Massachusetts Department of Conservation and Recreation
Bureau of Forest Fire Control and Forestry
Forest Management Proposal
Name: Two Cubs Timber Sale

Date Posted:	**March 15, 2019**
End of Comment Period:	**April 29, 2019**
Region:	**West**
Recreation District:	**Mountain**
Forest Management District:	**Western CT Valley**
State Forest:	**Windsor State Forest**
Closest Road:	**Bush Road and Bush Cemetery Road**
Town	**Windsor and Savoy**

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Overview:

The Windsor State Forest Two Cubs Forest Management project is located on the Windsor State Forest in the towns of Windsor and Savoy. It consists of 13 forest stands located comprising of approximately 132 acres on Bush Road, Bush Cemetery Road, Windsor Bush Road, Ridge Road, and Lower Road. The focus of this project will be to treat softwood plantations that are in decline and encourage regeneration of native species. Biotic factors affecting these stands include root rot fungus (Armillaria spp.) which is contributing to the decline of the plantations and allowing other factors such as insects and wind to further compromise these stands. This project may be completed with one or multiple timber sales.

The guiding criteria to select this site for forest management are:

- There has been observed ongoing mortality of the overstory plantation Norway spruce and white pine
- The plantations are at risk for significant impending loss due to their age and recent abiotic (ice) damage.
- It offers an excellent opportunity to demonstrate and fulfill objectives for DCR Woodlands.
    - Restore and maintain native ecosystems
    - Create early successional forests

- Provide forest products to a regional economy

Goals of the Windsor State Forest Management Project:

- Regenerate native species within a currently even age plantation regime using even and uneven age silvicultural techniques.
- Demonstrate harvesting techniques and best management practices that protect forest productivity, soil and water resources.

Fulfill management approaches for Woodlands as directed by the Management Guidelines (2012).

- Manage conditions to promote early successional forest stages.
- Ecological restoration of non-native plantations to a more natural appearing forest community.
- Provide protection of forest productivity with state of the art sustainable forestry.
- Provide benefits to wildlife.
- Sequester carbon in retained overstory trees, permanent forest products produced from the harvest, and in the vigorous regenerating forest.

Stand Description:

Stand Information: There are 13 separate forest stands, approximately 132 acres, as identified in the Sewell Vegetation Classification map which groups the forest based on tree species, density and height. The plantations are clearly defined in aerial photos and in most cases have a known date of planting. The primary focus is the Norway spruce (Picea abies) and red spruce (Picea rubens) plantations, eastern white pine (Pinus strobus) plantations, mixed pine and spruce plantations and several eastern white pine-hardwood stands that lie adjacent to some of the plantations. These stands are all from the original plantings dating back to 1910 with the red and Scotch pine being established during the 1915 to 1921 period. The Norway spruce stands are high density, composed of mature stems that average 80 to 90 feet in height with an average diameter of 16-18". Some of these stands were treated with thinnings and strip-cuts but several of them have not been treated. The dense crown canopy blocks most sunlight from reaching the forest floor and as a result, only the most shade tolerant species such as American beech (Fagus grandifolia) survive in the understory. The white pine plantations are similar in size and density to the spruce plantations with the most important difference being a definite lack of quality and vigor. While the Norway spruce seems to thrive on this forest, the white pine exhibits extensive damage from ice and snow storms, such as multiple leaders and crooked stems, and has a coarse branched appearance which may be a result of the growing site quality not being suitable for the pine. The tree mortality in the mixed red and Scotch pine plantation has allowed native northern hardwoods to regenerate and become part of the overstory.

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 site history (land use; agriculture/logging) and conditions (soil types, productivity; vegetation cover) suggests lower soil and forest complexity. Even-aged forest management methods of regeneration are appropriate in this project but uneven age methods may be considered as a future goal.

Topography: The project area consists of ridgetop and rolling hills. Plantations were established on abandoned agricultural lands and in most cases these cleared areas were on moderately sloped to flat topography usually with good road access.

Soils: The two major soil types are Tunbridge-Lyman and Peru- Marlow. The Tunbridge soil is moderate to well-drained and the Lyman soils are excessively drained. These soils are very rocky and can be prone to drought depending on the depth to bedrock. They are usually found on the tops of hills and mountains. The Peru- Marlow soils are moderately well-drained, very stony and found on the crest and sides of glacial till uplands. (Excerpts from "The Soil Survey of Berkshire County Massachusetts" NRCS 1988).

Previous Silvicultural Treatments: Most of the 13stands have been managed in the past with a combination of pre-commercial and commercial thinnings, strip shelterwood and some patch cuts in the Norway spruce stands. Advanced regeneration is present in most of these treated areas.

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

Aesthetic: All slash will be dealt with in a way that meets or exceeds the regulations of Chapter 48 of MGL, the Massachusetts Slash Law. There are no formal trails or recreational areas within the project area. Main forest roads will have a 50% buffer for visual aesthetics.

Recreation: There is a developed day-use area and camping area, which is currently closed to the public, located in the southern section of the forest. The recreational opportunities consist of hiking, cross country skiing, hunting, mountain biking, fishing, bird watching and snow mobiling.

Streams and Wetlands: The Windsor State Forest drains into the Westfield River. There are multiple streams in the proposal area and several seeps are also present. Adequate filter strips will be implemented according to Chapter 132 regulations. Stream crossings will be minimized and existing culverts and bridges will be used when possible.

Cultural Resources: There are known cellar holes and wells in the project area. Stonewalls are present throughout the forest and the project area as this was former agricultural land. All cultural features will be protected to the standards outlined in the "Landscape Designations for DCR Parks and Forests: Selection Criteria and Management Guidelines". The timber sale project will be reviewed by DCR's archeological/cultural resource expert and any recommendations will be incorporated into the final silvicultural prescription.

Rare and Endangered Species: According to the Natural Heritage Endangered Species Program atlas, there are no known endangered species (animals or plants) in the proposed project area.

Wildlife: The gradual transition of the monoculture of Norway spruce and pine plantations to a mixed hardwood and softwood stand will add to both the diversity of tree species and wildlife. Within the project area 1-3 large trees per acre, preferably greater than 18 inches in diameter will be left that show characteristics favorable to wildlife such as large holes and dead branches; approximately 4 trees per acre 12 – 18" diameter will be left. Large dead snags that do not pose a

danger to the operator or general public will be retained. Large amounts of coarse woody debris (CWD) are present within the project area and will be maintained to favorable amounts (2-3 cords/acre) in order to provide habitat to both vertebrate and invertebrate species.

Sale Layout and Harvesting Limitations:

Project Access: Route 116 will provide access to most of the project area with southern portions exiting to route 9. Road and weather conditions will determine the best routes.

Landings: These will be located as needed and existing landings will be utilized when possible.

Forwarder Roads and Trails: Forwarder roads will be utilized to access the forest. These will also provide access to future harvests. Roads will be planned in advance of the sale in order to facilitate access of harvesting equipment. Future field work will be needed for actual road placement and this will determined by proximity to truck roads and stand silviculture.

Wetland and Stream Crossings: Stream and wetland crossings will be avoided whenever possible and crossed by using existing roads and culverts. Temporary bridges will be used when crossings are required.

Road and Trail Buffers: There are no authorized recreational trails to buffer and the existing state forest roads will be provided with a 50' buffer as needed.

Equipment Limitations: Timber harvesting equipment will be restricted to a mechanized cut-to-length system with the wood products being transported to the landing by forwarder. No ground skidding will be permitted. Hand –falling of larger trees will be permitted provided that proper directional-falling techniques are used to protect residual trees and any cultural resources.

Excluded Areas: None at this time.

Erosion and Sedimentation and Site Restoration: All forwarder roads/trails and the landings will be stabilized with water bars, and seeded and mulched according to the recommendations found in the "Massachusetts Forestry Best Management Practices Manual". Harvesting operations will be limited to dry, frozen or otherwise stabile soil conditions.

In Kind Services: Steel gates will be purchased to control unauthorized access by off-road vehicles. Several sections of state forest road are in need of grading, gravel and drainage.

Silviculture:

Silviculture Goals: The primary silvicultural goal is to begin the process of converting the spruce and pine plantations to northern hardwoods with a softwood component. A secondary goal is to promote tree species that are deep-rooted in order to establish a forest that is resistant to wind damage. A third goal is to modify / increase the structural diversity of the forest.

Methods Used To Accomplish These Goals: The plantations will be regenerated using irregular shelterwood, small patch cuts and large patch cuts up to 3 acres – a combination of uneven age and even age systems. All regeneration openings will retain single trees and patches of trees for habitat and structural diversity purposes. These systems utilize a series of small and large gaps to regenerate the forest. The focal point for these groups will be patches of existing northern hardwood regeneration and high quality northern hardwood and spruce crop trees. Patches of advanced spruce regeneration will also be released when they occur on areas with good site quality. Areas of the stand along the westerly and northern boundaries will be treated in a manner to reduce windthrow. This may consist of smaller openings or buffers if needed. A series of forwarder roads will be marked in advance in order to gain access to the groups and prevent any damage to either the crop trees or desirable regeneration. A mechanized cut-to-length harvester will be used to reach into these groups and areas of regeneration to remove trees designated for harvest. Also, in addition to the regeneration harvest cuts, the plantations will be thinned from below in order to remove small diameter overtopped trees in the areas which will not be a part of the group or patch openings.

Short and Long Term Desired Conditions: The immediate desired condition is the regeneration of desirable native species, release existing patches of regeneration and a series of forwarder roads establishing access to the plantations. Long term desired conditions include small and large gaps throughout the plantations filled with a mix of northern hardwood and red spruce regeneration and eventually, entire northern hardwood stands with a component of spruce and white pine. A long term desired condition would also be the creation of both vertical structural diversity and diversity among age classes represented in the stand. This would be present in the form of retained large trees, living and dead snags and a wide variety of age classes represented though out the forest. The irregular shelterwood/ patch cut system is flexible enough in its application that it can be used to eventually shift the stand to multiple age classes found in all-aged forests.

Future Silvicultural Treatments: The irregular shelterwood and patch selection systems will be used to re-enter the stand in another 10 to 15 years. Established regeneration will continue to be released by expanding the prior gaps and creating new ones to regenerate. The process of converting even-aged plantations to an all-aged forest will both lengthy and continuously ongoing. Once this structure becomes established then the entries at the stand can spread out to longer intervals. This will be based on periodic monitoring of the forest and adjusting the cutting cycle to accommodate rotation lengths and biological or environmental issues.

District Forester: _____ **Date:** 1/4/2019

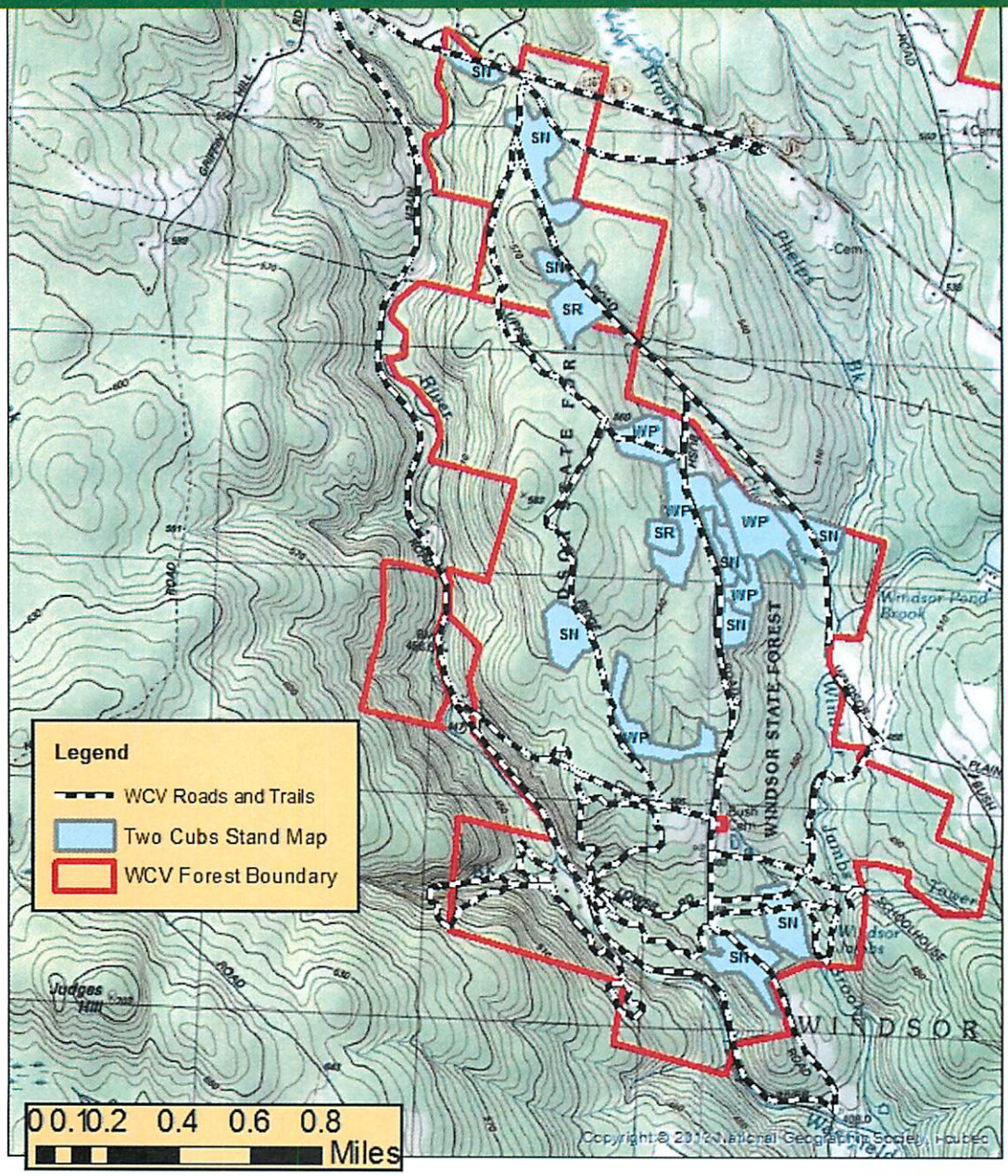
Field Operations Team Leader Or Park Supervisor: _____ **Date:** 1/7/2019

Regional Director: Dom F. Sacco **Date:** 12/27/18

Management Forestry Program Supervisor: _____ **Date:** 1/2/2019

Attached: Topographic map, Stand maps and Locus Map showing location of Forest Products Sale Area

Two Cubs Management Proposal
Windsor State Forest
Windsor and Savoy, Massachusetts
Proposed Stand Locations



Two Cubs Management Proposal
Windsor State Forest
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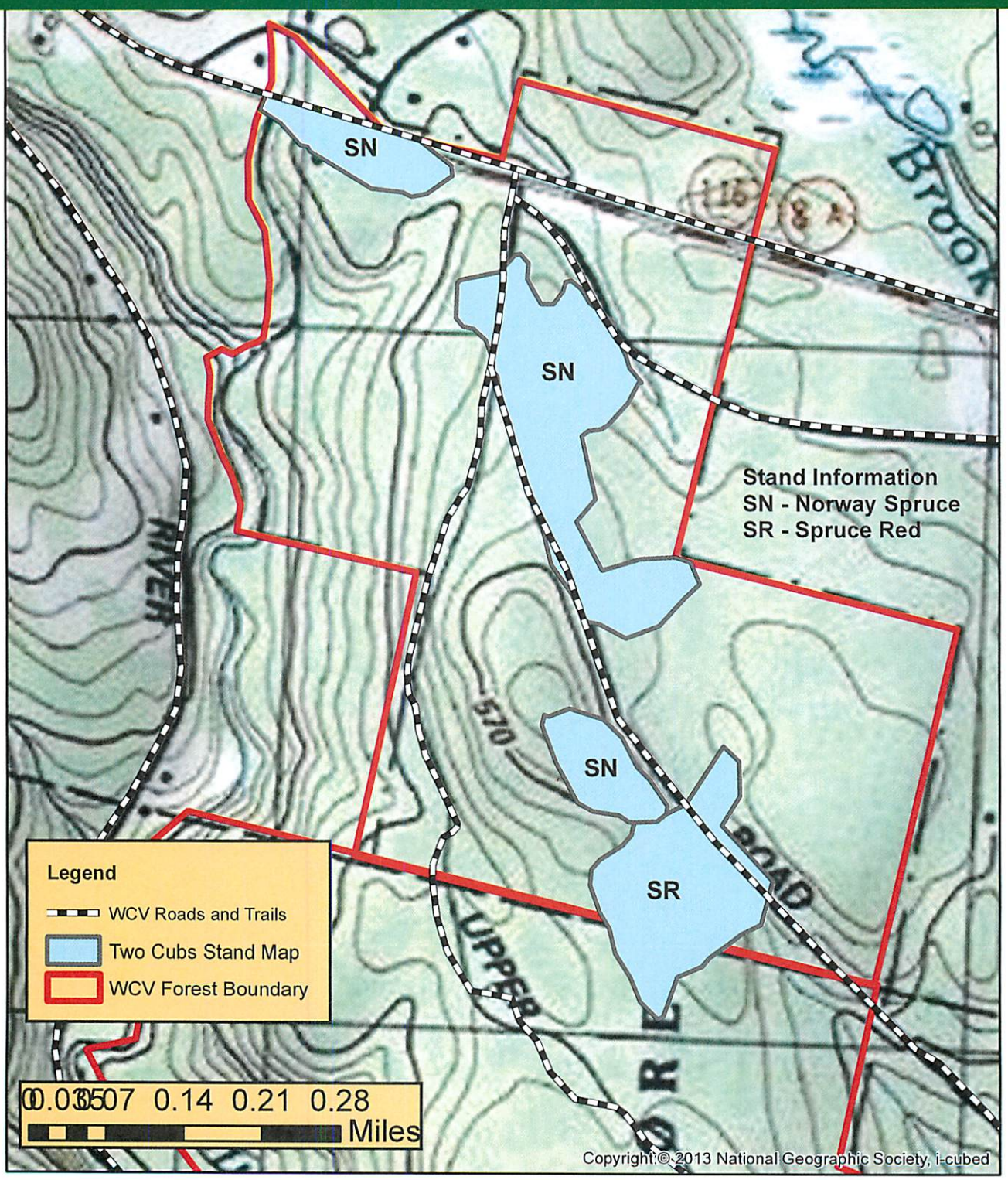
Proposed Stand Locations
North Section



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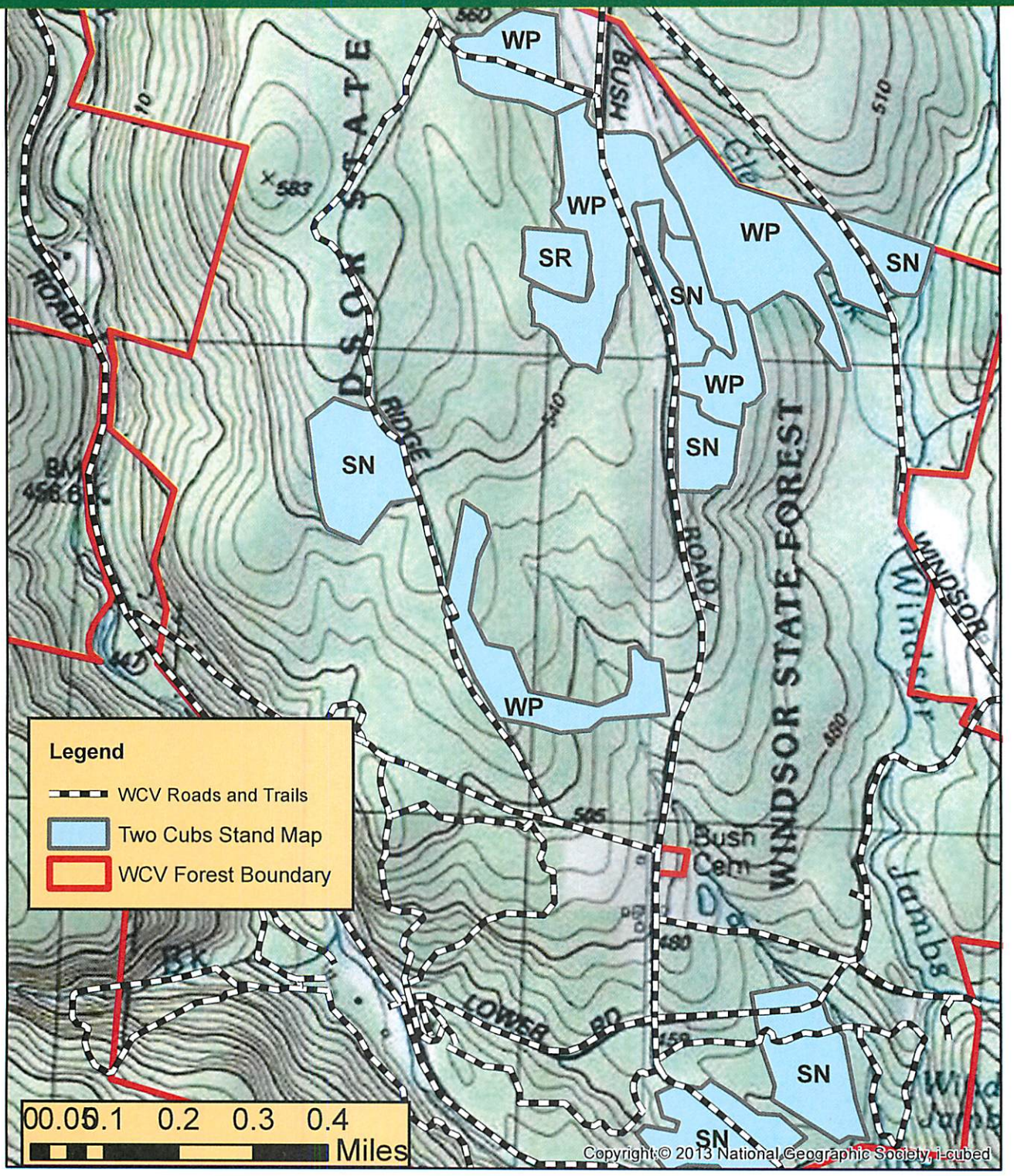
Proposed Stand Locations
South Section



Two Cub Timber Sale -Locus Map
Windsor State Forest
Savoy and Windsor, Massachusetts