

Spring 2023



The Boreal Forest Newsletter

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

From the editor:

Spring is here!

Wow, when?

Eventually, the snow will melt, the grass will dry out, and presto, it will be fire season. Dead, dry winter-killed grass, too little moisture following snow melt, an unattended burn barrel, sparks in dry grass and suddenly a difficult-to-control wild-fire rips from your yard into the neighborhood.

Get a burn permit from the state of Alaska and follow it to the letter.

This spring we hear from: University of Alaska President Pat Pitney about new UA lands; IANRE research about shrub expansion and persistent alders; "A Woman in the Woods" from the Michigan Department of Natural Resources and Project Learning Tree; tips on planting trees; fertilizing and watering trees; small-scale forest management with several outcomes; and forest technician training in Alaska.

Spring, leaning toward summer is reported in several locations if we can finally warm up!

Be Firewise and see you in the woods!



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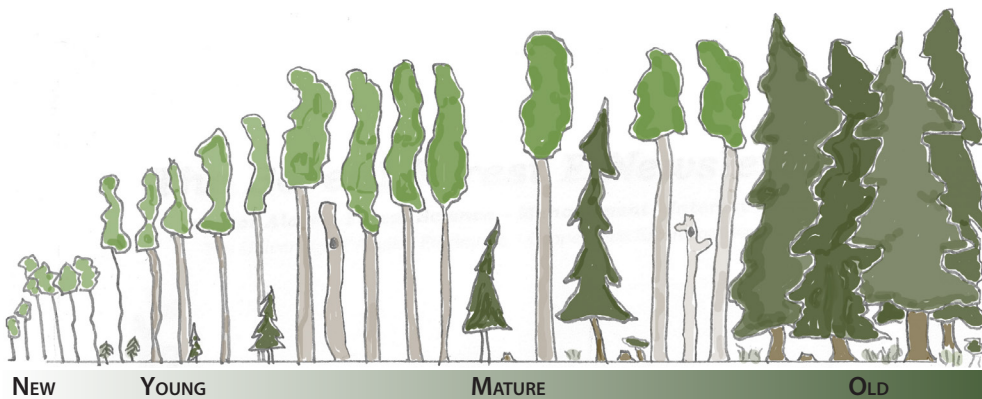
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Land grant for University of Alaska

Letter from University of Alaska President Pat Pitney on Jan. 6, 2023

Dear UA Community,

Over winter break, we received great news that our days of being a land grant university without our full land grant have come to an end. President Biden signed into law a bill that provides many good things for the university. Chief among them is the resolution of our efforts to acquire 360,000 acres of land to complete our land grant allotment promised so many years ago.

The law establishes a framework for the university to work with the state Department of Natural Resources to jointly identify up to 500,000 acres of federal land to be conveyed to the state. It would require the Bureau of Land Management to survey the selection and work with UA to transfer up to 360,000 acres of state land to the university. The UA Lands office already has selected 200,000 acres and provided the selection to DNR for review.



Land in Tongass National Forest may be selected.

The acreage ultimately transferred to UA would be deducted from Alaska's outstanding statehood lands entitlement and managed by the UA for the benefit of our students and to further meet our mission of teaching, research, and workforce development for Alaska.

We are most grateful to Sen. Lisa Murkowski, who is responsible for this tremendous outcome. I also want to thank Rep. Mary Peltola and Gov. Mike Dunleavy for their leadership on this issue and Sen. Dan Sullivan for his support of the UA Fiscal Foundation Act. I also want to recognize the bipartisan backing we've had from our Alaska businesses, organizations, and state leaders who advocated for this positive outcome.

As with many land issues in Alaska, the original congressional intent to convey lands to the university has been eroded by a complex history of federal laws and adverse court rulings. As a result, the University of Alaska has one of the smallest allotments of any land grant institution. With the passage of this act, the university, working with the state, now has four years to jointly select 500,000 acres of previously federal land of which up to 360,000 acres will be conveyed to the university to fulfill the unmet land grant.

Historically the UA Lands office earns revenue from the university's existing acreage that includes real estate, timber sales, mining, gravel sales and other activities. Income from UA's lands has funded the highly successful UA Scholars Program, awarding \$12,000 scholarships to the top 10 percent of graduates from each Alaska high school who attend UA. Land earnings have also supported teaching and research in natural resources, fisheries/ocean science, biology, agriculture, minerals, and education.

While this is fantastic news for the long-term, there is still a long way to go before the 360,000 acres are identified and conveyed to the university, and even more time before the university will be able to monetize the lands conveyed.

I want to thank everyone who has contributed to this long-standing effort including our federal relations team, general counsel's office, UA Land office and the hard work of many staff to find a solution to the long-standing land deficit.

— UA President Pat Pitney

Boreal tree adaptation to seasonal drought conditions

Excerpted from a University of Alaska Fairbanks news release about work done by Jessie Young-Robertson, forest ecologist, and graduate student Sam Dempster.

IANRE researcher Jessie Young-Robertson presented a paper in December 2022 at the American Geophysical Union Fall Meeting in Chicago.

Here's an excerpt from her presentation:

Climate change is bringing shifting rainfall patterns and warmer temperatures to the boreal forest. Young-Robertson is studying how boreal trees store and regulate water use.

"I want to talk about the drought response of boreal forest trees over a long period of time," Young-Robertson said. "... how the trees use water, how stressed they get and how they respond to environmental changes in air temperature and rainfall."

The study is focusing on two tree types: coniferous black spruce and deciduous aspen/birch in the Caribou-Poker Creeks Research Watershed near



Aspen/birch is boreal tree type "one" being studied near Fairbanks.

Fairbanks. In summer 2022, sensors measured environmental variables, sap (water) flux and trunk water content every 30 minutes. Canopy water stress measurements were taken weekly.

"The story so far is we really need a snowpack," Young-Robertson said. "We're seeing the impacts of



The boreal black spruce forest is the second type of forest being studied.

earlier springs, super-hot summers, and changes in the packaging of precipitation."

As in when and how much rain falls during the summer. Rain only in August has a different effect than rain that falls all summer.

Trees grow most in June and July. No rain during this growing season adds stress. Ongoing research is revealing that trees are approaching their climatic limit with increased drought pressure.

At the same meeting, IANRE undergrad student Samuel Dempster presented research on the "Consequences of shrub expansion in the boreal forest."

Here's an excerpt from Dempster's presentation:

Dempster's research is studying boreal forest alder

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Alder is a common shrub in the boreal forest.

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species' physiological response to changing environmental conditions. His research seeks to better understand how the expansion of small trees and shrubs may affect large-scale ecosystem processes in the boreal region. Dempster studied a stand of alders near Fairbanks in a non-permafrost area where alder are spreading.

"I was looking at them from breakup all the way to the first snow," Dempster said. He gathered weekly measurements of stem and leaf water content, photosynthesis, transpiration rates and changes and other related variables.

One of his questions is: "Are (the alders) looking good where all of the other trees are not doing that great?"

Summer 2022 in Interior Alaska was hot and dry. Alder within his research area responded to those

conditions with higher transpiration rates and lower photosynthesis rates overall and further showed those alders maintained a stem water content of around 50%, suggesting they were able to regulate some physiological processes to cope with that hot, dry summer weather.

Dempster's research seems to indicate that alder may tolerate seasonal drought climate change conditions allowing them to expand to adjacent areas.

These ongoing IANRE research projects correlate directly to the changes Alaskans are experiencing throughout our state. We hope to keep you informed on future IANRE research.

Dr. Jessie Young-Robertson is a research associate professor with the IANRE Agricultural and Forestry Experiment Station at the University of Alaska Fairbanks. She is the principal investigator as well as a contributor to both research projects.

This woman's place is in the forest

Introduction and minor edits by Glen Holt

CES Outreach Forester

Brenda Haskill wrote the following story about being a woman and a professional forester in Michigan for the Department of Natural Resources.

She shares her story of being a woman working for the woods in the March Project Learning Tree newsletter:

I'm lucky to have developed an early love for the forest. I was raised in a logging family, and my mom started driving logging trucks for our business when I went to kindergarten. Every time I smell fresh-cut wood, see sawdust, and hear a diesel engine while out on a harvest site in the forest, I am transported back to those early years.

It never occurred to me as a child that there were perceptions about what women could not or should not do as a career. Reality set in during college. When I attended Michigan Technological University in the late 1980s to obtain a Bachelor of Science degree in forestry, there were five women and around 35 men in the program.

Unfortunately, diversity has not expanded much in the past 30 years of my career, and the percentage of women and minorities in forestry is still sadly low. As of 2019, women represented just 16% of forestry and conservation professionals in the United States.

"So, what's a forester?" Well foresters care for and manage forests and trees to suit desired outcomes.



Brenda Haskill has had an interesting and diverse career in forestry.

Photos by Brenda Haskill, used by permission.

We include urban foresters, consulting foresters, state government foresters, and more. We have a deep love for the trees and forested landscape.

Traditional foresters manage tracts of land with specific goals. Sometimes, providing a haven for wildlife, or for timber production to create income opportunities, or to help the forest be as healthy as possible. Often, we manage for a mixture of all those outcomes, depending on who owns the land.

Just like other professions, there are various branches (pun intended) of forestry.

When my career began, if you studied forest manage-



Career opportunities are abundant for women in natural resources.

ment, you were a forester. Foresters can now study ecology, ecosystems, environment, hydrology, engineering, and many more specific courses of study.

Working as a woman in forestry has difficult days. Even now, I am occasionally mistaken for a secretary and asked if male colleagues could better talk about the issues at hand.

But as I walk into meetings with a hard hat and 30 years in my profession, I enjoy watching the faces of sawmill owners and loggers as I share my experience and discuss industry specifics about lumber, logging site complications, and trucking issues.

Their surprise at my expertise turns to curiosity and then to acceptance as they enjoy discussing the finer points of the forest industry with me.

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Haskill, continued from page 5

Gender diversity is slowly growing in the forestry sector, due in part to the efforts of groups like the [Women's Forest Congress](#) and [Women Owning Woodlands](#), both of which formed during the last several years.

The ownership of North American forests includes more women. Agencies and landowners are searching for women foresters to connect with and learn from as they own and manage their own forestland. The need for women foresters is growing every year.

"I really like spending time in the relaxing, deep cool green of a forest — and getting paid to do it," Haskill adds.

From the PLT e-Newsletter:

A career in natural resources can be a rewarding path.

Learn more about green careers in forestry, conservation, and natural resource management at: [The Green Jobs Guide](#), which helps young people ages 12-25 learn about green jobs in forestry and natural resource management in settings ranging from community youth programs and school classrooms to college and career preparation.

Look also at <https://www.plt.org/workingforforests>.

Check out this video celebrating the many contributions of women in forestry and natural resources conservation for [International Women's Day](#).

Brenda Haskill is a forester for the Michigan Department of Natural Resources with 30+ years of experience in the forestry and forest products sector.

Check out the Project Learning Tree e-Newsletter with Megan Annis: megan.annis@forests.org

Follow best practices when planting a tree

From the UAF CES booklet "Plant a Tree"

Adapted By Glen Holt

CES Outreach Forester

Tree planting is a tradition around holidays like Arbor Day, Earth Day, Memorial Day, Mother's Day, Father's Day, and the Fourth of July.

The shovel is the tool of choice and most often used when planting a few trees. Planting your tree/shrub where it is most likely to survive long term is very important. Here are some suggestions to make your planting successful:



Planting near power lines can cause power outages and fires.

Don't plant your new tree or shrub in a depression or low spot. Puddled water and ice can damage or kill your planting.

Don't plant evergreens in windy locations. They can suffer winter needle damage from wind burn, abrasion and drying. Blowing snow, ice crystals, and wind-borne soil can damage evergreen needles in windy winter locations.

Avoid planting tall growing trees or shrubs near power lines, ground utilities or too close to buildings, foundations, and sidewalks. Avoid planting evergreens that have flammable foliage in a wildfire defensible space zone. Don't plant trees that will seasonally block snow removal or where drifting snow typically accumulates.

Also consider:

Sunlight: Make sure the planting site has the right sun exposure for the species being planted.

This information is usually on a tag attached to your tree or shrub when it is purchased from a reputable dealer.

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Tree sources:

Obtain trees and shrubs from a reputable local nursery because they will more apt to match local growing conditions including the climate, soil conditions, and length of growing season. Avoid buying trees on sale at the end of the season. They are often those that others didn't buy because of physical flaws, and are also often root bound from being in the pot too long. Buy good growing stock.



Planting a tree in a small enclosure can create future problems.

Timing: Plant your growing stock soon after

purchase. Certainly, the same season in which they are purchased. Trees and shrubs can be stored in their container and watered as needed until time and site conditions allow planting. Spring planting is fine but can be accompanied a drying period with little rain, so water them as needed until it rains.



This tree was left unsold due to stem injuries or canker.

Site preparation: With a shovel dig a wide shallow hole at least two times the width of the root system and deep enough to accommodate all the roots without impinging or bending them when planting or without a hole or gap at the bottom of the roots. Put the best topsoil from the dug hole on a tarp separate from the rest of the sub soil.

Use the soil in the pot or that is around the roots when planting and combine it with the best dug soil from the hole. Sprinkle about a cup (not much) of granular fertilizer recommended by the nursery around the roots before filling in the hole with your good soil.

Water the tree in the pot prior to planting so the soil around its roots is moist but not soaking. Pot soil should stick to the roots and not fall away from the roots by being too dry when the pot or wrap is removed. Set the unpotted tree in the dug hole adjusting its depth using soil dug from the hole. Fill in around the roots making the plant soil even with the top of the dug hole. Don't plant too deeply, which may cover part of the stem and also not too shallow, which may expose, kill or injure some of those critical roots.



Plant the tree or shrub where it won't block access.

After filling the hole in around the tree roots, firmly tamp the soil down around the roots, making sure to cover them all.



Older left-over potted trees can be root bound.

Water the tree thoroughly after planting. Check soil depth to make sure it is still at the right depth around the tree. Sprinkle more good hole soil on top if it recedes from watering. Check trees every week and water as needed until the summer rains come. Some people put mulch or bark chips around the tree but don't pile that mulch right up on the trunk. This can help keep the roots moist.

Fertilizing trees helps keep them healthy

Adapted from CES publication: "Tree Health and Fertilization" FWM-00119

By Glen Holt

CES Outreach Forester

We get more yard tree health questions than any others here at the UAF Cooperative Extension Service. Trees planted in subdivisions and around other highly disturbed sites are commonly planted in soils disturbed by compaction, topsoil removal, or altered soil drainage.

Tree health and growth can be affected by climatic warming, spring drought, slower growth, invading grass competition for nutrients and water, escalating insect outbreaks, disease and wildfire.

Increasingly, Alaska is experiencing drier springs. April showers used to bring spring flowers. Now? Not always. Lately, it's often mid-summer before significant precipitation occurs.

This is hard on our yard trees. The remedy is supplemental watering. This helps keep the tree green, growing and better able to fight off insects and disease.

Adequate soil moisture can affect a tree's appearance, its ability to take up nutrients, its duration of photosynthesis and the length of growing season.



Drought can adversely affect tree health.



Left, tree fertilizer's N-P-K ratio is marked on its packaging. Right, tree spikes are one form of tree fertilizer.

Photosynthesis, or tree growth is affected by dry conditions and in turn affects leaf health, and the tree's ability to fight off infections or insects. Slow growing due to a spring drought can affect the tree's ability to sequester carbon or grow more wood for products in the future. Drought and water shortages can become an ecological problem and a future longevity issue for trees in your yard and in the forest. This can affect an array of ecosystem functions including future production of wood products and economic sustainability.

Soil nutrients largely include nitrogen (N), phosphorus (P), and potassium (K). These key elements make up about two-thirds of the total mineral content of healthy tree tissue. Deficiencies can cause a variety of tree and shrub symptoms.

Nitrogen (N) is one of the most important nutrients for tree health and vigor. Lack of nitrogen is seen in tree leaves where they can turn progressively light green to yellow. Adding nitrogen can increase photosynthesis in deciduous trees and to a lesser extent to conifers.

Phosphorus is the middle number in the fertilizer ratio, 8-3-3, (N-P-K). Phosphorus (P) is used to enhance roots growth, flowering and fruit production. A phosphorus deficiency may look like leaves exhibiting a blue-green or red-purple color, and a reduction in flowering and fruiting. You can boost this tree need by fertilizing.

Potassium (K) helps flowering and fruiting, stem sturdiness, disease/stress resistance, cell growth, sto-

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mata control and photosynthesis. With a potassium deficiency, leaf margins may have a scorched appearance. Leaves can look brown or mottled and curly. An 8-32-16 fertilizer ratio is high in phosphorous and acts as a good root builder, which is recommended for planting and transplanting trees.

One well known tree spike brand is an 8-3-3 nutrient ratio. The “tree spike” is hammered into the ground around the tree just inside outer foliar dripline. This fertilizer slowly emits into the ground over time as the tree receives moisture.

Granular fertilizer works well. Sprinkle it around the roots at the dripline where new roots are most

likely forming. When planting a new tree, don't put granular fertilizer right on the root ball but around it near the top of the hole. Be careful to apply only as much as needed. More isn't better. Doing this limits ground or surface water pollution.

When? Fertilize trees in the spring as soon as the ground thaws and the tree is sprouting leaves. Don't fertilize trees beyond the first week of July. Fertilizer needs to have its effect and dissipate prior dormancy. Late fertilizing may injure the tree if it can't go dormant and can affect its natural cold hardiness.

Water trees after fertilizing to help carry the fertilizer to the roots and allow it to help boost growth especially when they may most be affected by drought or dry periods.

Active small-scale management aids forests

By Glen Holt

CES Outreach Forester

In many forest settings “letting nature take its course” can be problematic, especially close to communities in a wildfire-prone landscape. Barriers to active forest management coupled with 100% wildfire suppression and societal preferences can create conditions leading to an overabundance of flammable forest fuels and increased wildfire danger.

Prior to European influence in North America, forests were often managed by indigenous people. Many native peoples periodically set fires to clear the forest around where they lived for security, sanitation, to foster wild foods like berries, and maintain habitat for wildlife they used for subsistence.

As a result of this lack of indigenous management, many of our modern forests are becoming increasingly threatened by diseases, insect outbreaks, and increased forest fuels that risk even older-growth forests during wildfires.

Risks to the structure, function, health, productivity, and the safety of forests whether through insects like spruce beetle (*Dendroctonus rufipennis*); or wildfires are being studied nationwide to determine whether “hands off” is the “best management practice” choice.



Recutting part of this 15-year-old clearcut adds diversity to the forest.

Forest managers and community planners are finding out again as indigenous managers knew, that active rather than passive management can be essential to reducing fuel loads and for maintaining forest diversity. Selective thinning and patch cutting for instance can create habitat diversity that is required by certain wildlife and also helps reduce the size and the amount of fuels on the landscape.

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Professional tree cutters reduce forest fuel size and fuel loads.

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On my forested 3-acre homesite, I contracted a one-acre cutting to accomplish three personal goals: first, to maintain my view of the ocean. Second, to reduce the size and volume of forest fuels to improve defensible space around my home and building. Third: to maintain young growth forest regeneration essential to bird and three-season Sitka black-tailed deer habitat.

I contracted a reputable local licensed and bonded tree thinning contractor to do my work and accomplish it quickly prior the songbird nesting season. A professional crew of three cutters versed in and geared with the proper personal protective equipment did the job on my acre in three hours. They met and exceeded my personal expectations.

The work was accomplished on April 1 quickly as they recut approximately one acre of south-facing sloping terrain covered in fast-growing evergreen saplings. I wanted this done before the trees grew larger, which would have been harder to deal with and would leave more fuels on the ground.

My project was in the verdant Southeast Alaska temperate rain forest. Trees grow quickly here. The cut created an additional forest age class, size and structure of forest habitat. The cut will soon regenerate similar species at the small size.



Active small-scale management can be critical to wildfire defensible space.

The surrounding 15-year-old forest regenerated after clear cutting is age-class two, and the older growth forest surrounding my subdivision is the third forest age-class. All three sizes were important to us personally.

This treatment preserved my view, reduced wildfire fuel size and volume, and will regenerate the site to smaller trees and sun-loving forbs for deer and birds. The job was well done, quickly and under my direct supervision, by professionals.

Even small-scale, yard “forest management” can accomplish a variety of goals and reduce the impact of a possible future wildfire in any forest type. Since we don’t own or manage the surround property, this is our only recourse. Active small-scale forest management can include several goals and objectives and be critical to surviving a wildfire event.

Forest management like this is best done before a wildfire event that threatens your loved ones, home, property, and neighborhood. This kind of activity can help wildfire crews catch and control a future wild-

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Management, continued from page 10

fire. Thickly growing fuels are much harder to control wildfire in so sooner is always better than later when your goal is defensible space.

The additional diversity created by cutting will maintain and improve our habitat, and maintain full sunlight benefiting berry production, which was part of our lifestyle at this time in our lives.

Private companies able to manage small landscapes in the rural-urban interface can assist residents allowing them to minimize wildfire risks and improve their properties for a variety of forest land ownership outcomes.



This cut preserves three-season habitat for Sitka black-tailed deer.

Natural Resource Academy addresses a need

By Glen Holt

CES Outreach Forester

A field training Natural Resource Academy is being developed by Sealaska Corp., which is partnering with Southeast Alaska Sustainability Strategy. The U.S. Forest Service is funding the academy, which is being delivered through VOTECH in Klawock. The academy will provide field certification to Alaskans working with and in forestry as a career. Participants' main function will be to measure forest growth as it accumulates credits for monetary revenue.



Forestry skills-based training in Klawock trained participants to properly measure tree diameters in the field.

Until recently, universities including UAF have found it difficult to find students interested in studying or working in the forestry profession instead of

“general” natural resources management.

Demand is increasing for people skilled in field forestry and in forest management to address serious issues around community wildfire danger, forest insect outbreaks, tree disease impacts, measuring and monitoring forest health/diversity and also measure carbon credit accumulation.

At this time in Alaska, private, state, federal, Native corporation and Native village forest landowner agencies are looking for technical and professional foresters to fill positions that require practical and technical forestry skills.

Nationwide, the demand for foresters and trained, skilled forest technicians is also on the increase.

Active long-term management seeks to limit tinder-box forest conditions in fire-prone landscapes where wildfires are threatening lives, destroying communities, and wasting resources like timber and watersheds.

In the west and in Alaska, fire-prone conditions and larger wildfires are becoming more frequent and dangerous.

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Academy, continued from page 11

In addition to the wildfire situation, forest management agencies in Alaska are pursuing carbon credit certification that measures the progress of forest land acres in carbon credit agreements. There is a growing demand for people who can do forest field monitoring.

Sealaska is one Native corporate timberland owner turning its focus from revenue through timber harvest to revenue through providing carbon credits within productively growing forests.

Other entities in Alaska are also looking to manage some of their land for carbon credit certification. Carbon credit forest management requires periodic field monitoring and inspections to determine carbon accumulation.



Participants practice skills such as tree identification, field traversing and plot measurement.

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