Borealis

the newsletter of the

Alaska Native Plant Society

PO Box 141613, Anchorage, Alaska Dec/Jan 2018

Join us at our Next Meetings!

Monday, Dec. 3, 7:00 PM

Main Topic: ***"Greetings from Interior Alaska's Native Plant Society"***

Speaker: **Jeff Mason**

Mini-Botany – "What a Plant Knows"
Chapter 2:"What a Plant *Smells*"
Speaker: **Joan Tovsen**

Roseaceae Family Plant: ***Aruncus***
Presenter: **Beth Baker**

Monday, Jan.7, 7:00 PM

Main Topic: ***"Alaska Climate Change"***

Speaker: **George Donart**

Mini-Botany – "What a Plant Knows"
Chapter 3:"What a Plant *Tastes*"
Speaker: **Debbie Hinchey**

Roseaceae Family Plant: ***Rosa***
Presenter: **Joan Tovsen**

All of our meetings, unless otherwise announced, are held at the Campbell Creek Science Center, S600 Science Center Drive, just off Lake Otis Parkway, south of Tudor.

For the latest information about ANPS events and field trips, go to www.aknps.org/

"Like" Us on Facebook!

AROUND THE STATE

Our Northern Neighbors

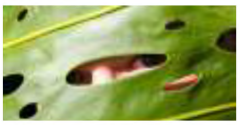
The Alaska Native Plant Society is based in Anchorage, and that makes it difficult for botany enthusiasts in much of the state to commune with us on a regular basis, especially during the winter months.

Back in the 1980s, when the Alaska Native Plant Society was first formed, there was an official statewide organization and a local chapter in Anchorage. In 1983 a Fairbanks chapter was formed with approximately 25 members. Another group attempted to form on the lower Kenai Peninsula. Neither Fairbanks nor Homer was able to sustain itself as an organized chapter, and at the same time in Anchorage it was difficult to maintain both a statewide structure and a local chapter from the same pool of participants. So the Anchorage chapter and the statewide organization merged into one statewide umbrella organization, based in Anchorage.

Fairbanks native plant lovers have again taken the matter into their own hands and have created their own "chapter". They meet monthly in the fall, winter, and spring to discuss something of common interest – plants! Meetings either include a pot luck style dinner or are at an establishment with food options. Informal presentations each month spur hearty discussion on topics to include anything vegetation related from weeds to wildflowers, plant ecology or even the best domestic garden varieties for the interior (which could include some culinary sampling). They also host wildflower hikes in the spring and summer around the interior, visit rare plant populations or provide plant ID instruction or participate in community weed pulls.

Jeff Mason has spearheaded this organization since its inception in 2014 and he will be our keynote speaker at our December meeting here in Anchorage, telling us about that group's activities and suggesting ways we might coordinate. Jeff is an ecologist with the Salcha-Delta Soil and Water Conservation District in Delta Junction. He has been a long-time participant in the Alaska Plant Forum and he may have other interests besides botany. Ask him if he knows anything about The Woodshedders.

What A Plant Knows – What a Plant Sees



In the kick-off of this season's mini botany series on What a Plant Knows, Tom Choate talked about what a plant sees and why. What do plants see? The obvious answer is that, like us, they see light. Just as we have photoreceptors in our eyes, they have their own throughout their stems and leaves. But, whereas humans have 4 photoreceptors, plants have as many as 13 and can detect light we are blind to.

Plants have different priorities, and their sensory systems reflect this. As Daniel Chamovitz, the author of "What A Plant Knows", points out in his book: "light for a plant is much more than a signal; light is food." Plant receptors allow them to differentiate between red and blue, and even see wavelengths that we cannot, in the far red and ultraviolet parts of the spectrum. Plants also see the direction light is coming from, can tell whether it is intense or dim and can judge how long ago the lights were turned off. Recent work also shows that some plants, such as the cabbage and mustard relative *Arabidopsis*, make proteins that are involved in the development and functioning of eyespots—the ultrabasic eyes found in some single-celled organisms such as green algae. These proteins specifically show up in structures called plastoglobuli, which are famed for giving autumn leaves their red and orange hues. "This discovery suggests that plastoglobuli in plants may act as eyespots," says plant cell biologis František Baluška says.

Other observational research reveals plants have visual capabilities we just do not understand yet. For instance, as reported in 2014 in *Current Biology*, the climbing wood vine *Boquila trifoliolata* can modify its leaves to mimic the colors and shapes of its host plant.

Although the evidence for eyelike structures in higher plants remains limited, it is growing. The next challenge is to figure out all the ends to which plants put their complex sense of sight.

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ALASKA NATIVE PLANT SOCIETY

Borealis is published bi-monthly, fall through spring. Articles may be sent to Ginny Moore, , Anchorage, AK 99516. Phone or FAX: , E-mail: elfinwood@gmail.com

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Newfoundland 2018

Story by Beth Baker Photos by Dennis Ronsee

ANPS has traveled all over our lovely state….Nome, Barrow, Kodiak, Dutch Harbor/Unalaska but international travel? Yes we do that too!! Last July a fortunate group traveled to Newfoundland as far east as you can go in Canada….in fact as far east as you can go in the continental US. The trip started in St John's, the capital.

Pitcher Plants (*Sarracenia purpurea)* were at peak of flowering. Vase-like leaves contained a pool of fetid acidic water, attractive but lethal to most insects. Mosquitoes however, could survive / thrive in the bowl of pitcher plants.

Immediately before our trip started the North American Rock Garden Society had their annual meeting there organized by Todd Boland. A few of us attended that three day meeting composed of two field trips a day and lectures at night. Todd wrote the field guides Trees and Shrubs of Newfoundland and Labrador and in 2017 published Wildflowers and Ferns of Newfoundland. These two guides were rarely out of our hands for the next week as we crawled around on hands and knees exploring their flora.

With 2 comfortable vans we traveled east to west across Newfoundland visiting two provincial parks Terra Nova and the UNESCO heritage Gros Morne. Lovely day hikes occupied our time. We then traveled north stopping at unique endangered habitat spots of limestone barrens. Endemic plants exist here in a challenging environment of limestone soil, drying winds, and cycles of freezing and thawing which disturbs the soil. Ecological reserves have been set up to save the unique flora that survives there.

Spotted Coral-root (*Corallorhiza maculata*). We found 13 different species of orchids! This one does not produce chlorophyll, gets food by parasitizing the mycelium of fungi in the family Russulaceae. From Wikipedia: "Several Native American groups historically used the orchid's stems dried and brewed as a tea for such maladies as colds, pneumonia, and skin irritation. *Corallorhiza maculata* is also the topic of the poem *On Going Unnoticed* by Robert Frost." *Photos by Dennis Ronsse*

But this trip had a lot more than just unique flora. There was interesting geology and human history too. We visited a museum dedicated to the geology and learned more about geology everywhere we visited. We hiked on the Appalachian Trail where Captain Cook hiked (yes there is Appalachian Trail in Canada. Who knew?). We visited another UNESCO World Heritage Site, l'Anse-aux-Meadows where Vikings had settlements dating back to 1000 AD.

For a more complete descriptions and for views of the many lovely plants we saw please attend Debbie Hinchey's keynote talk on the Newfoundland trip at the Feb 2019 meeting.

Should we go international again? We can do it. Where do you want to go? Yukon…Borneo…Mars. Share your ideas… dream trips do come to fruition if you can imagine them.

Hooker's Iris (*Iris hookeri*), abundant in some coastal areas, very similar to our AK native *I. setosa*.

FROM WHAT WE GATHER

Partial mycoheterotrophs: The green plants that feed on fungi

The majority of land plant families form mutually beneficial partnerships with root-inhabiting fungi known as mycorrhizal fungi. But some plants have evolved to cheat this mutualism. They don't provide any known return benefits – such as carbohydrates derived from photosynthesis – to their fungal partners. Instead, these mycoheterotrophic plants receive both carbohydrates and other nutrients from their mycorrhizal partners, subverting the need to compete with neighboring plants for resources.

This selfish kind of symbiotic relationship between plants and fungi was a surprising revelation for botanists and adds some nuance to our basic understanding of how plants make a living.

When it comes to mycoheterotrophy, orchids present a particularly interesting example due not only to their sheer diversity and wide global distributions, but because they are the bet hedgers of the plant kingdom. All wild orchids rely on fungi to feed developing seedlings. But once they mature to the point of forming leaves – thereby becoming capable of feeding themselves via photosynthesis – not all orchids give up the cushy sugar-daddy relationship they have with fungi.

Instead, these orchids remain partially mycoheterotrophic, deriving a portion of their carbohydrates from their fungal symbionts while meeting the remainder of their demands through photosynthesis. Interestingly, this reliance on mycoheterotrophy can increase or decrease in response to changing environmental conditions such as light availability.

Read more at: https://phys.org/news/2018-11-partial-mycoheterotrophs-green-fungi html#jCp

Drones hunt down rare plants in Hawaii

There's something inherently creepy and annoying about drones buzzing over our heads — a frequent backyard irritation in cities like New York. But it turns out, a drone's spying abilities can be useful: an un-crewed drone discovered a super-rare plant on a steep cliff on the Hawaiian island of Kaua'i. The discovery wowed botanists — and shows how technology can help conservationists in their fight against extinction. "We were really excited," says Ben Nyberg, a GIS specialist and lead drone pilot at the National Tropical Botanical Garden, a nonprofit institution charted by US Congress in 1964. Nyberg was flying the drone that found the plants at NTBG's 1,000-acre Limahuli preserve.

Drones are frequently used in conservation. In Africa, drones are deployed to catch poachers slaying endangered elephants and rhinos — especially at night, when they're most active but harder to see. The same is happening in Nepal, where poachers target elephants, rhinos, and tigers. The vehicles are also used to study river dolphins in the Amazon, as well as orangutans in Indonesia.

In Hawaii, the focus is on preserving native species, especially plants. For instance, the plant discovered by drone is a critically endangered species called Laukahi that's being wiped out by invasive goats that love munching on its leaves. The Laukahi plants have been pushed to steep cliffs that goats can't get to — but humans can't get there either. So until this discovery, people thought fewer than 25 individual Laukahi plants remained in the wild. The drone footage added about 10 more plants, Nyberg says.

NTBG acquired its first drone in February, and has been using it to scour remote areas where many native species are taking refuge. Hawaii's plants are so vulnerable because they evolved in isolation for millions of years, so they lack the defense mechanisms to fend off invasive species — like weeds, rats, goats, and pigs — imported by people through the years. Several individuals of different endangered plants were discovered through the use of drones, says Kawika Winter, the director of Limahuli Garden and Preserve, but the Laukahi is the rarest.

Read more at: https://www.theverge.com/2017/6/17/15817076/drones-endangered-plants-discovery-hawaii-laukahi-conservation

One of the Laukahi plants found by a drone atop a steep cliff in Limahuli preserve in Hawaii.

Campbell Creek Science Center Butterfly Garden

ANPS COMMUNITY PROJECT UPDATE

In 2018 ANPS received a $1,000 2 year grant to renovate some of the garden beds at the Campbell Creek Science Center, with the specific goal of making them more attractive to native butterflies. ANPS members have spent a great deal of time in this first year, creating the vision and laying the ground work – literally!

Tasks which have been done in roughly the order of completion include:

1. a list of the butterflies in southcentral Alaska was compiled; this data was gathered predominately by reviewing the range maps in Butterflies of Alaska-A Field Guide-2nd Edition by Kenelm Philip and Clifford Ferris, and from Carole Lloyd's compiled data. She was one of the co-founders of the Eagle River Nature Center.

2. a list of preferred plants for the larvae and adult butterflies was compiled using the field guide listed above, Carole Lloyd's notes, and information supplied by BLM personnel in addition to the book Gardening for Butterflies produced by the Xerces Society, a number of websites including the North American Butterfly Associations;

3. a list of the requirements for an ideal butterfly garden were determined predominantly from Gardening for Butterflies, various websites, and from persons who have worked on butterfly gardens in the past;

4. multiple meetings by phone conferencing and in person were done with BLM personnel to obtain their input and to make sure our visions for the garden were similar;

5. an inventory of the plants currently in the 14 beds;

6. the 14 beds were measured and in some cases combined and designated to be used for a particular plant color since butterflies are attracted to large areas of one color. There will be 3 beds for pink plants, 3 purple beds,
   3 yellow beds, and one white bed.

7. rocks to line the beds were donated by the Alaska Botanical Garden and brought by pickup to the site;

8. wood chips were donated by a woman who had cut a tree down; chips were hauled in a pickup truck to the site

9. plastic strips to line the beds and soil to place in the beds were purchased and hauled to the site;

10. the beds were relined with plastic strips and rocks;

11. a method for moving the plants to the correct bed color was trialed and was successful; this method will be used next summer to complete the plant relocation to the correct color bed.

Thus far $233,28 of the $1,000 grant has been spent for plastic, soil, and the acquisition of a few native plants. Costs have been minimized by generous donations of materials and time.

The tentative plan for the coming winter:

1. Write the greenhouses and gardening clubs requesting donations of the needed plants for our beds. We will supply a list of the plant types we are seeking.

2. Investigate the feasibility, cost, and design for a large sign(s) that would educate children and adults about butterflies and pollinators of native plants. We are in contact with the MUN Botanical Garden in St John's Newfoundland. They have excellent signage on these topics and may be willing to share their designs with us which would spare that expense. Explore funding sources for such signage.

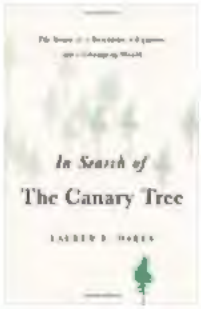
The tentative plan for the summer of 2019, which will allow our organization to complete this plan as scheduled, will include:

1. moving the plants presently in the beds to the correct bed color;
2. purchasing plants to complete the beds given what is needed after plant donations have been received;
3. add a water feature for the butterflies;
4. discuss with CCSC/ BLM the removal of trees to increase sun light and warmth for the garden;
5. complete small labels of types of plants present (the Alaska Botanical Garden generously is willing to lend us their plant labeler for this purpose) ;
6. if it is feasible financially and logistically, erect large educational signage regarding butterflies and native plants and their pollinators.

Where Do Butterflies Sleep? https://davesgarden.com/guides/articles/where-do-butterflies-sleep/

- Where do butterflies sleep? On cater-pillows, of course!
- Butterflies don't actually sleep. Instead they rest, or become quiescent, at night or during the day when it's cloudy or cool. They rest with eyes open, typically hidden amid the foliage and hanging upside down from leaves or twigs in trees and shrubs. At night, they drowse in evergreen and broad-leaved trees and shrubs, fallen leaves, pieces of bark, or in a rock crevice or brush pile equipped with many nooks and crannies.

- Even while resting, butterflies always remain alert. As they are cold blooded they slow up when it's cool. Low light levels make no difference as it is movement they detect. Interestingly, butterflies can distinguish between movements of, for example, the wind moving grasses, flowers and leaves, and they take no action. However with movement from an approaching predator, they are off in seconds!
- In areas where temperatures drop below freezing during part of the winter, at least one stage in a butterfly species' life cycle must be resistant to freezing if the species is resident. Most butterflies that live in cold climates spend the winter as caterpillars, while almost as many spend the winter as pupas. A few species, mainly tortoiseshells (Nymphalis) and anglewings (Polygonia), spend the winter as adults, hibernating in holes in trees, in crevices in man-made structures, or in other shelters. A very few species spend the winter as eggs.
- When resting in either hot or cool weather, they just sit and wait until hunger or conditions are suitable for them to fly again. They are quite simple creatures and are programmed to react to heat, cold, light, daylight length, humidity and rainfall. Using a combination of these factors you can breed them at any time of year.
- Why didn't the butterfly go to the dance? Because it was a moth ball! Doh!



FROM OUR BOOKSHELVES

In Search of The Canary Tree

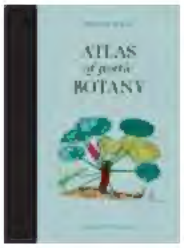
The Story of a Scientist, A Cypress and A Changing World
by Lauren E. Oakes
little, brown Book Group
January 2019

The surprisingly hopeful story of one woman's search for resiliency in a warming world

Where mountains meet ocean in Alaska's Alexander Archipelago, white skeletons of dead yellow cedar trees stand prominently amidst a verdant landscape of old-growth forests. Researchers spent nearly three decades deciphering the cause of the majestic species' death and uncovering climate change as the culprit. Lauren E. Oakes, a young scientist at Stanford University, was one of them. But even as she set to record the demise of a species, she soon found herself immersed in an even bigger, and totally unexpected, story: how the people of Alaska were adapting to the tree's disappearance, and how the tree itself, seemingly doomed, was adapting to a changing world.

In Search of the Canary Tree is the story of six years that Oakes and her team spent in the Alaskan wilds, studying thousands of trees and saplings along the archipelago of southeast Alaska. Far from losing faith in the survival of our woodlands, she discovered the resiliency of forgotten forests, flourishing again after years of destruction and decomposition. And, through deep encounters with loggers, naturalists, Native weavers, and enthusiasts of the yellow cedar, Oakes discovered how the people of Alaska were determined to develop new relationships with the emerging environment. Where many scientists and commentators have found in climate change an unmitigated disaster, Oakes found beacons of hope even in the disorienting death of a species.

Above all else, Oakes shows us that, although we can respond to climate change with either fear or denial, we can also find in it a new world, and one that doesn't necessarily have to be for the worst. Eloquent, insightful, and deeply heartening, *In Search of the Canary Tree* shows how human and natural resilience can help preserve ourselves, even in our rapidly changing world. *Review from https://www.littlebrown.co.uk/books/*



Atlas of poetic Botany

By Francis Hallé (Author), Erik Butler (Translator), Éliane Patriarca (Contributor)
MIT Press
November 27, 2018

This *Atlas* invites the reader to tour the farthest reaches of the rainforest in search of exotic—poetic—plant life. Guided in these botanical encounters by Francis Hallé, who has spent forty years in pursuit of the strange and beautiful plant specimens of the rainforest, the reader discovers a plant with just one solitary, monumental leaf; an invasive hyacinth; a tree that walks; a parasitic laurel; and a dancing vine. Further explorations reveal the *Rafflesia arnoldii*, the biggest flower in the world, with a crown of stamens and pistils the color of rotten meat that exude the stench of garbage in the summer sun; underground trees with leaves that form a carpet on the ground above them; and the biggest tree in Africa, which can reach seventy meters (more than 200 feet) in height, with a four-meter (about 13 feet) diameter. Hallé's drawings, many in color, provide a witty accompaniment. Like any good tour guide, Hallé tells stories to illustrate his facts. Readers learn about, among other things, Queen Victoria's rubber tree; legends of the *moabi* tree (for example, that powder from the bark confers invisibility); a flower that absorbs energy from a tree; plants that imitate other plants; a tree that rains; and a fern that clones itself.

The *Atlas of Paetic Batany* allows us to be amazed by forms of life that seem as strange as visitors from another planet.

https://mitpress.mit.edu/books/atlas-poetic-botany

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, pleas 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

☐	**Full-time Student**	**$12**
☐	**Senior Citizen**	**$12**
☐	**Individual**	**$15**
☐	**Family**	**$20**
☐	**Organization**	**$30**

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City: _____ State_____Zip_____

Telephone: (Home)_____(Work)_____E-Mail: _____

Membership is on a calendar year basis.

IT IS TIME TO RENEW MEMBERSHIP
All memberships are on a calendar-year basis and expire at the end of the year.
Don't miss out on our latest news!

Alaska Native Plant Society
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