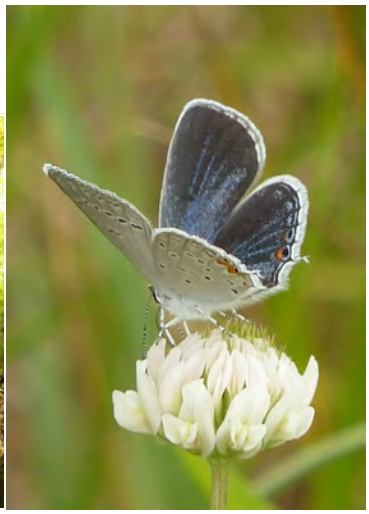
The Natural History of the Mineral Hills Conservation Area

Prepared by Laurie Sanders, M.S.
March 2015



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Sources & Citations

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In addition, I relied on Mike Mauri's forest stewardship plans (2010, 2013), Molly Hale's 2006 ecological report for the Jedoron property, deed records & plans from the Hampshire County Registry of Deeds, court documents (Civil Action 00-226, 00-271), MA GIS data, as well as many other records that are available in Northampton's public file cabinet.

About the Author:

Laurie Sanders, M.S. is a field biologist, radio journalist and natural history tour leader. She has lived in the Connecticut River Valley for nearly thirty years. A graduate of UVM's Field Naturalist Program and Smith College, she prepared *Rediscovering Northampton* in 1993. At the time, it was the first comprehensive ecological assessment of the city's conservation lands, which included only 13 parcels that collectively totaled about 800 acres.

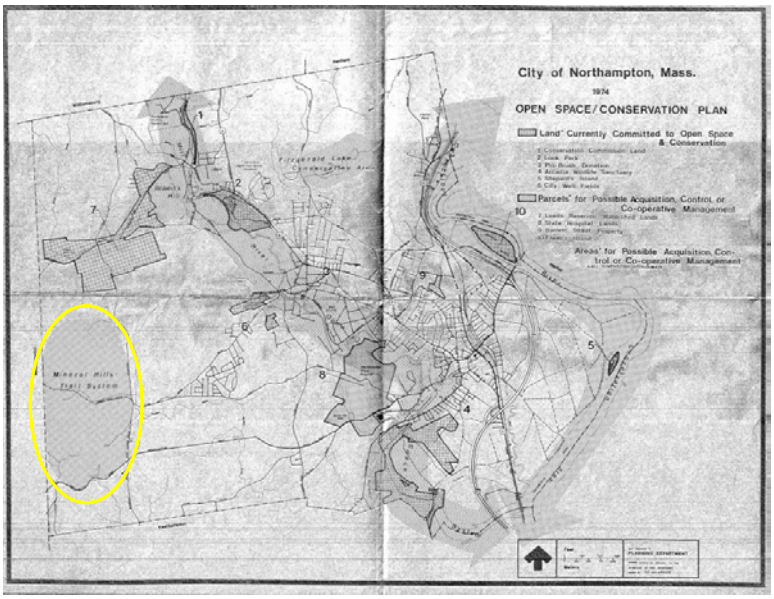
Photographs

Unless otherwise noted, all photographs by Laurie Sanders.

A Natural History of the Mineral Hills Conservation Area

Overview

In 1974, as part of Northampton's first comprehensive master plan, the Conservation Commission was asked to identify areas around the City that they thought should be protected as conservation land. Their final plan (*right*) was impressive for many reasons, but especially for its ambition. The highlighted areas encompassed several thousand acres and included a large block of land in the Mineral Hills.

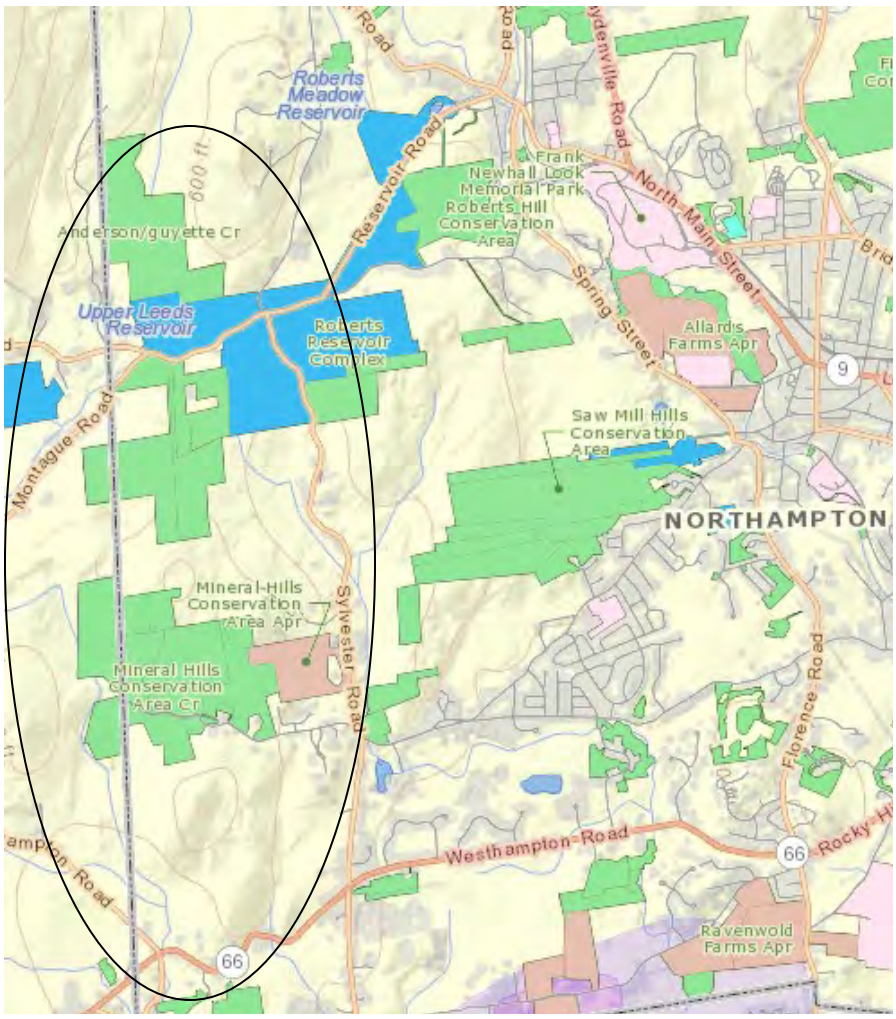


Over the next twenty years, the City's conservation program took off. By 1994, the City owned more than a thousand acres of conservation land spread across more than a dozen different conservation areas. And that year, thanks to the generosity of Armand and Rosel LaPalme, it also owned conservation land in the Mineral Hills.

The LaPalmes had moved to Northampton in 1953, purchasing 88 acres along Sylvester Road. The land included farm land along the road and woods up on the hills. In 1994, after stewarding the land for forty years, the LaPalmes approached the City with an offer to sell the 65 acres around their home to the Conservation Commission for a discounted price—in fact, just 10% of its market value. Their reason was simple: they loved the land and they didn't ever want it to be developed. The couple had few stipulations when it came to the sale, but one of them was that the new property be called the Mineral Hills Conservation Area. The Conservation Commission had the final say, but it was in complete agreement.

During the next decade the LaPalmes' property became the anchor in the Mineral Hills and a source of inspiration. Many people credit them for the conservation successes that have followed—and there are

an impressive number of them. In fact, in the twenty years since their gift, land protection along Northampton's western boundary has proceeded at an unprecedented pace. Since then the City has worked with the Town of Westhampton and Kestrel Trust and has helped to protect another 750 acres, with 638 acres in Northampton and 112 in Westhampton. This acreage, when viewed from above, form two core areas within the Mineral Hills: a 415-acre block contiguous with the LaPalme property and centered around the now-abandoned quarry and another 587-acres to the north that includes city-owned watershed land and property owned formerly or currently by the Clapp family (90 acres owned in fee as conservation land; 280 acres held under private conservation restriction). What now separates these blocks is a single parcel.



The protected land within the Mineral Hills (circled) in context to other nearby conservation land. The Mineral Hills includes a mix of conservation land (green), APR land (light red), and watershed land (blue). When all of these parcels are tallied, their collective total exceeds 1,000 acres. When the DPW and conservation land along Chesterfield, Sylvester and Reservoir Roads is added in, the number jumps to more than 1,500 acres.

All of that land protection work in the Mineral Hills has added up to multiple

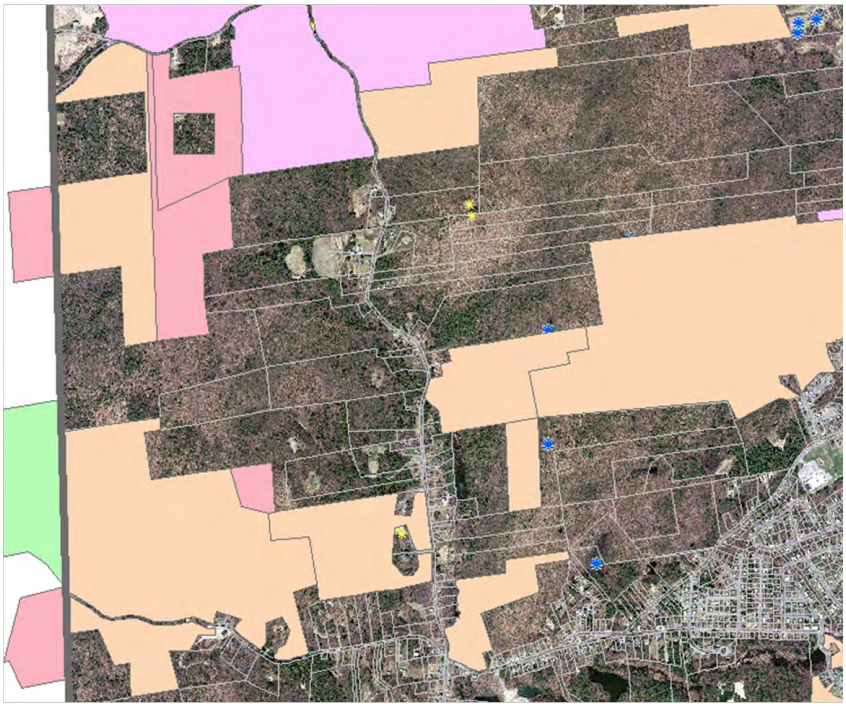
Acres of Protected Land in the Mineral Hills in Northampton and Westhampton (as of March 2015)			
Northampton Conservation and APR Land	Contiguous DPW-owned Watershed Land (Bounded by Chesterfield and Sylvester Roads)	Private Conservation Restrictions (Northampton Only)	Contiguous Protected Land in Westhampton
413	191	290	112

benefits. These include not only the usual set—miles of trails, pretty views, improved water quality, impressive wildlife habitat, active farmland—but also some geological and ecological treats. There is the now-abandoned quarry, which has both raw beauty and also some weird and unusual (i.e. interesting) microhabitats that have developed following disturbance. In addition, because the underlying bedrock includes calcareous (limey) inclusions, the Mineral Hills is the only place in Northampton where you can find an oak-hickory forest. This special natural community type is uncommon in the Commonwealth and from a parochial perspective, it provides habitat for several plants that occur nowhere else in Northampton.

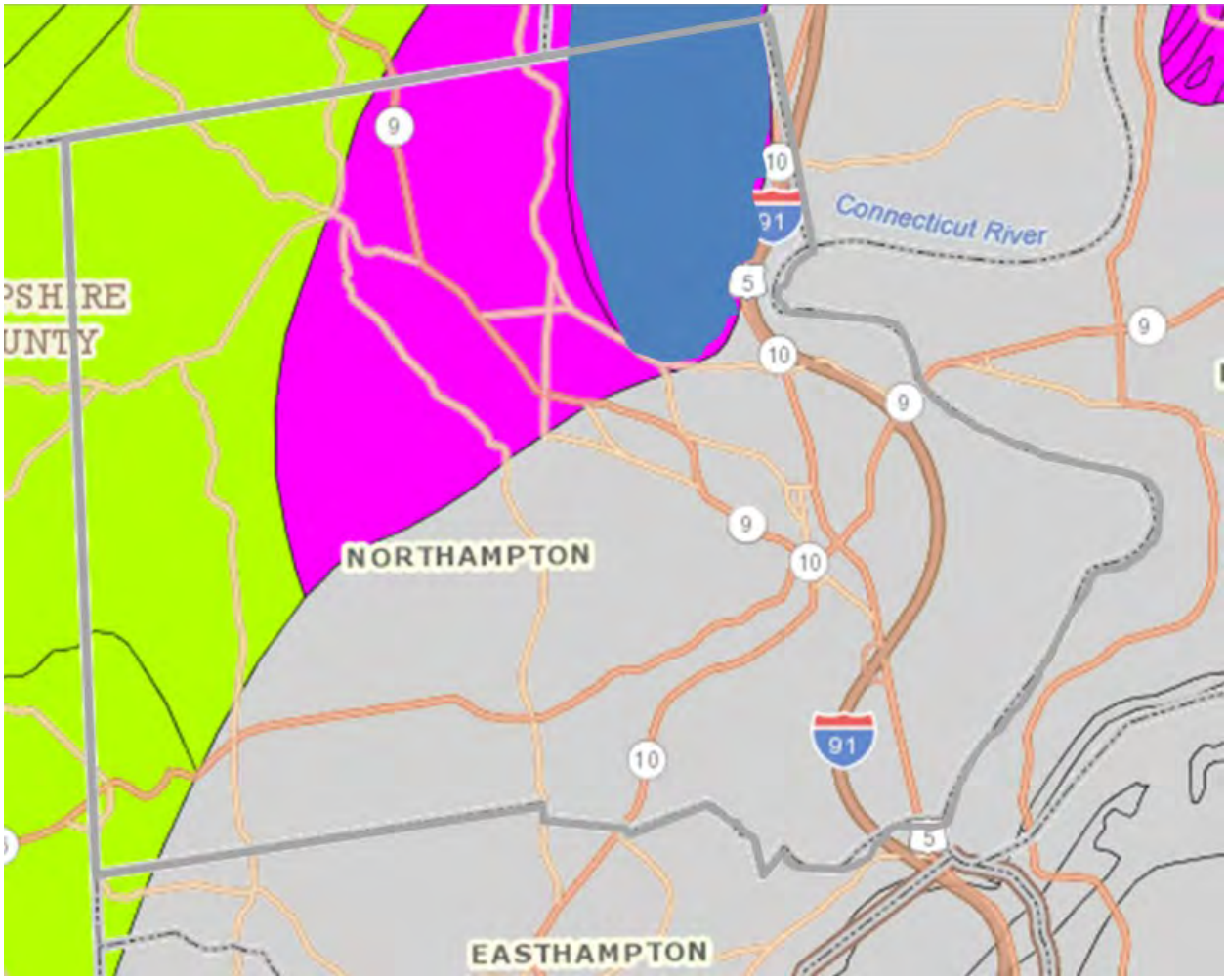
The edge of the farm field, below the LaPalmes' house, is one of the places within the Mineral Hills that is loaded with invasive plants: Japanese knotweed (*seen here*) as well as multiflora rose, Autumn olive and Asiatic bittersweet.

Finally, while invasive plants do occur in the Mineral Hills, they are found in relatively few areas—mostly in former pastures, along roadside edges and trails, and in and around the old quarry.

The remainder of this report provides an overview of the natural history of the Mineral Hills, followed by more detailed descriptions of the two primary areas that have been protected—the conservation land in and around Turkey Hill Road Quarry and the land that was once part of the Clapp Farm. More information about invasive plants and recommendations are included in the specific sections.



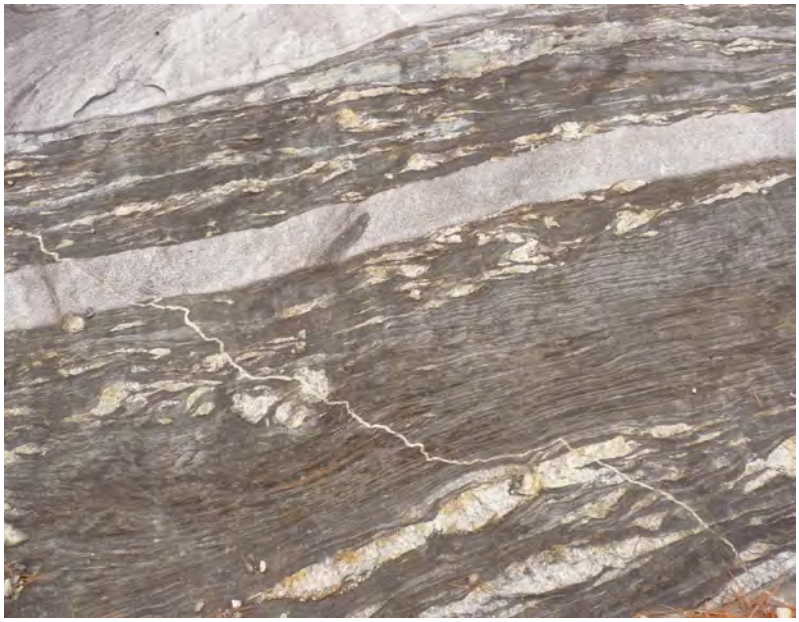
The Jigsaw Puzzle of Protected Land: Only one privately held parcel now separates the northern portion of the Mineral Hills Conservation Area from the southern portion around Turkey Hill Road.



Bedrock Geology

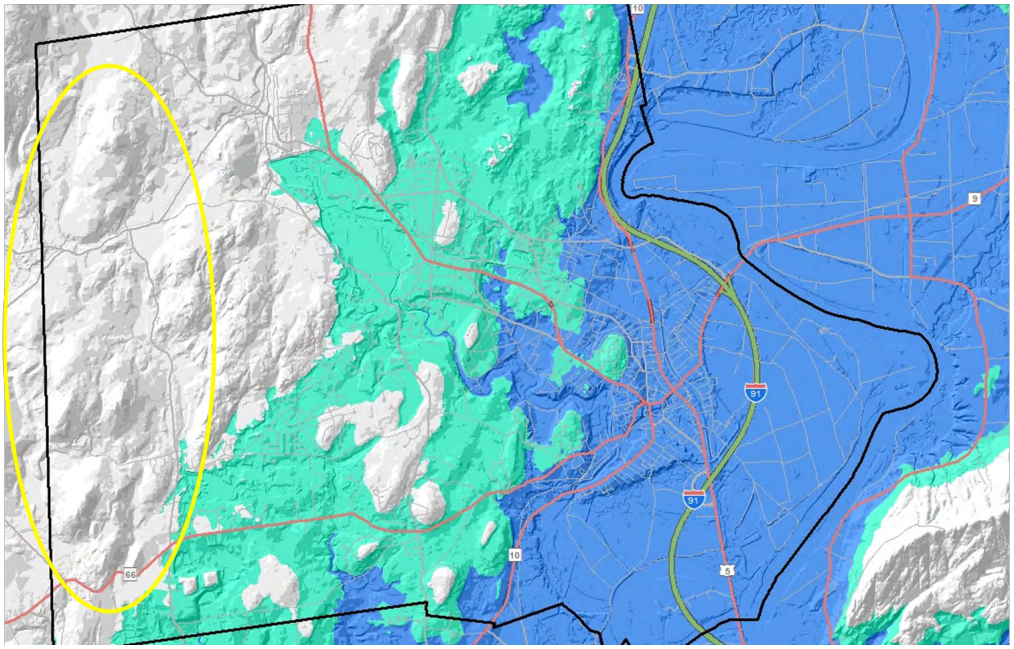
Among the reasons that the Mineral Hills is interesting geologically is the fact that the rock type underlying these hills is different than the bedrock in other parts of Northampton. In the very simplified image above, the bright green is the Gile Mountain Formation. This is metamorphic rock that is mostly phyllite/schist with beds of light gray quartzite. What makes it interesting from a botanical perspective is that within the core matrix are calcareous granofels, quartzose marble and vein quartz. Translation: these rocks were metamorphosed (changed from the ocean sediments and volcanic they once were) during one of several episodes that had island arcs and even entire continents crushing against the proto-North American continent, eventually creating the super continent Pangaea. Some of those original ocean sediments were calcareous (limey). As these rocks weather, the calcareous minerals partially neutralize the soil, which increases its fertility and the diversity of plants that can exist here.

The name Mineral Hills was first given to the hills further to the south near Route 66 and near the border of Southampton, Easthampton, Westhampton and Northampton and where minerals like lead and barite were mined during the 17th, 18th and 19th centuries. As new maps were made, the entire band of hills became known as the Mineral Hills. And while the mines have been closed since the 19th century, two new rock quarries are now located on Turkey Hill in Westhampton, due west of the now-abandoned quarry that is within the conservation area.



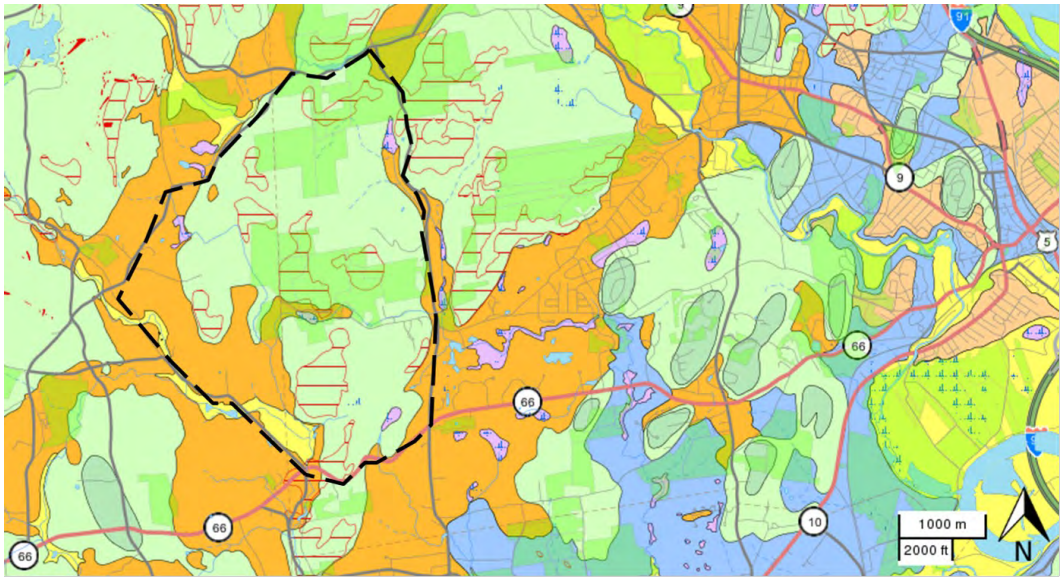
The size and steep walls of the now-abandoned quarry are the features that attract most people's attention in this part of the conservation area. But there is another geologic feature of note close-by. It's a surface exposure (because of past gravel mining) of the underlying bedrock that tells several stories. John Brady, a geology professor at Smith College, brings his students every year to see the quarry and in particular, to see this exposed bedrock outcrop. In a letter to the City's planning department in support of the property's acquisition, Brady described it as an outcrop with a "glacially smooth surface that displays wonderfully-folded metamorphic rocks intruded with Williamsburg granodiorite, which is an igneous rock."

The outcrop can be found in the abandoned gravel pit, a little southeast of the quarry.



Glacial Lake Hitchcock

Although the Mineral Hills were too high to be covered by the waters of Glacial Lake Hitchcock (~15,400 to 12,600 years ago), a small stretch of land along West Farms Road and Turkey Hill Road was part of the lake's shoreline. In fact, part of that old shoreline/beach/outwash plain forms the small cemetery on West Farms Road .

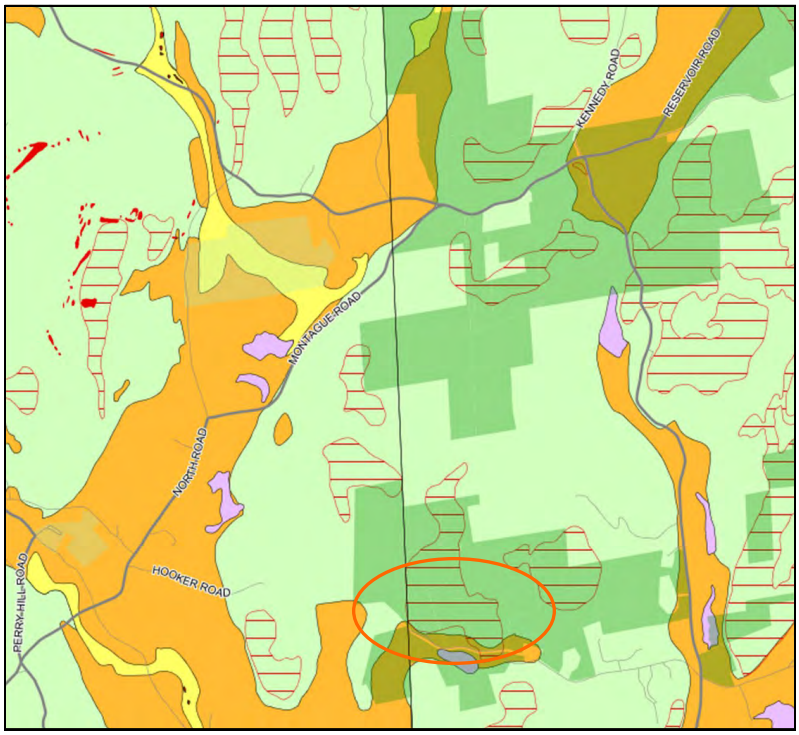


Surficial Geology—Big Picture

The Mineral Hills (outlined by dashed lines on local roads) are covered mostly with glacial till (light green) and marked by prominent rock outcrops (red hatching). Around the base of the hill are deposits of water-sorted sands and gravels (orange), which were deposited ~15,000-12,000 years ago as deltas, outwash plains and possibly some beach deposits.

Surficial Geology: A Closer Look

This image focuses in on the surficial geology underlying the City's conservation and watershed lands (darker green). As seen in the broader view, almost all of the Mineral Hills are underlain by till deposits (lighter green), with bedrock (red hatching) frequently at or near the surface. Note that the small-scale sand and gravel mining that took place along Turkey Hill Road, before the rock quarrying, was located in a finger of glacial outwash sediments (circled in red). The lavender and yellow areas are recent organic deposits and alluvial sediments.



For early farmers in West Farms, the till-derived soils on the hillsides provided challenges and resources. Although all the rocks made growing crops difficult, they were useful when it came to making stonewalls to keep in sheep and other livestock. Most stonewalls were constructed at the peak of land clearing (1820-1850) when timber was so scarce that wooden fences were harder to come by. This stonewall is located on the former LaPalme property.

Part of an old gravel pit is located to the southeast of the quarry.

Ecological Value

Underlain by phyllite/schists/quartzite with some calcareous minerals and covered with till deposits, the hilltops, slopes and wetlands in the Mineral Hills support a mix of habitat types—a sampling of which are profiled here and on the following pages. All told, sixteen natural communities were identified. Of particular interest are the circumneutral rocky summit and oak-hickory communities, which are found nowhere else in Northampton. Good examples of these communities occur within the conservation area, while even bigger examples occur on the prominent knob south of Turkey Hill Road.

In addition to natural communities, the Mineral Hills also contain a few anthropogenically-generated habitats, including some small grassy clearings, three old gravel pits, and the quarry floor. Biologically, these are interesting, ephemeral and often strange habitats. The quarry floor, for instance, provides habitat for a few native plant and animal species that are only known in Northampton from other abandoned gravel pits.

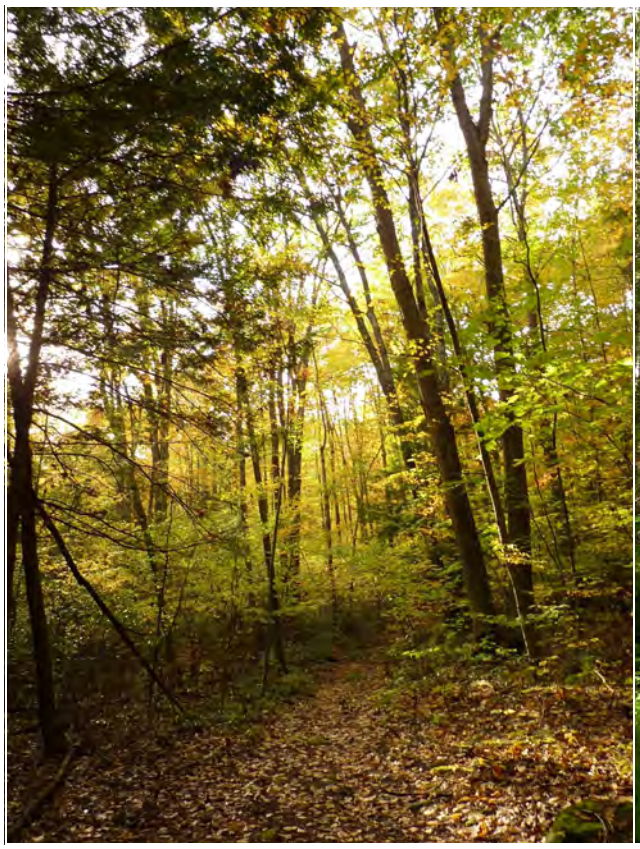
Natural Communities in the Mineral Hills

(follows MA NHESP Classification of Natural Communities)

1. Acidic Rocky Summit/Rock Outcrop
2. Circumneutral Rocky Summit/Rock Outcrop
3. Acidic Rocky Cliff*
4. Circumneutral Talus Forest
5. Acidic Talus Forest/Woodland*
6. Oak-Hemlock-White Pine Forest
7. Successional White Pine Forest
8. Mixed Oak Forest
9. Ridgetop Chestnut Oak Forest/Woodland
10. Oak-Hickory Forest
11. Dry, Rich Acidic Oak Forest
12. Red Oak-Sugar Maple Transition*
13. Red Maple Swamp
14. Deep Emergent Marsh
15. Hemlock Hardwood Swamp
16. Woodland Vernal Pool*

* Found within the Mineral Hills region, but not currently within the protected land

Circumneutral rocky summit/rock outcrop. Open and park-like, this is one of the most biologically diverse and interesting natural communities within the entire conservation area. It supports a variety of spring wildflowers, including early saxifrage and wild columbine, which are shown here.



Oak-Hemlock-White Pine

Red Oak-Sugar Maple Transition

Successional White Pine (Seriously Thinned)

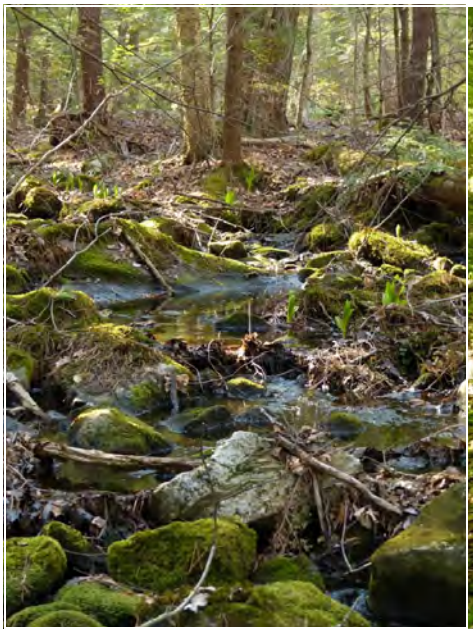
Circumneutral Talus Slope (Holyoke Range in distance)

Hemlock-Hardwood Swamp

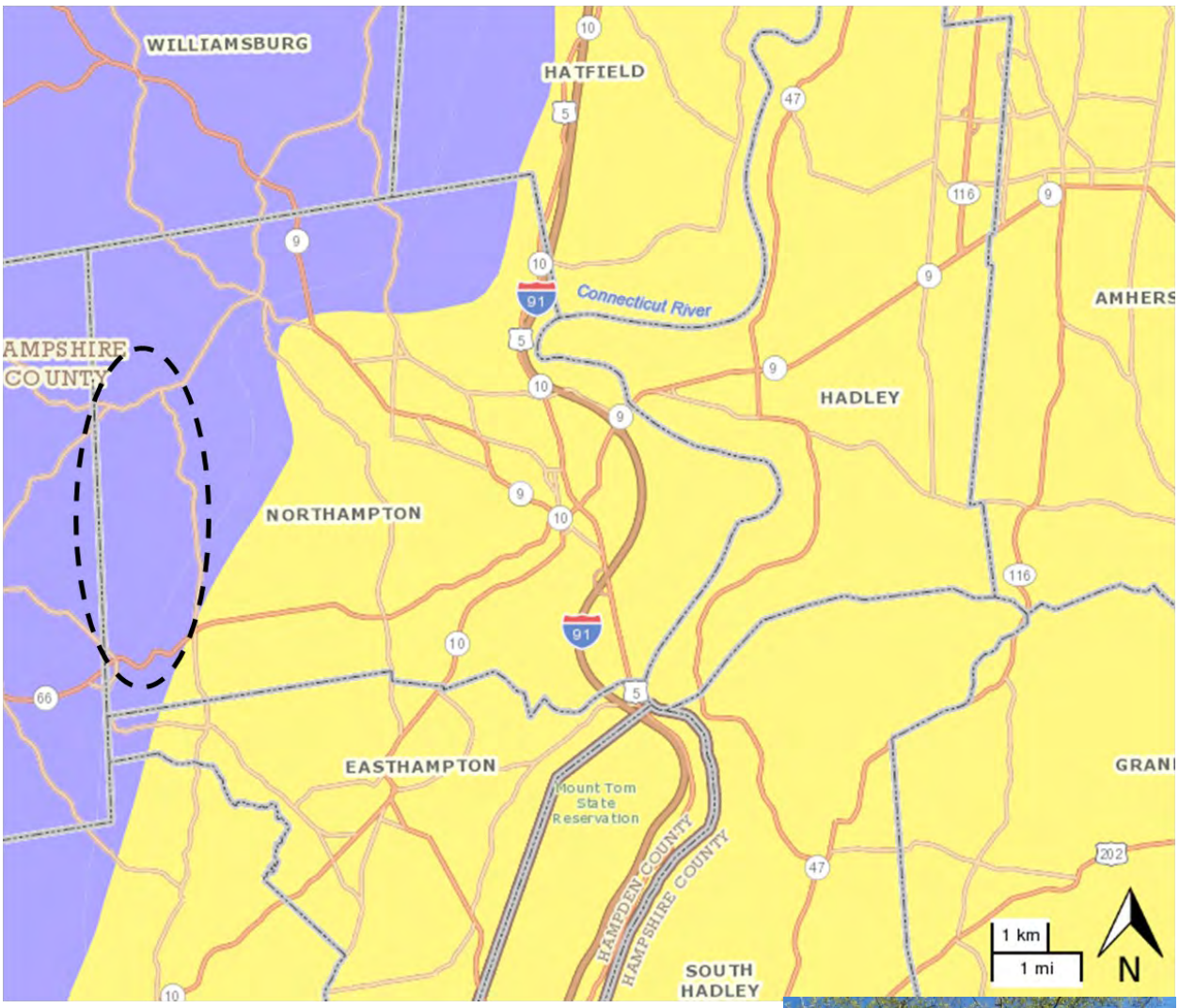
Red Maple Swamp

Anthropogenic Deep Marsh Habitat (in the abandoned quarry)

Natural Deep Marsh Habitat (created courtesy of beavers.)



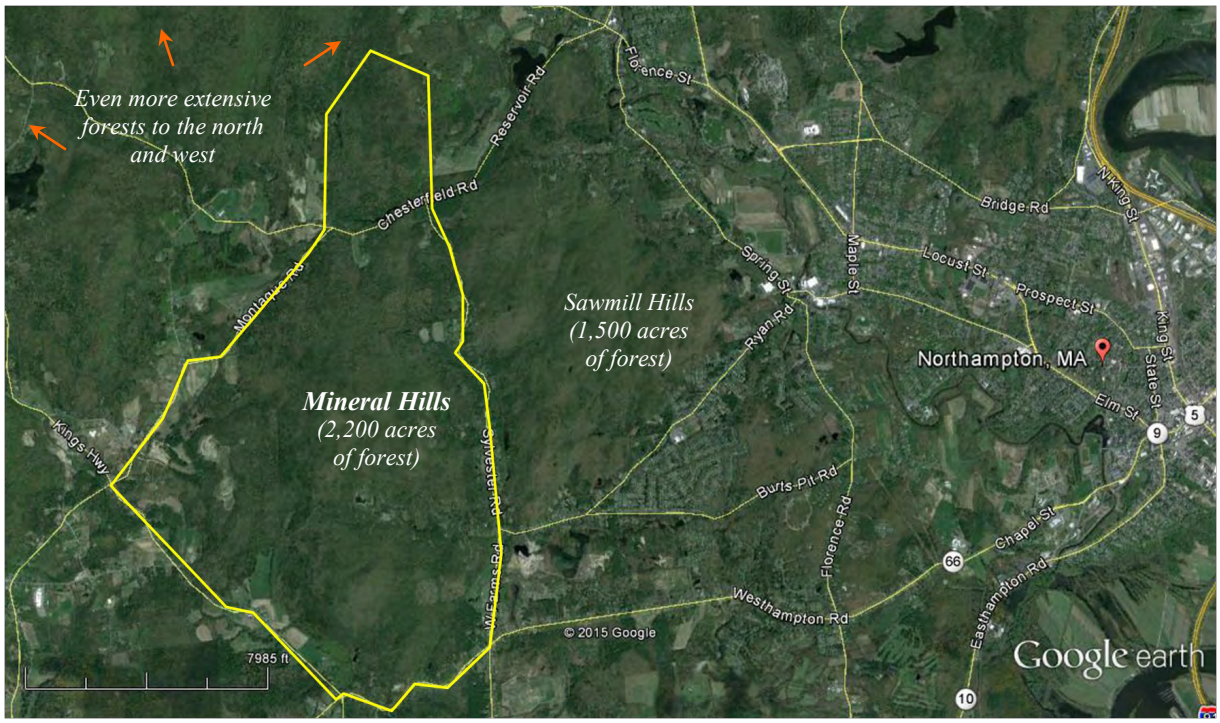
Intermittent Streams vary from rocky, hemlock-covered waterways to sandy bottomed streams within deciduous forest.



Ecoregion

The Mineral Hills are associated with an ecotone that lies between the Connecticut River Valley lowlands and the Berkshire Plateau and is called the "Berkshire Transition." This band of hills is not only higher in elevation, but cooler than the milder temperatures typical closer to the Connecticut River. It is also far enough away from the Connecticut River to feel the effect of its moderating influences. This extends even to fog conditions: the Mineral Hills, for instance, are seldom bathed in the fogs that regularly engulf the lower valley in the spring and fall.

American beech (*right*) is an example of a species that is more typical of northern forests. It occurs in low numbers within the Mineral Hills.



Wildlife Value

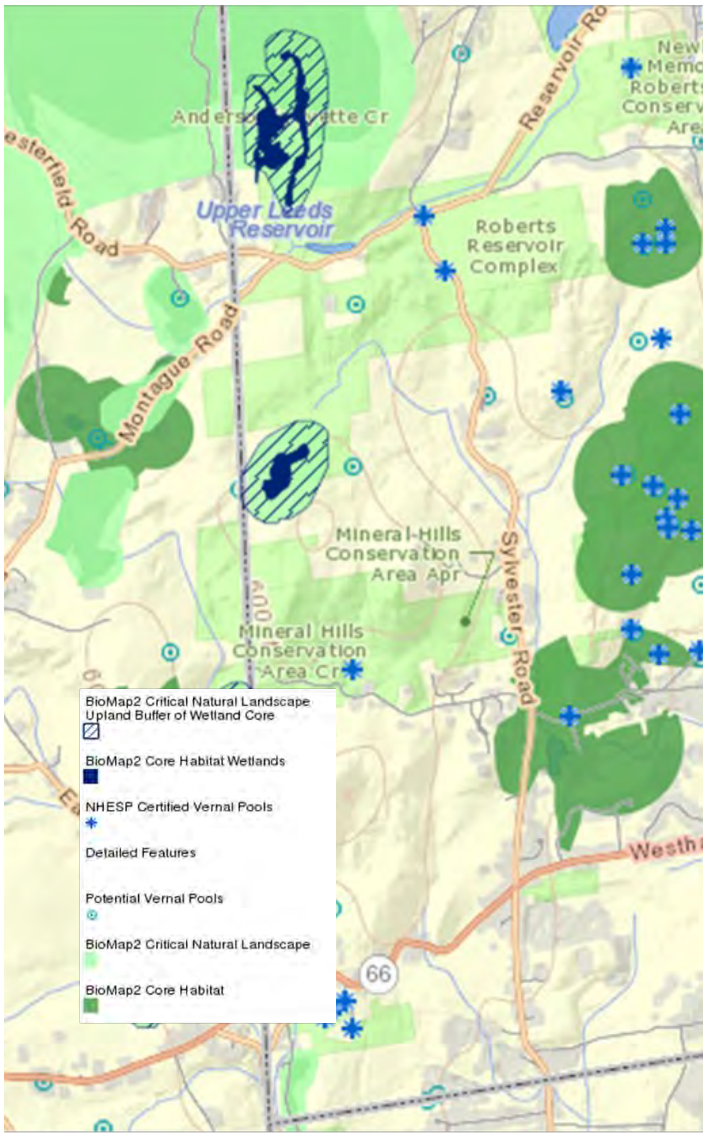
The Mineral Hills encompass a large block of forest that includes roughly 1,500 acres in Northampton and another 700 (or so) acres in Westhampton. On its own, the size of this wooded tract makes it valuable to forest-dependent animals, especially to species like wood thrush and rose-breasted grosbeak, which are suffering from population declines. In addition, the area's wildlife value is further enhanced by its proximity to two other big blocks of uninterrupted woodland: the Sawmill Hills to the east, with 1,500 acres, plus thousands more wooded acres to the north and west. These qualities--large size and connectivity--are critical factors in terms of this area's ability to maintain biodiversity and ecosystem function over the long haul. Put simpler, bigger is better—especially now with impending climate change.

The mix of habitats in and near the Mineral Hills also increases its biodiversity value, from larger, more obvious creatures like porcupines to smaller, often overlooked creatures.

Vernal Pools

Of the 99 certified vernal pools in Northampton, only two have been certified within the Mineral Hills, one on the DPW property just off Sylvester Road and the other is located at the north end of the quarry. The main pond in the quarry does not qualify as a vernal pool under MA NHESP's criteria because goldfish were released there and have been able to overwinter for at least ten years. That said, the pond does provide breeding habitat for gray tree frogs, pickerel frogs, green frogs and bull frogs. In addition, a very small depression near the northern rim does contain enough water to act as a vernal pool.

Only four "potential" vernal pools have been mapped within the Mineral Hills, but others probably exist. More work on vernal pools could be done within the Mineral Hills.



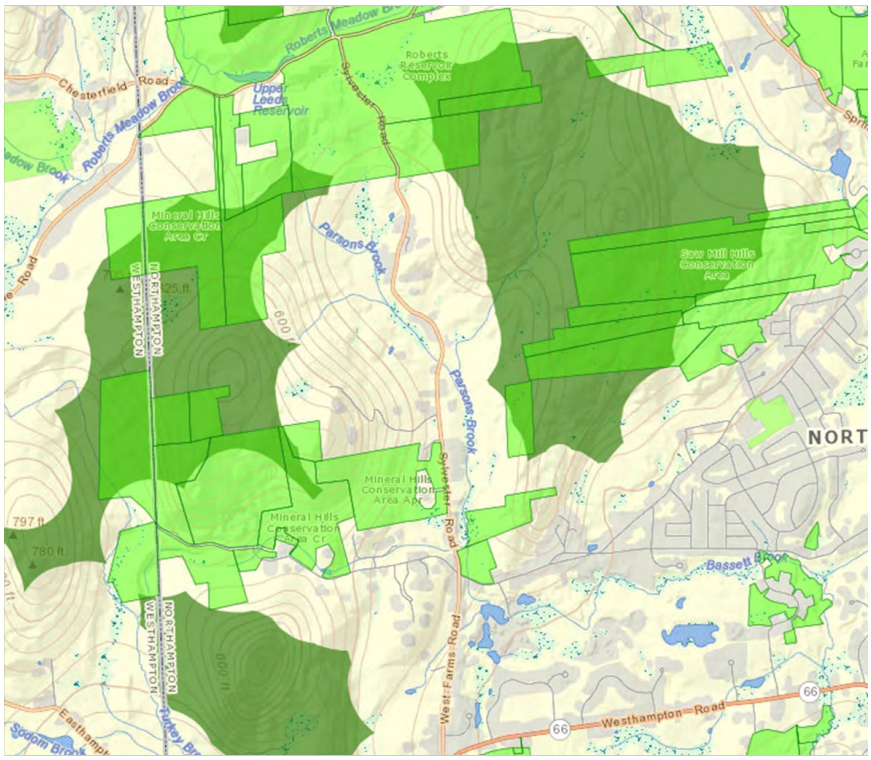
Rare Species

So far, only one state-listed species (wood turtle) has been confirmed within the existing conservation area and it was observed close to the intersection of Montague and Chesterfield Roads. Additionally, one state-endangered plant (Rock buttercup (*Ranunculus micranthus*)) and two watch-listed species—Early Buttercup (*Ranunculus fascicularis*) (*pictured)* and Rock Spikemoss (*Selaginella rupestris*)—are known to occur in the Mineral Hills (but outside of the existing conservation land).

Aside from taxa tracked by MA NHESP, a few other species that are uncommon in the state have been in or near the City's conservation land. The quarry, as disturbed a setting as it is, provides habitat for two species that were historically tracked by MA NHESP: the Red-belly Tiger Beetle (*Cicindela rufiventris* var. *rufiventris*) and Varied Scouring Rush (*Equisetum variegatum*). The band of oak-hickory forest in the Mineral Hills is also the only known site in Northampton for four-leaved milkweed (*Asclepias quadrifolia*) (*pictured right*), squawroot (*Conopholis americana*) and wood violet (*Viola palmata*). Two uncommon terrestrial snails are also found only in this habitat type.

Interior Forest

This map that shows the least fragmented interior forest cores (dark green) in relationship to protected land (bright green). Interior forest areas are recognized as critically important to species that are sensitive to forest fragmentation (scarlet tanagers, many warblers). These areas are "becoming increasingly scarce in highly populated states like Massachusetts," according to MA NHESP. As such, knowing the location of interior forest helps prioritize properties for land acquisition, whether the focus is resilience to climate change or forest-dependent species.

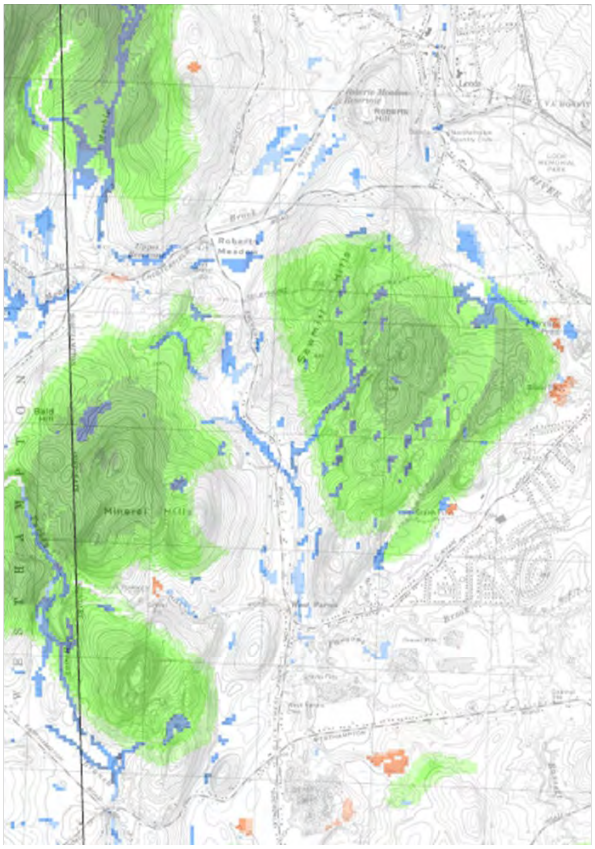


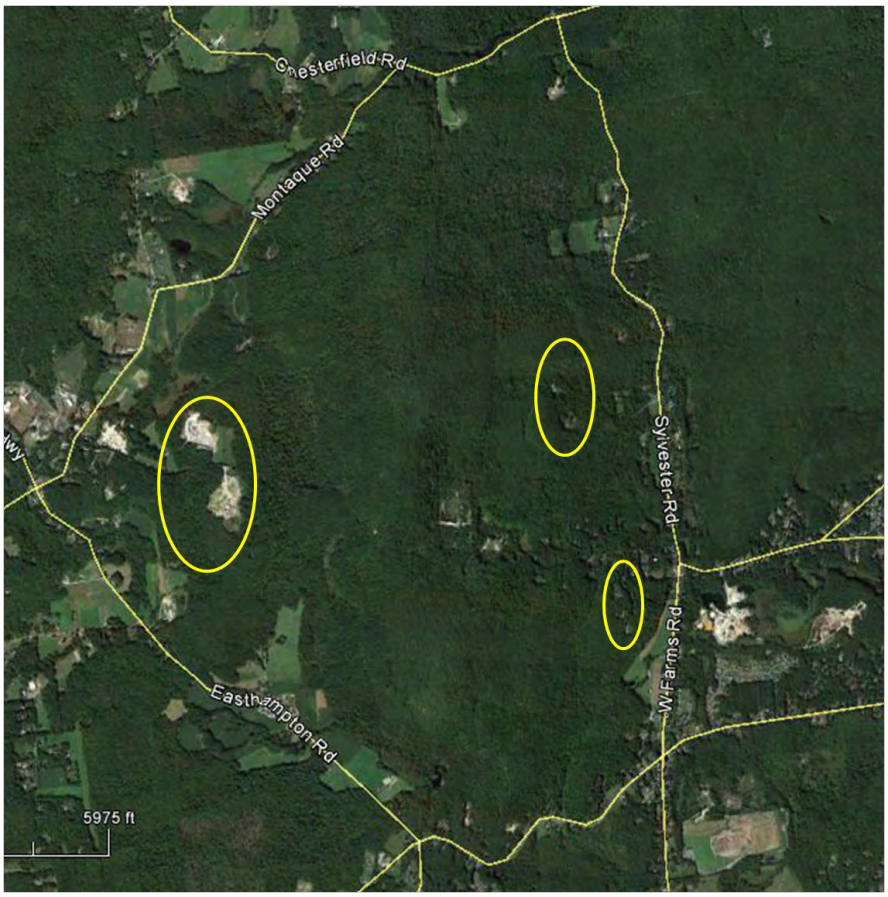
UMASS Conservation Assessment Prioritization System (CAPS)

Researchers at UMASS have developed computer software (CAPS) that analyzes the landscape and prioritizes land based on its ecological integrity and long term sustainability. The integrity of interior forests is one of the metrics that this model measures, but it also takes into account many others.

Based on a CAPS analysis, the Mineral Hills are one of the highest ranking areas in Northampton in terms of its ability to sustain ecosystem processes and maintain biodiversity over the long-term. Like "Interior Forest" above, CAPS is yet one more way to measure a landscape's value and in this case, it provides support for the continued acquisition and protection of properties within Mineral Hills.

In this image, the colored areas are better than average based on CAPS analysis, with blue representing aquatic habitats, red is shrub and grassland, and green shading is forest. White areas are below average based on CAPS. The darker the color, the "better" it is in terms of its biodiversity potential.

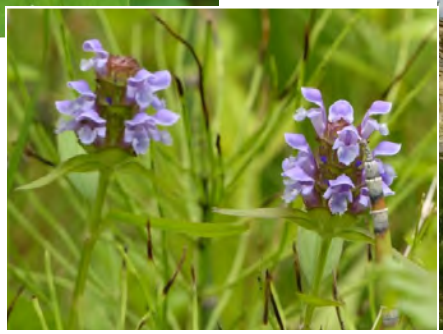


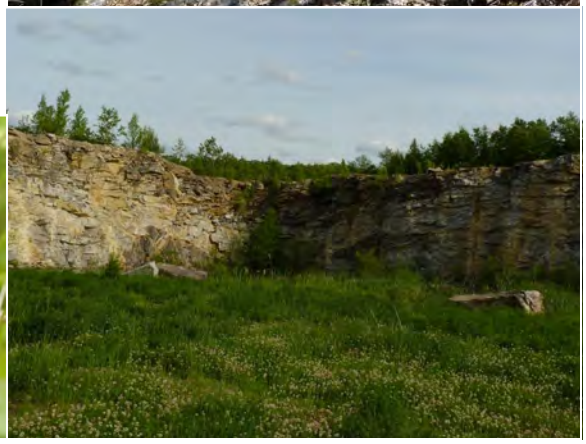


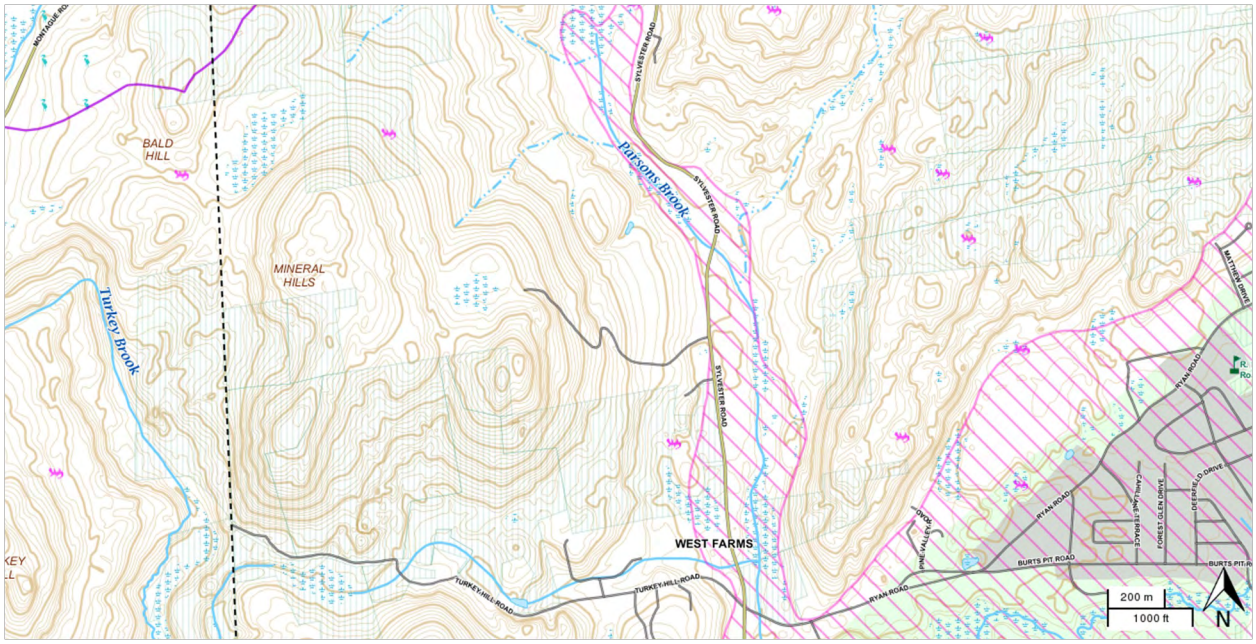
Although much of the Mineral Hills has now been protected, its interior forest core is still at risk from fragmentation. During the last fifteen years, two new hard rock quarries were created along the western edge in Westhampton (largest yellow circle) and during the last 25 years several new homes with long driveways were built along the eastern slopes (smaller yellow circles).

Aesthetic Value

The beauty of the Mineral Hills can be appreciated from a distance and experienced firsthand within the conservation area.

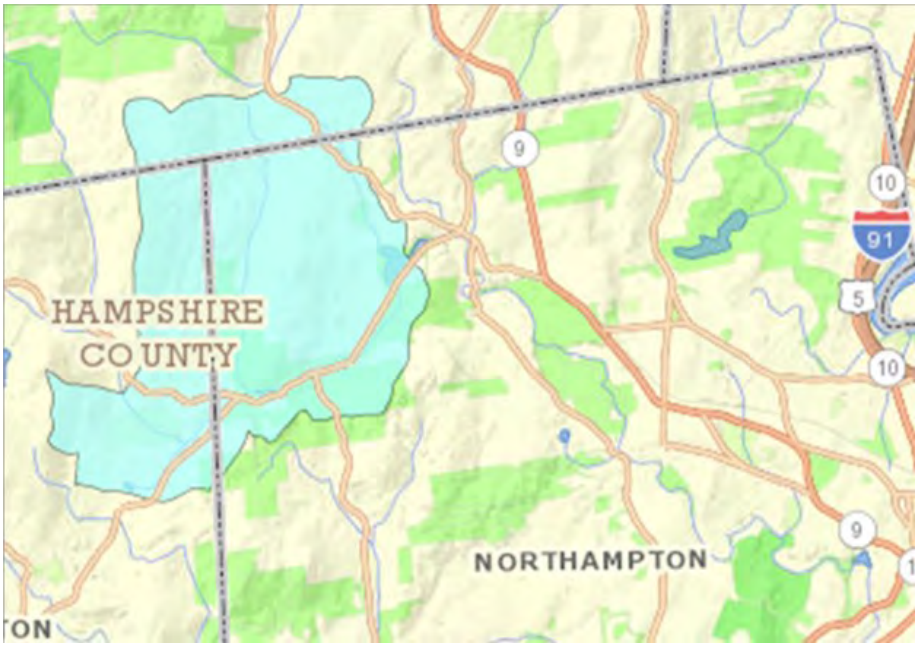






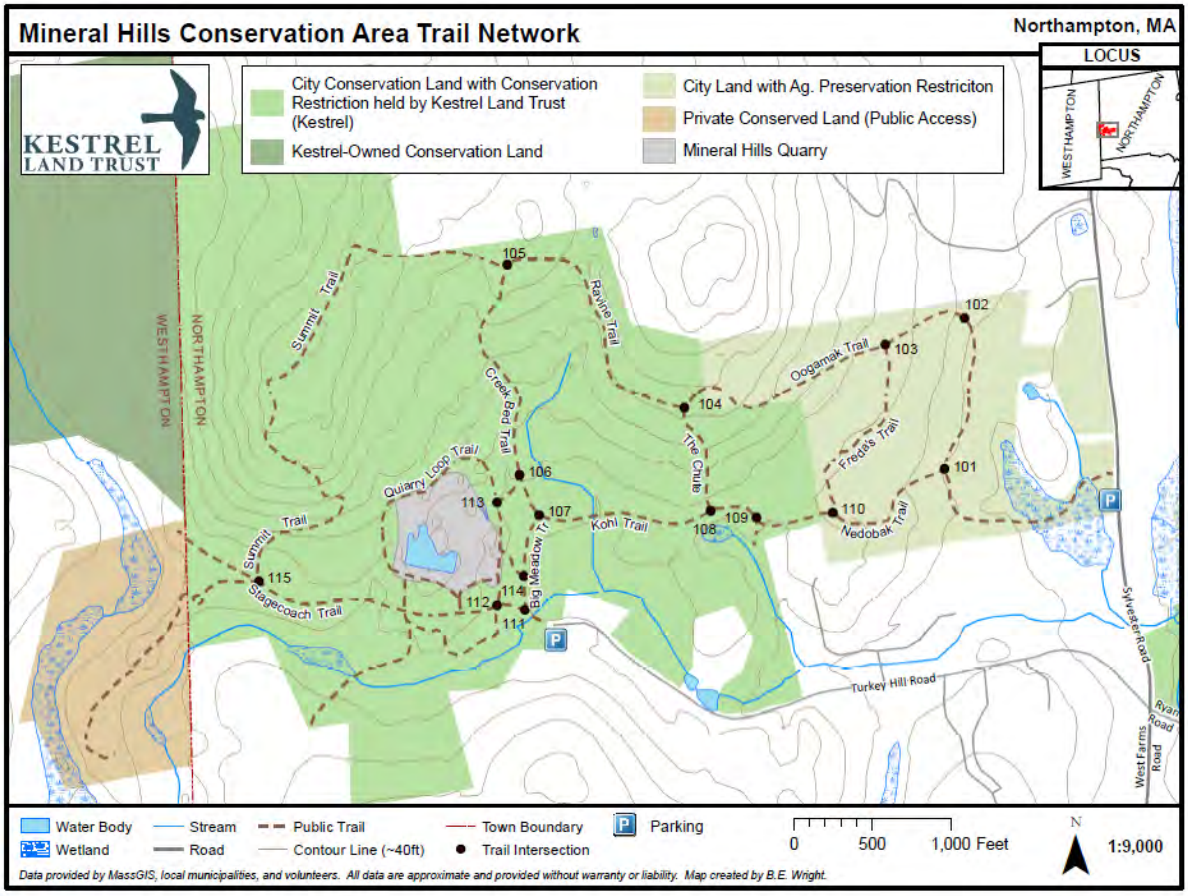
Zone II Aquifer

The narrow band of water-sorted sediments left behind during the era of Glacial Lake Hitchcock is an outlying finger of a Zone II aquifer and contributes to the recharge and quality of Easthampton's aquifer. A small portion of the Mineral Hills Conservation Area along Sylvester Road is within this area.



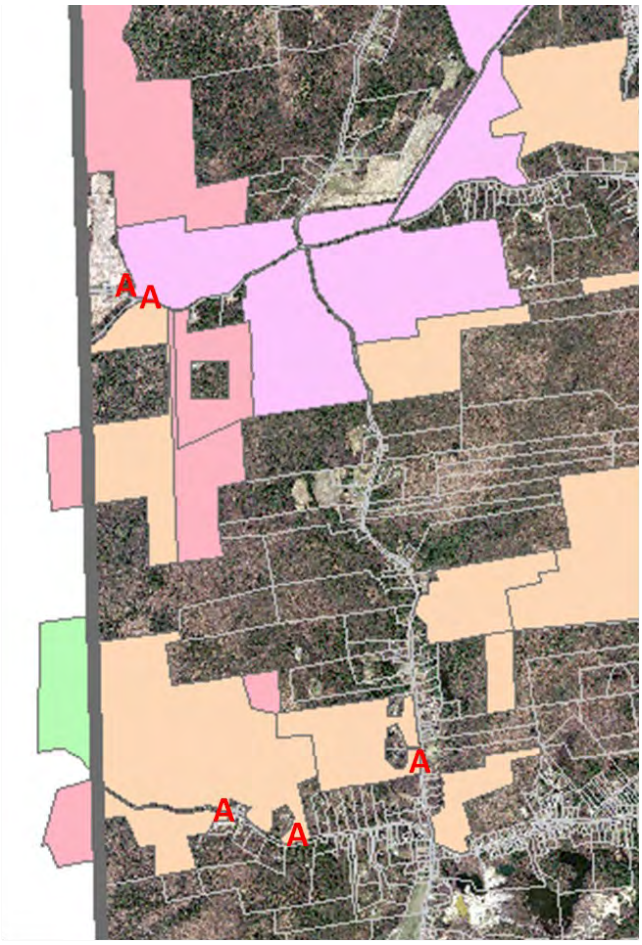
Outstanding Resource Water: Tributary to a Surface Water Reservoir

A small portion of the Bookends parcel (formerly Sarafin/Clapp Farm) drains to Roberts Meadow Brook, which is the principal tributary to the Roberts Meadow Reservoir. On this map what looks like a giant lake is the drainage area for the streams that have been designated by DEP as Outstanding Resource Waters. Today the reservoir is an emergency water supply, but in the 1800s it was the City's primary source for drinking water and fire protection.



Recreation Value

Although still unfamiliar to many Northampton residents, the Mineral Hills includes an elaborate network of old wood roads and footpaths. Of these, the best marked trail system is located within the 413-acre core property. It includes an old wood road that connects to other trails, one of which leads into Westhampton (A) and another that links with the trail at the north end of the Mineral Hills. Other trails (B) within the Clapp Farm have been obscured by recent logging activity and without some attention, they will soon be overwhelmed and lost. The trails are maintained by the Friends of the Mineral Hills, an all-volunteer group.



There are currently five access points into the conservation land, including three parking areas.

Turkey Hill Road/Sylvester Road

- Parking is available on Sylvester Road. There is a trailhead and kiosk here.
- Parking is also available at the end of Turkey Hill Road, which is discontinued from this point. This is the simplest way to reach the quarry and ridge trails.
- A footpath on Turkey Hill Road begins near the ponds and connects to the network of trails.

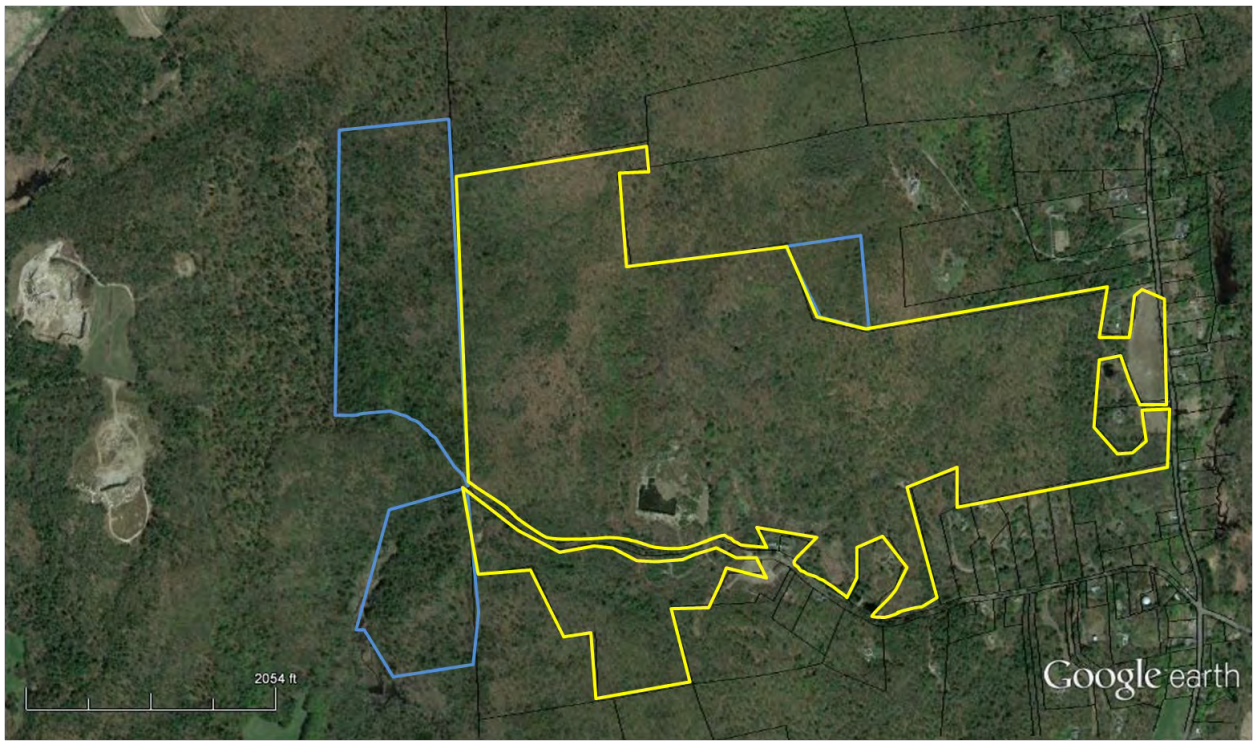
North Bookend (Clapp Farm)

- Marginal parking is available by pulling off the road near the stop sign at the end of Montague Road. A trail leads into the protected conservation land. Across the street, on the west side of Roberts Meadow Brook, is a wood road that leads to the 168 acres held through a private conservation restriction. This road was historically known as Mosquito Hollow Road. In the 19th century Judson Marble lived about 1/2 mile in along this road. A small stream in this vicinity now bears his name and is a tributary to Roberts Meadow Brook.

Agricultural Value

Prime farmland can be seen around the margins of the Mineral Hills. Within the conservation land, about 13 acres are still farmed. This includes the 7-acre field that was formerly owned by the LaPalmes and is now farmed by Henry Parsons of Mayval Farm in Westhampton. The remaining six acres is a hayfield that is mowed by John Clapp and is part of the original Clapp Farm.

Part 1: A Natural History of the Quarry & Vicinity



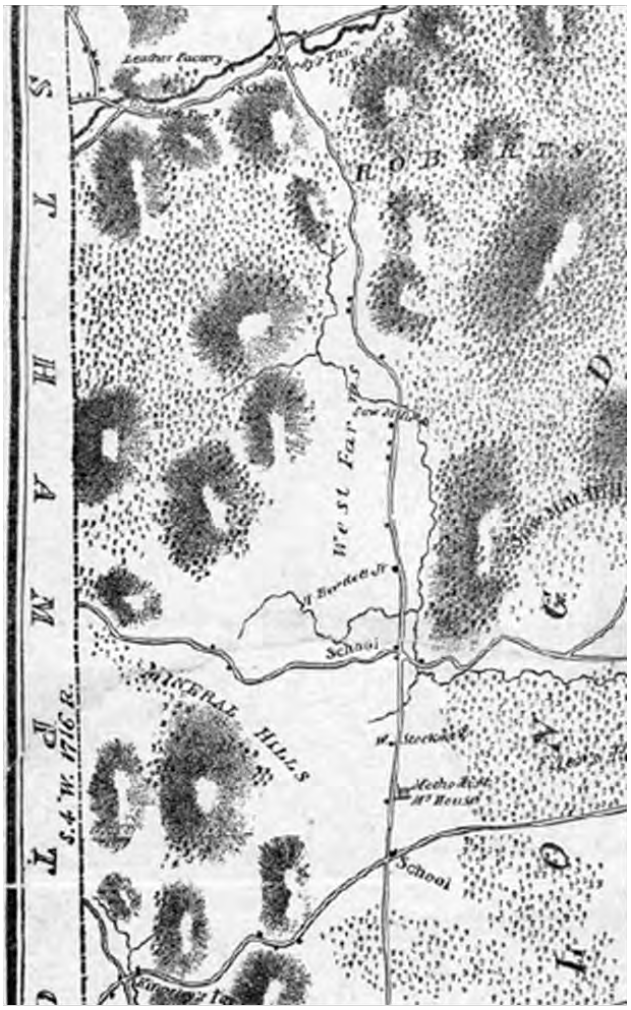
The Mineral Hills Conservation Area near Turkey Hill Road is outlined in yellow, with land under conservation restriction outlined in blue. The westernmost conservation restrictions are in Westhampton. Just west of these areas are two hard rock quarries that have opened since the closing of quarry on Turkey Hill Road.

The Natural History of the Quarry & Vicinity

History & Conservation

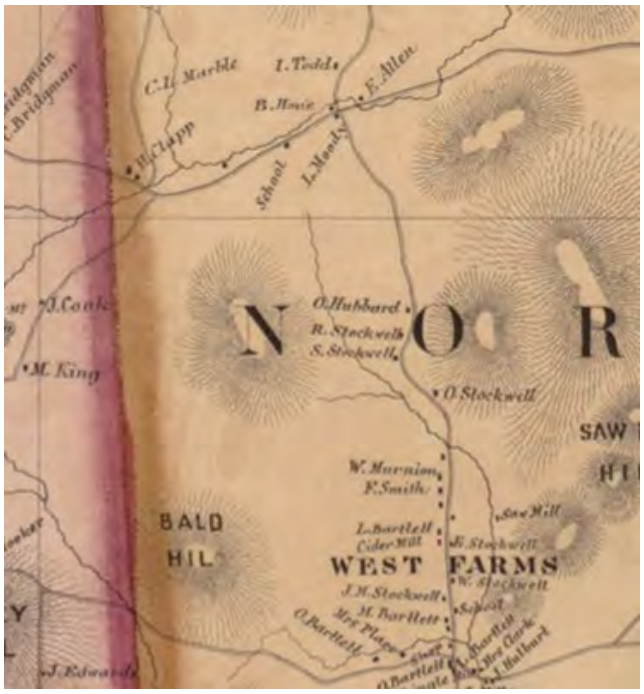
Unlike some other parts of Northampton, news from West Farms was seldom reported in the Gazette during the 19th or even early 20th century, probably because this region was sparsely settled and its primary activities of farming and logging weren't viewed as particularly newsworthy.

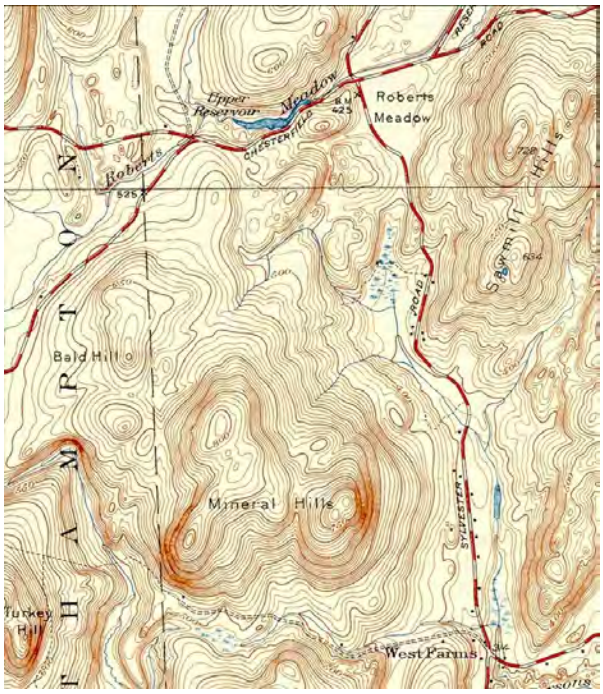
In spite of that, it's possible to make some good guesses as to what West Farms and the Mineral Hills were like. Based on the descriptions of early English explorers, it's likely that the Nonotuck used this area infrequently and not for farming, but for hunting and gathering. In addition, like most upland areas, they probably burned the wooded slopes every few years. This would have created a forest with relatively little undergrowth and old, widely spaced canopy trees.



Once the English arrived and settled in Northampton, they continued the practice of intentional burns in some parts of town (especially along the rivers), but they also adopted rules on cutting trees and prohibiting fires in the uplands. In the early days of settlement, this part of Northampton was set off as part of the Long Division and until the 1680s, it was held in common. During those years, the early settlers probably used it intermittently (if at all) as a place to harvest firewood, candlewood and timber.

Judging from nearby settlement patterns, the first full-time residents probably didn't arrive in





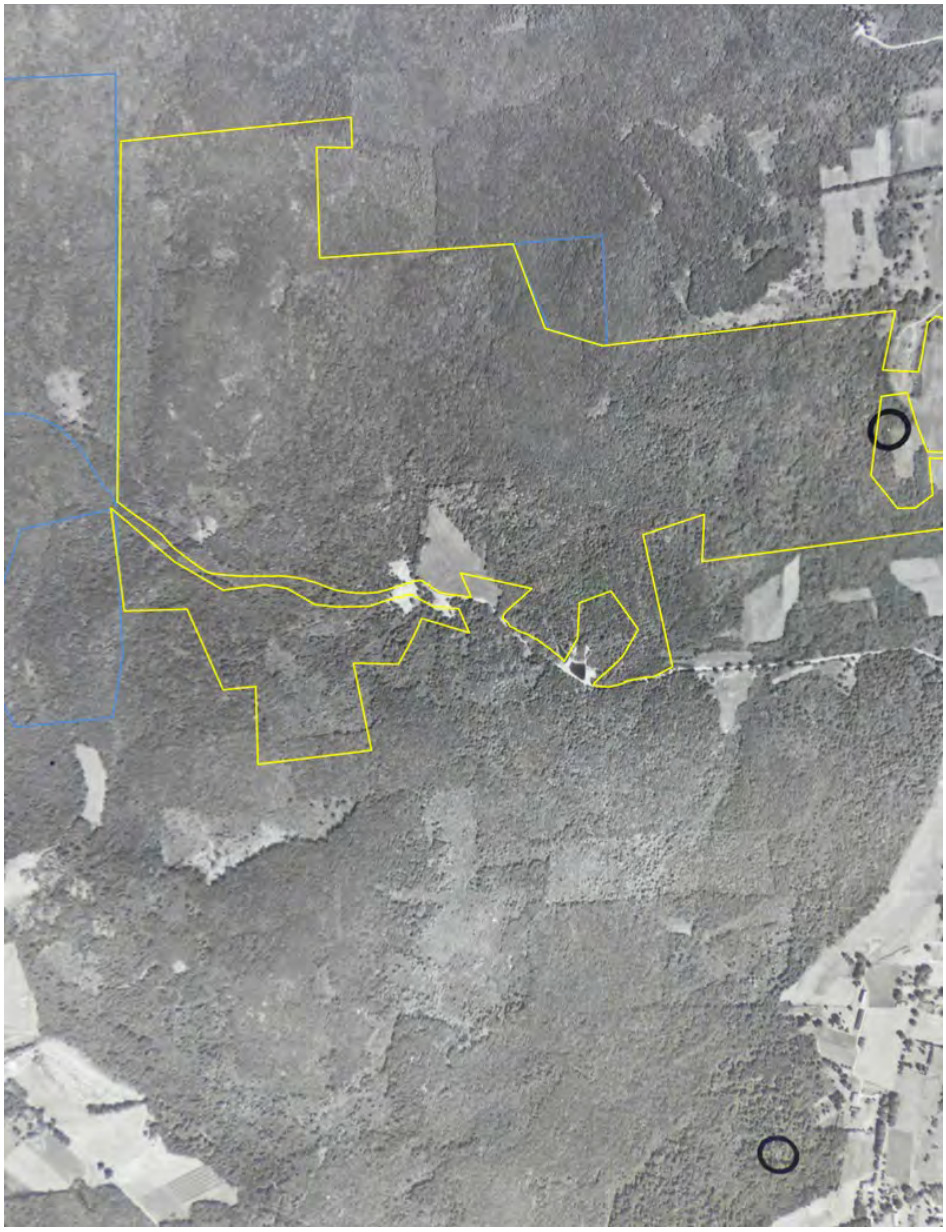
No name is given to the hills north of Turkey Hill Road in the 1831 map (*shown on the previous page*), but by the time the 1856 map is created (*above, left*) , the knob where the now-abandoned quarry is located is called Bald Hill. On the 1939 topographic map (*above, right*), the name Mineral Hills is used to describe this entire range, from Route 66 north to Chesterfield Road. Meanwhile, the place name "Bald Hill" is now given to a lower-elevation knob further to the north. Today's topographic maps are consistent with the 1939 map.

West Farms until the mid to late 1700s. (Westhampton's first settlement was in 1762 and Florence was settled in 1778). The relatively gentle slopes and broad flats along Parson's Brook were good pasture and the brook itself provided water power to run a sawmill. By the time the 1831 map was produced, several families were living here, much of the area was cleared, Turkey Hill Road connected to Westhampton and the area had become known as West Farms. This district also had its own school, a church and a sawmill on Parson's Brook (which was then known as Sawmill Brook.) The residents of West Farms could visit with their neighbors to the north in Roberts Meadow District, which also included several farms, two small manufacturing operations, a school and a tavern. To the southwest, Loudville was as busy or busier, with mills, mining operations and a tavern.

Workers at Bartlett's Sawmill in the 1880s. They harvested wood from the Mineral Hills as well as the Sawmill Hills. *Photo copied from Images of Northampton by James M. Parsons.*

During the 19th century, West Farms didn't'

change much. Although some new homes and names appear on the historic maps, it remained sparsely settled. In fact, it wasn't until after WWII that change began to take place—but only modestly. In 1947, John Omasta, who had grown up in West Farms (his descendants still own and operate the family farm) bought land with his brother along Turkey Hill Road and opened up a small sand bank, which was located just south of the now-abandoned rock quarry. Several other sand and gravel operations began in the vicinity around the same time: the area off of Burts Pit Road owned by Bill Willard, the former gravel pit that became Northampton's landfill on Glendale Road, and the gravel pits owned by the Brakey family, also on Glendale Road.

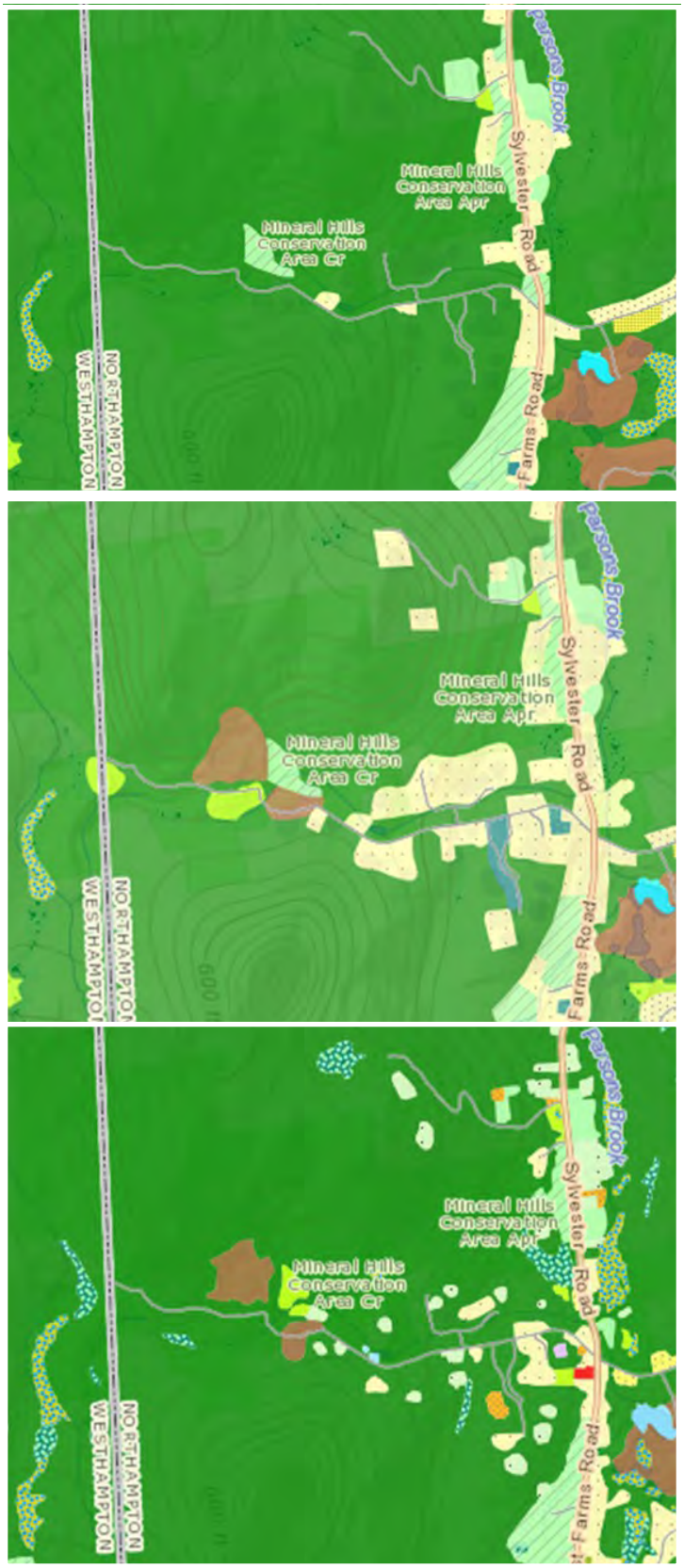


The conservation area, roughly outlined, and the surrounding landscape as it appeared in 1952. What's worth noting is the patchwork of forest, which reflects this area's logging history and different aged stands. In addition, this image shows the small sand quarries opened by the Omastas on Turkey Hill Road in 1947/48. The sand banks are located at the "end" of Turkey Hill Road, south and west of the large hayfield that can be seen in the center of the image. Today this former hayfield includes two single family homes along Turkey Hill Road, while the rest has become wet meadow and shrub swamp.

Over the next three decades, the Omastas and subsequent owners continued on-and-off small-scale sand and gravel mining. In the 1971, the land was purchased by James Wzorek, another gravel operator, who ramped up the sand and graveling operations. In addition, during the next three years, Wzorek bought three more nearby

properties and by 1975, had stitched together 195-acres of land. By then, he had hit ledge while graveling and had begun quarrying the highly fractured rock. Although hard rock quarrying was technically outside of the special permit that allowed him to remove "gravel, sand and topsoil," no one stopped him. By 1978, he was operating a stone crusher on the site, which allowed him to break up the rock before hauling it away.

Wzorek continued mining gravel and quarrying rock until 1986, when he sold all of his land to a Connecticut-based gravel and stone business known as Valley Aggregates. It continued operations and in 1988, the company requested a permit from the City to build a cement plant on the site. This was denied and two years later, Valley Aggregates asked for a permit to expand their stone crushing on-site to include secondary and tertiary processing. Until then, only primary crushing was done in the quarry. This request was also denied and in 1990, in the wake of the second denial, Valley Aggregates appealed the local decision to Superior Court. In his decision, the judge not only ruled in favor of the City, but he also noted that the stone quarrying operation and stone-crushing were non-conforming and "unlawful"



Land use changes along Turkey Hill Road from 1971-2005.
Top image 1971, middle image 1999, bottom image 2005.

uses. In spite of the judge's ruling, quarrying and graveling continued.

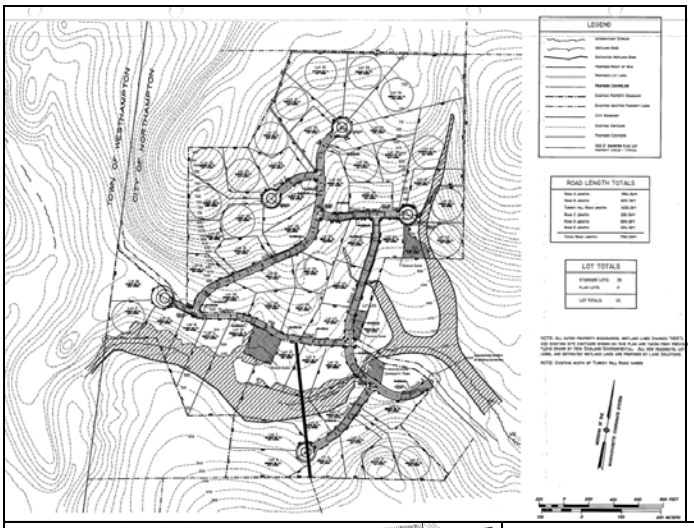
But between 1990-1998, the operation was minimal. The local zoning rules were part of the reason, but so was a slow economy. During those years the company blasted just five times. But in 1999, they ramped up their operations, detonating three times between April and December. The following year, they blasted five times. Meanwhile, to keep up with the added quantity of material, eighteen wheelers were now making multiple daily runs up and down Turkey Hill Road.

Not surprisingly, the neighbors were upset. Since Wzorek began quarrying in the early 1970s, a dozen plus homes had been built along Turkey Hill. And as the number of large trucks and blasts increased, the neighborhood pulled together. They were concerned about the safety of their families with all of the added traffic. They were alarmed by the noise from the blasts and the crushing machine. And finally, they were worried about structural damage to their homes from the blasting. Already some people had noticed cracks in their ceilings.

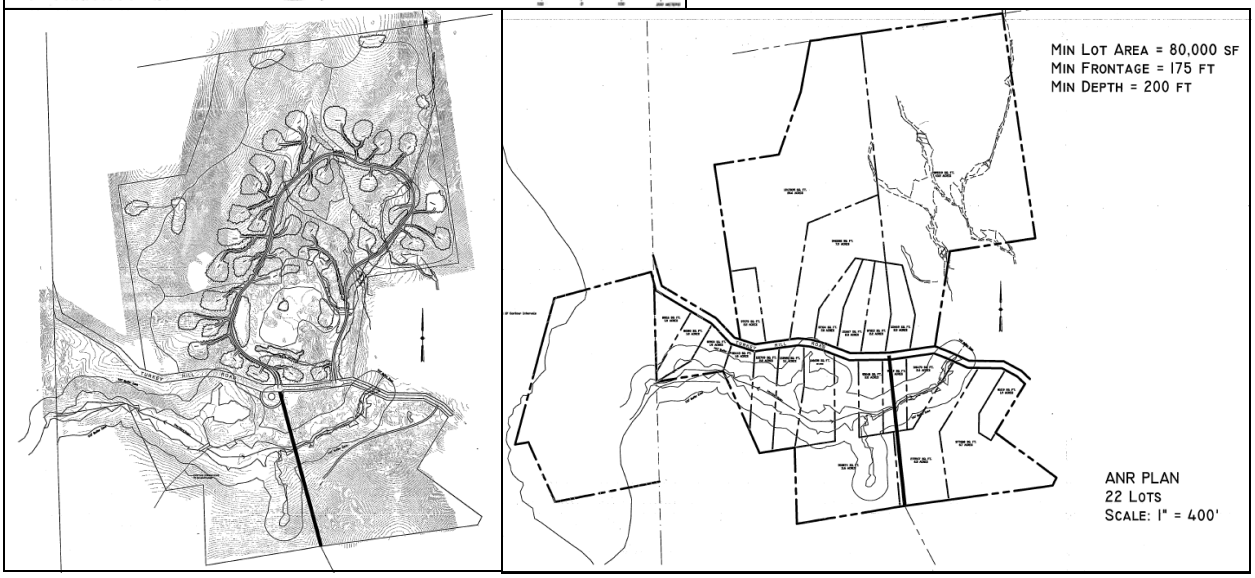
The quarry in 1995 (*top*), 2001 (*middle*) and finally, in 2005 (*bottom*), a year before it was protected as part of 150-acre conservation project.

In 2000, the neighbors sought help from the City and the building inspector, after visiting the quarry, cited Valley Aggregates for a lack of permits and issued a cease-and-desist order. The company appealed, and the next few years were full of meetings, lawyers and court proceedings.

Although there were some stretches when work at the quarry was required to stop, mostly it was business as usual. Then, in 2003, Ron Dahle, the owner of Valley Aggregates, informed neighbors that he was planning a significant expansion, with 6-10 blasts per year and 70 truck trips per day. Based on projections, he said, the quarry could operate for a century. Faced with this news, the neighbors asked if he would consider closing the quarry and putting in a housing development instead. But the quarry, they were told, was worth much more than as a development.



In spite of this information, neighborhood reps kept reaching out to Dahle, encouraging him to shut down the quarry and consider a subdivision. It's unclear exactly when along the timeline he changed his thinking, but by 2005, Dahle had agreed. Unfortunately his initial plan was almost as alarming as the quarry's continued operation: nearly 60 homes and more than a mile



Three potential subdivision layouts for the land in and around the quarry, showing 57 homes (*top),* 37 homes (*above, left*) and 22 homes (*above, right*). In the end, an even smaller scale project was built that protected 150 acres of land.

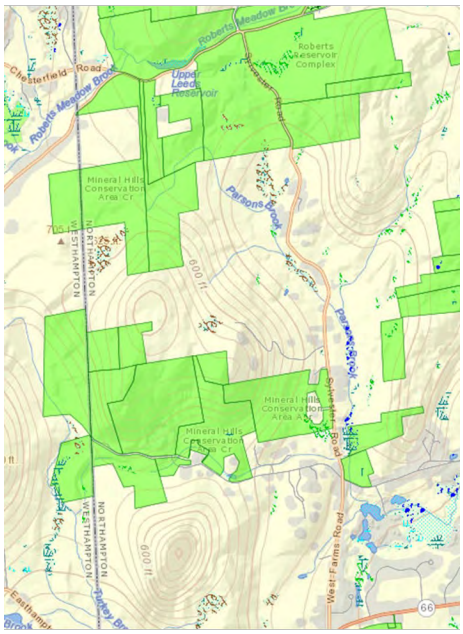
of new road threading throughout the entire property. But as site constraints and negotiations continued, the plans were revised and scaled down, first to 37 homes, then 22 and finally to 11 units (3 triplexes and two single family homes) on 22 acres, with most of the remaining land—150 acres—sold for conservation purposes (30 acres in Westhampton and 120 in Northampton).

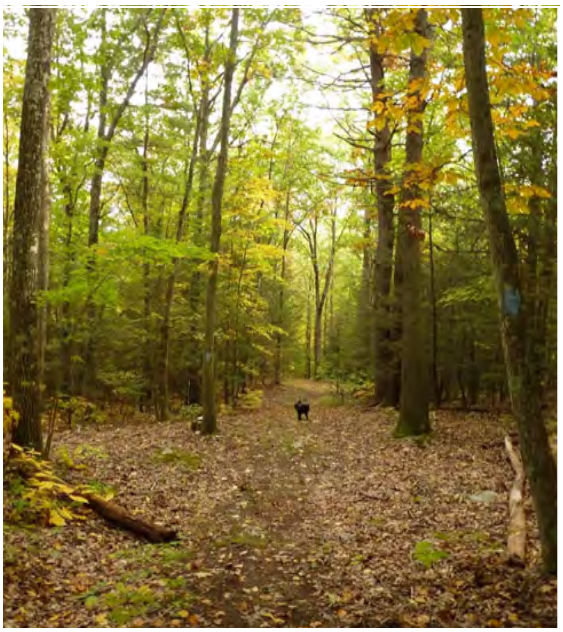
To pay for the conservation portion, the City secured a self-help grant and the neighborhood and other conservation groups raised the balance. The neighborhood effort was particularly stunning. In less than two months, hundreds of individuals sent in a total of $186,000, with contributions coming from as far away as Illinois, Texas and Alaska.

Finally, in late 2006, the 30 acres in Westhampton land were protected, and in early 2007, the 120 acres in Northampton—including the quarry--were transferred to the City's Conservation Commission. After fifty years of gravel mining and more than 30 of quarrying, the sand and rock operations on Turkey Hill Road in Northampton were over.

Since 2006

Since the acquisition of the 150 acres around the quarry, the City has continued buying land in the Mineral Hills. In the last ten years, it has completed five more transactions in the Turkey Hill area, including a purchase two years later that linked the LaPalme property to the 150 acres in and around the quarry site. All told, the City has helped to protect another 400 acres in the Turkey Hill/Sylvester Road neighborhood, with 87 of those acres in neighboring Westhampton and the remainder in Northampton.





Vegetation Patterns

The changing look of the quarry as vegetation creeps in, in September 2011.

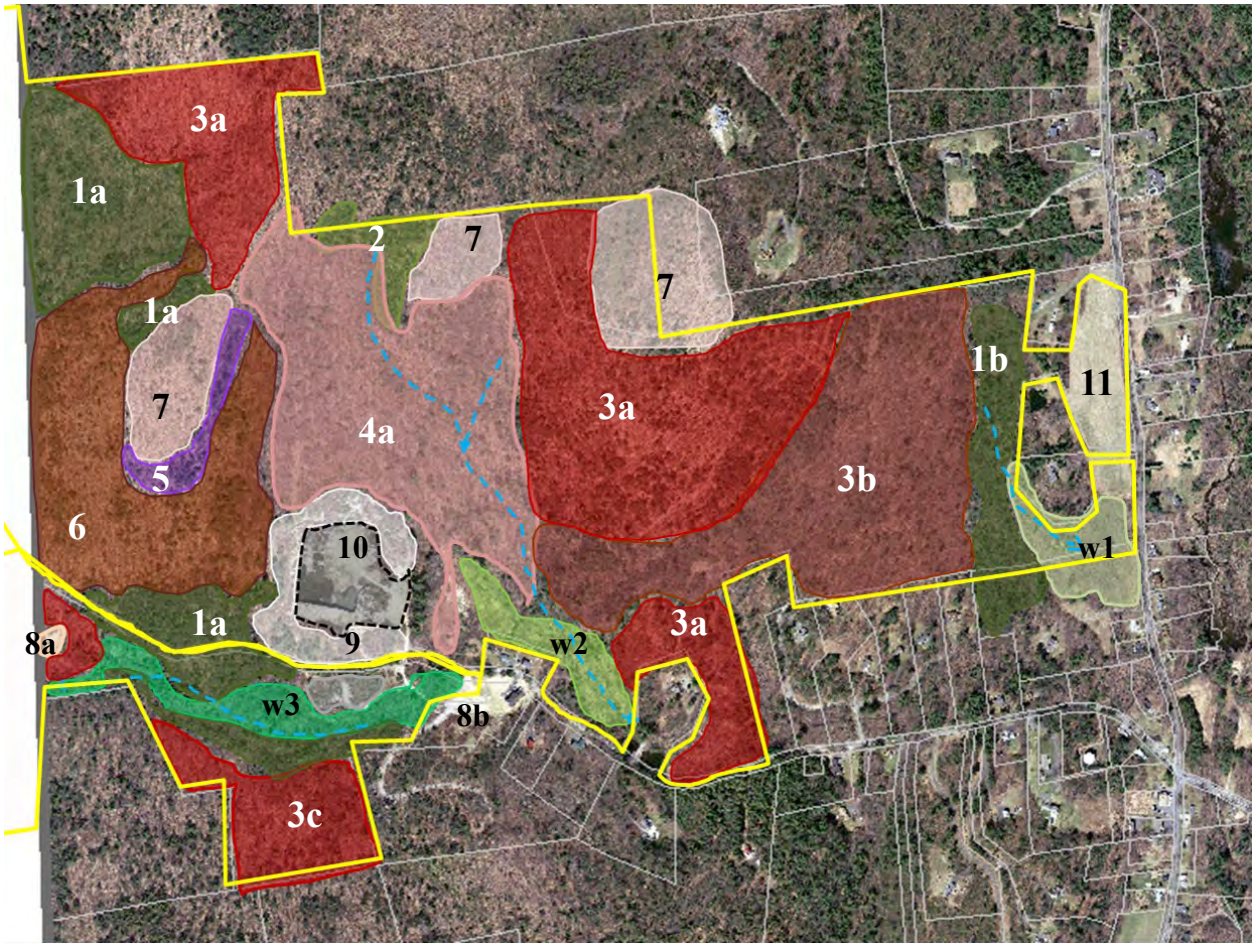
Of the two core areas of protected land within the Mineral Hills (Clapp Farm and Turkey Hill), this southern 413-acre block is much more biologically diverse. In addition to the old quarry and abandoned gravel pits, it includes a former field/wet meadow and beaver pond, rock outcrops, red maple swamp, and several kinds of forest communities. In many of these areas, there are few management or stewardship issues. The trail system is well-maintained by the Friends of the Mineral Hills, ATV traffic has mostly ended, parties seldom happen at the quarry (once an incredibly popular party spot), and the bulk of the property is free of invasive plants. There are some troubles, however, as noted by Molly Hale in a write-up she prepared in 2006 for the City's Self-Help grant and also by forester Mike Mauri, who prepared a forest stewardship plan in 2010. What follows are detailed vegetation descriptions, which are based on multiple visits to the conservation area during 2014 and Mike Mauri's findings. The descriptions correspond to the Vegetation Map on the next page.

Indian Cucumber Root

American Spikenard

Whorled Loosestrife

Vegetation Patterns Map



Uplands

1a: Hemlock dominated with mixed hardwoods, some springs
1b: Hemlock with mixed hardwoods, some seeps and some Japanese barberry and Asiatic bittersweet
2: White pine dominated with mixed hardwoods
3a: Mixed oak (red oak, black oak, scarlet oak, with some chestnut) dry slope dominated hardwoods
3b: Mixed hardwoods (oak dominating) with history of cutting and wood roads
3c: Mixed hardwoods with oak, black birch
4a: Northern hardwood mix with black birch, some sugar maple, red maple, hickory, occasionally pine and hemlock
5: Circumneutral oak-hickory forest, rich with some talus—open and park like
6: Oak-hickory-dry slopes, abundant rock outcrops
7: Ridgetop Oak, with chestnut oak dominating. Low bush blueberry, huckleberry in shrub layer
8a: Former sandbank, white pine, quaking aspen, etc. kept open by ATVs
8b: Former sandbank, rock exposures, white pine and gray birch abundant, growing in; Japanese knotweed
9: Highly altered former clearing with young white pine, gray birch, black birch, etc. bittersweet and multiflora rose
10: Former quarry
11: Active farmland, with abundant invasive plants along edges and roadside border

Wetlands

W1: Red maple swamp
W2: Wet meadow, shrub swamp and former beaver impoundment
W3: Watershed divide swamp with some invasives (east draining side) and richer flora (west draining side)

Uplands *(Numbering Corresponds to Vegetation Patterns Map, page 29)*

A shady stand of hemlock.

1. Hemlock Dominated Forest

1a: Dense stands of dying hemlock. The stand to the south includes some huge pines, plus scattered red oak, black oak, red maple, black birch and hickory. The stand to the north is on a slope and at its base of the slope, there are more hardwoods (including sugar maple) plus multiple springs and seeps. This area is free of invasives.

1b: This hemlock stand also includes scattered white pine, shagbark hickory, red oak, white oak, ash, sugar maple, black birch, big-toothed aspen, and some tulip trees. The understory is varied and shifts with moisture and topography. In drier areas, the shrub layer includes mountain laurel, maple leaved viburnum, striped maple, and hazelnut, while the ground layer includes New York fern, hayscented fern, Canada mayflower, wild oats, Indian cucumber root, partridgeberry, starflower, false solomon's seal and Christmas fern. Interestingly, along the stonewall near the former LaPalme pond, the soil is more fertile and the plants include wild geranium, red trillium, perfoliate bellwort, white baneberry, and poke milkweed. In wetter areas, spicebush, hog peanut, and various violets, grasses and asters can also be found. Some Japanese barberry and Asiatic bittersweet have invaded near forest edge not far from the LaPalmes' former home.

2. White Pine Forest

This small patch is dominated by white pine, but also includes a mix of oaks and other hardwoods. Rock outcrops are common here.

3. Mixed Oak/Hardwoods (3a, 3b and 3c)

3a: An oak-dominated forest (red oak, black oak, chestnut oak, and some scarlet oak) with a mix of red maple, hickory, black birch and scattered pine and hemlock. The drier areas have swaths of Pennsylvania sedge, huckleberry, and lowbush blueberry and more chestnut oak. American chestnut resprouts can also be found here, suggesting that historically chestnut was an important component in the canopy. Exposed rocky outcrops occur here, and there are occasional patches of little bluestem, wild basil, pussytoes and different asters and goldenrods. This rich zone deserves more botanical exploration.

3b: Some of these woods have been cut fairly recently. There are cut stems and an abundance of resprouts. More generally, this area includes a mix of oak (red, black, white), white pine, black birch, pignut hickory,

red maple, big-toothed aspen, paper birch, and hemlock. There is also some sugar maple, shagbark hickory, beech. The shrubby understory includes mountain laurel, striped maple, maple-leaved viburnum, and beaked hazelnut. Ferns are bracken, hayscented, New York and Christmas fern, and in wetter spots, interrupted fern. Wildflowers include Virginia creeper, spotted wintergreen, common cinquefoil, wild licorice, pipsissewa and woodland asters. It includes a network of trails and wood roads, an old log landing/small clearing and some old test pits. The clearing and old test pits should be monitored for invasive plants; they are ideal sites for Asiatic bittersweet to get a foothold.

(A) The dead trunk of a red cedar can be seen in the center of this mage, a telltale sign that this area was once open. (B) A view of the oak forest on the drier slopes, with clumps of huckleberry, lowbush blueberry and barren patches of dry leaves.

(C) Black birch, hemlock and several other species are common in this forest typically dominated by oak. (D) This healed wound on this tree is a clue of past logging operations: it was caused by a skidder.

3c: Located on the south side of the wetland, this forest slope includes a mix of red oak, black oak and other hardwoods (red maple, black birch, ash, hickory, poplar, as well as some black cherry and yellow birch). Hemlock and pine are less common. Mike Mauri estimated that the forest east of the Cowls access road was last cut around 1920, while the forest to the west (mostly red maple, black birch and paper birch) was cut in the 1960s. Finally, next to the old gravel bank (Stand 7) in the westernmost section of the property, the mixed oak woods include black birch, red maple, and paper birch. Mauri estimated that these trees were about 25 years old.

4. Long-Ago Pasture/Mixed Hardwoods

A few old sugar maples, wolf pines, dead red cedars, and strands of barbed wire indicated that this area was a pasture long-ago. The area is varied topographically, with mostly gently sloping hillsides, a steep ravine, and two small streams. Overall the forest is a mix of northern hardwoods, with black birch, sugar maple, red maple, ash, hickory and some hemlock in moister areas and black oak and red oak in drier areas. There is also some beech. Mauri estimated the different ages of the forest, with the western half cut around 1930-1950 and the eastern portion last cut around 1910.

The understory plants are typical of the Mineral Hills. When present, the shrub layer often includes mountain laurel, witch hazel, striped maple, maple-leaved viburnum, and beaked hazelnut. Spicebush is common on the wetter slopes, along the streams and in the seepy areas. Grape vines are present in more fertile areas. Hayscented, NY fern, lady fern and Christmas fern are common and often abundant. Partridgeberry, Indian pipe, true solomon's seal, wild sarsaparilla are among the common wildflowers.

The ravine includes a mix of hemlock, red maple, dying ash, sugar maple and mountain laurel, witch hazel and striped maple. There are broad swaths of New York fern and hayscented fern, as well as

Two views of the deciduous forest along the trail that loops through the long-ago pasture, now hardwood forest.

Christmas fern, interrupted fern and also wild oats and white baneberry.

Although most of this area is free of invasives, some can be found closer to the quarry (e.g. Japanese barberry and bittersweet).

5. Circumneutral Oak-Hickory Forest

Perhaps the most visually enchanting and botanically interesting, this narrow band includes abundant rock outcrops and an open, park-like forest. Hickory, chestnut oak, and hop hornbeam are common and red cedar, both stumps and some living specimens, can be found here. The understory includes swaths of Pennsylvania sedge and several kinds of grasses. The rockier slopes, meanwhile, provide habitat for several plants that are otherwise unusual for Northampton, including wild columbine, early saxifrage, several sedges (including *Carex plantaginea*), gooseberry and red-berried elder. Nearby, on slightly drier ground, grow four-leaved milkweed, ebony spleenwort, round-leaved ragwort, blue-stemmed goldenrod, tick trefoils and other oddities that make this area interesting to explore. Unfortunately a few invasive plants have also become established here and should be removed (e.g. Japanese barberry, Asiatic bittersweet, winged euonymus, garlic mustard). Monitoring should be done here to ensure that these unwelcome invaders do not overrun this special habitat.

This area was probably burned in the distant past, either through lightning strikes or carelessness, but the presence of old wire fencing also reveals that it was once used as pasture.

Four views of the circumneutral oak-hickory forest.

6. Dry, Oak-Hickory-Sugar Maple Slopes

Adjacent to the circumneutral oak-hickory forest are drier, less rocky slopes that include a similar, but slightly different mix of oak, sugar maple, red maple, birch, hemlock and occasional white pine. The forest is taller and its patchy understory includes open grassy/sedgy clearings as well as thickets of huckleberry, deerberry and lowbush blueberry. The understory plants include asters and goldenrods that are less commonly found in Northampton, as well as wild basil, four-leaved milkweed, perfoliate bellwort, early violet, enchanter's nightshade, and white snakeroot. This area is also one of the few known sites in Northampton for round-leaved dogwood. No invasive plants were found within this habitat.

Some old bricks, daylilies and the remains of an old boat can be found near an old foundation located along the trail that leads through this forest to the ridge.

(A) Wire strung now embedded in a large hickory. (B) The remains of an old rowboat lie adjacent to the trail. (C) A typical view of the rich, dry oak-hickory-sugar maple slopes. (D) Ebony spleenwort (*Asplenium platyneuron*), a species that survives in drier, richer sites and within Northampton, known only from the Mineral Hills.

7. Ridgetop Oak

Three areas within the conservation area are characterized as ridgetop oak communities and are dominated by oaks (mostly chestnut oak, but also white, scarlet, and black oak). Red maple is also fairly frequent and white pine is sometimes present. The understory is mostly huckleberry and lowbush blue-

berry. The conditions on the ridge, with droughty, thin soils, are so stressful that the trees are dwarfed and only about 20-25 feet in height. At this point, there are no invasive plants known from this area.

In 2009, Brian Kitely, a native of Northampton and writer, published a novel called The River Gods. In it, he brings his ancestors and relatives to life, writing from their personal perspectives. One of them includes a journal entry in 1852, "written" by the" Sage of Mineral Hill:

> *...Northampton below from Mineral Hill is as remote as the Northwest Passage. We live on what we find, the dog and me-service berries in June, tart strawberries, carrots that taste of metal. What is any man's discourse to me, if I am not sensible of something in it as steady and cheery as the creak of crickets? In it the woods must be relieved against the sky. Men tire me when I am not constantly greeted and refreshed as by the flux of sparkling streams. Surely joy is the condition of life.*

8. Abandoned Sandpits

8a: This former sandpit remains a mix of open sand, with a margin of gray birch, white pine, black birch, and sweet fern. The barren soils support few plants, but include frostweed, whorled loosestrife, bluets and red clover. Although anthropogenic in origin, this area provides habitat for certain species, especially insects. Butterflies regularly seek these areas for basking, and tiger beetles and native bees depend on areas like this for nesting. Turtles from the nearby beaver pond might also use this area for nesting. In recent years, this spot has been unintentionally kept open by ATVs. It would be good to keep this area open (but not by ATVs!). Volunteers could cut the vegetation back, and while they're at it, they could cut out the few Morrow's honeysuckle that have established. They could also monitor this area to make sure other invasive plants haven't become established.

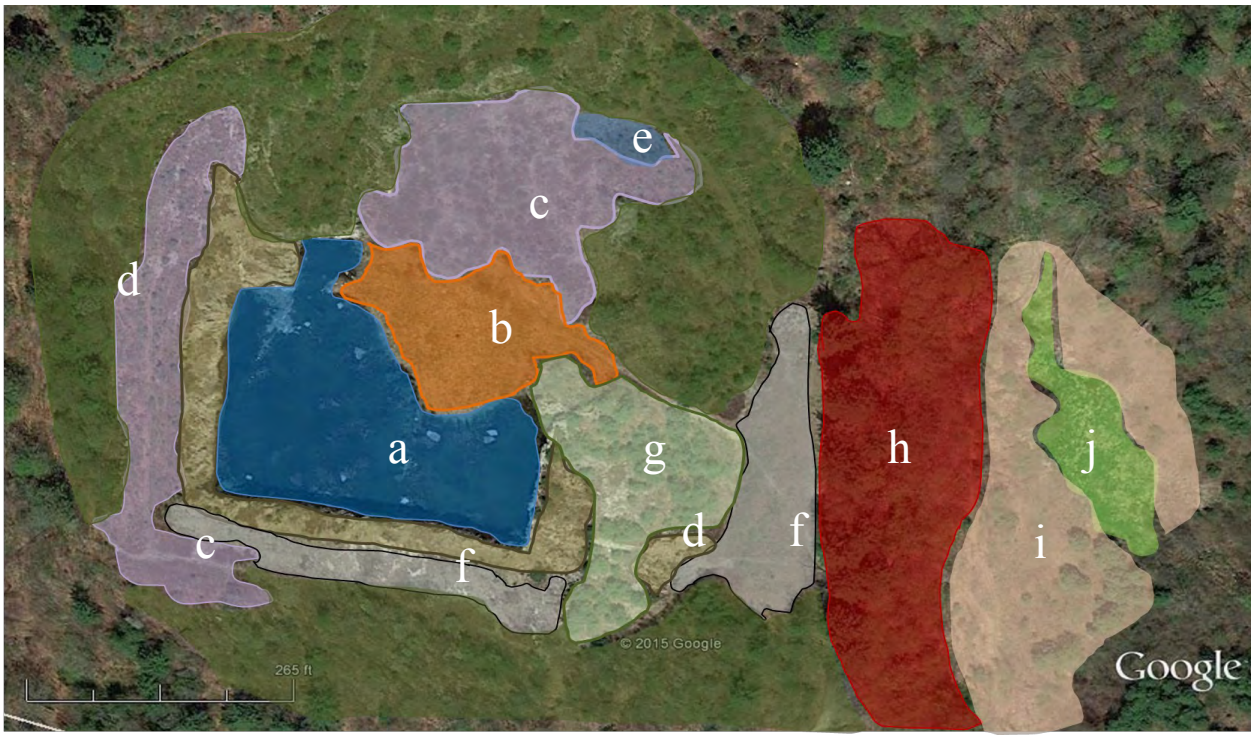
Gray birch, *Betula populifolia.*

8b: This sandpit includes rock exposures and some exposed sand. Much of it has grown in with pine. There is a patch of Japanese knotweed within this highly altered area.

9. Highly Altered Land Immediately Around Quarry

This is a highly altered area that was cut and in some areas, scarified. It is now a brushy area with a mix of white pine, black birch, gray birch, pin cherry, quaking aspen, wild grape, sweet fern and blackberry. Asters, goldenrods and various grasses are common, as are patches of bracken and Polytrichum moss. Although invasive plants in this area were treated in 2007, Asiatic bittersweet and multiflora rose are still present and should be controlled.

The trail around the quarry rim growing in with sweet fern, gray birch, pine, blackberries, oaks and other species.



10. Now-Abandoned Quarry

(a) *Open Water:* Fed by groundwater and rain-water, the pond now supports a mix of cattails (*Typha latifolia, T. angustifolia*) as well as bladder-wort and pondweed (*Potamogeton* sp.). Along the margins grow three kinds of willows, a variety of sedges, bulrushes and grasses, and also several different wild-flowers (tickseed sunflower, marsh bedstraw, groundnut).

Gray tree frogs, American toads, bullfrogs and green frogs all use the open water in the quarry for breeding.

(b) Quarry Floor/Wildflowers: This area was seeded with wildflowers years ago and now includes a mix of grasses (timothy, orchard grass) and wildflowers (St. Johnswort, sweet white clover, sweet yellow clover, hop clover, black medic, red clover, white clover, bird's foot trefoil, yarrow, ox-eye daisy, brown-eyed susan, common speedwell, common milkweed, wild alfalfa, Queen Anne's lace, asters, etc.)

Two of the many species of wildflower planted in the floor of the quarry. Although many of these wildflowers are non-native, they do not spread into natural communities, but are essentially confined to disturbed settings like this. Aside from their inherent beauty, the wildflowers attract a wide array of insects.

(c) Quarry Floor and Rim: These areas of the quarry have revegetated on their own and are now dominated by sweetfern, with patches of blackberry, winged sumac, raspberry, gray birch, white pine, quaking aspen, bracken, goldenrod and asters. The vegetation within the quarry should be mechanically cut back to provide shrub habitat. Otherwise it will all grow up into brush and forest.

Sweet fern is a relative of bayberry and not a fern at all. It thrives in settings like the quarry floor and around the rim. In some parts of the old quarry, species like sweet white clover and daisy fleabane have established in the more open clearings. Unless this area is managed, the sweet fern and other woody species will spread into these areas.

(d) Quarry Rock Walls: Black locust, staghorn sumac, black birch, quaking aspen, gray birch, pin cherry, plus coltsfoot, yarrow, ladies' tresses (in wet areas)….and some tangles of Asi-

(A) The quarry walls are highly varied-some are tangled with vegetation —like this bittersweet—while others (B) are completely open. Ravens have been nesting on one of these open ledges for the last five or so years.

atic bittersweet.

(e) Vernal Pool & Wetland: A small seep and depression form a vernal pool (certified) and the surrounding area includes wet ground that has revegetated since 2006. This area includes an interesting mix of plants, including various violets, swamp candles, seedbox, meadowsweet, steeplebush, round-leaved sundew, marsh fern, blue-eyed grass, field horsetail, scouring rush, variegated horsetail (only known from one other site in Northampton). It also includes a mix of sedges, rushes, sphagnum moss, cattail and a small patch of Phragmites, which should be controlled.

This diminutive variegated horsetail (*Equisetum variegatum*) is known from only one other site (also a gravel pit) in Northampton. (B) The small depression that holds water and is a certified vernal pool is threatened by the spread of Phragmites, seen here.

(f) Open Gravel: Scoured open areas with sands, gravel and exposed ledge are found just outside the quarry entrance and on its southern rim. These areas are mostly open, but include patches of sweet fern, quaking aspen, gray birch and winged sumac. There are also broad patches of Polytrichum moss as well as other grasses, violets, blue curls and some other hardy plants. More concerning is that these areas also have some Asiatic bittersweet and

autumn olive.

(g) Tree Islands and Formerly Cut Forest: These areas are former spoil piles that have been allowed to grow back and now include: big-toothed aspen, gray birch, sweet fern, willows, white pine, red maple, hayscented fern, whorled loosestrife, coltsfoot and sedges. These areas also host several invasive plants, including Morrow's honeysuckle, Asiatic bittersweet and multiflora rose.

Weedy patches along with white pine, birches and aspen characterize these young stands found in the quarry. These are places where Morrow's honeysuckle, seen here in fruit, has established.

(h) White Pine/Sugar Maple: Located along the entrance road, this area is dominated by white pine and sugar maple. Also present are hemlock, some oaks, and one of the largest shagbark hickories I have seen in Northampton. Canada mayflower, wild oats, sedges, red trillium,

(A) This remnant patch of pine and sugar maple forest has little growing in the understory. (B) Japanese knotweed grows along the edge of the parking area at the end of Turkey Hill Road.

and woodland asters grow in the understory. The road in this area is eroding.

(i) Former Hayfield/Shrub Meadow and Parking Lot Edge: Once a hayfield, this area is now a wet meadow with a mix of grasses, young shrubs (panicled dogwood, alder, willow). The nearby parking lot edge shares some species, but it is generally drier, with a history of more alteration. It was once part of a much larger gravel bank. On its margin grow both native and non-native plants. Cottonwood, staghorn sumac, willows and goldenrods are among the more common natives, while Asiatic bittersweet, multiflora rose, Japanese knotweed and tree-of-heaven are very abundant non-natives. These should be controlled—and since the invasions are still small enough, they could be.

The open hayfield shown in the 1952 aerial photo is now a mix of wet meadow and shrub swamp.

(j) Wet Meadow: A soggy, more open stretch along the stream with sedges, bulrushes, touch-me-not and other common wetland plants.

11. Agricultural Fields

Although the bulk of this land is under cultivation, the field's brushy borders, below the former LaPalme home and along an old stonewall, include a mix of young trees and shrubs as well as an abundance of invasive plant, including a large and expanding patch of Japanese knotweed, as well as multiflora rose, autumn olive, Morrow's honeysuckle and quite a bit of Asiatic bittersweet. Controlling these invasives

will be difficult because the vegetation in this area is so dense. There are also several young butternut along the edge; these should not be cut.

The edge of the farm field includes a mix of non-natives, a few of which are seen here: Japanese knotweed, multiflora rose and autumn olive.

Wetlands

Although wetlands and streams make up a relatively small portion of the property, their contribution to the site's overall biodiversity is disproportionately large. In addition to the old quarry site and the intermittent streams draining through the hardwood forest, there are three other wetlands on the property.

w1: A swamp dominated by red maple, winterberry and spicebush, this wetland also includes hemlock, black birch and yellow birch in the canopy. Silky dogwood, highbush blueberry, ironwood and mountain laurel as well as a variety of grasses, sedges, wildflowers and ferns fill in the understory. Sphagnum and other mosses are abundant.

*w2*This wetland varies from open, wet meadow to shrub swamp (alder, willow) to a former beaver pond that at this point is drained. The beavers, which arrived ~2003, used an old stonewall as the base for their dam. During their tenure, all of the trees were killed by flooding or chewing. Today the former beaver pond includes fewer trees and more shrubs.

w3: Portions of this wooded wetland varies dramatically and it includes a watershed divide. The invasive plants are all found on the east side, close to an old gravel pit.

Wetland Draining to East

Closest to the old gravel pit and parking area the drier, altered margins include quaking aspen, cottonwood, willow, and big-toothed aspen. There is a small pond near the old access road that includes cattail, alder and tussock sedges, as well as Phragmites and Japanese knotweed. This area has been highly altered (gabions, culvert), but the small depression provides breeding habitat for toads and green frogs. Other plants in the area are silky dogwood, red maple, sensitive fern and several grasses. There is also some bittersweet.

Moving away from the highly altered area, the wet forest includes a mossy stream that is very pretty. The bordering land is moist and includes hemlock, red maple and sugar maple. In the understory there is witch hazel, spicebush, witch hazel and a variety of wildflowers and ferns (golden saxifrage, touch-

me-not, violets, wood anemone, dwarf ginseng, jack in the pulpit, Virginia creeper, Indian cucumber root, hellebore, as well as hayscented fern, Christmas fern, lady fern and interestingly, even a little maidenhair fern.

Moving still further from the areas that were once disturbed, the stream becomes deeply shaded and dissecting. There are occasional seeps, and the vegetation shifts to more hemlock, with white pine, red maple and yellow birch. The forest floor now includes partridgeberry, foam flower, golden ragwort, wood anemone, poison ivy, bluebead lily, cinnamon fern, turtle head, and lots of dewberry. The rocks are more moss covered and to the south, there is a small area where the hillside is covered with rocks and dominated by hemlock, with scattered ash and red maple. Bluebead lily, Canada mayflower, gold thread and cinnamon fern are very common here.

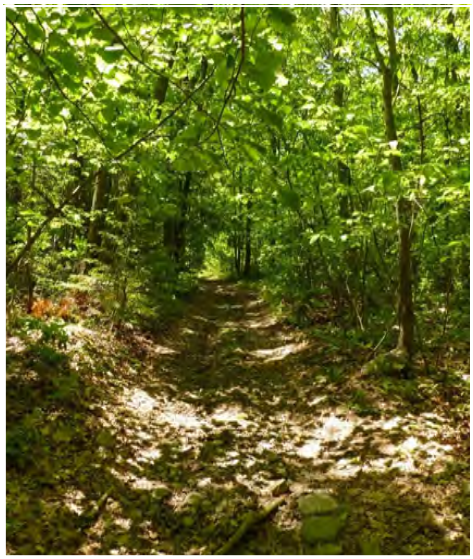
The character of the wetland shifts again and now includes more yellow birch, as well as black ash and scattered hemlock. Cinnamon fern, royal fern, swamp saxifrage, Canada mayflower, poison ivy, and a sedge called *Carex bromoides* are the most common in the understory. Several other less commonly observed sedges are present here as are a number of other wildflowers.

Swamp Forest draining to West

At the watershed divide, the character of the wetland changes and becomes very rocky and dominated by hemlock. A gurgling stream can be heard below and then emerges. There is much less cinnamon

fern (than in the east draining wetland) and lady fern is much more common, as is silvery spleenwort. Leatherwood, a species that prefers neutral soils, is common here, and the canopy includes yellow birch, red maple, black ash, with an abundance of mountain laurel and witch hazel on the drier borders. Touch-me-not, hellebore, foam flower, golden ragwort, enchanter's nightshade and broad beech fern are also present as well as some mountain maple. The topography changes and the stream enters a narrow, tight ravine with hemlock borders. The 30-foot right of way for the Cowls lot crosses the wetland in this vicinity.

As the topography flattens out, the stream winds through a hemlock swamp forest with abundant sedges, wood horsetail, poison ivy, cinnamon fern, various sedges and grasses. It eventually drains into Turkey Brook in Westhampton.



The access road to the Cowls land.

Two botanical indicators of richer soils: (A) leatherwood and (B) silvery spleenwort.

The intermittent stream draining to the west flows into this beaver pond in Westhampton, which is protected through a private conservation restriction.

Recommendations

Mike Mauri's forestry stewardship plan for this property included several management recommendations, several of which are echoed here.

1. Control existing invasive plants & monitor for new invasions

   At present, there are four primary areas with invasive plants: along the parking lot at the end of Turkey Hill Road, in and around the quarry, along the farm field edge of the former LaPalme property, and within the narrow band of circumneutral oak-hickory forest. From an ecological perspective, controlling invasives in the rich oak-hickory zone is the most important. It is also the most easily accomplished; at this point, the number of invasive plants is still low and one or two people could remove all of them in less than a day. In contrast, the other three areas will require more effort over a longer period of time. Although volunteers could make a big difference, the invasive plants in these areas are particularly difficult to eradicate (e.g. Japanese knotweed, Asiatic bittersweet, multiflora rose, autumn olive, *Phragmites* and Morrow's honeysuckle), which means that until a biological control is found, any volunteer efforts would need to be followed up with herbicide spot treatments.

2. Maintain the shrub habitat and open meadow in and around the quarry and in the adjacent gravel pits by using a Brontosaurus and/or brush hog.

3. Fix the erosion on the trail leading to the quarry.

4. Work with Smith Vocational, volunteers or a tree service to clear one or two views at the top of the ridge.

5. Remove the ugly, old silt fence and fix the clogged culvert at the end of the Turkey Hill Road.

6. Continue to control ATV use.

7. Keep trails wide to reduce the chance of encountering deer ticks.

Deer ticks!

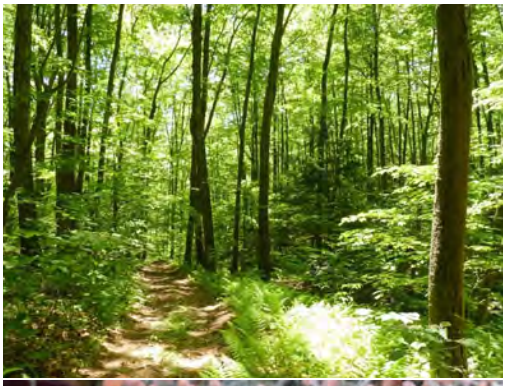
8. Certify/investigate potential vernal pools in and near the conservation area.

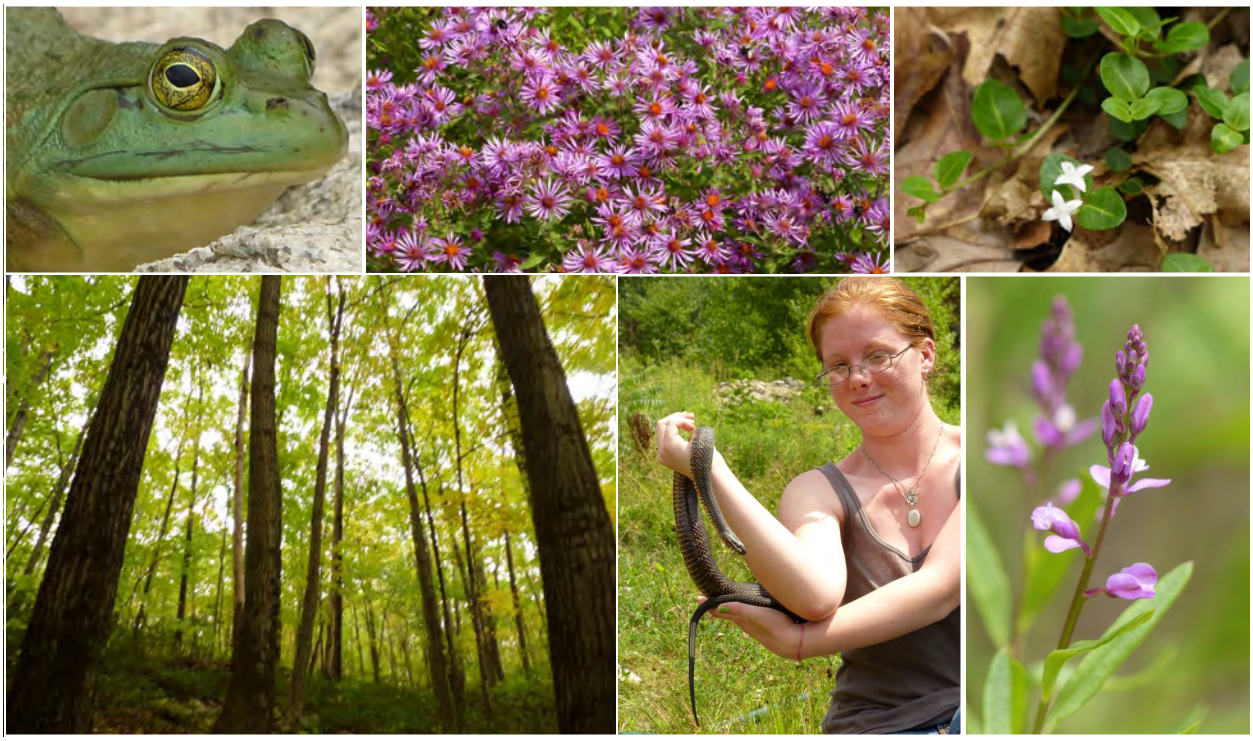
9. Extend a trail to the beaver pond in Westhampton and to the old gravel pit that has the nice exposure of bedrock.

10. Conduct a detailed natural history inventory of the plants and animals within the Mineral Hills Conservation Area.

11. Record/video tape interviews with Armand and Rosel LaPalme, Paul Foster-Moore, Mark Carmien, Jo-Anne Bessette, Wayne Feiden, and others about the conservation of this part of the Mineral Hills.

12. Provide support and guidance to the Friends of the Mineral Hills.

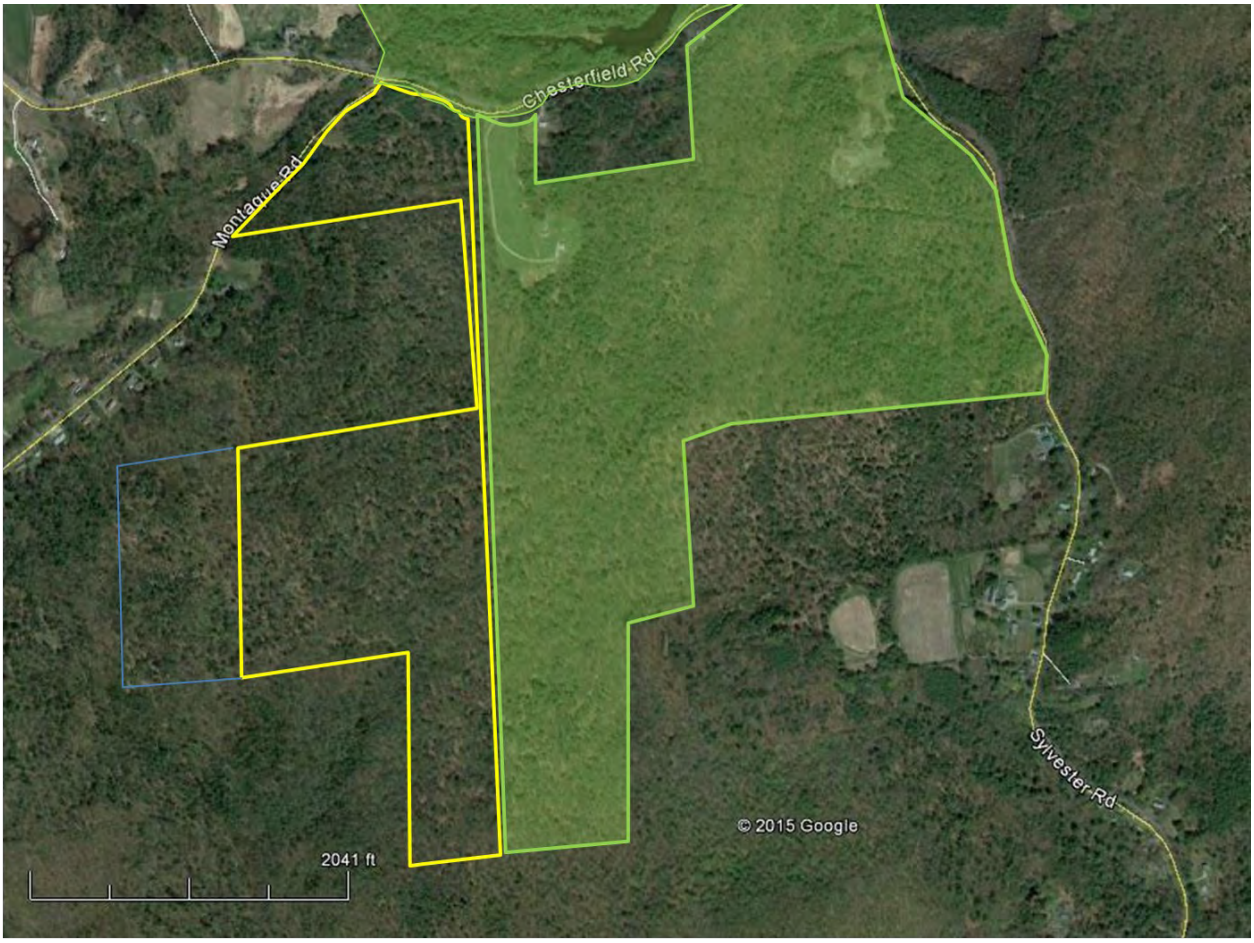




Part II: A Natural History of the Bookends Parcel

(Formerly Sarafin/Clapp Farm)

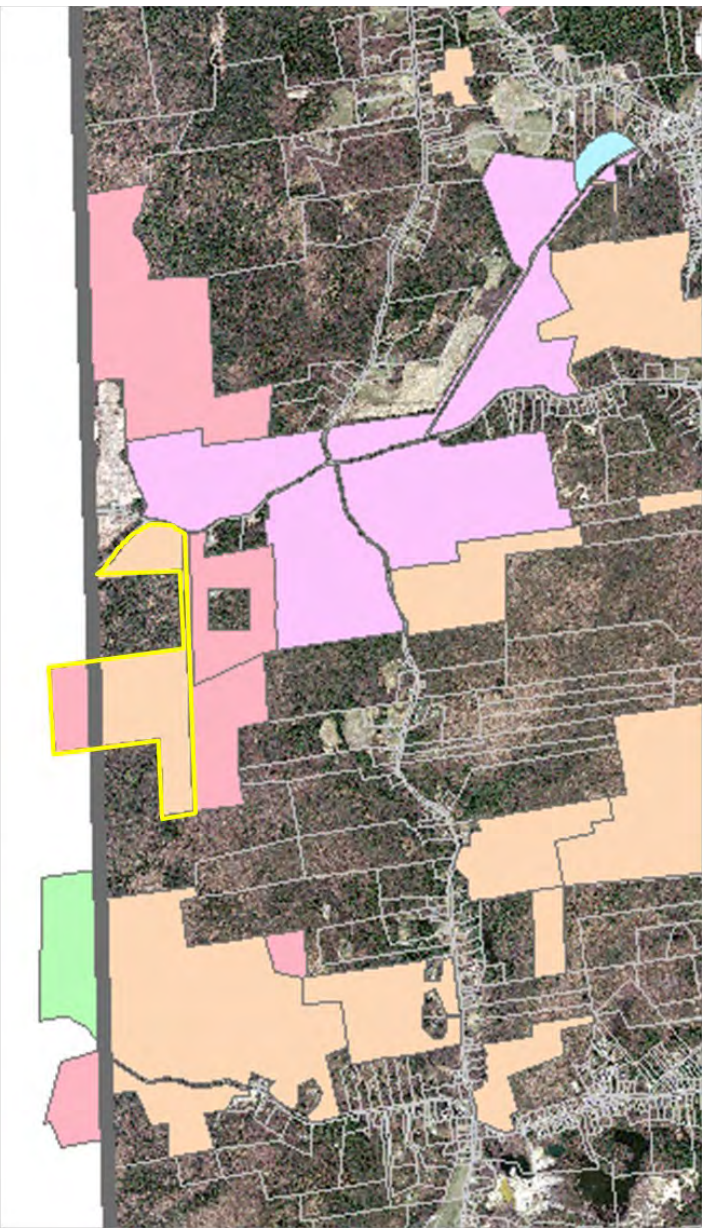
~ 90 acres



The Bookends Parcel (120 acres) includes 90 acres of conservation land in Northampton (outlined in yellow) and 30 acres in Westhampton (outlined in blue). The land to the north and east is protected through private Conservation Restrictions or owned by the DPW.

Conservation of the Clapp Farm

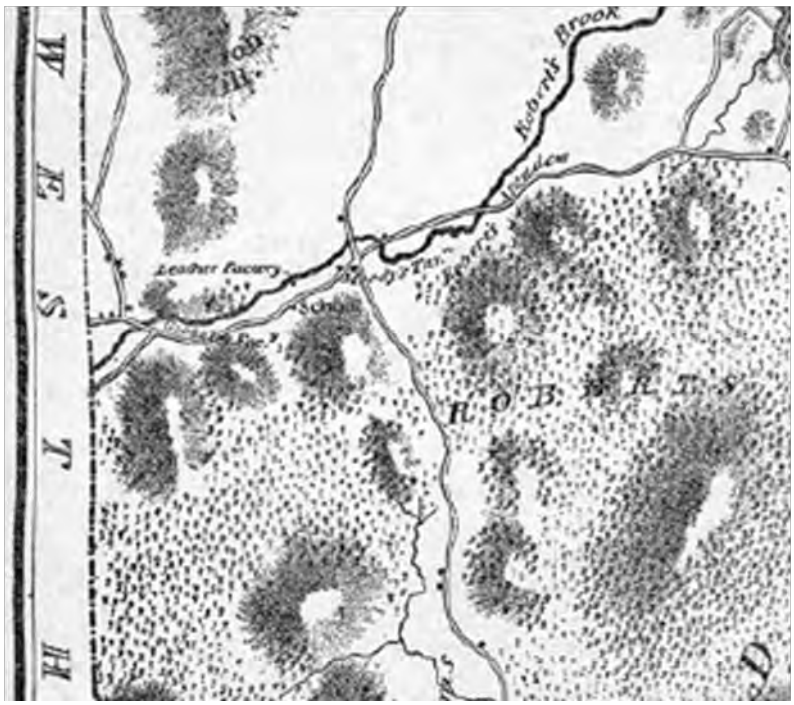
In 2005 John Clapp asked his cousin/forester Tom Jenkins to mark the timber on his land and after cruising the property, Jenkins asked Clapp if he had ever considered putting his land under a conservation restriction. At the time, Clapp admits, he didn't know much about conservation restrictions, but after learning more about them, he and his wife Dee were on board. The following year they worked out the terms of a conservation restriction with a fledgling conservation group called the Nonotuck Land Fund (now part of Kestrel Trust), sold their development rights and placed twenty acres of hayfield and forest under a permanent Conservation Restriction.



The Bookends Parcel (120 acres) in context, with the other Clapp family farmland (light red) and the City's DPW land (lavender). Its protection helped protect a block of land that now extends all the way to Roberts Hill and helped fill a key piece in the Mineral Hills. The frontage along Montague Road and Chesterfield Road was particularly vulnerable to development.

By then, Clapp had also been talking about conservation restrictions to his sisters, encouraging them to take similar steps with their shares of the family farm. The next year, Clapp's sister Miriam put her share—57 acres—under Conservation Restriction and two months later, Clapp and his wife placed another 35 acres under easement. Three years later, two other sisters—Liz Clapp Anderson and Christine Clapp Guyette--worked with the Nonotuck Land Fund and placed their 168 acres under a conservation restriction. Two years later, in 2012, another relative, Joan Sarafin, protected her 120 acres, selling 90 acres of the family farm to Northampton's Conservation Commission and 25 contiguous acres in Westhampton to the Kestrel Trust. Known as the "Bookends" parcel during the fundraising effort, its protection filled in a key parcel. In less than a decade, nearly 400 acres of the Clapp Farm had been protected in perpetuity.

History



The 1831 map shows about ten houses, two factories a school and Moody's Tavern. Other farms were nearby in Westhampton and to the south in West Farms. The stippling on this map suggest that most of the Sawmill Hills and Mineral Hills were still covered with some kind of forest, but probably none of it was virgin by then and was growing back.

The connection between the Clapp family and this corner of Northampton extends through six generations. In 1826 Henry Clapp (John's great-great-great grandfather) purchased 100 acres from Leander Moody's family. Moody was best known as the owner of the then- famous tavern at the intersection of Chesterfield and Sylvester Roads, but he also operated a sizeable farm. In those early days, this part of Northampton was known as the Roberts Meadow District and although small, it was fairly busy and included a school house, a tannery, a sawmill and another small factory. Henry Clapp settled in the district largely to work as a blacksmith, but he also farmed and was a co-owner of the local sawmill.

By the time of his arrival, a lot of the forest in this area had been cut and cleared. A sawmill had been built nearby almost 60 years before and the leather factory just down the road had been operating for nearly 40 years. In the early 1800s, the tannery was in its heyday and was considered one of the most important leather factories in the Commonwealth, processing up to 30,000 hides a year and employing up to 20 men. Its operation, however, required enormous quantities of oak and hemlock bark, which were ground up and used in the processing of hides and so the tannery alone had a huge impact on the surrounding forest.

But the tannery wasn't the only source of pressure on the local woodlands. The development of the woolen mills in nearby Leeds (then known as Shepherd's Hollow) in the early 1800s was another. By the time, Henry Clapp settled his growing family here, Leeds was bustling and like everywhere else in those days, wood was the only source of fuel for heating and cooking. For the factories and workers in Leeds, some of their firewood almost certainly came from this part of town. In addition, more forest

clearing was done to create pasture for sheep that were being raised by the thousands to supply local textile mills with wool. “Sheep fever,” as it was known, played an important role in land clearing here and elsewhere in southern New England. When Henry Clapp arrived, land clearing was at its peak, with upwards of 80% of the state open.

By 1895, when this map was produced, James Clapp had taken over his grandfather’s farm. During his lifetime, he increased the size of the family’s holdings from 200 acres to 1,000. What this map doesn’t show is the City’s new reservoir, which was built in 1883, just opposite the schoolhouse, on Roberts Meadow Brook. .

During his tenure, Henry Clapp and his wife Nancy Root Clapp raised six sons on the farm and during the next three generations, his descendants bought more land, eventually accumulating 1,000 acres in this corner of Westhampton, Northampton and Williamsburg. The Clapp Farm owned dairy cows, grew crops, harvested hay and cut timber off their land.

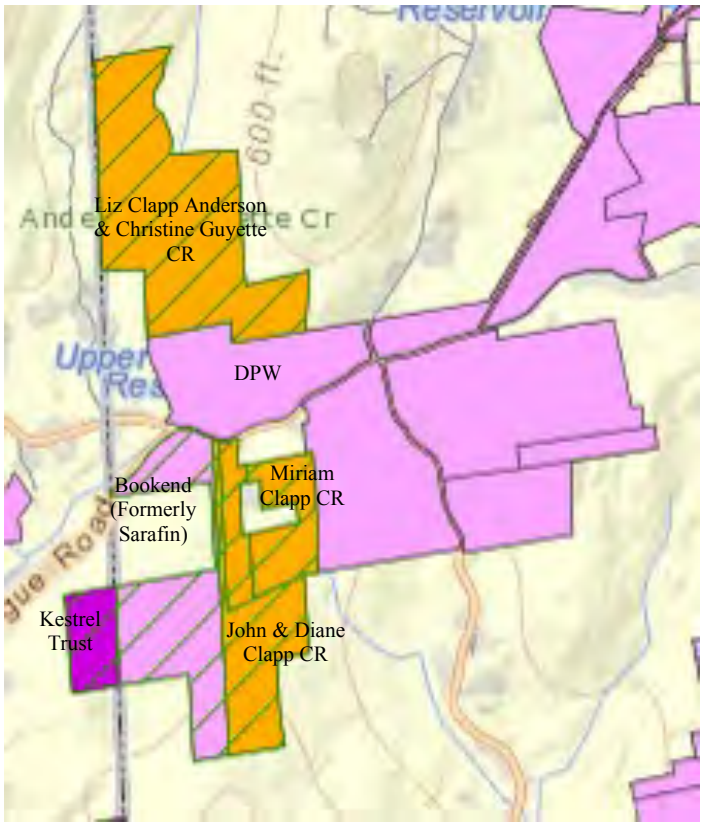
During the last fifty years, John’s father and Uncle Philip ran the farm. In the 1960s, they sold off several parcels (~300 acres) and in the late 1980s, they sold off the last of their dairy herd. After John Clapp’s father and uncle died, the farm was subdivided among the family’s heirs, which included John and his five sisters and also his uncle’s step daughter, Joan Sarafin and her husband John. The

Evidence of the land’s farming history is easy to find. Rough stonewalls mark old field edges and boundaries and although they are now found in the middle of the forest, they tell a story of past land clearing. Most of these walls probably date to the 1820s-1840s. Barbed wire is also easy to find. It was invented after the Civil War, came into widespread usage in the 1870s and is still a popular fencing material.

The pasture at the intersection of Montague and Chesterfield Road in 1952 and 2013. Today this former pasture is seriously invaded by non-native plants, particularly Asiatic bittersweet and multiflora rose. Returning this portion of the property to an open clearing would help reveal the historic stonewalls, control invasive species, improve access, and restore habitat for wood turtles and grassland birds (woodcock, savannah sparrow, bobolink). Once cleared, a portion of this pasture could be leased to a local farmer or it could be maintained as grassland/shrub habitat.

Sarafins received 120 acres (90 in Northampton and 25 in Westhampton) and in 2006, they hired a local logging company to begin harvesting some of the trees. Logging continued, albeit sporadically, until 2011, when a new logging company was hired. During the next year, a fairly heavy cutting job was done (~276,000 board feet), with most of the trees being white pine and oak.

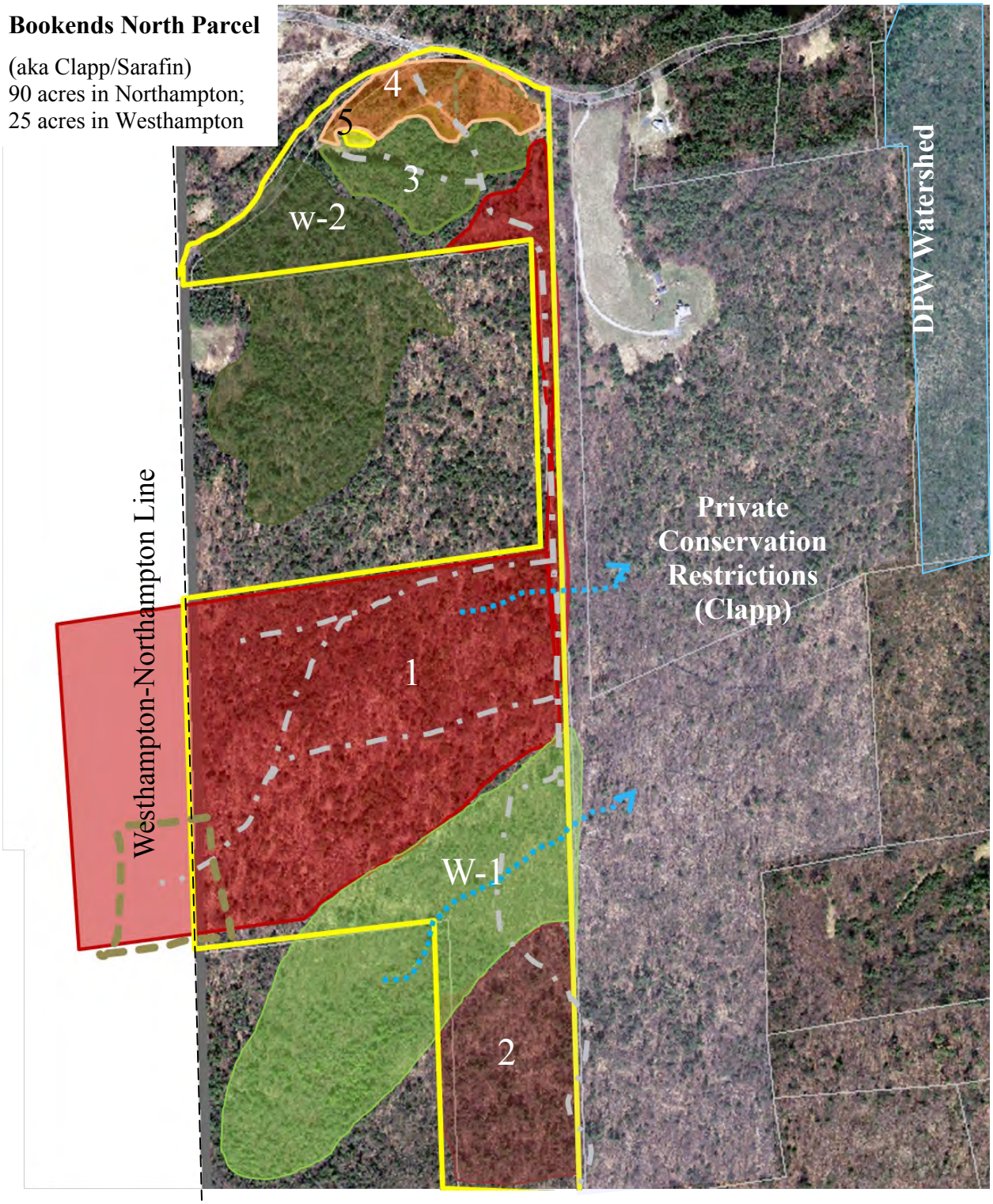
In 2013, forester Mike Mauri completed a stewardship plan for the property, but otherwise no management or stewardship activities have been done since the land's acquisition.



These two aerial views show a bigger view of the Bookend parcel, the Clapp CRs properties and vicinity in 1965 and in 2013.

Bookends North Parcel

(aka Clapp/Sarafin)
90 acres in Northampton;
25 acres in Westhampton



Vegetation Patterns

1: Hardwood dominated (logged 2006-2012), mostly level
2. Hemlock/hardwood mix (logged 2006-2012), 25-35% slope
3: Successional white pine
4: Former pasture/brushy field/invasives
5: Log landing/open grasses & goldenrods

w1: Hemlock/yellow birch swamp
w2: Hemlock dominated swamp/perched wetland

Vegetation Patterns

Except for a steep slope at the south end, most of this 90-acre property is fairly level, with mild slopes and no exposed bedrock. The land is mostly uplands (75 acres), with only two small wooded swamps. Aside from two small clearings that have been kept open by log landings and ATV use, the rest of the property is forested.

In spite of the property's relative uniformity, the composition of the canopy—thanks to the richer, deeper soils--is diverse. Oaks are the most abundant trees (red, black and white oak), but many other hardwoods are common (shagbark and pignut hickories, black and paper birch, red maple). The hardwood component of the canopy also includes minor amounts of ash, sugar maple, black cherry and yellow birch. White pine is also common and widely scattered throughout forest, and there is one good-sized stand that has grown up in an abandoned pasture. Hemlock too is found throughout much of the property, but, at least for now, it is most common in the property's two main wetlands—one in the interior of the property and the other along Montague Road. All of the hemlocks are affected by both hemlock woolly adelgid and scale.

Most of the property is fairly level, with only the north end of Bald Hill having any significant slope.

What follows are more detailed descriptions of the vegetation patterns. These numbering and descriptions correspond to the vegetation patterns map on page 52.

Uplands

Mixed Hardwoods—Level & Gently Sloping (1)

This mostly level area was cut repeatedly between 2006-2012 and includes a diverse mix of hardwoods, white pine and hemlock. Oaks are the most common (red oak, white oak, black oak) but hickory, red maple, and black birch are also widespread, and several other hardwood species occur in low numbers (black cherry, ash, sugar maple). Chestnut oak can also be found, especially along the drier ridges within the Westhampton portion, where some small rock outcrops are exposed.

Within this large block, the understory varies widely. In some sections (especially recently logged sites) there is a carpet of hayscented fern, while in many other areas, the ground layer is virtually absent. When herbaceous plants occur, the most frequently encountered are partridgeberry, Canada mayflower, starflower, common woodland aster, wild sarsaparilla, Indian pipe, bracken fern, New York fern and Christmas fern. The shrub layer is also variable. Mountain laurel is the most common, but witch hazel, maple-leaved viburnum, huckleberry and low-bush blueberry are patchy. Blackberry is abundant in the sunnier, logged clearings. In parts of the central section, the forest includes more hemlock (all dying), and dozens of young bittersweet seedlings were found growing below. Whether these plants will survive is unclear, but their establishment in the interior part of the forest was worrisome. Aside from this area, the only other non-native plants found were some Japanese barberry growing in the Westhampton portion and a single Asiatic bittersweet in a seepy spot.

A dying hemlock stand.

Bittersweet seedlings below the dying hemlock.

Hemlock/Red Oak/Mountain Laurel—Steep Slope (2)

The slope at the property's southern end is dominated by hemlock and red oak, but scattered throughout are a mix of other species, including black birch, red maple, hop hornbeam, hickory, American chestnut, white pine and chestnut oak (some good sized). The soils here are drier and more acidic, and the understory vegetation is patchy. Mountain laurel is the most abundant and witch hazel is common. The other shrubs here include huckleberry, lowbush blueberry and maple-leaved viburnum. The herbaceous layer is very thin. Starflower and partridgeberry are some of the only plants. What's "interesting" about this slope is that although it feels like you are deep in the forest and away from civilization. The trees along the boundary, however, have strands of barbed wire, indicating that this area was used as pasture decades ago.

So far, there are no invasive plants found within this patch of forest. There are, however, invasive insects. All of the hemlock here is dying due to the non-native hemlock woolly adelgid and hemlock scale.

Succession White Pine Stand (3)
This old white pine stand was cut fairly hard between 2006-2012 and is now thin and patchy. Red maple is common in the canopy and there is also some red oak. In the wake of logging, the forest understory has grown into a tangled mix of blackberry, witch hazel, hay-scented and lady fern. There is also an abundance of multiflora rose and Asiatic bittersweet, particularly along the stonewall that borders John Clapp's property. Regrettably the last cutting job left lots of slash and the trail is now blocked in many places.

Old pasture/Brushy Tangle & Log Landings (4 & 5)
Used as cow pasture by the Clapp family until the late 1980s, this area along Chesterfield and Montague Road has grown into a brushy mix, with dense stands of young white pine (no understory vegetation below) and deciduous species (staghorn sumac, red maple, black cherry, old apple trees, black birch). This area has the most serious invasive species problem within this 90-acre property. Mike Mauri, in his stewardship plan, estimated that non-native plants currently cover about 10% of this area. The most widespread and abundant are Asiatic bittersweet, multiflora rose and Morrow's honeysuckle, but Japanese barberry is also present. Two small areas in the old pasture are still open and grassy, and also include steeplebush, sweetfern, dewberry, goldenrods, blackberry, and yarrow. These clearings have remained open because they were used as log landings or by ATVs.

Wetlands

Swamp Forest (w-1)
Dominated by yellow birch, hemlock and red maple, this seepy swamp forest is a headwater for Parson's Brook. Striped maple and witch hazel are common on the higher hummocks, while wetter places support winterberry, northern arrowwood and spicebush. The understory plants are typical of wooded swamps. Ferns include interrupted fern, New York fern, spinulose wood fern, crested shield fern, and sensitive fern, while the wildflowers include Virginia creeper, swamp dewberry, poison ivy, gold thread, turtlehead, spotted touch-me-not, foamflower, enchanter's nightshade, hog peanut and violets. There are no invasive plants growing here.

Hemlock Hardwood Swamp (w-2)
This small, shady swamp is dominated by hemlock, but also includes white pine, red maple, black birch, and occasionally yellow birch. The shrub layer is mostly absent, but includes sporadic patches of mountain laurel and witch hazel. The forest floor is full of wet, moss-covered rocks and seepy springs. Wildflowers include hellebore, wintergreen, foamflower, partridgeberry, poison ivy, golden ragwort, golden saxifrage and painted trillium. The ferns include spinulose woodfern and

Christmas fern. Ultimately this water coalesces into an intermittent stream, which drains under Montague Road and joins Roberts Meadow Brook. A barbed wire fence runs through this forest and along the trees bordering Montague Road, indicating that cows were allowed to roam through this wet area in the past. The hemlock is infested with woolly adelgid and scale and Japanese barberry, garlic mustard and multiflora rose can be found along the roadside edge.

Recommendations

1. Restore the former pasture/clearing at the intersection of Montague & Chesterfield Roads .

   This project would make the management and control of invasive plants much easier and it would also improve the habitat for species in decline (e.g. wood turtle, American woodcock, savannah sparrow, kestrel and possibly bobolink, which nest successfully in the vicinity), reveal the historic stonewalls (now almost entirely hidden by brush), and possibly create an opportunity for a local farmer. The East Quabbin Land Trust, for instance, has a cooperative agreement with a beef farmer that has been a win: win for both parties. The farmer gets use of the land and in return is responsible for maintaining the field edges and controlling invasive plants.

   Initially a brontosaurus mower would be required, followed by annual (or every other year) disc cutting or brush hogging. The abutting owner, John Clapp, expressed interest in collaborating.

2. Control invasive plants in and around the former pasture.

3. Create a small parking area along Montague Road at the edge of the former log landing. (Trash would be a concern, but right now the only parking is along the roadside and suitable for only 1-2 cars.)

4. Work with the Friends of the Mineral Hills, nearby residents, AmeriCorps, Smith Vocational, the County Jail and/or other volunteers to restore the pre-existing trail system, fix erosion issues, and map the trails.

5. Secure permission to cross private land and formally link the trails between the Turkey Hill Road conservation land and this property.

6. Discuss with DPW the possibility of access to the ravine on the other side of Chesterfield Road, which is one of the most beautiful spots in Northampton.

7. Install a kiosk at the trailhead describing the history of the area.

8. Continue acquisition of adjacent parcels.

9. Encourage field walks and research projects in this area.

10. Enroll the land in the Forest Stewardship Program (as per the forest stewardship plan.)

Footpaths and wood roads that used to exist within this conservation area have been obscured by slash left after the last logging job. Unless they are re-opened soon, they will disappear as the vegetation grows in.

This is one of the few places where erosion occurs along the main wood road. It could be improved with a few water bars.

This wood road heads south and connects to the trail system in the conservation land along Turkey Hill Road. Although mostly free of invasive plants, Asiatic bittersweet and multiflora rose occur in this stretch as the trail enters the forest from the old pasture.

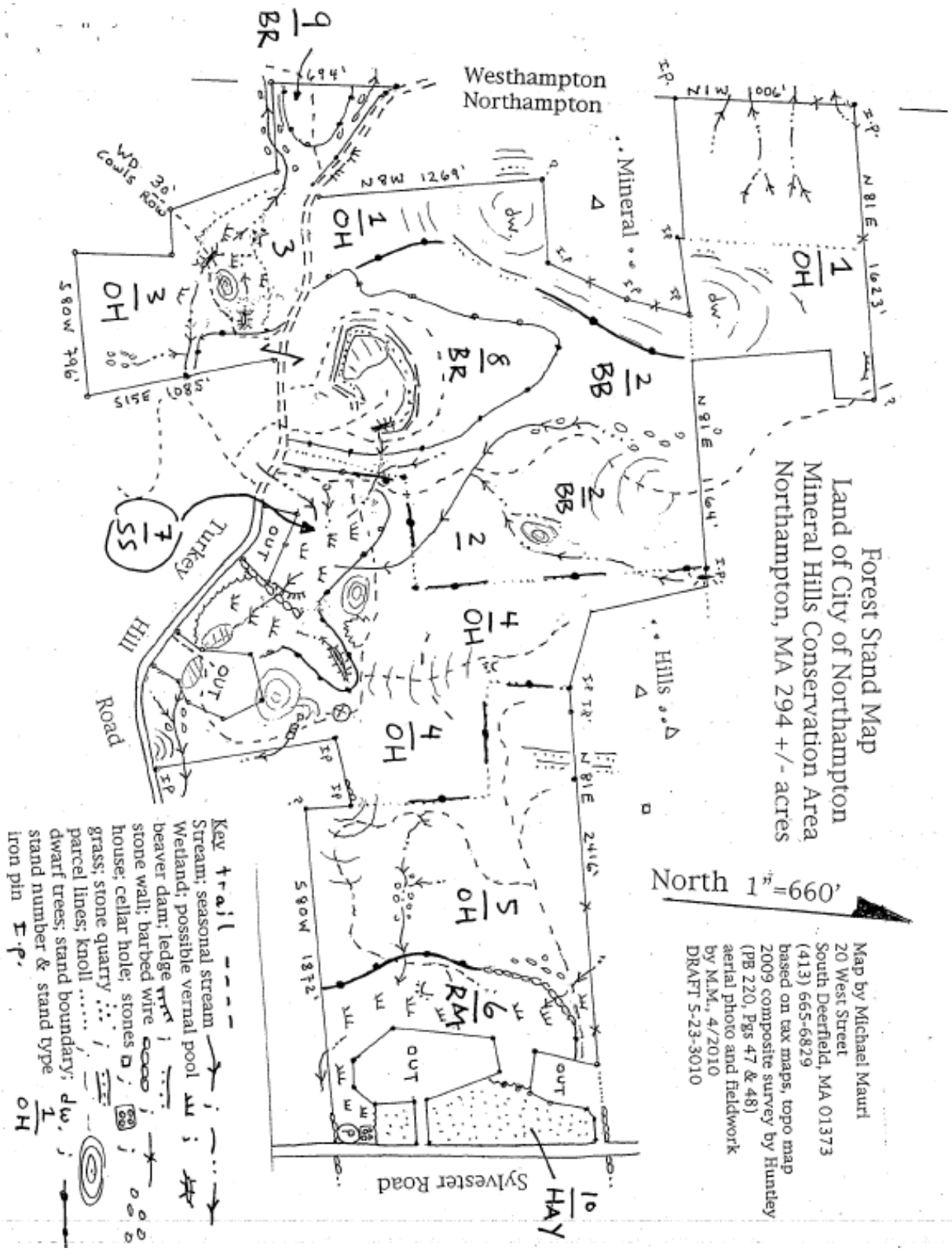
Although these 90 acres have been recently been logged, the cutting was a shelterwood and there are still many good sized trees within the forest. Even bigger trees can be found along the property's borders and its corners, like this old white oak. There are also a few very large red oak, black birch, and bitternut hickory along the wood road near the old pasture.

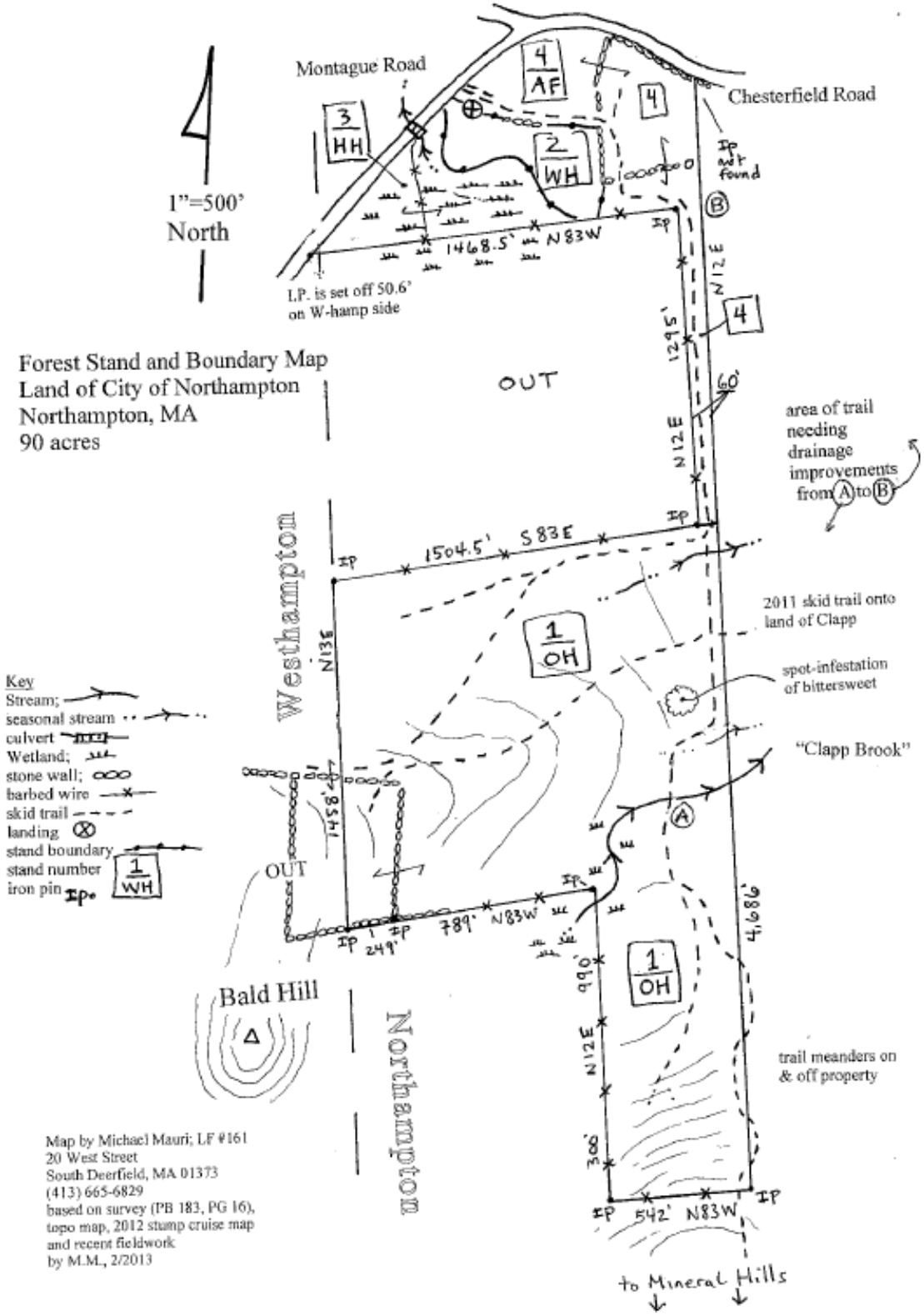
Along the narrowest section of this property is one small area with sweeter soils. Growing here is a mix of sugar maple, Christmas fern, hazelnut, maidenhair fern and spicebush. There is also some Asiatic bittersweet and Japanese barberry near a small intermittent stream (right).

The property in 1952. At the top of the image is the upper reservoir, Chesterfield Road and the original Clapp family farm house. To the south, the now-abandoned telephone & telegraph right-of-way can be seen cutting east-west across the forest and pasture. In the lower left is a former pasture that is growing in. Bald Hill is further south and outside of this image.

Appendix 1

Forest Stand Map—Turkey Hill Road Vicinity Prepared by Mike Mauri



Appendix 2

Forest Stand Map—The Bookends Parcel (formerly Sarafin) Prepared by Mike Mauri