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

Date Posted: **March 15, 2019**
End of Comment Period: **April 29, 2019**

Region: **Central**
Recreation District: **Central Highlands**
Forest Management District: **Northeast**
State Forest: **Townsend State Forest**
Closest Road: **Barker Hill Road**
Town **Townsend, MA**

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Overview:

The Barker Hill Lot was selected for a forest management project in order to build upon previous forestry projects conducted by the Commonwealth of Massachusetts Bureau of Forestry. The proposed project is located off of Barker Hill and Dudley Roads in the westerly part of Townsend State Forest.

The Barker Hill Lot was selected as a proposed forestry project at this time because:

- Regeneration is lacking in hardwood and white pine (*Pinus strobus*) stands due to interference from Mountain Laurel (*Kalmia latifolia*).
- Red pine (*Pinus resinosa*), in plantations are susceptible to fungal and insect pathogens that cause rapid mortality of the pine.
- Seedlings established in the pine plantation during previous treatments are of the size and condition to be released to grow into the forest canopy.
- There is an opportunity to provide Woodlands ecosystem services that as directed by the Forest Futures Visioning Process (2010) and subsequent Management Guidelines (2012). Examples include:
    - Sustainable production of renewable wood products for the local forest products industry.
    - Sequestration of carbon through the production of solid wood products, retention of woody material of all sizes, retention of large legacy trees in reserve areas, and an energetically regenerating forest of native species.
    - Creation of diverse habitats that benefit native wildlife and build forest resilience to stressors.

The major objectives for this project are:

- Remove red pine susceptible to the fungal pathogen diplodia blight (*Diplodia pinea*), and red pine scale (*Matsucoccus resinosae*), and releasing white pine and native hardwood species established during previous silvicultural treatments.
- Use multiple age (expanding gap irregular shelterwood) management techniques to release and establish regeneration thus increasing species and age diversity within project areas.
- Increase the vertical and horizontal structure of forest stands to benefit local wildlife.

- Provide food sources for native wildlife.
- Demonstrate Best Management Practices (BMP's) that protect water and soil resources.

Project Area Description:

The proposed ±90 acre project area consists of 2 stands that are even aged (± 85 years old). The overstory trees located within Stand1 (±40 acres) range from small sawlog (11" to 14" diameter at breast height (DBH)), medium (15" to 19" DBH), with scattered >20" DBH specimens found throughout the stand (topographical detail map 1). The red pine growing within this stand are not uniformly distributed. Instead, they are in small homogenous groups throughout the stand. Previous silvicultural treatments have established an excellent cohort of white pine seedlings under the red pine and white pine overstory ready for release. In areas of a pure white pine overstory, previous treatments established regeneration, but most have succumbed to mortality due to overstory shading, along with damage from ice and snow events leaving scattered pockets of white pine and mixed hardwood regeneration in the understory.

The overstory trees located within Stand 2 (±50 acres) are pole sized (5" to 11" DBH) to sawlog size with some larger specimens in the stand (>16" DBH). This stand has thick patches of mountain laurel throughout essentially shading out any tree regeneration. In areas where gaps have formed in the canopy due to wind throw, or natural mortality of overstory trees, and mountain laurel is not as thick, white pine, red maple (*Acer rubrum*) and black birch (*Betula lenta*) have seeded in. Part of this stand was acquired in 2011 from a developer. The remains of old stumps indicate that some forestry operations occurred on this property prior to State ownership, however no records of any management plan for this parcel have been discovered. There are the remnants of septic field test pits scattered around the parcel as originally it was slated for housing development.

These forest stands are a result of the forest that grew up either through direct planting by the Civilian Conservation Corps (Stand 1) or naturally seeded trees that grew on the site following agricultural abandonment (Stand 2) or forest fires. Anthropogenic and naturally occurring fires are documented throughout this area. The last fire event in this area burned several acres along the northwest section of Stand 2.

The tree species present in the project area include: white pine and red pine, along with hardwood trees consisting of red oak (*Quercus rubra*), black oak (*Quercus velutina*), white oak (*Quercus alba*), black birch, white birch (*Betula papyrifera),* black cherry (*Prunus serotina*), and red maple. Occasionally observed trees found in and around the project areas consist of species such as pitch pine (*Pinus rigida)*, white ash (*Fraxinus americana*), American beech (*Fagus grandifolia*), shagbark hickory (*Carya ovata*), and eastern hemlock (*Tsuga canadensis*). Some American chestnut (*Castanea dentata*) sprouts and saplings were also noted in the project area

The understory of the stands consists of: Mountain laurel, witch-hazel (*Hamemelis viginiana),* low bush blueberry (*Vaccinium angustifolium)*, sheep laurel (*Kalmia angustifolia*), high bush blueberry (*Vaccinium corymbosum)*, partridge berry (*Mitchella repens*), Canada mayflower (*Maianthemum canadense),* dewberry (*Rubus flagellaris*), huckleberry (*Gaylussacia sp.*) along with various ferns, shrubs, and grasses.

DCR Management Guidelines state the forest stands will be classed and considered for silvicultural treatments that generally fit their productivity, structural complexity (or potential thereof), and diversity. Analyzing the site productivity and complexity using geographic information system (GIS) data layers of prime forest soils, potential vegetation complexity, late successional potential, forest diversity, early successional potential, continuous forest inventory (CFI) site index, and CFI stand structure imply low to moderate productivity of these forest stands. Forests with this type of productivity levels lend themselves to both even aged and uneven aged silvicultural systems.

Topography:
Elevations range from approximately 350 to 500 feet, with the terrain best described as rolling with occasional steep sections with a south and south-west aspect.

Soils:
The soils in the project area are typical of this area of Middlesex County and are of the glacial outwash and glacial till types. The soils are of a sandy-loamy nature (Mantauk series) with many stones and boulders present in the project area (Hollis and Charlton rock outcrop series). Soil productivity is moderate to good with site index ratings of 55 (Hollis and Charlton series) and 75 (Mantauk series) for white pine respectively.

Previous Silvicultural Treatments:
Review of records dating back to 1982 note that Stand 1 was treated on three separate occasions with two thinnings and one biomass harvest. Stand 2 has not had any forestry operations conducted since acquisition by the State.

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

Aesthetic:
As outlined in the Management Guidelines Document, forest management activities will be designed to promote native vegetation, retain large diameter trees, promote species diversity and provide a safe experience for users. Legal recreational users of the State Forest will be given proper consideration during project implementation by marking trees for removal on one side within 50 feet of trails and roads to minimize aesthetic impacts. Slash will be kept low (< 2 feet), away from trails, and run over or otherwise treated to promote rapid decomposition and a light appearance. All slash will be treated to comply with current Massachusetts Slash Law regulations. Landing areas will be seeded at the cessation of operations to rapidly re-vegetate disturbed areas.

Recreation:
Hiking, mountain biking, and hunting are the most prevalent activities in this area of the forest. The few trails that are located within the project area are sparsely used as there are no areas to park vehicles for access. The project area will be closed to the public during operational hours and activities will be timed seasonally to minimize impacts to recreational users as much as possible.

Wetlands:
Located within the project area is one wetland complex and one intermittent stream (see detail map). There are no potential or certified vernal pools in the project area according the Natural Heritage and Endangered Species Program (NHESP) GIS data layer.

The project area is located within the Squannassit Area of Critical Environmental Concern (ACEC). ACEC areas provide protection to public and private groundwater supplies, provide flood control, and protect valuable fisheries and important wildlife habitat. A 50 foot no cut buffer from intermittent streams and wetland resources will provide protection to these valuable areas. All resource areas will be mapped, flagged, and painted in the field in accordance with filing a MGL Chapter 132 Forest Cutting Plan for this project with the Massachusetts DCR Service Forestry Program along with simultaneous filing of the cutting plan with the local conservation commission. The Massachusetts Forestry BMP's are required by law to minimize adverse impacts on an ACEC. Impacts will also be minimized by restricting the project to times of year when conditions are favorable for harvesting. It is anticipated that only one stream crossing will be needed and that will be made with a temporary bridge that will be removed at project closing.

Cultural Resources:
Located within and around the project area are the remains of a few stone walls that document previous land use history. The walls are discontinuous and there is ample room for equipment to access the site without disturbing

them. No other cultural resources were located during field reconnaissance. All resources discovered during stand examination will be mapped and documented to protect their historical significance and consultation with the Office of Cultural Resources will take place prior to preparing a written prescription for the project.

Rare and Endangered Species:
Review of the Massachusetts Natural Heritage and Endangered Species Priority Habitat GIS data layer of the project area shows that there are no priority habitats for rare and endangered species in the project area.

Wildlife:
There is evidence of deer feeding and traveling within the project area. Other animal species that have been noted in the area are; black bear, coyote, beaver, opossum, turkey, chipmunk, squirrel, pileated woodpecker and a variety of other avian species. Anticipated impacts by these animals on regeneration should be minimal as opening up the forest canopy will allow grasses, forbs and other forms of browse to become more plentiful.

As per the 2012 Management Guidelines large size trees (18 inch diameter at breast height (DBH)) with wildlife cavities, live snags and known nest trees shall be retained. Large mast producing species will be retained and released where possible to provide food to native species. Within gaps wildlife trees will be targeted for retention. Fine and course woody material will be retained in forest stands to provide habitat and cover to wildlife.

The proposed project will provide positive benefits to native wildlife by increasing plant species diversity and vertical structure of the forest. Coarse woody material (minimum 256 cubic feet per acre) on the forest floor and retention of snags will benefit invertebrates, amphibians, and small mammal species that depend on them. Retention and releasing of mast trees (oak, hickory, and cherry) will benefit numerous bird and mammal species that utilize these sources of food as part of their diet as canopies of these species expand and produce more mast. The proposed project will have positive benefits to wildlife, however, the planned silvicultural treatments will provide little habitat to species that require substantial patches of early successional habitat.

Sale Layout and Harvesting Limitations:

Project Access:
Access to the project area will be off of Dudley and Barker Hill Roads. Existing woods roads will be used to haul forest products out of the project area.

Skid Roads and Trails:
Within project stands existing skid trails will be reused wherever possible taking care to avoid sensitive areas, steep slopes and minimize aesthetic impacts. Equipment skid trails will be laid out prior to harvesting operations with flagging and paint.

Landings:
Two potential landing areas have been identified (see detail map). At project completion landing areas will be seeded and straw mulched to rapidly establish vegetation to mitigate aesthetic impacts.

Equipment Limitations:
A cut to length harvester and forwarder will be required for this project to protect established seedlings from skidding damage.

Excluded Areas:
No harvesting will be allowed in filter strips or wetlands, with the exception of trees that may need to be removed at approved stream crossings for equipment access.

Erosion and Sedimentation:
Operations will be seasonally restricted to dry or frozen times of year to minimize impacts to the project area. Operations during "spring breakup" will not be allowed in order to prevent any soil rutting. At close of operations all skid trails will be stabilized as required in the latest edition of the Massachusetts Forestry Best Management Practices Manual. Landings and will be seeded and straw mulched at cessation of operations.

In Kind Services:
It is anticipated that in kind services will be in the form of access gates to prevent unauthorized access along with typical stone and gravel installation for truck access improvements.

Silviculture:

Primary and Secondary Goals for all Stands:
The primary goals for stands within the project areas are to establish and release regeneration within forest stands. Secondary goals are to provide habitat and food for native wildlife species. A third goal is to improve access for fire control and forestry.

Silvicultural Methods:
Stands 1 and 2 will be treated using an expanding gap variant of the irregular shelterwood silvicultural system. This type of system is one that has a long regeneration period with a continuous cover of trees. Small, randomly spaced, irregularly shaped gaps up to 1 acre are made in the canopy to encourage the regeneration process and over time these gaps are expanded creating a mosaic of age and size classes across the landscape.

Gaps in Stand 1 will focus on areas of pure red pine to release the white pine understory creating a stand with two distinct age groups. Gaps in Stand 2 will center on dominant or codominant oak and white pine that can provide a source of seed to establish regeneration. Outside of gaps in both stands trees will be thinned removing low vigor and low quality specimens to promote growth of the residual forest.

In areas of dense Mt Laurel harvesting equipment will be directed to cut, run over and otherwise treat thickets. Scarification to bare mineral soil in these areas will encourage tree regeneration.

Desired Future Conditions:
The desired future condition of these forest stands are seedling, sapling and pole size white pine and native hardwoods populating harvested gaps and growing into the upper canopy (Stand 1); and vigorous oak and pine seedling regeneration in harvested gaps (Stand 2). A healthy forest of native tree and shrub species that provides habitat and food for native wildlife is the overall desirable future condition in the project.

Anticipated Future Treatments:
Follow up monitoring of regeneration response will be conducted within five years after harvest to measure success. The possibility exists to enhance the oak-pine forest type of Stand 2 with prescriptive fire. If the opportunity to use this management technique presents itself a separate burn plan may be developed for the site.

District Forester: _____ **Date:** 12/17/18

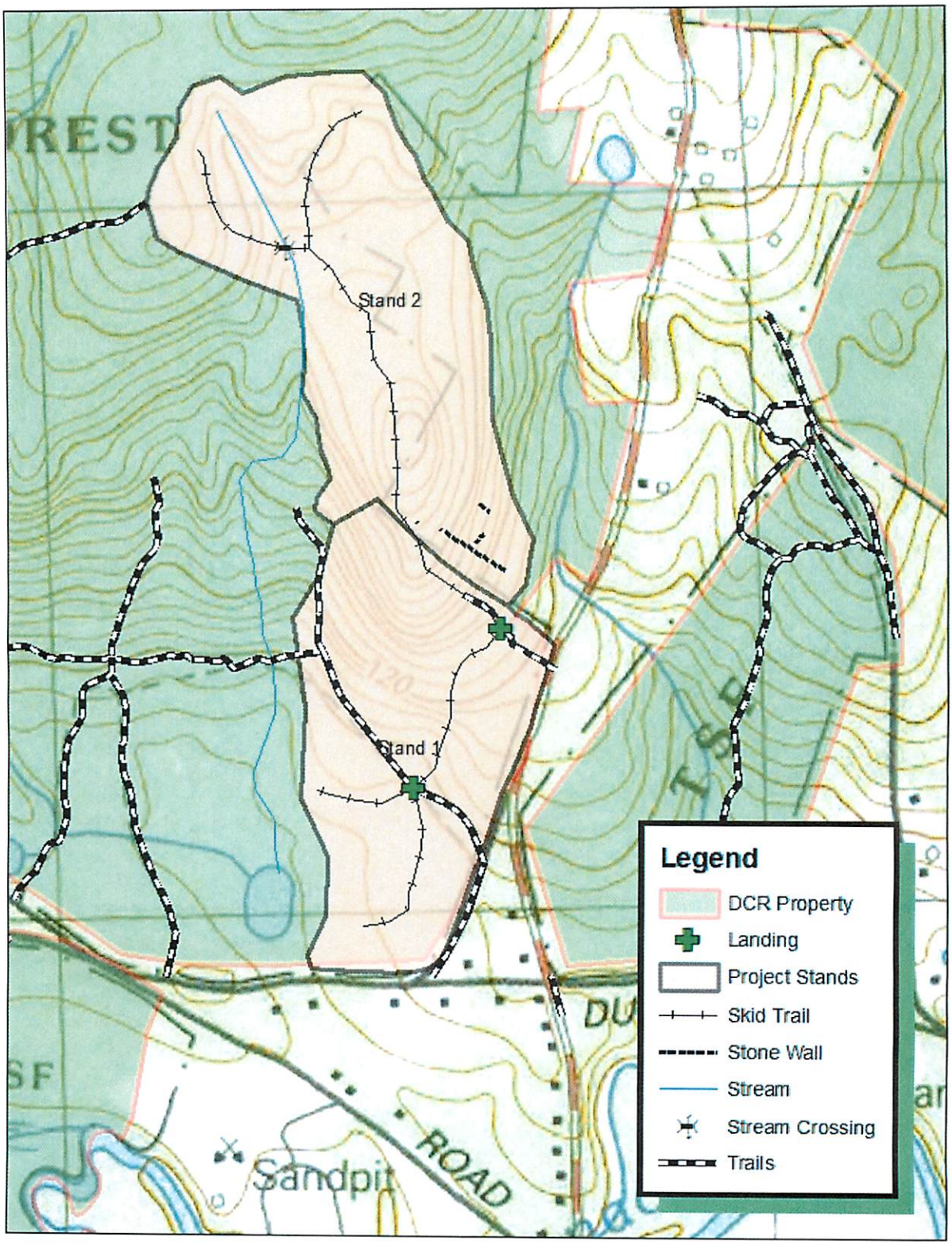
Field Operations Team Leader
Or Park Supervisor: _____ **Date:** 12/18/18

Regional Director: _____ **Date:** 1/2/19

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

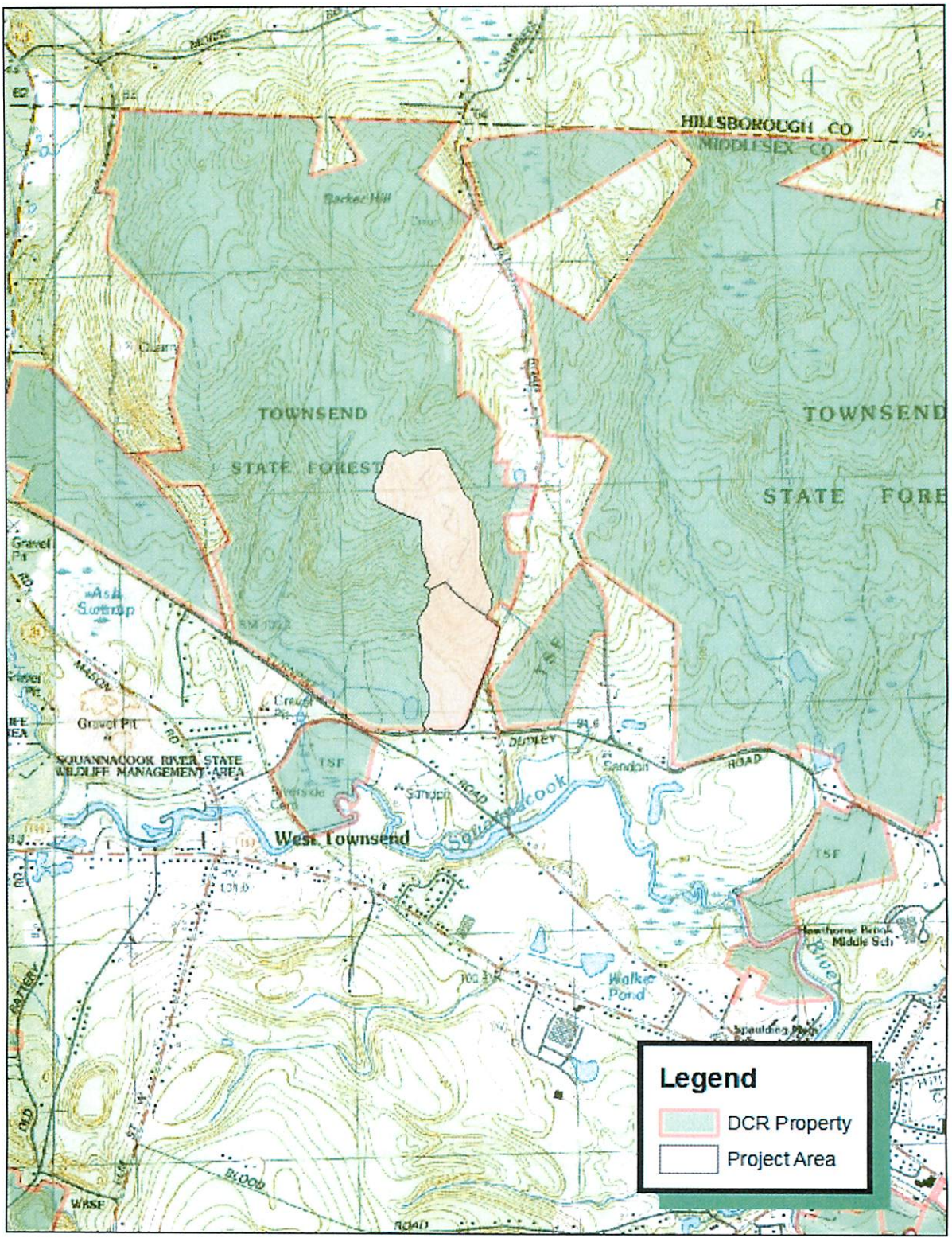
Attached: Topographic maps showing project details. Locus map showing project location within regional context.

Barker Hill Lot-Detail
Townsend State Forest
Townsend



Topographical Detail Map-1

Barker Hill Lot-Locus
Townsend State Forest
Townsend



MJW 11-8-18

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Feet

Topographical Detail Map-2