



Koma Kulshan Chapter WNPS Newsletter

Inside this issue

p1 President's Corner
p1-2 Canadian Botanist
p1 Calendar Sale
p2 Grants
p2-3 Smoke and Trees
p3 Programs
p3 Field Trips

Find Koma Kulshan Online

Website: www.wnpskoma.org
Facebook: WNPSKomaKulshan



2021 Calendar

 Washington Native Plant Society

2021 WNPS Calendar

The 2021 WNPS calendar is beautiful as always, but will only be available by on line purchase this year. As a member of the Koma Kulshan chapter, \$3.00 of your purchase will come to the chapter, so you will be supporting us locally as well as the state WNPS.

The URL for purchasing the calendar online is:

<https://www.wnps.org/store/2021-calendar>. The calendars are now available for purchase, and shipping will begin October 5th.

Fall (October, November, December) 2020

President's Corner

by Allan Richardson

This year has certainly been different for native plant enthusiasts. Our last in person meeting was in February, the last chapter field trip was in early March, and who knows when we will meet in person again—maybe early in 2021. I managed just four family hikes in the mountains over the summer, so my botanizing was seriously limited. Tending the various native plants in my yard at home and walking in the nearby woods does involve a good bit of appreciation and some stewardship. I also took water to this spring's plantings in the Native Plant Teaching Trail along Whatcom Creek, but was shocked by the abuse that the vegetation is suffering there in Maritime Heritage Park. Even so, Amy Brown reports that amazing work is being done by native plant stewards in other city parks.

Looking ahead, we are having discussions with the City of Bellingham about another stewardship class in 2021. The city is seriously short of funds due to the pandemic, and staff positions have already been cut. As was the case last year, the city may be able to cover half the cost of the class, with WNPS paying for the rest. Much of our half would be staff time at the state office, compensated with state stewardship funds, perhaps also using some funds from the chapter.

Another challenge ahead may be our plant sale next April, since our long-time supplier of plants has quit business. Assuming that the sale can be held as usual, we are considering buying bare root plants now to pot up and winter over.

Another chapter activity that will be different this year is sales of WNPS calendars. In recent years we have bought an order of 50 calendars, then sold over 40 of them and gifted a few to guest speakers. We will do none of this for the 2021 calendar, since there will be no meetings in person at least to the end of this year. Pick up spots or personal deliveries aren't a good idea either. The calendars are available on line and proceeds will be shared with the chapter of the purchaser. See details elsewhere in this newsletter.

Canadian botanist advocates for trees (cont'd p2)

by Annie Prevost

Diana Beresford-Kroeger is passionate about trees. She is a botanist and medical biochemist and author who calls herself a "renegade" scientist. Her love for trees began as a child in Ireland. Even then she knew the scientific names of her favorite trees. Aging rural relatives taught her traditional Celtic plant lore and she carries this knowledge forward.

Beresford-Kroeger is an author who combines biochemical knowledge of plants with a reverence for indigenous plant knowledge and traditional uses. In her books she talks about how the vital medicinal aerosols released by trees contribute to the health of the planet. Her emphasis is on trees and plants that provide food for people and wildlife. Her extensive knowledge, especially of the plants medicinal potential, makes fascinating reading.

After a couple of decades in academia she "retired" to the farm she and her husband have in southern Ontario, Canada. Here her advocacy for trees became her fulltime work. She and her husband search for remnant threatened and endangered tree species. She then propagates these trees in her research gardens for restoration projects. She grows medicinal plants in her Medicine Walk garden and advocates for planting urban trees and developing healing gardens for health facilities. She believes planting trees and saving forests is key to slowing climate change.

Koma Kulshan Chapter WNPS Newsletter

Canadian botanist (cont'd from p2)

She and her husband spent more than two years propagating twenty-two tree species whose genetics were in decline in Canada for her millennium project to celebrate the year 2000. It became the biggest tree planting ever launched in Canada by an individual. The give-away included seeds, seedlings, bare root and potted trees. These were sent to many destinations in Canada and even the U.S. Plant sales of unusual flowers she breeds paid for the project

Beresford-Kroeger has written half a dozen books related to trees. In *Arboretum America: A Philosophy of the Forest* she discusses 20 tree species and their families in depth. For example she explains how the Cayuga aboriginal peoples used slippery elm, *Ulmus rubra*, in the management of childbirth. Also how Dutch elm disease resistance develops. And she usually mentions the fungi associated with the tree.

When she realized the threats to boreal forests she wrote *Arboretum Borealis: A Lifeline of the Planet*. It includes trees and medicinal plants of the boreal region. Her book *To Speak for the Trees* is somewhat autobiographical. We learn that Ireland was once forested and that Celts were a woodland culture who developed an alphabet, Ogham script, with 20 letters. Each letter is based on a tree.

A good introduction to Beresford-Kroeger is her documentary film *Call of the Forest: The Forgotten Wisdom of Trees*. In it she visits various parts of the world to tell us about the trees. Interesting and very informative, it is available on Vimeo or Amazon.

Grant Proposals Sought and Scholarships Available

The Koma Kulshan Chapter of the Washington Native Plant Society invites submittal of proposals for full or partial project funding. Project goals should be consistent with the Society's mission to promote the appreciation and conservation of Washington's native plants and their habitats. Applicable project categories include those related to native plant research, conservation, or education, as well as other types of plant-centered projects.

The chapter is also committed to offering scholarships to defray costs to attend events such as WNPS Study Weekends, Botany Washington, scientific conferences, and other workshops. Anyone with an interest in expanding their knowledge of Washington's native plants are encouraged to apply. Applicants must be members of the Koma Kulshan chapter of the Washington Native Plant Society.

For more information on how to apply for a scholarship or submit a grant proposal please see our website at wnpskoma.org or contact Grants and Scholarships committee members Barry Wendling, Barry.Wendling@wwu.edu and Ellen Kuhlmann, ellenkuhlmann@gmail.com.

How Smoke Affects Trees (cont'd p 4)

by Jim Kling

The wildfire season of 2020 has been unusually intense, with smoke greatly impacting local air quality. We can expect more such events in the coming years as the effects of climate change continue, and the health hazards for humans and animals are well documented.

But how does smoke affect plants? Some research on wildfires in Indonesia found that the presence of smoke reduced photosynthesis, despite greater amounts of carbon dioxide in the air. There are several theoretical mechanisms through which this could happen. Smoke particles may lead to change in water vapor pressure around leaves, and this can cause the pores (stoma) in leaves and stems to close, cutting off the plant's supply of carbon dioxide.

That's a physical mechanism. There are potential chemical mechanisms as well. Smoke contains more than a hundred known chemicals, including NO₂ (nitrogen dioxide), CO₂, SO₂ (sulfur dioxide), and O₃ (ozone). Ozone may harm chlorophyll and can disrupt ion channels in the cells that surround the stoma and regulate its opening and closing. Sulfur dioxide interferes with the release of oxygen after photosynthesis and inhibits key cellular enzymes. Exposure to nitrogen dioxide and sulfur dioxide also impede the antioxidant defenses of plants. Combined with the powerful oxidation effects of ozone, extended smoke could lead to serious plant stress.

The news isn't all bad, though. Fire reduces pathogen activity by increasing the amount of calcium available to plants, which is important to their disease resistance mechanisms. Smoke also has fungicidal properties that may reduce fungal growth on leaves. Those effects, if they lead to less pathogen and insect pressure, may also allow plants to emphasize growth and reproduction over creation of foliage defense compounds like tannins, which make up as much as 30% of the dry weight of some plants.

Most of these effects are theoretical. The actual impact of smoke on plant physiology has not been well documented. In a 2010 paper, researchers at Brigham Young University and the University of California, Berkeley tested how smoke alters photosynthesis and growth in six species: The deciduous Quaking Aspen (*Populus tremuloides*), Rocky Mountain maple (*Acer glabrum*), and Gamble Oak (*Quercus gambelii*), and the evergreen conifers Ponderosa Pine (*Pinus ponderosa*), Douglas Fir (*Pseudotsuga menziesii*), and Blue Spruce (*Picea pungens*) trees. All species except for Blue Spruce are adapted to fire.

The researchers obtained trees as wild root cuttings or bare root seedlings from nurseries, then transplanted them in late March to pots and placed them in climate controlled greenhouses. In late May, they exposed five seedlings from each species to 20 minutes of smoke generated from dried leaf material from the same species, and this was repeated in mid-June.

30 minutes after smoke exposure, all species except Douglas Fir had reduced conductance of gas across the stoma as well as depressed

Fall (October, November, December) 2020

Chapter Meetings

Meetings have been moved to a Zoom meeting format. For updates on future webinars, watch for announcements with details and instructions on our chapter website (wnpskoma.org) and the wnps-koma email list. You can also find Zoom webinars sponsored by WNPS at <https://www.wnps.org/events>.

October 21 (ZOOM): Anticipating and Planning for Climate-Driven Species Movement

In the past, as the earth's climate changed, many species moved across continents to track suitable conditions. Projected future changes in climate will likely result in similar shifts in today's flora and fauna. Josh Lawler, professor of sustainable resource sciences at Western Washington University, will discuss studies in which he and his colleagues have used a combination of bioclimatic models, dispersal models, and other approaches to explore how species will likely move across the landscape and how we can conserve biodiversity as they do.

November 18 (ZOOM): Reconstructing Past Climate Using Tree-Ring Data from Ancient Bristlecone Pine

The annual growth rings from ancient Bristlecone Pine contain valuable information about climate variability extending back thousands of years. These proxies for variation in temperature and precipitation allow us to reconstruct past climates in a way that helps us understand the dynamics of the climate system and puts modern climate change into a long-term context. Andy Bunn is a professor of environmental science at Western Washington University, with a focus on paleoclimate and carbon cycling. He leads the Huxley Tree Ring Lab, and was the founding director of the Institute for Energy Studies.

You can find previous WNPS Zoom seminars archived at <https://www.wnps.org/wnps-annual-events/virtual-events>, including Katrina Poppe's presentation on blue carbon research in the United Arab Emirates ("Chasing Blue Carbon on the Arabian Peninsula"); and Alex Lowe's presentation on fossil plants in western North America ("The Evolution of Temperate Vegetation in North America").

Field Trips

With the ongoing COVID-19 pandemic, there are no chapter plans for fall or winter field trips. How can we enjoy native plant field trips in some form? Consider taking advantage of the following WNPS resources to facilitate field trips with your household:

* WNPS online plant lists. These are introduced on the WNPS web site with, "Over the years WNPS members have compiled plant lists for many of our favorite sites. We offer them to you to enhance your enjoyment of these special places." 78 lists are available for Whatcom county alone. If you are looking for ideas for a day hike in our area, you could hardly do better than reviewing the lists available here. Visit wnps.org and look for "Plant Lists" in the site's menu.

* Our greatest resource, our members, available on our groups.io online site and email list! Among our members we have a true wealth of knowledge and experience about every corner of Whatcom county and beyond. Some of our members are still active day by day out in our natural areas. If you need advice about a field trip for your household, and if you are signed up with groups.io, try reaching out to our membership: just send an email to wnps-koma@groups.io.

* You might enjoy a virtual field trip from the comfort of your home. Our indefatigable member Abe Lloyd -- related to his instruction at WWU -- has thoughtfully produced (with much help from Katrina Poppe) video field trips to a number of local sites. These feature instruction and narration relating to natural history and ethnobotany. Find Abe's videos on YouTube by searching for "Abe Lloyd."

Smoke/Trees (Cont'd from p3)

photosynthesis. Two weeks later, all species had recovered to normal levels of photosynthesis. Overall, the deciduous species recovered photosynthesis slower than evergreens when the carbon dioxide exposure during the photosynthesis test was 1,000 parts per million. At 385 PPM, which is typical of ambient carbon dioxide concentrations, there was no significant difference in recovery between species. This suggests that smoke impacts photosynthesis by lowering conductance through stoma and by interfering with the plant's biochemistry

The researchers found no difference in growth patterns or production of defensive chemicals following exposure to smoke, suggesting that the 20-minute exposures in the experiment left no long-term effects. They speculated that the slower recovery of deciduous trees could be due to an adaptation to fire in which the overstory dies back and is later regenerated through asexual growth. Evergreens employ thick bark to resist fire, and the overstory often survives fire to continue photosynthesis. Generally, the authors believe that plant species that attempt to resist fire would be more reliant on tolerance mechanisms to avoid smoke damage.

The smoke exposure during the experiment can't replicate the conditions seen in the wild, since fuel load, fuel consumption, dispersion rate, and other factors are so variable, and the 20-minute exposures are also much shorter than the weeks or even months of smoke exposure that can occur in western North America. Tree ring data could be used to examine the relationship between growth patterns and smoke exposure, as long as other factors could be controlled for.

The study is just the beginning, the authors wrote: "Because there are many compounds in smoke and we know so little about how they can affect plants, we have much to learn about the influence of smoke on plant function. The fact that different plant species can show varying responses to smoke, in addition to the potential for different plant species to produce their own complex suite of compounds, suggests there may be some intriguing roles for smoke in plant and ecosystem function."

Koma Kulshan Board

President

Allan Richardson: (360) 733-5477
asrichardson5@gmail.com

Vice President

Lyle Anderson: (360) 739-9249,
lyleand2@comcast.net

Secretary

Katrina Poppe: (360) 303-7806
katrinalee_98@yahoo.com

Newsletter Editor

Jim Kling: (206) 876-0231
jkling@gmail.com

Treasurer

Jazmen Yoder: (360) 927-9895
navicariscus@gmail.com

Program Team

Jim Kling: (206) 876-0231
Anu Singh-Cundy: (360) 650-7473
Katrina Poppe: (360) 303-7806

Field Trip Chair

Eric Worden: (360) 778-3542,
eric@ericworden.seattle.wa.us

Backyard Habitat Liaison

Molly Porter: (360) 714-0781

Greenhouse Chair

Wendy Scherrer: (360) 715-2993

Grants Committee Chair

Barry Wendling: (360) 393-9181

Publicity Chair

Aimee Wright:
aimwright07@gmail.com

State Board Representative

Mark Turner (at large)
(360) 671-6851

Koma Kulshan Chapter WNPS Newsletter

If you would like to join WNPS

Please return the membership application form to:
Washington Native Plant Society
6310 NE 74th St., Suite 215E
Seattle, WA 98115

Please make checks payable to WNPS
(outside US add \$5 to dues)

Name: _____

Address: _____

City, State, Postal Code: _____

Phone: _____

Email: _____

Koma Kulshan Chapter Total Enclosed: _____

Membership Category:

\$20 Budget (Senior/Student)

\$40 Individual

\$55 Family

\$75 Club/Institution

\$100 WNPS Friend

\$250 Special Friend

\$500 Best Friend

\$1000 Sustaining Member

The Koma Kulshan chapter of WNPS is dedicated to the preservation and study of native plants and vegetation of Washington State and the education of the public to the values of native flora and its habitat.

WNPS -- Koma Kulshan Chapter
Newsletter Editor
2928 Cherrywood Ave
Bellingham, WA 98225