Borealis

The Newsletter of the

Alaska Native Plant Society

PO Box 141613, Anchorage, Alaska

April - May 2021

Join us at our Next Meetings!

Monday, April 5 1, 7:00 PM

Main Topic: **"Verna Pratt's MA Roots & Their Glacial Connection to AK"**

Speaker: **Ginger Hudson**

Mini-Botany

Beringians:

Speaker:

Apiaceae Family: Lovages (*Ligusticum caldera, L. scathicum*) and Podistera (*P. macounii, P. yukonensis)*

Speaker: **Glenn Brown**

Monday, May 3, 7:00 PM

Main Topic: **"The Western Exploration of Alaska's Flora"**

Speaker: **Carolyn Parker**

Mini-Botany

Beringians: *Saxifraga eschscholtzii*

Speaker: **Dennis Ronsse**

Apiaceae Family: Parsnip (*Heracleum lanatum, H. mantegazzianum*)

Speaker: **Elizabeth Bluemink**

PLEASE NOTE:. VIRTUAL MEETING

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

Our Virtual Universe

We'll continue to hold our monthly meetings virtually through the rest of 2020. We will be using ***Google Meetings***, as we did last spring. The bright side is that people all over the state (and world) can participate!

To join the webinar and watch the presentation:

1. Click on the Meeting ID link below to open it in a web browser. The best web browser to use for this is Chrome, but Firefox or Safari will also work. Avoid Internet Explorer.

   Meeting ID: https://meet.google.com/vax-nosy-fzd

2. A Google Meet window should open in your browser and your camera will turn on. You'll see an image of yourself (from your computer's camera) and "What's your name?"
3. Enter your name on the line below "What's your name?" and then click the "Ask to join" button.
4. You will be granted access to the webinar. This may take a minute or two.
5. Hover over the image of yourself and click the "Mic" icon and camera icon to mute your computer mic and turn off your camera (so we all don't see you...unless you want to be seen :), respectively.

Audio:

1) If you use the above link you can listen and talk using headphones connected to your computer, or

2) alternatively you can call the phone number below, and enter the pin and you can listen and talk through your phone while watching the live video.

Phone Number: +1 617-675-4444

PIN: 146 152 270 6175#

Botanical Laughter

Are you a Genus Genius?

Pun Quiz by ANPS Member Tom Choate

All answers are a local flower genus (as pronounced.)

1. **What flower is a musical instrument?**
2. **What flower tends its flock?**
3. **What flower has boring colors?**
4. **What do you do if your dog team gets lost?**
5. **What did the soldiers in Iraq see?**

Answers on Page 4.

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ALASKA NATIVE PLANT SOCIETY

State and Anchorage Chapter Officers

President	Elizabeth Bluemink
Vice President	Zoe Meade
Secretary	Ginger Hudson
Treasurer	Aaron Wells

Anchorage Chapter Program Coordinators

Membership	Mary Stella
Plant Family	Timm Nawrocki
Mini-Botany	Timm Nawrocki
Field Trips	Dennis Ronsse

Newsletter ("*Borealis*")

Editor	Ginny Moore

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

Fred Meyer community rewards
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Fred Meyer is donating $2.5 million per year to non-profits in Alaska, Idaho, Oregon and Washington, based on where their customers tell them to give. Here's how the program works:

- Sign up for the Community Rewards program by linking your Fred Meyer Rewards Card to (non-profit) at www.fredmeyer.com/communityrewards. You can search for us by our name or by our non-profit number **GC263**.
- Then, every time you shop and use your Rewards Card, you are helping (non-profit) earn a donation!
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- If you do not have a Rewards Card, they are available at the Customer Service desk of any Fred Meyer store.
- For more information, please visit

Flora of Chugach State Park: An Update

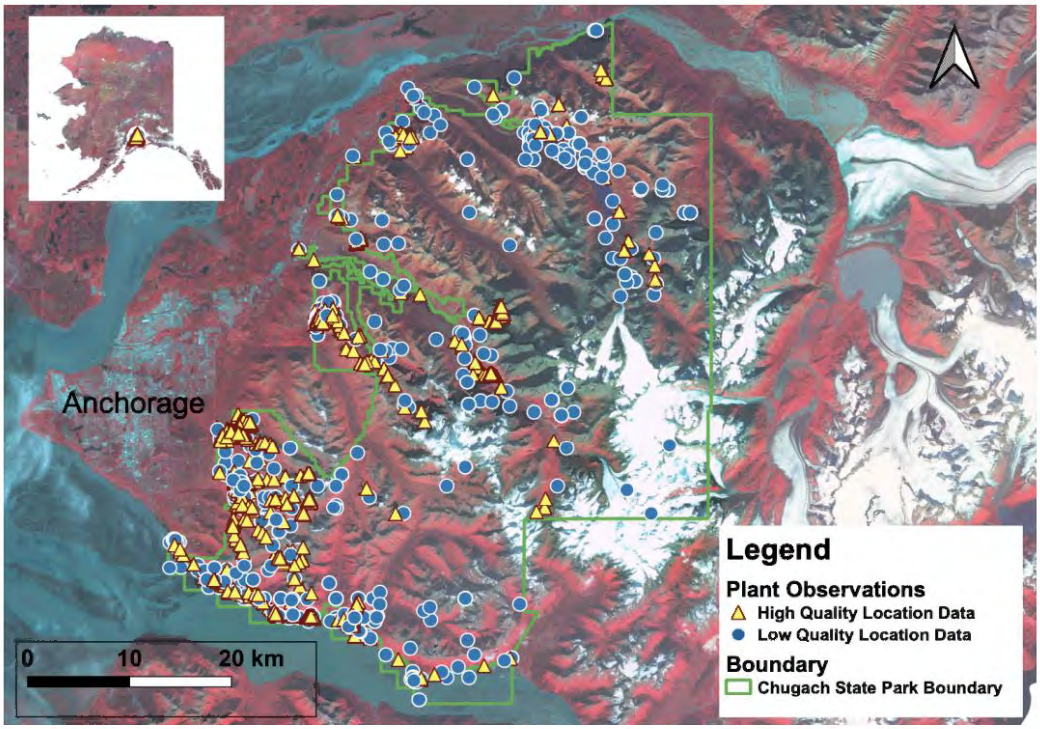
by Aaron Wells

Chugach State Park (CSP) in Southcentral Alaska contains approximately 495,000 acres of land, and is one of the four largest state parks in the United States (Figure 1). The Flora of CSP project is a volunteer led project organized by the Alaska Native Plant Society (AKNPS) in cooperation with CSP staff. The objective is to document the flora of the Park, including vascular plants, bryophytes, lichens, and fungi.

Methods

We are relying on crowdsourced observations through iNaturalist, existing herbarium records, and new voucher specimens to document the flora of CSP. The project was initiated in the spring of 2020 with the creation of the Flora of Chugach State Park iNaturalist project (www.inaturalist.org/projects/flora-of-chugach-state-park). Next, we applied for a permit from CSP, which was granted, to collect voucher specimens during the summer and fall of 2020. During the summer, volunteers recorded hundreds of observations of the flora of CSP and submitted those to iNaturalist. Additionally, we collected 99 voucher specimens. In the fall and early winter, volunteers provided identifications on iNaturalist, and experts verified voucher specimens. The voucher specimens have been sent to the herbarium at the University of Alaska Anchorage (UAAH) for curation.

In February 2021, we compiled over 3,000 existing herbarium records and research grade iNaturalist observations from the Global Biodiversity Information Facility (www.gbif.org) into a PostgreSQL database (Figure 1). We are currently in the process of performing data quality assurance and control review, beginning with a review of the location for each record (e.g, latitude/longitude). Observations with high quality location data have an accuracy of 11 m or better, and were recorded after the year 2000 when the U.S. government stopped intentionally degrading public GPS signals (known as "selective availability"). Records with low quality location data have an accuracy of >11 m and/or were recorded in 2000 or earlier when GPS technology was either 1) unavailable and observations were marked by hand on topographic maps, or 2) GPS signals were scrambled through selective availability.



Observations from the Flora of Chugach State Park Project, Alaska.

We will soon prepare a progress report which we will submit to CSP and share on the ANPS website (www.aknps.org). The report will provide an overview of the project, data summaries, a species list, and recommendations for data collection in 2021. Many thanks to all those who contributed observations and assisted with identifications in 2020!

How You Can Help

If you would like to contribute observations to this project.....it's possible that you already have! The iNaturalist project is a "collection" project, which means that all observations that are recorded within the boundary of CSP and uploaded to iNaturalist are automatically included in the project. The Flora of CSP project will continue in 2021, and we need your help to make observations and provide identifications! To learn more please go to the iNaturalist link above. Please direct all questions to Aaron Wells, treasurer@aknps.org.

Native Plant Seed Fundraiser

Did you know the Alaska Native Plant Society distributes native plant seed via donation? Your donations support our non-profit programs to promote preservation of Alaska native plants, education, and awareness.

Check out our inventory at https://tinyurl.com/2jwuzbw4, then contact treasurer@aknps.org with your request. Please include with your request a list of the species you'd like, the number of packets of each, and your mailing address.

- The price is $2.50 per package (reduced to $1.00 for seeds more than 3 years old).
- Our packets this year have at least 10-30 seeds / packet.
- Shipping & Handling within the United States $1.50 per order. Canada $5.50 per order.
- Unopened packets may be returned within 30 days. Shipping & handling is not refundable.

Donations for seeds can be made via check or online using the donations page on our website here: https://aknps.org/donations/

Checks should be made out to "Alaska Native Plant Society" with a memo "donation for native seeds" and sent to: Alaska Native Plant Society, P.O. Box 141613, Anchorage, Alaska 99514

Growing Native Plants From Seed

Alaska has a diverse flora that is gradually becoming more used in cultivation. In recent years there has been a steadily increasing interest in the use of native plants in Alaska gardens. They offer great landscaping possibilities, are relatively disease and pest free, and often have low maintenance requirements.

Currently, a few native species are available from a few wholesale growers, but any one retailer is apt to stock only a few. Many species that are desirable for cultivation are best grown from seeds and often these require special germination procedures. Seeds of native Alaska species are not always easy to obtain; but seeds of a number of species, particularly annuals, can be purchased from seed companies and seed collectors (See above!).

The seeds of many native plants have built-in dormancy mechanisms that protect them from germinating before killing frosts or in times of drought. In the wild, seeds will lie dormant until the proper conditions for growth occur. But in cultivation, the successful gardener must become familiar with several simple pre-sowing seed treatment methods that will unlock the dormancy mechanism and stimulate quicker, more consistent germination.

For more detailed information on seed germination and sowing options you may find the following links helpful:

Nursery Manual For Native Seeds: https://www.fs.fed.us/rm/pubs_series/wo/wo_ah730/wo_ah730_133_151.pdf

Prairie Moon Nursery Germination Guide: One of the best online sites to help you successfully grown plants from your native seeds: https://www.prairiemoon.com/blog/how-to-germinate-native-seeds. You may need to research which type of seeds you have, but the germination instructions here are very helpful.

https://wildseedproject.net/how-to-grow-natives-from-seed/

https://calscape.org/seed_propagation.php The major part of this publication is a list of suggested pre-sowing treatments for seeds of over 900 species and varieties of California native plants.

Happy Planting!

Answers to Genus Genius Test on page 2

1. Viola **2. Shepardia** **3. Draba** **4. Ledum** **5. Anemone**

FROM WHAT WE GATHER

Microbes Unknown to Science Discovered on The International Space Station

Researchers from the United States and India working with NASA have now discovered four strains of bacteria living in different places in the ISS – three of which were, until now, completely unknown to science.

All four of the strains belong to a family of bacteria found in soil and freshwater; they are involved in nitrogen fixation, plant growth, and can help stop plant pathogens.

One of the strains – the HEPA-filter find – was identified as a known species called *Methylorubrum rhodesianum*. The other three were sequenced and found to all belong to the same, previously unidentified species, which they proposed calling *Methylobacterium ajmalii* after Ajmal Khan, a renowned Indian biodiversity scientist. This new find is also closely related to an already known species called *M. indicum*.

The new strains may be "biotechnologically useful genetic determinants" to assist with the growth of plants in space, the scientists said in a statement. "To grow plants in extreme places where resources are minimal, isolation of novel microbes that help to promote plant growth under stressful conditions is essential."

Leafy greens and radishes have been successfully grown on the space station, but growing crops in space is not without difficulty. Methylobacterium could be used to help plants overcome the stressors they face trying to grow outside of Earth. The researchers found that one of the ISS strains - IF7SW-B2T - had promising genes involved in plant growth, including a gene for an enzyme essential for cytokinin, which promotes cell division in roots and shoots.

There's much more research to be done here - the researchers acknowledge that they've barely scratched the surface of microbial diversity on the space station. Around 1,000 samples have already been collected on the ISS, but are still awaiting a trip back to Earth. This research was published in *Frontiers in Microbiology*.

Disappearing glaciers are threatening rare alpine plants with extinction

In a new study published in ***Frontiers in Ecology and Evolution***, researchers found that one-fifth of alpine plant species on four glaciers in the Italian Alps are likely to become locally extinct once the glaciers vanish from the high mountains. Some of these species are plants which are found nowhere else on Earth. Other areas of the world

As glaciers retreat, they unveil bare ground which, in many places, has been covered by ice for thousands of years. In the past, glaciers have advanced with cooler temperatures and greater snowfall, and retreated in warmer and less snowy periods. Scientists have long studied the sequence of colonization of bare ground by plants as time passes from the glacier's retreat, often over many centuries. New areas of bare ground in front of retreating glaciers are where many unique alpine plants are adapted to thrive. But with continued warming threatening the extinction of some glaciers, halting the uncovering of new bare ground year upon year, the rare alpine colonizers are forced higher and higher up the mountain and eventually left with nowhere to grow.

Without glaciers exposing new bare ground, not only are pioneer species lost, but the process they help start is affected. The very warming that is causing glaciers to retreat is also forcing plants from lower altitudes upwards into the alpine zone, adding to the pressure on existing alpine specialists and ultimately favouring fewer, more competitive plants.

What will happen with these new communities of plants is unclear. But plants support a wider community of species, including pollinating insects, grazing animals and soil microbes that stitch together alpine ecosystems. Losing certain plant species and reducing the mountain's overall biodiversity will have consequences stretching far beyond the plants themselves.

FROM OUR BOOKSHELVES

Driven by Nature: A Personal Journey from Shanghai to Botany and Glob Sustanability

Peter Raven
Chicago University Press
April 2021

It's safe to say that few people have lived lives as thoroughly devoted to plants as Peter H. Raven has. The longtime director—now president emeritus—of the Missouri Botanical Garden, author of numerous leading textbooks and several hundred scholarly articles, Raven has been a tireless champion of sustainability and biodiversity, earning him the plaudit of "Hero for the Planet" from the Time.

Driven by Nature is the first chronicle of this prominent scientist and conservationist's life. Moving from his idyllic childhood in the San Francisco of the 1940s to his four decades leading the Missouri Botanical Garden, Raven's autobiography takes readers across multiple continents and decades. _Driven by Nature_ follows the globetrotting botanist from China to the American Midwest as he works to foster concern for a changing planet, further the cause of biological education, and build the Missouri Botanical Garden into the world-renowned haven for plant life it is today. Raven brings his story into the twenty-first century with a timely epilogue that reinforces the crucial importance of scientific learning, active conservation, and committed activism in the face of a rapidly changing natural world.

Featuring an introduction by the Pulitzer Prize-winning naturalist E. O. Wilson, this beautifully illustrated book should thrill nature lovers, plant enthusiasts, and environmentally-conscious readers looking to take action to preserve our planet's biodiversity.

Finding The Mother Tree

Suzanne Simard
Deckle Edge Publishing
May 2021

Suzanne Simard is a pioneer on the frontier of plant communication and intelligence; she's been compared to Rachel Carson, hailed as a scientist who conveys complex, technical ideas in a way that is dazzling and profound. Her work has influenced filmmakers (the Tree of Souls of James Cameron's *Avatar*) and her TED talks have been viewed by more than 10 million people worldwide.

Now, in her first book, Simard brings us into her world, the intimate world of the trees, in which she brilliantly illuminates the fascinating and vital truths--that trees are not simply the source of timber or pulp, but are a complicated, interdependent circle of life; that forests are social, cooperative creatures connected through underground networks by which trees communicate their vitality and vulnerabilities with communal lives not that different from our own.

Simard writes--in inspiring, illuminating, and accessible ways--how trees, living side by side for hundreds of years, have evolved, how they perceive one another, learn and adapt their behaviors, recognize neighbors, and remember the past; how they have agency about the future; elicit warnings and mount defenses, compete and cooperate with one another with sophistication, characteristics ascribed to human intelligence, traits that are the essence of civil societies--and at the center of it all, the Mother Trees: the mysterious, powerful forces that connect and sustain the others that surround them.

She writes of her own life in a logging world in the rainforests of British Columbia, of her days as a child spent cataloging the trees from the forest and how she came to love and respect them--embarking on a journey of discovery, and struggle. And as she writes of her scientific quest, she writes of her own journey--of love and loss, of observation and change, of risk and reward, making us understand how deeply human scientific inquiry exists beyond data and technology, that it is about understanding who we are and our place in the world, and, in writing of her own life, we come to see the true connectedness of the Mother Tree that nurtures the forest in the profound ways that families and human societies do, and how these inseparable bonds enable all our survival.

How Many Tree Species of Birch Are There in Alaska?

Published: Plant Sci., 11 June 2020 | https://doi.org/10.3389/fpls.2020.00750

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Wetland areas are critical habitats, especially in northern regions of North America. Wetland classifications are based on several factors, including the presence of certain plant species and assemblages of species, of which trees play a significant role. Here we examined wetland species of birch (*Betula*) in North America, with a focus on Alaska, and the use of birche tree species in wetland delineation. We sampled over 200 trees from sites, including Alaska, Alberta, Minnesota, and New Hampshire. We used genetic data from over 3000 loci detected by restriction site associated DNA analysis. We used an indirect estimate of ploidy based on allelic ratios and we also examined population genetic structure. We find that inferred ploidy is strongly associated with genetic groupings. We find two main distinct groups; one found throughout most of Alaska, extending into Alberta. This group is probably attributable to *Betula kenaica, Betula neoalaskana*, or both. This group has a diploid genetic pattern although this could easily be a function of allopolyploidy. The second major genetic group appears to extend from Eastern North America into parts of southeastern Alaska. This group represents *Betula papyrifera*, and is not diploid based on allelic ratios. Published chromosome counts indicate pentaploidy. Because *B. papyrifera* is the only one of the above species that is distinctly associated with wetland habitats, our findings indicate that tree species of birch found in most parts of Alaska are not reliable indicators of wetland habitats. These results help to support stronger wetland ratings assigned to the tree species of birch for delineation purposes.

The state of Alaska includes over 700,000 km^2 of wetlands which accounts for approximately 8% of global wetland areas. Much of Alaska's wetlands are dominated by trees, especially birch (*Betula*) species. Because of the potential contribution of percent cover in determining hydrophytic vegetation for delineation purposes, birch trees often affect the outcome of wetland delineation determination. The most recent treatments of Alaskan birches denote three tree species (Hultén, 1968; Furlow, 1997; Packee, 2004): *Betula papyrifera, Betula kenaica*, and *Betula neoalaskana.* Although Furlow (1997), in Flora of North America (FNA), discusses *B. papyrifera* in Alaska, the distribution map only shows the species in the southeastern part of the state. Wetland ratings for species range nationally from obligate wetland to upland. In Alaska before 2016, *B. papyrifera* had a facultative (FAC) wetland rating, whereas the other two species are considered facultative upland (FACU) species (Lichvar et al., 2016). Thus, being able to identify birch trees to species has implications for wetland delineation in Alaska. However, morphological distinctions among these tree species are subtle, and the limited distribution of *B. papyrifera* in Alaska has often been overlooked, which may have led to further confusion. *B. kenaica* is distributed across central Alaska and south to Kenai Peninsula, and barely into Yukon, whereas *B. neoalaskana* is found throughout much of Alaska, except the northern and western regions, as well as across much of Yukon, Northwest Territories, Alberta, Saskatchewan, and Manitoba. Note that several upland dwarf birches (e.g., *Betula nana*) are also found in Alaska, and some of these are used in wetland rating systems, but these species are not the focus of the current study. This study used genetic tools to examine groupings of *B. papyrifera, B. neoalaskana*, and *Betula kenaika a*nd to determine: (1) if there are distinct genetic groups of *Betula* within Alaska; (2) whether any genetic groupings match taxonomy, and (3) to examine genetic relationships among *Betula* samples in Alaska and other parts of North America.

In conclusion, we find convincing genetic evidence, and indirect cytogenetic evidence that eastern *Betula (B. papyrifera)* is distinct from the tree species found throughout most of Alaska. We detected few putative hybrids between these groups, even in areas (of Alberta) where both groups were detected together. We have some evidence to suggest that *B. kenaica* and *B. neoalaskana* are similar genetically, but this will require additional studies to test. It is important to realize that plant distributions do not conform easily to geopolitical boundaries and this can have consequences when comparing Floras for different areas. In fact, it is very likely that *Betula* taxa in Alaska have much closer affinities with Eurasian populations, especially those in Siberia (Furlow, 1997). Future studies should therefore focus on possible relationships between birches within Alaska, adding samples from western and northern Alaska, and with populations from Eurasia, using molecular and morphological approaches, and chromosome counts.

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	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:**_____

PLEASE RENEW OR JOIN TODAY!
ANPS Membership is on a calendar-year basis so please be sure to renew for 2021.
Check your mailing label to make sure this isn't your last newsletter.

Alaska Native Plant Society
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