Summer 2020

The Boreal Forest *Newsletter*

This printing was paid for by the Renewable Resources Extension Act (RREA).

From the Editor:

Summer is here and it's everyone's hope to see a significant decline in the incidence and spread of the COVID-19 virus.

In the meantime, we look to the future. Due to COVID-19, we have to continue to change our methods and means of accomplishing work, research, education and outreach as individuals, scientists, practitioners, loggers, mill owners of every kind, agencies, corporations and NGOs. All of us are working to maintain our lives in various ways within and because of Alaska's forests.

Many methods have been developed to socially distance and maintain productivity, research projects, the educational experiences we offer and, especially, the industry that many reading this newsletter are a part of and that helps provide the resources we all need and use every day.

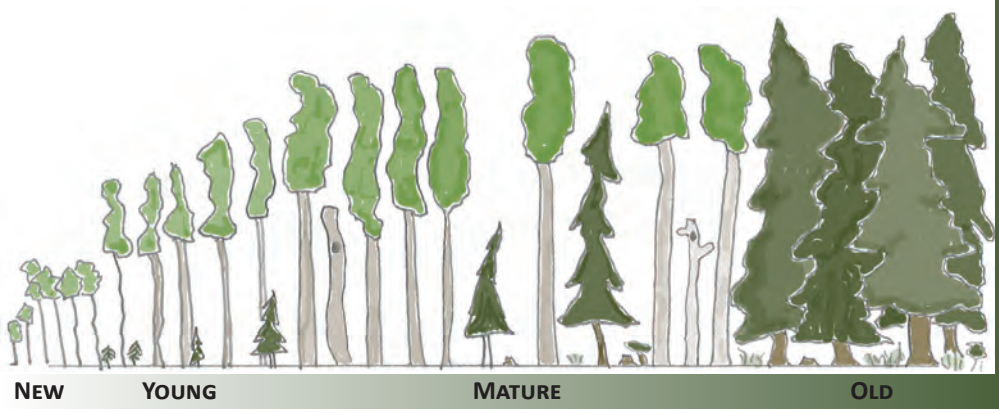
In this newsletter, we hear from our governor, Alaska's state forester, Alaska spruce bark beetle experts and UAF scientists. We'll also have more about non-timber forest product gathering and other stories.

We welcome two articles from Miho (Morimoto) Welton, our RREA forestry research associate at UAF. She has conducted relevant and interesting forestry research supporting the RREA Forestry Program and research about Alaska's forest regeneration efforts.

We wish Miho all of the very best in her new and exciting job and position with the Division of Forestry in Fairbanks, where she will be the lead

— Continued on back page

What's Inside



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Governor Dunleavy Urges Alaskans to Prepare for, Prevent Wildfires

By Alaska Division of Forestry

With the state's second-worst wildland fire season looming large in Alaskans' memories, Governor Mike Dunleavy has proclaimed Wildland Fire Prevention and Preparedness Week (May 10–16) to help reduce the risk of a replay this summer.

The governor, along with fire managers with the Alaska Division of Forestry, is urging Alaskans to take personal responsibility for helping prevent human-caused wildfires this summer, lest we experience a repeat of fires that consumed nearly 2.6 million acres of land and destroyed almost 60 homes last year.

"As we witnessed last year and in previous years, wildfires pose a dangerous and costly threat to communities, infrastructure and natural resources in Alaska," Governor Dunleavy said. "Mother Nature starts enough wildfires in Alaska each summer with lightning; she doesn't need any help from us."

The ongoing COVID-19 pandemic is adding an extra layer of uncertainty for this wildland firefighting season. Alaska has historically relied heavily on assistance from Lower 48 firefighting personnel to help contain wildfires, importing more than 5,000 last year. But the ongoing health crisis has brought travel restrictions and quarantine requirements that will likely reduce the amount of resources available from the Lower 48.

Those concerns prompted the Division of Forestry to impose a burn permit suspension for much of the state (excluding Southeast Alaska) on May 1, to reduce the risk of human-caused fires. The governor urged Alaskans to adhere to the burn permit suspension, which prohibits the use of burn barrels, open debris burning and lawn burning.

"As Alaskans, we need to do everything we can to protect our great state and that means preventing human-caused wildfires," Dunleavy said. Over the last 20 years, more than 60 percent of wildfires in Alaska have been human caused. Those fires are the most dangerous because they tend to be close to urban areas where most residents live and recreate. Already this season, firefighters from the Alaska Division of Forestry have responded to more than 50 human-caused fires, most of them in the Matanuska-Susitna Valley and on the Kenai Peninsula.

The current "pre-greenup" conditions are among the most dangerous of the year for wildfire ignition, as dead, dry grass exposed by melting snow can easily be ignited by even the smallest spark or flame and grow quickly into a wildfire. With hotter, drier days to come, Alaskans need to be careful with any activity that might ignite a wildfire. It's important to remember that those who light fires are responsible for them and can be held responsible if that fire escapes due to negligence.

For more information about safe burning in Alaska, go to http://forestry.alaska.gov/burn.

The Anchorage Daily News *published this article in early May.*

The McKinley fire destroyed 52 primary residences, three commercial structures and 84 outbuildings on the night of Aug. 18, 2019.

State Forester on Wildfires and COVID-19

By Chris Maisch

Remember last summer's wildfires with smoke, traffic jams, evacuations, and damaged homes and property? Now, imagine having to battle fires while fighting the coronavirus at the same time.

The Alaska Division of Forestry and its national partners are working to keep firefighters and residents safe while dealing with both wildfires and the COVID-19 pandemic this summer.

A crew conducts burnout operations on the Trumpeter fire, near Port McKenzie, on April 29, 2020. Photo by Brian Quimby, courtesy of Alaska Division of Forestry.

Our number one priority is public and firefighter safety. We plan to follow as closely as possible the Centers for Disease Control antivirus protocols, best practices on hygiene standards, social distancing and nonessential travel. Thus, we hope to reduce the spread of the novel coronavirus by protecting firefighters, their families, their communities and the communities they protect.

Preparation helps keep firefighters safe on the job, and so we've taken unprecedented measures to make sure they get training to be safe on the fire line while reducing their risk to the virus. We are delivering some training online, evaluating regular training and modifying plans to reduce exposure to this health hazard.

Firefighters work side by side in hot, dirty conditions and eat and sleep in close proximity with few amenities. We will work to reduce risks from fire and coronavirus. Each person sidelined by illness weakens our ability to hold the line against wildfires.

Last year, Alaska imported 5,000 firefighting personnel from the Lower 48, including 120 crews, during one of the longest and most expensive fire seasons on record. The division and other agencies are planning how to respond to wildfires to keep Alaskans safe without robust Outside help. We Alaskans must do our part to prevent small fires that can quickly become big fires.

Compost instead of burning grass clippings. Chip brush instead of burning it. Go without campfires. Maintain equipment and ATVs in fire-safe condition. Report suspicious smoke early. Help spread the fire safety message. Let's use this opportunity from self-quarantine to utilize the Firewise program to make our properties as fire-resistant as possible.

The Division of Forestry will use every fire prevention tool available, including statewide burn permit suspensions, delaying prescribed fires, increasing prevention patrols, possibly implementing burn closures, and working with the state fire marshal to ban fireworks during our driest summer months.

Fire is an indiscriminate destroyer of property, lives and dreams. Alaskans understand their responsibility to families, friends and neighbors to be ultra-cautious.

On behalf of all firefighters, I ask you to do everything you can this summer to protect the people and state we love by thinking, planning and acting responsibly throughout the fire season. We can do it together.

Chris Maisch is the state forester and director of the Alaska Division of Forestry. This article appeared in the Opinion section of the Anchorage Daily News *and is edited for length here. — Glen Holt*

Alaska's Boreal Forest

By Miho Welton

Alaska's Interior forest is considered a boreal forest, which occurs in northern high-latitude regions and is primarily composed of coniferous evergreen trees. The boreal forests are facing challenges due to climate warming. Frequency, size and severity of wildland fire have been increasing, which affects forest ecosystems and human lives. Tree growth is affected by warmer temperatures both negatively and positively, depending on the location. Insect outbreaks, such as aspen leaf miner, have become more common.

Some management practices might mitigate the effects of climate warming on the boreal forests. Forest harvest management, which is a process in which forests are harvested and regenerated, is a potential mitigation practice. In this article, opportunities in forest harvest management as mitigation due to climate change are described.

History of Forest Harvest Management in Alaska's Boreal Forest

A large area of boreal forest covers Interior Alaska, but only a small area of it has been harvested for timber. In the Interior, forest harvest management and record-keeping began in the late 1960s and 1970s. Limited access to most forest stands, low product values, the high cost of labor and the distance to major markets all contributed to the small harvest. Most harvesting occurs on state-owned forestlands in the Tanana Valley, but just 1.3 percent of those lands were logged between 1975 and 2012. To minimize logging and access costs, harvesting was concentrated near roads.

Aspen leaves are affected by aspen leaf miner.

Most timber harvested in the boreal forest comes from mature white spruce stands. Selective cutting was the harvest system used most, and it is a method that cuts the best trees based on maturity, growth rate, diameter and vigor. The other most-used major harvest method is clear-cutting, which removes all stems, large and small, in the stand. Clear-cutting was most common in the 1990s, when harvesting was most active. The scale of clear-cutting in the Alaska boreal forest has been small compared to other boreal regions.

Salvage logging recoups economic benefit from trees damaged from wildfires or other natural disturbances like wind or beetle kill. Salvage logging in the Tanana Valley was used mainly after the 1982 Rosie Creek fire burned a part of state forest lands near Fairbanks. Harvesting has been well below what the state considers its annual allowable cut, which is the amount or volume of trees that can be cut without depleting the resource over the long term.

Regeneration management promotes regrowth after the timber is harvested. Post-harvest regeneration management has focused on promoting white spruce regeneration because of its higher economic value. Common regeneration methods in the Interior include scarification of the ground and then planting seedlings or direct seeding. Using heavy equipment to scarify, or remove the organic layer, can provide better mineral soil exposure for seedbeds and planting.

The use of regeneration methods is less common in boreal Alaska than elsewhere. More than 60 percent of the area harvested between 1975 and 2012 did not receive regeneration management. Of harvested sites, scarification was done on 15 percent of the state lands and planting was undertaken on less than 40 percent.

In most cases, scarification was used to prepare for planting seedlings.

It appears that clear-cutting and site preparation helps promote natural regeneration from seed fall following white spruce harvest and was the best method among all the harvest and regeneration management practices. Planting might be desirable if the management goal is to produce white spruce sawlogs in a shorter period of time. If that is not the goal, planting can be omitted, which saves a lot of money.

Successful white spruce regeneration also relies heavily on white spruce cone/seed crops. White spruce produces large and viable seed crops only about every 12 years, and white spruce germination is most successful when the ground is disturbed, exposing mineral soil to seed fall, such as after fire or harvesting. White spruce seed crop can be predicted in advance, so harvesting right before the seed crop might be a good practice.

Challenges to Harvests

Rapid climate change is a relatively new challenge in sustainable timber production. Wildland fire is becoming more large-scale and frequent in the Interior. White spruce is more susceptible to wildland fires because it is more flammable than hardwood species. White spruce has limitations on natural regeneration because it only reproduces from seeds, unlike birch and aspen, which grow from underground rhizomes or stumps. White spruce seed crop production is also limited.

More frequent fires could result in a lack of seed production at the right time. Spruce seeds are also dispersed shorter distances than other species, so a larger fire would provide a greater challenge for the seeds to reach to the burned areas. White spruce grows slower than hardwood trees like birch or balsam poplar. The projected rotation age, or the amount of time for a spruce stand to become harvestable again, is 120 years, which is 50 years longer than birch and aspen. These characteristics make white spruce more vulnerable to the intense and frequent fires expected under climate change. The historical focus on white spruce harvest needs to be shifted to other species to sustain white spruce forests.

More frequent wildfires may pose a problem in allowing truly mature stands of white spruce in the future.

Opportunities for Forest Harvest Management

Forest harvest management could help create ecologically and economically sound forest stands, particularly under climate change. The major benefits of forest harvest management are, but are not limited to:

- Wood production
- Fuel reduction
- Improving forest health
- Proactive management for climate change

Wood Production

Lumber or firewood production are economic incentives of forest harvest management. White spruce is the only species for reliable sawlog production in the Interior. However, white spruce typically requires more than 100 years to reach sawlog size. Therefore, having a long-term management plan is essential to continuously produce white spruce sawlogs. White spruce grows best on well-drained soils and warm, south-facing stands. However, white spruce growth on the warmest and driest stands could slow down due to climate warming. Birch may be an ideal species for firewood production because it is relatively high in BTUs (British thermal unit), which is a measure of the heat content of fuel or energy sources. Birch also grows and matures more quickly than white spruce.

Fuel Reduction

Wildland fire is essential to the dynamic process of the forest, but it may also threaten human lives and infrastructure, especially in overmature stands in which wildland fires are actively suppressed. Forest stands accumulate fuels, such as unhealthy or dead wood, as they age and become more flammable. This condition along with warmer and longer summers could cause larger-scale and more intense wildfires than were previously typical.

To reduce fire risks, landowners can thin dense stands and create fuel breaks in continuous spruce stands. Hardwood species are less flammable and could be used as fuel breaks. However, even hardwood stands may burn under warmer and drier conditions than historical conditions.

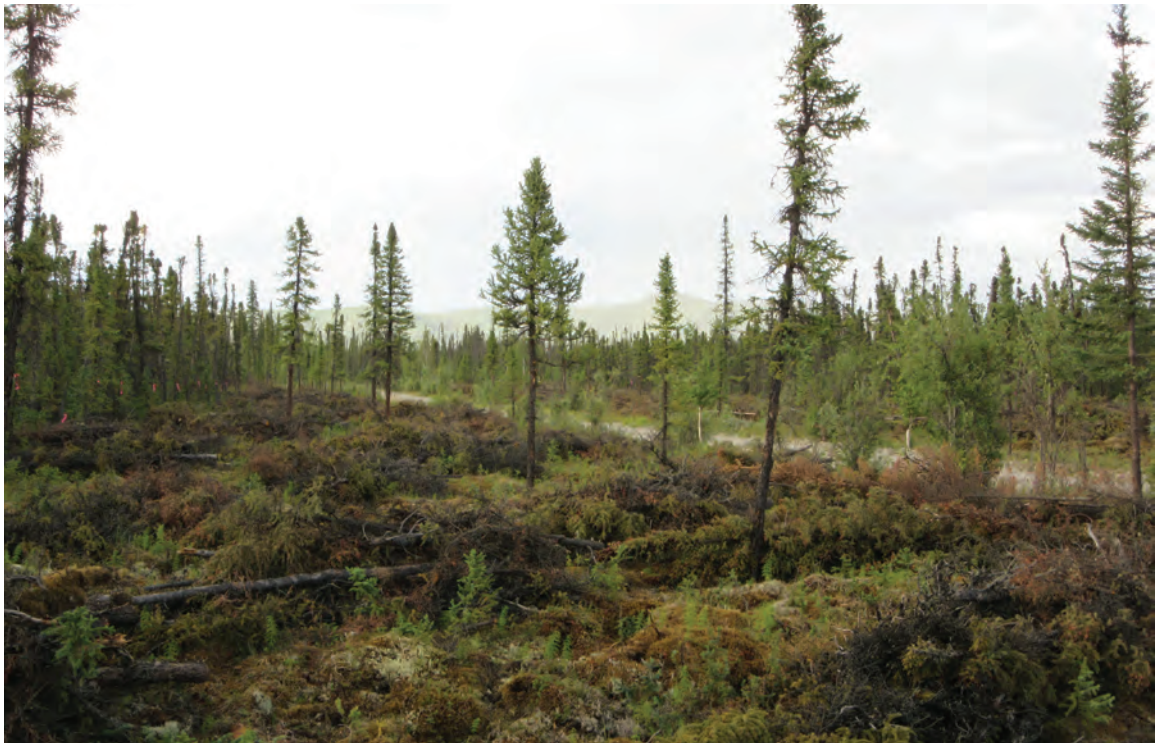
Improving Forest Health

Climate change has caused insect outbreaks and diseases due to warmer temperatures. Overmature forests and old trees attract more insects and diseases than young vigorous forests or trees. Landowners can maintain and improve forest health by removing unhealthy trees or stands and maintaining adequate spacing for trees by thinning.

Proactive Management

With warmer winters, spruce beetle is killing mature white spruce trees in the Mat-Su Valley.

Some species will do better under climate change than others. Current species or genetic varieties native to the Interior may not survive under warmer and drier conditions. Assisted migration is a management practice in which species are manually moved within or between their current ranges. Assisted migration might be an option if the landowner wishes to keep forestlands or improve productivity. This could be done with current species by identifying their new optimal stands (e.g., higher elevation or more northerly aspect), new genetic varieties of the current species from a southern region, or new species such as lodgepole pine. Introducing new species could result in undesirable outcomes, such as outcompeting the current species. Therefore, the decision to implement assisted migration should be made with scientific knowledge or under controlled environments.



A fuels reduction project in an overstocked spruce forest reduces fire danger along a road accessing homes in Interior Alaska.

Miho Welton recently accepted a position with the Alaska Division of Forestry, but until recently has been a forest management postdoctoral fellow with the Agricultural and Forestry Experiment Station at the University of Alaska Fairbanks.

Featured Tree Species: Sitka Spruce

Sitka spruce (*Picea sitchensis*) is our state tree and one of the largest and most valuable trees of Alaska. It can be very large, commonly growing up to 49 meters (160 feet) tall. Some have been found measuring more than 200 feet tall. It can have a diameter of 2.4 meters (95 inches: nearly 8 feet!) or more. Sitka spruce grow from a large buttressed base, straight and tall with an evenly tapering trunk up to an open, pointed, broad, conical crown with horizontal branches.

Sitka spruce trees are commonly found throughout southern and Southeast Alaska and range north and west up through Prince William Sound and the Kenai Peninsula; north and west as far as Mount Susitna on the northwest tip of Cook Inlet; along the east coast of the Alaska Peninsula; and nearly to the southern boundary of Katmai National Park. They are also found on Afognak and the north half of Kodiak Island in pure stands and where it is the only conifer. Its range continues southeast along the Pacific coast and down to northwestern California.

In its northern reaches throughout the Kenai Peninsula and where it is found near Cook Inlet, Sitka spruce hybridizes readily with white spruce to form an additional spruce species named the Lutz spruce.

Sitka spruce habitat ranges from sea level along the coastal mountains, within the America's temperate rain forest, and on up to tree line at about 3,000 meters (nearly 10,000 feet) in elevation. It seems to grow at its best around 500 meters (about 1,600 feet) in elevation.

This coniferous evergreen tree has flattened, prickly, sharply pointed, dark-green needles that stand out stiffly on all sides of the twig and are from just over ½ inch to just under 1 inch long. Their needles are slightly keeled with two white lines of stomata visible on their upper side.

Sitka spruce cones are cylindrical in shape and hang down on short stalks from near the tip of the twig and at the top of the tree. They range from 5 to 9 cm long (2 to 3 ½ inches) and are a light orange-brown color. The cones fall off the tree at maturity. Cone scales are long, thin, stiff, rounded at the tip and irregularly toothed there as well. Seeds have a largish wing and are about 12 mm (½ inch) long in total.

Sitka spruce needles are ½ inch to 1 inch long, stiff and prickly. Cones are cylindrical and a light orange-brown color.

Sitka spruce bark is gray, thin and smooth on small trees; becoming only slightly thicker as the tree gets older when bark turns a darker purplish-brown with scaly plates of bark being more evident.

Sitka spruce wood is moderately soft and lightweight. It is also quite straight grained and even textured. The sapwood is very light in color and the heartwood is a light reddish-brown tone.

Sitka spruce wood makes high-value products, including high-grade wood pulp for newsprint, clear knot-free lumber from large old-growth timber, clear planks for boat building and making ladders, and clear lumber historically used for building wing spars and fuselage components of some World War II aircraft and propellers. It is still used for making oars and paddles. Clear Sitka spruce is still used for its singular resonant qualities in the making of stringed musical instruments, including guitars and violins and for piano soundboards.

Various kitchen tools, scaffolding and fish packing boxes are constructed using lesser quality lumber, and it is also used for general building and construction-grade lumber for housing, homes and buildings.

Adapted from Alaska Trees and Shrubs: Second Edition*, by Leslie. A. Viereck and Elbert L. Little, Jr. University of Alaska Press, 2007.*

Spruce Beetles Begin to Take Flight in Southcentral Alaska

From www.alaskasprucebeetles.org

Spruce beetles are beginning to emerge in Southcentral Alaska, and property owners should take steps to reduce the further infestation of live green spruce trees.

Adult spruce beetles typically emerge from their host trees each spring when temperatures reach 60 degrees Fahrenheit. Recent surveys by the Alaska Division of Forestry confirm that spruce beetles are on the move. Adult beetles seek out and attack new host trees during their summer flight period, which continues into July.

"Property owners are advised to keep an eye on their green spruce trees this summer for signs of beetle attacks and, if possible, to avoid cutting down live trees during the flight period," Division of Forestry Forest Health Manager Jason Moan said. "Any green or actively infested trees removed during this time should be processed promptly and properly."

"Cutting dead, dry spruce trees that no longer contain active beetles is of little concern time-wise, as these trees are no longer susceptible or attractive to spruce beetles," Moan added.

Southcentral Alaska has been experiencing a spruce beetle outbreak since around 2016 that so far has affected more than 1.1 million acres of forestland in the region (see photos below). Aerial surveys conducted jointly by the Alaska Division of Forestry and USDA Forest Service Forest Health Protection in 2019 suggest the outbreak appears to be on the downswing regionally, though many areas are still experiencing steady or increasing beetle activity.

For information on mitigating spruce beetle, signs and symptoms of spruce beetle attacks, upcoming public workshops and more, visit https://www.alaskasprucebeetle.org/.

Dead needles falling off the spruce and needle bare branches indicate the tree has been dead at least a year, the larva have matured into beetles and they are gone from that tree.

One of the signs of new spruce beetle attack on a live green spruce tree is "pitching-out" where the spruce tries to eject beetle larva with spruce pitch.

UAF Research: Drone Use in the Boreal Forest

By Miho Welton

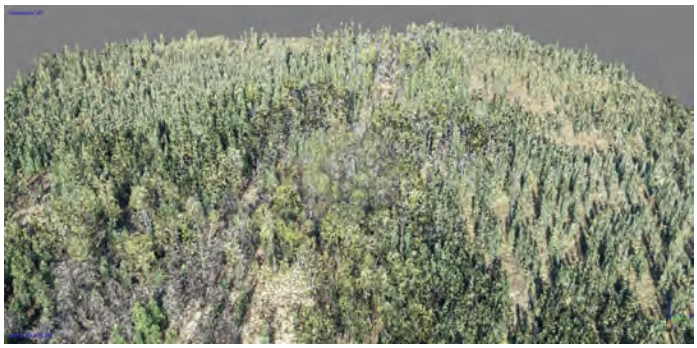
Drones have become more accessible by civilians in recent years, and scientists are using them for various natural resource surveys. In forestry, drones have been used in many ways, including wildland fire detection, vegetation-type identification and forest health monitoring. Forest structures such as tree heights can be estimated using camera-equipped drones.

Tree measurements are necessary in forest management for many purposes, including timber sales, forest inventory, estimating carbon credits and in various research methodologies. Measuring trees in the field and on the ground is very labor intensive. In addition, it is often impossible to measure all trees, so samples are used to estimate the conditions of the boreal forest. Scientists have long used remote sensing technology to fill in the gaps between ground-sampled survey points by using aerial images taken by satellite and small aircraft.

Drones now can also collect aerial images that have significant advantages over the more conventional aerial platforms such as satellite or small aircraft use. Advantages include higher-resolution images, greater flexibility in flight area and imagery timing, and significantly lower costs.

A major drawback to current drone survey use is a short battery life, which results in smaller area coverages. At this time, however, flight time on the Phantom 4 Pro drone is up to about 25 minutes, which is better than average. Battery and drone technology increases rapidly as new models of drone are developed and battery technology progresses.

The DJ Phantom Pro drone is shown in flight here. Provided by Miho Welton.



A 3D reconstruction of forest stands is made up of dense points generated by a photogrammetric algorithm. A total of 144 photos were taken over the flight area of about 2.5 acres to create this 3D model. You can see individual trees. Provided by Miho Welton.

Drone surveys will not replace field measurements completely at least in the foreseeable future; however, they can reduce the time required and increase the coverage of sampling areas, leading to increased accuracy.

Estimating forest structure using aerial photogrammetry is a technique that has been used in various fields, including forestry, for a long time. A photogrammetric algorithm (Structure from Motion) has been developed on this simple technique to reconstruct 3D structures from 2D images.

The algorithm uses many overlapping images that contain views from different angles to estimate 3D models. The algorithm applies the human ability to see 3D structures. These 3D models allow us to estimate tree heights without physically measuring trees on the ground. Challenges exist, especially in broadleaf forests where canopy structures are much more complicated than in conifer forest types. However, great possibilities exist for increasing use and development of these drone photogrammetry techniques in the management of the boreal forest.

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Non-timber Forest Product Collecting Considerations

By Glen Holt, RREA forester

The Winter 2020 newsletter elicited a response from a Fairbanks area reader regarding the collection of non-timber forest products (NTFP) on lands not owned by the collector:

> Dear Glen Holt, I'm exceedingly concerned that you write about NTFPs including chaga harvesting and marketing without any words about respect in the harvesting process. You have a list of important questions but don't include, "Is it legal and respectful for me to harvest in a specific location?"
>
> From your article the potential harvester just sees dollar signs and you give no directions to respect landowners, including tribal lands, and to harvest sustainably so the tree is not killed.
>
> I live in the birch forest near Fairbanks, on just a few acres, yet chaga hunter, spurred on by articles like yours, have come on my land and that of my neighbors to take chaga without any respect to the landowners or the trees. Some get carried away and cut the tree down or scar it beyond recovery so they can get to the chaga.

I appreciate the reader's email response. She makes excellent points. Let's consider them.

I work most often with private and tribal forest landowners interested in managing their own land. Having said that, it is important to realize that if expanding harvest to lands other than your own or without specific permission, that expansion could lead to or involve trespassing. Are your NTFP suppliers obtaining their commercially harvested resource using permits and with permission from the landowner? This is important. Utilizing agency best-management practices means that the resource landowner is more likely to issue permits, make product available and expand their NTFP program.

Trespassing on private land without permission is illegal. In addition, stealing someone else's resource sheds a bad light on collecting NTFPs and denies the landowner the opportunity to harvest.

Gathering a few conks to make tea for personal use on allowed state lands has very little impact across the landscape. Don't gather in state parks, on Mental Health Trust Lands or on university land where gathering might not be allowed or is otherwise regulated.

Much of the unposted land near road systems is privately owned. Find out first before going on it. One way to determine who owns land is on an app you can purchase called OnX. It costs a yearly fee, uploads on an Android phone and identifies private, municipal, government, tribal lands, etc. using GPS. Contact the landowner before harvesting. Likely they have a program and can work with your commercial NTFP enterprise. NTFPs are gathered and managed extensively throughout the Lower 48, and land managers have experience and plenty of resources from which to work up and offer programs equitable to various size operations.

Harvest NTFPs on land that allows legal access and collecting. Much of Alaska's state land allows personal use harvest of NTFPs for private consumption with no fee.

Birch sap is a non-timber forest product used in syrup, candy and sauces. These buckets collected sap at Valene and Rod Ebersoles' property near Fairbanks.

Branches and wood from birch, aspen, alder, cedar and cottonwood may be split out and carved into kitchen implements and other tools.

Commercial harvesting on state land requires a permit. The state has excellent guidelines and best-management practices to sustainably harvest NTFPs so that these valuable products remain on our Alaska landscape in perpetuity. Very few people harvest any non-timber forest products commercially in Alaska. Collecting is hard work, costs time and money and is only half the process. What is done after collecting determines whether the time or resource is wasted or added to your net income. Honestly, the hourly rate may be very low if travel is very far from home to collect NTFPs.

A state of Alaska NTFP Harvest Manual, issued April 2, 2008, was put together from a variety of resources around the United States. The state also has a downloadable NTFP permit for commercial harvest available and other pertinent information to help with commercial NTFP collection.

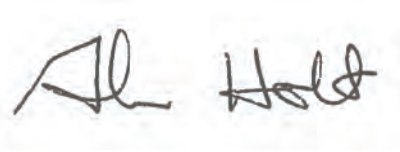
This is the link to the NTFP harvest manual: http://dnr.alaska.gov/mlw/ntfp/pdf/soa_ntfp_harvestmanual_04022008.pdf.

Here is the online link to the NTFP commercial permit for State of Alaska lands: http://dnr.alaska.gov/mlw/ntfp/. For further information, contact the Alaska Department of Natural Resources, Division of Land Management.

From the Editor, continued from page 1

forester in the state's Forest Inventory Program. It monitors changes to our forests and potentially the forest industry here as our climate has its own way on statewide landscapes.

Have a great summer! Be safe, be careful with fire, and keep us informed on what you think and how it's going out there in Alaska's forests during these times of change.



Glen Holt, RREA forester

OneTree Alaska

By Jan Dawe

OneTree Alaska is an integrated K-20 research, education and community engagement program affiliated with the University of Alaska Fairbanks' Agricultural and Forestry Experiment Station. The mission of the program is to build the capacity of K-12 and university teachers and students, networks and institutions to engage deeply with the natural resource issues facing our state, especially in this time of rapid environmental change.

The program's thematic focus is phenology (seasonality) and climate change, and it works primarily with Alaska white birch, *Betula neoalaskana* Sarg. The name of the K-8 curriculum it has been creating with a core group of teacher-leaders is "A Year in the Life of a Birch Tree."

With 10 years of experience in growing seeds to trees, OneTree has developed an approach that:

- sustains teacher-scientist-community partnerships,
- encourages entrepreneurial mindsets in learners of all ages, and
- engages the people of Alaska with UA research and creative scholarship through broader impact and public engagement initiatives.

Liam Quirk drills into a birch tree to set a tap at the beginning of this year's birch sap season near Fairbanks. His father, Bill Quirk, supervises. The Quirks are members of OneTree's birch sap cooperative. Photo by Marlo Quirk.

The program is based out of the OneTree Alaska STEAM Studio (aka the former Lola Tilly Commons kitchen), which functions as a K-12 field trip destination, community science center and birch sap production kitchen. The Generation OneTree Research Plot in the lower T-field is a progeny evaluation trial of the offspring of eight original "onetrees." Each winter, K-12 students in the Fairbanks North Star Borough, Alaska Gateway, and Nenana City school districts test the germination rate of seeds produced by trees in the plot.

Jan Dawe is the program lead for OneTree Alaska and an assistant research professor at UAF.

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