Massachusetts Department of Conservation and Recreation
Bureau of Forest Fire Control and Forestry
Forest Management Proposal
Name: Whitcomb Hill Lot

Date Posted:	**February 16, 2017**
End of Comment Period:	**April 2, 2017**

Region:	Central
Recreation District:	**Central Highlands**
Forest Management District:	**Mid State**
State Forest:	**Otter River State Forest – Whitcomb Hill (East and West)**
Closest Road:	**Gavin Road**
Town	**Templeton and Winchendon, Massachusetts**

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Overview:

The Whitcomb Hill lot is a ±547 acre isolated parcel of the Otter River State Forest complex. It is located off of Gavin Road in Templeton and Winchendon, Massachusetts. This parcel of land was acquired in 1915 and is considered the first state forest in Massachusetts. Due to the geographical location of the state forest in relation to the Millers River and the Otter River, the U.S. Army Corps of Engineers (ACOE) acquired by takings many acres of the original acquisition of Otter River State Forest to the north and east of what is currently owned in the mid 1900s for flood control operations (Birch Hill Dam). The Otter River State Forest complex encompasses about 1,200 acres, plus an additional 4,000 acres which is leased by the ACOE. In 1916, a nursery was established at Otter River State Forest. In 1935, Otter River State Forest housed a Civilian Conservation Corps (CCC) camp which planted thousands of trees throughout the area.

There are seven forest stand types located on the property. Of the seven forest stands, there are three plantations of non-native tree species, including Scots pine (*Pinus sylvestris*), Norway spruce (Picea abies) and red pine (*Pinus resinosa*). Additionally, the property has a native plantation of white pine (*Pinus strobus*), totaling approximately 279 acres. There is an estimated 139 acres of white pine-hardwoods, 66 acres of white pine-hemlock and 63 acres of oak-hardwoods. A Forest Survey conducted at Otter River State Forest in 1929 shows that most of the plantations on the property were planted beginning in 1916. In 1929, the land area surrounding the plantations consisted of early successional forestland that contained a mixture of gray birch, white birch, red maple, white pine and oak. The white pine on the property is showing severe signs of decline due to needle blight pathogens. Caliciopsis canker (*Caliciopsis pinea*) is also present on mature trees. This includes extensive needle browning and canopy dieback, which has resulted in pockets of dead standing white pine trees. In addition, patches of red pine have recently died. This is likely the result of the red pine scale (*Matsucoccus resinosae*), an insect and diplodia tip blight ((*Sphaeropsis sapinea*), a fungus.

Project Purpose, Goals and Objectives:

The project at the Whitcomb Hill lot is being proposed at this time because:

1.) White pine trees are declining in health and vigor due to needle blight pathogens and are currently posing a high risk of mortality as a result.
2.) Red pine plantations are declining in health and vigor due to stagnation and are highly susceptible to mortality from red pine scale and diplodia tip blight.
3.) The plantations offer little vegetative diversity and are rapidly declining in health and vigor.
4.) Public safety and assets are being jeopardized by the current forest condition.

The goals and objectives of this project include:

1.) Demonstrate thinning to prepare an even aged plantation of red pine, white pine, Scots pine and Norway spruce for the regeneration of a mixture of native tree species, including white pine and deciduous hardwoods.
2.) Demonstrate thinning to prepare forest stands consisting of white pine-hemlock, oak-hardwoods and white pine-hardwoods for the regeneration of a mixture of native tree species and to increase tree vigor through thinning.
3.) Release advanced regeneration of native tree species present in portions of the forest which have undergone past forest management.
4.) Increase the vegetative diversity and structural complexity within the project area to include an assortment of native plant species including native shrubs and herbaceous plants.
5.) Demonstrate harvesting techniques and best management practices that protect forest productivity, soil and water resources.
6.) Mitigate public safety risk by implementing silvicultural treatments that work to proactively harvest trees which are rapidly failing in condition.
7.) Use in-kind services via the timber sale contract to repair and enhance access to the state forest in addition to improving the condition of the interior forest roads within the state forest.

Stand Descriptions:

The property is underlain by an outwash plain of mostly droughty soils that are moderately well drained to excessively well drained. Soil types include Naumburg fine sandy loam, Adams loamy sand, Allagash fine sandy loam, Colton gravelly loamy sand, Croghan loamy fine sand, the Lyman-Tunbridge-Berkshire association, the Pillsbury-Peacham association, the Tunbridge-Lyman-Berkshire association, the Becket-Monadnock association and the Becket-Skerry association. The wetlands are underlain by very poorly drained soils, including Searsport loamy sand and Bucksport and Wonsqueak mucks.

At this time, the entire property will be evaluated for forest management under this proposal. The reason for this is that white pine is present on over 400 acres of the property. While needle blight pathogens and the Caliciopsis canker are affecting white pines throughout the property, the severity of white pine decline varies due to site characteristics, tree density and past forest management. With this proposal, a stand exam will be conducted to assess the current forest condition in order to prioritize management of white pine where it is in the poorest condition. Additionally, the non-native plantations are a priority for management at this time.

The DCR Management Guidelines state 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 stands 1 – 7 of the Whitcomb Hill lot site history (land use; agriculture/logging) and conditions (soil types, productivity; vegetation cover) suggests that the majority of these even-aged,

lower complexity stands have a medium productivity and complexity. This implies that the site is suited for both even-aged management and uneven-aged management.

Stand 1 is a 208 acre white pine stand located in six distinct areas. The overstory consists mostly of mature white pine trees. The large majority of the stand consists of planted white pine. Needle blight pathogens occur on the needles of mature white pine trees as well as on the needles of advanced regeneration that is present in the understory. The presence of needle blight pathogens occurs throughout this stand and is severe at this time. Caliciopsis canker is present throughout the property and on regeneration. Tree stocking is very dense in portions of this stand. Site quality, stand age, stand density and environmental conditions (temperature and precipitation) are all contributing factors to the presence, spread and degree of infection by needle blight pathogens which are affecting the white pine in this stand. There are patches of dead standing white pine as a result. Crown dieback and widespread needle browning are present throughout. As a result, stand condition and tree vigor is declining at this time. Tree quality is fair and the stocking level, or tree density, is moderate to high. Stand age is approximately 85 years. Separate portions of the stand were treated with a "commercial thinning" in 1991, 1993, 1994 and 1997 respectively, totaling approximately 79 acres. A large portion of the stand has had no recent treatment, or in some cases, has never been treated since planting. Advanced regeneration from past treatments includes areas with pure white pine saplings as well as a mixture of white pine and deciduous hardwoods.

Stand 2 is a 65 acre red pine plantation located in ten distinct areas. The overstory consists mostly of mature red pine trees. Advanced regeneration of mixed hardwoods and white pine is present and ranges from adequate to very dense as a result of past silvicultural treatments and overstory mortality. The entire stand was treated with a "commercial thinning" in separate entries made in 1991, 1993, 1994 and 1997 respectively. Stand condition and tree vigor is declining at this time. Tree quality is fair to good. The mature overstory trees have reached their maximum productive economic age and have stagnated in growth. Since these trees are no longer growing vigorously, they are more susceptible to infestation and mortality from insects and disease. Red pine scale and diplodia tip blight have caused widespread mortality in nearby red pine stands that are in similar condition to this plantation. Mortality is present in sections, including patches of dead standing red pine, some of which have died in the recent past. The stocking level, or tree density, is moderate to high.

Stand 3 is a 1.6 acre Norway spruce plantation located in the north central portion of the property. The overstory consists of mature Norway spruce trees that were densely planted. Tree quality is fair to good and tree density is high. As a result, there is a lack of regeneration present in the understory. Stand condition and tree vigor is declining at this time. The mature overstory trees have reached their maximum productive economic age and have stagnated in growth. Since these trees are no longer growing vigorously, they are more susceptible to infestation and mortality from insects and disease.

Stand 4 is a 3 acre Scots pine plantation. The overstory consists mostly of poor quality mature Scots pine trees. This stand was essentially clearcut in 1994. There is a very low density of mature Scots pine that remains in the overstory. The current stand condition is a mixture of deciduous hardwoods, mostly oak (*Quercus spp.)*, birch (*Betula spp.)* and maple (*Acer spp.)* species that are regenerating the site and are generally between 5"- 8" diameter at breast height (dbh).

Stand 5 is a 139 acre white pine-hardwood stand located in ten distinct areas on the property. The overstory consists of a mixture of mature white pine and deciduous hardwoods. Northern red oak (*Quercus rubra)* is the most common hardwood in the overstory. Stand quality is fair at this time.

Portions of the stand contain white pine trees which have needles that are infected with needle blight pathogens. In the more recent past, separate portions of the stand were treated with a "commercial thinning", including strictly intermediate thinnings in which only firewood sized trees were harvested. These treatments took place in 1984, 1991, 1992, 1993 and 1994 respectively, totaling an estimated 46 acres. White pine quality is fair to poor. Red oak quality is fair to good. Regeneration in the understory consists of white pine and mixed hardwood seedlings and saplings. Tree density is moderate.

Stand 6 is a 66 acre white pine-hemlock stand located in two distinct areas on the property. The overstory consists of a mixture of mature white pine and hemlock (*Tsuga canadensis)* trees with inclusions of red oak and other deciduous hardwoods. Stand quality is fair at this time. Portions of the stand contain white pine trees which have needles that are infected with needle blight pathogens. Hemlock quality and health is good at this time. Hemlock woolly adelgid (*Adelges tsugae)*, although present, appears to be at a somewhat light infestation and hemlock health appears to be good at this time. There has been no recent forest management in this stand. Portions of this stand were planted to white pine (1931) and red pine (1932). There are no known records regarding management of the planted red pine or if the stand was successful at all. The white pine plantation continues to occupy a portion of the stand. The 1929 Forest Survey of Otter River State Forest shows much of this stand contained 4" – 8" dbh hemlock, poplar (*Populus spp.)*, maple, birch and oak species at a high crown density. Advanced regeneration in the understory contains a mixture of hemlock, white pine and mixed hardwoods.

Stand 7 is a 63 acre oak-hardwood stand located in five distinct areas on the property. The overstory contains a mixture of mostly oak trees with inclusions of white pine, red maple and other hardwood species. Tree quality is fair to good and tree stocking is moderate to high. Portions of this stand underwent a "commercial thinning" in 1991 and 1994, totaling an estimated 20 acres. Regeneration in the understory consists of white pine, oak and red maple seedlings and saplings. Portions of the stand contain a mature overstory. Other portions of the stand contain smaller, more densely spaced oak trees.

Aesthetic, Recreation, Wetlands, Cultural, Rare Species and Wildlife Considerations:

Aesthetic:

The Whitcomb Hill lot is located along a small portion of Route 68, however truck access is provided from Gavin Road in Templeton, MA for recreational users of the state forest. All aesthetic considerations will be made to legal recreational users of the state forest. Slash over 1" in diameter will be lopped to under 2 feet in height above the ground. Larger trees along the edges of trails will be retained. As mentioned in the DCR Management Guidelines for roads and trails, hazard trees will be harvested along the truck roads, skid trails and hiking trails. Harvester operation will be limited to times when ground conditions are stable. Directional felling to protect residual trees, wetlands, woods roads and trails will also be implemented.

Recreation:

There are many passive recreational uses of the Whitcomb Hill lot and surrounding protected lands (Birch Hill Wildlife Management Area, Lake Dennison Recreational Area, Birch Hill Flood Control Area). Hiking, mountain biking, cross country skiing, snowshoeing, hunting and fishing, equestrian use, dog sledding, swimming and legal snowmobiling are potential uses of this state forest. The project area will be closed to the public during active harvesting hours. There is a snowmobile trail that is permitted for use and maintained by the Coldbrook Snowmobile Club within the property. This trail will be utilized

during harvesting operations. Active harvesting operations will be planned to minimize impacts to recreational users as much as possible.

Wetlands:
There are several wetland resource areas and intermittent streams located on the property. Approximately five of these resource areas are listed as potential vernal pools by the Natural Heritage and Endangered Species Program (NHESP). All wetlands, potential vernal pools and streams will have appropriate buffers and filter strips as indicated in the Massachusetts Forestry Best Management Practices Manual (BMPs). These buffers and filter strips will be delineated in the field prior to harvesting. This will aid in directional felling away from these resource areas. No equipment will operate in streams, wetlands or wetland buffers except on pre-existing woods roads and trails or at designated crossings approved by a forest cutting plan.

Cultural Resources:
The Whitcomb Hill lot was reforested by plantings on lands which were cut over, burned over and agriculturally abandoned. There is a significant cultural history surrounding the state forest and within the state forest itself. "New Boston", once located in the vicinity, was a town hamlet that was abandoned when the ACOE took much of its land for flood control and management along the Millers River and associated tributaries. During construction of the flood control area, Route 202 and the railroad were moved to their current locations. Birch Hill Dam and associated Tully Dam (Royalston, MA) and their flood control areas prevent the downtown areas in the towns of Athol and Orange from flooding during high water events along the Millers River and its tributaries. There are many old town roads, cellar holes, wells, New Boston Cemetery and other historical features located in the area. There are five CCC built fire ponds located on the property. Additionally, there is a CCC fire pond just off the property boundary to the south off Gavin Road. There were no interior stone walls noted during the preparation of this proposal. Portions of the property boundary, particularly by the Templeton Developmental Center, are stonewalls. Otter River State Forest is the first established state park in Massachusetts and celebrated its 100th anniversary in 2015.

Carbon Sequestration
There are many acres of forestland at the Whitcomb Hill lot that have stagnated in growth, specifically in the plantations. Carbon has been stored in these trees since they were planted. The rate at which carbon is being stored in these stagnated trees with poor vigor is much slower than when the trees were first planted. By implementing a harvesting project, two important points can be made about carbon sequestration. The first is that wood products harvested from the Whitcomb Hill lot will produce permanent wood products and therefore will store the carbon that the harvested trees have sequestered in perpetuity. Lastly, harvesting overstory trees will create the growing conditions needed for regeneration to become established in the understory. This young tree growth will rapidly absorb carbon in the forest.

Rare and Endangered Species
A review of the Natural Heritage and Endangered Species Program (NHESP) atlas shows that there is a small priority habitat area for rare species located along the Otter River in the far northeastern corner of the property. NHESP will review the project prior to any harvesting to determine if any limitations or modifications will be required.

Wildlife

There are signs of deer, moose and turkey using this area. Moose and deer browse are not problematic for the regeneration at this time. Pileated woodpecker sign was observed throughout the project area. Large and small mammals and numerous bird species are assumed to utilize the project area. Ring-necked pheasants are stocked regularly within the vicinity and additional hunting for native game birds is a common activity. Rabbit are common in the area as well. As outlined in the DCR Management Guidelines, selected large trees will be reserved as wildlife trees. Snags, dead trees and coarse woody debris (CWD) will be retained for habitat as well. Browse for wildlife will be enhanced during the harvest and for many years after the harvest as regeneration becomes established. Mast producing trees such as black cherry and oak will be retained whenever possible. All potential vernal pools will be treated as certified vernal pools.

Silviculture:

The intent of this proposal is to evaluate the condition of the white pine over the entire property in order to prioritize management against the negative impacts that needle browning and canopy dieback due to needle cast pathogens have caused. The priority at this time is to recognize portions of the property that are most affected by these needle cast pathogens and initiate management that will either increase air flow around white pine trees that have been marginally affected or to harvest areas that are in imminent threat of mortality. It is likely that 2-3 timber sales will be implemented over the course of 5 years to treat the entire property. At this time, stands 1, 2 and 3 are planned for harvest, totaling 274.6 acres.

The overall goal of this harvest is to regenerate mature non-native plantations of red pine, Norway spruce and Scots pine and a native plantation of white pine that are losing vigor and in some cases succumbing to a combination of insect, disease and competition induced mortality to a forest that is dominated by a diversity of species which are vigorous in growth.

The primary goal of this project is to remove a portion of the overstory to allow sunlight to reach the forest floor in order to regenerate stands that are currently lacking structural diversity and a younger age class, to partially release advanced regeneration and to remove the declining overstory trees. Conversion of red pine, Norway spruce and Scots pine plantations to native stands comprised of a diverse mix of native tree species are also a primary goal. Similarly, the goal for the white pine-hemlock, white pine-hardwood and oak-hardwood stands are to create a new age class that contains a more diverse mixture of native species while also improving the vigor of the overstory trees. White pine and other hardwoods, particularly red oak that are well adapted to droughty conditions are preferred for this site. Enhancing and diversifying the structural and vegetative diversity of these stands is also a primary goal of this project.

Even-aged silvicultural treatments in the red pine plantation in the 1990's began the regenerative process of the plantation. The "commercial thinnings" as described in the cutting plans from the 1990's essentially describe the first cut in the even aged shelterwood regeneration system. The shelterwood system gradually reduces the overstory stand density in a series of thinnings in order to fully regenerate the stand over time. Advanced regeneration present in areas of the plantation is adequate, growing vigorously and ready to be partially released at this time. Enough of the overstory in each stand will be harvested to reduce the stocking level from high to medium-low. This will allow for an increase in available sunlight and moisture in regards to advanced regeneration.

It is unlikely that any work is to be prescribed in the Scots pine plantation, stand 4. The stand was described and mapped in this proposal to give context to the stands past management. The Scots pine plantation was originally 6 acres prior to its clearcut in 1994.

Stands 1, 2 and 3 will undergo a combination of even aged and uneven aged management. A combination of the shelterwood regeneration system, group selection and patch clearcutting will be implemented. Openings up to 5 acres in size will be implemented with DCR Commissioner approval. The shelterwood system will be implemented in areas that will partially release advanced regeneration. Openings that vary in size from 1/3 acre to 5 acres will be implemented, particularly in stand 1. At this time, this stand is in such poor quality and condition that the overstory trees will respond poorly if at all to any treatments which thin the overstory. Creating openings in these stands will create the light requirements for tree species that are mid-tolerant and intolerant to shade (white pine, red oak, birch and maple) than the more shade tolerant species (beech, hemlock). It is anticipated that by varying the opening sizes, species diversity will be enhanced from the current condition. Patch clearcuts exceeding 2 acres in size will be implemented in areas of the forest that are near areas of mortality, encompass areas of mortality or expand areas that have been clearcut in the past, such as the Scots pine plantation.

Stands 5 and 6 will also be treated with a combination of even aged and uneven aged management systems. A combination of the shelterwood regeneration system, group selection and patch clearcutting will also be utilized. It is anticipated that portions of these stands contain vigorously growing white pine trees with large, healthy crowns. Although they may be affected by the needle blight pathogens, they might respond positively to a thinning which would increase air flow around the white pine trees. It is thought thinning stands which are affected by needle blight pathogens could counteract some of the negative effects of the needle blight.

Stand 7 will be treated with a combination of the shelterwood regeneration system and group openings. The primary goal in this stand will be to enhance species diversity, increase vigor in overstory trees and begin the regenerative process in the stand.

Sale Layout and Harvesting Limitations:

There is one potential landing site identified at this time. Additional landings will be created if necessary to reduce skidding distance. Providing multiple options to the harvester will allow for better access and resource protection at the state forest.

Access from Gavin Road is excellent, although the dirt roadway leading to the state forest is in fair condition and would have to be improved for trailer use. It is currently unclear if Gavin Road (off pavement) is a legally discontinued town road or if it is an abandoned town road. There are several interior roads available for trucking and skidding (see Project Map). Most of the pre-existing skid trails and woods roads will be utilized as primary skid roads during the harvest. Secondary skid trails will be created when necessary to access parts of the project area that do not already have access. Trees will be cut up to the edges of roads and trails to lessen hazardous tree presence where necessary.

All wetland resource areas as well as no-cut areas will be delineated using paint in the field. This will indicate that machinery should not operate within the buffer and trees should be felled away from the buffered area. At this time, it is unknown if stream or wetland crossings will need to be created. If it is determined that a crossing is necessary, BMP's will be used to lessen the pressures on wetland resource areas. Wetlands will be buffered with a 50-foot no cut area except in situations where hazardous trees

are present along roadways and trails and on pre-existing roads and trails. All potential vernal pools will be treated as certified vernal pools.

A whole tree logging system or a cut to length logging system will be utilized for this project. There is a significant amount of low quality wood present within this proposed project. A whole tree system will better utilize larger volumes of low quality wood than a cut to length system. The stand exam will determine an estimated volume of this low quality wood. If a whole tree logging system is used, the sale will be laid out in such a way that an average of two cords of CWD per acre is retained onsite.

The project will take place when the ground is dry, frozen or otherwise stable. The well drained soil conditions of this site will prove to be very stable compared with other more moderate to poorly drained soil types. Skid trails will be properly stabilized to prevent erosion and sedimentation with the use of water bars and/or slash where necessary. Winter harvesting would require some of the snowmobile trails to be plowed/sanded, weather permitting. This could prove problematic for local snowmobilers. Discussions to work out an agreed upon arrangement that will be beneficial for both this recreational group and moving the harvest forward will be worked out.

References:

Commonwealth of Massachusetts. Department of Conservation and Recreation. *Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines*. March 2012.

Attached: Topographic map showing project details. Locus map showing project location within regional context.

District Forester: [signature] **Date:** 2/7/17

Field Operations Team Leader
Or Park Supervisor: [signature] **Date:** 2-1-17

District Manager → ~~**Regional Director:**~~ [signature] **Date:** 2/7/2017

Management Forestry
Program Supervisor: [signature] **Date:** 2/13/2017

Otter River State Forest
Whitcomb Hill Lot
Project Map

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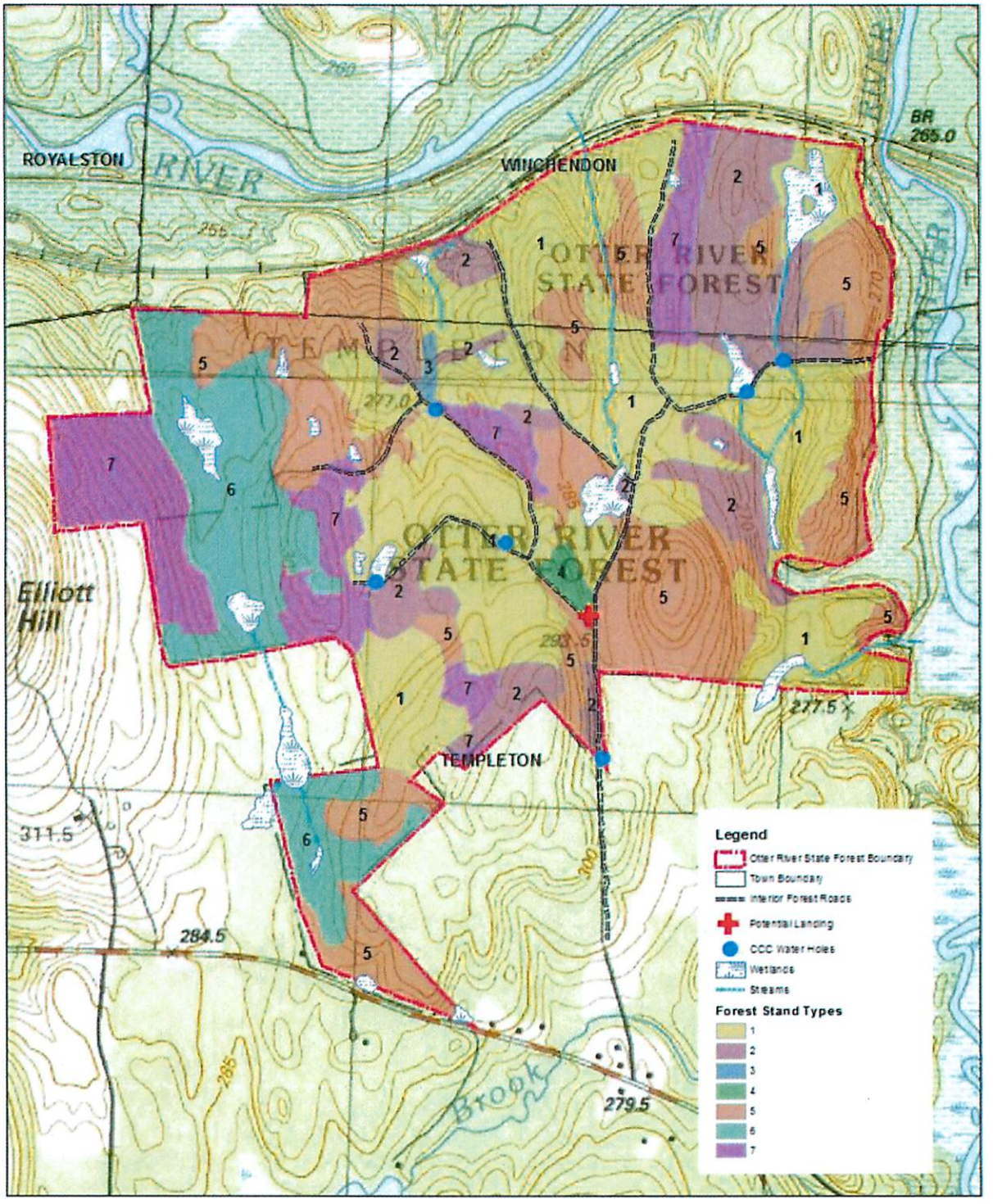
0 450 900 1,800
Feet



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Otter River State Forest
Whitcomb Hill Lot
Locus Map

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Feet