

Tall Pines Trail

**Location: Mohawk Trail State Forest.
Updated 7-29-2019**

County: Franklin

Township: Charlemont

Start and End of Trail Network: Lat 42.638425 N, Long 72.936285 W

Trail length (complete loop plus spur): 3.0 miles

Introduction

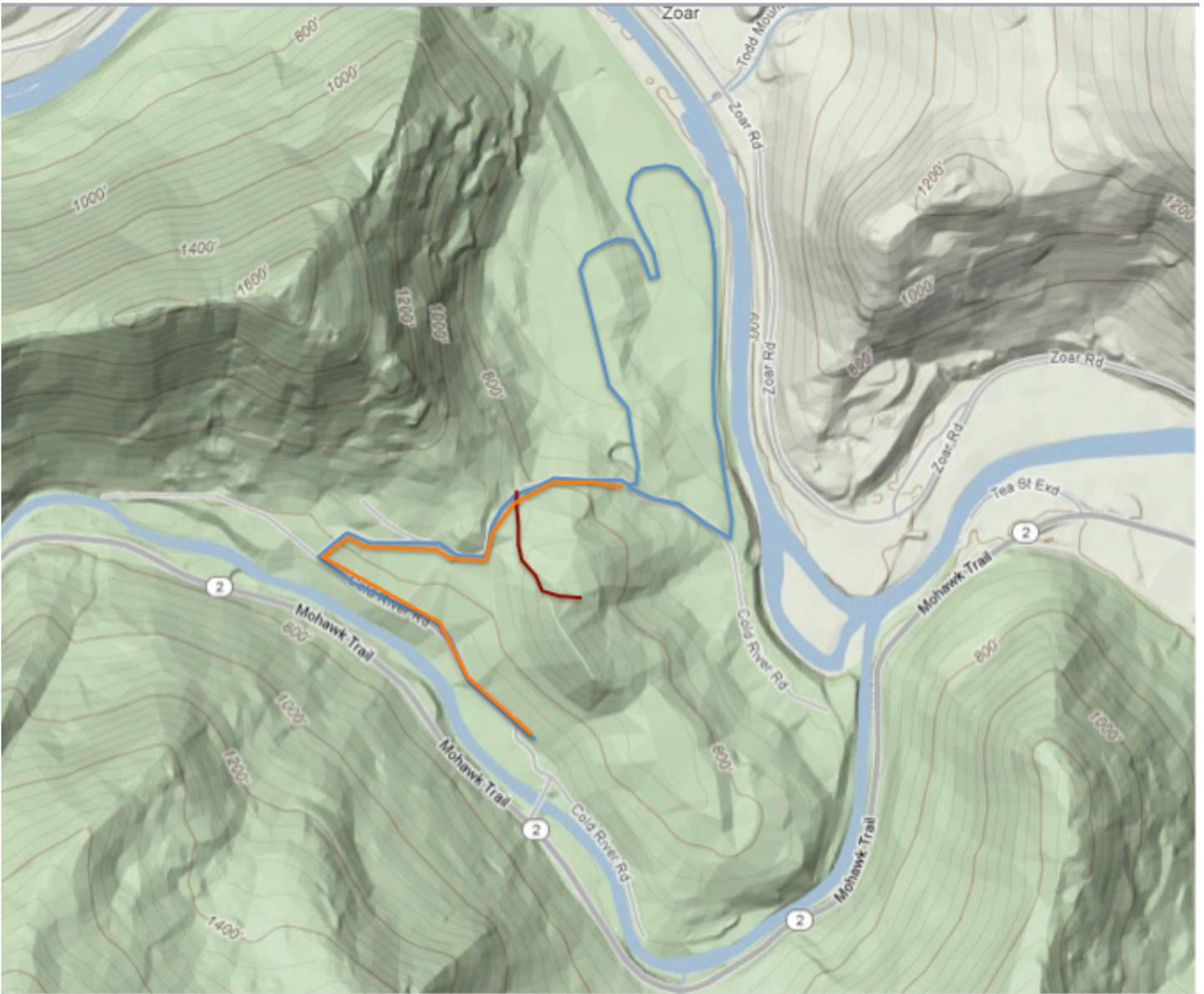
Mohawk Trail State Forest (MTSF) was one of the first state forests to be established as part of the Massachusetts system of Forests and Parks. Today the property covers approximately 6,700 acres and is split by State Route #2, named the Mohawk Trail in recognition of the ancient Indian path that ran from the waters of the Hudson to the Connecticut River. MTSF is mountainous, possessing some of the most rugged topography in the Commonwealth. The Cold River and Deerfield River gorges reach depths of 1,000 feet in Mohawk, and elevations vary from 600 to almost 2100 feet within the property.

Mohawk has many outstanding features, including: (1) its wealth of old growth forests (nearly half of the total for Massachusetts), (2) record-breaking tall, second-growth white pines, (3) a section of the original Mohawk Indian Trail, (4) section of the old Shunpike, (5) site of an old Indian encampment, and (6) the gravesite of Revolutionary War veteran John and his wife Susannah Wheeler. The State Forest is part of the 9th Forest Reserve, which is maintained in pristine condition. The Park area is located on the north side of Route #2, and includes the Headquarters, picnic area, campground (for RVs and tents), cabin area (six rental cabins), the Old Cold River Road, and the upper and lower meadows. Mohawk provides access to the Deerfield River for rafting.

MTSF maintains a network of hiking trails. The network consists of: (1) the Elders Grove Trail (0.5 miles), (2) River Trail from the Elders Grove around Todd Mountain (including part of the old Shunpike) past its intersection with the Old Cold River Road and on to near the old Indian encampment, (3) a section of the Mahican-Mohawk Recreational Trail, (4) the Totem Trail, (5) the Trout Brook Trail, (6) the Nature Trail Network (Tall Pines Trail and Nature Trail Loop), and (7) the Thumper Mountain Trail. There are overlaps among some of the trails.

The Mahican-Mohawk Recreational Trail is a long trail, running through Mohawk in basically an east-west direction following the pathway of the old Indian Trail and its colonial aftermath. The Mahican-Mohawk Trail gains the most altitude, from 600 to 1,900 feet for a gain of 1,300. The Totem Trail is second with a gain of 800 feet. The Elders Grove Trail from Zoar Gap to the Elders Grove, and the Thumper Mountain Spur Trails are the shortest.

The following two maps show the trails. In the first map, the blue is the original Nature Trail path, and the orange overlay is the Tall Pines Trail section.



The second map is the one provided by DCR, showing the full Mahican-Mohawk Trail within Mohawk up Todd and Clark Mountains. The map also shows a long trail following Trout Brook on the south side of Route #2, but Hurricane Irene severed this trail, and only the lower half-mile is navigable. DCR plans to eventually reopen this trail to Harwood Road.



Tall Pines Nature Trail – the Start

The Nature Trail Network officially starts at the Headquarters. The first 0.95 miles is informally called the Tall Pines Trail, which runs from the Nature Center to the start of the Nature Trail Loop. The Loop is approximately 1.1 miles in length. The network offers visitors a wide range of natural, historical, and cultural features spread over a round-trip distance of 3.0 miles. The round-trip distance for the Tall Pines Trail is 1.9 miles, except for the Campground spur, which is included for people who are camping in the tent and RV section.

From the Tall Pines Trail's beginning at the Nature Center (log cabin located in front of the headquarters building), the trail follows the paved road uphill, bypassing the road to the tent and RV camping section (spur trail). From that point, the main trail curves to the right around a large leach field. Continuing, the trail follows the dirt road past Cabin #6 on the right, and a second leach field, also on the right, to the Group Campsite. The trail crosses a large flat area, passing through a gate, and down the Old Cold River Road to the designated start of the Nature Trail Loop. From the Group Campsite to the start of the nature loop is approximately 0.3 miles. The whole trail is an easy walk. The increase in elevation, a gradual ascent, is roughly 180 feet from the Nature Center to the Group Campsite. From the group site, the elevational drop to the designated start of the Nature Trail Loop is approximately 120 feet. If the visitor takes the same route back, the round-trip elevation-gain is 300 feet.

From the Nature Center, looking toward the ridges, the spires of white pines rise above the hardwood canopy. This is a hint of things to come. The visitor passes the Headquarters on the left and a swath of trees along the road going up the hill. Species include white pine (*Pinus strobus*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), eastern hemlock (*Tsuga Canadensis*), northern red oak (*Quercus rubra*), yellow birch (*Betula Alleghaniensis*), black birch (*Betula lenta*), white oak (*Quercus alba*), and white ash (*Fraxinus Americana*). Several bigtooth aspens (*Populus grandidentata*) grow near the road. The principal shrub species include mountain laurel (*Kalmia latifolia*), and hobblebush (*Viburnum lantanoides*). The larger trees are mature, but not old growth. They date to a period of intense land use by the settlers of the area for the purpose of sheep pasturing, timbering, and possibly charcoal manufacture. At this point, nothing stands out as exceptional among the mix of hardwoods and hemlocks. As a benchmark for what is to come, the hardwood-hemlock canopy along the first part of the road varies from 80 to around 95 feet, with a few hardwoods and hemlocks reaching 100 feet. Tree diameters at breast height are typically 15 to 30 inches. Dimensions such as these are not uncommon in Massachusetts forests. They are what we can expect in a mature New England forest, and here the operative word is mature. We begin the interpretive process by focusing on species identification around us.

Tree identification involves studying bark, tree form, leaves, twigs, flowers, and fruits. There are many good sources for help with these features, including the Internet and iPhone applications. One conventional source that is particularly useful is *Bark – a Field Guide to Trees of the Northeast* by Michael Wojtech. *The National Audubon Society Field Guide to Trees- Eastern Region* is a reasonably good traditional field guide. For leaf identification, the website dendro.cnre.vt.edu/forsite/idtree.htm from Virginia Tech is well organized and a good aid.

From left to right in the image below, taken across from the Headquarters, we see a young northern red oak followed by a partially obscured hemlock (dark brown trunk), and a light-barked sugar maple. We will cover the northern red oak and the sugar maple.



The oak in the image is a young tree. At this age, red oak bark is relatively smooth and gray, but becomes increasingly furrowed and blocky with maturity. Branching is alternate. Crowns flatten in age and branches become stout in appearance. Northern red oaks are a monoecious species, meaning that each tree contains both sexes. Flowering for the oak begins between 20 and 25 years of age.

The larger sugar maple is mature, perhaps 130 years old. Branching is opposite. Sugar maples are both monoecious and dioecious (sexes occur on different trees), and similar to the oak, begin flowering at between 20 and 25 years of age. Flowers are yellowish-green. Many people confuse them with new leaves. The sap is sweet and forms the basis of a thriving New England industry. The species is very popular across the East. The sugar maple is the state tree of Vermont, New York, Wisconsin, and West Virginia.

Of particular interest is the fact that the young northern red oak requires moderate light reaching the forest floor in order to be a successful competitor. In contrast, the sugar maple can grow in extreme shade. However, both species adapt to a wide variety of conditions as illustrated by the location of the maple. By the way, the northern red oak is the state tree of New Jersey.

The visitor is likely to notice that a couple of trees in this location have a distinctive yellowish bark with small peeling curls, as shown in the next image. These trees are yellow birches, a common species in Mohawk Trail State Forest. An image of yellow birch bark follows.



The yellow birch was the favorite tree of Henry David Thoreau. In places like Michigan, it is also called silver birch.

As you walk up the small hill, notice a clearing immediately to the right. It is a leach field for the bathrooms at the Headquarters and Nature Center. When the road reaches the level of the leach field, you can walk past a large rock and into the clearing and observe the tree species around you. Red oaks, maples, and hemlocks make up most of the canopy. None of the species are large. However, there is at least one unusual feature – a fused hemlock and red maple at the left edge of the field. The image below shows the pair. The red maple is the straight trunk in the center, and the other trunks are eastern hemlock.



Bizarre forms such as these illustrate the infrequent union of different species. The maple and hemlock share a cambium interface (the living cells beneath the bark) and an interlocking root system. Nutrient sharing is assumed. It is unclear if one or both species benefits or suffers from the union, though research suggests that both scenarios occur.

Most of the oaks, maples, and hemlocks in the immediate area of the Headquarters are modest in size. Bedrock is close to the surface and the shallow sandy soils do not support big trees. Even poorer growing conditions occur on the steep ridge just above the headquarters. Stunted hemlocks reach ages of 150 to nearly 200 years. Some of these hemlocks can be seen on the Thumper Mountain Trail.

Emergence of the Pines

If the modest sizes of the hardwoods and hemlocks at the beginning of the trail are typical for many Massachusetts woodlands, what is not typical are the heights reached by the other conifer species, the white pine, which sends its crown far above the hardwoods and hemlocks, achieving such dominance that we call the first section of the Nature Trail Network the Tall Pines Trail. Let's examine *Pinus strobus* more closely.

The white pine is our only native pine in the eastern United States that has its needles displayed in bundles of five. The whites range northward to southern Canada and southward to northern Georgia and South Carolina. Its westerly range limit is Iowa and Minnesota. Although it reaches northern Georgia, its southern distribution is limited to the Appalachian Mountain corridor. Interestingly, a couple of subspecies of white pine grow in the mountains of Mexico. The eastern white pine is the state tree of Maine and Michigan. It probably achieved this distinction largely through its vast past economic importance, which continues to this day.

The white pine is monoecious. Its small male cones produce yellow pollen in the spring. Later the female cones appear and grow long. They are green when young, turning brown when mature. Bumper seed crops are produced in intervals of 3 to 5 years. Studies show that up to 73 good seeds can be produced per cone. Seeds travel from 200 to 700 feet from the parent tree. Female cones are produced when the tree is 5 to 10 years old. Male cones come later. The male cones are very small. It is the longer female cone that we associate with the species.

The white pine has a colorful history in New England. At one time it was the most valuable timber tree in the United States, possibly the world. It was introduced to England by Lord Weymouth where it is called the Weymouth Pine. The most conspicuous feature of the eastern white pine is its size, especially height. Stories of the species' great stature are legendary, and despite anecdotal exaggerations, it is unquestionably the tallest tree species in New England and throughout most of the Northeast. The tuliptree (*Liriodendron tulipifera*) is the white pine's only competitor. From southern Pennsylvania southward, the two species are neck and neck for the honor of tallest. In New England, the white pine's dominance over the tuliptree increases dramatically from south to north. In southern Connecticut, the tuliptree challenges the white pine in a few locations, but from central Connecticut northward, the white pine's dominance is absolute.

While white pines can develop thick trunks, especially when grown in the open, it is the species' stature that is the stuff of legends, and the focus of this guide. How tall can white pines grow? Accounts of past monarchs claim heights of 250 feet or more. Such stories come from no less than Timothy Dwight, past president of Yale University. Anecdotal accounts say a white pine in Lancaster, NH reached 260 feet. However, we now believe these accounts to be exaggerations, with a true maximum of around 220 feet. That height is attributed to a pine in Pennsylvania that may have been measured on the ground. We must also remember that during colonial times, the foot and inch had not yet become standardized.

Today, the tallest known white pine in the United States is the Boogerman Pine in the Great Smoky Mountain National Park. As of its last careful measurement, the Boogerman was 188.9 feet tall. At one time it was 207 feet, before an October snowstorm in 1996 broke its top. The pine was pared back to 180 feet. A limb turned upward to become the new leader and since then it has been growing several inches per year. By comparison, the tallest tuliptree, the white pine's only true competitor, also grows in the Great Smoky Mountains. Its present height is 191.9 feet, making it #1 in the East as of today. Both trees have been climbed and tape-drop-measured by Will Blozan, past president of the Native Tree Society (NTS). The Boogerman pine is over 350 years old.

Interestingly, in northern Georgia, we have measured two white pines to around 185 feet, and several other in North Carolina to slightly over 180. How do these southern white pines compare with those growing farther north? Up until its demise on May 4th, 2018, the tallest white pine in the Northeast was the Longfellow Pine in Cook Forest State Park, Pennsylvania. It was 184.5 feet in height then. Its girth was 11.3 feet at breast height. The Longfellow pine is likely between 250 and 350 years old. Many of the oldest pines in Cook Forest date to a fire in 1644. So, the Longfellow pine is likely older than 300 years.

The story of MTSF's particular woodlands can be related through two principal features: the swaths of old growth forest on the ridges above the Cold and Deerfield Rivers, and the stands of exceptionally tall pines. Of these two features, the stature of the Mohawk pines is by far the most visible. But it wasn't always that way. Most of the pines are between 100 and 180 years old. The larger ones began life just prior to or after the American Civil War. Their story has been slowly building in the intervening decades to the point that today tall white pines can be thought of as being to Mohawk as what geysers are to Yellowstone National Park and waterfalls to Yosemite. The MTSF pines are the reason that the park is the forest icon of Massachusetts. So, let's take a tour of these trees.

Headquarters Hill Pines

Starting up the hill from the headquarters, the road is lined with stately pines, the subject of past photographic introductions to MTSF. Are these the ones that achieve great stature? No, they are generally between 120 and 135 feet tall. However, more prominent ones are nearby. A small leach field is located on the north side of the road. It is worth walking over to the field. You entered it at its west end. From there, looking eastward, several tall pines dominate the view. They grow through an understory dominated by small mountain laurel shrubs. Laurel is common in MTSF, as is the laurel/pine combination, and will be seen elsewhere along the nature trail network. It creates a particular aesthetic that never loses its appeal, and owes its existence to the abandonment of the area for sheep pasture and other uses, and after brush fires. Fields that have experienced past fires often support a growth of mountain laurel. The large white pines growing up through the laurel preceded the small shrubs.

The uncommon aspect of this scene as compared to white pine/laurel combinations elsewhere in Massachusetts is the stature of the pines – the real story of MTSF, and one that will be often repeated in this guide. We begin that story by looking at the cluster of pines at the east end of the small leach field, which includes two trees that exceed 140 feet in height, one making 150.2 as of a 2019 measurement. That pine is featured in the next photograph. For scale, environmental science student Dylan Perrier appears in the image. Dylan stands next to the straight trunk of the Headquarters Pine, as it was first named. The arrow-straight pine measures 9.5 feet in circumference (36 inches in diameter), respectable but not exceptional. However, the tree's 150.2-foot height introduces us to trees of that scale, and sets the stage for many exceptional trees to follow. The pine is the first member of the elite 150-Club as we call it. This important height threshold is the standard used to identify exceptionally tall eastern trees, and was cited by Henry David Thoreau as the litmus test for the once great white pines that grew across New England. It should be noted for comparison purposes that 150 feet is roughly the height of a 13-story building.

While this pine is the tallest tree in the immediate area of the Headquarters, it is not unusual for MTSF. Still, it exceeds all tall trees measured to date in the Connecticut River Valley corridor of Massachusetts. Its closest Valley present-day competitor is a pine on the property of Smith College, informally named the John Berryhill Pine for the arborist who climbed and trimmed it. John's tree was 144.1 feet as of its last measurement in April 2019.

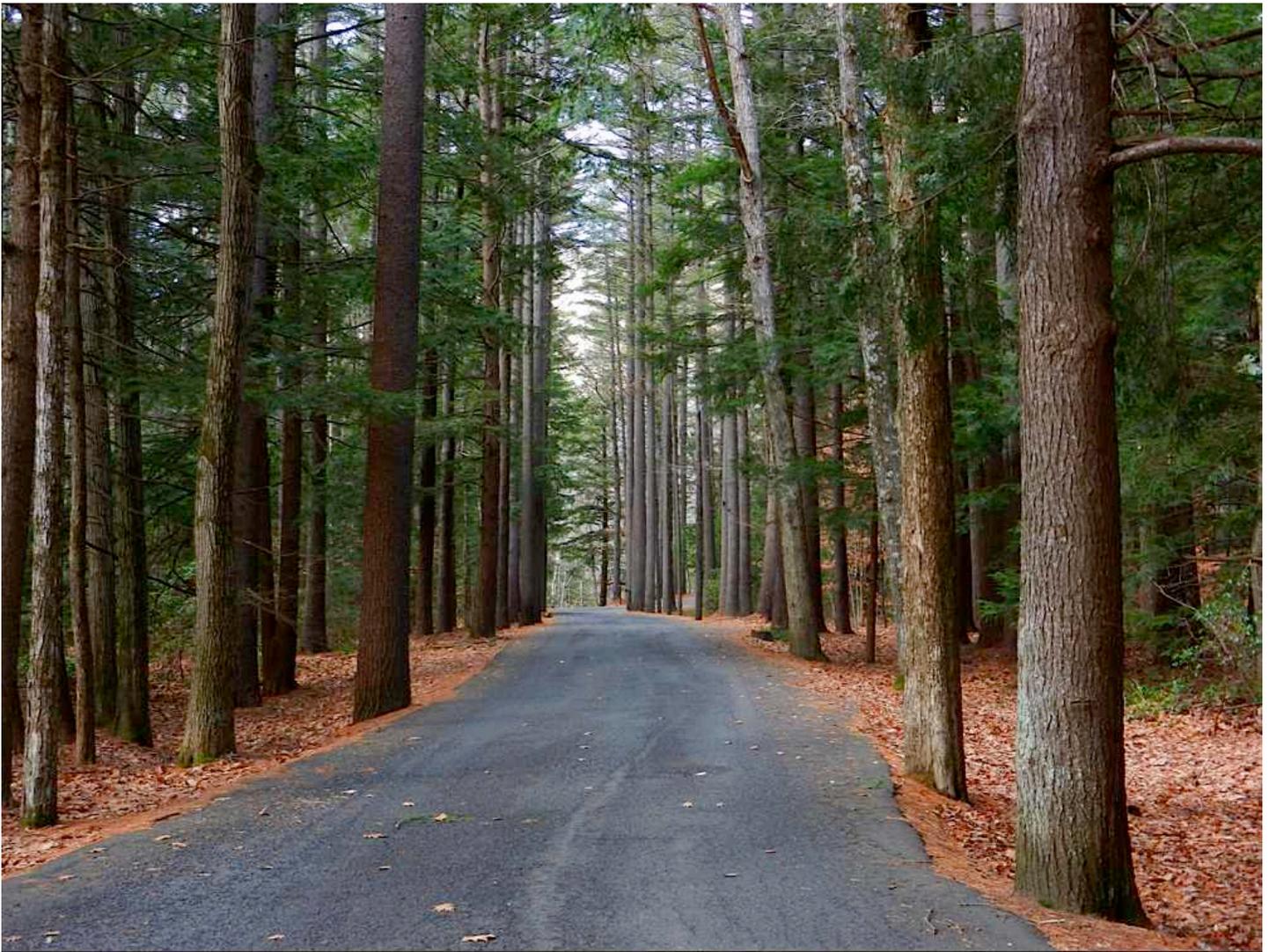
Let's take a look at this first Mohawk member of the prestigious 150-Club.



Incidentally, in 2018, the Headquarters Pine was renamed to honor Dr. Tony D’Amato, professor at the University of Vermont, and author of a scholarly study of Massachusetts’ old growth sites. Tony has visited his pine in the past.

To get us conditioned to the size of trees like Tony’s pine, we calculate that its trunk and limbs have a volume of between 450 and 475 ft³. This translates to between a theoretical 5,400 and 5,700 board feet in the trunk. But not all of this volume would be usable – perhaps 2,500 board feet, which still an eye-popping number to lumberman and greatly exceeds the board feet obtained for most commercially harvested trees in Massachusetts (theoretical board feet = volume in cubic feet x 12). While the trees in MTSF are in a forest reserve and not subject to harvesting, it is useful to understand how they compare with harvestable pines located elsewhere. The larger size of the Mohawk trees emphasizes the common practice of cutting pines at relatively young ages, an economic decision that has no other utility.

Leaving the leach field and continuing up the campground access road, the visitor enters what we call the Avenue of the Pines. One straight trunk after another rises upward. A remarkable sight, the cathedral effect of the pines is dramatic in all seasons. We present a late fall image below.



Most of the pines in the above photograph are between 115 and 140 years in age. A few hemlocks, northern red, and white oaks are mixed in, forming an attractive open forest. The combination of species is an example of old-field succession, with the mere existence of the pines announcing this historical land use. But, why do we find the pines instead of domination by other species? After the retreat of the glaciers, the Cold River deposited sand, forming silt-sand soils on terraces that are ideal for pines. Young pines need sunlight and cannot survive in dense shade. Abandoned fields are a favored environment for white pine regeneration in New England.

The white pines growing along the road corridor have a natural life expectancy of between 200 and 300 years unless attacked by an insect or pathogen. So, at 110 to 140, these pines are in early middle age, but most won't make it into old age. For a pine to survive over 300 years, it must weather storms, outbreaks of insects, attacks by fungal agents, and intense competition from other pines, as well as actions by humans. These multiple challenges to survival dramatically increase pine mortality and progressively thin out the stands until only the strongest remain. A 20-year old stand may have 500 stems in an acre. By age 150, there may be no more than 50 pines remaining. We see this scenario playing out in older pine stands such as Hearts Content in Pennsylvania. The new forest growing up from beneath the standing trees won't be repopulated with pines unless a major forest opening occurs. The forest will slowly revert to shade-tolerant hemlock, sugar maple, American beech, yellow birch, and a scattering of other species. This is called forest succession.

The next image shows a healthy grove of pines growing between the road and the bank leading down to the Cold River.

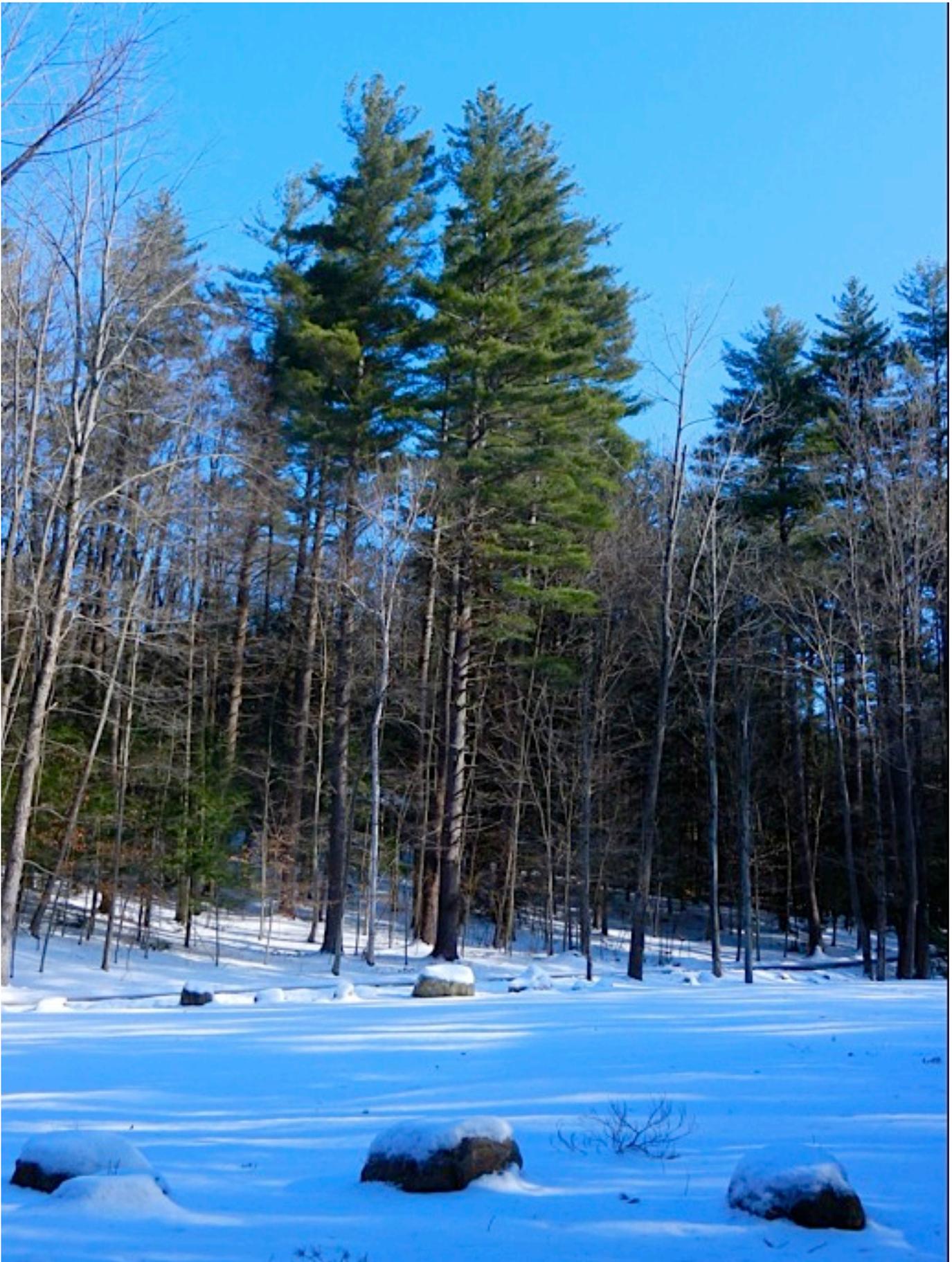


Continuing uphill on the campground road, the pines dominate, but a few other species make their presence known. The white oak is one of them. White oaks follow the human paths up the south-facing side of Todd Mountain. They appear to be a cultural vestige in the sense that clearing of the land along the Mohawk Trail corridor changed soil chemistry and the microclimate in ways that allowed white oaks to better compete. However, in Mohawk the white oaks are not standouts. Their dimensions are modest for the species. The Mohawk specimens typically reach girths of 5 to 9 feet, at most, and heights to 100 feet. In the valley regions, open-grown white oaks can reach girths approaching 20 feet, and we have measured the whites to heights of nearly 120 feet in Massachusetts. The next image shows the trunk of a white oak on the north side of the road going up the hill. This tree is probably around 130 years old, perhaps 150. The white oak is the state tree of Connecticut, Illinois, and Maryland. It dominates the red oak in this department. This likely results from the superiority of its wood for lumber. The white oak was also used extensively as a food source by Native Americans. White oak acorns are sweeter than those of the red oak family.



At 0.35 miles from the start, the road splits. Follow the branch that curves to the right and circles around a second, much larger leach field. The white pines continue their domination, and those that form the boundary of the leach field tell the story of a battle that is being waged. Their exposure to extra sunlight from the opening promotes added growth. However, they are also exposed to more wind and sun scalding. Weaker trees succumb to the elements. Stronger trees make good use of the extra sun and grow rapidly. Each year, the pines put on a new growth whorl. Younger trees sometimes put on as much as 30 inches a year. By counting the whorls, you can compute the age of the pine. However, the lower limbs die when shaded, the limbs drop off and the bark heals over, so that evidence of early limb whorls becomes more difficult to identify.

In the image below, the two pines shown grow on the opposite side of the road from the leach field. The tree on the left reaches 146.4 feet and the pine on the right is 142.0 feet. A third trunk seen just to the left of the rightmost pine, but farther back reaches 144.5 feet. These trees afford the viewer with a comparison between heights of hardwoods versus the pines.



On the opposite side of the leach field, a tall pine bends to the left. It is the Bellows Pine, named for the late Chuck Bellows, a longtime employee and friend of MTSF and of the author. Chuck's tree stands 150.5 feet in height and is 8.2 feet in girth. It is the second member of the 150-Club as we move up the road. The image below looks upward along the graceful curving trunk.



These leach field pines announce the presence of even taller trees that begin at the end of the field. The stand is named the Pocumtuck Pines in honor of the Pocumtuck Indians who once occupied the area that is now Old Deerfield. Native peoples would have been frequent travelers along the old Mohawk Trail for both war and trade. The Pocumtucks had been allied with the Mohawks for a period until a squabble over the beaver trade ended the peace between them in the late 1600s.

One pine at the edge of the field stands out. It is a double, meaning it is actually two trees that have grown together. The combined trunk reaches 14.1 feet in girth. The Native Tree Society has named the tree the Massasoit Pine. Massasoit, who lived from 1590 to 1661, was the grand chief of the Wampanoags. He was known for his enduring friendship with the Pilgrims, and as a consequence, Massasoit is a common place-name in Massachusetts. The Massasoit Pine is 150.4 feet high. We will say more about this pine in the next section.

Climbing and Measuring

A big part of the story of Mohawk's pines is the sheer amount of measuring that has been done to tell their story. Tree-measuring is an essential part of the forestry profession, but foresters are not usually the ones that do the very precise measuring of big and/or tall trees. The timber persons' chief interest is in the commercial part of a tree, which might be to the point up the trunk that reaches a 4-inch diameter. The remaining part may be of little or no interest. The forester can usually measure commercial trunk length accurately, but the common tape-and-clinometer method (or hypsometer equivalent) used, does not suffice for the whole tree. That mission falls to a handful of big tree hunters, *avant garde* scientists such as Drs. Steve Sillett and Bob Van Pelt of California and Washington, the Native Tree Society (NTS), and the American Forests National Cadre of expert tree-measurers. In the eastern United States, it has been NTS and its Cadre spin-off that has led the way.

The breakthrough in tree-height measuring came with the laser rangefinder. With that instrument and a clinometer, the following trigonometric relationship could be employed.

$$H = L \sin(A)$$

Here, H = height between target and eye level, L = straight-line distance from eye to target, and A = angle between eye and target. In this case, the target could be the top or base of a tree. This method works independent of where the tree's top is located in three-dimensional space relative to its base.

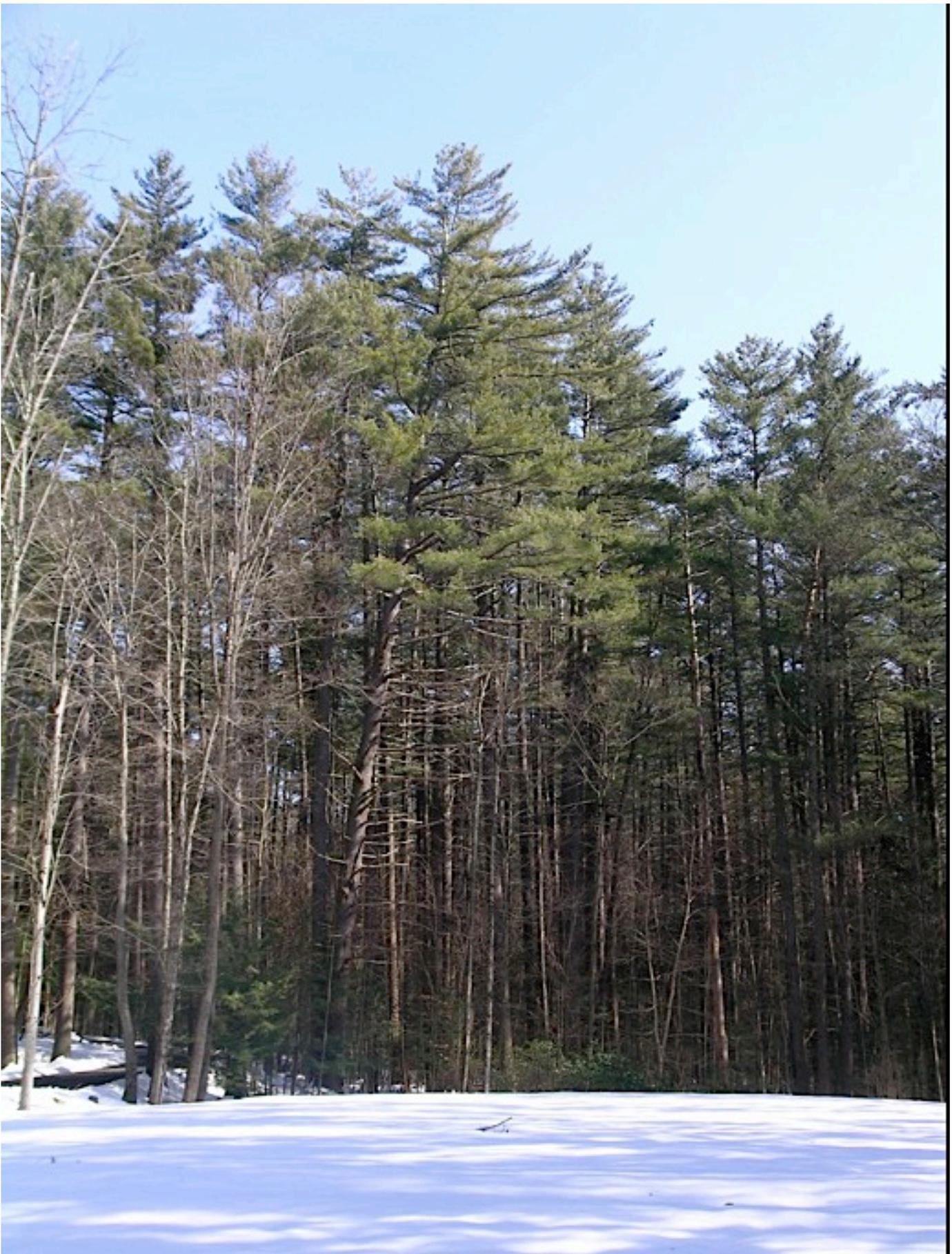
Massasoit Pine

The Massasoit Pine at the end of the leach field was climbed in 2006 by Will Blozan, President of NTS. Blozan did a tape-drop measurement of the pine, which proved to be 146.5 feet at the time. The measurement took place at a tree-measuring workshop that allowed measurers to test their skills and compare techniques on a target of known height. NTS continued to monitor the tree, and on March 8, 2012, Robert T. Leverett re-measured Massasoit to a height of 150.4 feet. This represents an average growth rate of 0.78 feet per year. For more information on measuring techniques go to www.nativetreesociety.org and select "Tree Measurement Guidelines PDF". A more recent tree-measuring guide can be found at:

https://www.americanforests.org/wp-content/uploads/2019/07/AF-Tree-Measuring-Guidelines_MW.pdf.

This guide was written by the author with retired USFS forester Don Bertolette and is meant for amateurs and professionals who want to measure champion tree candidates.

The next two images show the Massasoit Pine. The first is a photograph taken from a distance of 270 feet from a yellow marker placed on the trunk. The second image shows the pine's crown with a red arrow pointing to the highest sprig. From the more distant vantage point, the referenced point doesn't appear to be the highest, but that sprig grows farther back into the crown than the center sprig. Confirming it as the top requires the combination of an infrared laser rangefinder to measure distance and an inclinometer for angle. In addition, the higher sprig can't be seen from the middle of the leach field.





Changing our focus from the pines for the moment, one tree on the left side of the road shortly beyond the big curve catches the eye. Because of its bark curls, it can be mistaken for a shagbark hickory, but it is, in fact, a red maple, state tree of Rhode Island.

The Noble Red Maple

Red maple is also called soft maple as compared to sugar maple, which is called hard or rock maple. In the 1800s, trees were cut with axes, and cutting a hard maple with an axe was no small feat. As a consequence, red maple was more valuable for building during the colonial period and beyond, until crosscut saws replaced the axe. Today lumbermen often consider red maple to be an undesirable species. It gets bad press, but not everyone thinks that way, especially in the fall when its brilliant red foliage competes with the sugar maple's iridescent colors.

The red maple enjoys one of the widest distributions among eastern species. It grows in the broadest range of soil types and is one of the first trees to flower. Its red blossoms in the spring and brilliant red fall foliage are eye-stoppers. In New England, the species is often associated with swampy areas and is called swamp maple. It can fulfill a wetland role because red maple roots are tolerant of soil saturation. Where soils are dry, a longer taproot is put down. This adaptive behavior allows the red

maple to grow from swampy lowlands to the tops of moderately dry ridges. Also, red maple is a sexually diverse species. Some trees are male (producing no seeds), some are female, and some are both. In a botanical sense, red maple flowers are perfect, i.e. they contain all the parts.

Looking aloft, the visitor will notice opposite instead of alternate branching, identifying it as a maple instead of a hickory. When the leaves are on the tree, there is no mistaking it for a hickory, which has compound leaves and alternate branching.

A final bit of information that many people do not know is that the sap of the red maple is sweet like the sugar maple, but once the red maple flowers, its sap no longer serves the purpose. Since the red maple blooms before the sugar maple, the period during which it can be tapped is much shorter than for its cousin.

A few stray facts about the ubiquitous red maple is that the USFS recognizes it as the most abundant tree species in eastern America. In logged forests, red maple populates quickly, but then thins out as the forest matures. During its establishment in a forest, red maple can be found in both wet and dry areas, on north and south-facing exposures. It is highly adaptable.

The image below shows our red maple on the left side of the road.



In appearance, very young red maples have smooth gray bark. As the maple ages, though, the bark begins to split and tends to turn increasingly brown. The shagginess of this red maple suggests an age greater than 100 years, but the bark of this particular specimen has not turned brown, suggesting an age under 100 years.

The surrounding pines dwarf this slender red maple. It has a small waistline, and will not likely be noticed except possibly for its scaly bark. However, it deserves a second look. What is most significant is that it rises to a surprising height of 105.5 feet. Red maples have been measured in Mohawk to 128 feet with many between 105 and 115 feet. The largest single-trunk red maples, girth-wise, in Mohawk are 6 to 8.5 feet. An isolated multi-trunk specimen in the Trout Brook cove is approximately 13 feet around, but a single-stem red maple will not grow to such dimensions in the Berkshires. The slender red maple is an example of a Mohawk hardwood that has a small diameter, but a fairly significant height for the species. In fact, red maples all over Mohawk Trail State Forest exceed 100 feet in height, but few exceed 8 feet in girth. Mohawk, then, is the abode of tall trees: hardwoods and conifers. Reinforcing the point further, no less than 14 species in Mohawk have reached record heights for Massachusetts at one point or another. Those species are: white pine, red pine (plantation), white ash, sugar maple, American beech, red maple, black cherry, American basswood, bigtooth aspen, N. red oak, American elm, black birch, hophornbeam, and striped maple.

Most visitors are not likely to recognize the red maple's height as significant for two reasons. First, the visual impact of the pines overpowers the maple, and secondly, gaining perspective on the maple's height requires an object of known size to be in close proximity for comparison. In the next image, we see the whole tree with a human figure visible at the left side of the base of the trunk. The human figure stands about 5.6 feet tall. The full height can be seen as roughly 19 times that of the human figure, and this maple is not exceptional.



The tall slender red maple brings up a talking point. Most tree-conscious visitors are likely to be more impressed by trees with large diameters. Mohawk's trees are not exceptional in terms of diameter. Three feet is common, but four feet isn't. None that we have measured so far reach five. By contrast, the Connecticut River Valley has a large population of trees sporting diameters of five feet or more. In the case of the famous Sunderland Sycamore, its diameter is a robust 8.2 feet.

Into the Skyscrapers

Moving beyond the leach field, most of the pines on the downhill side of the road have slender trunks and great heights. Up to this point, we've seen 130 and 140-foot pines and three over 150, but there are at least nineteen of the pines in this next area that exceed 150 feet. Of these, at least three exceed 160 feet. The pines are in intense competition with one another, and the stand will continue self-thinning over the next few decades. Only the strong will survive, and they will grow larger. The *Pocumtuck Pines*, as we call them, bear witness to the intense competition that pine stands experience.

The pines below the road grow in a rather wet area so there is abundant undergrowth. Striped maple trees are common, and some of them are large and tall relative to what is usually seen in Massachusetts woodlands. Most woods walkers are accustomed to seeing thin green-striped trunks with large leaves. Total heights are usually between 20 and 35 feet. However, the species can do a lot better, and especially in MTSF. In fact, the tallest striped maple tree in Massachusetts grows in Mohawk. As of its last measurement, it was 68 feet tall.

Beyond the moose-wood (striped maple), witch hazel, mountain laurel, and hobblebush also grow among the pines. A single American chestnut has been identified in the area, one of only two located in all of Mohawk.

In this area, at the edge of the road there are also mountain maples (*acer spicatum*). They are more commonly found on the boulder fields of Todd and Clark Mountains. But fortunately, at this location, it is possible to see sugar maple, red maple, striped maple, and mountain maple all with a few yards of one another. The sugar maple and red maple are canopy species and the striped maple and mountain maple are understory species. The sugar maple is the longest lived among the four. On occasion, it can reach close to 400 years in age, although the average is probably around 250. Red maple lives to around 200 years, and the understory species considerably less. An image of mature sugar maple bark follows.



At approximately 0.5 miles from the start, the paved road circles to the left up to a bathroom facility and five of the six cabins. Staying in one of the cabins allows the visitor to sleep beneath Mohawk's exquisite pines. In the next image, Cabin #7 is seen peeking through the trees. It is one of the two newest.



At this point, the Nature Trail departs from the paved road and follows the dirt road, once known as the Old Cold River Road. Cabin #6 is immediately on the right, surrounded by the continuation of tall pines. One tree is especially noteworthy. In front of Cabin #6 and located a few yards down the hill to the right, the crown of the Cabin Pine stands out against the sky. It has a circumference of 8.9 feet, which is not exceptional, but it reaches the height of 160.1 feet. It is the second of the 160-footers that the visitor will pass up to this point. The first grows near the Cabin pine, but is less apparent, which generates a question.

How many 160s are there in Mohawk? So far, twenty-one trees have been confirmed to a height of 160 feet or more. Recent LiDAR scans done by Michael Taylor of redwood fame suggest there may be 10 to 15 more. They would be trees that have not been measured within the last 10 years or more. What is the significance of the 160-foot threshold? Outside of MTSF, we know of only three others reaching to 160 feet. These exceptions are the huge 160.1-foot tall Thoreau Pine located in Monroe State Forest, the 160.2-foot tall Ice Glen Pine in Stockbridge, MA, and the 162.4-foot tall Bryant Pine in Bryant Homestead's woods, Cummington, MA.

The next image shows the Cabin Pine. Note its steady conical taper. This feature allows us to model its trunk volume with surprising accuracy. We estimate that the Cabin Pine has a combined trunk and limb volume of between 400 and 430 ft³. If we settle on the average of 415, this represents 2.4 tons of elemental carbon. Its equivalent CO₂ load is 8.8 tons. A 50-year-old version of the Cabin Pine would have sequestered approximately 1.6 tons of CO₂. So, between 50 years and the present (probably around 135 years), the Cabin Pine increased its CO₂ sequestration by a factor of 5.5 while increasing its age by a factor of 2.7. The efficacy of size is apparent, yet this fact is not always appreciated or understood.

The pines along the Tall Pines Trail are part of the Department of Conservation and Recreation's system of forest reserves. The trees offer us a treasure trove of data on the role of mature white pines from different perspectives: ecology, local wildlife, climate mitigation, history, and aesthetics.

Below, we see the Cabin Pine.



The next two images provide a sample of what visitors can expect. In the first image, Cabin #6 is seen down through the pines in front of Cabin #5.



A few yards east of Cabin #6, the trail passes by the third leach field, affording visitors another opportunity to walk out into the grass and enjoy the view. Thereafter, the trail goes up a small hill and emerges into a clearing – the Group Campsite. This is also the trailhead for Thumper Mountain, which will be covered as the last section of the Nature Trail Network.



The visitor's attention will be drawn to the mature mountain laurel in the area, especially when in full bloom in June. The laurel follows the spine of Todd Mountain all the way to the top, a gain of around 900 vertical feet from this point. Midway up that ridge, old growth forest appears.

Proceeding across the flat area by the port-a-potties and beyond the gate, the visitor will see a pond on the left. It is an old fire pond, built by the CCC in the 1930s, as a WPA project. The pond acts as a vernal pool in dry years. Vernal pools, by definition, are wet in the spring and dry in autumn. The fire pond is now used as a breeding site by wood frogs and spotted salamanders, which deposit egg clusters after the first spring rains. Chorus male wood frogs can be observed if one quietly approaches the pond on warm, sunny days in late April and early May, and swarms of their darkly colored tadpoles can be observed after the eggs hatch. The tadpoles transform into miniature frogs in early summer. Adult wood frogs are terrestrial and are frequently seen along the trail, along with American toads and red efts (the terrestrial, juvenile stage of the red-spotted newt). Wood frogs are conspicuous when they hop, but their rich brown coloration renders them almost invisible when they come to rest on the leaf litter. Spotted salamanders live underground most of the year, and can be seen in large numbers only by visiting their breeding ponds at night, after the first warm spring rains.

The image below shows the pond.



Past the pond and down the road, the pines on the downhill side have special significance. They are the *Trees of Peace*, dedicated in 1997 by DCR in honor of Native Americans who passed through this area. On the uphill side, we have the *Cherokee-Choctaw Grove*. From this point on to the next Nature Trail sign, the pines form a continuous canopy on both sides of the road. The trees tower. As of 2019, a total of at least 24 white pines had been measured to heights of 150 feet or more in the *Trees of Peace*. An additional six are located in *Cherokee-Choctaw Grove*.

The stature of the *Trees of Peace* is especially noteworthy. Six of Mohawk's twenty-one 160-footers are located in this stand. Two trees have been named for chiefs of the Mohawk Nation: the late Chief Jake Swamp and Grand Chief Joe Norton of the French Mohawks. A third 160-foot pine is named for John Brown, chief of the Rhode Island Narragansetts. A fourth pine is named for Lakota Chief Arvol Looking Horse, nineteenth carrier of the White Buffalo Calf Bundle. All four Native American dignitaries have visited the *Trees of Peace*. The other two 160s are on the side of the Old Cold River Road going downhill. This brings us to an individual tree of special interest.

The Jake Swamp Pine

How likely is it that Massachusetts would have the tallest tree in New England? Most forest-savvy people would probably consider it highly unlikely. Visitors might expect the tall tree honors to go to Maine (the White Pine State), New Hampshire, or Vermont, but in fact, the winner is the Jake Swamp Pine in Mohawk Trail State Forest, Massachusetts. At 176.2 feet (as of June 3, 2019), the pine is the tallest accurately measured tree we know of in New England, and possibly the Northeast. This fact is not widely known, and for good reason. The pine needs to be protected from excessive attention. Pines that get too much attention generally suffer from soil compaction. We do not give out the exact location of this tree.

The author with friend Jack Sobon first measured this pine in 1992 with a transit. At that time the Jake tree was 155.0 feet in height and 9.7 feet in girth. Since then, it has been climbed four times and tape-drop-measured. Today, the pine is around 160 years of age, as are its nearby companions. A few yards away, the Joe Norton Pine reaches to 168.0 feet in height and 9.7 feet in girth. Also, close by, the John Brown pine measures 161.9 feet and is 8.0 feet in girth, and lastly, Arvol Looking Horse pine at 160.0 feet. So, in just a few yards, we have four white pines reaching to a height 160 feet or more.

As of 2019, the Jake Swamp Pine is 10.8-foot in circumference. That is large, but not overpowering. It continues to grow, adding height at the rate of 7 to 9 inches per year, and until recently, girth at about a quarter of an inch per year. The girth rate has slowed to imperceptible with the advent of the needle cast fungus. Jake, may not gain any more girth, but what it has tells a story.

Today, Jake has approximately 660 ft³ of trunk volume. Adding in the limbs, this rises to 710 ft³. By comparison, at 50-years Jake probably had around 120 ft³. Normal growth for the species on fairly good sites is about 80 ft³ by 50 years. Assuming 120, Jake has increased its volume by a factor of 5.9 while increasing its age by a factor of 3.2. Note the comparison to the Cabin Pine. However, more average pines for the general region will increase their growth by a factor of between 3.5 and 4.0 as their ages increase by a factor of 3.0 (50 to 150 years). Slow-growing pines will increase their volumes by a factor of 3.0 to about 3.3 while their ages increase from 50 to 150 years. So, through this analysis, it is apparent that most of Jake's growth has come after the age of 50 years.

Because of the sheer size of the pines, it is easy to miss the other species. As in the *Pocumtuck Grove*, tall striped maples grow beneath the pines. A few yards down the hill from the road, one specimen reaches 66.5 feet in height and 1.9 feet in girth. A second striped maple just a few yards away reaches 60 feet. These two join at least four others in Mohawk that exceed 60 feet. The tallest grows on the east side of Thumper Mountain and is 68.0 feet. The next image shows the tall striped maple. Altogether, we have measured six striped maples to heights of 60 feet or more. Specimens between 45 and 55 feet are fairly common in Mohawk, and a number of other western Massachusetts sites.

The following image shows the 66.5-foot striped maple in the *Trees of Peace*.



The trail continues to follow the road downhill. In the next image, the pine in the center of the photograph is in the *Cherokee-Choctaw Grove*. The tree is named the Calibration Pine and is often used to check instrument calibration of the Native Tree Society's tree measurers. Its top is easily spotted from the road. The Calibration Pine's height is 158.5 feet as of July 2018. It is a double-trunk pine, measuring 13.1 feet around the fused stems. The tree is showing stress, as do many of the double trunk pines. The area of fusion between the separate trunks can create structural problems, especially in advancing age.

The author encountered a scout troop leader several years ago who estimated the Calibration Pine's height at 90 feet. The tree was about 153 feet tall at the time. The stature of these trees is hard to gauge sometimes even for experienced woods walkers. Without a reference object, most people cannot estimate the heights of the Mohawk pines.

The trunk of the Calibration Pine has an estimated 844 ft³ of trunk volume. The image below shows the Calibration Pine in the center, right before the road curves. Closer branches partially obscure the tree. Again, it is the distant trunk the center of the image.



Other Significant White Pine Sites

The visitor may wonder how the Mohawk pines compare to other famous white pine sites. There are between 2,500 and 3,500 mature pines in MTSF. Between 145 and 155 of them reach heights of 150 feet or more. Based on our current measurements, Mohawk has the greatest concentration of 150-foot tall trees known in New England, if not the Northeastern United States. At least 400 pines surpass the 140-foot height threshold, and we believe that 1,500 to 2,000 exceed 130 feet. The diameters of most of these pines are between 24 and 36 inches.

The second greatest concentration of tall pines in the Northeast is Cook Forest State Park in Pennsylvania, which has at least 112 pines over 150 feet. However, many tall Cook Forest Pines have not been measured since 2001, so the Cook site likely now rivals Mohawk in the total number of 150s. For the Northeast, these two properties stand unchallenged by any other site of comparable size. Elsewhere, a private location in New Hampshire is in third place with between 60 and 80. Thereafter, the number of tall tree sites drops dramatically. Hearts Content, the great virgin remnant in the Allegheny National Forest of Pennsylvania, has 19. William Cullen Bryant Homestead in Cummington, MA has 18. A small site in the High Peaks Wilderness of the Adirondack Park has 16 pines reaching the 150-foot threshold. All other white pine sites in the Northeast of ten thousand acres or less that have been inventoried and measured for extremely tall specimens have fewer than 10 trees that reach the 150-foot threshold. For example, Anders Run in Pennsylvania has seven 150s. The Elders Grove in the Adirondacks has about the same. The big pines of Ice Glen in Stockbridge have 6 pines reaching to 150, and quite a few sites have 2 to 4 trees meeting that threshold. This does not mean that all sites have been inventoried. The use of LiDAR helps us to locate promising stands, but LiDAR coverage can be spotty and not of equal sensitivity. In the end, ground-truthing is necessary.

The White Pine's Closest Species Competitor

What about other species of trees that could challenge the noble white pine? It turns out that the tuliptree (*Liriodendron tulipifera*) is the only competitor to the white pine's height dominance in not only the Northeast, but the entire East. *Liriodendron* is not a good cold weather tree. Growing conditions must be ideal beyond latitude 40 degrees north. As a consequence, significant numbers of tuliptrees exceeding 150 feet in height do not occur until southern Pennsylvania where tuliptrees have been measured to 164.5 feet, and 170 feet in eastern Ohio. Tuliptrees achieve heights of 150 feet in Connecticut and southern New York. North of there, they rarely reaches the 150-foot threshold. In locations like Philadelphia's Fairmount Park, a substantial number of 150-foot tuliptrees occur, although we have no accurate determination of the number. Farther south in the Great Smoky Mountains National Park, a tuliptree has been measured to a height of 191.9 feet. That tree was climbed and tape-drop-measured by Will Blozan, the same arborist who climbed the Jake Swamp Pine. Tulips over 150 feet are common as weeds in the coves of the southern Appalachians.

What Does the Future Hold?

What does the future hold for the Mohawk pines? Since these trees are in middle age, they would normally continue to gain in stature, and barring damage, would remain as New England's premier white pines for decades. However, a needle fungus named *Canavirgella banfieldii* is threatening many of Mohawk's pines. Their future is not bright. This is also true of white pines in other regions. So, between the white pine blister rust, the white pine weevil, and the needle cast fungus, our iconic tree symbol of Colonial New England is ailing.

Carbon Value of Mohawk's Pines

Visitors coming from many backgrounds may fairly ask what are the purposes served by the Mohawk pine. There are several, including wildlife habitat, aesthetic value, climate stabilizers, and oxygen generators. In climate stabilization, the pines sequester carbon, a greenhouse gas. It is natural to ask how well the Mohawk trees perform in this role. Opinions differ on how effective larger, older trees perform in sequestering carbon as compared to younger trees. The majority of forest managers believe that because young trees grow fast, they acquire their carbon load more quickly than older trees both on a percentage and absolute basis. While young trees obviously do grow fast, what happens with the older trees is surprising. The Mirror Pine will be used to investigate the sequestration role.

In the photograph below, the Mirror Pine is seen from a distance. As of 2019, it stands 156.6 feet in height and is 11.4 feet in circumference at 4.5 feet above its mid-slope base position. In the photograph on the next page, the arrow points to the crown of the tree. In the second photograph, the author stands next to the Mirror Pine for scale.

What do its height and girth alone tells us about the amount of carbon held in the trunk and limbs? If we use the USFS's COLE carbon estimator, we get 578 ft³ in the trunk. That amounts to 3.3 tons of carbon in the trunk. However, the model is statistical and tends to underestimate the volume in large trees. We can refine the actual volume determination of its trunk and limbs. Once this is known, we can calculate the mass, and finally the proportion of the mass represented by carbon. Let's first take a look at the Mirror Pine.





The volumes of trees with straight, tapering trunks like the Mirror Pine can be modeled using geometric solids such as cylinders, paraboloids, cones, and neiloids (consult the Internet for definitions of these solids). The pines do not conform exactly to any of these regular geometrical forms, but a combination of them can be employed to successfully model the trunk and larger limbs.

Using this approach, we have calculated the trunk and limb volume of the Mirror Pine to be approximately 650 cubic feet, which translates to approximately 15,000 lbs based on an average air-dried density of 25 lbs/ft³. Of this mass, 7,500 lbs are carbon. At current growth rates, the Mirror Pine adds between 5 and 6 cubic feet of new wood per year. If we settle on 5.5 lbs, this equates to approximately 68 lbs of new carbon annually, which further translates to 249 lbs of CO₂ absorbed from the atmosphere. By comparison, a 30-year old pine may add only 2.0 ft³ in its 31st year. This amounts to 25 lbs of new carbon or 92 lbs of CO₂. The Mirror Pine does the job of 2.7 thirty-year old pines.

As good as this sounds, the annual growth of the largest Mohawk pines such as the Saheda Pine equals the combined annual growth of between three and four 30-year old pines. But it is when overall totals are compared that the role of the big trees is revealed. The total amount of carbon in a large 150-year old pine can equal the total in 10 fast growing 50-year old pines.

Going from a single tree to a stand, an acre of the mature Mohawk pines can sequester as much as 190,000 lbs of carbon, and be adding carbon at the rate of between 3,000 and 4,000 lbs per year. This does not count the contribution of the other species scattered among the pines. The aggregate statistics are eye-popping. Over 15,000,000 lbs of carbon are being held in the trunks and limbs on the 80 acres of mature Mohawk pines. Each good growing year adds another 250,000 lbs of carbon for these mature pines, or 916,000 lbs of CO₂ absorbed from the atmosphere. To be sure, there is carbon loss from decay, but at present, the accumulation far outpaces the loss at the ages of these trees.

The Ernestina

Continuing on from the Mirror Pine, towering forms continue to line the sides of the road down hill to the beginning of the Nature Trail Loop. The visitor's focus will naturally be on standing trees, but there is one especially distinguished stump just off the road on the downhill side. The next image shows the remains of the stump with a downed log lying across it.



In 1994, a Mohawk pine was cut to replace the broken mast on the historic schooner, the *Ernestina*. Here is a brief description of the *Ernestina* taken from the Department of Conservation and Recreation website.

The Schooner Ernestina is a one hundred year old ship designated by the Department of the Interior as a National Historic Landmark. Originally built at the James and Tarr Yard in Essex,

Massachusetts and launched February 1, 1894 as the Effie M. Morrissey, she has sailed on through the century to become one of six remaining Essex-built schooners.

She reached within 600 miles of the North Pole and is the last ship to bring immigrants to this country under sail from the Cape Verde Islands. Ernestina was given to the people of the United States by the people of the Cape Verde Islands in 1982. Her history is a remarkable legacy that spans continents, races and generations.

The pine used for the mast was 137 feet tall and 125 years old at the time of cutting. It was felled and moved by the late Chuck Bellows, his son Jared, and logger Norman Hicks to the Lower Meadow and fashioned by crafts-persons into a mast 82 feet long. This bit of the *Ernestina's* history cannot be found on the official website, but it is part of the record.

The use of a Mohawk pine for a ship mast has precedent. In the early 1600s, the white pine was introduced to England, and by the mid-1600s, the Royal Navy was using New England white pines for ship masts. The supply of Baltic pine (*Pinus sylvestris*) had become unreliable after centuries of use, and the white pine was the perfect replacement. The colonists had many uses for the tall pines and were not eager to surrender them to the king. Pilfering was more the rule than exception. As a consequence, in the late 1600s and early 1700s, England enacted a series of unpopular laws in the American colonies known as the King's Broad Arrow Policy. Basically, all mature pines measuring 24 inches in diameter at one foot off the ground were declared the property of the King. English officials began marking white pines with a three-stroke pattern (/|\), the Broad Arrow marking, to identify them as the King's property. A major cause of the American Revolution was economic competition between the King and the colonists for white pines. Pines in locations like Mohawk were too far inland to be used for masts, but many of the Mohawk pines would have qualified.

A Special Dedication

For years the author has been in the habit of naming pines. A name is usually given to a noteworthy tree to honor a person who has made significant contributions to protection of the environment and/or championing important trees. On the downhill side of the Old Cold River Road two handsome pines exhibit split tops. The one at the edge of the road is called the Mast Pine, and the second just below it has been named for Michael Taylor of redwood fame. Michael and associate are the discoverer of the Hyperion, the world's tallest tree, which is currently 379.5 feet or a few inches more. Although Michael has never visited the Mohawk pines, he has run LiDAR scans for the author, and the two have collaborated on developing advanced methods for measuring tree height and volume. Michael's tree is seen in the next image. It is the tree that forks into a double-stem well up the trunk. The tree in the center of the photograph and in the background. Michael's tree is 160.25 feet tall and 8.7 feet in circumference. It has approximately 410 ft³ in trunk and limbs, and is still growing well.



A Tribute to Rachel Carson

Proceeding farther down the trail, a small road to the left cuts down hill to a gravel pit. This cutoff road marks the end of the *Trees of Peace* area. The cutoff road also marks the beginning of the *Rachel Carson Pines*. Six of Mohawk's 150-footers grow in the *Rachel* stand. In the image below, the Rachel Carson Pine can be seen through the dense surrounding of trees. The red arrow points to the top of the pine. Measuring these tall, crowded trees is technically challenging, but they are gradually divulging their dimensions to justify the name the Tall Pines Trail.



In the next image, the larger tree in the center of the image grows within 50 feet of the road. It reaches 154.6 feet in height and 9.0 feet in girth. Notice that the limb scars are still visible, and even more

apparent on the smaller tree to the right. These are still relatively young pines. They have lots of growing left to do if the needle cast fungus doesn't cut short their lives.

Trees, such as this one, were bypassed literally for years. We had no expectation that the pines near the road were significant, and when they were first noticed by the author, they would have been in the 120-foot class. It is important to understand that the Mohawk pines have grown into the skyscrapers they are today in the last 40 years, which further attests to the continued growth of the species long past the time when many forest managers believe growth slows.



As the Nature Trail Loop sign is approached other species of trees show a greater presence. Large northern red oaks are scattered among the pines. They date to a period when the area was sheep pasture. A rock wall cutting through the area suggests ages of 160 years or more for the older oaks. But youthful offspring are also making their presence known. One of the slender young oaks stood 110 feet tall, while measuring only 4.1 feet in girth when we last measured it. This skinny oak must put all its energy into growing upward to have a chance of survival among the taller pines.

In a few yards, notice a sign on the left side of the road announcing the departure of the Nature Trail Loop from the Old Cold River Road. At this point the Mahican-Mohawk Trail following the road up the hill joins the Nature Trail. This marks the end of the Tall Pines Trail section of the Nature Trail Network.

Campground Spur to Tall Pines Nature Trail

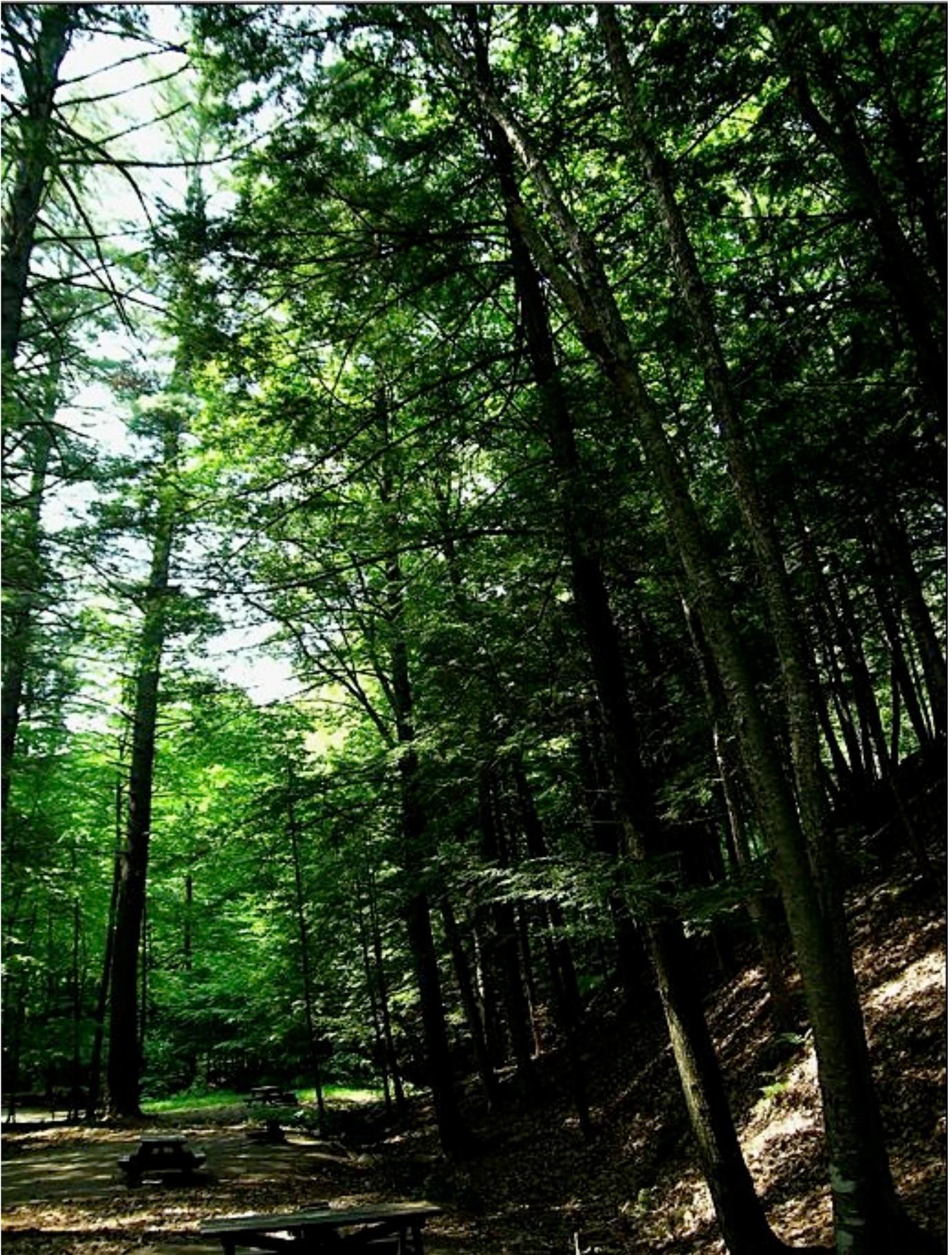
Campers can enjoy the Tall Pines within the campground area. Walking down the campground road the pines on the right side of the road are called the Indian Springs Pines. One of these trees has a girth of 12.0 feet and height of 140.7 feet. It is one of nine single-trunk white pines in Mohawk with a breast-high girth of 12 feet or more. Two are now dead. There are several double-stem pines that exceed 12 feet. Another pine close by measures 10.1 feet in girth and 144.6 feet tall. The image below shows the 12-foot girth, 140.7 height pine. The Indian Springs tree is shown on the next page.



A large pine on the edge of the hill near the first campsite measures 10.2 feet in girth and 142.6 feet in height. On the lowest level of the campground in the area where cars are restricted, two of the 150-footers can be seen. One is a double pine that has been named Dave's Double for a past Mohawk supervisor Dave Miller. Former District Manager Tim Zelazo stands next to Dave's Double in the next image. The double measures 14.6 feet in girth and stands 150.9 feet tall.



Tim Zelazo has his own pine in the area – the other 150-footer. It has been named Tim’s Tower and reaches 154.0 feet in height and 9.9 feet in girth. The pine’s height would be more apparent with an individual in the image for scale, but even then it is difficult to appreciate the stature of these trees. The pine’s crown is partially visible as light green.



Summary

The Tall Pines Trail offers visitors a casual walk among New England's tallest trees. The statistics, as presented above, speak for themselves. As of July 2019, 145 white pines have been measured to a height of 150 feet or more. Twenty of those exceed 160 feet (formerly 21), and two surpass 170. Another of the 160s will likely reach 170 in 2020. However, LiDAR scans suggest that there are more trees in 150 and 160-foot classes. They are likely trees that were last measured over 10 year ago.

The Mohawk pines are not old growth, but mature second growth, with the bigger ones dating back to the Civil War era. A few individual trees on the side of Todd Mountain may approach 250 years in age, and two stands at lower elevation are approaching 200 years.

Beyond the exceptional growth accomplishments of Mohawk's pines, individually and collectively they represent a huge carbon sink, and will continue for some years. Still, the trees have challenges. A fungus attacks new needles and leaves a tree's canopy thin. In time, the tree is expected to succumb. This is disheartening and has fueled the author's determination to thoroughly measure and document these remarkable pines and their story while we still have them. However, even as individual trees succumb, their snags will continue as wildlife habitat.

An important contribution of the Mohawk pines including those along the Old Cold River Road is that they offer us a chance to observe environmental changes on trees that are not being managed. This is one of the purposes of the forest reserves.

The author has put together this trail guide in an attempt to generate appreciation for the Mohawk pines. By all means, enjoy them, but please do so from the trail. It is critically important that we do not put extra stress on the trees from excessive foot traffic by straying off trail. The trees visible from and growing adjacent to the road look substantially the same as those farther into the stands.