

CFA NEWS



The Newsletter of the Catskill Forest Association, Inc.
Volume 30, Number 1&2 - Winter/Spring 2012



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“Maple Sugaring 2012—How did it Go?”

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CFA News
 Volume 30, Numbers 1&2
 Winter/Spring 2012
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 Published Quarterly

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Subscriptions: *CFA News* is mailed quarterly to members of the Catskill Forest Association. If you are interested in joining CFA, give us a call, visit our office or fill out and mail in the form on the back cover of this publication. Contact information is located above. Please submit address changes to Michele at the address above.

SPECIAL ANNOUNCEMENT!

For a CURRENT listing of CFA's
 EVENTS you must visit CFA's
 Website!

www.catskillforest.org

Cover Photo:

*A waterfall — "Frozen in Time" — This winter proved to be almost completely absent of snow!
 (Photo—Jim Waters)*

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Sign that it's time to take down the bird/bear feeders in the Catskills! It's over 6 ft. from the ground to the top of the railing. Didn't hear a thing. The suet feeder was out next to the fire-pit. (photo by Jim Waters)

Welcome New Members!!!

November

Cindy Taylor—Margaretville
 Bill Drew—Andes
 John Berg Kimberton Farming Associates—PA
 Susan Kottermann—Fleischmanns
 Howard Hermann—Fleischmanns

December

Santiago Garcia

February

Dan & Crimora Millrood – Kerhonkson
 Brian Drabkin – High Falls

March

Matthew Wittman: Christofferson, Robb & Co. NY
 William Weinpahl — Fleischmanns
 John & Sally Fairbairn — Arkville
 Ursala & John DeCore—Halcottsville
 Ron Guichard Ralty—Andes
 Betsy Weidbach—Delhi



EXECUTIVE DIRECTOR'S MESSAGE

2011/2012 — The year with no winter. Largest snow storm here was about 6 inches in October! We had a few 2" to 3" storms and the warmest March on record. Last fall's deer harvest was about the same as the year before, so with the easy winter I would expect the deer population to be up in the Catskills. Make sure that you put tubes on any trees that you plant and fence in your gardens.

CFA will be putting a lot of effort this year into initiating a new program to benefit our members. We are going to start offering a management plan service for CFA's forest owners that have less than 50 acres. We have not worked out the details yet and need to acquire some equipment and software.

We are also working on reviving our "branding" and increasing our visibility as well as our membership. We have set up a team of members that have experience in this area, have met once and have already started implementing some of the ideas. Michele will be a big part of this effort and in that light, she has been promoted to "Office Manager & Outreach Coordinator".

Many events have been planned. Be sure to watch your email alerts and visit our website to find out about them. The Catskill Forest Festival will be even bigger this year. The competition will still be a part of it and a new tent is being set up where various adult education topics will take place throughout the day. We are also planning a new workshop on successional planning this fall that will help families do their planning for holding onto their land for generations to come.

Please let us know if you would like us to help you

with any of your land management issues. That is why we are here — kind of the "Consumer's Reports" for landowners in the Catskills. We are impartial and everything is held confidential unless otherwise agreed upon. There is no other service provider like us that we know of.

Don't forget about our on-site visit program. No one has ever said it was not worth-while. We also have a timber marking program, where we will come out to your property and mark stands for improvement harvests that do not have many saw-logs in them at all. Makes a great way for a person to know which trees they should take for firewood and which ones should be left for future sawlog values.

Have a great Spring and Summer!

Naturally, *Jim Waters*



Listen to "From the Forest", Wednesday evenings from 6 pm to 7 pm with Jim & Ryan. Streaming on the Internet — go to: wioxradio.org. CFA members can now listen to archived podcasts on CFA's website: www.catskillforest.org



Biomass (Wood Chips) Plant at a school in Hartford, NY that is supplying that school with all of its heating requirements. (It is running at the time of this photo.) LOTS of money saved and the fuel cost fluctuations are greatly reduced, so budgeting is much easier. (photo by Jim Waters)

CFA is working with a local community to investigate a wood-based community heating project as well as helping a flooded forest products company rebuild and include a cellulosic ethanol plant as part of the rebuilding plans.



This is a very efficient and large boiler made by ACT Bio-energy—Advanced Climate Technologies, LLC in Schenectady, NY. It is fueled by wood chips in this photo, but they also make boilers fueled by wood pellets.

The Forest Connection — Humans as Manager

By: Ryan Trapani (Education Forester, CFA)



For thousands of years, humans have served as “managers” of the eastern forest. Native Americans did not have metal tools to manipulate vegetation with, so they used fire. Instead of being contained in a combustion engine, fire was employed freely in the forests and fields. In burning, nutrients such as nitrogen and phosphorous could be better assimilated by some plant species. Also, plants requiring open sunlight were also able to germinate and establish. Firing the landscape favored some species over others because of their bark thickness, seed-protection, seed dissemination, growth rate and root depth. Examples include oak, hickory, chestnut, pitch pine, sassafras, blueberry, raspberry, sweet-fern, mountain laurel, blackberry, serviceberry, wintergreen, and many more. The presence of one of these species alone does not necessarily indicate fire, but in conglomeration will indicate a more probable past involving fire or other large disturbances. Fires burned in varying intensity over the landscape, creating diverse forests varying in species, size and age. In turn, diversity in forest types offered food and cover sources for a variety of wildlife. Humans that used fire to create this illumination in the forest were able to access this variety for food, clothing, tools, fuel, and shelter. In this way, fire provided the means to regenerate both human and ecological communities.

Humans are often perceived as resource exploiters because in removing fire from the forest and field and confining it to the combustion engine they removed themselves from their previously important role as active conservationists. The flora and fauna also relied on humans to responsibly employ this sacred knowledge of fire that could enhance habitats. The Native American’s connection to their land existed between fire and forest—a connection that so many romantics idealized, but failed to truly understand—and how could they? They were early immigrants, grain people, and

although their European predecessors probably used fire to perpetuate grasses, they did not do so nearly as much in a forest setting. Any management system that did not include wheat, rye, oats, barley, or buckwheat would seem bizarre to them. A forest provided wood materials to build ships with, and enclose grain and livestock. A forest was known as “the woods”, and fire could only damage this resource.

The early American farm aimed at clearing forestland for growing crops or grazing livestock. During this time, the landscape resembled a patchwork of field and forest in some places and nothing but fields in others. Local wildlife such as deer and turkey that required diverse forest could not find adequate cover from predators or food in farm habitat. Wildlife such as wolves and cougars that competed against livestock had no role to play near a farm and was quickly extirpated. The spaces between good pasture and crop-lands were allowed to remain as forest and served as a woodlot for wood products including firewood. Less agriculturally suitable areas such as the mountains where shorter growing conditions and un-even terrain existed normally had more forestland as well.

In the northeast, land clearing reached a maximum in the late 19th century and in New York State, over 70% of the land was cleared of forest-growth. After the Civil War and Great Depression, many farmers could not reap enough income from their land to make a reasonable life for their families. They had to abandon family farms for a wage in the city. Pastures and fields no longer mowed, burned or eaten by livestock immediately began to reforest. This regeneration incidentally mimicked a large-scale disturbance where many shade-intolerant and intermediate-tolerant tree and shrub species could thrive. Species such as black cherry, apple, oak, chestnut, hickory, serviceberry, sassafras, aspen, paper birch, white pine, eastern redcedar, blueberry, wintergreen, blackberry, black and red raspberry began to dominate



the young forest. Prey species would return first as early succession forest filled in the abandoned pastures offering plentiful food and cover. Wildlife species included ruffed grouse, woodcock, whip-poor-will, turkey and white-tailed deer. In time, fox, bob-cat, coyote, black bear, and fisher would hunt this abundant prey.

As pastures reverted to forest, old stone-walls that fenced in sheep, goats and cows were covered up by saplings, shrubs and eventually larger trees. Shrub-lands became pole-stands (trees 4 inches to 10 inches in diameter at breast height) which eventually became mature forest. The shade-intolerant and intermediate-tolerant species that had their time in the sun were gradually out-competed by slower growing, shade-tolerant ones. Fields of low-bush blueberry that once carpeted a hillside were now barely holding onto leaves under the shade of larger, mature trees. Among the trees was also a "changing of the guard." Shade-sensitive apple trees planted by the former farmer's family, mulberry, and butter-nut no longer had enough energy to bear fruit next to more shade-tolerant trees like oak, maple, beech, and yellow and black birch. Trees intermediate in shade tolerance began to succumb to the most tolerant. An example would be oak succumbing to maple, beech, and hemlock.

In the absence of Native American burning and land-clearing for crops and livestock, fewer openings in the forest over-story are present today except those mostly for houses. Early settlers were unaware of the pyrogenic ways of Native Americans, as today's urbanites and suburbanites are sometimes uninformed of both ways of living. Stone walls in the forest seem out-of-place and their purpose less apparent to the new-comer. Since most food, goods, and services can now be easily purchased from other regions, the forests and fields are no longer pantries--but instead an observation on the way to work or a weekend destination.

Smokey the Bear had ingrained fire as perpetual enemy for many Americans. Dr. Seuss had touted the 'Lorax' who bemoaned cutting of all trees. Bambi portrayed horrors of hunting and emphasized the scary effects of fire on forests and wildlife. The pendulum had swung! In the 'Lorax', the 'once-ler' who cut the trees once to make a quick buck, had grown today into a 'never-againer'. The philosophy of "never-again" began to germinate, establish and multiply into forest preserves both large and small throughout the landscape. Who could blame them? After all, the 19th century humans had created one big pasture in the northeast where numbers of wildlife had been reduced and some even extirpated through loss of habitat and market hunting. Water-ways (in some places) filled in with sediment in the absence of vegetation, and were also polluted by human,



livestock, and industrial waste. Parcelization, land development, fragmentation, and urban sprawl continue to threaten the forest.

Today, our forests suffer least significantly from forest fires, land-clearing for agriculture, or even forest-land conversion in some places. Although most northeastern states are predominantly forested, they may be more threatened by a general disconnect from the humans living nearby. Signs of this cultural disconnect are often reflected in the adjacent forests. Because we no longer rely upon local wildlife or vegetation for sustenance, or wood for timber and fuel, we have become estranged to our environment.

In importing our food, goods, and services we have exported our knowledge of and connection to our land. Modern-day disconnect from nearby forests and fields stretches far beyond our homes. Landscapes that were formerly fertilized by Native American fire or farmer's manure are now using delivered bags of fertilizer from thousands of miles away. Wood is imported even to areas where wood is plentiful. Blueberries are planted and fenced from deer, and then shipped thousands of miles. Even in a landscape teeming with deer, venison is imported from New Zealand from farms that have fences too. Humans have even re-created this disconnect by erecting *nature centers* as places to visit and experience an alternate environment. Although humans still live in the same world, it is their perception of nature and wilderness that perpetuates their separation from it.

It is true that the forest is more abundant today than in the last 100 years. However, quantity does not necessarily mean quality. Our forests are maturing and becoming similar in species composition. They have grown quiet. Fewer acorns drop, and fewer berries grow. The abundant deer herd which thrived in the diverse forest mosaic created from Native American burning and farm abandonment now lacks forest understorey to seek food and cover. The deer are still there, but are less vigorous and must over-browse what little grows under shady canopies.

Deer, like humans, have a great influence over the forest. As the forest understorey is whittled away by deer and lack of sunshine, so too are many other wildlife species that depended upon vegetation for food and cover from predators. Cotton-tail rabbits are now considered rare in most of New England and some parts of New York State. Songbirds too are becoming scarcer as quality forest understorey vegetation is reduced. The "silence" according to the Ruffed Grouse Society is akin to Rachel Carson's '**Silent Spring**' in reaction to pesticide impacts upon bird populations of the 1970s. The 'Lorax' touted that cutting 'truffula' trees would send all the area's wildlife inhabitants packing. However, a forest devoid

of human influences and connection also has its consequences and can send some plant species and their associated wildlife packing as well.

The good news is that we can re-establish our connection to the land. Doing so will demand hard work, trial and error, and adaptive management. Although fencing around a forest as in a preserve, or letting nature take its course may have good intentions—it is just as practical as fencing in a human and seeing if they survive well. We do not live in a vacuum, nor do forests or the wildlife and vegetation they contain. Our forests are resilient, just as we are.

A few years ago a camp-fire escaped a fire-ring inside one of New York's forest preserves igniting over a thousand acres. Forest Rangers and local fire-fighters were quickly dispatched to fight the fire. It burned up hill where oxygen was able to feed it from below and burned hottest near the summit. Some of the mature trees consisting of oak, maple and pine were girdled and killed. Some felt the forest had not been protected adequately and had not been preserved that day. However, the forest had something in store since a forest is more than mature trees. Seed that had long been stored under soil had been patiently waiting for the right conditions to arise. The fire had killed and burned the over-story canopy allowing plenty of sunlight and nutrients to accumulate on the forest floor. Five varieties of wild blueberries exploded into motion along with blackberries, and wintergreen.

More surprisingly, American chestnut sprouted from the roots of older trees previously killed by chestnut blight decades ago! Many of these chestnuts even fruited and this author feasted on them. Pregnant does dropped their fawns in the thick cover that would also provide plenty of browse for future generations. Bears pulled over chestnut saplings to acquire the rare and nutritious chestnut fruit. Rabbits, grouse and birds galore! The silence had been broken by the abundance of songbirds. Those humans had accidentally created more wildlife habitat than 10,000 textbook pages on wildlife management had ever done. From the ashes had germinated an ancient forest connection older than any old growth forest. Those humans had unintentionally played a part in something larger than themselves. They had given back the gift given to humans and the forest reflected it. The chestnut could grow. The blueberry had a place to fruit. The bear had something to eat. The grouse had a place to beat its wings. Here it was again--a place the old-timers spoke of and their great-grandparents too. It was again a place to pick berries in the summer and harvest a deer in the fall. When humans connected to their forest and shared their exclusive ability to shed light upon it, they could serve as a mechanism for regenerating not only their own communities, but ecological communities across species as well.

There are many ways to manage a forest and not one is appropriate everywhere, and not everywhere requires one, but every forest and nearby human requires this connection. It is this connection that the Catskill Forest Association (CFA) strives to create by educating the public and raising awareness. The health and vigor of our forests and communities depends upon this connection. By fostering this connection, CFA hopes that humans can continue to tend a healthier role in the forest, and release sunlight upon it so that it may grow, spread, and regenerate healthier communities and forests. www.catskillforest.org



**Planning a Harvest?
CFA's "Got Your Back!"**

**DEC Average Stumpage Prices—Winter 2012:
Catskill Region (Scribner Log Scale—per MBF)**

Ash, White	\$175	\$75—\$500
Basswood	\$90	\$40—\$140
Beech	\$40	\$30—\$50
Birch, Yellow	\$125	\$50—\$275
Cherry, Black	\$525	\$300—\$700
Hickory	\$60	\$60
Oak, Chestnut	\$245	\$100—\$300
Oak, Red	\$338	\$80—\$500
Oak, White	\$250	\$100—\$375
Hemlock	\$40	\$20—\$70
Pine, White	\$90	\$70—\$300
Firewood (per cord)	\$7	\$5—\$8

Maple Sugaring 2012—How Did It Go?



Ryan, outside his new sugar shack.

Typically the maple sugaring season throughout most of New York State takes place in the month of March. Not this year! Temperatures that are most conducive for sugaring occur when day-time temperatures are above freezing and below freezing at night causing the sap to flow. Temperatures following this pattern began early in January in parts of the region. For many maple producers even in lower elevations such as the Rondout Valley, tapping in January is rare and considered too early. One maple producer near Samsonville (elevation 950 feet) told me that he normally looks to tap between President Lincoln's birthday and President Washington's birthday (February 12th & February 22nd). Maple producers located at higher elevations such as Arkville, Delaware County normally tap sometime during the last week in February and the first week in March. Maple producers at the highest elevations in the region such as Denning, Ulster County can tap as late as the second week in March.

Other factors that can influence time of tapping are aspect. A sugarbush that faces north will be tapped later than a sugarbush that faces south due to its aspect in relation to the sun's warming rays. However, a north-facing sugarbush can be tapped later in the season after one that faces south no longer yields sap. The bottom line is that a maple producer's season is highly variable to another's and depends on where he is located. Still, there are generalizations we can make about this year's season, and reasons for and against why they occurred. It is part of the fun of maple sugaring to guess why the season turned out the way it did and what it will be the next time around. So... here goes!

A typical maple sugaring season lasts 4 – 6 weeks – plus or minus 2 weeks. This year in the Rondout Valley, the season was fantastic and lasted over 6 ½ weeks! Even though the season ended typically early for many in mid March, the season made for a long one if taps were drilled in January. From late January to mid March, temperatures in the Rondout Valley were perfect for sap flow. Other regions at higher elevations experienced a shorter season since day-time temperatures were not warm enough for sap to flow. Afterwards, temperatures warmed up too much at night further reducing sap flow. In previous years, lower elevations like the Rondout Valley have experienced shorter seasons than higher elevations since they

warmed up too early in the season – so this year made up for some lost syrup.

Even though some producers had more sap than they could boil and others had not enough, sugar content of the sap was another story. The sugar in the tree is made during the growing season when the leaves capture the sun's energy; combine it with water, carbon dioxide, soil minerals, and a lot more materials beyond the scope of this article. Although there is a lot we do know about photosynthesis and maple sugar content, there is a lot we do not know. The mysterious nature of the sugary substance's creation is what boils down to good conversation and wild guesses and predictions before and after a season.

The Rondout Valley's sugar contents were extremely low, while sap flow was high. The reasons for this are enough to overflow a bucket in a short amount of time! Some believe that since we did not have a cold winter, the sugar was not drawn up into the tree so that when they did flow, the sap was diluted. It is then believed that a tree has only so much sugar, just as a chicken has only so many eggs it can lay in its lifetime. In the tree's case, since sap flow was high, sugar content was then diluted and made for weak sap since sugar is limited. In the colder, upper elevations where sap flow was low, sugar contents were much higher so maybe there is some merit in this equation. Still others believe sugar content was low since last fall the sugar maples diverted a lot of their energy towards producing seed. Last autumn was a banner year for maple seed and many maples were full of double-samaras (helicopter-like seeds). Others believe that the trees did not receive enough sunlight during the growing season or that caterpillars had damaged the leaves for too many years leading to less photosynthesis and hence lower sugar contents. Like most things, it is probably due to a number of things. However, there is probably one aspect that many producers can agree upon after this year. Sometimes, old notions must be questioned. If you had tapped early this year, you probably made out well. If you did not, then it was probably a shorter season. If you had any sap to boil, then afterwards you most likely were left with more maple syrup than you originally had in the first place and this is **a good thing no matter the reason!** The question is – when will the season begin next year?

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HARDWOOD KRUMMHOLZ OF THE WESTERN CATSKILLS

By: Dr. Michael Kudish

This article is printed in two parts. The first part appeared in the 2011, Summer/Fall Issue of "CFA NEWS" and touched on the following topics:

*No Spruce-Fir then, No Spruce-Fir Now
Arctic-Alpine Zone
Hardwood Krummholz (i.e. Shrubthickets)
Exposed Ledge Shrubthickets*



The ridge hardwoods (deciduous, broad-leaved trees) of the Catskill Mountains

BOG SHRUB THICKETS

In the bogs and fens in the Catskills today, there is an assemblage of shade intolerant shrubs. Some of them require the high water tables, but others are there simply because it is too wet for a continuous closed canopy forest of yellow birch and red maple; light is ample (Fens are similar wetlands to bogs, but are less acidic and have more water, mineral nutrients, and oxygen flowing through them, i.e. they are slightly better places for plants to grow).

At the higher elevations along the ridgelines, mainly above 3000 feet, are three shrubs that can grow either in the wet depressions (i.e. bogs and fens) or on the surrounding well-drained sites: mountain holly (*Nemopanthus mucronata*), wild raisin (*Viburnum cassinoides*), and black chokeberry (*Aronia melanocarpa*). Mountain ash (*Sorbus americana*), a small tree, can also grow both in and out of wetlands.

At the lower and middle elevations, mainly between 2000 and 3000 feet, are additional shrubs that are almost always restricted to wetlands. These are winterberry holly (*Ilex verticillata*), speckled alder (*Alnus rugosa* or *incana*), and several members of the heath family: leatherleaf (*Chamaedaphne calyculata*), bog laurel (*Kalmia polifolia*), sheep laurel (*Kalmia angustifolia*), cranberries (*Vaccinium oxycoccus* and *macrocarpon*), and – in one bog – Labrador tea (*Ledum groenlandicum*).

In Newfoundland and Labrador today, arctic-alpine meadows and bogs still coexist side-by-side. I suspect that in the Catskills they once did, too. The bog

shrubs most likely filled the wet depressions in the still-fresh glacial till, and they also possibly mixed in with the arctic-tundra plants still occupying the surrounding well-drained uplands.

One shrub of note is the green or mountain alder (*Alnus crispa*). It is in the eastern Adirondacks today in limited numbers, but becomes increasingly common through northern Vermont, New Hampshire, and Maine, forming dense thickets in the Canadian Maritime Provinces. I have not seen it at all living in the Catskills today, but found a fossil twig and leaves in Bog #310 on Mill Brook Ridge with a radiocarbon date of 5200 years. This northern shrub had been here and is now gone from the region!

How did these shrubs “find” these small, isolated wetlands in a sea of ridge hardwood forest? They didn’t. The shrubs were most likely here first and covered a much larger area than they do today: wetlands and probably some surrounding well-drained sites alike.

One wonders how long the bog shrub thickets persisted before the ridge hardwoods, especially yellow birch and red maple, moved in and replaced most of them? The fossil record is scant because in most high-elevation ridge-line bog basins, the oldest deepest peat has rotted along away with any old fossils in them.

See also the paragraphs below on ground cover herbaceous species for more detail.

RIDGE HARDWOODS

The ridge hardwoods, with their superior height, eventually seeded in and shaded the hardwood krummholz out. The hardwoods replaced the krummholz on all sites except the very driest and the very wettest. This forest was much like that we see today – yellow birch, red maple, American beech, and black cherry.

Did all these four dominant ridge hardwoods migrate in simultaneously from what is now Pennsylvania and New Jersey, or did they arrive individually over time? If they arrived individually, which species arrived first?

Yellow birch –

Most likely yellow birch arrived first. Yellow birch is abundant as fossils in numerous Catskills bogs and fens, already here by 12900 years ago at lower elevations of around 2000 feet (such as at Byrne Road Bog near Platte Clove).

Between 12500 and 10000 years ago, I have found fossils of yellow birch wood and bark in numerous bogs between 2000 and 2400 feet elevation. Between 9550 and 8700 years ago, it was already atop Balsam Lake Mountain in a bog at 3680 feet. By 8600 years, it was at 3260 feet on the Wildcat Range. It was already on the crest of Mill Brook Ridge at 3120 feet in a bog between 8500 and 8200 years ago. My guess is that this species was here and climbing the mountains to their crests long before that.

Today, yellow birch climbs to about 4020 feet on Hunter Mountain and 3920 feet on Slide Mountain. It is present on the summit of Thomas Cole at 3940 feet.

Red maple –

I suspect that red maple may have been the next ridge hardwood to invade the crests of the western Catskills. See the paragraphs below on Canada for one reason



Shrub thickets in the higher elevations of the Catskills.

why. Strangely, I have not yet found red maple fossils in older bogs in the Catskills; this is puzzling because it is a common component of bog and fen vegetation today. Remnant chunks of wood and bark should have been preserved. Does it rot rapidly? Perhaps fossils of it will appear in the full peat cores extracted from bogs just this year.

Today, red maple's highest Catskills' elevation is on the summit of Graham Mountain at 3868 feet.

American beech and black cherry —

The highest elevation beech in the Catskills today is on Slide Mountain at 3880 feet. For black cherry, I have not yet found any higher than Graham's summit at 3868.

Beech and black cherry might have come in about the same time on the western Catskills ridges, but there is a problem with these two species. They cannot grow in wetlands so that I would not expect any fragment of wood, bark, leaves, fruit, etc. to readily fall into most of the bogs. This is because the vast majority of bogs have gently-sloping, and therefore poorly-drained, edges. The only way to prove the early existence of beech and black cherry in the Catskills is to search for those few bogs with steep banks or bluffs along at least one edge. On top of the bank, on well-drained soils, the black cherry and beech could have had branches overhanging the bog. In this way, tree parts could have fallen in and been preserved as fossils.

Indeed, this has happened in two bogs on Mill Brook Ridge, but the peat isn't old enough to tell us when these two species first arrived. I have found beech wood dating back to about 5200 years in the bog, #310, where I found mountain alder. I have found cherry seeds in another Mill Brook Ridge bog, #319, dating back 6200 years; but these cherry seeds could have been from choke or red cherry, not from black – cherries which probably arrived in the Catskills before black. Beech and black cherry might have been here for thousands of years before.

If the hardwood krummholz shrub species were not here before the ridge hardwoods, the alternative is that they must have arrived either with the trees or after them. Arriving with or after suggests that the shrubs had to "find" those few sites still free of trees and capable of supporting them – exposed bedrock ledges and bogs. The likelihood is nil.

NORTHERN LIMITS OF SHRUBS AND RIDGE HARDWOODS IN CANADA TODAY

Clues to the early post-glacial vegetation in the Catskills may be obtained by studying the northern limits

of woody plant species in Canada today. The farther north the geographic limit for a species, generally the lower the mean annual temperature that it can tolerate. But one must use caution because plant species distributions are caused by many more interacting factors than temperature and growing season alone.

Climatic data is available in the Canadian Almanac and Directory, published in 1988 and probably updated periodically. The New York News, in 1962 and 1968 among other years, published a booklet entitled Weather Almanac, which also included some climatic data for Canada.

Data is from weather stations at selected cities and towns. The latitude and elevation for each weather station can easily be obtained in atlases.

I re-read my Catskills field notes to determine the current maximum elevations for each of these species. My current thinking is that the species that range farthest north today in Canada, and attain the highest elevations on Catskills slopes, can tolerate the coldest mean annual temperatures and therefore the shortest growing seasons. They would be the most likely species to tolerate the initial colder, post-glacial conditions in the Catskills.

Shrubs —

Soper and Heimburger's *Shrubs of Ontario* (published by the Royal Ontario Museum, Toronto, Canada, 1982) is a useful reference work with a distribution map for each species. I note that nearly all of the Catskills krummholz and bog shrubs range far north into Canada today. They terminate between 47 and 56.5 degrees north latitude, corresponding to mean annual temperatures of about 42 and 24 degrees Fahrenheit, respectively, near or at sea level. Mountain temperatures at those latitudes are even colder.

Currently, the summit of Slide Mountain, the highest and coldest in the Catskills, has a mean annual temperature of 37 degrees Fahrenheit. This suggests that any of the krummholz shrubs on Slide's summit today are existing nowhere near their limits for cold. Slide Mountain would have to be several thousand feet higher to approximate the mean annual temperature of many of the northern shrub limits in Canada. Krummholz shrubs probably once covered much more of the Catskills than they do today.

Ridge hardwoods —

The northern limit of tree species can be found in a multiple-volume set, *Atlas of United States Trees*, by Elbert L. Little, Jr. These were published by the United States Department of Agriculture's Forest Service. Volume I, *Conifers and Important Hardwoods*, was published as Miscellaneous Publication No. 1146 in 1971; Volume 4, *Minor Eastern Hardwoods*, was published as Miscellaneous Publication No. 1342 in 1977.

The shrubs range farther into Canada today than the ridge hardwoods, but even the two of the latter, yellow birch and red maple, reach far enough north so that the mean annual temperatures are colder there than that of Slide Mountain's summit.

Yellow Birch: Of the four ridge hardwood species, I find that yellow birch ventures the farthest north today – 50 degrees latitude, corresponding to a mean annual temperature at or near sea level of 33.5 degrees Fahrenheit. This suggests that yellow birch might have migrated into the Catskills first, certainly tolerating the short growing seasons. The fossil record, as described above, supports this. Yellow birch today reaches a maximum elevation of 4020 feet on Hunter Mountain, corresponding to a mean annual

temperature of 37.9 degrees Fahrenheit.

Red Maple: Although I have not found red maple today at an elevation higher than the summit of Graham Mountain (3868 feet), it does range farther north than beech and black cherry. It is in southern Newfoundland at 49 degrees north latitude, corresponding to a mean annual temperature of 35.5 degrees Fahrenheit. In Newfoundland, it occurs with yellow birch.

Beech: Beech does not reach Newfoundland today. Its northern limits are in New Brunswick, Nova Scotia, and Prince Edward Island and westward across southern Quebec and Ontario. The northern limit at 48 degrees corresponds to a mean annual temperature of 37.5 degrees near sea level; this is similar to the climate presently atop Slide Mountain.

Black Cherry: Black cherry also does not reach Newfoundland today. Its northern limits are similar to those of beech, but only as far as 47 degrees latitude. This corresponds to a mean annual temperature near sea level of 40 degrees Fahrenheit – actually warmer than that at the summit of Graham Mountain at 38.4 degrees.

BOREAL GROUND COVER

The ground cover flora of the well-drained high ridgelines in the all-hardwood western Catskills today is the same as that in the spruce- and/or fir-dominated eastern Catskills. See Kaatskill Life, Volume 25, Number 2, Summer 2010, pages 66-71, for a listing of the fifteen of the most common species.

This pan-Catskills boreal ground cover distribution suggests two ideas:

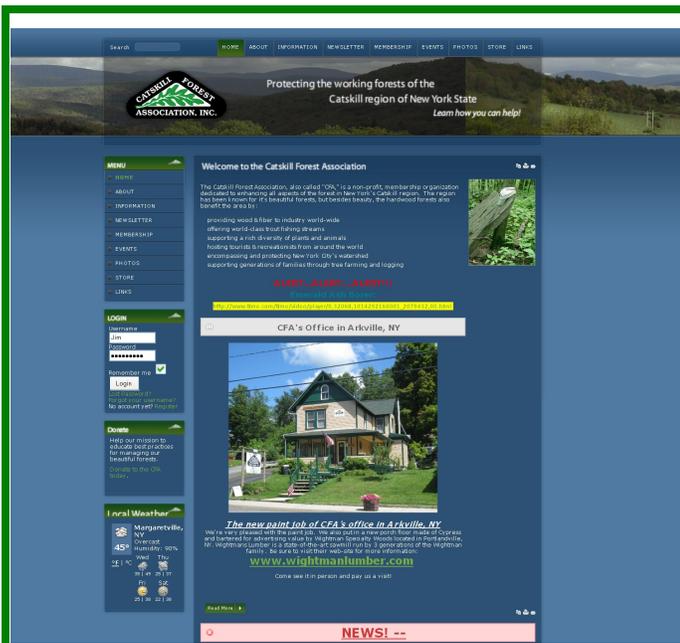
- (1) that these low herbaceous plants do not require the conifers for their existence, and –
- (2) they were probably here very early, moving in under the krummholz shrub thickets locally where a little sunlight would allow. When the ridge hardwoods conquered the crests later, the boreal ground cover plants persisted.

Many of the bogs and fens have a distinct herbaceous cover today – a cover that requires a high water table, i.e. these plants do not occur on neighboring well-drained sites. Examples are cotton grass (*Eriophorum virginicum*), pitcher plant (*Sarracenia purpurea*), sundew

(*Drosera rotundifolia*), three-way sedge (*Dulichium arundinaceum*), Canada rush (*Juncus canadensis* and *J. brevicaudatus*), and three-seeded sedge (*Carex trisperma*).

How did these bog plants “find” these isolated, small high-elevation wetlands in a sea of ridge hardwoods? They didn’t. “Finding” implies that these herbs migrated in after the ridge hardwoods. In actuality, these plants probably migrated in several thousand years before. The bog herbs might even have co-existed with, and been surrounded on the well-drained sites first by, arctic-alpine tundra plants and later by the shrub thickets. In Newfoundland and Labrador today, a mosaic of tundra plants, bog meadows, and shrub thickets still co-exist, so why not once here in the Catskills?

A backlog of plant fossils from the western Catskills bogs and fens awaits identification in my laboratory. Once these are identified and radiocarbon dated, we’ll have a better idea of the early vegetation of the western Catskills ridgelines.



CFA's WEBSITE:
www.catskillforest.org
CHECK IT OUT!

If you have not received an email with your user ID and password or if you have lost it please send an email to: cfa@catskill.net with the following information:

1. Name
2. e-mail address
3. Home Address
4. Telephone Number

Check out the Catskill Forest Festival Video on the Home Page!!!

Also—Podcasts from CFA's "From the Forest" Radio broadcasts!

CFA Tree Marking Program!

This is a great way to get an area marked that will provide you and others with firewood as well as improve the health of your forest. You are welcome to join us during the marking to learn how to do it yourself. This could save you money down the road as it will sharpen your understanding of forest management and you will be developing your own tree selection skills. Thinning out the forest will make it more resistant to insects and disease, a better water filter, better wildlife habitat and increase the value of the timber.

WE MARK ALL YEAR-ROUND!!!

DETAILS:

1. You must be a CFA member.
2. **AN "ON-SITE-VISIT" FEE OF \$200 (INCLUDES MEMBERSHIP RENEWAL FOR ONE YEAR) PLUS MILEAGE** will be charged for selecting, designating on the ground the area to be marked, and determining the acreage to be included.
3. After reviewing the forest management plan (if there is one) and taking into account the landowner(s)' objectives, a prescription for that stand will be recommended by the representative and the marking guidelines agreed upon by both the representative, the landowner(s)' forester (if there is one) and the landowner.
4. A maximum of 10 acres will be marked for each landowner in any one calendar year.
5. **A FEE OF \$100 PER ACRE WILL BE CHARGED FOR THE MARKING.**
6. The trees marked will be the trees that are considered "crop" trees (These are the trees that are the "keepers".) They will be marked by tree-marking paint at or just below eye height, most of the way around the bole of the tree, and on the stump.
7. It will then be up to the landowner to remove or kill all of the trees without paint. In most cases these trees will not be useful for anything but firewood. There may be an occasional saw-log tree, but unless there are a sufficient number of them, it will not be worth-while to have them delivered to a mill. The goal with this program is to improve the forest by removing the "weed trees". In some cases the trees can be left as fertilizer and wildlife habitat.
8. In the case that the landowner does not want to do the work themselves, a list of professionals will be given to them by CFA to contact in order to have the work done.
9. There is a limited amount of this we can get to, so sign up soon! Fill out the application below and mail it in. We will call to schedule.



A thinning typically removes about 4 to 5 cords per acre. If you had 10 acres marked, that would be about 45 cords of firewood being made available to you! That means that for an on-site fee and somewhere around \$10/cord you would get a rare and valuable educational experience along with the wood marked by a professional forester from CFA.

CFA is holding several special programs in chainsaw safety and use for landowners. (See the Calendar of Events on CFA's web site.)



CFA TREE MARKING APPLICATION

Name _____

Address of Property _____

Email address _____ Date _____

Phone Number and best time to call, where you can be reached during the weekday _____



PO Box 336
Arkville, NY 12406

MEMBERSHIP APPLICATION

I believe in enhancing the quality of the forest land in the Catskill Region through proper forest management.
To that end, I am interested in joining the Catskill Forest Association and supporting its efforts.

Name _____

Mailing Address _____

Phone #: _____ E-mail: _____

Membership Categories (Select the level & if you'd like, make an additional donation):

Membership	\$50 + \$ _____
Contributing	\$75 + \$ _____
Business / Supporting	\$100 + \$ _____
Supporting	\$150 + \$ _____
Sustaining	\$250 + \$ _____
Benefactor	\$750 + \$ _____

Do you own land in the Catskill Region? Yes _____ No _____

Property address: _____

Telephone #: _____ County: _____

Total acres: _____ Forested acres: _____ Pond Y / N Stream Y / N River Y / N

Would you like a CFA forester to come to your property to walk it with you forest, making suggestions and giving you impartial and confidential advice? (IT JUST COSTS \$200 PLUS OUR MILEAGE TO DO SO AND THE \$200 INCLUDES A FREE ONE YEAR MEMBERSHIP.) Y / N

(If so we will call you to schedule an appointment.)

Amount enclosed \$ _____

All membership dues and donations are fully tax deductible to the extent allowed by law. A copy of the most recent financial statement filed with the New York Department of State is available upon request.