Massachusetts Department of Conservation and Recreation
Bureau of Forest Fire Control and Forestry
Forest Management Proposal
Name: Red Pine Removal / Pine Barrens Restoration

Date Posted: **September 4, 2013**
End of Comment Period: **October 18, 2013**

Region:	**South**
Recreation District:	**Cape Cod.**
Forest Management District:	**Southeast**
State Forest:	**Myles Standish State Forest**
Closest Road:	**Several.**
Town	**Carver / Plymouth**

Contact Information:

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Overview:

The majority of introduced red pine (*Pinus resinosa*) plantations in Myles Standish State Forest are showing signs of infection by red pine scale, (*Matsucoccus resinosae*), as well as with diplodia blight, (*Diplodia pinea*). Outward signs of the combined insect and fungus attack are discolored and brown needles and in some plantations, complete tree mortality. It is currently a common occurrence in red pine plantations particularly in southeast Massachusetts.

The objective is to complete an ecological restoration of open pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) communities, which are often referred to as 'Pine Barrens'.

(http://www.mass.gov/eea/docs/dfg/nhesp/natural-communities-facts/pitch-pine-scrub-oak-commun.pdf)

These open natural communities are fire-adapted, and in the future prescribed burning will likely be employed to maintain these unique communities. Human effort to exclude fire in these pine barrens areas over the past half-century have favored growth of red pine and white pine over pitch pine and scrub oak. Many plantations of exotic softwood trees were established on former pine barrens habitat or are adjacent to existing pine barrens. The project also will protect and enhance public safety through the removal of dead and declining red pine trees, and through the reduction of fuels to reduce the risk of wildfire.

The Myles Standish State Forest ecological restoration project was selected for forest management at this time because:

- Non-native plantation removal is a high priority for pine barrens management in the 2011 resource management plan for the Myles Standish planning unit as well as in the 2007 Biodiversity of Myles Standish State Forest report from Natural Heritage and Endangered Species Program (NHESP).
- Red pine scale and diplodia blight have infected many of the red pine plantations.
- The red pine in the plantations is beginning to die rapidly, and in some cases entire stands are dead.

The Myles Standish State Forest ecological restoration project endeavors to:

- Restore native pitch pine-scrub oak barrens, pine barrens, to provide habitat for a diversity of endangered species.
- Protect public safety through the proactive removal of red pine trees along roads, forest roads, hiking trails, and paved bike paths.
- Reduce wildfire danger and provide safe access to firefighters and fire apparatus.
- Fulfill management approaches for Reserves as directed by the Forest Futures Visioning Process (2010) and subsequent Management Guidelines (2012). From page 20 of the Guidelines "... some situations may call for ecological restoration and vegetation management. Situations where some management may be appropriate include the removal of invasive species or for the protection of existing rare species. Fire adapted Reserves in Southeastern Massachusetts may require active restoration and management to maintain habitat for rare species and reduce the risk of catastrophic wildfire that can threaten human health and safety."

Stand Description:

There are several red pine stands located throughout Myles Standish State Forest. Many of these plantations were planted after large wildfires, principally after the 1938 and 1957 wildfires. Eastern white pine (*Pinus strobus*) and Norway spruce (*Picea abies*) plantations exist in the forest as well. The largest section of red pine plantations occur in the western portion of the forest, and were planted after the 1957 fire. Understory vegetation consists mainly of black huckleberry (*Gaylussacia baccata*), low bush blueberry (*Vaccinium angustifolium*), and scattered scrub oak. In some red pine plantations Norway spruce and/or white pine has seeded in from adjacent plantations. Norway spruce was also planted along side red pine in a few instances. The trees in the plantations range from 45 to 80 feet tall. Most of the red pine in the plantations are infected by the red pine scale as well as the diplodia blight as highlighted by the dying of needles seen on many red pine trees. In some cases, these two biological agents have killed entire red pine plantations. Many of the plantations are declining rapidly, going from no noticeable decline to dying in a matter of less than two years. Small rows of red pine are located along paved roads, forest roads, hiking trails, or paved bike paths.

Status Class	Acres
No signs of decline	108
Starting to show signs of decline	274
Heavily infested, all trees showing decline	150
Greater than 50% dead	44
Total	576

The soils of the red pine plantations are classified mainly as coarse sand or sandy loam that are excessively drained or somewhat excessively drained, respectively. The plantations are composed of gentle to rolling terrain. Approximately 131 acres of the plantations have had previous silvicultural treatments. These plantations will be evaluated to determine if previous skid trials and landings can and should be utilized.

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

Aesthetics:

As whole tree removal will occur, the resulting landscape will have a dramatic change in appearance as large clearings will be created. The removal of the trees will reduce fuel loads and prepare for future prescribed fire. It is expected that only a small amount of slash will remain on site after the trees are removed. Paved roads, forest roads, hiking trails, and paved bike paths adjacent to red pine plantations will be cleared of all debris following operations. Given the objective to enhance public safety, there will be no retention of road or trail buffers so as to reduce future risk of injury from falling dead trees or limbs. Visuals in the trail areas where harvest occurs will change from a forest canopy to an open shrubland savannah. Because red pines will be removed to promote native pitch pine, scrub oak, and shrubs the landscape view will change from a single species forest monoculture to a more diverse and native shrubland community.

Recreation:

Boating, biking, birding, camping, cross-country skiing, fishing, geocaching, hiking, horseback riding, hunting, picnicking, snowmobiling, snowshoeing, and swimming occur in Myles Standish State Forest throughout the year.

Several paved roads, forest roads, hiking trails, paved bike paths, and illegal trails are abutting or located within the proposed project area. These trails will be closed during harvesting activity. Legal trails will be reestablished once the project is completed. DCR Management Guidelines of 2012 state that all trails that interface with forest management will include a 50 foot wide corridor on each side of the road or trail. However, the Guidelines also state that if deemed appropriate by DCR and reviewed by the Forest Reserves Science Advisory Committee (FRSAC), removal of hazardous trees directly adjacent to official DCR trails and abutting properties may be allowed.

Wetlands:

The proposed project has one certified vernal pool within its limits according to the NHESP datalayers downloaded April 2, 2013, available from MassGIS. A few small isolated wetlands exist within the limits of the proposed project and a few small ponds are adjacent to the project. Massachusetts Forestry Best Management Practices concerning vernal pools and wetlands will be followed.

Cultural Resources:

Several charcoal pits and two stone lined wells, one being the certified vernal pool mentioned above, exist within the project area. A few grown over and abandoned forest roads/trails have been located as well. The project will have an archeological review and evaluation by DCR's archeologist.

Rare and Endangered Species & Wildlife

Most of the Myles Standish State Forest, including many of the red pine plantations, is mapped as NHESP priority habitats of rare species. The pitch pine-scrub oak barrens within Myles Standish provide habitat for a diversity of state-listed animals and plants, including 15 species of moths and butterflies, two tiger beetle species, and three species of plants. Most of these barrens species rely on habitat with an open vegetation structure, such as scrub oak shrublands and heathlands. A few of the "barrens" species prefer even more open habitat, perhaps more accurately described as savanna or sandplain grassland. Per the 2007 Biodiversity of Myles Standish State Forest report from NHESP, plantation removal of non-native species is the highest priority recommendation for pine barrens management.

Myles Standish State Forest is also an Important Bird Area (IBA) as designated by Mass Audubon. An IBA is a site providing essential habitat to one or more species of breeding, wintering, and/or migrating birds. The state forest is a significant breeding site for regional high conservation priority species such as: Whip-poor-will, Brown Thrasher, Prairie Warbler, Eastern Towhee, and Field Sparrow, all of which will benefit from the proposed treatment.

Invasive Species

Glossy buckthorn (*Frangula alnus*) is a non-native invasive deciduous perennial species that has been identified in the northeastern section of the State Forest under some of the red pine plantations as well as between the Barrett Pond campground and Halfway Pond Road. A glossy buckthorn vegetation management plan will be prepared in conjunction with this forest management plan.

Sale Layout and Harvesting Limitations:

The method to remove the red pine plantations will be whole tree harvesting and chipping, with all chips removed from the site to allow for future use of prescribed fire and/or mowing in maintaining the pine barrens habitat. From page 65 of the Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines (2012) "On DCR harvests this tool [Whole Tree Harvesting and Woody Biomass Removal] may be used in limited circumstances in order to:...Intentionally impoverish site conditions and reduce fuel loads when converting plantations on sand-plain ecosystems to native scrub oak, tree oak and pitch pine vegetation communities."

The project will begin within the calendar year in order that the rapidly declining red pine plantations can be harvested economically. Harvesting operations will start after the recreation season closes and then take place over the 6 month, fall and winter season before recreation begins in 2014.

The project will have multiple landings. Signs will be displayed to close the sale area during timber harvesting operations. Roads will be graded if damage, e.g. ruts, has occurred from timber harvesting operations. The state forest has an excellent network of paved and unpaved public and forest roads to easily enable access for this project.

Silviculture:

Short Term

The objective is to restore these stands to native woodlands or shrublands characterized by pitch pine, tree oaks, scrub oak and associated native shrubs. Many red pine plantations already have pitch pine scattered within the canopy and scrub oak, and native shrubland species underneath. Removing the red pine will result in an open shrubland habitat that will benefit a

variety of rare, declining, and common species. Red pine plantations with Norway spruce interspersed will have the Norway spruce removed as well. A small amount of middle to large eastern white pines exist in some of these plantations which will be removed to facilitate pitch pine barrens and scrub oak habitats. Small isolated red pine plantations not near paved roads, forest roads, hiking trails, or paved bike paths may be retained.

In evaluating the red pine plantations a few different scenarios were considered:

- Remove all red pine trees within two tree lengths of all roads, trails, and bike paths to address immediate safety concerns. This approach will not effectively restore the pine barrens, consists of many small parcels, and is neither economically viable nor ecologically effective.

- Remove only red pine plantations that are dead and heavily infested. This approach would restore the pine barrens vegetation in those areas. However, the low commercial value of the dead and dying trees makes this approach uneconomical because the Commonwealth would have to pay for the removal of the dead trees. This approach also ignores the high probability that the majority of the red pine in Myles Standish will soon expire.

- Include all red pine plantations for removal except those most isolated that have >50% mortality. This will restore pine barrens vegetation over a larger area. Removal of trees and plantations that have completely expired will increase project costs (negative value product). It is anticipated that this approach will be economically viable. This is the preferred option.

Approval from the DCR Commissioner will be required for openings above 1/3 acre that harvest all merchantable trees.

Long Term

This project will promote regeneration of pitch pine, scrub oak and heath vegetation. Future silvicultural treatments will be prescribed burning, mowing, and a combination thereof to kill white pines that typically sprout in such areas and to stimulate sprouting and growth of native shrubs. Active management using these methods will be planned in coordination with NHESP and done at variable frequencies and intensities to encourage a mosaic of pine barrens, shrublands, and woodland communities.

Approximately 469 acres of the total 576 acres are large enough and adjacent to existing pine barrens to warrant further management after the removal of the red pine. Taking into account the physical features of the plantations, along with aspect and the proximity to and vegetation type of the surrounding landscape, the plantations will be evaluated, partitioned, and categorized into three broad management groups with increasing amounts of overstory tree canopy: scrub oak shrubland (typically <5% overstory canopy), pitch pine–scrub oak community (typically 5-10% overstory canopy), and pitch pine woodland (typically about 50% overstory canopy). Due to these 469 acres coming under more direct management, a concerted effort will be needed to maintain these natural communities.

The scrub oak shrubland areas are existing valleys and isolated frost pockets in the landscape. Having an open vegetation structure in these areas will allow cold night air to drain

into these landscape features to perpetuate a microclimate of a shorter growing season, late spring frosts, and persistence of shrubs, heath, and grass species. The pitch pine-scrub oak communities have an open canopy of pitch pine and dense areas of scrub oak along with patches of black huckleberry, lowbush blueberries, bearberry (*Arctostaphylos uva-ursi*), and lichens. The pitch pine woodland consists of a canopy of pitch pine and tree oaks with low bush blueberries, black huckleberry, and other heath shrubs. The remaining 107 acres of the total 576 acres were either too small or isolated from existing pine barrens and do not warrant future active pine barrens management.

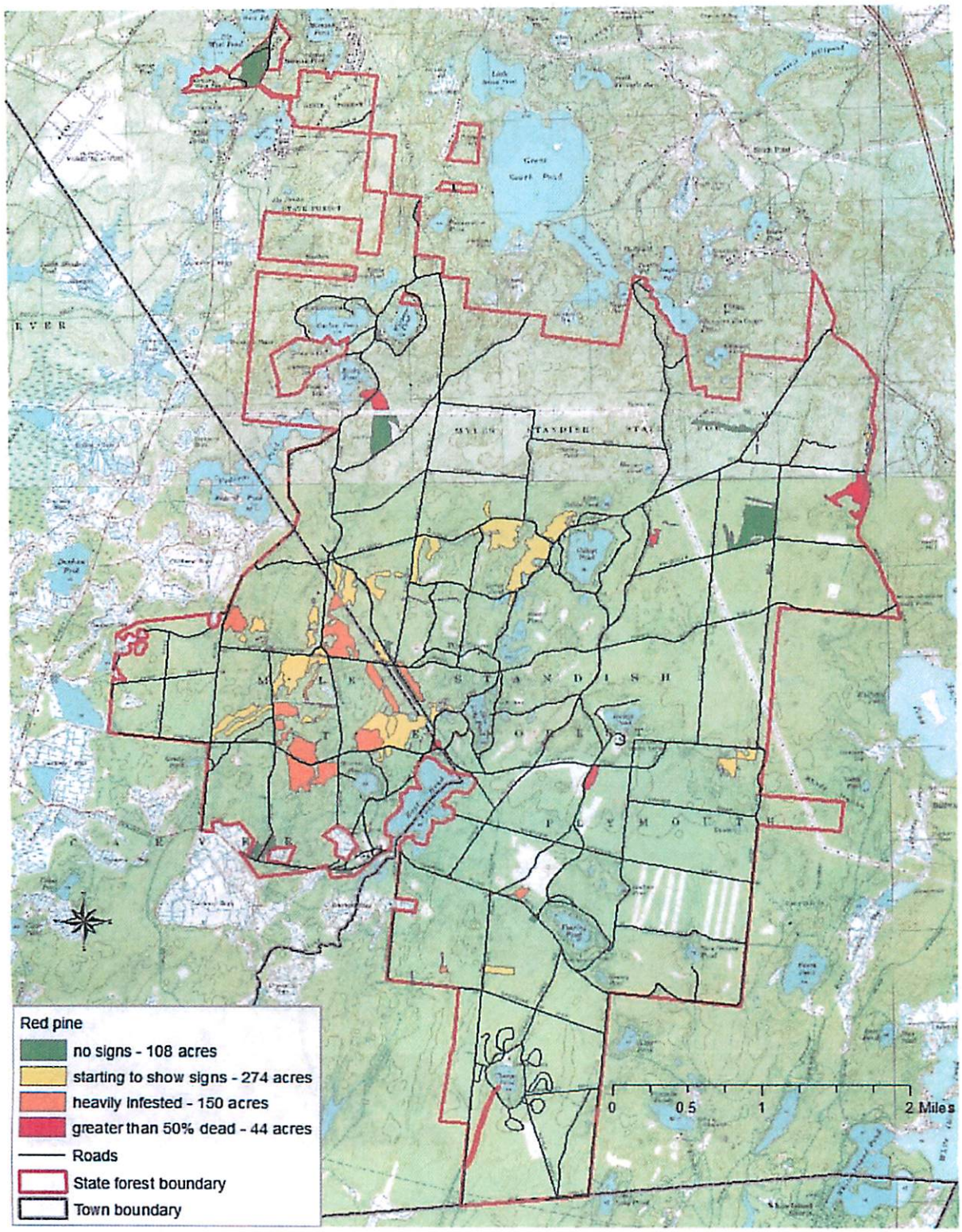
District Forester: Paul Gregory **Date:** 8/28/13

Field Operations Team Leader Or Park Supervisor: John C Roberts **Date:** 8/29/13

Regional Director: [signature] **Date:** 8/29/13

Management Forestry Program Supervisor: [signature] **Date:** 8/30/2013

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


Red pine
no signs - 108 acres
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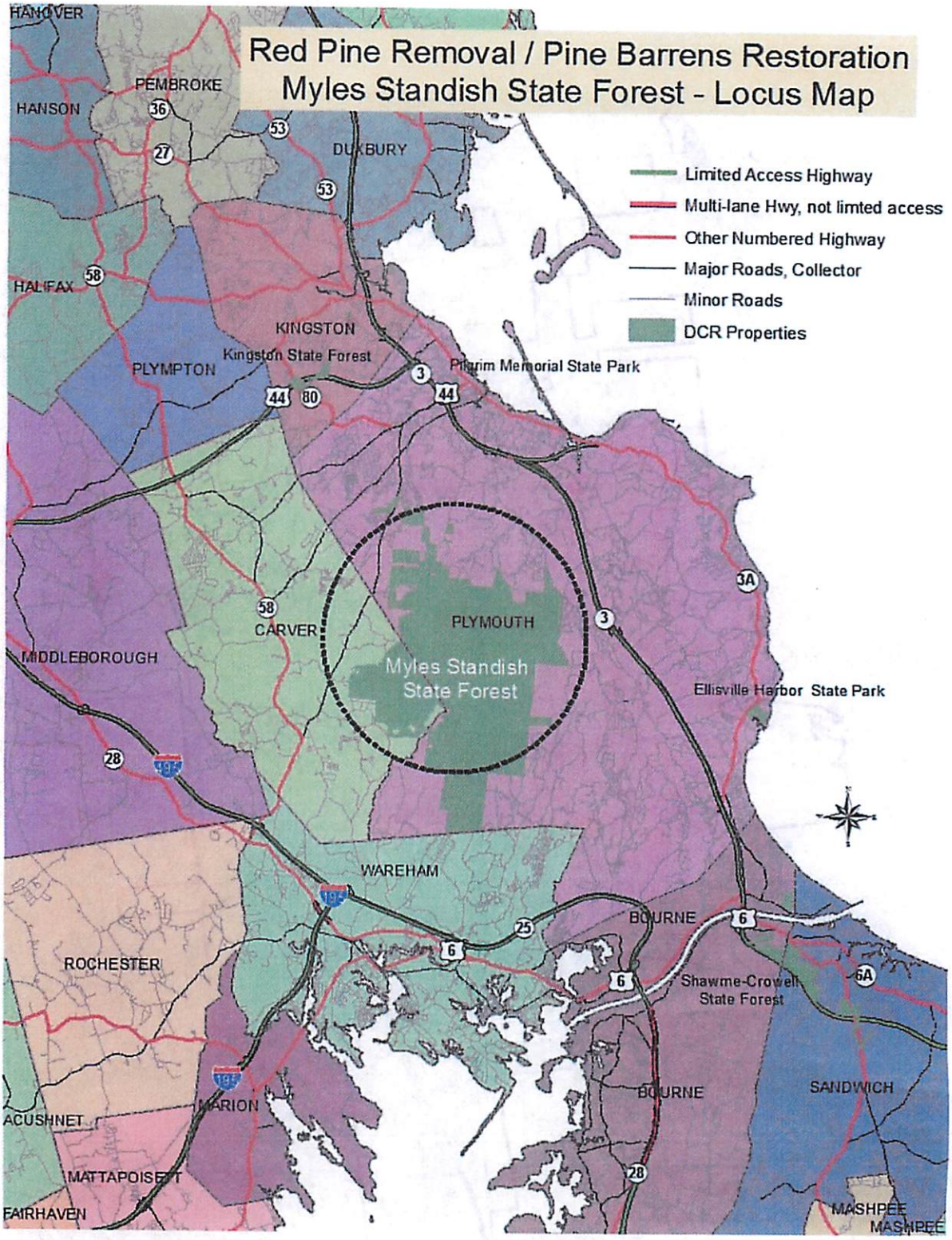
heavily infested - 150 acres
greater than 50% dead - 44 acres
Roads
State forest boundary
Town boundary
0
0.5
1
2 Miles


Red Pine Removal / Pine Barrens Restoration
Myles Standish State Forest - Locus Map
Limited Access Highway
Multi-lane Hwy, not limted access
Other Numbered Highway
Major Roads, Collector
Minor Roads
DCR Properties
HANOVER
PEMBROKE
HANSON
DUXBURY
HALIFAX
KINGSTON
Kingston State Forest
PLYMPTON
Pilgrim Memorial State Park
CARVER
PLYMOUTH
Myles Standish
State Forest
MIDDLEBOROUGH
Ellisville Harbor State Park
WAREHAM
BOURNE
ROCHESTER
Shawme-Crowell
State Forest
MARION
SANDWICH
ACUSHNET
MATTAPOISETT
FAIRHAVEN
MASHPEE