



Massachusetts Department of Conservation and Recreation

*Silviculture Prescription
Sherlock Lot - B*

*Massachusetts Department of Conservation and Recreation
Bureau of Forestry*

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

Prepared by:

*Kristopher Massini – Management Forester – Central Berkshire District
Massachusetts Department of Conservation and Recreation
P.O. Box 1433, 740 South Street, Pittsfield - MA 01004
kris.massini@state.ma.us – 413 442 8928 x121*

07/14/2017

Approved by:
Management Forestry
Program Supervisor

William N. Hill, CF

Date: October 19, 2017

Overview:

The Sherlock Lot Forest Management project is on the eastern slope 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) agents and the overstory trees are in decline.
- The project area has a moderate percentage of white ash which is or will be infested with Emerald Ash Borer (EAB) soon.
- Due to the loss of the overstory trees there is a danger of heavy sprouting of American beech and subsequent loss of site diversity.
- This project area offers an excellent opportunity to demonstrate and fulfill objectives for DCR Woodlands including maintaining and establishing diverse and resilient native forests.

The Sherlock Lot Forest Management Project endeavors to:

- Demonstrate thinning for stand improvement and patch clear cuts (up to 5 acres) for regeneration in Northern Hardwood forests that have been damaged by ice storms, beech bark disease and emerald ash borer.
- Demonstrate multi-age silvicultural systems including irregular shelterwood surrounding even aged silvicultural patch clear cutting to regenerate forests primarily composed and dominated by severely diseased American beech.
- Prevent proliferation of American beech with beech bark disease complex.
- Remove/salvage white ash prior to mortality from infestation of EAB.
- Demonstrate harvesting techniques and best management practices that protect forest productivity, recreation values, soil, water resources advanced regeneration.
- Fulfill management approaches for Woodlands as directed by the Forest Futures Visioning Process (2010) and subsequent Management Guidelines (2012)

The Sherlock Lot Forest Management Project is 161 acres in size and has resulted in two timber sale entries. Harvesting of the first entry which totaled 54 acres was completed in the fall of 2015. This second entry called "Lot B" will encompass 107 acres.

Site Data:

Stand Information: The project area covered by this prescription is 107 acres of northern hardwood forest types. Throughout the project area the dominate tree species that were observed are American beech (*Fagus grandifolia*), white ash (*Fraxinus Americana*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), quaking aspen (*Populus tremuloides*), yellow birch (*Betula alleghaniensis*), red spruce (*Picea, rubens*), white birch (*Betula papyrifera*), Eastern hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*). This project area has been shaped in recent years by beech bark disease, white ash die back, EAB mortality and the ice storm of 2008. These events are pushing all these forest types into high risk / low quality beech dominated forest.

The northern hardwood forest types within this project area have variations of species density and size classes creating a mosaic effect. This general forest type will be broken down into two individual stands for administration purposes based on topography and species composition to assist planning in proper management decisions. Size classes in this project area range from small to large diameter trees with high to moderate density levels.

There are existing natural small gaps in the forest canopy mostly caused by white ash mortality and beech bark disease. Throughout the project area white ash has been in decline for several years. It is

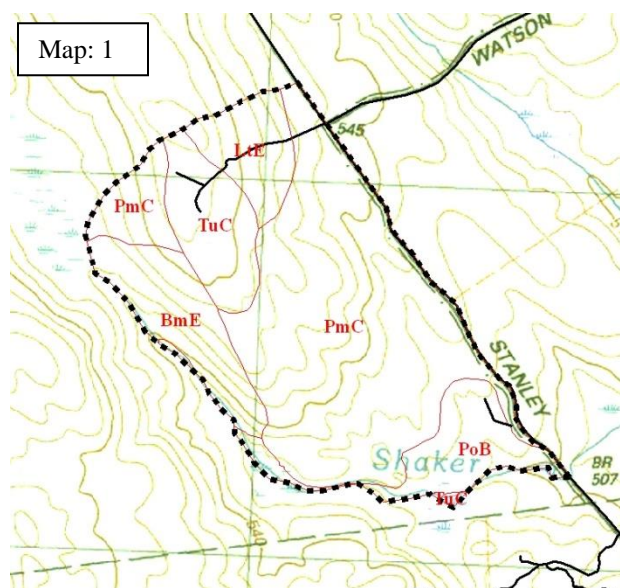
anticipated that the emerald ash borer (EAB) will kill the remaining stressed trees. The stand age is approximately 85-100 years old.

The Landscape designations for DCR Parks and Forests: Selection Criteria and Management Guidelines (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 Sherlock Lot - B site history (land use; agriculture/logging) and conditions (soil types, productivity; vegetation cover) suggests a moderately high level of complexity indicating that uneven age methods of regeneration may be appropriate. The average site index throughout the project area is 64 for white ash and 56 for sugar maple.

Geology and Landforms: This proposed project area is located along the southern boundary of the Town of Washington within the October Mountain State Forest (see Appendix I: Locus Map). The project area is bound by Watson/Stanley Road to the east, Shaker Mill Brook to the south and west, a wetland complex associated with Shaker Mill Brook to the northwest and a change in forest cover type to the north. The east, west and southern sides of this area rise in elevation from a low of 1670 feet at the intersection of Shaker Mill Brook and Watson Road to the northern boundary where at the top of the hill is an elevation of 1900 feet. According to GIS analysis at no point in this project area do slopes 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) .

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 below (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. (109.2 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. (22.5 ac)
- TuC – Tunbridge-Lyman Association: This map unit consists of moderately deep, well drained Tunbridge soils and shallow, somewhat excessively drained Lyman soils. (19.2 ac)
- LtE – Lyman-Trunbridge Association: This map unit consists of shallow, somewhat excessively drained Lyman soils and moderately deep, well drained Tunbridge soils. (14.6 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. (20.5 ac)

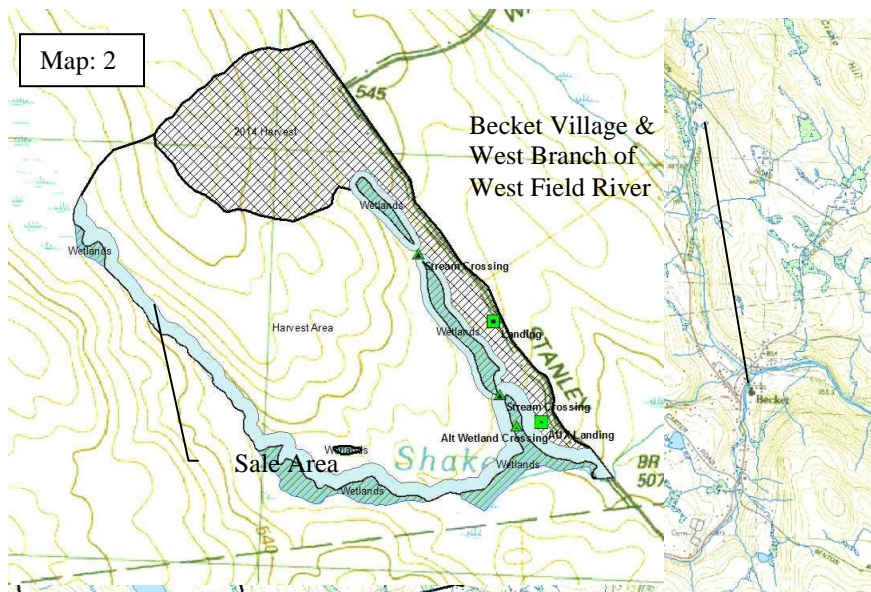
Climate: The project location lies in an area of mild summers and moderate winters with year round precipitation possible. Winds generally come from the west. Although major weather events can happen in any given year the chances of hurricanes, tornadoes, ice storms or other forest changing events are 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 Westfield River Watershed. Much of the Westfield River and several of its tributaries are designated as a National Wild and Scenic River. All water within this site drains directly into or through wetlands linked with intermittent streams into Shaker Mill Brook which is a designated tributary of the Wild and Scenic River. Shaker Mill Brook then travels east to North Becket Center where it enters the West Branch of the West Field River as seen in the map below (Map: 2). Regulations affecting the Wild and Scenic River are the same which would be in place without the designation. There are no municipal watersheds or private water supplies within or near the boundaries of the project area.



Shaker Mill Brook and its headwater wetland area make up the western and southern boundary of the project area. Prior to leaving the sale area the brook flows into a dammed area on the west side of Watson road, then crosses under the road and continues. Along with Shaker Mill Brook there is one other perennial stream with associated wet lands located in the eastern portion of the

project area. This unnamed stream runs parallel with Watson Road. There are also numerous seeps, intermittent streams and small forested wetland areas located throughout the area. 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”. There will be no timber management in regulated wetlands during this scheduled harvest to avoid timing issues with seasonal operation of the harvest.

Shaker Mill Brook and its headwater wetland area which make up the western and southern boundary of this project area will have at minimum a 100 foot filter strip where traditional harvesting will not occur, and filter strip standards of the “Massachusetts Forestry Best Management Practices Manual” as needed beyond 100 feet. There are no anticipated stream or wetland crossings for Shaker Brook and its associated wetland complex.

The boundary to the east of the current project area is the unnamed stream and its associated wetlands. This unnamed stream runs parallel with Watson Road with the 2014 harvest being in-between. This unnamed stream will have at minimum a 50 foot filter strip where no traditional harvesting will occur and will follow filter strip standards of the “Massachusetts Forestry Best Management Practices Manual” as needed beyond 50 feet. There will be no harvesting in the associated wetland complex of this stream and a 50 foot buffer along the wetland boundary which will exclude equipment.

Within the 100 foot filter strip of Shaker Brook and the 50 foot filter strip of the unnamed brook white ash may be removed where conditions are favorable for harvest. All additional upland drainages, intermittent streams, seeps and wetlands, and vernal pool resources found within the active project area will be mapped and protected to filter strip standards of the “Massachusetts Forestry Best Management Practices Manual” as needed.

There is a need for possibly two new stream/wetland crossing along the intermittent stream drainage near Watson Road (see attached Stand Map) to access the log landing used during the 2014 harvest. There is also an alternate existing wetland crossing location which may be used based on seasonal operating conditions in the south east corner of the project area. Skid road and trails will be laid out to minimize the number of other crossings throughout the remaining project area. Shaker Mill Brook will not be crossed. All regulated stream and wetland crossing will be bridged and/or corduroyed.

It is not anticipated that any other live stream or wetland crossing will be needed. Any stream or wetland 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”

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.

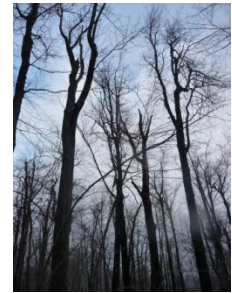
There is evidence of resistance to the BBD in some individual beech. This is evident in dense beech stands where one or several stems appear vigorous and free of BBD when all others are damaged. Potential resistant beech are generally maintained and promoted throughout the stand.



- 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.

- 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 and currently only 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, however there are ways to reduce and slow the spread to areas not yet infested.

Roads, Trails and Recreation: Watson and Stanley Roads located in Washington and Becket are both gravel secondary roads which are maintained year round for vehicle traffic. There is a private dwelling located 0.6 miles to the east along Watson Road in Washington and a private dwelling located 1.5 miles to the south on Stanley Road in Becket. As per the "Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines", there will be a 50 foot buffer along Watson road where no more than 50% of live basal area will be harvested and no slash within 25' of the road will remain. The Massachusetts Slash Law will be observed beyond the 25' no slash zone.

There are no formal trails or recreational activities to buffer for this project. The project area is however open to all legal passive recreation activities that are allowed on DCR properties. There is currently no formal parking area for visitors.

Cultural and Archeological Feature: There are several homestead sites located on Watson / Stanley Road to the north and south of the project area with full foundations and evidence of out buildings. There are no known within the project area, any additional features found will be mapped and protected.

To the south of the project area on Stanley Road is the location of the former CCC camp. No parts of the camps foot print are within the proposed project area.

Wildlife / Rare and Endangered Species: According to the NHESP “Massachusetts Natural Heritage Atlas 13th Edition” there is no priority or estimated habitat sites located in this proposed project area or the immediate area. No rare plants have been identified in the field to date. Care will be taken to address the needs of any rare/endangered plant if found. There are no certified or potential vernal pools mapped by NHESP.

No rare animals or critical habitat were noted upon the initial site visit. Large mammals noted were deer, moose, bear and coyote. Small mammals noted were squirrel, turkey 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.

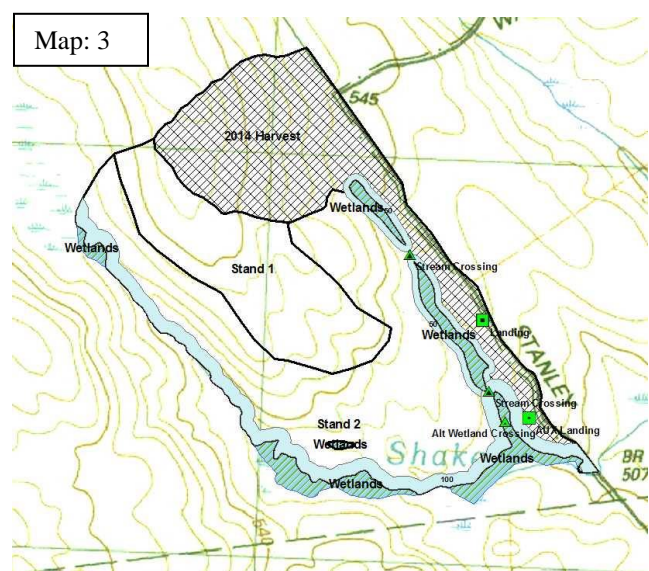
Due to the deteriorating nature of the forest types in this project area there is an abundance of large diameter course woody debris (CWD) and both live and dead wildlife trees (snags), see Stand Structure Section for more information. There were also a large amount of live wildlife trees observed in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

Throughout the Project Area where possible 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.

Stand Data:

Forest Stand Attributes: This prescription will describe the conditions and treatments of “Lot B” encompassing 107 acres of northern hardwood forest types that will be treated out of the total 161 acre project area (Map: 3). In 2014 the first 54 acres “Lot A” of this project area were harvested.

This project area will be broken down into two stands for management and treatment purposes. These stands are typical variations of northern hardwood stands for this area consisting primarily of American beech, sugar maple, white ash, red maple and black cherry. Much of the project area as well as surrounding areas 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. In some portions of the project area hobble bush has also taken over the understory. There are no defining boundaries of these stands as the species composition changes slowly; the defined boundary on the map is for general description and location purposes.

Silvicultural / Disturbance History: This project area has been shaped in recent years by beech bark disease, white ash die back, 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.

During the late 1970's and early 1980's commercial fuelwood cutting occurred in portions this project area. The goal of this project was to thin low quality and undesirable growing stock from maturing overcrowded stands. This operation allowed the remaining forest to grow with more vigor. Although there are no written records, evidence within the project area show signs of previous access roads and skid trails throughout the project area. This area was likely harvested prior to DCR ownership.

Stand Structure: Both of these stands are northern hardwood type and considered to be fully stocked. Both stands are approximately 85-100 years old and due to abiotic (ice) and biotic (beech bark 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.

- **Stand 1 (~ 37ac.):** This stand is fully stocked with a basal area of 95 ft² of basal area / acre (ba/ac) and is considered to be a low "A" level according to local stocking charts. There is currently 27 ba/ac of standing dead trees. Under the current conditions the stand is thinning quickly due mortality in the already stressed trees succumbing to beech bark disease and emerald ash borer. Acceptable growing stock, trees free of mechanical and biological defects, account for only 37% of the stand. American beech, sugar maple, and black cherry dominate the overstory with red maple, yellow birch, and white ash present in smaller amounts. The quadric mean of the stand is 11.6"dbh with measured trees reaching 24"dbh. (Table 1)

The understory of this stand is dominated by American beech seedling and saplings of all sizes (3515 stems/acre). Other understory species noted during field inventory outside of measured plots include, sugar maple, black cherry, red maple and yellow birch seedling. Striped maple covers approximately 44% of the stand area. (Table 2) In this stand hobble bush and ferns are the dominant ground cover species that would affect regeneration of tree species. In this stand American beech will inhibit regeneration of desirable tree species. A table showing the results of interfering understory plots is below. (Table 3)

Throughout the stand there is an average of 72 snags per acre. The majority of these snags are American beech and sugar maple between 6 and 18"dbh. Snags as large as 26"dbh were recorded in the stand inventory. (Table 4) On average is 527 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 1: Stand 1 Overstory (all measured trees greater than 5"dbh)

	All species	American beech	Sugar Maple	Black Cherry	Yellow Birch	Red Maple	White Ash
Basal area (square feet)	95	42.5	30	7.5	10	2.5	2.5
percentage of stand BA	100.0	55	24	8	8	2	2
% in AGS	37	15	75	0	75	100	100
Stems per Acre	129.4	80.5	34.4	2.6	9.7	1.1	1.1
Quadric Mean Diameter	10.6	9.1	12.7	10.5	13.8	20	20
Relative Density	79	41	28	2	6	1	1
Sawlog Gross Total (bd/ac)	9631	3838	3050	1258	803	335	345
Cords Gross Total (cds/ac)	34	17	9	4	3	1	1

Table 2: Stand 1 Understory (measured trees less than 5"dbh)

	All species	American Beech
Percentage of Plots Observed		93.8
<1 ft Per Acre	557	557
1-3 ft Per Acre	557	557
3-5 ft Per Acre	842	842
>5 ft Per Acre	1516	1516
Total Stems Per Acre	3514	3514

Table 3: Stand 1 - Regeneration Interference

	Plot count	Percent plots	
Tall woody interference	7	70	Set to 70% because basal area of sapling/pole undesirables is at least 10. There are 44 percent of plots where a tall woody species was identified
Undesirable saplings/poles		30	basal area of undesirable trees less than 12-inch dbh in the overstory plots
Low woody interference	7	44	average cover= 29
Fern interference	2	13	average cover= 10
Grass interference	0	0	average cover= 0
Any vegetative interference	12	75	plots with tall woody, low woody, fern or grass interference

Table4: Stand 1 Snags

	Total All Species	American Beech	Sugar Maple	Black Cherry	Yellow Birch	Red Maple	White Ash
Basal Area	27.5	25		2.5			
Trees per Acre	72.3	70.5		1.8			

- Stand 2: (~ 82 ac.) This stand is stocked with a basal area of 113 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 57% of the stand. Sugar maple, American beech, red maple, white ash, and yellow birch dominate the overstory with black cherry, paper birch and red spruce present in smaller amounts. The quadric mean of the stand is 10.6"dbh with measured trees reaching 26"dbh. (Table 5)

The understory of this stand is dominated by American beech seedling and saplings of all size classes (3630 stems/acre). Other understory species include striped maple, red maple, red spruce, sugar maple, white ash, black cherry, and hop horn beam. (Table 6) 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 American Beech. A table showing the results of interfering understory plots is below. (Table 3)

Throughout the stand there is an average of 26.5 snags per acre. The majority of these snags are white ash and American beech over 12"dbh. White ash snags as large as 24"dbh were recorded in the stand inventory and sugar maple snags over 24"dbh were observed in the field (Table 8). An average 433 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. This figure exceeds the recommended minimum of 85 cubic feet of CWD as required in the CBFMRP.

Table 5: Stand 2 Overstory (all measured trees greater than 5"dbh)

	All species	American Beech	Sugar Maple	Red Maple	White Ash	Yellow Birch	Black Cherry	Paper Birch	Red Spruce
Basal area (square feet)	113	26	26	20	20	12	3.5	3.5	1.2
percentage of stand BA	100	23	23	18	18	10	3	3	1
% in AGS	57	18	64	71	71	70	67	100	100
Stems per Acre	184	70.6	43.4	20.3	28.2	8.8	3.2	2.6	.5
Quadric Mean Diameter	10.6	8.2	10.5	13.5	11.4	15.6	14.2	15.7	20
Relative Density	81	25	25	11	8	6	1	2	1
Sawlog Gross Total (bd/ac)	10031	1992	1872	1987	2116	1174	322	299	233
Cords Gross Total (cds/ac)	32.6	6	7.2	6.5	6.2	3.6	1.2	1.2	.5

Table 6: Stand 2 Understory (measured trees less than 5" dbh)

	All species	American Beech	Sugar Maple	Red Maple	White Ash	Yellow Birch	Black Cherry	Paper Birch	Red Spruce
Percentage of Plots Observed		93.9	9.1		3			9.1	15.2
<1 ft Per Acre		560						35.0	70
1-3 ft Per Acre		817					11.7	23.3	
3-5 ft Per Acre		782						23.3	
>5 ft Per Acre		1423	46.7		11.7		11.7		46.7
Total Stems Per Acre		3583	46.7		11.7		3	81.7	116.7

Table 7: Stand 2 Regeneration Interference

	Plot count	Percent plots	
Tall woody interference	9	27	Based on percent of plots with an identified tall woody interference species. The basal area of sapling/pole undesirables is below 10, so tall woody interference was not set to 70%
Undesirable saplings/poles		7	basal area of undesirable trees less than 12-inch dbh in the overstory plots
Low woody interference	15	45	average cover= 31
Fern interference	4	12	average cover= 12
Grass interference	0	0	average cover= 0
Any vegetative interference	22	67	plots with tall woody, low woody, fern or grass interference

Table 8: Stand 2 Snags

	Total All Species	American Beech	Sugar Maple	Red Maple	White Ash	Yellow Birch	Black Cherry	Paper Birch	Red Spruce
Basal Area	15.3	2.4	1.2		10.6		1.2		
Trees per Acre	26.5	7.1	.7		17.7		1.1		

Evaluation of Data and Projected Results:

Goals and Objectives: Silvicultural practices in Stand 1 and 2 (see attached Stand Map) figure will demonstrate patch regeneration (up to 5 acre openings) of beech dominated areas as well group selection (up to 1/3 acre openings) and commercial thinning of northern hardwood portions of the project area.

- Control of undesirable diseased beech regeneration is a priority. This harvest will begin the process of moving these stands to a more uneven aged structure by aiding/creating a new age class through removal of diseased and damaged trees. Subsequent harvests will continue this process by adding/expanding regeneration by harvesting more patches/groups of mature trees. In this first harvest entry trees to be removed either by thinning or patch/group removal will be chosen based on crown health and sign of disease/insect damage.
- Create 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. The

commercial thinning between the patches will provide additional light and nutrient resources for remaining trees.

- Secondary goals of this project are to capture value of damaged and/or diseased trees, capture the value of mature white ash prior to mortality due to EAB, and to provide raw materials to the lumber industry.

Silviculture Methods:

Stand 1: Throughout the diseased American beech stands approximately half the area will be treated in patch harvests ranging from 1 to 5 acres in size to begin regeneration of the stand. Patch size and shape will be laid out on the ground based on tree health, density, terrain and access. Where possible these patches will be used to expand natural existing patches. These patches will total approximately 18 acres or about 50 percent of the stand area. Generally within each patch cut all trees above 5" dbh will be marked for removal as well as all beech above 3.5 feet in height, however 1-2 trees/acre with good wildlife features or preferred genetic stock may be left. If possible this harvest will occur under bare ground conditions to create scarified soil conditions for regeneration.



The patch openings will provide ample light conditions for regeneration of shade intolerant species such as paper birch, pin cherry, black cherry and poplars where large openings are needed. Mid shade tolerant species such as Ash, oak and maple are expected to thrive closer to the edges.

This harvest will create openings in the current overstory greater than 1/3 acre and therefore DCR Commissioner approval will be obtained as required in the "Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines". It is anticipated that the retained advanced regeneration (non beech species) along with naturally regenerated stems will surpass the 1000 stems/acres regulation within 5 growing seasons. To ensure desirable species have a chance to compete, mechanical and/or chemical control of beech will be used in these stands.

The remainder of the stand will be thinned from 95 ba/ac to approximately 60ba/ac. This will move this stands location on the stocking guide from a "A" level to a low "B" level. Thinning will be based on tree species, crown damage, health and quality.



Stand 2: The practices used in these stands will be a species and quality based commercial thinning with group openings of up to 1/3 acre in areas that have acceptable advanced regeneration or severe crown damage and/or disease. These groups will remove all trees over 5 inches in diameter leaving behind all acceptable advanced regeneration and not exceed 20% (16 ac) of the total stand base.

The 1/3 acre patch size was chosen to comply with current guidelines established in Landscape designations for DCR Parks and Forests: Selection Criteria and Management Guidelines (2012). This 1/3 acre size is generally considered the smallest opening 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, mechanical and/or chemical control of beech will be used in these stands.

The basal area of live trees will be reduced approximately 35%; from 113 ba/ac to approximately 75 ba/ac moving this stand from an “A” level to a low “B” level. This thinning will be prioritized by the removal of white ash and American beech first followed by mechanically damaged trees.

Beech Control Project Wide: If harvest occurs during non-winter conditions (non-frozen or snow covered) beech will be controlled by mechanical means. Within each patch cut all beech stems greater than 3.5’ in height will be cut, and the operator will be encouraged to scarify these opening to expose soil as a seed bed for seed regeneration of other desirable species. If the timing of the project does not create these conditions a post chemical treatment to control beech regeneration may be needed to meet the goals of this project.

Throughout the sale area all American beech that appears to be free of beech bark disease will be retained. If chemical treatment is needed these clones will be avoided 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.

Desired and Expected Results: By removing a large portion of the damaged, diseased and dying trees through thinning and patch and group removal the remaining stand will be comprised of a larger percentage of healthy trees with patches of regeneration advancing into the upper canopy. Removal of American beech understory will allow other native northern hardwood species to successfully compete for light and nutrient resources establishing new age classes. These stands should be monitored in approximately 3- 5 years to determine the success of the mechanical and/or chemical treatment of American Beech and to ensure adequate regeneration of desirable species.

Operation Plan:

- **Logging System Requirements:** Harvesting of these stands can be accomplished with a variety of logging equipment 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 be allowed in this prescription area. Skidding length of stems can/will be restricted based on equipment size as well as operator ability to protect residual trees.
- **Project Access and landings:** Access to the proposed project area will be from either State Route 8 in Becket, to County Road to Stanley Road which turns in to Watson Road upon crossing the town line into Washington or State Route 8 in Washington to Frost Road to Pittsfield Road (also known as Washington Mountain Road) to Watson Road. Both are existing landings.

The preferred landing to be used for this project was created for the 2014 portion of this project and is located in the eastern portion of the project area along Watson Road. Depending on the suite of equipment used by the operator and season of harvest additional space and gravel may be required to facilitate use.

There is an alternate landing in the southeastern portion of the project area that may be used for this prescription entry. This landing can only be used under dry or frozen conditions and would require additional gravel to facilitate use.

Upon completion of all harvesting activity the landing(s) will be free of debris, graded to prevent erosion, and seeded with “Berkshire Conservation Mix” grass seed and mulched with straw. Boulders to block vehicle access to the harvest area will be left at the entrance of each landing used.

- **Skid Road and Trails:** Throughout the project area there are existing skid trail segments still visible from the previous harvests. These existing segments will be evaluated and connected as needed to gain access to necessary portions of the project area. Primary skid trails will be laid out and marked prior to the project being advertized. The anticipated stream/wetland crossing will be located and marked (see attached Stand Map).
- Upon completion of all harvesting activity all skid roads 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 restored and 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) may 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.
 - Chemical control of beech, to help these stands retain a diverse northern hardwood forest type, if needed.
 - Equipment and materials to maintain/restore roads and trails within October Mountain State Forest.

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 wetlands and associated streams (also act as sale boundary).
2. Locate and paint with two red diagonal stripes the sale boundary to the north.
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 landings and with one red 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
Edge / Boundary	No tally	One/Two Red Slash

Stand 1:

Patch Clear Cut: There will be up to 18 acres of patch cuts ranging from one to five acres. Patches should be laid out to enhance current natural openings, remove portions of heavily diseased beech and have jagged edges. Each patch will be delineated by one red strip painted on perimeter trees (to be retained after harvest) and GPSed to verify acreage. Within these patches all live trees 5" dbh and above will be marked for harvest, 5 trees with good wildlife features or preferred genetic stock will be left per acre.

Commercial Thinning: Remove 1/3 of the basal area reducing the stand to approximately 80ba/ac by following the prioritized guide below.

1. Unacceptable \ Diseased American beech
2. Unacceptable \ Diseased white ash
3. Unacceptable \ Diseased beech
4. Unacceptable black cherry, red maple or birch
5. Unacceptable Sugar Maple
6. Any other tree based on appearance of mechanical strength and vigor

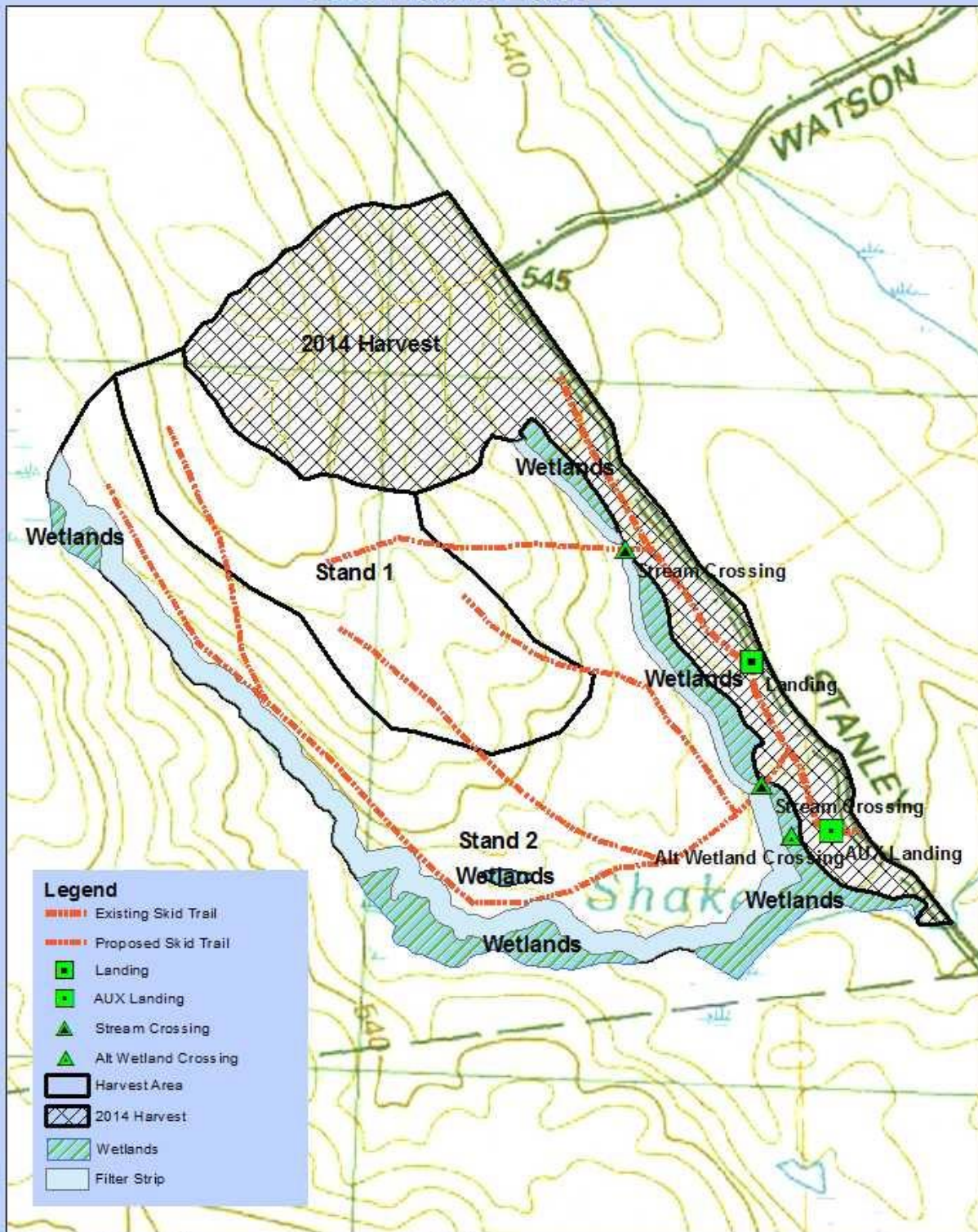
Stand 2: Group Selection Cutting: There will be up to 53 1/3 acre group openings within this stand. Each group will be located with a GPS unit and will have an adjustment allowance of 100 feet. This adjustment will be used for moving the group to areas of established desired advance regeneration and/or 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 openings 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.

Commercial Thinning: Remove 1/3 of the basal area reducing the stand to approximately 80ba/ac by following the prioritized guide below.

1. Unacceptable \ Diseased American beech
2. Unacceptable \ Diseased white ash
3. Unacceptable \ Diseased beech
4. Unacceptable black cherry, red maple or birch
5. Unacceptable Sugar Maple
6. Any other tree based on appearance of mechanical strength and vigor

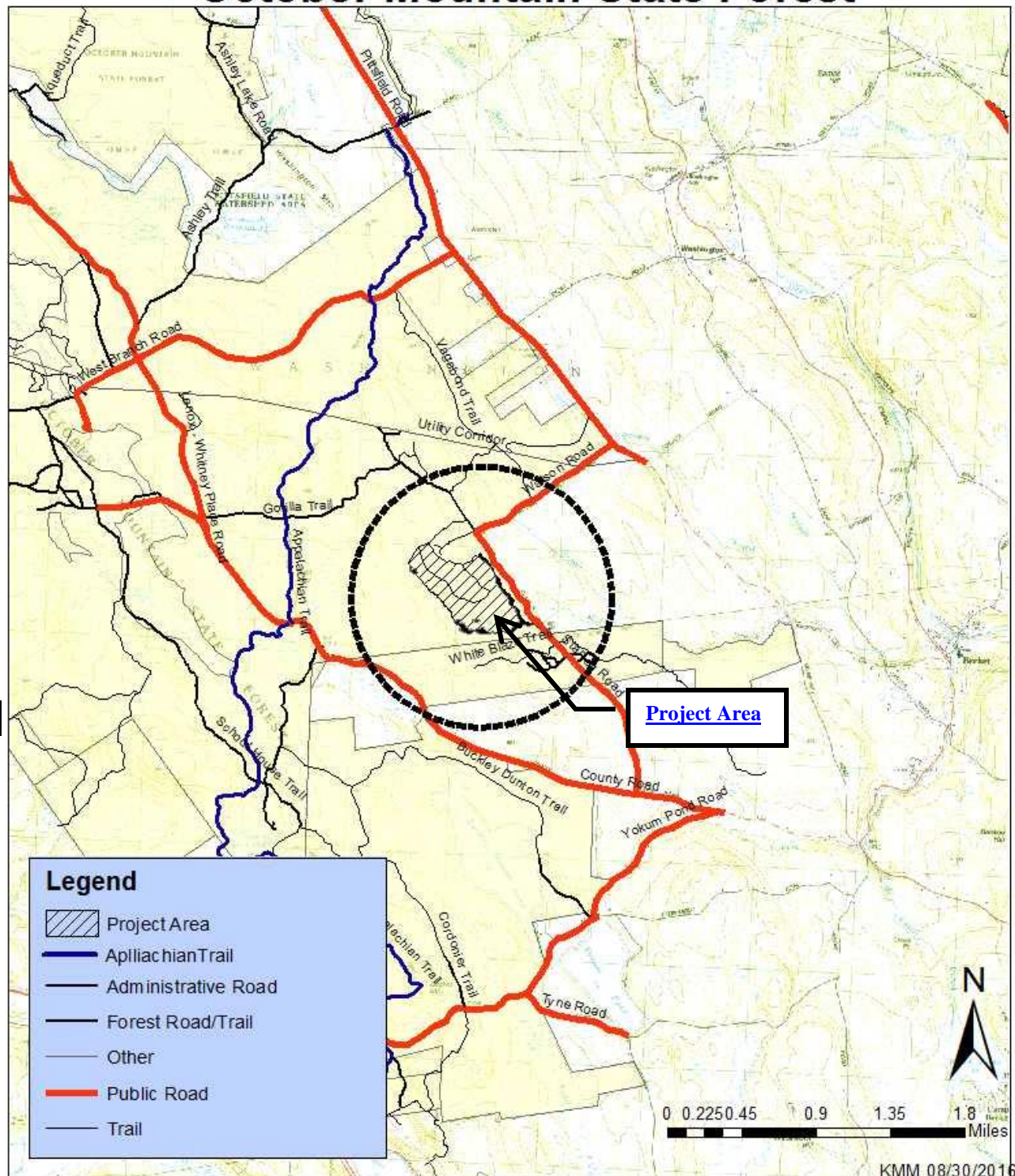
Attached: Stand Map and Locus Map showing location of Forest Products Sale Area

October Mountain State Forest Sherlock Lot B



KMM 02/26/2013

Sherlock Lot Sale B Locus Map October Mountain State Forest



KMM 08/30/2016

References

- Smallidge, P.J. and R.D. Nyland. 2009. *Woodland Guidelines for the Control and Management of American Beech*. Cornell University Cooperative Extension Forest Connect Fact Sheet. P. Smallidge, ed. 6pgs.
- Kochenderfer, Jeffrey D.; Kochenderfer, James N. 2009. *Effects of Herbicide Concentration and Application Timing on the Control of Beech Root and Stump Sprouts Using the Cut-stump Treatment*. Gen. Tech. Rep. NRS-48. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 10 pgs.
- Batzer, Harold O. and Morris, Robert C. 1978. *Forest Tent Caterpillar*. Forest Insect & Disease Leaflet 9. U.S. Department of Agriculture, Forest Service.
- Houston, David R. and O'Brien, James T. 1983. *Beech Bark Disease*. Forest Insect & Disease Leaflet 75. U.S. Department of Agriculture, Forest Service.
- Burns, Russell M., and Barbara H. Honkala, tech. coords. 1990. *Silvics of North America: 1. Conifers; 2. Hardwoods*. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. vol.2, 877 p.
- McCullough, Deborah, G., Schneeberger, Noel F. and Katovich, Steven A. 2008. *Pest Alert Emerald Ash Borer*. NA-PR-02-04. Northeastern Area State and Private Forestry. U.S. Department of Agriculture, Forest Service
- Leak, William B. 2003. *Best Density and Structure for Uneven-Aged Northern Hardwood Management in New England*. Northern Journal of Forestry, Vol. 20, No. 1
- Scanu, Richard J. 1988. *Soil survey of Berkshire County Massachusetts*. United States Department of Agriculture, Soil Conservation Service.
- Massachusetts Department of Conservation & Recreation. 2012. *Landscape Designations for DCR Parks and Forests: Selection Criteria and Management Guidelines*.
- Massachusetts Department of Conservation & Recreation. 2007. *Central Berkshire District Forest Resource Management Plan*.
- Catanzaro, Paul, Fish, Jennifer and Kittredge, David. 2013. *Massachusetts Forestry Best Management Practices Manual*. Massachusetts Department of Environmental Protection, Office of Watershed Management and U.S. Environmental Protection Agency, Region I, Water Division, Water Quality Section.
- Goodwin, D.W. and W.N. Hill. 2012. *Forest Productivity and Stand Complexity Model [A GIS Grid Analysis using ArcGIS®]*. Massachusetts Department of Conservation and Recreation, Amherst, MA.
- Hoffard, William H. and Marshall, Philip T. 1978. *How To Identify and Control the Sugar Maple Borer*. United States Department of Agriculture, Northeastern Area State & Private Forestry. NA-GR-1
- Jensen, Sandra. Updated 2011. *Plant Disease Fact Sheet: Black Knot*. Cornell University, Plant Disease Diagnostic Clinic