Summer 2021

The Boreal Forest Newsletter

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From the Editor:

This summer forestry entities are in the field fighting fire, and managing forests throughout North America. Many of us are guardedly optimistic this will begin a return to business as usual in Alaska's forests.

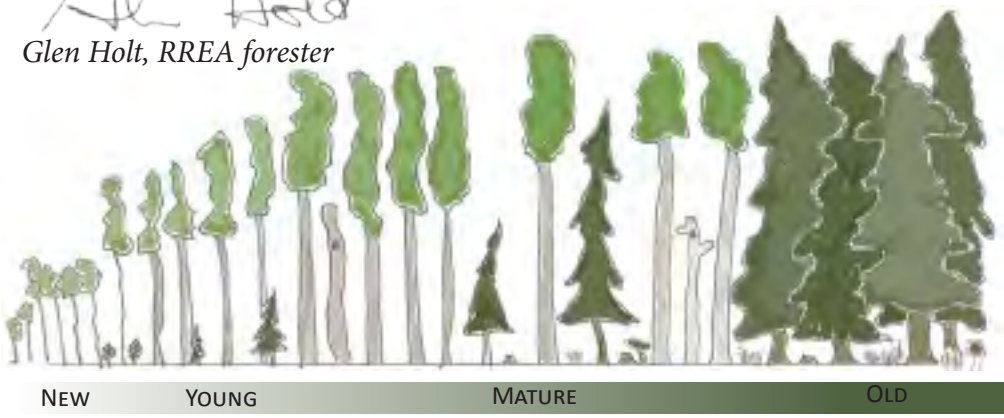
We begin a new section here on forest ownership in Alaska and start with the USDA Forest Service. I worked for the Forest Service seasonally from 1979 through 1982. Fighting forest fires is how I put myself through college. In the future we will look at job opportunities there and throughout forestry.

This issue looks at:

- Forestland ownership in Alaska starting with national forests.
- The Tongass National Forest in Alaska.
- The new Tongass Forest Sustainability Strategy.
- Soil compaction and timing tree fertilization for yard trees.
- Project Learning Tree: environmental/forestry education in Alaska.
- The featured tree is the Pacific yew.
- Introduce wildlife habitat in Southeast Alaska.
- Forest Pests: The Western blackheaded budworm.

A standard firefighting order I've adapted to life in general, especially living and working in the woods, is as follows: "Fight fire aggressively, but provide for safety first." Carry on!

Glen Holt, RREA forester



What's Inside

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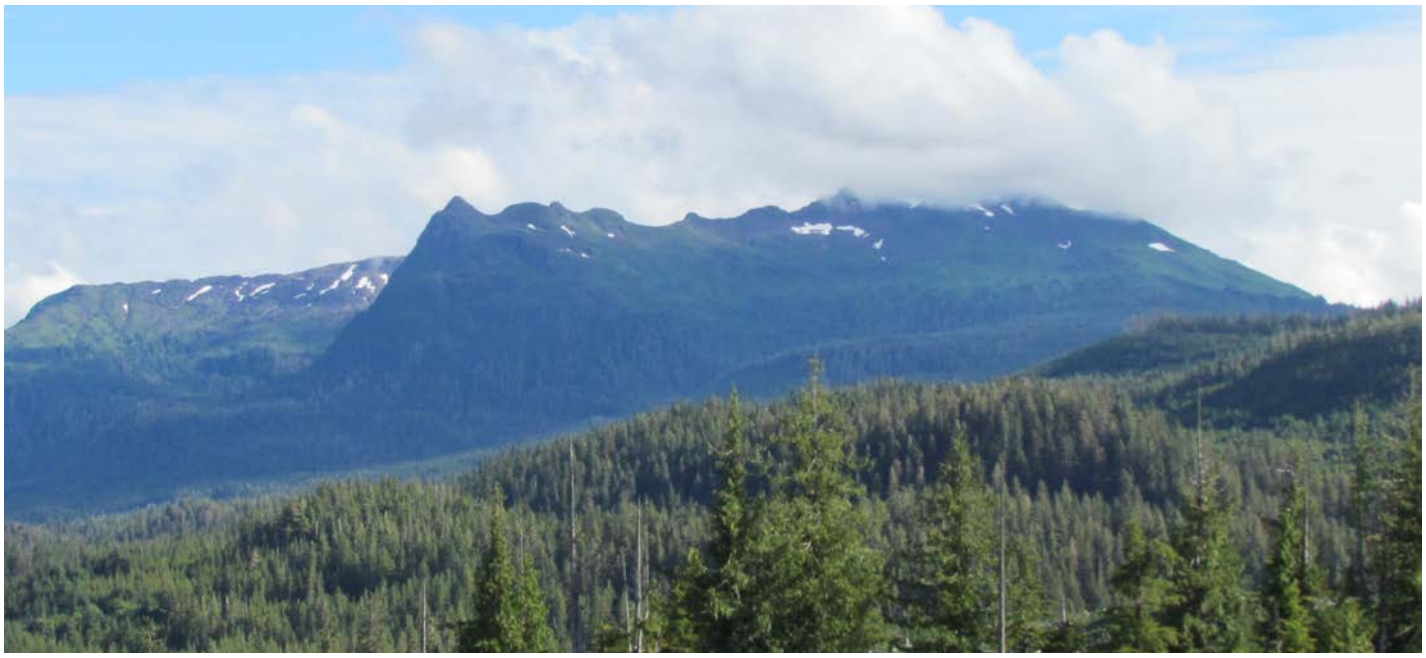

The Tongass National Forest is located in Southeast Alaska.

Forestland Owners: The USDA Forest Service

Glen Holt, RREA forester

Future issues of the Boreal Forest Newsletter will look at forestland owners in Alaska; identify who owns Alaska forestland, why; what they manage, their goals, objectives and policies; who they employ, why and to what extent. We will present a variety of owners including federal, state, corporate and private.

We begin by introducing the U.S. Department of Agriculture's (USDA) Forest Service (USFS), a government agency and the largest single landholder of forest lands in the United States. Historically, their dominant concern was to protect the nation's forests, watersheds and grasslands and to provide a continuous supply of timber and range and to manage wildfires.

The U.S. Forest Service was established in 1905 by President Theodore Roosevelt. During his two-term presidency, Roosevelt placed approximately 230 million acres under protection including the new U.S. Forest Service lands.

The USFS oversees and manages nearly 193 million acres of federal land, and within that land base, 154 national forests and 20 national grasslands. That area makes up one-fifth of all forestland in the United States and 1.5% of it globally.

Since then, the Forest Service has changed and grown. USFS management has broadened through acts of Congress, the courts and public input to include the original conservation of natural resources for the future but also toward present day quality of life considerations interested in environmental conditions.

The Forest Service Mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands and to meet the needs of present and future generations, through five main activities:

1. Forest protection and management
2. Research
3. State and private forestry
4. International programs
5. Workforce development

In the last 115 years, the public continues to expand the list of what they want from national forests. Today, nearly 30,000 people work for the USFS providing employment for an array of professionals, technicians, trades and laborers including foresters, technicians, firefighters, biologists, ecologists, geologists, hydrologists, planners, engineers, equipment operators and others.

For more information about the Forest Service and what they do, go to: https://www.fs.usda.gov/

The Tongass National Forest

Glen Holt, RREA forester

The Tongass National Forest is largest of the two National Forests in Alaska and encompasses nearly 17 million acres of federal land in Southeast, Alaska. It is the largest national forest in the United States, and the largest contiguous temperate rainforest in the world. The Tongass sustains dozens of communities and native cultures and enables occupations in recreation, tourism, fisheries, mining, timber harvest, wilderness experiences and others. Designated by President Theodore Roosevelt in 1907, the Tongass is over 100 years old.

The Tongass National Forest practices sustainable forest management.

The Tongass National Forest encompasses the largest contiguous temperate rainforest in the world.

More than 2.8 million people visit the Tongass National Forest annually, generating more than $380 million in spending with over 5,000 jobs attached just to the visitor and tourism industry, while it protects and maintains some of the most diverse and beautiful ecosystems in the country.

Within this vast national forest, people come to Ketchikan on Revillagigedo Island; Hoonah on Chichagof Island; Petersburg on Mitkof Island; Craig and Thorne Bay on Prince of Wales Island; Juneau on the mainland; Sitka on Baranof Island; Angoon on Admiralty Island; Wrangell on Wrangell Island; Yakutat on

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Tongass National Forest, continued from page 3

the mainland; and a host of other bays, inlets, glaciers, rivers and millions of acres of wild and primitive land in, around and through it.

The Tongass National Forest is the location of 32 towns and villages. These communities are enabled by a large assortment of natural resources including sustainable supplies of timber, the production of approximately 64 million salmon from its watersheds, and a growing tourism industry.

Salmon from the Tongass support 1 in 10 jobs in Southeast Alaska. Sport fishing in the Tongass is described as "phenomenal" and there are lodges and guide services that cater to sport fishermen helping to support the local economy.

The Tongass National Forest itself offers 142 rustic reservable cabins, 210 campsites within 13 campgrounds, 19 wilderness areas, two national monuments, and 450-miles of hiking trails there. There are more brown bears on one island (Admiralty) than the entire Lower 48 combined.

Cabins, interpretive sites and many miles of maintained trails are in the Tongass.

National Forest activities within the Tongass include: interpretive trails, fishing derby's, Junior Ranger Programs, Family Field Guides, kayaking, air charters, flight-seeing, ferry systems, boat rentals, fishing charters, bear viewing, tide pools, glacier viewing, bed and breakfasts (B&B), bird watching, cave tours, boardwalks, stream fishing, wildlife observation sites, and a road system built by the timber industry during its hay-day for exploring by car on Prince of Wales, Island.

Learn more at www.fs.usda.gov/tongass

- Forest Supervisor's Office in Ketchikan: 907-225-3101
- Admiralty National Monument Juneau Ranger District in Juneau: 907-586-8800
- Craig Ranger District on Prince of Wales Island in Craig: 907-826-3271
- Thorne Bay Ranger District on Prince of Wales Island: 907-828-3304
- Hoonah Ranger District: 907-945-3631
- Ketchikan Misty Fjords Ranger District in Ketchikan: 907-225-2148
- Petersburg Ranger District in Petersburg: 907-772-3871
- Sitka Ranger District in Sitka: 907-747-6671
- Wrangell Ranger District in Wrangell: 907-874-2323
- Yakutat Ranger District in Yakutat: 907-784-3359

Public Forest Management

A new Tongass National Forest Southeast Alaska Sustainability Strategy

Adapted from USDA Press Release No. 0157.21

The U.S. Department of Agriculture (USDA) announces a new Southeast Alaska Sustainability Strategy to help support a diverse economy, enhance community resilience and conserve natural resources. Within this strategy, the USDA will consult with tribes and Alaska Native corporations, and engage partners and communities in a collaborative process to invest approximately $25 million in financial and technical resources in sustainable opportunities for economic growth and community well-being and identify priorities for future investments.

A key part of this strategy will end large-scale old-growth timber sales in the Tongass National Forest and instead focus management resources to support forest restoration, recreation, climate resilience, wildlife habitat and watershed improvement. Small and micro old-growth timber will still be offered for community consumption and cultural uses such as totem poles, canoes and tribal artisan use.

The strategy proposes to restore the 2001 Roadless Rule protections on the Tongass National Forest, encompassing 9.3 million acres of the world's largest temperate old-growth rainforest.

USDA agencies, including the Forest Service, the Natural Resource Conservation Service, and Rural Development, will consult and work with tribes, partners and communities in Southeast to identify investment priorities that reflect diverse regional needs and opportunities, including for recreation, fisheries and the fishing industry, mariculture, renewable energy, sustainable timber management including for young growth, traditional and customary cultural uses, and carbon sequestration.

The Tongass National Forest is the largest national forest in the United States.

The USDA will have a locally based team to consult with tribal governments and Alaska Native corporations to meet with stakeholders, communities and partners to identify practical near-term opportunities to deploy up to $25 million in additional funding and technical assistance for projects and workforce development in the region. The team will recommend opportunities for longer-term investments responsive to tribal and local priorities for sustainable economic development in Southeast Alaska, and support ongoing partnerships complementing the work of Indigenous Guardians Network, the Sustainable Southeast Partnership, the Hoonah Native Forest Partnership, the Keex' Kwaan Community Forest Partnership, Tribal Conservation Districts, the Southeast Conference, and the Forest Service and NRCS's Joint Chiefs' Restoration Initiative project.

The team also will build on collaborative work between the state and the Forest Service, Rural Development's work with municipalities, tribal governments, Alaska Native corporations and other partners on community and economic development, and partnerships that collaborate and respect indigenous knowledge, building trust and opportunity in Southeast Alaska.

USDA's actions are intended to support local Southeast Alaska economies and preserve Alaska's expansive, increasingly rare, old-growth temperate rainforest. The strategy will advance economic, ecologic, and cultural sustainability in a manner directed by local voices and which builds on the region's private-sector economic drivers of tourism, fishing and recreation. In implementing this strategy, USDA will prioritize respecting tribal sovereignty and self-governance, renewing their commitment to Federal Trust responsibilities, and engaging in regular, meaningful and robust consultation.

Tree Health and Fertilization

Glen Holt, RREA forester

Alaska's forest health is declining due to environmental stress and is affecting middle- to older-aged trees in the forest and especially in long-established neighborhoods. Stress factors include warming and drying trends, which lead to declining vigor.

Yard trees are often planted or retained on highly disturbed sites where soil fertility is diminished due to land clearing, house building and access development. Middle- to old-aged forests and trees in Alaska are naturally exhibiting slowing growth; reduced production of plant protective compounds; greater accumulations of forest floor grass growth cooling the soil and tying up nutrients; increased sunlight (fostering more grass/brush competition) and increasing levels of insect outbreaks and tree disease.

Soil disturbance around mature trees is stressful to them.

Soil moisture stress and less nutrient availability leads to reduced tree growth. Soils that are dry, compacted by equipment, low in fertility or with root systems compromised by insects or diseases are less able to take on or give up sufficient moisture. These trees will have lower levels of photosynthesis and much slower growth.

Tree health is also affected by soil fertility and nutrient deficiencies. Fertility is diminished on sites that have been disturbed by construction. Yard owners often fertilize their trees and lawns to enhance tree growth on damaged soils. Trees and plants require an array of nutrients, however, nitrogen (N), phosphorus (P) and potassium (K) comprise two-thirds of the total mineral content of tree tissue.

Fertilization can increase photosynthesis and improve tree growth. Fertilizing middle aged and older trees should boost their root system's ability to take up moisture and fight off insects.

Compacted soils around established yard trees make it harder for them to take up moisture and fight off insect attacks.

Nitrogen is one of the most important nutrients. Deficiency can be noted by leaves turning light green to yellow (known as chlorotic). Severe deficiency is indicated by leaves appearing scorched along their margins and may lead to the death of that leaf. However, adding too much nitrogen can be toxic.

Fertilization can increase photosynthesis and improve tree growth. Fertilizing middle aged and older trees should boost their root system's ability to take up moisture and fight off insects.

Application of an N-P-K fertilizer can improve:

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Tree Health, continued from page 6

- Low moisture availability (when applied during a period of sufficient moisture in order to increase root surface)
- Soil compaction (enhanced root development leads to reduced compaction)
- Recovery from physical damage
- Ability to compete with grass accumulations and other vegetation
- Insect and disease problems

Get your soil tested

Turn in a sample of your soil to your local University of Alaska Fairbanks Cooperative Extension agent. They will have it analyzed and then advise you on how to remediate your soil to best advantage.

Limit fertilizing to the proper season

Over fertilizing or at the wrong time of the year can be harmful. In Alaska, the best time to fertilize trees is in the spring after the snow is gone and the leaves are fully developed.

Re-stimulating a tree with fertilizer after the end of July can result in severe cold weather injury to the tree.

For application rates reflecting the current and ongoing knowledge of tree fertilization look at the UAF Cooperative Extension Service publication titled "Tree Health and Fertilization: FWM-00119," in which much of the material here was found.

The Project Learning Tree (PLT) Program in Alaska

Project Learning Tree, better known in the education community as PLT, has been around a long time in Alaska and the United States and provided many teachers and educators with materials to deliver forestry and environmental education activities and curriculum for K-12 students.

Here are links to PLT:

• **Green Jobs: Exploring Forestry Careers:** https://www.youtube.com/watch?v=r4UmY6QLDtk

• **Forest Literacy Framework:** https://www.plt.org/forestliteracy

For more information about the Project Learning Tree program and their options for environmental education, contact: Molly Gillespie, the Alaska PLT Coordinator at: alaskaplt.molly@gmail.com

A PLT workshop and teacher training about PLT curriculum.

Featured tree species: Pacific yew

The Pacific yew (Taxus brevifolia) also called western yew and mountain mahogany, is a shrubby to medium-small coniferous evergreen tree usually less than 49 feet tall and less than 20 inches in diameter. They are extremely slow growing and hard to age due to rot in older ages.

They are found as far north as southern Prince of Wales Island in southern Southeast Alaska. Pacific yew grows as a tree beneath a closed forest canopy of overtopping late successional stage forests beneath hemlocks, Sitka spruce and cedars. In Alaska, this shade-tolerant species often grows short and stunted with multiple tops.

Pacific yew has thin scaly brown bark covering off-white sapwood around a darker heartwood that varies in color from brown to a purplish or deep red.

The needles are evergreen, lanceolate shaped, flat, dark green, just over an inch long and less than 0.1 inches wide. The needles appear to align in two flat rows.

The seed cones are highly modified, each containing a single seed from 0.1 to nearly 0.3 inches long, partly surrounded by a modified scale that develops into a bright red berry-like structure called an aril, which itself is from 0.3 - 0.6 inches long and wide and open at the end. Arils of the Pacific yew mature 6–9 months after pollination. Male cones of this generally dioecious species are globe shaped, 0.10 – 0.24

Pacific yew needles are soft to the touch and lay in two flat rows.

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Pacific yew, continued from page 8

inches in diameter and give off pollen in early spring.

It is an uncommon tree species yet has significant economic, social and cultural value in the Pacific Northwest. Pacific yew has been used by Native Americans to make bows and canoe paddles, and other items of daily use.

Pacific yew has been used to derive the cancer fighting drug Taxol used to treat breast, ovarian and lung cancer. Since it was becoming scarce when its chemotherapeutic potential was realized, the Pacific yew was never commercially harvested from its habitat on a large scale. The widespread use of Taxol was enabled when a semi-synthetic compound was developed from extracts of cultivated yews of other species and this is taking the heat off wild stocks of this less common but significant tree species.

This information was adapted from Wikipedia, the Free Encyclopedia

What's bugging Southeast Alaska?

Adapted from an article by Elizabeth Graham

After a 30-year break, Alaska Region entomologist Elizabeth Graham is keeping a close eye on an outbreak of the western blackheaded budworm in the Tongass National Forest.

The Forest Health Protection team heard about the insect's activities and conducted its annual aerial surveys to detect the extent of the outbreak. The survey data is still being processed, but the hardest hit areas include Admiralty, Baranof, Kuiu, Kupreanof, Mitkof, Prince of Wales, Wrangell and Zarembo islands, as well as several drainages on the mainland as far north as Juneau.

Western blackheaded budworms are one of the major disturbance agents in the Tongass National Forest. Caterpillars feed on the buds and new growth of hemlock, which is causing hemlock trees to turn reddish-brown.

Some trees may not survive but those that do may benefit in the long-term with increased light and nutrients to the forest floor. The tree's top may die in heavily impacted areas. In extreme cases mortality can occur.

Western blackheaded budworm outbreaks recur periodically in Southeast Alaska. The most recent took place in the mid-1990s. A more extensive and intensive outbreak occurred in the 1950s in the Tongass. The results of these outbreaks were top kill and scattered areas of mortality.

As the budworms turn into moths in the coming weeks, Alaska Region entomologists are looking for help tracking the insects to learn more about what next year's budworm population may look like.

Ted Sandhofer, Petersburg district ranger, uses a beating sheet to help the Forest Health Protection team survey and collect hemlock defoliators. The sheet is placed under branches and beaten, insects fall into the sheet. The defoliators are collected, identified and recorded. USDA Forest Service photo by Elizabeth Graham.

Several methods are used to track insect activity, including iNaturalist, a social media platform allowing users to upload observations. Data related to sightings of the insect and tree damage are automatically uploaded into the Alaska Forest Health Observations Project.

"We are hoping to improve our monitoring with the public being our eyes on the ground," Graham said. "We plan to use those observations in our national reports on forest health."

The Forest as Habitat: Southeast Rainforests

Glen Holt, RREA forester

Basic wildlife habitat requirements include: food (adequate to every seasonal need), cover (nesting cover may be different than winter protective cover), water and living space (variable by gender and species).

Southeast Alaska forests are covered with Sitka spruce, western and mountain hemlock, red and yellow cedar, black cottonwood, alder and shore pine.

Habitat requirements can be specific to a wildlife species. Some factors might overlap and the species then would be in competition for those resources like seasonal food, or nesting cover, or living space.

Sitka black-tailed deer and black bear live in the forests of Southeast Alaska and may occupy much of the same area, but their specific requirements for food, cover and living space are not similar and so they don't directly compete for most of those basics. However, black bear in spring when deer fawns are born can become a significant predator for weeks before the fawns grow large enough to get away.

The forest habitat in Southeast Alaska is identified as the Northern Pacific Temperate Rainforest Ecoregion and is characterized by high amounts of rainfall and moderate summer and winter temperatures. Its landscape consists of mainland surrounded by islands and fiords near the ocean. It is often dominated by steep mountainous terrain with many wildlife species that depend on both the forest and the ocean.

The five species of salmon found here are referred to as the "keystone species" of Southeast Alaska's temperate rainforest. Salmon are important to aquatic and terrestrial animals by the nutrients they contribute first in the streams where they spawn and die and later as bears, birds and other wildlife distribute their remains throughout the forest, recycling nutrients from the sea to the environment from which they originated.

Salmon return from the ocean to spawn and leave their remains as nutrients to the rainforest.

Temperate rainforest conditions favor the presence of lush moss that covers nearly everything along with species of ferns, berry bushes, other shrubs, forbs and plants unique to this ecoregion.

A rainforest sea bird, the marbled murrelet, nests and sleeps in old growth trees by night and feeds in the ocean during the day. Other iconic wildlife of this

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Large amounts of rain and moderate temperatures foster lush moss growth.

Forest Habitat, continued from page 10

region as well as black bear and Sitka black-tailed deer, include bald eagles and the coastal brown bear.

Large old-growth trees, including Sitka spruce and western hemlock along with red and yellow cedar, were logged since the 1950s to make pulp for paper and lumber that was marketed all over the world. Old-growth timber is being left alone at this point, except in special cases as mini-sales. A large amount of second-growth timber continues to grow for future markets.

Trees generally grow back naturally after logging

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Clear-cut logging was most often employed when harvesting large timber sales.

Clear cuts grow back fast to closed canopy stands with very little food habitat potential until light is let in to the stand by thinning or blow-down.

Forest Habitat, continued from page 11

in the Tongass National Forest of Southeast Alaska. In doing so they regenerate abundant food for deer, bear and other wildlife. After 20 years or so, the regenerating trees have grown back so profusely they shade out all other plants in the understory. Almost no wildlife food grows there after 20 or more years from clear cutting, until the stand opens again allowing light to regenerate plants.

It could take 50 years or more for un-thinned stands to begin to regrow understory plants, shrubs and forbs that wildlife need for food.

Wildlife habitat supports the culture of Southeast Alaska with a variety of personal use subsistence resources. Forest management is challenged by weighing forest land use considerations with what is vitally important to people that still live on, in and with the landscape in Southeast Alaska's Northern Pacific temperate rain forest.

UAF UNIVERSITY OF ALASKA FAIRBANKS

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