Fall 2022

The Boreal Forest *Newsletter*

From the editor:

As of this issue, I have a new title! I am now the CES Outreach Forester, and I am still funded by the federal Renewable Resources Extension Act.

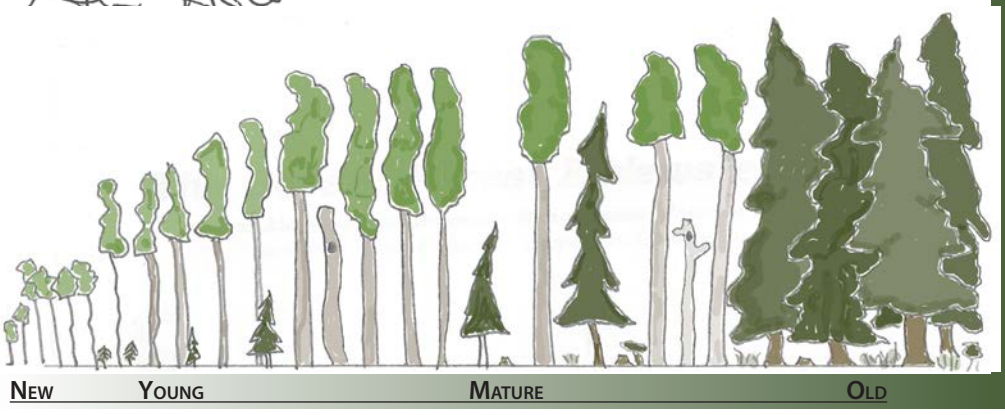
As often as I can, I include articles from the Institute of Agriculture, Natural Resources and Extension. Please contact me at ggholt@alaska.edu to share what is going on. Forestry is alive and well in Alaska and continues to evolve and grow.

Faculty and research here at UAF and from the surrounding forestry community contribute articles, insight, and information about Alaska forests. That is exciting! We will look for more of this so we may share with you what is going on.

In this issue we look at why leaves turn so brilliantly red some years (by UAF's Dr. Jessica Robertson-Young) and at 35 years of forest ecology research by UAF's Dr. Glenn Juday. We will also do an overview of JK Wood Products on Prince of Wales Island; what they are doing; what the future is; and how they practice forestry in their specific location in southern Southeast Alaska. We have an article about wildlife as agents of injury in our forests and yards. And there are other interesting articles related to forestry.

Have a great fall as we speed on toward winter.

What's Inside



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Logging industry worker shortage and a new degree pathway in Idaho

By Glen Holt
CES Outreach Forester
adapted from a story by Andrew Baertlein
September 2022

The timber industry accounts for nearly $2.5 billion of Idaho's economy, according to the Idaho Forest Products Commission, but that industry is and has been suffering a labor shortage for several years.

Second-generation Idaho logger Gerry Ikola has been running the family logging business since the 1970s. He says, "I grew up in it — it hasn't ever been just a job."

But despite Ikola's love for his career pathway, it is a job that is not attracting new workers to the industry. Even despite how large and important the industry is to Ikola personally and to the overall economy of Idaho, no one is sure what the future of the industry and the source of the important products that industry provides will be for the future.

Harvesting is done more by machines like feller-bunchers than previously. Glen Holt photo

"We struggle to have a full crew," he said. The average employee at Ikola's logging company is 55 years old and many of them are close to retirement.

"Who am I going to replace them with?" Ikola asked. "The perception that it's all nothing but physical work is just not the case anymore."

In the 1990s, Ikola hired 15 sawyers: people who cut down trees with chainsaws. Today, he only hires three sawyers. The industry has changed significantly. Most loggers now operate large equipment with buttons and joysticks that harvest, move, and haul logs.

Hand-felling timber is much less common with modern logging operations. Glen Holt photo

"Logging equipment now is mechanized. You get in and there's a lot of resemblance to gaming," Idaho Forest Products Commission Director Jennifer Okerlund said. The demand for Idaho's forest products is increasing.

The University of Idaho is working with Idaho loggers in response to the decline in worker participation by offering a new two-year associate degree program in forest operations and technology.

This is not a four-year Bachelor of Science forestry degree, but a two-year associate degree program designed to train individuals interested in going out

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and working in the field in various forestry and logging operations.

In Alaska, the forest products industry has the same problem: Most people in the industry are older. Younger people aren't as interested in working in the field outdoors. But the demand for forest products continues to increase everywhere, including in Alaska.

Competent forest technicians are in high demand by forest products industries and forest landowners nationwide and in Alaska. Glen Holt photo

A solution is needed soon. Idaho timber industry officials say lumber sales are increasing at rates far faster than loggers can produce, and the industry is concerned about meeting that future demand. It is believed the new technical Idaho degree will offer some relief to the industry; however, the problem itself is difficult to diagnose.

Ikola pays people fresh out of high school $25 per hour and provides specific onsite training. Numbers from the Bureau of Labor and Statistics show Idaho is the highest-paying state for loggers in the entire country. Some in the industry don't think lack of good pay is the whole problem.

Professional consulting forester Clare Doig of Anchorage describes the problem here in Alaska.

In Alaska, forest technicians who know how to cruise timber, lay out timber units and monitor timber sales knowledgeably are in short supply. Glen Holt photo

"What we really need in Alaska, at this time, is skilled forest technicians, people able to work, navigate, and provide expertise in the field," he said.

"The timber industry will need professional graduate foresters in the future, but right now we need trained people able to lay out timber sales, cruise timber, navigate with map, compass and GPS, who know and understand logging systems, and like to work in the woods," he added.

Technology is changing the industry but the demands on it are much the same.

Falling into autumn: Pretty reds can mean pretty dry and warm

By Jessie Young-Robertson
Sept. 20, 2022

Have you noticed more red leaves this autumn compared to the past few years? I have lived here since 2008, and I have never seen so much red in our aspen and birch leaves.
I'm a boreal forest ecologist in the Institute of Agriculture, Natural Resources and Extension at UAF, and I study tree physiology. In the fall, I keep an eye on when the leaves change colors as well as the colors that show up.

Why are there more red leaves this year? It has to do with what the leaf pigments or colors do. First, they absorb light in the visible part of the spectrum.

Chlorophyll makes plants appear green. Chlorophyll is used in photosynthesis, the process of plants using light, carbon dioxide, and water to make oxygen and sugars for growth and reproduction. Chlorophyll is "expensive" for a plant because it "costs" a lot of nitrogen. At the end of the summer, nitrogen is reabsorbed by the plant as the chlorophyll breaks down.

The yellow and orange colors are called carotenoids which is what we see in the autumn.

During summer, carotenoids and chlorophyll are present in the leaf at the same time, but we can only see the green chlorophyll. In the autumn, when the chlorophyll breaks down, the carotenoids' yellows and oranges are revealed. Most of our forest in Fairbanks appears yellow in the fall.

The combination of chlorophyll and carotenoids makes plants more efficient at capturing a wide range of the light spectrum for photosynthesis. Carotenoids also help the plant shed excess energy to reduce the damage too much sun can cause to leaves.

The red colors are called anthocyanins. Unlike carotenoids, anthocyanins are not present throughout the summer. They are produced in the late summer under a certain set of conditions (we'll get back to this in a minute). Anthocyanins form a pigment layer that acts as a screen to protect the leaf from sun damage as the plant moves nutrients from the leaves into the stem when chlorophyll breaks down in mid to late August. Studies have found that plants that turn red versus yellow have better protection from high light stress.

Brilliant red leaves are showing up more often in recent years, as seen in this photo taken in fall 2022 by Jessie Young-Robertson.

What affects the colors we see in autumn? There are species differences. Dwarf birch and the leaves of blueberry plants tend to turn red and/or purple every year. However, aspen and birch tend to turn yellow in Interior Alaska, unless they are affected by the August weather.

In general, plants change color in response to decreasing sunlight. Typically, in August, we have a lot of cloudy days and low sunlight, triggering the plants to start their change. We also have days that are getting shorter, which cues plants for change. The extent of red color and how long leaves show colors depends on temperature and moisture in late summer. More reds

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are produced when days are warm, sunny, and dry, with cooler nights. These conditions lead to a lot of sugar production in the leaves, which contribute to making the red pigments. Cooler nights narrow the leaf veins and trap sugars in the leaves.

This year in Fairbanks, there are more reds present than in the prior 12 years. Air temperature this August has been warm compared to most years, but it is similar to August 2020 when there were not as many red trees. There has been more sunlight reaching the trees this year compared to most years, but again, this is similar to 2020.

The big difference this year is the amount of rain. Rainfall from May through August was significantly lower than in the past five years: about 3.5 inches this year compared to 8 inches in 2020 (7.3 in 2021, 9 in 2019, 6.9 in 2018). It is likely that the combination of low rainfall, warm temperatures, and more sunlight reaching the trees (due to fewer cloudy days from not raining much) has contributed to more reds this autumn.

Warm, dry weather affects how aspen and birch leaves change color in the fall. Pete Pinney photo

Keep an eye out for red aspen and birch when August is dry and warm!

Jessie Young-Robertson is a boreal forest ecologist at University of Alaska Fairbanks' Institute of Agriculture, Natural Resources and Extension.

Report: Russian timber disguised as Asian exports

By Glen Holt
CES Outreach Forester
Adapted and rewritten from a Washington Post article by Michael Tatarski on Oct. 1, 2022

Russian birch wood continues to flow to American consumers disguised as Asian wood products, despite economic sanctions imposed on Russia by the U.S. over its invasion of Ukraine, a new report says.
The Environmental Investigation Agency, a nonprofit watchdog organization based in Britain, found that most birch products currently being exported from Vietnam to the United States originated in Russia. According to Vietnam customs, roughly 40,000 cubic meters of birch wood is transported monthly from Russia and China into Vietnam, where it is manufac-

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Birch is an underutilized resource in Alaska and has potential for increased management throughout Southcentral and Interior Alaska. Glen Holt photo

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tured into furniture and plywood.

The Washington Post article indicates from the EIA reports that Russian wood chairs and bed frames end up on the shelves of major American retailers. The EIA reported that China birch is over 90 percent sourced from Russia. One Chinese company said that all the birch their company uses comes from Russia but is repackaged in China and re-exported to Vietnam with China listed as the country of origin. Russia's Federal Forest Management Agency asserted that the country's timber industry has not been significantly affected by sanctions.

Birch has papery bark and is a common tree species found throughout Southcentral and Interior Alaska. Glen Holt photo

Birch harvested from Russia's vast forests has long been considered the best source of construction-grade plywood used in floors, ceilings and partitions, as well as for decorative purposes on items such as doors and cabinets.

Trade data show that before the invasion of Ukraine, the United States imported hundreds of thousands of cubic meters of birch plywood from Russia annually. Strong demand for Russian birch imports surged in early 2022 before changing course in April, when the U.S. government raised tariffs on Russian birch from 10 to 50%.

From March to April, even as direct U.S. imports of Russian birch plunged, birch plywood imports from Vietnam grew by 206% as reported by the Decorative Hardwoods Association, which represents American hardwood industries.

A senior policy analyst who has studied Vietnam's wood industry for years, confirmed the EIA's findings. Sawed birch timber imports from China to Vietnam increased in the first half of this year, and it's highly likely that birch originated in Russia, he said.

While China also exports birch, the EIA said the world's biggest traders widely preferred Russian birch, which is seen as being more consistent and durable.

In Alaska, birch is made into paneling, flooring, trim, beautiful bowls, and useful kitchen utensils. Glen Holt photo

Thomas Chung, an advocate at the EIA who focuses on Vietnam, said the repacking of birch described by Chinese companies not only violates U.S. trade rules and legislation but could also be considered illegal under Vietnam's timber legality assurance system.

"There is the requirement to know the origin of a wood product as part of a due-diligence process when importing timber or wood products into Vietnam," he said. "This means that even when intermediary markets are used, the origin should be known. Any rebranding should be considered illegal."

35 years of boreal forest research

By Glenn Juday

For the past 35 years, Professor of Forest Ecology Emeritus Glenn Juday has led a team to map and measure all of the white spruce trees in six areas in the Bonanza Creek Experimental Forest, 20 miles southwest of the University of Alaska Fairbanks campus off the Parks Highway.

Each reference area covers 2.47 acres. Every year, Juday and his team measure the survival, growth in height and diameter, and other forest health indicators in the Reserve West reference stand. Reserve West was a 200-year-old white spruce forest that was completely burned in the 1983 Rosie Creek Fire, and so is now a 40-year-old forest.

A team of volunteers, Bonanza Creek technicians, and grad students led by Juday measured all 2,167 white spruce trees that were still alive at the end of 2021.

Data entry and analysis are just starting, but the white spruce trees had another good growth year. Nearly 10% of the trees are now taller than the 764-centimeter (about 25 feet) measurement pole that has been used for a couple of decades. The tallest spruce trees are 36 to 49 feet tall, about a fourth to a half the height of the trees that burned in 1983. Spruce budworm damage was essentially absent. Only a handful of trees

Many volunteers, students, staff, and faculty have assisted research efforts in the Bonanza Creek Experimental Forest for more than 35 years. Photo courtesy of Glenn Juday

Volunteers included Chelsea and Javeon Brigham; Gabriel Madore, Sierra von Hafften, Emily Nichols, Owen Henneman, Anushree Badola, Sumana Sahoo and AJ Hytry.

Juday also highlighted several other students and staff who have joined in the Reserve West fall measurements: Ryan Jess, Kimberley Maher, Miho (Morimoto) Welton, Andrew Allaby, Christin Anderson, Steve Winslow, Scott Sink, Emily Sousa, and Robert Solomon.

Timber Industry: JK Wood Products

By Glen Holt
CES Outreach Forester
The Timber Industry section views Alaska forestry, timber producers and manufactured forest products.

JK Wood Products is owned and operated by Jameson (Jay) and Josh Kohn of Thorne Bay on Prince of Wales Island in Southeast Alaska. They've been in business for five years and have worked in the wood products industry since 1995. Previously, they worked in Washington State with biomass and with their dad's timber business.

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JK Wood Products has been in business on Prince of Wales Island for the last five years. Glen Holt photo

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They purchase standing timber from the U.S. Forest Service in the Tongass National Forest and from Alaska state forestry in the Southeast State Forest on Prince of Wales Island in southern Southeast Alaska.

Their company is most interested in purchasing mature, older-growth red cedar and hemlock and secondarily in purchasing second-growth hemlock, Sitka spruce and red cedar timber as that market develops.

JK Forest Products has two sawmills. This is an LT-40 Wood Mizer band sawmill. Glen Holt photo

JK sells value-added products, including custom, green-cut lumber/timbers, red cedar lumber, siding, and kiln-dried products including milled and kiln-dried house logs. They also produce quantities of firewood and sell much of it to the Southeast Island School District to use in the wood-fired boilers that heat many of their school buildings and facilities. Using wood helps the school district save money they'd normally spend on fuel oil.

Their highest value product continues to be old-growth red cedar manufacturing lumber and milled log products. Their big concern is that less large old-growth red cedar is being made available as the U.S. Forest Service changes forest management policy from including old-growth to only offering second-growth timber.

Second-growth timber is not specifically sought yet for milling products from Alaska, whereas high-value old growth is still in high demand worldwide. Glen Holt photo

Thirty percent of JK timber comes from state-owned forest. In the future, they may purchase timber from the Alaska Mental Health Trust lands in Southeast Alaska on Prince of Wales Island.

JK Wood Products prefers an array of standing timber sources to avoid timber shortages. This is beneficial to small timber producers who may need a variety of access and species options to respond quickly to poor weather, access and market changes.

JK mills lumber for local construction, timbers, D-logs for cabins and processes hundreds of cords of firewood a year for local heating.

JK Forest Products owns and operates two sawmills:

• A diesel-powered LT-40 Wood Mizer band mill, which cuts smooth lumber and yields little waste sawdust due to its narrow saw kerf.

• The electric-powered Mobile Dimension "mega-mill" model, which uses circular saw blades that cut faster but create more sawdust. This mill may be

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JK has an electric Mobile Dimension "mega mill" model circular sawmill which will increase lumber volume output. Glen Holt photo

used to square up a log that may later be milled into lumber using the Wood Mizer.

Efficiency is key for JK within their ability to buy milling and logging equipment and the amount of timber made available to the local industry.

JK Wood Products makes firewood using a multi-Tech 20-inch circular saw firewood processor. This machine cuts logs to firewood lengths, splits it, and has the capacity to process up to 20 cords of split firewood per day.

Processed firewood is piled in boxes or bins and those are stacked using a forklift. The bins of firewood begin the drying process to become seasoned firewood, which is best used in wood boilers, wood stoves or any wood-burning combustion device. Putting the firewood-filled bins under cover of a shed is important to the drying process in Southeast Alaska. JK markets hundreds of cords on the island each year. Much of their lumber is sold green cut but increasingly they use their dry kiln for specialized products.

JK logs their timber with chainsaws, moves it to a landing with a Case 9040 Shovel, and moves logs to their mill with their log truck. They have a self-loading log truck and a rubber-tired loader. JK builds roads to access timber according to landowner specifications.

Split wood may be loaded directly in a truck for transport or stacked in a box to begin drying and shipped to schools. Glen Holt photo

JK Forest Products cut approximately 200,000 board feet of mixed species softwood timber last year, which is less than normal due to COVID-19. They would like to cut and market more than that in a year given their current and expected future capacity for logging and milling.

Many small mill owners are concerned about whether they can maintain economic feasibility. JK prefers to bid on several small individual concurrent timber sale offerings of 100,00 to 150,000 board feet each to make up their wood supply. This helps avoid supply bottlenecks and maintains flexibility and their ability to provide wood products to a variable customer demand.

Smaller timber producers can be vital to local economies with fewer options. They may often prefer flexible timber sale durations in the event of bad winters, road closures, landslides, and the economic scene that might thwart operations or market feasibility from year to year.

Value-added marketing options are important so that producers can offer and participate in higher-value forest products rather than just logs or green lumber. It will be a future challenge to timber landowners that they institute forest management policies that make economic sense for the survival of small timber producers in smaller communities common throughout Alaska.

Forest Service Research

USDA Forest Service Research and Development Newsletter
October 2022

In this section we reference research by the USDA Forest Service and their Research and Development Newsletter, with topics that may pertain to Alaska and may be viewed at: Forest Service Research News: sm.fs.research-web@usda.gov
Or google Forest Service Research News.

Previous Fire and Management Reduces Severity of Subsequent Fire

Current management and reforestation strategies are meant to encourage forests to bounce back from future fires and other disturbances.

Wildfires are part of Alaska's forest ecology. Prescribed fire is used to create habitat like moose browse. Photo by Jim McCann of Fairbanks.

Forest Service scientists and partners evaluated how these strategies fare once a wildfire occurs: https://www.sciencedirect.com/science/article/pii/S0378112721008550

Wildfire is often reduced and more controllable in landscapes that use controlled burning and active forest management practices. Glen Holt photo

They found that burn severity was usually lower in treated forests, especially those treated with prescribed fire. This reinforces the importance of proactive management strategies in reducing future risk to wildfire.

Summer trail crew gets hands-on experience

By Glen Holt
CES Outreach Forester

Reuben Schafir was trail crew boss for the 2022 summer field season of the Alaskan Youth Stewards trail crew program on Prince of Wales Island.
This is a significant youth and workforce development program that Sealaska and other cooperators are undertaking throughout Southeast Alaska to benefit young people in the region.

Schafir graduated from college in May 2022 and since then has taken a job as a full-time reporter/journalist in Colorado after the field season on Prince of Wales.

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Schafir is a friendly, look-you-in-the-eye kind of person and an outdoor enthusiast with outdoor work experience and a desire to work with young people. He especially likes conservation field projects on local landscapes.

This season and amid a host of other projects, Schafir led five AYS youth crew members to clear, build, improve and maintain trails through an interagency trail endeavor on Prince of Wales Island. Additional AYS program crews work in Hoonah, Angoon, Kake and Sitka.

Crew members on Prince of Wales Island operate a four-wheeler and trailer loaded with gravel for the trail they are constructing around Fivemile Lake near Klawock. Glen Holt photo

Along with Sealaska, the AYS program partners with the U.S. Forest Service; the Spruce Root organization; Tlingit and Haida ANCSA village corporations; the Nature Conservancy; the Sustainable Southeast Partnership; the Prince of Wales Vocational & Technical Education Center; and many others.

Crew members Prince of Wales this year were 15 to 16 years old. I observed that this crew worked well together, were productive, worked safely, were learning how to work as individuals and productively as a crew. The program is designed for 15- to 18-year-old students to work with hand tools.

They built trails laid out and marked with flagging set by lead program forester Bob Girt and consulting forester Gary Lawton. Girt is the rural community liaison for Sealaska Corp. He is in charge of the Prince of Wales program and offers the annual local budget to sponsors. Girt has recent specialized grant writing training that helps the program meet objectives. Other grant writers partner with him and are involved with program funding as well.

Crew members on Prince of Wales work together constructing a trail. They work safely as a productive crew. Glen Holt photo

Schafir answers directly to Girt and the program is considered critical to the future of Sealaska's workforce development efforts and program. Girt considers his involvement with AYS as fundamental to his role as liaison with Sealaska.

Girt also collaborates with island schools in the Southeast Island School District to carry educational programs emphasizing natural resources to Prince of Wales as well as employment opportunities. Crew

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students this year were from Craig and Klawock. In the past they also came from Hydaburg (on Prince of Wales), the community of Kake, and the city of Sitka.

AYS program funding is through a partnership, and funds are funneled through a grant distributor or host organization. Recent examples include the Student Conservation Association, the Spruce Root organization, and the Central Council of the Tlingit & Haida Indian Tribes of Alaska. The National Forest Foundation is also a consistent contributor.

Sealaska contributes cash and in-kind contributions each year. A sizable percentage of Girt's salary and Sealaska assets such as vehicles and equipment go toward funding and supporting the program.

The AYS umbrella program has been held on Prince of Wales since 2017. The federal program referred to historically as the Youth Conservation Corp in Angoon and Kake merged with the TRAYLS — Training Rural Alaskan Youth Leaders and Students — program to become the regional program in Southeast Alaska and is now referred to as the Alaskan Youth Stewards program.

On Prince of Wales, the program partners with the newly formed Klawock Indigenous Forest Stewards Partnership hosted by Shaan Seet, a Native corporation based in Klawock, as well as the Prince of Wales Tribal Conservation District.

The long-term program goal is to enhance workforce and professional development for youth on Prince of Wales Island and throughout Southeast Alaska and to contribute to the sustainability of local natural resources in rural communities, combined with indigenous values. Sealaska wants to encourage youth to stay on a local career development pathway if they demonstrate interest.

For instance, a 16-year-old Prince of Wales student in 2022 expressed her intent to study forestry at Cal Poly Humboldt in northern California when she graduates. She spoke with Cal Poly when several AYS students attended the American Indian Science and Engineering Society National Conference a few weeks ago. She plans to work on next year's AYS crew as well.

From left, Gary Lawton, a consulting forester for Sealaska; Frances Zoloth, a Sealaska intern; and Bob Girt, Sealaska rural community liaison on a stream crossing. Glen Holt photo

Another example includes a young man from Kake who started in the TRAYLS program in 2017 and has been on a crew in Prince of Wales and Kake multiple seasons since. Upon graduation from high school, he started college in northwest Washington. During college he spent summers working on a community forestry partnership crew hosted by the Kake tribe. The Keex' Kwaan Community Forestry Partnership, Sealaska, the U.S. Forest Service, The Nature Conservancy, Alaska fisheries entities, and local tribal entities are among the partners involved with this multi-year project.

Crew members on Prince of Wales Island learn to be safe and effective workers, and to develop a positive work ethic. They learn skills like punctuality, appropriate clothing in the woods and about raingear that works in the rainforest. Training is part of the program and students can take these skills on to other jobs in the future.

This program has proven successful and is gaining traction and momentum within Alaska's Southeast.

Wildlife damage to forest and tree

By Glen Holt
CES Outreach Forester

Wildlife can damage Alaska forests, as well as the ornamental trees and shrubs in our yards. These negative effects can be from overbrowsing or mechanical damage caused by antler rubbing or breakage when moose or bears browse branches or berries from upper reaches of a tree.

Winter moose browsing is especially hard on regenerating timber sale units as well as on individual trees and shrubs in your yard. Glen Holt photo

Commercial logging can positively affect wildlife habitat if harvesting is done so that it benefits wildlife, but in Alaska, wildfire generally has a bigger effect. Commercial timber harvest has greater effect on habitat where fire is rare, such as in Southeast Alaska, where it is too wet to allow frequent wildfire activity.

On mainland Alaska, large tracts of even-aged birch indicate a forest ecosystem less than 150 years of age. Beyond this age birch are generally scattered among more prevalent, longer-lived white spruce. The 150-year-old birch forest will continue to decline, and gradually be replaced by a mixed age stand of more shade-tolerant spruce.

As a resource forester for Alaska state forestry in the Mat-Su area near Palmer from 2000 to 2009, I managed state forest commercial timber sales and reforestation projects on logged land. In the Mat-Su area at that time, we seldom cut more than 10% of its biologically determined, Annual Allowable Cut (AAC) except for a couple years when there was a white spruce chip export market to make high-quality pulp.

Larger-sized timber sale units enable more regeneration to escape moose browsing and successfully regenerate a well-stocked forest. Glen Holt photo

During my tenure with state forestry, the timber sale program was limited by environmental concerns, timely markets, road access, logger ability, capacity, technology, and other factors. As a result, Mat-Su timber sale units were generally small, from five to 25 acres. Some private tracts during the chip market were larger, but only for that short window.

All harvest units required a certain level of forest regeneration within seven years after harvest as prescribed by the Alaska Forest Practices Act & Regulations. Getting adequate forest regeneration after harvesting was a problem.

Logging generally causes less disturbance than wildfire, which kills not only the mature timber targeted by loggers, but also the brush and herbaceous vegetation to varying degrees. Wildfire exposes mineral soil throughout the burn, either directly burning down to soil or when burned and dead trees tip over.

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Fire-killed trees often tip over and expose soil, creating good conditions for tree seed germination and forest regeneration. Glen Holt photo

Birch regenerate quickly after extensive wildfire and the more shade-tolerant spruce grow slowly until the birch die back. Glen Holt photo

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Fire in a mixed birch and spruce forest resets forest succession back to an earlier stage of development. That forest ecosystem begins growing a new forest of early successional stage with sun-loving trees such as birch, aspen and balsam poplar. As this forest grows rapidly toward the sun, more shade-tolerant white spruce will begin growing slowly in the understory beneath the birch.

Logging generally removes only mature trees and doesn't create enough disturbance to restart the regenerative process adequately like wildfire or controlled burning. Interior Alaska forests have been adapted to catastrophic change by wildfire for thousands of years. Fire is the regenerative force in Alaska's boreal forest.

Mechanical site preparation is used to remove enough competing vegetation to enable successful tree seedling regeneration. Glen Holt photo

In many areas of Interior and Southcentral Alaska, adequate "site preparation" after logging is necessary to expose mineral soil (mimicking wildfire) to allow tree seed germination and tree seedling survival. Site preparation methods are used to inhibit or remove excessive growths of grass, shrub and herbaceous plants, which are competition for small seedlings. This competition commonly occurs after only logging at a site. Site preparation should be done during or immediately after logging, so grass on the site doesn't completely take it over when more sunlight reaches the forest floor.

Site preparation methods include using a dozer blade or excavator to clear off enough competing vegetation that new tree growth, either by planting or naturally, regenerates the site adequately enough to re-create a well stocked forest.

Inadequate site preparation means that the logged location will probably not regenerate enough new hardwood trees like birch to overcome vegetative competition. In areas with an abundance of moose, there needs to be a large enough area of regenerating trees

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This birch seedling will never grow into a healthy tree due to excessive moose browsing year after year. Glen Holt photo

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to overcome intensive browsing. Site preparation methods should be intensive enough to overcome grass and brush (adequate), and extensive enough (larger acreages) on the landscape to prevent moose from suppressing all new regenerating seedlings.

In an area with limited regeneration most small logging units get completely browsed when winter moose move from snowed-in mountain valleys. Spruce is not prone to browsing and survive better. Birch saplings need to be free to grow beyond browsing or mechanical damage. They cannot survive as a tree if they are continually, season after season, browsed back to the form of a shrub.

Antler rubbing by rutting moose or deer can severely damage yard trees. Glen Holt photo

In much the same way, yard trees and shrubs are prone to wildlife damage. When natural regeneration is limited and other food sources are buried or leafless, a yard owner has little choice except to protect their browse-prone plantings. Additional damage from wildlife can include antler rubbing during the fall rut, and sapling breakage

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Site preparation in 1985. I helped plant spruce and pine. Natural birch regeneration came from seed on mineral soil on this site. Glen Holt photo

Tree wrap can prevent bark damage by mice, voles and antler rubbing by rutting moose and deer. Glen Holt photo

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when moose break down a sapling to get at its tender top shoots for browse.

Snowshoe hares, mice and voles can damage your trees and shrubs during a high cycle population of these species. Black bear damage to fruit trees can be devastating and porcupine damage to tree bark and shoots can occur in areas where they are found

Tree trunk wrap can protect yard trees from antler rubbing and bark damage. Fencing is expensive but in the long term seems to be the best method to protect trees from excessive browsing or antler rubbing. Bears are difficult to dissuade once they've tasted your fruit, so protecting your plantings might include solar electric fencing to keep them at bay.

All of us enjoy wildlife, but it is often a trade-off as to what is acceptable whether managing a forest landscape or expensive yard trees and plantings.

Fencing your high-value fruit trees can prevent wildlife damage and will last for years. Glen Holt photo

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