

The Boreal Forest Newsletter

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From the editor:

Alaska has been my home for 40 years. This state, its people, landscapes, and vastness from the Arctic where I lived in Kaktovik for seven weeks to now in southern Southeast the last four years, continues to fascinate and inspire me.

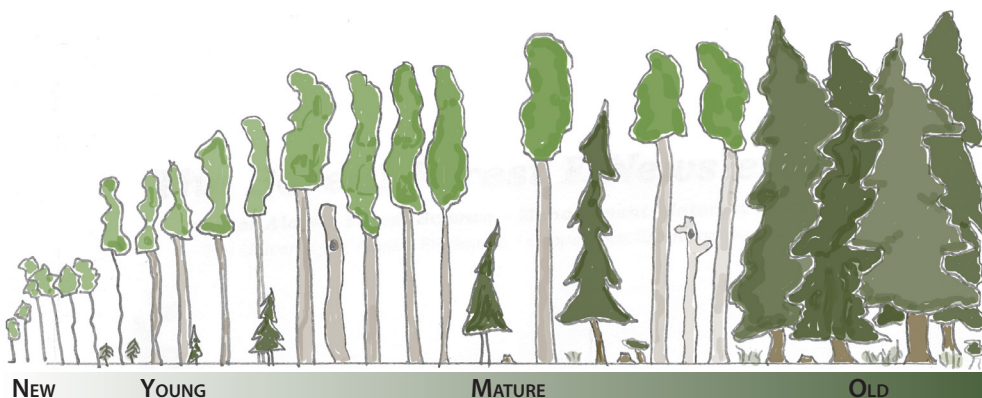
In this issue we look at tree planting as a reforestation option; about a dry firewood program in and around Fairbanks; the importance of burning seasoned dry firewood; how to tell how much wood a pickup truck bed holds; a bit about biomass insulation; carbon storage facilitated when building a home; safety tips for operating a chainsaw; and just in, the Society of American Foresters tree seedling sale. Order them soon!

Please contact me at ggholt@alaska.edu to share what is going on. Remember that a local forestry program provides sustainably grown, locally produced building materials and locally produced energy security. Both these attributes may have real benefits if the cost of transportation continues to increase.




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A reason to plant tree seedlings

By Glen Holt

CES Outreach Forester

Our Alaska forests provide useful timber products, habitats for wildlife, watersheds to protect and store water and reservoirs for hydroelectric energy. They also accumulate and store carbon, provide places for recreation and other important ecosystem attributes.



A forest ecosystem regenerated by fire.

Foresters in Alaska are required by law to plan for reforestation after commercial timber harvesting and meet reforestation guidelines at some time after harvesting. Some areas are too far away or too vast to treat or replant. Planning, assessment, and follow-up is essential to successful reforestation efforts.

One reforestation method is tree planting. The proper size, age and species of tree must be ordered a year or more in advance to be ready to plant. Poor timing of site preparation or seedling arrival can lead to less than successful efforts due to vegetative competition. Competition for moisture, nutrients and sunlight can be a barrier to successful regeneration.

Prior to planting, most sites must be prepared for planting and able to sustain growth through maturity. Site preparation might include soil exposure, brush removal, or herbicide use, all of which is intended to



Site preparation prepares the site for planting and natural regeneration.



Tree planting is an aid to successful forest regeneration.

reduce vegetative competition so planted or natural regeneration is free to grow to a well-stocked and biodiverse forest.

Tree planting should accelerate the reforestation process. It should provide a more desirable tree species mix and not foster a single species ecosystem, which can be susceptible to insect outbreaks.

Reforestation planning most often occurs prior to harvesting. Tree planting can't happen without an available supply of seedlings. As with natural regeneration, tree planting can also be risky. Risks to reforestation include fire, drought, flooding, grass/brush competition, insect outbreak, root/stem rot, diseases

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Site preparation suppresses competing vegetation and is important to natural regeneration as well as planting seedlings.

Seedlings, continued from page 2

like cankers and wilts, frost heaving, damping off, wildlife browsing, equipment damage, livestock, etc.

Foresters plan several years in advance to get appropriate local tree seed, order seedlings on time, receive and store seedlings and line up the labor to plant.

Some level of site preparation is essential prior to planting so seedlings can survive and grow. Planting seedlings in heavy accumulations of grass that grows after harvesting or insect mortality is nearly pointless because expanding grass growth will outcompete them for moisture, nutrients and sunlight.

Foresters are also increasingly looking to regenerate burned areas and ecosystems depleted by insect outbreaks. Getting trees back on a site by planting helps a more timely restoration of all ecosystem attributes much more quickly, sometimes by decades, than waiting for natural regeneration.

Intense wildfires may require tree planting because of seed source loss on hotly burned sites. Young, vigorously growing forests accelerated back to growth by successful tree planting will increase carbon storage more, year by year, than a site that is not planted, and for whatever reason, is not regenerating trees, and may not do so for many years naturally.

Tree seedlings are not cheap. Cones need to be collected at the appropriate time, the seed needs to be

extracted from cones, stored carefully, and sent to a competent nursery on time.

When seedlings are received, they need to be properly stored until planting, and the labor to handle and plant them must be secured for the proper window of time. Planted seedlings may need tending or watering to survive.



Planted seedlings become the future forest.

The cost of site preparation prior to planting can be hundreds of dollars an acre. It must not be done too long before planting or vegetation may re-encroach on the planting site. The cost of all these activities must be factored into budgets and future outcomes anticipated.

Tree planting is becoming more important to restoration. In many areas we either utilize our forests or lose them anyway, to fire, insects, old age, or other forms of mortality. A burned over forest that doesn't regenerate for 20 years or more, may be less of an option and more of a problem for future ecosystems.



Every longtime Alaskan knows the benefit of seasoning and protecting your hard-earned wood supply.

Dry wood program in Fairbanks

By **Glen Holt**

CES Outreach Forester

The Fairbanks / North Pole area of Alaska within the Fairbanks North Star Borough has a dry wood program put together by a partnership of participants to help clear the air in and around the populated areas of that region. Check out the following websites to get a fix on what is entailed and what they are doing.

To access the Alaska Department of Environmental Conservation website “burnwise” firewood program site go to <https://dec.alaska.gov/air/burnwise/wood-seller/>

The Fairbanks North Star Borough has a mandatory Wood Seller Registration requirement that implements its Wood Moisture Disclosure Program, which is designed to encourage communication between wood buyers who want to purchase seasoned wood and wood sellers who have it. The borough is concerned about the significantly increased air

pollution problem when wet, unseasoned firewood is burned in area woodstoves for winter heat. This effort is encouraging less air pollution and safer, healthier living conditions for many, especially seniors, and people with respiratory issues.

These programs are trying to raise public awareness about the importance of burning dry firewood to increase efficiency (more bang for your buck) and to reduce 2.5 ppm air pollution, which can be dangerous to health.

Use this link, <https://dec.alaska.gov/Applications/Air/airtoolsweb/WoodMoistureProgram/>, to identify current wood sellers and to register for this wood moisture program.

New participants can register online for free and people that want to take advantage of this “seasoned wood” resource can find participating dry wood sellers in the area. This site also identifies what the voluntary wood moisture program entails, dry wood use benefits, and how to dry or season wood yourself.

Why burning seasoned wood is better; buying wood from a vendor

By Glen Holt

CES Outreach Forester

Using seasoned firewood with 20% moisture content or less is best in any wood heating device. This is especially important in regions where temperatures get very cold, the air is still for weeks, and temperature inversions trap smoky air close to the ground. Using unseasoned firewood in and near Fairbanks has been blamed for high air pollution and unsafe air quality during the very cold, still air, winter months.

Live winter-cut trees can have 40% or more moisture content. Seasoned dry firewood is less than 20% moisture content. To season firewood: Cut logs in firewood lengths; split each of those rounds more than once; stack the split wood just off the ground (on sticks, lumber, pallets, etc.); and separate stacks a couple of inches to let air circulate and allow drying.



Split rounds of firewood more than once and stack them to begin drying.

Seasoning firewood as described above:

- helps firewood burn more efficiently. More heat is produced from seasoned dried firewood than wood burned green.
- saves time and money. You will have to burn more green wood and cut more, too, compared to burning seasoned dry firewood.
- green wood burns at a lower temperature to burn off the water before it can begin giving off higher temperatures that make heat. A lot less seasoned dry wood is needed, compared with burning green wood.
- reduces dangerous creosote chimney deposits. Creosote is a flammable gummy black tar that forms in a stovepipe when burning green wood and can increase the incidence of dangerous chimney fires.
- creates less woodstove maintenance. Green wood doesn't work well in the newer catalytic and non-catalytic woodstoves. Green wet firewood gums up the catalytic converter that helps efficient combustion.



Firewood from the forest is green with a 40% moisture content or more.

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Moisture, continued from page 5

Dried, seasoned firewood:

- Drying reduces moisture content and causes each firewood chunk to be noticeably lighter than green wood.
- Dried firewood has cracks and checks on the end of each split chunk indicating it has dried and lost much of its moisture.
- Has an average moisture meter reading taken at both ends and in the middle of a split firewood chunk that is 20% or less moisture content.

Signs firewood is wet or unseasoned:

- A smoky chimney or stove pipe.
- A smoldering fire.
- A sooty woodstove window.
- The pungent odor indoors of creosote from the chimney.

If buying firewood, treat it like any other utility. Buy from a reputable dealer. A cord of firewood is a stacked unit that measures 4-feet tall by 4-feet wide and 8-feet long. A cord equals 128 cubic feet. A pickup bed 5-feet wide by 6-feet long with firewood stacked 4.3 feet high is also a 128 cubic foot cord of wood.



Measure the load of wood you buy to see if it is 128 cubic feet, a cord.

Get a moisture meter at a local woodstove store and measure the moisture of wood you buy to see if it seasoned, if that is what you are paying for.

Refer to this UAF site through the Institute of Agriculture, Natural Resources and Extension to get more firewood information: <https://www.alaskafirewoodinfo.com/>



A moisture meter is a handy tool to check if firewood is dry.

2023 SAF tree seedling sale

By Glen Holt

CES Outreach Forester

This year the Society of American Foresters tree seedling sale is 100% online. Go to the following link to access the online store: <https://forestry.org/cook-inlet-seedling-sale/>

The SAF is working with the Confederated Salish & Kootenai Tribal Nursery in Ronan, Montana, to grow seedlings that will be offered to people all over Alaska. The nursery has decades of experience growing trees and has shipped seedlings to Alaska previously.

When seedling distribution dates and locations

are determined, purchasers will be notified by email and the information will be posted on the SAF Seedling Sale web page.

Purchasers in 2022 who did not receive seedlings last year and elected to have orders filled in 2023 will be contacted directly.

Other links to the Society of American Foresters in Alaska include:

AKSAF Cook Inlet Chapter
PO Box 240432
Anchorage, Alaska 99524-0432
www.alaska.forestry.org
treesalecisaf@gmail.com



These wood chips could be biomass turned into insulation board.

Biomass insulation bonded with fungal mycelium

By Glen Holt

Adapted from an article in the Anchorage Daily News by Ned Rozell from a conversation he had with Robbin Garber-Slaght at the Cold Climate Housing Research Center in Fairbanks.

Insulation is often made of oil-based material that gives off significant carbon in its extraction and manufacture. Foam insulation is petroleum based and remains in the environment a very long time. This is a problem. Foam insulation breaks down into smaller and smaller particles that are still always foam.

Robbin Garber-Slaght, an engineer working for the National Renewable Energy Lab's Cold Climate Housing Research Center in Fairbanks and Philippe Amstislavski, an expert on various fungi with the University of Alaska Anchorage, combined forces to study making a woody biomass fiber insulation board that would be bonded by fungal mycelium fibers.

Their process takes locally obtained woody biomass and turns it into locally produced fiberboard insulation. Unlike foam, wood insulation breaks down back to soil and won't emit toxic chemicals or clog up the digestive tracts of sea animals. Conversely foam insulation always remains unchanged in the environment.

Foam insulation is manufactured elsewhere and shipped to Alaska. Locally made biomass insulation can save expensive shipping costs and add to our local employment and economic base.

The manufacture of petroleum-based plastic foam insulation is only beat out by manufacturing steel with regards to emitting carbon dioxide (CO²). The Garber-Slaght and Amstislavski collaboration indicates their biologically based Alaska-made product is

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Biomass, continued from page 7



Biomass is often a byproduct in manufacturing more valuable forest products including lumber.

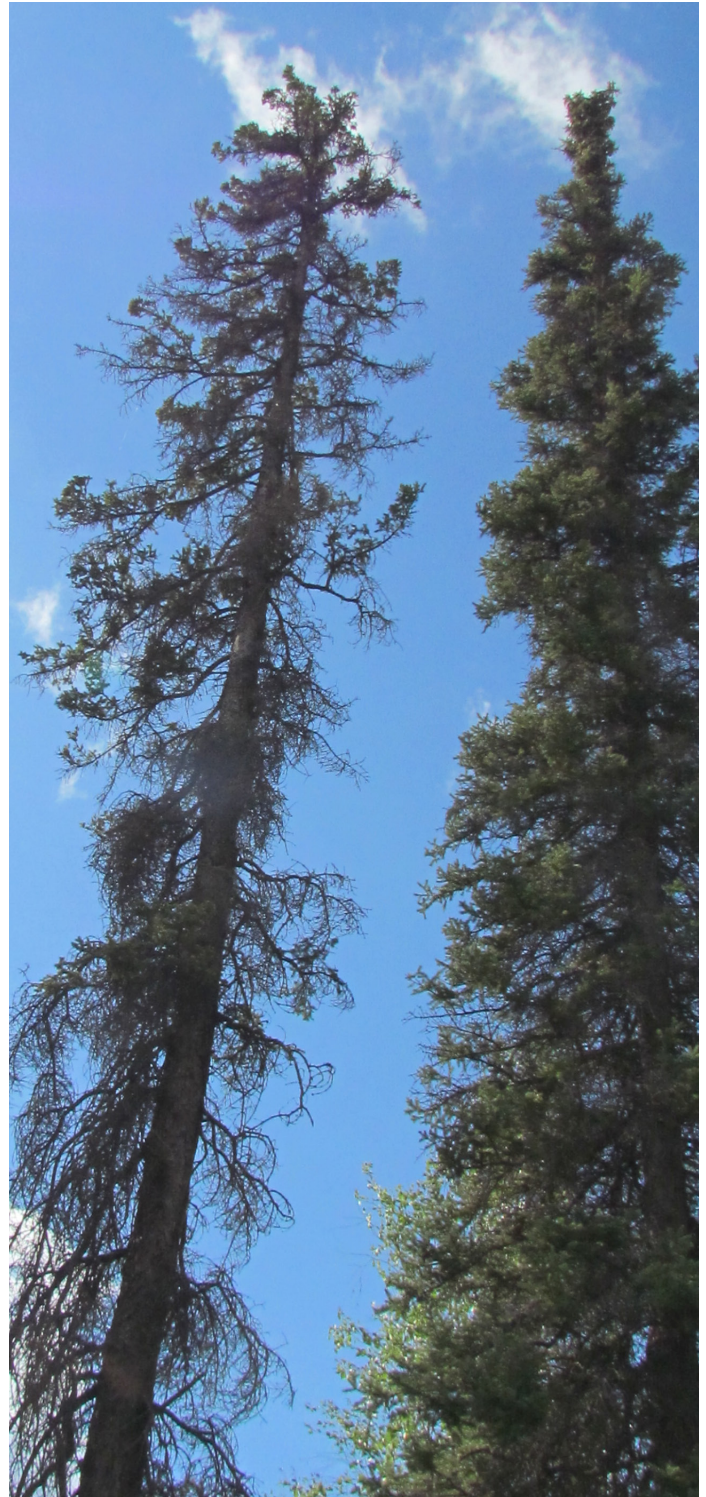
like foam in insulative value. This biomass board also repels water and doesn't trap it, which are important considerations in warding off mold and rot.

Part of their research determined which types of fungi will form a dense matrix-like bond and bind the biomass insulation board into a batt. Together they determined the necessary mixture of wood fibers and specific fungal mycelium. Fungal growth is stopped in the wood and insulative batt during a drying process that fixes the product and stabilizes it.

The right combination of ground-up birch and spruce wood makes up the insulative panels. The team is working on fire resistance. Garber-Slaght, the engineer, is looking to devise a portable insulation-making method that can be shipped in a single Conex container to communities that have available local wood. One local resource in certain areas may be the abundance of beetle-killed spruce trees as raw woody material to make biomass.

Making an effective local insulation in the community where it is needed would greatly save the ever-increasing costs of shipping. Appropriate insulation is important to the construction of homes needed in rural arctic and subarctic communities.

Amstislavski and Garber-Slaght hope to keep previously fixed carbon from trees by turning it into



Beetle-killed spruce in Southcentral Alaska could be a biomass source.

insulation panels, and out of the atmosphere. Their process and product also may help reduce the amount of plastic foam insulation that finds its way to the ocean.

Carbon stored in homes and trees

By **Glen Holt**

Adapted from the Forest Service Research and Development Newsletter

Sustainably harvested timber used in home construction sequesters carbon from logged trees over the long term. It is possible the carbon sequestered and preserved in a home would last longer than if left in a tree that risks loss by fire, rot, wind or insects and is given off to the atmosphere. More than 90 percent of new single-family homes are constructed mainly with wood. This carbon storage capacity adds up as more homes are built. Previously built homes continue to store carbon sequestered when those homes were originally constructed.



Unlike the burned forest, this constructed wood home continues to store carbon if it remains standing.

Every structure built of wood continues to store the carbon that was sequestered in the trees that grew. This carbon now is preserved as a durable wood product.

New research by Forest Service partnerships and Forest Service scientists indicates wood used to build and maintain houses continue to account for



This log furniture stores carbon.

half to more than three-quarters of the carbon stored in wood products annually.

Outcomes depend on yearly construction trends including the number of new homes built, their size, and the number of homes that underwent home improvement projects.



This log home stores carbon in the wood from which it was made.

Check out the following report by research shared through the Forest Service Research & Development Newsletter to learn more about this topic:

<https://fs.usda.gov/research/treearch/64622>

In addition to capturing stored carbon by harvesting trees and making durable products, live trees obviously store carbon as they actively grow. What is not so obvious is how much carbon they sequester. Forest Service Research continues to study and measure the amount of carbon sequestered in trees during all phases of forest development.

Their research compiled almost 3,600 wood observations and determined an average of 47.4 percent of this wood was carbon sequestered from the atmosphere during photosynthesis and other plant chemical interactions. Go to: <https://fs.usda.gov/nrs/highlights/2256> to get more of the story from U.S. Forest Service and partnership research on this topic.

Tips for safe chainsaw use

By Glen Holt

CES Outreach Forester

The Occupational Safety and Health Administration (OSHA) considers the chainsaw to be the most dangerous power hand tool. In some European countries, a person cannot purchase a chainsaw without first taking a chainsaw safety class. Prior knowledge and training can help prevent costly and debilitating accidents. A good chainsaw cutting video may be downloaded on YouTube. View those made by chainsaw manufacturers.

Chainsaw size should match the timber being cut. Residents of Southeast Alaska may encounter larger trees than do people living in Interior Alaska. Also, get a saw you personally can handle.



Have all your tools ready before going to the field to cut wood.

First, read the owner's manual. Even if you know chainsaws, you will pick up useful details on the safe, and efficient use of running that chainsaw. Note specifically the oil/gas mix ratio. With a permanent marker, write the mixture on that saw. Also, read how to start that chainsaw. It's no fun pulling a saw 20 times when three pulls will work. Read the manual.

Wear appropriate clothing, including a long-sleeved shirt, long pants and boots with toe protection. Don't forget eye protection, ear protection, chainsaw chaps, and a hard hat when felling trees and



Wear PPE when cutting any amount of wood, to protect yourself.

gloves to protect your hands. This safety gear is termed "personal protective equipment" (PPE). Get and use your own PPE. Don't wear loose, flappy clothing that can trip you in the woods.

Don't use a chainsaw when sick or tired. Don't drink alcohol, take drugs or medication that makes you sleepy when operating a chainsaw.

Make sure your chainsaw is maintained, has been cleaned since the last use, the gas and oil is full, and the chain is sharp. Take a chainsaw ready to go each day in the woods. A dull saw chain is more dangerous than one that is razor sharp. Dull saw chains can help cause "kickback" and fatigue.

Make sure your chainsaw chain brake works. It

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Chainsaw, continued from page 10

Maintain your chainsaw and have it ready before going to the woods.

will help prevent injury from kickback. Tighten the two chainsaw bar nuts, check the muffler bolts, grease the chainsaw bar tip, adjust saw chain tightness as described in the owners' manual, and clean the air filter prior to each day of use. A dirty air filter can cause the saw to run faster than idle, which can be a danger to the sawyer and others as they work around a sawyer to pull brush and branches.

Watch what is going on around you when using a chainsaw. Look up at the tree before cutting and check for hanging branches and widow makers in that tree and in the trees next to the one being cut. Clear the brush from around the tree to be felled. Make an escape route about 45 degrees away from the tree before starting to cut.

Watch the cut tree as it falls over at the top but also at the stump as you step away from it to make sure branches or rotten treetops are not flying back at you. Don't cut with a chainsaw higher than shoulder height. This is unstable and fatiguing. Remember, safety first.

Be careful using chainsaws during high fire danger weather. Sparks from the muffler or chain can start wildfires. Don't cut trees near powerlines, vehicles or buildings.

Avoid chainsaw kickback, which can cause serious



Look up into the tree for loose branches before cutting.

injury. Run the saw at full speed. This is what your saw is designed to do. Very little if any actual pressure needs to be applied on the saw to force it to cut if the chain is sharp and the saw is running properly.

To avoid or reduce the incidence of chainsaw kickback:

- Keep your face from being directly above the cut. Hold the saw a little off to the side. If the saw kicks back it won't be as likely to hit you in the face or neck. Kickback often happens instantly.
- Hold the saw firmly with both hands and keep arms at the elbows as straight as possible.
- Don't cut with the very top of the chainsaw bar tip. This is the kickback zone on a chainsaw.

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Chainsaw, continued from page 11

- Be careful cutting brush and of what is on the other side of a log being cut so as not to strike anything with the tip of the running saw chain.
- Check for nails, spikes and ingrown fencing. These materials are harder than wood and can cause kickback.

Warn others near you before felling a tree. Never leave a tree only partially cut down. This can kill someone later. Keep your chainsaw in top running condition. Use new, good gas that is properly mixed and make sure the gas and oil are full before cutting a tree down. Only use a sharp chain when cutting trees and bucking firewood. Do maintenance prior to any field cutting day for safety and efficiency.



The top tip of the chainsaw bar is the kickback zone.

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Institute of Agriculture, Natural Resources and Extension
1751 Tanana Loop
P.O. Box 756180
Fairbanks, Alaska 99775-6180

Phone: 907-474-5211
877-520-5211 (toll free in Alaska)
Fax: 907-474-2631
Email: UAF-RREA@alaska.edu