Winter 2022

The Boreal Forest Newsletter

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From the editor:

The forestry profession is alive and well. Forest management agencies and forest products industries are looking for foresters. Verify this on your own but:

The forestry workforce is aging, retiring and changing jobs. A forestry consultant informed me that the forest management industry and many corporate Alaska forest landowners are looking for foresters and people who can function in the field using forestry skills.

I wouldn't have missed my forestry career for the world.

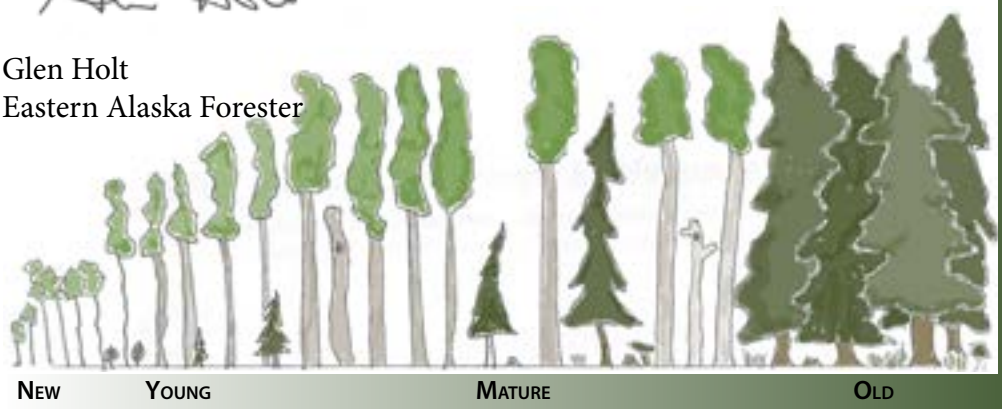
In this issue of the Boreal Forest Newsletter we look at:

- Organizations within UAF: SNAP & ACCAP
- Alaska forest landowners: the Chugach National Forest
- Forest Management: proactive forest management and wildfire mitigation
- Forestry Practice: why winter logging is used in parts of Alaska
- Forestry Tools: measuring forest carbon with satellites;
- Drone reforestation in Canada
- Forest Health and 2021 aerial survey connections
- Project Learning Tree: teacher student opportunities
- Non-timber forest products: Christmas trees in Minnesota

Stay warm and have a great winter!

Glen Holt
Eastern Alaska Forester

What's Inside



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UAF Program Partnerships:
Climate projections with SNAP, ACCAP and UAF

Many Alaskans are concerned with climate change in our state. Questions are often asked about weather trends, growing seasons, adapting to new conditions, fish and oceanic responses and what is going on with our forests and wildlife habitats.

Alaska is experiencing climatic changes that could affect us in the future.

Our apparently changing climate is affecting many Alaskans and especially to those of us that reside in subsistence communities, or have occupations or lifestyles that put food on the table and wood in the woodshed from our local environment.

The University of Alaska Fairbanks (UAF) cooperates and partners with two other science arms of the University, both also located in Fairbanks:

• the **Scenarios Network for Alaska + Arctic Planning (SNAP)** and

• the **Alaska Center for Climate Assessment and Policy (ACCAP)**

The UAF Cooperative Extension Service (CES) interprets and extends relevant university, research-based knowledge in an understandable and usable form to the public. See its website at: *https://www.uaf.edu/ces/*

The Scenarios Network for Alaska + Arctic Planning (SNAP) links university researchers with communities and resource managers. SNAP uses data sharing, research, modeling, and interpretation of model results to help others address the complex challenges of adapting to future conditions. See the SNAP website: *https://www.snap.uaf.edu/* to obtain regional climatic considerations for the Southeast, Southcentral, Southwest, Interior, North Slope, Northwest and statewide Alaska regions based on scientific scenarios.

The Alaska Center for Climate Assessment and Policy (ACCAP) assesses socioeconomic and biophysical impacts of climate variability in Alaska. ACCAP provides their information to decision makers, and helps all Alaskans adapt to a changing climate. Visit the ACCAP website at: *https://accap.uaf.edu/*.

Land management, community development, forest management, ecologists, research, industry, and society at large are looking for a frame of reference in evaluating what the future might become and how we might respond to our changing environmental conditions.

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Portage Lake with Portage Glacier in the background is a popular and easily accessible site in Chugach National Forest.

Chugach National Forest

The Chugach National Forest is located in Southcentral Alaska and is managed by the U.S. Forest Service (USFS). The Chugach encompasses more than 6,900,000 acres, approximately 1.1 million acres is forest, the rest is mostly rock and ice. The Chugach National Forest was created in 1907 from a larger federal forest reserve designated in 1892. [1]

There are three ranger district offices located in Cordova, Girdwood and Seward. Actual forest cover within the Chugach is located mostly along a narrow strip of land between the ocean (Prince William Sound) and the rock and icy alpine zone. The Chugach is exceptionally mountainous and remote. This narrow strip of forest is considered a temperate rainforest and is part of the Pacific temperate rainforest region. It is the second largest of our nation's national forests.

Tree species in the Chugach National Forest include Sitka spruce, western hemlock and mountain hemlock and this treed zone is also known as the "sub-polar rainforest." Mammals in the Chugach include moose, black and brown/grizzly bear, caribou, Dall sheep, mountain goat, wolf, marten, beaver, coyote. The adjacent ocean contains humpback whales, sea lions, sea otters and others.

Very little logging or commercial forest management occurs in the Chugach. Less than 2% of the forest is considered economically suitable for commercial

logging. Instead, the forest infuses money into local communities through tourism, recreation, mining and commercial fishing.

The Chugach National Forest: [2]

• Is the farthest north and farthest west of all our national forests

• 30% of it is covered by ice, glaciers and permanent snow fields

• Has approximately 41 public use cabins and more than 500 miles of trail

• Is the size of the state of New Hampshire

• Has all five North American species of Pacific salm-

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on: king, red, silver, chum and pink salmon

• Includes 1,800 miles of anadromous (salmon) streams

• Encompasses Prince William Sound, which is 48% of the Chugach and includes:

— 3,500 miles of shoreline

— 20 tidewater glaciers

— 3,000 to 5,000 thousand bald eagles, roughly equivalent to the entire population in the Lower 48

— More than 200 active seabird colonies

— The Copper River Delta, which encompasses 31% of the forest found within the Chugach.

The Copper River Delta:

• Contains the largest contiguous wetlands complex on North America's Pacific coast.

• Stretches across 700,000 acres.

• Drains a watershed the size of West Virginia.

• Is the largest unit in the Western Hemisphere Shorebird Reserve Network, and considered one of the most essential shorebird habitats in the world.

Many Alaskans live near the Chugach National Forest in the city of Anchorage and other nearby smaller communities such as Hope and Seward. People also work in the Chugach guiding or supporting visitors that want to partake of an array of adventures including: kayaking, rafting, boating, hunting, hiking, fishing, skiing, snowmobiling, gold panning, nature photography, and other recreational activities.

The Chugach National Forest ecosystem supports commercial industries that include commercial fishing for Copper River red salmon, gold mining claims and a traditional way of life for a number of Alaskan people.

(1) Wikipedia: the Chugach National Forest
(2) https://www.fs.usda.gov/main/chugach/about-forest

Jackpot Bay in Prince William Sound, which is encompassed by Chugach National Forest.

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Alaska forest health: highlights from 2021

Aerial forest health detection surveys in Alaska resumed after a one-year hiatus caused by the COVID-19 outbreak. This year, aerial flight detection surveyed 15.7 million acres. Of that, approximately 1.2 million acres were mapped. The forest health team also made more than 800 ground observations of forest sites damaged by diseases, insects, and noninfectious agents to verify and further describe what was seen from the air.

Alaska has approximately 126 million acres of forestland. Approximately 11 million of those acres are within our nation's two largest national forests: the Chugach has approximately 1.1 million acres and the Tongass approximately 9.8 million acres of forest within them.

One-quarter of all federal forestland and 43 percent of all state-owned forest land, in the entire United States, can be found in Alaska with diverse ecoregions and ownerships. This report goes on to declare that 35 million acres of forest land are owned and managed by more than 200 Alaska Native corporations.

A spruce beetle epidemic continues to infest parts of Southcentral Alaska. View the report on this in the website below.

These forests as well as those by other landowners and administered by other land managers are of value ecologically, economically and culturally.

Forest health issues including insect and disease outbreaks and infestations of invasive plants do not adhere to management boundaries. These yearly reports are of significant value to the agencies and forestland owners who work cooperatively to monitor and manage Alaska's forest health situation.

To access this most recent report and link to other years of Alaska Forest Health Reports on the worldwide web go to: *https://storymaps.arcgis.com/stories/ed997a1559ba4a3083c980e0dd2ad626* or google Alaska Forest Health Highlights 2021.

Forest management: Proactive forest management helps community wildfire protection

Forest management agencies often encounter resistance to forest management programs. Barriers to proactive forest management limits forest health, community safety, firefighter safety, and suppression effort effectiveness.

Those barriers also limit the forest products industry which is able to utilize wood harvested during effective forest and wildfire fuels management projects. Barriers to forest and fire fuels management also include restrictive and highly prescriptive regulations and guidelines to timber harvesting and other forest management activities.

Wildfire fuels mitigation grants and projects in Tok, Alaska, provide chips that heat and co-generate electricity for the Tok School facilities.

As a result, forest and wildfire professionals are limited in their ability to respond to forest fuel accumulations, insect outbreaks and declining local forest health.

It is more difficult to protect communities from uncontrollable wildfires when forest fuels build up over time. A downsized forest products industry is one result of prohibitive forestry regulations.

The forest instead dies from beetle infestation or is burned off in uncontrollable wildfires. Seldom is the fire-prone forest of Interior Alaska actually "saved" from logging with such an aggressive insect and wildfire occurrence trajectory. So the resource is lost, the watershed is lost and local communities can suffer loss of life and property in a worst-case scenario.

Wildfires are much more uncontrollable in an unmanaged forest. Who can suppress this fire? (Miller's Reach Fire 1996)

Forest fuels programs should be ongoing, extensive and effective to maintain landscapes in a less fire-prone condition. Unmanaged forests that surround communities can make wildfires difficult to suppress.

Wildfire defensible space and forest fuels reduction programs help local communities survive wildfires.

Some regions view forestry as too much tree cutting and too hard on other natural ecosystem resources. However, a lack of proactive forest management, can

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leave the landscape prone to large uncontrollable wildfires. Forest management with a viable outlet for diverse wood products can help maintain safe communities and forest ecosystem diversity.

Proactive forest management can reduce forest fuels, improve forest health, maintain critical watersheds, create diversity, maintain and improve wildlife habitat, enhance recreational opportunities and be compatible with other natural resource uses. Other societal benefits include locally sustainable wood products, added employment and economic diversity.

Prior planning and proper implementation are key: Visit *https://healthyforests.org/*: Healthy Forests, Healthy Communities – Supporting active, multiple-use management of federal forest lands.

One challenge to community wildfire protection is to reduce barriers to proactive forest management. This is done by educating the public about effective forest management, fostering public buy-in on implementing forest health, forest improvement, local fuelwood energy security, forest fuels reduction programs, and proactive forestry programs.

Prior forest planning is essential and should welcome input and the concerns of all voices including the local forest products industry, resource users, forest managers, and native land management entities.

Forest and wildland fuels programs should support strategic management of the landscape to restore and maintain ecosystems and limit the negative impacts of wildfire. *https://www.doi.gov/wildlandfire/fuels*

Communities and landowners should also explore economically viable ways to keep fire- and bug-killed timber from the burn pile or landfill. Durable goods made from killed timber sequesters the carbon contained in trees for a much longer term than the slow decay and eventual release of CO2 when trees are left on the landscape after wildfires or from insect mortality.

The cost of proactive forest management and timber salvage should be compared to values lost if communities are destroyed by wildfire. Management should provide compatible forest and landscape diversity focused on wildfire protection and prevention. Treatment projects should leave the resource such that wildfire suppression efforts can effectively protect communities.

Poor quality wood harvested during fuels reduction projects make excellent premium grade wood pellets for local home heating.

Forest Management, fuels reduction, timber salvage and wood utilization should combine with desired environmental benefits, healthier forests, preserved watersheds, recreational opportunity and a supply chain that provides an array of forest products, including locally produced fuelwood, chip wood and biomass.

Alaskans can participate in community wildfire preparedness by getting help from the State of Alaska Division of Forestry to develop a Community Wildfire Protection Plan (CWPP). For further information about community wildfire protection go to the State of Alaska Division of Forestry website: *http://forestry.alaska.gov/fire/cwpp/index*.

To obtain assistance in developing your own private forestland management plan or Forest Stewardship plan for your property, go to: Forest Stewardship (*alaska.gov*).

Winter logging roads are cheaper to install than many other methods of accessing timber sale areas.

Forest management: Winter logging access

Winter is logging season, in many parts of Alaska. Frozen snow-covered ground protects the soil from compaction and tree's roots from excessive damage during logging operations. Winter roads may also be the most cost-effective method to access timber sale areas and extract wood products. Winter logging accesses timber sale areas separated from major transportation corridors by wetlands, swamps, lakes and waterways.

Winter logging may be contractually required to access timber across riparian areas near fish stream habitat. Stream bank disturbance is minimized using winter water crossings across frozen rivers, sloughs and water ways. A special written state of Alaska permit factors in onsite conditions and the specifics of each winter water crossing.

Frozen snow-covered soil is better able to bear the heavy weight of logging equipment and log trucks. Loggers may have no other option than frozen and snow conditions to operate effectively and cost-efficiently.

Winter logging and winter access protects the soil from compaction and water crossings from undue damage.

Snow and ice roads and bridges thaw, disappear, and leave minimal impact the following spring. Winter roads and crossings also limit unwarranted access by other vehicles when they melt. Winter ice and snow roads and crossings are cheaper than installing and maintaining bridges or building gravel access roads.

Winter logging takes considerable planning and experience to accomplish effectively.

The forest and the trees: Measuring carbon storage

Universities are known for research, higher education, and as developers of cutting-edge tools to help solve the problems of our modern world. A project led by the University of Maryland is helping researchers understand how and where global ecosystems are storing carbon.

Carbon is stored or "fixed" through plant photosynthesis, which takes atmospheric CO2 and turns it into wood or biomass in trees and plants. Sustainably managed, forests can produce wood that can be manufactured into homes and other durable goods and those store carbon many more years than many tree species can live.

Expelled CO2 during fuel combustion for heat, electrical generation, during transportation and other sources including wildfire and volcanic activity is widely associated with climate change.

NASA's Goddard Space Center developed a project with the University of Maryland that built "The GEDI instrument" (pronounced Jedi) and is a high resolution, LIDAR camera-like telescope carried by an Earth-orbiting satellite.

The Global Ecosystem Dynamics Investigation, or GEDI, can help reveal the carbon content of remote

High resolution satellite imagery works better than traditional aerial photographs for helping scientists to map fixed carbon gains or losses in our global forests.

Scientists know that about half the content of a tree's biomass is carbon.

forest ecosystems by measuring tree height and canopy density below its flight path helping scientists map forest structure and content to better understand how ecosystems are storing or releasing carbon.

GEDI's LIDAR instrument sends laser pulses down to Earth that ricochet off leaves, branches, the forest canopy and the forest floor between trees. Those signals return to GEDI and help provide intricate three-dimensional maps of forest canopies in remote worldwide forest ecosystems.

Obtaining a global map of forest carbon can later be compared to future carbon gains or losses as CO2 is either gained through wise forest management or lost back to the atmosphere through wildfire or poor forestry.

The GEDI Project telescope helps scientists accurately measure tree height so they can estimate tree weight, carbon content and how much carbon could be released through forest loss as a result of site conversion by wildfire, industrialization, slash and burn agriculture, poor forestry practices and urban expansion.

Reforestation in Canada using drones and reforestation considerations

A Canada-based company proposes to deploy specially modified aerial drones to replant fire-killed landscapes with seedpods that are disseminated precisely from the air. The Toronto based company named Flash Forest intends to regenerate landscapes with diverse site-adapted tree species to fix carbon and provide other ecosystem benefits.

Thousands of acres of forests are killed by wildfire. Recently, the Caldor and Dixie fires in California alone burned more than a million acres of forest. One fire in British Columbia burned more than 237,000 acres.

Fires and spruce beetle kill thousands of acres of forest in Alaska each year.

Flash Forest wants to be a tree-planting first-responder. They plan to mobilize drones with onboard seedpods and start reseeding as soon as possible, supercharging reforestation needs and efforts in North America.

Drones might help forest regeneration projects improve, adding to the use of shovels-alone tree planting. The intent is to successfully plant 10 times more trees than humans can, especially in rugged, inaccessible areas, and for less cost. Flash Forest wants to plant a billion trees using special seedpods by 2028.

They also have reforestation plans in the United States and the Netherlands. Flash Forest drones require extensive modification to plant seedpods. It will be some time before the success of their method can be evaluated.

In addition, there is debate about the environmental benefit of "reforestation" being used as a weapon against climate change. A leading expert on deforestation, Bruno Locatelli, has been critical of planting trees for carbon sequestration without extreme care. Locatelli is concerned about biodiversity, water sources and livelihoods in planted areas. A lack of forest diversity can be bad for species that require the interdependence of diverse plant and animal ecosystems to prosper.

Fire killed trees left on the landscape slowly release their carbon as CO2.

Another concern is about leaving too many fire- or beetle-killed trees on the landscape that may increase CO2 emissions. Dead trees will eventually release all the carbon they've absorbed over their lifetimes. Decomposition releases fixed CO2 back into the atmosphere.

Increasing the rate of reforestation using drones may shorten the time trees regenerate naturally back to the ecosystem. There are positive benefits to careful, considered, forest regeneration.

John Innes, a forestry professor at the University of British Columbia is quoted as saying, "We can actually plant a more diverse forest than would occur naturally." Innes so liked Flash's approach that he joined on as an adviser. Jones says the company's seedpods are matched to the environment and will foster biodiversity.

• Adapted from an article that appeared in The Washington Post by Steven Zeitchik on Oct. 21, 2021.

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Project Learning Tree - PLT

Project Learning Tree (*PLT.org*) is a nonprofit organization that helps teachers develop K-12 student environmental awareness, knowledge, and appreciation. Project Learning Tree® (PLT) is an initiative of the Sustainable Forestry Initiative. PLT has a newsletter called Branches, which may be viewed at: *vanessa.bullwinkle@forests.org*

The PLT program uses trees and forests as windows on the world to increase student understanding of the environment and actions they can take to conserve it. Since 1976, PLT has reached 138 million students and trained 765,000 educators.

The PLT program is characterized by three equally important components:

- high-quality instructional materials for grades Pre-K-12,
- carefully designed professional development, and
- an extensive distribution and support network.

PLT's instructional materials can be used with students in formal school settings and with youth in informal settings and help teachers and students connect to nature, engage them in learning, improve student achievement, and grow 21st century skills — including the ability to think critically and solve problems.

PLT instructional materials are distributed along with professional development through in-person workshops or online courses. More than 20,000 educators attend PLT workshops annually. Some materials can be purchased directly from *shop.plt.org*.

PLT workshops introduce environmental curriculum to teachers.

PLT has developed high-quality instructional materials, units and lesson plans that supplement existing curriculum in schools as well as enhance educational programming in informal settings. Activities and lesson plans can be integrated into all grade levels and subject areas (especially STEM, reading, writing, and social studies). Topics include forests, wildlife, water, community planning, waste management, energy and others.

The activities are practical, hands-on, and fun, and aligned with state and national academic standards. For more information about PLT go to their main website at: *PLT.org*

Non-timber forest products: Christmas trees in Minnesota

Non-timber forest products (NTFP) come in many forms. Not every product applies everywhere. I am not aware of anyone growing Christmas trees and selling them in Alaska at this time. However, Christmas trees are a huge product grown and tended in many parts of the United States and Canada.

University of Minnesota Extension forest resource specialist Matt Russell reports Minnesota sells about 500,000 Christmas trees each year valued at $30 million annually in sales. This revenue helps support the Minnesota Christmas tree industry. Sixty-two Christmas tree growers are listed in the Minnesota Grown Directory.

In addition, each tree absorbs approximately a ton of carbon dioxide (CO2) from the atmosphere during its lifetime of approximately eight years before it is harvested and sold as a Christmas tree. For each Christmas tree harvested, approximately three seedlings are planted the following spring. Each tree over

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Christmas trees, continued from page 11

its lifetime absorbs CO2, holds the soil, provides habitat and other ecosystem functions on its way to becoming a holiday icon.

Christmas trees are a commercial non-timber forest product.

To be successful, non-timber forest product harvesters require marketing and utilization studies and acquired skills to determine economic feasibility and the products value above and beyond the cost and time of growing, harvesting and handling the product.

Minnesota Christmas tree growers learn the ins and outs of becoming successful by joining a local chapter of a Christmas tree growers association. Tricks of the trade are shared by others already successful in the business. Marketing and advertising skills are developed over the years to be successful with any product.

About 20 years ago, I did a nonpublished survey of Christmas tree vendors in parts of Anchorage, Eagle River and the Matanuska and Susitna valleys. I found that no one purchased Christmas trees from Alaska, that all their trees were trucked in from Outside and that more than 70% of their Christmas trees were a variety of fir tree. The rest were pines with a few blue spruces. No one I met sold Alaska trees.

Lodgepole, Scotch pine and other species of pine grow in Alaska.

Many Alaskans cut their own Christmas trees on allowed state or federal lands. An operation that offers a U-cut option on planted lodgepole or Scotch pine or other climate-adapted fir and pine species able to grow in Alaska, might be worth studying and consideration.

The most favored Christmas tree cut by people in Southeast Alaska seems to be the shore pine, also called the lodgepole or bull pine found in muskeg areas.

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