committee ANPS

Mini-botany at ANPS Meetings

Alaska Native Plant Society Five-Minute Plant Talks

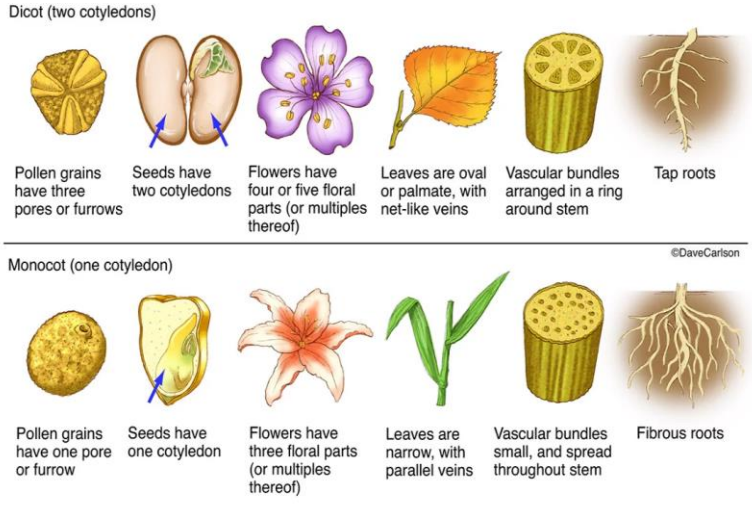
Teach yourself and others about Alaska's native plants by signing up to give a 5-minute talk at an upcoming Alaska Native Plant Society meeting.

Medicinal Plants: Pick any medicinal plant that is native to Alaska. Tell us the scientific name, growth characteristics, how to ID, medicinal uses, and any contraindications or other concerns. *Plants already covered in this series: Artemisia/stinkweed; Rumex/sourdock; Devil's club; Rhodiola/roseroot; Urtica/nettles; Moneses/single delight; Achillea/yarrow; Equisetum/horsetail; Cypripedium/lady slipper orchids.*

Monocots:

This year the board decided to focus on the monocots for the Plant Family 5-Minute Talk. Since many of us learned our botany many years ago, we are sticking with the classical definition of "what is a monocot". "Monocot" is short for Monocotylodoneae.

Traditionally, flowering plants were divided into 2 groups Monocotyledoneae and Dicotyledoneae. Monocots were characterized by having 1 **cotyledon** (seed leaf), parallel veined leaves, flower parts divisible by 3 and scattered vascular bundles, so lacking a vascular cambium and secondary (woody) growth. Dicots in contrast were characterized by having 2 cotyledons, net venation, flower parts divisible by 4 or 5, vascular bundles in a ring, permitting a vascular cambium and allowing secondary growth. Plants don't always follow the rules: there is a dicot with one cotyledon, a monocot with net venation, a 4-parted lily; but mostly plants are easily seen as monocot or dicot.



Modern taxonomy has blurred these lines a bit. Emphasis is now placed on pollen grains with monocots having **monosulcate** pollen. Several new groups have been created from the easy old "monocot-dicot" classification.

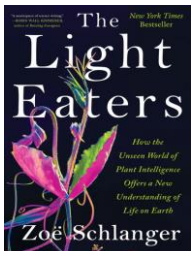
Monocot presentations will start in January with a general introduction to monocots, February is the Cyperaceae or sedge family, March the Iridaceae or iris family, April the Juncaceae or rush family, May the Liliaceae or lily family . Continuing in the fall November is the Orchidaceae followed by the Poaceae, or grass family in December.

Presentations are expected to be 5 minutes long and just an overview of the families, not an in depth listing of every genus in each group (if we did that, Orchids or Grasses could take up the entire year or even more).

No prior experience necessary. Review the online schedule 5 Minute Plant Talks Signup and click on the button to sign up for a date that works for you!

If you would like to discuss a potential presentation, please contact (marilynbarker29@gmail.com) or Elizabeth Bluemink (president@aknps.org).

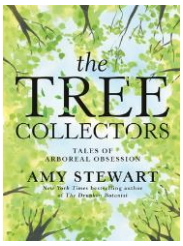
From Our Bookshelves



The Light Eaters

Author: Zoe Schlanger
Harper Collins Publishing: May 7, 2024
ISBN : 9780063073852

"The contemporary world of botany is divided over the matter of how plants sense the world and whether they can be said to communicate. But research in recent decades has prompted the question that animates Schlanger's book: Are plants intelligent? Schlanger writes about scientists who are studying how plants change their shape and respond to sound, how they use electricity to convey information, how they send one another chemical signals. Along the way, she becomes a sort of anthropologist of botanists. The book's focus on the researchers themselves overcomes a challenge inherent to science writing: where to find drama. *The Light Eaters* is a special piece of science writing for the way it solves the genre's bind; it doesn't force people or their findings into narrative engines. Instead, the field of botany itself functions like a character, one undergoing a potentially radical change, with all the excitement, discomfort, and uncertainty that transformation brings. The book's power comes from showing a field in flux and reminding us that ideas have their own life cycles: from crackpot theory to utter embarrassment to real possibility to the stuff of textbooks." — ***The New Yorker***



The Tree Collectors - Tales of Arboreal Obsession

Author: Amy Stewart
Random House: July 16, 2024
ISBN 9780593446850

Our ANPS Bookshelf has several times highlighted books by Amy Stewart including *The Drunken Botanist* and *Wicked Plants.* She has alsor written several other popular nonfiction titles about the natural world. *The Tree Collectors,* her latest publication, is a collection in itself: 50 vignettes of remarkable people whose lives have been transformed by their obsessive passion for trees.

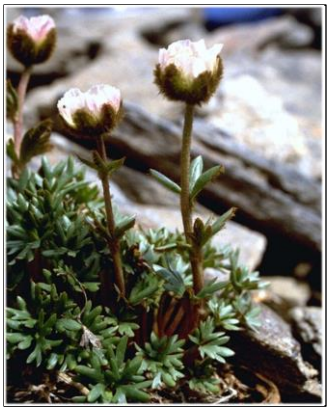
When Amy Stewart discovered a community of tree collectors, she expected to meet horticultural fanatics driven to plant every species of oak or maple. But she also discovered that the urge to collect trees springs from something deeper and more profound: a longing for community, a vision for the future, or a path to healing and reconciliation.

In this slyly humorous, informative, often poignant volume, Stewart brings us captivating stories of people who spend their lives in pursuit of rare and wonderful trees and are transformed in the process. Vivian Keh has forged a connection to her Korean elders through her persimmon orchard. The former poet laureate W. S. Merwin planted a tree almost every day for more than three decades, until he had turned a barren estate into a palm sanctuary. And Joe Hamilton cultivates pines on land passed down to him by his once-enslaved great-grandfather, building a legacy for the future.

Stewart populates this lively compendium with her own hand-drawn watercolor portraits of these extraordinary people and their trees, interspersed with side trips to investigate famous tree collections, arboreal glossaries, and even tips for "unauthorized" forestry. This book is a stunning tribute to a devoted group of nature lovers making their lives—and the world—more beautiful, one tree at a time.

From What We Gather

Endangered Species Protection Sought for Threatened Alaskan Arctic Flower



In February, The Center for Biological Diversity petitioned the U.S. Fish and Wildlife Service to protect the Alaskan glacier buttercup (*Ranunculus glacialis ssp alaskensis*) as either threatened or endangered under the Endangered Species Act. They believe that this buttercup is found only in the Kigluaik Mountains on the Seward Peninsula in Western Alaska, and there are currently no specific protections for it. The Arctic flower is imperiled by climate change, facing threats from increased precipitation, rapidly warming temperatures and extreme weather events. The Arctic is warming four times faster than the rest of the planet and recent modeling has shown that many Arctic plants may lose all their suitable habitat as soon as 2040.

"Climate change poses an existential threat to the Alaskan glacier buttercup and so many Arctic plants and animals," said Cooper Freeman, Alaska representative at the Center. "Without more protections, I'm afraid much of the Arctic's unique and special biodiversity, like the Alaskan glacier buttercup, will quietly fade into extinction. We can't let that happen."

Potential mining activities in the Kigluaiks, including the proposed Graphite One mine and haul road, also threaten the plant and its limited habitat. The mining company has not completed plant surveys and has not announced plans to conduct them. Graphite is a common component in electric vehicle batteries and will be an important mineral resource for decades to come. The US would like to be able to have some control over this resource.

Other threats to the flower from increased activity in the area include invasive species, off-road vehicles and human trampling, which would be exacerbated by the proposed mining road bisecting the mountain range.

Much of the Kigluaiks, excluding the Graphite One mining claims on state land, are protected from industrial development by the U.S. Bureau of Land Management. The Biden administration is considering removing these protections, called D1 withdrawals, which could enable mining activites across the glacier buttercup's range.

"This small but rugged plant is an example of what we stand to lose if we allow the Arctic to be torn up and bisected by huge mines and haul roads," said Freeman. "We have to reject the false choice between a renewable energy transition and preserving the most remarkable places on the planet. If we aren't careful, we'll end up with an Arctic devoid of the plants and wildlife that make the region so special and vibrant."

Did you miss it?

The Cooperative Extension has created public YouTube recordings of the 2024 Alaska Native Plant Month 1-hour webinars they hosted in partnership with AKNPS.

These webinars can be viewed at the following links:

Celebrate Alaska Native Plant Month May 2024: Native Plant Gardens
https://youtu.be/IsUIHn4ztKU

Celebrate Alaska Native Plant Month May 2024: Native Plant Restoration
https://youtu.be/IJKg_T4ZpzQ

Celebrate Alaska Native Plant Month May 2024: Native Plant Nurseries https://youtu.be/xy3luDfm25Y

Alternatively, you could go to the Alaska Native Plant Month webinar page where a synopsis and link to each webinar are provided.

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 or to renew, you can either use our convenient on-line method by going to https://aknps.org/membership, or 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	E-Mail Newsletter	Snail-Mail Newsletter	Both Mail Deliveries
☐ **Full-time Student**	**$12**	**$22**	**$22**
☐ **Senior Citizen**	**$12**	**$22**	**$22**
☐ **Individual**	**$15**	**$25**	**$25**
☐ **Family**	**$20**	**$30**	**$30**

Name: _____

Address:_____

City _____**State:** _____**Zip:**_____

Telephone: (Home)_____**(Cell)**_____**E-mail**_____

Join Us In Kicking Off a New Fall Season

Meeting ID: 947 5146 9324; **Passcode:** 812931

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