



*Silviculture Prescription  
Schoolhouse Lot*

*Massachusetts Department of Conservation and Recreation  
Bureau of Forestry*

*Central Berkshire District  
October Mountain State Forest  
Washington, MA*

*Prepared by:*

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Approved by:

Management Forestry  
Program Supervisor

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## **Overview:**

The School House Lot Forest Management project is the central portion of the October Mountain State Forest (see Locus Map). The conditions that led to selecting this project for forest management are:

- Significant portions of the project area have been affected by abiotic (ice) and biotic (beech bark disease and black knot) agents and the overstory trees are beginning to decline.
- Due to the loss of overstory cover there is a danger of heavy sprouting of American beech and subsequent loss of tree diversity.
- Desire to maintain softwood (hemlock, spruce and fir) component in Hemlock/Hardwood stands.
- This project area offers an excellent opportunity to demonstrate and fulfill objectives for DCR Woodlands.
- This project will provide an opportunity to repair poor road and trail conditions that are leading to erosion of trails, sedimentation in Washington Mountain Brook and rutting in wet soil conditions.
- This project will provide an opportunity to curtail and repair damage by illegal off-road vehicle use in the borrow pit adjacent to Schoolhouse Reservoir.

The School House Lot Forest Management Project endeavors to:

- Use group selections to regenerate shade tolerant and mid-tolerant species in Northern Hardwood and Hemlock/Hardwood forests..
- Prevent proliferation of American beech with beech bark disease complex.
- Demonstrate harvesting techniques and best management practices that protect forest productivity, soil and water resources.
- Repair and/or relocate portions of Schoolhouse Trail and Schoolhouse Loop Trail.
- Replace bridge over Washington Mountain Brook.
- Control access and restoration to the borrow pit adjacent to the Schoolhouse Reservoir.
- Fulfill management approaches for Woodlands as directed by the Forest Futures Visioning Process (2010) and subsequent Management Guidelines (2012)

The School House Lot Forest Management Project is 276 acres in size and will result in one or more timber sale entries. This prescription will cover the whole project area.

## **Site Data:**

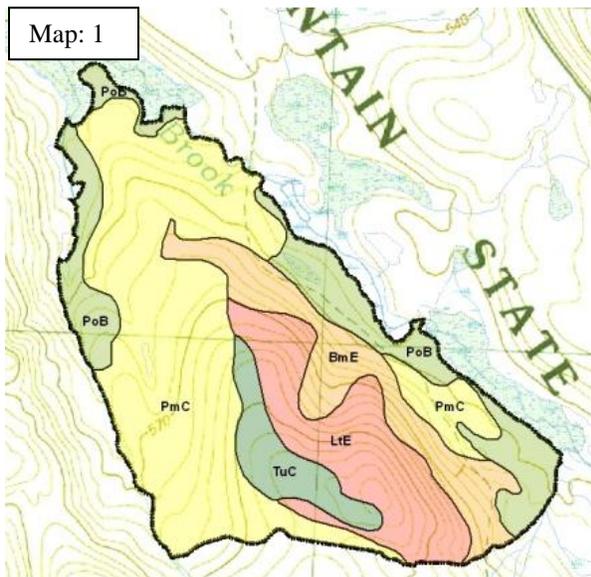
**Geology and Landforms:** This proposed project area is located in the south western portion of the Town of Washington within the October Mountain State Forest (see Appendix I: Locus Map). The triangular project area is bounded by Schoolhouse Reservoir to the north, Washington Mountain Brook to the east, and an unnamed brook to the west. The southern boundary will consist of a portion the Schoolhouse Circle Trail and an intermittent stream that flows east to Washington Mountain Brook. The east, west and northern sides of this area rise in elevation from a low of 1700 feet at the Schoolhouse Reservoir to the southern portion of the project area where the top of the hill is an elevation of 2050 feet.

Located along the brooks mentioned above there are associated wetlands and beaver ponds. There are also other seeps, intermittent streams and small forested wetlands areas located throughout the project area. Further description of these features is in the wetlands section below.

The project area has slopes facing west, north and east which range from less than five percent to as much as 40 percent on approximately less than two acres. Portions of this area are covered in sporadic rocks and boulders.

According to GIS analysis there is approximately one acre where slopes may exceed the 40% management restriction guidelines set forth by the Landscape designations for DCR Parks and Forests: Selection Criteria and Management Guidelines (2012) or the Central Berkshire Forest Resource Management Plan (2007) (CBFRMP) . The location will be evaluated while conducting on the ground project layout to determine if an internal “no cut” area will be established.

This area has been shaped largely by the retreat of the last glacial period. Much of this area is covered in sporadic rocks and boulders that become denser in and around drainage areas. Along the higher elevations in the northern portion of the stand several outcroppings occur.



**Soils:** There are five soil types associated with this project area as shown on the soils map to left (Map: 1). The soils range from very poorly drained to flat bottom types to excessively drained upland soils. All of these soils formed as a result of glacial till. As with topography the forest composition changes with the soil types. The five types are described below (excerpts from “Soil Survey of Berkshire County Massachusetts”, NRCS 1988).

- **PmC - Peru-Marlow Association:** This map unit consist of very deep, moderately well drained Peru soils and very deep, well drained Marlow soils. Peru soils are typically on the lower parts of slopes or in slightly concave areas and Marlow soils are on the upper parts of slopes on in convex areas.

Permeability of Peru soils is moderate above the substratum and moderately slow to slow in the substratum. Permeability of Marlow soils is moderate above the substratum and moderately slow or slow in the substratum. Potential productivity is moderate for sugar maple on Peru soils and for northern red oak on Marlow soils. The main management concerns are the large stones and boulders on the surface and plant competition. (129 ac)

- **BmE – Berkshire-Marlow Association:** This map unit consists of very deep, well drained Berkshire and Marlow soils. The soils are on the sides of hill and mountains. Berkshire soils are typically on the steeper and higher slopes, and Marlow soils are on the less steep and lower slopes or in concave areas. Permeability in Berkshire soils is moderate to moderately rapid, and that in Marlow soils is moderate above the substratum and moderately slow to slow in the substratum. Potential productivity is very high for eastern white pine on Berkshire Soils and moderate for northern red oak on Marlow soils. The main management concerns are large stones and boulders, slope, and severe erosion hazard. Constructing access roads and trails on the contour and installing water bars help to control erosion. Plant competition is moderate. (38 ac)
- **TuC – Tunbridge-Lyman Association:** This map unit consists of moderately deep, well drained Tunbridge soils and shallow, somewhat excessively drained Lyman soils. These soils are on the sides and tops of hill and mountains. Tunbridge soils are typically on the

flatter parts of slopes between rock outcrops, and Lyman soils are on the upper slopes or in convex areas. Permeability is moderate or moderately rapid in Tunbridge soils and moderately rapid in Lyman soils. Potential productivity for sugar maple on these soils is moderate. Wind throw is a moderate hazard because of depth to bedrock. Generally, the soils are droughty. (17 ac)

- LtE – Lyman-Trunbridge Association: This map unit consists of shallow, somewhat excessively drained Lyman soils and moderately deep, well drained Tunbridge soils. These soils are on the mountainous uplands. Lyman soils are typically on the upper steep slopes and Tunbridge soils are in the less sloping areas or in pockets between Lyman soils and rock outcrops. Permeability is moderately rapid in Lyman soils and moderate or moderately rapid in Tunbridge soils. Potential productivity for sugar maple on these soils is moderate. The main management concerns are shallow depth to bedrock, the low available water capacity of the soils and slope. (47 ac)
- PoB – Pillsbury Loam: This is a nearly level to gently sloping, very deep, poorly drained soil on foot slopes of drainage ways and in slightly concave areas of glacial till uplands. Permeability of this Pillsbury soil is moderate above the substratum and slow in the substratum. Potential productivity for sugar maple on this soil is moderate. The main management concerns are the seasonal high water table, high seedling mortality, and the wind throw hazard. (48 ac)

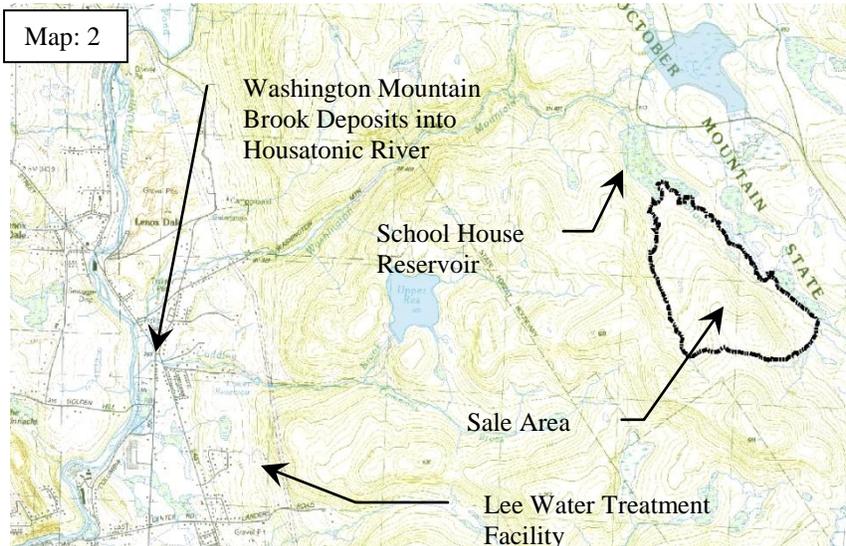
**Climate:** The project location lies in an area of mild summers and moderate winters with year round precipitation possible. Winds generally come from the west. Although major weather events can happen in any given year, the chances of hurricanes, tornadoes, ice storms or other forest changing events are seldom but do occur. The figures below (Table 1) are excerpt from the National Weather Service 2012 Climatological Report for Pittsfield, MA. The climate period used to determine normal value is 1981 through 2010.

Table 1:

	2012 Annual	2011 Annual	Normal Annual Value	Normal Winter	Normal Spring	Normal Summer	Normal Fall
Annual Maximum Temp	58.4	56.5	55.3	31.7	54.3	76.7	57.9
Annual Minimum Temp	39.2	37.4	35.4	15.4	32.9	55	38
Annual Mean Temp	50	50.2	48.3	23.6	43.6	65.8	48
Total Precipitation (in)	36.36	59.46	45.38	8.6	11.44	12.74	12.6
Days with $\geq$ .01 Precipitation	144						
Average Wind Speed	6.1						

The most recent major event which damaged this project area was the ice storm of 2008. This event produced ice amounts of 0.5 – 1.5 inches thick on all surfaces causing extensive tree damage by breaking limbs and uprooting due to the ice’s weight. This damage is still evident in the project area where many trees with more than 50% crown loss have not recovered and broken branches and downed trees remain on the ground.

**Hydrology and Watershed:** The project area falls entirely within the Housatonic Watershed. All rain fall within this project area drains directly into or through wetlands linked with intermittent streams into the School House Reservoir. From here the water flows down Washington Mountain Brook to the Housatonic River in the town of Lee and through the 16 inch water supply line directly to the Lee Water Treatment Plant. The entire project area and much of the October Mountain State Forest falls within the Outstanding Resource Water (ORW) area delineated by the Massachusetts Surface Water Quality Standards, 314 CMR 4.00. (Map: 2).



Washington Moutnain Brook and its wetland areas make up the eastern boundary of the project area. Prior to leaving the sale area the brook flows into the School House Reservoir which is the northern boundary of the sale area. Other unnamed perennial streams with associated wet lands make up the western boundary and part of the southern boundary of the project area.

There are several small seeps, intermittent streams and small forested wetland areas

located throughout the area that are not currently mapped.

The Schoolhouse Reservoir was created to supply the Towns of Lee and Lenox with water. Currently the town of Lee receives half of the water needed from this source and Lenox is not drawing from this reservoir. The Lee Source Water Protection Plan, written in 2007, discusses the concerns, threats and recommendations and goals for management within the Schoolhouse watershed; (<http://www.lee.ma.us/DPW%20files/Water/LeeSourceWaterProtectionPlan.pdf>). Many of these recommendations and goals for the Town of Lee mirror those of this project, including reducing erosion from roads and trails and protecting water quality.

**Stand Information:** The proposed project area consists of approximately 300 acres of northern hardwood and hemlock/hardwood forest types. Throughout the project area the dominant tree species that were observed are white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), quaking aspen (*Populus tremuloides*), yellow birch (*Betula alleghaniensis*), white birch (*Betula papyrifera*), Eastern hemlock (*Tsuga canadensis*) and red spruce (*Picea rubens*). This project area has been shaped in recent years by beech bark disease, white ash die back, black knot in black cherry, recent history of forest tent caterpillar outbreaks and the ice storm of 2008.

Much of the understory throughout the project area is dominated by American beech and red maple with smaller amounts of sugar maple, yellow birch, striped maple, hemlock, hophornbeam, fir and red spruce. Major ground cover species include ferns, rubus, hobblebush, bindweed and grasses. Other ground cover species observed were sarsaparilla, lycopodiums, Solomon's seal, trillium, clover, Canada mayflower, Indian cucumber, Indian pipe and hazelnut. It was also noted that a number of red oak seedling (less than 2' in height) were observed throughout the project area and a

substantial amount of American beech seedlings in the groundcover layer. Both the understory and groundcover species are thriving due to increased light from the declining overstory. There were no observed invasive species located in the project area, however the disturbed burrow pits near the Schoolhouse reservoir area are assumed to contain invasive species.

According to a 1924 inventory this site contained mainly yellow birch, white birch, sugar maple, ash, cherry, beech, red spruce and fir of an average diameter of 7-8 inches in dbh and fairly well stocked. Due to a lack of stone wall and/or barbwire fencing it is assumed this area was not used for pasture. There is however evidence of extensive charcoal pits and access trails within and outside of the project area. This portion of the forest appears to be a result of this past use. There are no records of timber management since the Commonwealth took ownership of the Whitney estate around 1915, however it is possible and likely some form of management may have occurred prior to the 1970's.

This project area has been shaped in recent years by beech bark disease, white ash die back, black knot, sugar maple borer and a recent history of forest tent caterpillar outbreaks and the ice storm of 2008 (insects and diseases described in next section). These events are pushing all these forest types into beech dominated forest due to the slow natural decline of forest canopy and American beech ability to aggressively compete in a shaded understory. Previous defoliation events have been recorded by the DCR Forest Health Program between 1968 and 1972 (insects), 1982 (insects), 1987 (pear thrips) and 1996 (drought).

The DCR Management Guidelines of 2012 stated that forest stands will be "classed . . . and considered for silvicultural treatments that generally fit their productivity, structural complexity (or potential thereof) and diversity". An analysis of the Schoolhouse Road site history (land use; agriculture/logging) and conditions (soil types, productivity; vegetation cover) suggests a high level of complexity indicating that uneven age methods of regeneration may be appropriate in the core of the unit (northern hardwood stands). These stands have an average site index of 60 for both white ash and hemlock.

The three major forest types within the project area are as follows.

- Beech Birch Maple – Approximately 100 acres, is in a traditional mixed northern hardwood type. These stands are located in the PmC, BmE, LtE, Tuc, and PoB soil types (see next section on soil description). This forest type will be broken down into individual stands for management purposes based on dominant tree species, topography and soils to assist planning in proper management decisions. The current size class in this forest type range from medium to large diameter trees. The density of the northern hardwood stands is generally a high but there are some gaps in the forest canopy mostly caused by white ash mortality and weather events. Throughout the project area white ash has been in decline for several years. It is anticipated that the emerald ash borer (EAB) will kill the remaining stressed trees as the insect spreads from the northern part of the forest. The stand age is approximately 85-100 years old.
- Sugar Maple - Approximately 120 acres of the project area are stands dominated by sugar maple. These stands generally consist of more than 50% of the basal area in sugar maple with other northern hardwood species as associates. These stands are located in the PmC, BmE, LtE, Tuc, and PoB soil types (see next section on soil description). This forest type will be broken down into individual stands for management purposes based on dominant tree species, topography and soils to assist planning of proper management decisions. The current size class in this forest type ranges from medium to large diameter trees. The density of the sugar maple stands is generally a medium to high but there are some gaps in the forest canopy mostly caused

by white ash mortality and weather events. Throughout the project area white ash has been in decline for several years. The stand age is approximately 85-100 years old.

- Hemlock/Hardwoods – This forest type is found along the lower elevations of the project area and comprises of PoB and PmC soil types. These stands are typically adjacent to Schoolhouse Reservoir and associated streams with wetlands that drain to them. This forest type represents approximately 80 acres of the project area. These stands are approximately 50 percent hemlock with red spruce, black cherry, white ash, red maple and sugar maple as associates. The estimated age is 85-100 years old.

**Disease and Insects:** There are past, current and potential threats to this project area including beech bark disease, forest tent caterpillar, white ash decline and emerald ash borer whose damage has been can or can be amplified by the crown damage and weakening of the trees during the 2008 ice storm.

- Beech bark disease (BBD) was first found in Maine in the 1930s and has been spreading throughout the Northeast and beyond since then. It is believed to have come to the US from Europe through Nova Scotia. It has spread throughout the eastern United States and Canada.

BBD is a two stage insect/disease which starts when the beech scale insect attacks the bark leaving a path way for the Nectria fungus to invade and eventually lead to the death of the tree. BBD can attract other insects and diseases to hasten the declining tree into death. BBD reduces nut production negatively affecting wildlife which depends on it as a source of food. This disease will continue to re-infect the root sucker regeneration creating a continuous state of diseased beech in the stand.



There is evidence of resistance to the BBD in some individual beech. This is evident in dense beech stands where one or several stems appear vigorous and free of BBD when all others are damaged. Potential resistant beech are generally maintained and promoted throughout the stand.



- Forest tent caterpillar (FTC) is a native insect with an outbreak occurrence of 6-16 years and typically lasting three years in duration. During these outbreaks complete defoliation each year by caterpillars may occur weakening the trees over time. This event generally will only kill previously weakened trees or when timed with another damaging event.

In this region the insects preferred host trees are sugar maple and aspen, but will feed also on birch, cherry basswood and ash. The project area as well as much of western Massachusetts experienced the last FTC outbreak between 2006 and 2008. Maintaining a vigorous forest will minimize mortality.

- Black Knot is a native fungus which causes enlarged black growths on the branches and stems of black cherry trees. This damage reduces the trees vigor, weakens the infected branch or stem and eventually may kill the tree. The galls caused by this fungus make the trees susceptible to other pathogens and weakens the mechanical structure of the tree. Infected trees should be removed during harvesting operation to prevent the continued spread of the fungus.



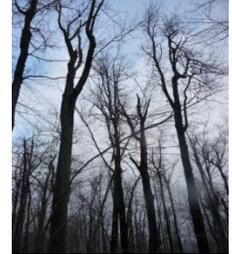
- The native sugar maple borer is a long horned wood boring beetle that generally attacks the lower bole of the tree leaving

behind a linear open scar. The damage caused by this borer acts as a girdle around the tree, reducing vigor and weakening the structure of the tree. This borer attacks previously stressed trees, generally due to overcrowding, suppression or drought. Tree vigor should be maintained by reducing competition for resources to control sugar maple borer.

- Ash Decline or ash dieback is still fully not yet understood. It is believed to be caused by a combination of biotic and environmental conditions. This list of potential stresses includes ash yellows, air pollution, fungi, viruses, drought and insects. Ash decline is evident in most stands in the region where stands are overcrowded and with a high density of ash.



- Emerald Ash Borer (EAB) was first found in Michigan and Ontario in 2002. It was introduced from Asia and has few natural predators here to control populations. EAB has spread from Michigan and is now located throughout the northeastern part of the United States and Canada. This insect feeds exclusively on ash trees and has destroyed millions of trees across its range already. EAB is generally attracted to trees which were previously weakened or stressed.



The EAB has a one year life cycle in which each female lays 30-60 eggs on average with maximum of 200 in some cases. After the eggs are deposited in bark the larvae chew into the tree and begin feeding on the phloem of the tree. The following year the adult will exit the tree through a D-shaped hole and begin feeding on foliage to continue the cycle.

The first infestation found in Massachusetts is located approximately 6.5 miles from this project area. It is generally accepted that there is no way to stop or control EAB.

**Roads, Trails and Recreation:** County Road which begins at an intersection with Route 8 and McNerney Road in Becket is a secondary road of asphalt, stone and oil and gravel that is maintained year round for vehicle traffic to the border with the Town of Washington which is also the boundary line for the October Mountain State Forest. From this point County Road is maintained by the Town of Washington for non-winter vehicle traffic and is gravel. The closest private dwelling (seasonal camp) is located at the town/state forest line and is approximately 2 miles from the entrance to the landing area for this project.

County Road is one of the main entrances into the State Forest. During non-winter months it provides access to the October Mountain Lake Day Use Area as well as several ATV parking lots, trail heads for the Appalachian and other local trails and hunter access. Most years in winter months County Road is blocked for vehicle use and is groomed as a snowmobile trail and is open for snowmobiles, snow shoes, and cross country skis.

The Schoolhouse Trail and Schoolhouse Circle Trail (both historic forest roads) are located within the project area; both of these are considered ATV / Snowmobile / Multiuse trails and are not open to recreation vehicles over 1000 pounds. These trails are extremely degraded and in very poor condition due to natural and vehicle caused erosion in combination with a lack of maintenance. Since the Hurricane of 2011 this portion of the trail network has been closed due to the loss of the bridge over Washington Mountain Brook on the



Schoolhouse Trail. There is continued illegal use of these trails and vehicles fording Washington Mountain Brook.

Along with ATV/Snowmobile access this portion of October Mountain is open to all legal passive recreation activities that are allowed on DCR properties including hunting, fishing, snowshoeing, hiking and birding. As directed in the Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines” a 50 foot buffer where slash will be light and natural in appearance will be in place along the above mentioned trails. The Appalachian Trail’s closest distance to the project area is over 500 feet.

**Cultural and Archeological Feature:** Within the proposed project area one possible stone foundation has been found along the Schoolhouse Loop Trail. This stone foundation site and any others found within the project area will be protected from disturbance during any operation and will be treated according to guidelines set forth in the “Bureau of Forestry – Cultural Resource Management Protection Standards & Guidelines”. According to available maps of the area there were not structures in the project area. During reconnaissance no stone walls were found. If any walls are found they will be left intact during this project.

Through the initial walks through this area several charcoal pits and associated trails have been found. These are a very common historic land use feature throughout the region. They date back to the 1800’s when the charcoal industry thrived in the Berkshires to fuel the many iron furnaces of the region.

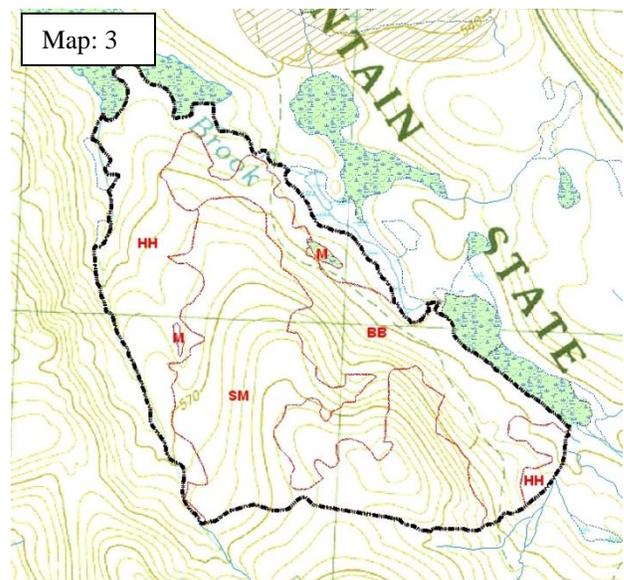
#### **Stand Data:**

**Forest Stand Attributes:** This prescription will describe the conditions and treatments within the 278 acre project area. (Map: 3) This project area will be broken up into three stands for silvicultural treatment based on forest type.

These stands will be beech/birch/maple (BB-86 acres) and sugar maple (SM-112 acres). Both of these stands are typical northern hardwood stands for this area consisting primarily of American beech, sugar maple, white ash, red maple and black cherry. These stands are in a state of decline due to disease and weather events of the past decades. The slow collapse of the overstory has given rise to a thick understory of diseased American beech seedling and saplings, hobblebush, ferns and rubus.

The third stand is predominately hemlock / hardwoods (HH-78 acres). These stands are primarily located along the perimeter of the project area. Some wind damage has occurred however the understory in this forest type is trending to red maple and beech, with little ground cover.

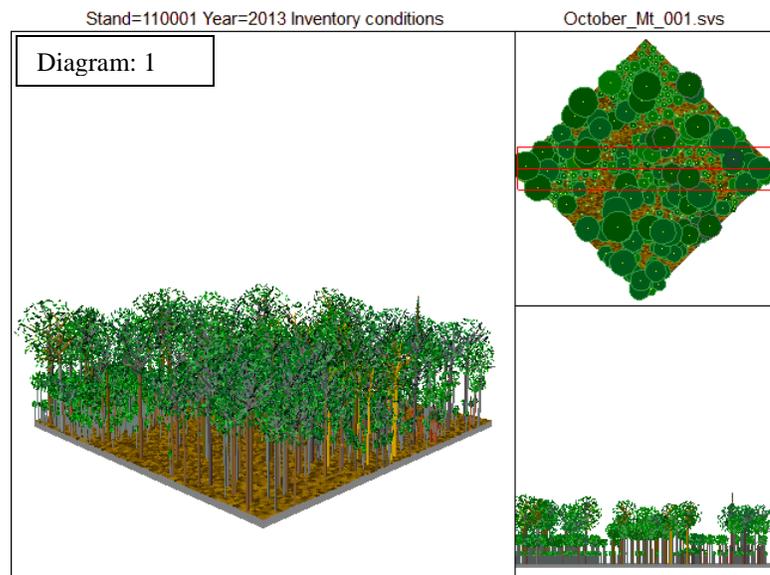
Additionally there are two forested wetlands location within the project area (M – 1.5 acres). These two wetlands and any others will be excluded from the harvest.



**Disturbance History:** This project area has been shaped in recent years by beech bark disease, white ash die back, a recent history of forest tent caterpillar outbreaks and the ice storm of 2008. These events are pushing all these forest types into beech dominated forest due to the slow natural decline of forest canopy and American beech ability to aggressively compete in a shaded understory.

There is no recorded timber management conducted by the DCR in this area based on department records; however there may have been activity. This area was cleared for charcoal production most likely in the late 1800's, which has given rise to the forest today.

**Stand Structure:** Both of northern hardwood forest types (BB and SM) and considered to be fully stocked. A representation of the current stands derived from the stand exam inventory is seen in the diagram to the right (Diagram: 1). Both of these stands are approximately 110 years old and due to abiotic (ice) and biotic (insect and disease) agents the overstory trees are in significant decline. The original single age class stand is beginning to break up due to the above mentioned disturbances and regenerate slowly to American beech.



- **Beech/Birch/Maple (BB):** This stand is fully stocked with a combined overstory and understory basal area of 150 ba/ac and is considered to be a high “A” level according to local stocking charts. Under the current condition the stand is overcrowded causing the already stressed trees to compete for the limited resources. Acceptable growing stock, trees free of mechanical and biological defects, account for 74% of the stand. Sugar maple, white ash, black cherry, American Beech and red maple dominate the overstory with yellow birch, hemlock, red spruce, fir and hophornbeam present in smaller amounts. The overstory quadric mean of the stand is 13.2”dbh with measured trees reaching 28”dbh. (Table 1)

The understory of this stand is dominated by American beech seedling and saplings of all size classes (262 stems/acre over 4.5’). Other understory species include striped maple, red maple, and red spruce. (Table 2) The dominant ground cover species (all trees less than 4.5’ in height, shrub and herbaceous species) that would affect regeneration of tree species are ferns, hobblebush and blackberry and American Beech. A list of other observed species is below. (Table 3)

Throughout the stand there is an average of 20 snags per acre. The majority of these snags are sugar maple and white ash trees under 12”dbh. White ash snags as large as 24”dbh were recorded in the stand inventory and white ash and black cherry snags over 24”dbh were observed in the field. (Table 4) On average 864 cubic feet of coarse woody debris (CWD) per acre were recorded in inventory transects. This material is greater than three inches in diameter and three feet in length. Much of this CWD is a result of the 2008 ice storm and is

still in the hard/sound category. (Table 5) This figure exceeds the recommended minimum of 256 cubic feet of CWD as required in the Landscape Designation Guidelines.

Table 1: Beech/Birch/Maple Overstory (all measured trees greater than 5" dbh)

	All species	sugar maple	white ash	Black Cherry	American beech	Red Maple	Yellow Birch	Hemlock	red spruce
Basal area (square feet)	146.3	63.8	35.0	20.0	10.0	8.8	5.0	2.5	1.3
Acceptable growing stock (square feet)	111.1	48.8	31.2	17.5	5.0	6.2	1.2	0	1.2
Unacceptable growing stock (square feet)	35.2	15.0	3.8	2.5	5.0	2.6	3.8	2.5	0.1
percentage of stand	100.0	43.6	23.9	13.8	6.8	6.0	3.4	1.7	0.9
Stems per unit area (stems per acre)	153.2	75.9	22.7	10.4	20.3	904	5.0	3.2	6.4
Quadric Mean Diameter	13.2	12.4	16.8	18.8	9.5	13.1	13.6	12.0	6.0
Relative Density	88.83	51.24	11.94	6.44	8.29	5.02	3.98	1.14	.07
Sawlog Gross Total (bd/ac)	16,188	5,263	4,883	3,608	1,074	908	304	148	0
Cords Gross Total (cords/ac)	56	24	15	9	3	3	2	0	0

Table 2: Beech/Birch/Maple Understory (measured trees less than 5" dbh)

	All species	American beech	Red Maple	Yellow Birch	Fir	Red Spruce	Sugar Maple
Basal area (square feet)	4.0	2.7	0.7	0.3	0.3	0.1	0
percentage of stand	100.0	66.1	18.6	6.8	6.8	1.7	0
Stems per unit area (stems per acre)	500	262.5	100.5	12	12.5	12.5	62.5
Relative density (percent)	5.8	4.4	0.9	0.4	0	0	0

Table 3: Beech/Birch/Maple Ground cover (all trees less than 4.5' in height, shrub and herbaceous species)

species	Density	Rel Density	Frequency	Rel Frequency	Percent cover	Rel Percent cover	Importance Value
red maple	1075.00	46.49	56.25	6.21	2.50	2.44	18.38
Ferns All	0.00	0.00	100.00	11.03	30.00	29.27	13.43
American beech	587.50	25.41	81.25	8.97	0.00	0.00	11.46
striped maple	0.00	0.00	75.00	8.28	13.44	13.11	7.13
hobblebush	0.00	0.00	50.00	5.52	10.94	10.67	5.40
Vines All	0.00	0.00	37.50	4.14	10.31	10.06	4.73
wild sarsaparilla	0.00	0.00	62.50	6.90	7.19	7.01	4.64
Rubus	0.00	0.00	43.75	4.83	8.44	8.23	4.35
sugar maple	162.50	7.03	31.25	3.45	0.00	0.00	3.49
Grass All	0.00	0.00	56.25	6.21	4.06	3.96	3.39
black cherry	137.50	5.95	25.00	2.76	0.00	0.00	2.90
clubmoss	0.00	0.00	37.50	4.14	3.75	3.66	2.60
yellow birch	100.00	4.32	18.75	2.07	0.00	0.00	2.13
red spruce	62.50	2.70	25.00	2.76	0.00	0.00	1.82
clover	0.00	0.00	31.25	3.45	1.88	1.83	1.76

species	Density	Rel Density	Frequency	Rel Frequency	Percent cover	Rel Percent cover	Importance Value
Solomon's seal	0.00	0.00	25.00	2.76	1.56	1.52	1.43
white ash	37.50	1.62	12.50	1.38	0.00	0.00	1.00
northern red oak	37.50	1.62	12.50	1.38	0.00	0.00	1.00
unidentified species	0.00	0.00	18.75	2.07	0.94	0.91	0.99
Indian cucumber	0.00	0.00	18.75	2.07	0.94	0.91	0.99
Hophornbeam	50.00	2.16	6.25	0.69	0.00	0.00	0.95
fir	50.00	2.16	6.25	0.69	0.00	0.00	0.95
elderberry	0.00	0.00	6.25	0.69	1.88	1.83	0.84
mountain ash	0.00	0.00	12.50	1.38	0.94	0.91	0.76
cohosh	0.00	0.00	6.25	0.69	1.25	1.22	0.64
sedge	0.00	0.00	6.25	0.69	0.94	0.91	0.53
serviceberry	12.50	0.54	6.25	0.69	0.00	0.00	0.41
trillium	0.00	0.00	6.25	0.69	0.31	0.30	0.33
partridgeberry	0.00	0.00	6.25	0.69	0.31	0.30	0.33
nettle	0.00	0.00	6.25	0.69	0.31	0.30	0.33
Indianpipe	0.00	0.00	6.25	0.69	0.31	0.30	0.33
Canada mayflower	0.00	0.00	6.25	0.69	0.31	0.30	0.33
eastern hemlock	0.00	0.00	6.25	0.69	0.00	0.00	0.23

Table 4: Beech/Birch/Maple Snags

dbh range	Total	Sugar maple	White ash	Black cherry	American Beech
6.00 - 12.00	12.6	7.4	3.6	1.6	0
12.00 - 18.00	6.7	1.8	4.0	0	0.9
18.00 - 24.00	1.5	0	1.5	0	0

Table 5: Beech/Birch/Maple Course Woody Debris (CWD) Volume (cu.ft/ac)

Diameter	hard (sound) - with bark	hard (sound) - without bark	soft (decayed) - with bark	soft (decayed) - without bark
0-6	89.3	22.6	38.5	8.4
6-12	203.4	14.9	152.5	0.0
12-18	167.5	75.6	91.4	0.0
18-24	0.0	0.0	0.0	0.0

- Sugar Maple (SM): This stand is over stocked with a combined overstory and understory basal area of 151ba/ac and is considered to be an “A” level according to local stocking charts. Under the current condition the stand is overcrowded causing the already stressed trees to compete for the limited resources. Acceptable growing stock, trees free of mechanical and biological defects, account for 76% of the stand. Sugar maple, white ash, American beech and red maple dominate the overstory with black cherry, hemlock, paper birch and yellow birch present in smaller amounts. The quadric mean of the overstory stand is 11.5”dbh with measured trees reaching 28”dbh. (Table 6)

The understory of this stand is dominated by American beech seedling and saplings of all sizes (306 stems/acre over 4.5'). Other understory species include yellow birch, red maple, hemlock, white ash and sugar maple. (Table 7) In this stand American beech and ferns are the dominant ground cover species (all trees less than 4.5' in height, shrub and herbaceous species) that would affect regeneration of tree species. A list of other observed species is below. (Table 8)

Throughout the stand there is an average of 17 snags per acre. The majority of these snags are sugar maples between 6 and 12" dbh and white ash between 12 and 18" dbh. White ash and black cherry snags over 24" dbh were observed in the field. (Table 9) On average is 1068.58 cubic feet of coarse woody debris per acre were recorded in inventory transects. Much of this total is a result of the 2008 ice storm and is still in the hard/sound category. (Table 10)

Table 6: Sugar Maple Overstory (all measured trees greater than 5" dbh)

	All species	Sugar Maple	White Ash	American Beech	Red Maple	Black Cherry	Hemlock	paper birch	Yellow Birch
Basal area (square feet)	137.3	72.0	32.0	14.7	9.3	4.0	2.7	1.3	1.3
Acceptable growing stock (square feet)	105.4	58.7	24.0	13.3	2.7	2.7	2.7	1.3	0
Unacceptable growing stock (square feet)	31.9	13.3	8.0	1.3	6.7	1.3	0	0	1.3
percentage of stand	100.0	52.4	23.3	10.7	6.8	2.9	1.9	1.0	1.0
Stems per unit area (stems per acre)	192.0	120.6	17.8	33.4	6.8	1.4	10.6	0.6	0.8
Quadric Mean Diameter	11.5	10.5	18.1	9.0	15.8	23.1	6.8	20.0	18.0
Relative Density	91.81	59.2	10.5	12.4	5.1	1.2	1.1	1.3	1.0
Sawlog Gross Total (bd/ac)	11,911	4,927	4,450	886	791	498	0	181	177
Cords Gross Total (cda/ac)	45	19	9	3	2	1	0	0	0

Table 7: Sugar Maple Understory (measured trees less than 5" dbh)

	All species	American beech	yellow birch	Red maple	Hemlock	White ash	Sugar maple
Basal area (square feet)	13.7	6.8	3.9	1.2	1.2	0.3	0.3
percentage of stand	100.0	49.5	28.7	9.0	8.5	2.1	2.1
Stems per unit area (stems per acre)	466.7	306.7	80.0	40.0	13.3	13.3	13.3
Relative density (percent)	17.1	9.1	4.6	1.7	0.4	0.8	0.5

Table 8: Sugar Maple Ground Cover (all trees less than 4.5' in height, shrub and herbaceous species)

species	Density	Rel Density	Frequency	Rel Frequency	Percent cover	Rel Percent cover	Importance Value
American beech	746.67	45.16	73.33	8.33	0.00	0.00	17.83
Ferns all	0.00	0.00	100.00	11.36	15.53	36.90	16.09
striped maple	133.33	8.06	86.67	9.85	5.40	12.83	10.25
black cherry	240.00	14.52	40.00	4.55	0.00	0.00	6.35
Rubus	0.00	0.00	66.67	7.58	4.27	10.13	5.90
hobblebush	0.00	0.00	53.33	6.06	4.47	10.61	5.56
sugar maple	146.67	8.87	33.33	3.79	0.00	0.00	4.22
yellow birch	133.33	8.06	33.33	3.79	0.00	0.00	3.95

Vines all	0.00	0.00	53.33	6.06	2.17	5.15	3.74
Grass all	0.00	0.00	46.67	5.30	2.43	5.78	3.69
wild sarsaparilla	0.00	0.00	46.67	5.30	1.43	3.40	2.90
clubmoss	0.00	0.00	33.33	3.79	2.07	4.91	2.90
red maple	80.00	4.84	20.00	2.27	0.00	0.00	2.37
white ash	93.33	5.65	6.67	0.76	0.00	0.00	2.13
Solomon's seal	0.00	0.00	33.33	3.79	1.07	2.53	2.11
trillium	0.00	0.00	33.33	3.79	0.80	1.90	1.90
serviceberry	53.33	3.23	20.00	2.27	0.00	0.00	1.83
clover	0.00	0.00	13.33	1.52	1.00	2.38	1.30
northern red oak	26.67	1.61	13.33	1.52	0.00	0.00	1.04
Canada mayflower	0.00	0.00	20.00	2.27	0.10	0.24	0.84
marigold	0.00	0.00	6.67	0.76	0.33	0.79	0.52
chokecherry	0.00	0.00	6.67	0.76	0.33	0.79	0.52
goldenrod	0.00	0.00	6.67	0.76	0.23	0.55	0.44
Indian cucumber	0.00	0.00	6.67	0.76	0.03	0.08	0.28
elderberry	0.00	0.00	6.67	0.76	0.03	0.08	0.28
aster	0.00	0.00	6.67	0.76	0.03	0.08	0.28

Table 9: Sugar Maple Snags

Dbh Range	Total	Sugar maple	White ash	Black cherry	Red maple
6" – 12"	6.26	6.26	0.00	0.00	0.00
12" – 18"	10.69	0.75	6.31	1.71	0.95
18" - 24"	0.00	0.00	0.00	0.00	0.00
24" – 30"	0.31	0.00	0.00	0.00	0.00

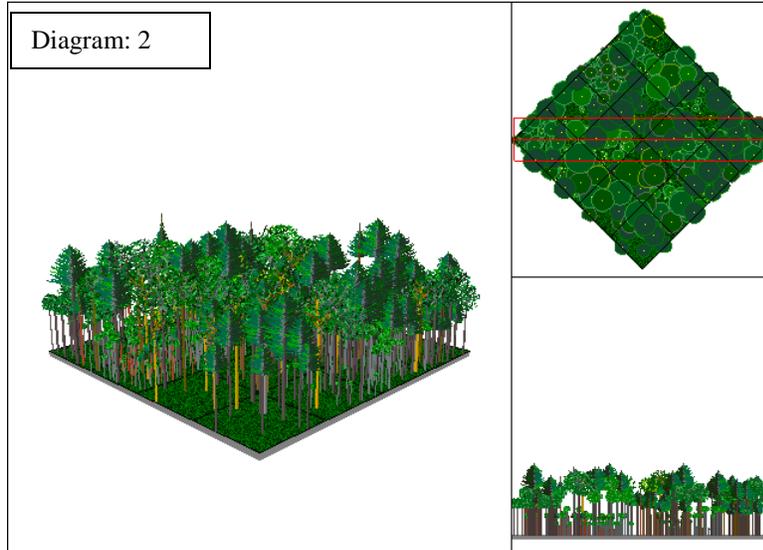
Table 10: Sugar Maple Course Woody Debris Volume (cu.ft/ac)

Diameter	hard (sound) - with bark	hard (sound) - without bark	soft (decayed) - with bark	soft (decayed) - without bark
0-6	59.2	20.4	34.3	0.0
6-12	189.3	157.2	133.4	24.9
12-18	129.4	208.0	48.8	63.7
18-24	0.0	0.0	0.0	0.0

- Hemlock Hardwoods (HH): This stand is over stocked with a combined overstory and understory basal area of 195.4ba/ac and is considered to be an “A” level according to local stocking charts. A representation of the current stands derived from the stand exam inventory is seen in the diagram below (Diagram: 2). Under the current condition the stand is overcrowded causing the already stressed trees to compete for the limited resources. Acceptable growing stock, trees free of mechanical and biological defects, account for 70% of the stand. Hemlock, red maple, yellow birch and black cherry dominate the overstory with red spruce, beech, white ash, sugar maple, fir, paper birch and red oak present in smaller amounts. The quadric mean of the overstory stand is 11.3”dbh with measured trees reaching 28”dbh. (Table 11)

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The understory of this stand is dominated by red maple and beech with red spruce, hemlock, yellow birch, fir and sugar maple represented in smaller amounts. (Table 12) In this stand beech, ferns, hobblebush and clubmoss's are predominant ground cover species (all trees less than 4.5' in height, shrub and herbaceous species), however the density of these species would should not prohibit regeneration or tree species. A list of other observed species is below. (Table 13)

Throughout the stand there is an average of 23 snags per acre. The

majority of these snags are white ash, beech and firs between 6 and 12" dbh. (Table 14) On average is 787.9 cubic feet of coarse woody debris per acre were recorded in inventory transects. Much of this total is a result of the 2008 ice storm and is still in the hard/sound category. (Table 15)

Table 11: Hemlock/Hardwood Overstory (all measured trees greater than 5" dbh)

	All species	Hemlock	Red maple	Yellow birch	Black cherry	Red spruce	American beech	White ash	Sugar maple	Fir	Paper birch	Red oak
Basal area (square feet)	176.3	72.5	41.3	13.8	12.5	8.8	7.5	5.0	5.0	5.0	2.5	1.3
Acceptable growing stock (square feet)	137.5	65.0	30.0	10.0	7.5	8.75	1.23	3.75	3.75	5.0	1.2	1.23
Unacceptable growing stock (square feet)	38.8	7.5	11.2	3.7	5.0	0	6.2	1.3	1.3	0.0	1.3	0
percentage of stand	100.0	41.1	23.4	7.8	7.1	5.0	4.3	2.8	2.8	2.8	1.4	0.7
Stems per unit area (stems per acre)	253.8	108.4	56.1	25.9	6.6	8.6	18.3	8.4	9.2	9.3	1.6	0.5
Quadic Mean Diameter	11.3	11.1	11.6	9.9	18.6	13.6	8.7	10.5	10.0	9.9	16.9	22.0
Relative Density	96.16	32.96	24.60	11.38	4.07	2.78	6.35	2.35	4.15	3.37	2.41	1.06
Sawlog Gross Total (bd/ac)	12,983	6,204	2,274	524	1,526	1,209	105	180	226	97	293	144
Cords Gross Total (cds/ac)	58	22	15	4	5	3	2	2	2	1	1	0

Table 12: Hemlock/Hardwood Understory (measured trees less than 5" dbh)

	All species	Red maple	American beech	Red spruce	Hemlock	Yellow birch	Fir	Surgar maple
Basal area (square feet)	19.2	5.7	4.6	3.4	2.0	1.4	1.2	0.6
percentage of stand	100.0	29.9	23.8	17.8	10.3	7.1	6.4	3.2
Stems per unit area (stems per acre)	650.0	75.0	200.0	125.0	62.5	125.0	25.0	12.5
Relative density (percent)	21.5	6.3	6.9	2.9	0.5	2.8	1.0	0.8



Table 15: Hemlock/Hardwood Course Woody Debris Volume (cu.ft/ac)

Diameter	hard (sound) - with bark	hard (sound) - without bark	soft (decayed) - with bark	soft (decayed) - without bark
0-6	12.1	53.6	3.7	106.8
6-12	33.8	87.9	0.0	247.2
12-18	0.0	45.7	0.0	196.9
18-24	0.0	0.0	0.0	0.0

**Wildlife Habitat Conditions:** According to the NHESP “Massachusetts Natural Heritage Atlas 13<sup>th</sup> Edition” there is no priority or estimated habitats located in the proposed harvest area. There is however a 700 foot section along the Schoolhouse Trail which is on the fringe of a NHESP priority habitat polygon. The standard guidelines for the species of concern in this location allow for the unrestricted use of existing roads. NHESP will be contacted for an official evaluation. No rare plants have been identified in the field to date. Care will be taken to properly report and address the needs of any state-listed rare plant or wildlife species if found on the site.

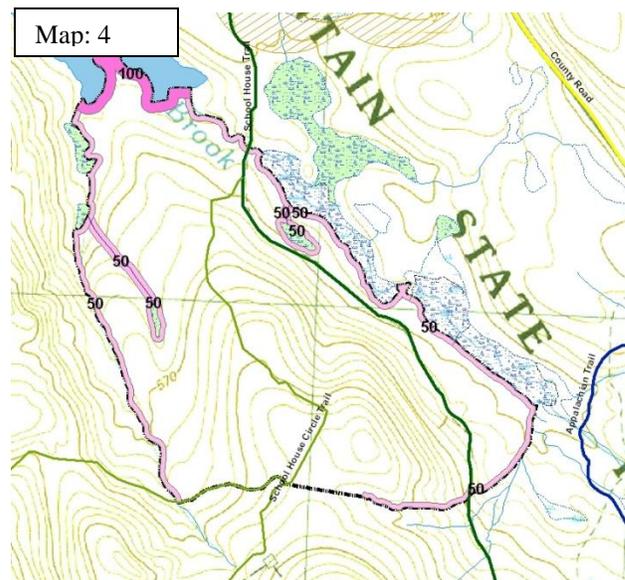
No rare animals or critical habitat were noted upon the initial site visit. Large mammals noted through observed signs were deer, moose, bear and coyote. Small mammals noted were squirrel and porcupine. It has been observed in previous forestry operations nearby that large herbivore pressure is not a concern. The proposed project area is a small portion of the total land in these forest types in the immediate vicinity.

Within the proposed buffer strip of the Schoolhouse Reservoir wildlife management areas were found. These were small fenced in plantings of fruit and cover trees that were established as a condition of dam construction. These areas total less than one acre in size. If there is opportunity through this project these trees will be released by removing competing vegetation. Equipment will not travel through these areas.

Due to the deteriorating nature of the forest types in this project area there is an abundance of large diameter course woody debris (CWD) and both live and dead wildlife trees (snags), see Tables 4, 5, 9,10, 14 and 15. There were also a large amount of live wildlife trees observed in the field. These included large trees of various species with large cavities, rotten portions, large dead branches and broken tops.

**Water Resources:** There are several identified water resources on this proposed project area. They will all be treated at or above the minimum standards set forth in “Massachusetts Forestry Best Management Practices Manual” for “Outstanding Resource Waters”. This level of protection is a requirement when work near a public water supply is conducted. There will be no timber management in regulated wetlands.

Washington Mountain Brook will have one stream crossing at the existing location on the Schoolhouse Trail. This has been the location of several bridges in the past, the latest a small wooden bridge for snowmobile/ATV traffic was lost due to flooding during the hurricane of 2011.



A portable steel frame steel bridge designed for highway use will be installed for this project. Permission to retain the bridge in place will be sought from the Town of Washington Conservation Commission. It is hoped that retaining the bridge will prevent bank erosion from illegal off road vehicle water crossings.

Washington Mountain Brook and the un-named brook with their associated wetlands which make up the eastern and western boundaries of this project area will have a variable width filter strip where equipment will not be allowed within the first 50 feet and will follow filter strip standards of the “Massachusetts Forestry Best Management Practices Manual” (BMPs) as needed beyond 50 feet. As suggested in the BMPs a 15 foot no-cut buffer adjacent to wetlands and streams will be in place as well.

Schoolhouse Reservoir will have a no-cut and no equipment buffer/filter strip for 100 feet from the high water mark to provide a visual buffer of the shoreline and to add an additional safe guard against erosion.

Approximately 500 feet of the Schoolhouse Trail will be relocated to prevent further damage to a bordering wetland. The current trail has become braided by users trying to avoid standing water. The existing section of trail will be blocked, restored and returned to a natural condition. All additional upland drainages, intermittent streams, seeps and wetlands, and vernal pool resources not currently mapped or identified within the project area will be mapped and protected to filter strip standards of the “Massachusetts Forestry Best Management Practices Manual”.

It is anticipated that an occasional intermittent stream crossing may be needed within the harvest area for skidding off of the main trails. Any stream crossing will be designed using standards of the “Massachusetts Forestry Best Management Practices Manual” and “Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines”

**Recreation & Aesthetic:** Within the project area there are two existing forest access roads, Schoolhouse Trail and Schoolhouse Circle Trail that are currently designated for OHV and snowmobile use. As directed in the Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines” a 25 foot buffer where slash will be light and natural in appearance will be in place along the above mentioned trails. Along each trail an attempt to identify and remove hazard trees will be made to reduce potential injury and to reduce future maintenance costs.

These trails will be used as a primary forwarding and/or skidding road throughout the project. Sections of these trails will be relocated and/or repaired to prevent further erosion on steep ground, prevent further rutting of wet areas, to control sediment flow into the adjoining streams and to control access. Upon completion of this project these trails will be left in a more stable condition for recreational use. Skid trails branching off of Schoolhouse Trail and Schoolhouse Circle Trail will be blocked from recreation OHV and snowmobile access by use of boulders, logs or other natural debris.

Upon completion of the harvest in cooperation with Recreation Staff the Schoolhouse Trail trail head will be relocated or redesigned to prevent further illegal vehicle access into the burrow pit area. If funds are available for excavation work a restoration of the burrow pit will occur.

### **Evaluation of Data and Projected Results:**

**Objectives:** Silvicultural practices in Stands BB and SM (see Map: 3) will demonstrate 1/3 acre group regeneration of northern hardwoods as well as control of undesirable ground cover and understory species. This harvest will begin the process of moving these damaged even aged stands

to a more uneven aged structure by aiding/creating a new age class through removal of diseased and damaged trees.



Within the hemlock/hardwood stands (HH see Map: 3) smaller 1/4 acre size groups will be harvested to promote regeneration of the more shade tolerant hemlock, spruce and fir. These stands do not currently have competing vegetation in the understory. This harvest will begin the process of continuing this softwood forest type in an uneven aged state.

In this first harvest entry for all stands, a GIS exercise will randomly select the approximate location of the tree groups to remove. Subsequent harvests will continue this process by adding/expanding regeneration opening by harvesting more groups of mature trees. Along skid trails and immediately surrounding group openings trees of high economic value that are high risk of mortality may be removed. This would include trees such as white ash, diseased cherry and other tree species with less than 25% live crown due to ice damage.

The result of the patch removals is for a high level of diversity in tree and understory plant species as well as creating and maintaining vertical (tree heights) and horizontal (down woody material) stand complexity

**Primary/Secondary goals:** The primary goal of treatment in these stands will be to ensure future diversity of age, size and species mixture of these stands to provide for protection from major storm events. These northern hardwood stands are currently in decline due to ice damage and insect damage, mortality due to disease, and a dense understory of beech. Currently there are 306 understory stems per acre of beech in the SM type and 262 in the BB type. These stands also contain dense patches of rubus, ferns and hobblebush. If left unchecked, the two stands will become dominated by diseased beech with steady decline in diversity and complexity. The goal of management in the HH type is to assist these stands that are reaching maturity and currently do not have suitable amounts of desirable regeneration in the understory. This harvest is to support the continuance of this species type.

Secondary goals of this project are to capture value of damaged and/or diseased trees, capture the value of mature white ash prior to infestation of the EAB, to provide raw materials to the lumber industry and to assist the OHV and Snowmobile community by repairing the trail network in this area.

**Silviculture Methods:** Overstory treatments will create group openings of a 1/4 acre in the HH type and up to 1/3 acre in the BB and SM types. The groups will remove all trees over 5 inches in diameter and cut beech of all sizes leaving behind all acceptable advanced regeneration. The total number of acres to be harvested in groups will be 20 percent of the eligible project area. This area will be determined by subtracting wetlands, filter strips, buffer strips, possible steep areas and other non-harvestable areas from the total project area to determine the net acreage.

Type	Gross Acres	Exclusion Acres	Net Acres	20% to be Harvested	Size of Groups	Number of Groups
BB	86.9	9.5	77.4	15.5	1/3	46
SM	112.3	6.8	105.5	21.1	1/3	63
HH	78.1	19.8	58.3	11.6	1/4	46
Wet Land	1.3		1.3			

Initial center point location of these groups will be randomly selected by GIS program (map 5). When placing these groups on the ground these location may be moved to avoid rare/specimen/wildlife trees, unique features, buffers/filters or for any other reason. Each group will be connected or linked to a main or secondary skid road to ensure accessibility for the harvester.

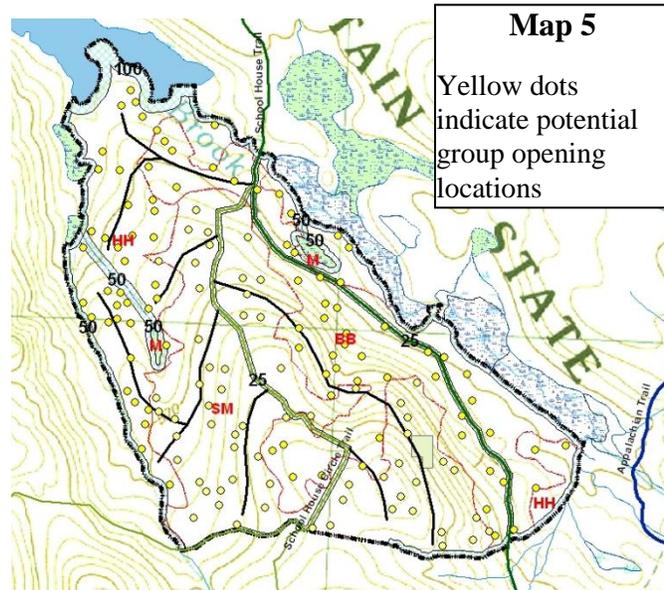
**Beech Birch Maple and Sugar Maple Stands:** Within these stands 1/3 acre group opening where all trees over 5 inches in diameter will be harvested. The 1/3 acre size was chosen to comply with current guidelines established in

Landscape designations for DCR Parks and Forests: Selection Criteria and Management Guidelines (2012). A 1/3 acre canopy opening is generally considered the smallest size for regeneration of shade intolerant and mid-tolerant species. Due to existing canopy conditions American beech dominates the understory. The existing American beech understory and small proposed opening size will inhibit fully shade intolerant species such as pin cherry (*Prunus pensylvanica*), black cherry, white birch and aspen (*Populus*). To ensure the shade intolerant and mid-tolerant species have a chance to compete in this marginal light environment, chemical control of beech will be used in these stands.

Thinning of damaged or diseased trees along skid trails and immediately surrounding each group opening will remove approximately 30% percent of the basal area. It is anticipated that there will be less thinning in the HH forest type. This thinning will be used to capture the immanent loss of value in white ash, diseased black cherry and other species with significant crown damage and improve the growth of residual trees. These thinning will not typically reach beyond 75 feet of the skid roads or group edge.

Throughout the sale area all American beech that appears to be free of beech bark disease will be retained. Chemical treatment will avoid these clones in hope that the clean appearance of the trees is a sign of disease resistance. By leaving these trees a resistant population of American beech may be established.

Due to the current levels of American beech regeneration as well as dense shrubs and ground cover in the BB and SM forest types a pre-harvest chemical treatment is planned. A determination if each group will need treatment will be made while marking. Groups with an acceptable amount of regeneration or where less than 25 or less percent of the area has interference will not be treated. Regeneration interference control will be conducted in 1/3 acre patches and a 15 foot buffer around



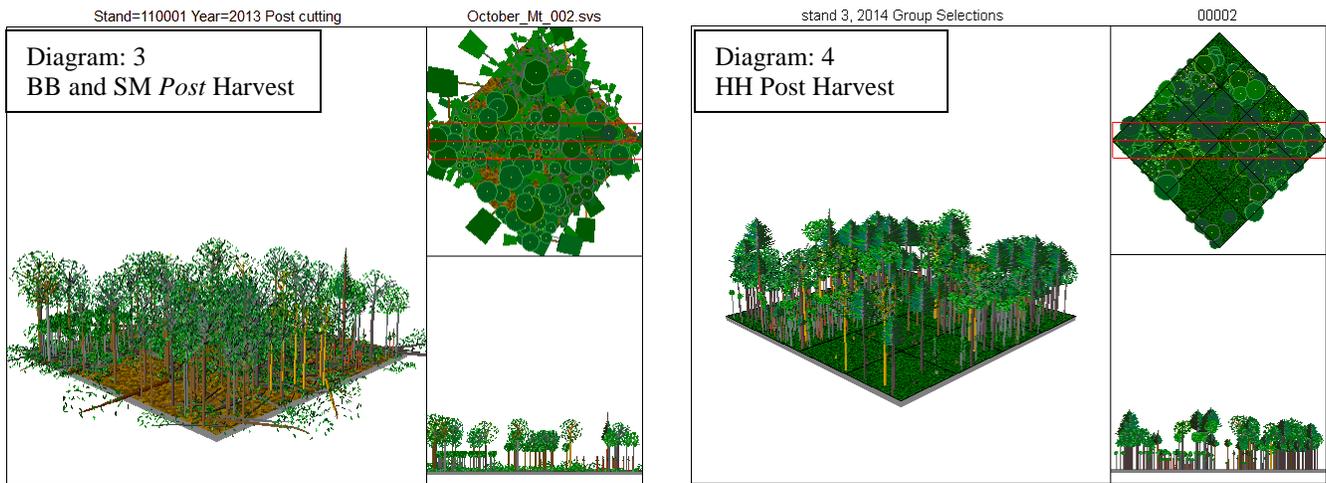
these patches prior to the commercial harvest. This treatment will be conducted late in the growing season, likely in the month of September. A combination of Rodeo (glyphosate 53.8%) and Arsenal (imazapyr) will be used in a water solution, applied with a motorized backpack sprayer. This method of application allows for targeting the desired beech trees and minimizes damage to non-target plants. Individual beech saplings too large to foliar spray will be treated with a cut stump treatment.

**Hemlock Hardwoods:** Within these stands ¼ acre opening will be created to favor regeneration of shade tolerant hemlock and red spruce. Subsequent harvests will be used to release this new understory by placing future groups opening adjacent to existing ones. Currently there is no consistent understory competition for establishing regeneration in these stands.

These stands are generally lower in elevation in comparison to the BB and SM stands and there for have less crown damage from the 2008 ice storm and also have a low percentage of white ash. Because of these factors only sporadic thinning along the skid trails to capture damaged or diseased trees will occur, this thinning will generally not reach beyond 50 feet from the edge of the skid trails.

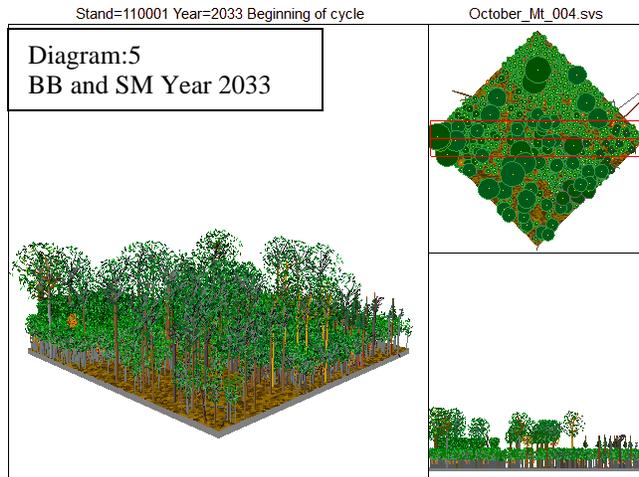
Because there is no current regeneration interference there is no anticipated understory chemical treatment planned for the HH forest type. The harvester will be encouraged to scarify the ground during the logging operation to expose mineral soil to aid in the regeneration process.

**Desired and Expected Results:** By removing approximately 20 percent of the mature trees through group selection the understory can successfully compete for light and nutrient resources establishing a new age classes. The diagram generated from The US Forest Service SVS program below shows what these stands will generally look like upon completion of the prescribed harvest (Diagram: 2 and Diagram: 3). These stands should be monitored in approximately 3- 5 years to determine the success of the chemical foliar treatment of American Beech and other shrub and ground cover species.



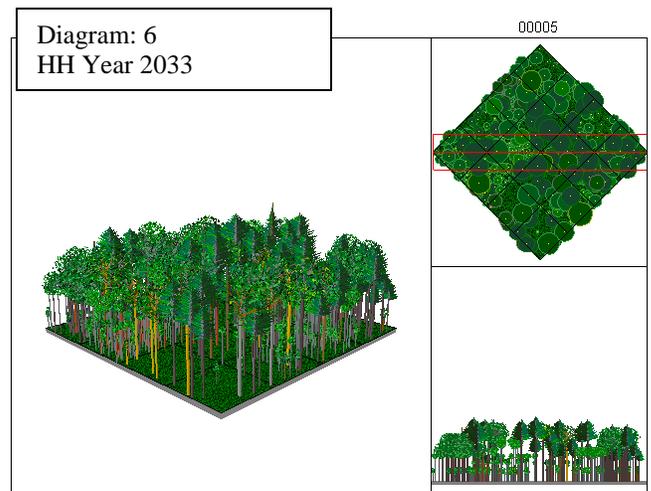
Below is a description and diagram of what the BB and SM stands and the HH stands may look like in 2033 prior to a next treatment if the stand is unaffected by natural disturbances such as ice, wind, insects or disease (Diagram: 3). The data used for this description was based on growth models derived from US Forest Service programs NED and FVS.

- BB and SM Stands: The stocking of the stand will grow back to approximately 120-130 ba/sq in the next twenty years. The quadric mean tree diameter of the over story will be



within one inch of the pre-harvest mean. The under story is expected to be regenerating in the patch openings. This stand should be monitored between 2029 and 2034 to determine if regeneration in the patch openings was successful. When regeneration is successfully established it is anticipated that the next silvicultural treatment will be used to expand and create new patch openings to further regenerate the stand.

- **HH Stands:** This basal area of this stand will grow to a level of 202 ba/ac (original stand was 195 ba/ac) after the completion of this first growing cycle. The quadric mean diameter of the stand will grow an inch to 7" dbh. The current prescribed harvest will create an understory environment where hemlock and red spruce can regenerate. This stand should be monitored between 2029 and 2034 to determine if regeneration of the groups openings was successful. A second round of group opening may be prescribed at this point to further the growth of this regeneration.



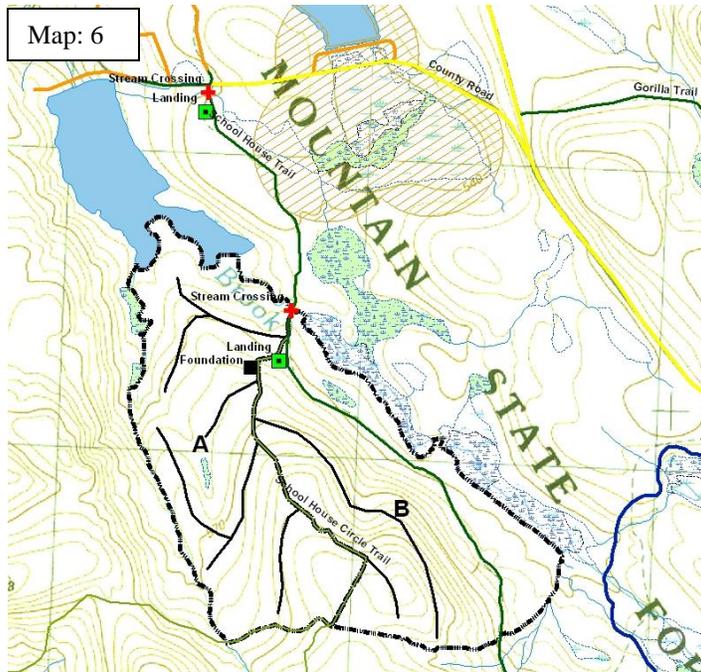
**Logging System Requirements:** By using Schoolhouse Circle Trail as a division line, this project will be divided in two operational units. The harvester will have to complete one section prior to beginning work on the second. Work will begin in the rear of each section and move towards the interior landing. The Forester and harvester will cooperatively decide which section to begin with.

The harvesting of these stands can be accomplished with a variety of logging equipment safely, efficiently and effectively. Both mechanized and conventional felling systems will be allowed provided equipment has a ground pressure of 6psi or below. Whole tree harvesting will not be allowed in this prescription area, all trees felled will be limbed within the stand leaving slash dispersed in the felled location except where needed for skid trail use.

A forwarder will be required to transport logs from the internal landing to the truck landing off of County Road. Either a forwarder or a skidder will be permitted to move product from the stump to the internal landing at the intersection of Schoolhouse Trail and Schoolhouse Circle Trail. Skidding length of stems and weight of forwarder loads can be restricted based on equipment size as well as operator ability to protect residual trees and roads/trails.

- **Project Access and landings:** Access to the proposed project area will be from State Route 8 in Becket, to County Road. The truck landing will be at the intersection of County Road and Schoolhouse Road in the area cleared during the construction of the Schoolhouse Reservoir Dam.

The landing is a dry gravel area with ample room for efficient sorting of product (Map: 6, Landing: 1). A requirement of the harvest will be to provide a minimum of 5 wooden bridge panels (minimum of 4'x16'x8") to bridge a drainage crossing near the entrance to the landing. Approximately 10 yards of bank run gravel will be required for the creating ramps over the bridge panels.



If skidders will be used for this harvest an interior landing at the intersection of Schoolhouse Trail and Schoolhouse Circle Trail will be created to act as a decking area for loading product onto forwards for transport to the truck landing (Map: 6, Landing: 2). If used this landing will be cleared and stumped but will stay a natural surface.

Upon completion of all harvesting activity both landings will be free of debris and graded to prevent erosion. Cleared portions that are not grveled will be seeded with "Berkshire Conservation Mix" grass seed and mulched with straw. Where possible, boulders will block access to the landings from illegal vehicles.

- **Forwarder Road and Skid Trails:** The Schoolhouse Trail from the truck landing to the interior landing will require restoration work prior to the start of harvesting. This work will included clearing trees to widen the road to the previous width, excavation work to correct damage from poor drainage and installation of a bridge across Washington Mountain Brook. The abutment stones for the previous bridge will be reinstalled and a temporary bridge will be placed on top.

Beyond the interior landing sections of both the Schoolhouse Trail and the Schoolhouse Circle Trail will be relocated to avoid wetlands and eroded areas. Throughout the project area there are existing skid trail segments still visible from the previous harvest. These existing segments will be evaluated and connected as needed to gain access to necessary areas of the project area. Primary skid trails will be laid out and marked prior to the project being advertized. The bridge crossing will be located and marked (Map: 6).

Upon completion of all harvesting activity all skid road will be left in a stable state and water bars will be installed according the "Massachusetts Forestry Best Management Practices". The stream/wetland crossing will be stabilized.

- **Wildlife Resources:** Current snags will be retained; however operators have the right to remove any snag that poses a safety hazard to themselves or equipment. Operators will not be required to utilize cull trees, if left behind they will add to the amount of large diameter CWD. Limbs and tops (slash) will also be left in place to augment existing CWD and add soil nutrients through decomposition.

- **In-kind Services:** Upon final tally of product the extent of in-kind services will be determined.
  - Repair and Restoration of bridge where Schoolhouse Trail crosses Washington Mountain Brook.
  - Installation of a gate and boulders to control access on Schoolhouse Road.
  - Restoration of illegal off-road vehicle damage in the borrow pits.
  - Equipment and materials to maintain/restore roads and trails within October Mountain State Forest.
  - Control of beech regeneration in areas of project of higher concentrations.

**Prescription Documentation:**

**Project Marking Guidelines:** Follow the directions below for marking instructions of sale and stand level features.

**Sale Level:**

1. Locate, flag (pink wetlands) and paint with two red diagonal stripes the buffers and filter strips along all wetland and associated streams. These lines are also the project boundary line for the west, north, east lines and much of southern line.
2. Locate, flag and paint with two red diagonal stripes the remaining wooded project boundary line of the southern line.
3. Flag temporary layout of primary and secondary skid trail network with orange flagging. Using orange paint mark small non commercial stems or stems already marked for removal located along adjusted skid trails upon completion of marking (Orange).
4. Flag Temporary layout of all wetland and stream crossing with labeled orange flagging. Using Red paint mark and label each crossing upon completion of marking and any final adjustment to location.
5. Locate and mark perimeter of interior landing and group openings with two orange diagonal stripes.
6. General tree marking guide:

Type of Tree	Tally Method	Mark Type
Cut Saw Log	Individual tally DBH & height	Blue Horizontal Line
Cut Pulp/Cord Wood	Individual tally DBH - 1/10 height	Blue Dot
Cut Live Cull Tree	Count	Blue X
Dead Tree Warning	No tally	Blue X

**BB and SM Forest Type:**

Group Selection Cutting: There will be 46 1/3 acre opening within the BB Forest type and 63 within the SM forest type. Each group will be located with a GPS unit and will have an adjustment allowance of 100 feet. This adjustment will be used for moving the group to areas of established desired advance regeneration and/or areas of trees of poor health due to disease or mechanical damage. Adjustment will also be made to ensure the group is not located in any excluded area. The opening will be randomly distributed throughout the area. These opening will cover approximately twenty percent of the total delineated eligible areas. Within these patches all live trees 5”dbh and above will be marked for harvest.

Pre Salvage: Remove no more than 1/3 of the basal within 75 feet of skid trails and group openings using the following prioritized guide below.

1. White ash greater than 12" DBH
2. Black cherry infected with black knot
3. Other species with less than 25 percent live crown

**HH Type:**

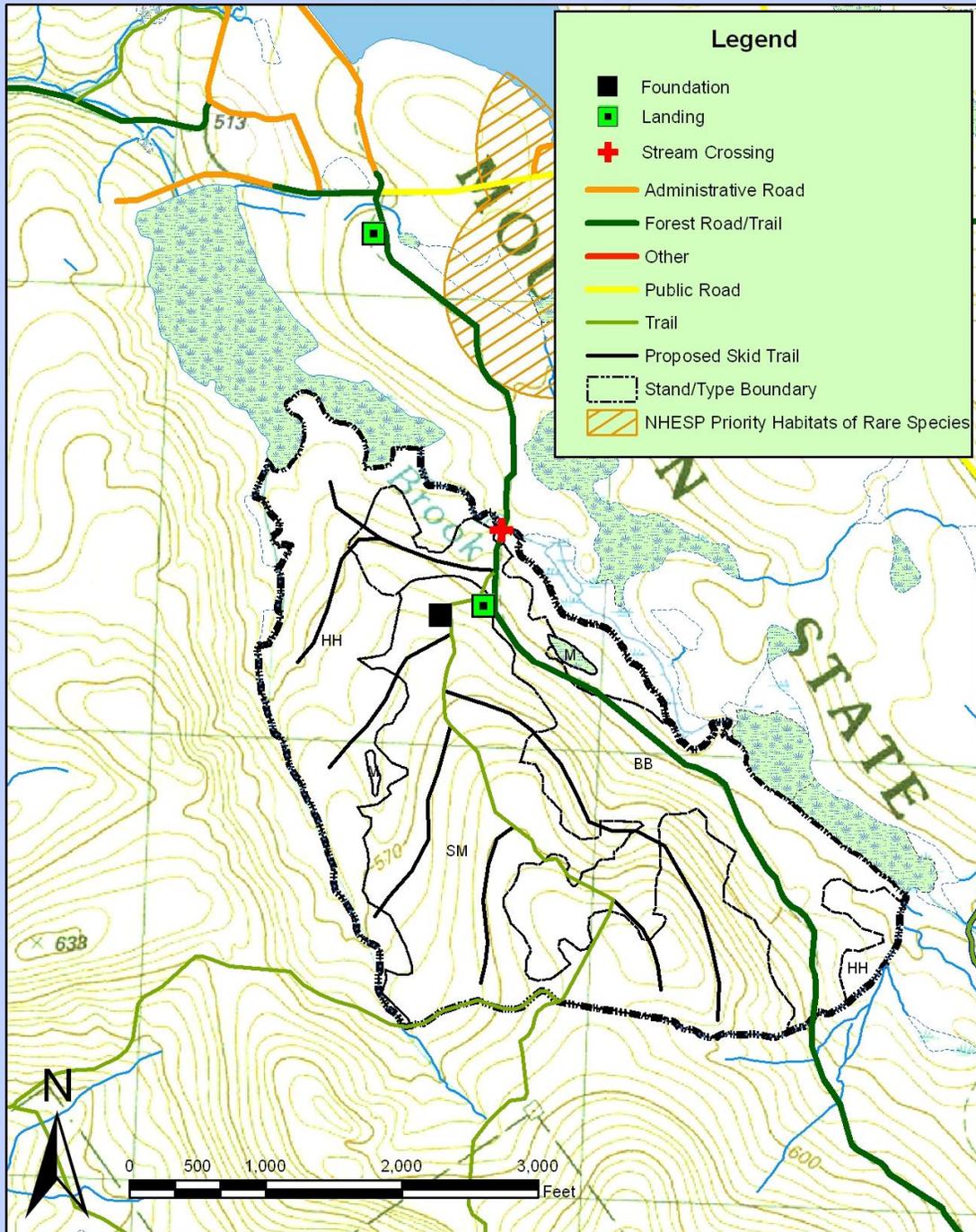
Group Selection Cutting: There will be 46 1/4 acre opening within the HH forest type. Each group will be located with a GPS unit and will have an adjustment allowance of 75 feet. This adjustment will be used for moving the group to areas of established desired advance regeneration and/or areas of trees of poor health due to disease or mechanical damage. The opening will be randomly distributed throughout the area. Adjustment will also be made to ensure the group is not located in any excluded area. These opening will cover approximately twenty percent of the total delineated eligible areas. Within these patches all live trees 5" dbh and above will be marked for harvest.

Pre Salvage: Remove no more than 1/3 of the basal within 75 feet of skid trails and group openings using the following prioritized guide below.

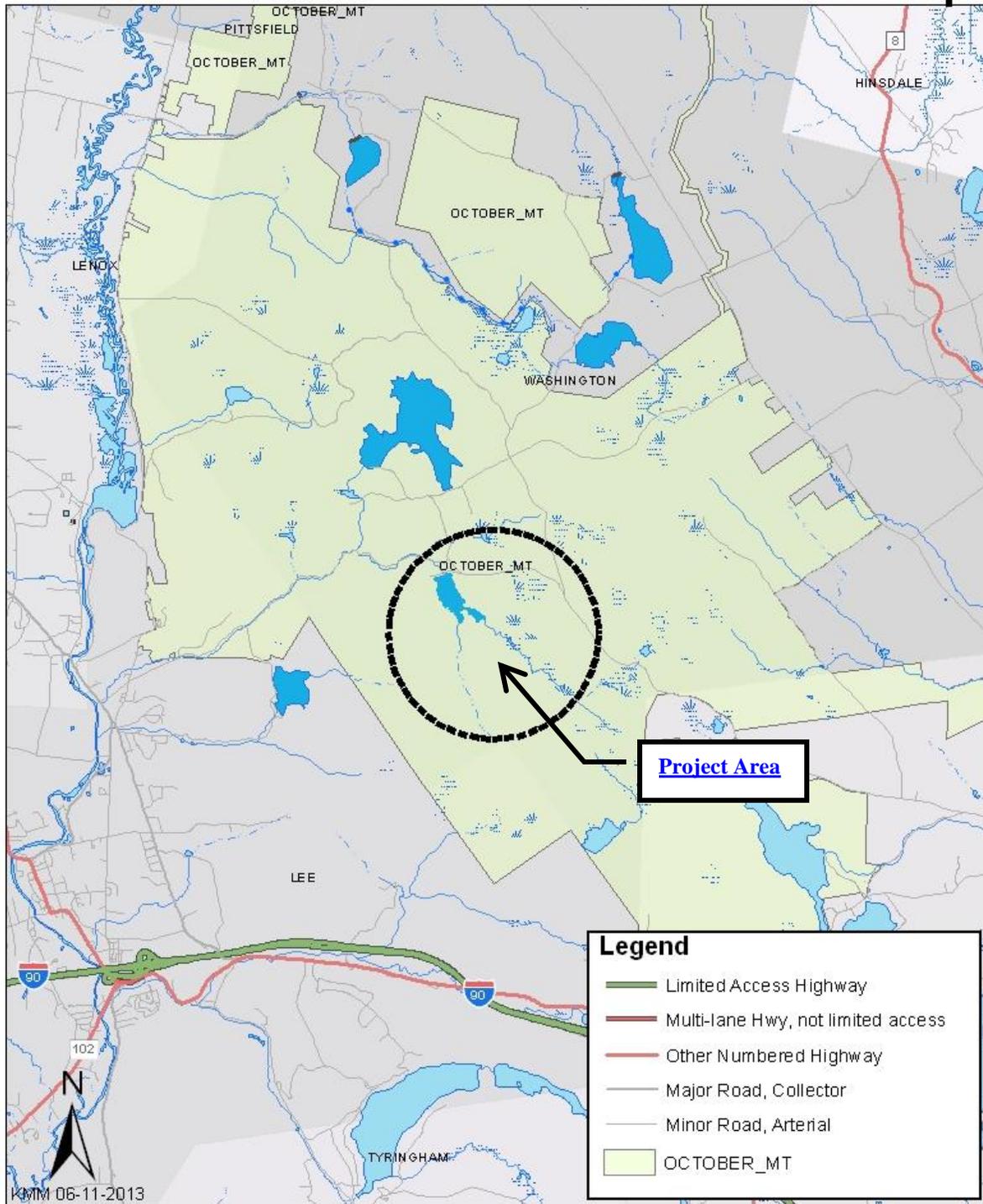
1. White ash greater than 12" DBH
2. Black cherry infected with black knot

Attached: Stand Map and Locus Map showing location of Forest Products Sale Area

# October Mountain State Forest Schoolhouse Lot



# School House Forest Mangement Proposal October Mountain State Forest - Locus Map



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