Meshomasic State Forest

Diamond Lake Block Forest Management Plan

Forest Ecosystem Health & Diversity

The Diamond Lake Block contains healthy and diverse forest ecosystems of oak/hickory ridges, red maple bottomlands and mountain laurel thickets that provide highly functional, valuable and resilient habitats for plants and animals.

Climate Change Mitigation through Sequestration and Storage

Climate change is an important global issue. The management of the Diamond Lake Block provides the opportunity to sequester and store carbon, through sustainable forest management, in vegetation and long-lived wood products.

Economic Benefits

The following plan outlines timber harvesting activity on 524 acres, the production of maple syrup from a 500 tap sugar bush as well as the harvesting of mountain laurel boughs annually for Christmas wreaths. These sustainably harvested forest products provide jobs and local goods that are sold in the local economy.

Forest Protection

The plan addresses threats such as wildfire, extreme weather events, invasive plants and insects and unauthorized use. Management strategies are outlined for each of these threats to protect this valuable public forestland asset.

Wildlife Habitat

Meshomasic, a Native American term for “a place of many snakes.” The timber rattlesnake is endangered in Connecticut. Forest management practices in this forest are implemented to benefit this species.

Recreational/Health Benefits

The Blue-Blazed Trail provides four miles of scenic trail, traversing Meshomasic, providing recreational opportunities and a place to explore in a healthy and active way.

Encouraging Mature Forest Growth

26%, 598 acres, of the Diamond Lake Block is protected under the Old Forestland Management Site (OFMS) classification, ensuring the most remote and sensitive areas of the forest will remain wild and unaltered by humans. This will encourage mature forest growth within this block of forestland.

STATE OF CONNECTICUT

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION

Bureau of Natural Resources

Division of Forestry

FOREST MANAGEMENT PLAN

2021 through 2031

Meshomasic State Forest
Diamond Lake Block

2,293 Acres

Glastonbury & Marlborough

Approvals:

1/15/2021

Christopher Martin, Director Date
Division of Forestry

1/15/2021

Rick Jacobson, Bureau Chief Date
Bureau of Natural Resources

1/21/2021

Mason Trumble, Deputy Commissioner Date
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Contents

Introduction

Connecticut is the 14th most forested state in the United States with approximately 60% forested cover. It is also the 4th most-densely populated state in the country. These two factors create a unique and challenging environment to develop meaningful and effective resource management strategies that will meet the needs of its citizens while protecting and enhancing its natural an ecological resources.

The 2021 – 2031 Meshomasic State Forest, Diamond Lake Block Management Plan incorporates priorities and specific strategies developed for Connecticut's forests within the 2020 Connecticut Forest Action Plan, an implementation guide for broad statewide forest management strategies based on three national priorities;

1. Conserve and manage working forest landscapes for multiple values and uses;
2. Protecting forests from threats; and
3. Enhancing public benefits from trees and forests.

The following objectives were considered in the development of the Meshomasic State Forest, Diamond Lake Block Management Plan with considerable site-specific input provided by the DEEP, DEEP partners and various user groups.

1. **Forest Ecosystem Health and Diversity** – The Diamond Lake Block contains healthy and diverse forest ecosystems of oak/hickory ridges, red maple bottomlands and mountain laurel thickets that provide highly functional, valuable and resilient habitats for plants and animals.
2. **Wildlife Habitat** – Meshomasic, a Native American term for "a place of many snakes." The timber rattlesnake is endangered in Connecticut. Forest management practices in this forest are implemented to benefit this species.
3. **Climate Change Mitigation through Sequestration and Storage** – Climate change is an important global issue. The management of the Diamond Lake Block provides the opportunity to sequester and store carbon, through sustainable forest management, in vegetation and long-lived wood products.
4. **Encouraging Mature Forest Growth** – 26 %, 598 acres, of the Diamond Lake Block is protected under the Old Forestland Management Site (OFMS) classification, ensuring the most remote and sensitive areas of the forest will remain wild and unaltered by humans. This will encourage mature forest growth within this block of forestland.
5. **Recreational/Health Benefits** – The Blue-Blazed Trail provides four miles of scenic trail, traversing Meshomasic, providing recreational opportunities and a place to explore in a healthy and active way.
6. **Economic Benefits** – The following plan outlines timber harvesting activity on 524 acres, the production of maple syrup from a 500 tap sugar bush as well as the harvesting of mountain laurel boughs annually for Christmas wreaths. These sustainably harvested forest products provide jobs and local goods that are sold in the local economy.
7. **Forest Protection** – Meshomasic's Diamond Lake Block management plan addresses threats such as wildfire, extreme weather events, invasive plants and insects and unauthorized use. Management strategies are outlined for each of these threats to protect this valuable public forestland asset.

DEEP welcomes questions and comments regarding the management of state forest lands and encourages public engaging in the management of state resources. The Division of Forestry may be contacted by email at deep.forestry@ct.gov or by phone at 860-424-3630.

Meshomasic State Forest

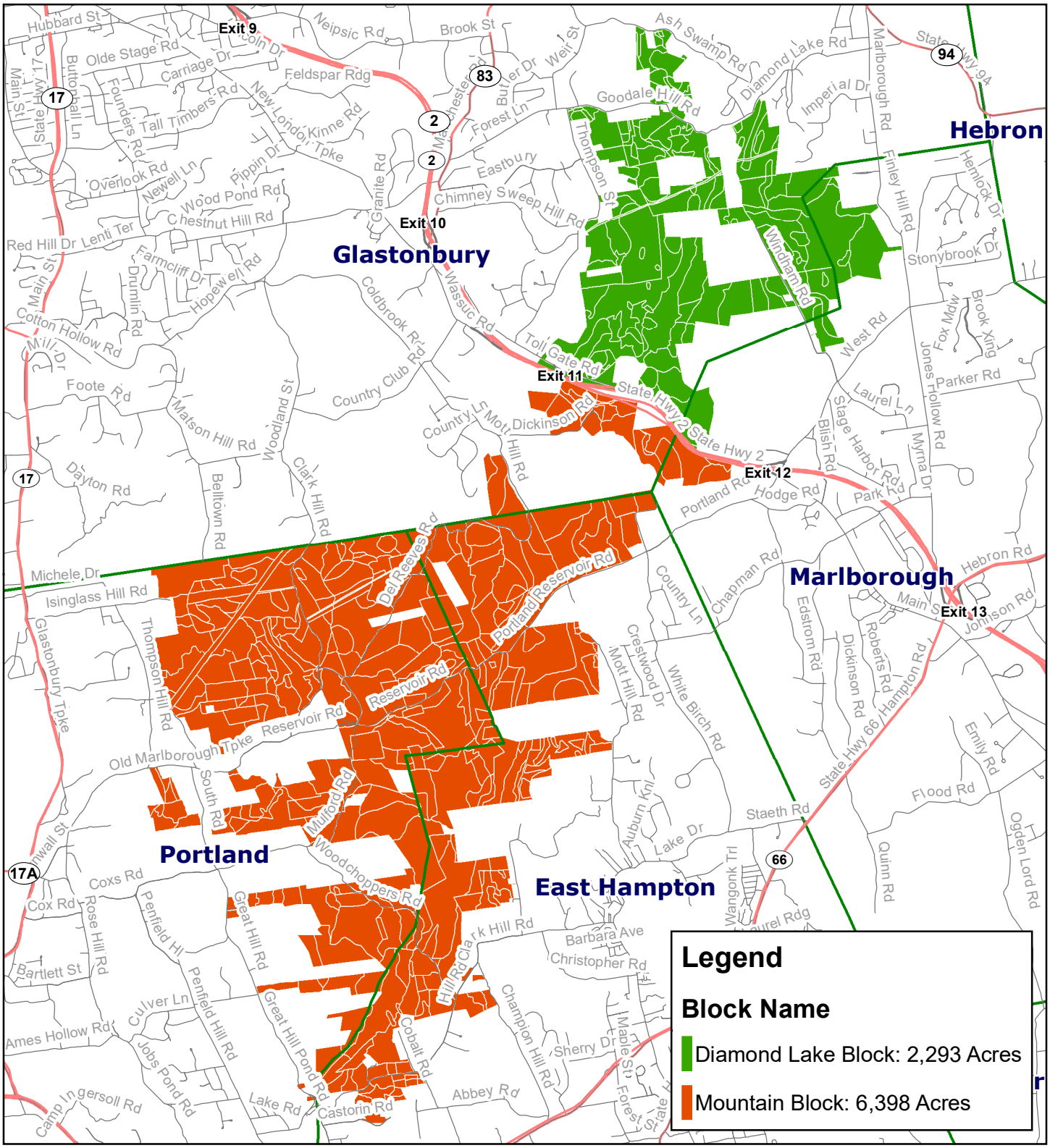
Location & Division of Forest Blocks

June 18, 2020

Map prepared by: Nathan Piché

0 3,000 6,000 12,000 Feet

Map Scale: 1 inch = 6,000 feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

A. Executive Summary

The Diamond Lake Block

The Diamond Lake Block is one of two blocks that make up Meshomasic State Forest. Connecticut Route 2 divides Meshomasic State forest, with the Mountain Block being located south of this highway and the Diamond Lake Block being located north of this highway.

The Diamond Lake Block, 2,293 acres located in the towns of Glastonbury and Marlborough, within Hartford County, is divided into 11 separate compartments. Compartment separations are determined by access and are numbered in a chronological order based on when that particular section of the forest was acquired. Each compartment is further divided into stands, or individual management units of similar forest composition or site quality, in order to aid in management making decisions.

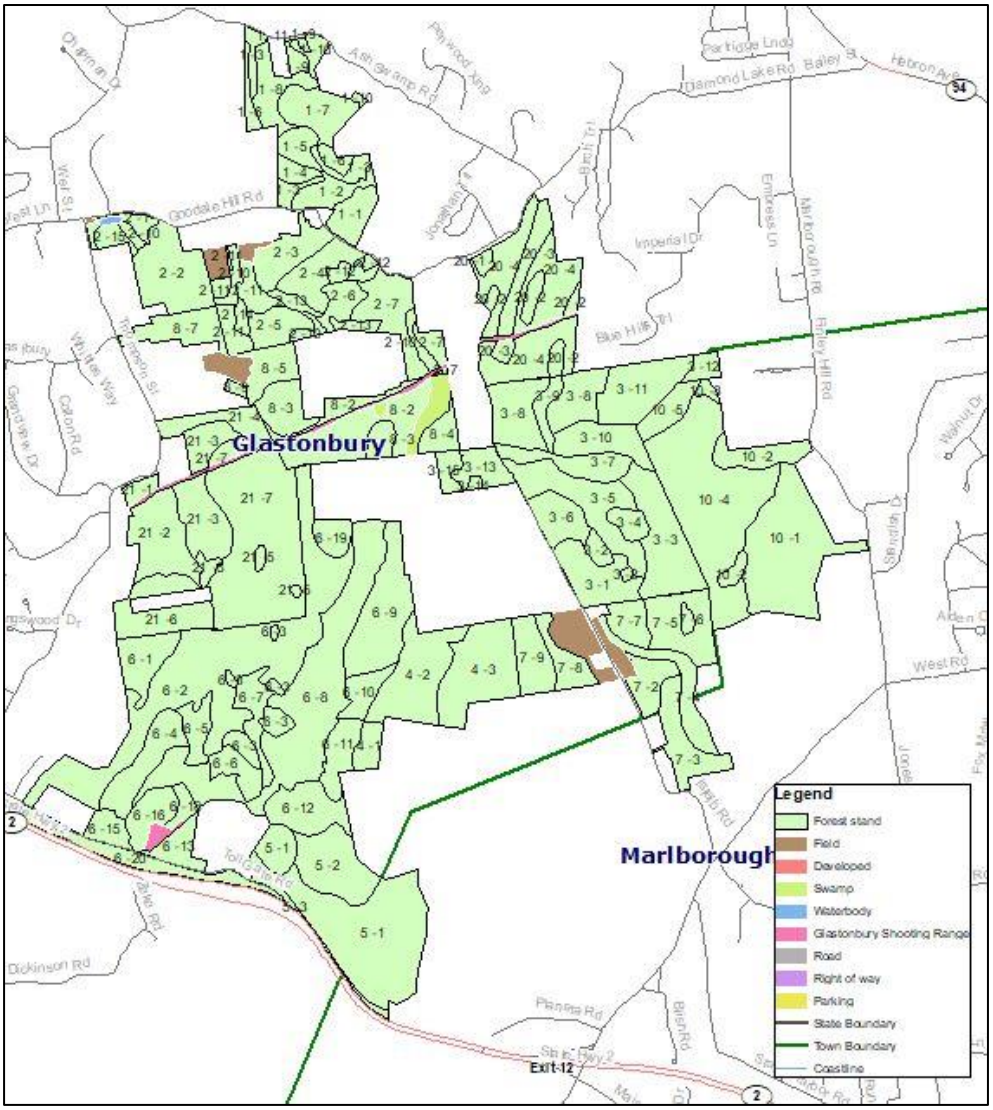


Figure 1.0. Map showing compartment and stand numbers within the Diamond Lake Block.

The last forest management plan for the Diamond Lake Block of Meshomasic was written in 1986. Silvicultural activity prescribed in the last plan was carried out in the 1990's. Since that time period much has changed within this block of land. Additional lands were acquired and the forest has matured. The prolonged absence of active management in the area combined with land acquisition efforts has created great opportunities to now implement new management practices.

This management plan will focus on both short and long term objectives aimed at improving access to the forest, maintaining and diversifying wildlife habitat, supporting recreational activities, ensuring the long term health and productivity of the forest and the continued protection of state-listed threatened and endangered species. These objectives will be achieved by implementing silvicultural practices on 524 acres in order to increase the growth rate of residual trees, regenerate a new cohort of trees and to diversify habitat type and structure, designating 598 acres as Old Forestland Management Sites in order to preserve and protect old forests and allow them to develop in the absence of human activity, eradication of invasive plants on 95 acres in an effort to protect interior forests from being populated with invasive plants and to promote the growth of native herbaceous plants, maintaining fields as open grassland areas to maintain open land and edge habitats, marking property boundary lines to protect the forest from unauthorized use and adopt adaptive management principles in order to make sound management decisions in the event of unforeseen impacts to the forest.

B. History

Meshomasic: A Place of Many Snakes

The name of the forest comes from Meshomasic Mountain, located in the Mountain Block. It is believed that "Meshomasic" was a Native American term for "a place of many snakes." The timber rattlesnake is on the State of Connecticut Endangered Species List and forest management practices across Meshomasic State Forest have been influenced by the conservation of this species.

The Diamond Lake Block receives its name for its close proximity to Diamond Lake, located to the northeast of the forest.

Cultural

This block of forestland is in an area believed to have been purchased by early settlers from Sowheag, a Grand Sachem of the Wangunk Native Americans.

Even though considerable portions of the forest contains exposed ledge and boulder deposits from the last glacier period, much of it was cleared for agricultural purposes during the colonial era. Old cellar holes, stone walls and stone piles remain as evidence of the work done by early settlers. As these fields and pastures were abandoned the land gradually reverted back to forest, sprouting an abundance of oak, birch, maple, hickory and tulip trees throughout. Some areas were utilized for farming operations until the State acquired the land while other areas contained mature forest at the time of State acquisition. This combined with past forest management practices have resulted in the current forest, featuring a diversity of age classes and species compositions.

State of Connecticut Land Acquisition

In 1930, the State purchased the first parcel of land that would be later known as the Diamond Lake Block of Meshomasic State Forest. Since that time, the State has periodically acquired additional acreage. The most recent purchases occurred during the early to mid-2000's when the Department of Energy & Environmental Protection (DEEP) partnered with The Nature Conservancy to acquire a total of 215.62 acres along Thompson Street and 160.62 acres along Islib Road. Today the block encompasses 2,293 acres.

Reason for Acquisition & Funding Sources

Most recent acquisitions have been funded largely through the Recreation and Natural Heritage Trust Fund (RNHTF), DEEP's primary program for acquiring land to expand the state's system of parks, forests, wildlife management areas and other natural open spaces.

Development of Resources Prior & After Acquisition

Prior to state ownership the land was primarily used for agricultural purposes. Most of the land has since reverted back to forestland. Timber was likely harvested off of portions of this land after agricultural abandonment. However, little is known about such timber harvesting operations.

Under state ownership, the forest has been managed to protect and diversify wildlife habitat, in particular for state listed species as threatened, endangered or of special concern. This type of management has been passive in nature by leaving certain areas untouched in order to not disturb the natural patterns of state listed species. In other areas of the block active management has been done, in the form of timber harvesting, in an effort to improve forest growth as well as to regenerate a new cohort of trees. In total, 356 acres of forestland has been actively managed through timber harvesting in the Diamond Lake Block under state ownership.

From 1988 to 1998, an agricultural agreement with local farmers was administered allowing the use of approximately six acres of open land south of Goodale Hill Road for growing hay and pasturing livestock. In recent years no agreement regarding these fields has been made and the fields have been managed through periodic mowing by the State.

The Glastonbury Public Shooting Range, located on the north side of Toll Gate Road in the southern most section of the block, is another resource established in this block since the State acquired the land. The Range has been operated since 1980 and is staffed on a seasonal basis (April – November) with federal funding provided through the Federal Aid in the Wildlife Restoration Program, a program authorized by the Pittman-Robertson Act of 1937 (http://www.fws.gov/laws/lawsdigest/FAWILD.HTML). Federal funds available to the states through this program are derived from an excise tax on firearms, ammunition and archery equipment and are used for the acquisition, restoration and improvement of wildlife habitat, wildlife management research, hunter education and training programs and the development, operation and maintenance of public target ranges. Use of the range is free, however, reservations must be made prior to using the facility and all range rules and directions must be followed. Information regarding the use of the range can be found by contacting the DEEP Wildlife Division, or visiting the following website: https://www.ct.gov/deep/cwp/view.asp?a=2700&q=439010. In 2005, the Range underwent major improvements through a cooperative effort by DEEP's Division of Wildlife, Environmental Conservation Police, Eastern District Field Support Services and State Parks. The improvements included the construction of a 10-position covered shooting platform, construction of a building for spectators and registration behind the firing line, access and parking development, increased berm/impact zones, enhanced accessibility for handicapped persons and new signage. Funding for the project was provided by Section 10 of the Federal Aid Program.

Changes in the Last 10 Years

The Diamond Lake Block of Meshomasic has not received any active management since 1998. Since that time the primary use of the area has been hunting, passive recreation and wildlife research. The last forest management plan for the area expired in 1996. The purpose of this plan is to re-introduce forest management into areas that had been actively managed in the past, as well as to establish management goals and objectives on areas acquired since the last management plan was written.

In 2003 a 22.30 acre parcel of land was purchased by the State of Connecticut, located on Thompson Street and directly across from Eastbury Hill Road, in order to improve access to interior portions of the forest. A barn was located on that property and has since been removed from the site. A concrete slab is all that remains of this barn.

Rotations & Cutting Cycles

Much of the forest present within the Diamond Lake Block is considered upland oak mixed with northern hardwood species. Uneven aged management in this forest type typically results in the regeneration of undesirable shade tolerant species. As a result, even aged silvicultural treatments will be the primary focus of the management activities prescribed in this plan. Even aged management will use 100 year rotations. During this plan period 474 acres of forest will be scheduled to receive even aged silvicultural treatments.

Un-even aged management practices will also be implemented in an effort to improve wildlife habitat. Un-even aged treatments will use 15 year cutting cycles. During this plan period 50 acres of forest will be scheduled to receive un-even aged silvicultural treatments.

C. Acres and Access

Acres

In total, the Diamond Lake Block is comprised of 2,293 acres. These acres are divided into one of ten different classifications which are active forest, natural area preserves, old forest management sites, inaccessible areas, inoperable areas, inactive areas, recreational areas, areas managed for wildlife, wetlands and open/non-forested areas.

Land Classification	Acres
Active Forest	1465.14
Inactive Forest	0.00
Old Forest Management Site	598.50
Natural Area Preserves	0.00
Inaccessible Areas	15.66
Inoperable Areas	51.61
Recreational Areas	0.00
Areas Managed for Wildlife	88.70
Wetlands	21.96
Open/Non-forested	51.78
Total	**2293.35**

Table 1.0. Acres of land that fall into each land classification categories.

Although there are ten different land classification categories that each acre of land falls into, these categories are not necessarily mutually exclusive. For example, land classified as "Old Forest Management Site" or "Active Forest" may have just as much wildlife benefit as land classified as "Areas Managed for Wildlife." Land is divided into these categories by a close analysis of their current physical condition and is done so not to divide land, land use or wildlife habitat, but rather is done in order to aid and organize management making decisions. Active forestland is land actively being managed for its forest resource. There are two separate old forest management sites, one contiguous 120.90 acre section in the northern end of the block (Compartment 1) and another contiguous 477.60 acre section in the southern end of the block (within compartments 4, 6 & 7). This classification has been enacted in order to set aside a portion of land to allow for the natural processes of forest stand development to occur without the influence of active forest management. Inaccessible areas are areas that cannot be accessed due to the deterioration of access roads or due to being landlocked behind in-crossable geographical features such as wetlands. Inoperable areas are lands that contain physical features such as steep slopes and excessively rocky terrain that prevents active management from taking place. Areas managed for wildlife are designated forest stands where the primary objective of any active forest management activity will be for the benefit of wildlife. Wetlands are low lying areas that either consistently hold water or feature poorly drained soils that grow wetland associated vegetation. Lastly, open or non-forested areas are old fields, recently abandoned from agricultural use, where forest succession has not advanced to the point at which the area can be considered forested at this time. Old fields provide habitat for certain species such as field sparrow, blue-winged warbler and eastern kingbird. These species have been identified in the 2015 State Wildlife Action Plan as having Greatest Conservation Need (GCN). These areas will be managed for the benefit of wildlife.

Access: Roads for Public, Truck Roads & Gates

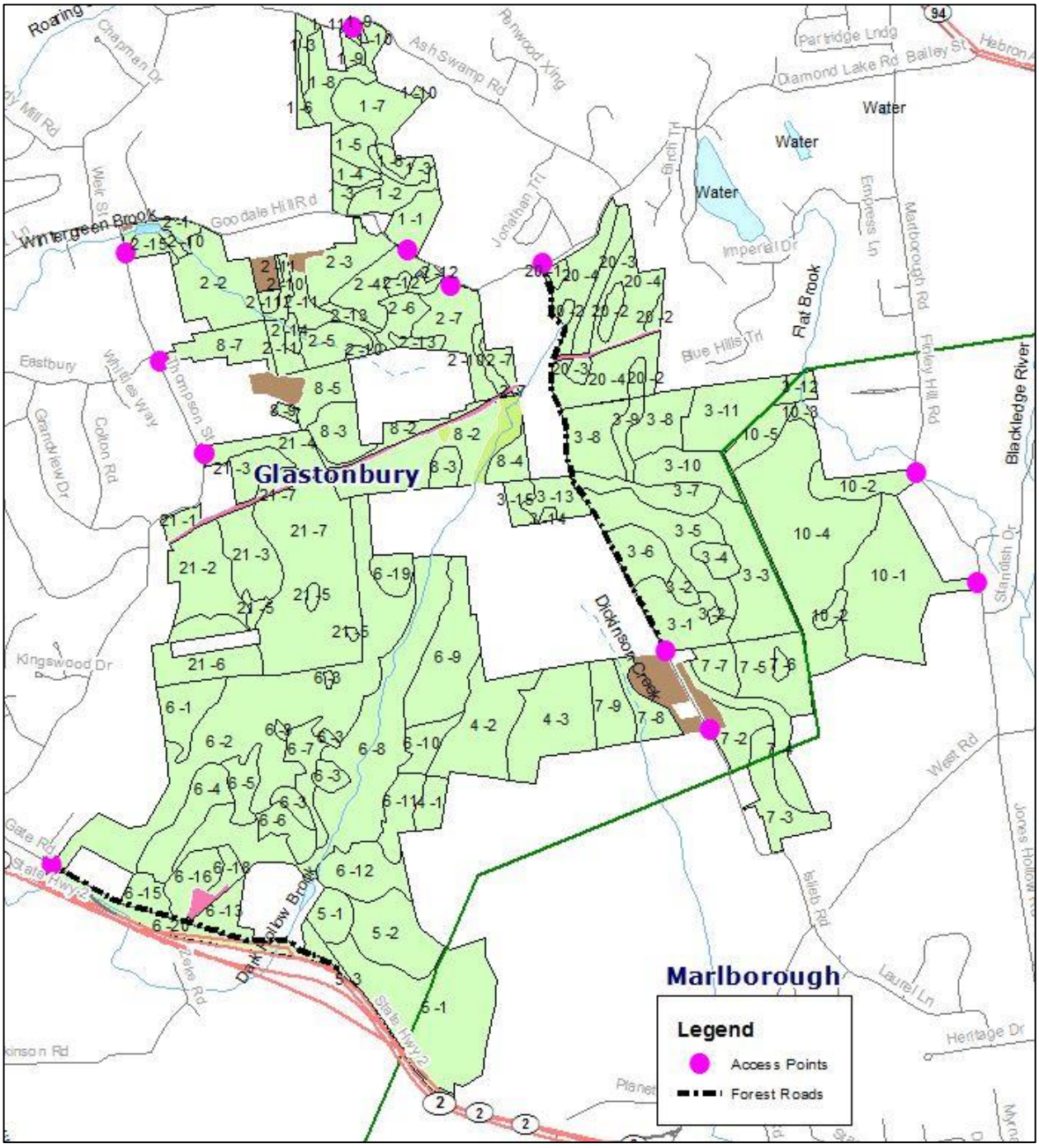


Figure 1.1. Map showing the various access points and forest roads within the Diamond Lake Block.

Access: Roads for Public, Truck Roads & Gates

Perhaps the most difficult aspect of managing this block of forestland is that the access is relatively poor. Much of the forest is located behind residential houses. There are only a small number of access points. Recent land acquisition efforts have increased access points to the forest. However, these access points are all in a state of disrepair and it must be made a priority to improve these access points for the future management of this forest resource.

The western side of the forest is accessible from Thompson Street. The western most portion of the block includes 487 acres within compartments 2, 8 and 21. There are only a few portions of the Block that abut Thompson Street and none of them have areas to park a vehicle in order to enter the forest for recreational use. There is one primary access point on Thompson Street, directly opposite Eastbury Hill Road. This is a narrow piece of land that leads into the Block. This narrow access corridor used to provide access to a barn prior to the States acquisition of the property. When the State purchased the property the barn was demolished and the area has grown up into a dense thicket of shrubs. Forest management prescribed in this plan will need to use this access point, providing a good opportunity to improve it and leave a small, two or three vehicle sized parking area open and accessible for public use.

The northern reaches of the forest are accessible from Goodale Hill Road and Diamond Lake Road. 337 acres within compartments 1, 2 and 20 are accessible from Goodale Hill Road and Diamond Lake Road.

The eastern most side of the forest is accessible from Finley Hill Road and Jones Hollow Road. 218 acres of forest are accessible from Finely Hill Road and Jones Hollow Road within compartment 10. An alternate access point to the eastern side of the forest is Windham Road. 391 acres of forest are accessible from Windham Road within compartments 3, 4 and 7. Windham Road is a dead end, however, an old forest road/discontinued town road exists which connects Windham Road to Diamond Lake Road, a distance of 1.33 miles. This interior forest road has been left unmaintained for 21 years and is now primarily used by the public for hiking. Significant improvements would have to be made in order to utilize it in the future for forest management purposes. These improvements would include the resurfacing of the road with new gravel and installing water drainage features. Gates are located at either end of this road to block unauthorized access to the forest. The gate on the north end of this road, where it intersects Diamond Lake Road, is on a Town of Glastonbury property making that gate their responsibility to maintain. However, the gate on the south end of this road, the Windham Road dead end, is located on State property and is the States responsibility to maintain. 156 acres of forestland are accessible from this interior forest road within compartment 3.

Lastly, the southern section of the forest, 689 acres within compartments 5 and 6, is accessible from Toll Gate Road. Toll Gate Road is a dead end leading to the Glastonbury Shooting Range, located within the block, but used to be the primary travel corridor before the construction of the adjacent CT Route 2 in the 1950's. Toll Gate Road, 0.95 miles long, is now used heavily for recreational purposes. A gate has been installed at the beginning of Toll Gate Road to block unauthorized access to the forest. This road is in fair condition because the original surface was built well to handle car and truck traffic. However, if this road were to be used for forest management purposes, improvements would still need to be made such as resurfacing sections with fresh gravel and installing water drainage features. Toll Gate Road and the forest road connecting Windham Road to Diamond Lake Road are the only interior forest roads within the Diamond Lake Block.

Inaccessible Areas

Terrain within the Diamond Lake Block varies from gently rolling in the eastern and western sections to steep, rocky terrain in the north and steep rocky ridges interspersed with swamp depressions in the south. Generally, the terrain slopes between 10-25% with southwesterly to northeasterly orientation. Kongscut Mountain is located at the northern end of the forest block and its slopes feature some of the steepest and most rocky terrain found within the entire block. Soils are predominately associated with Hollis, Gloucester and Charlton Series. Overall these soils are well drained, stony soils.

Although access points to the forest are relatively poor, it is the terrain and soils of the forest that determine what areas are inaccessible and/or inoperable. Of the 2,293 acres within this block, only 15 acres are truly inaccessible, including 6 acres of compartment 2, stand 7 and 9 acres of compartment 8, stand 4. These two areas are inaccessible because they are located on the eastern side of the Dark Hollow Brook and the only access point to this general area is from Goodale Hill Road, on the west side of Dark Hollow Brook. Therefore, these 15 acres are essentially cut off from the rest of the forest by Dark Hollow Brook and its associated wetland area.

Right-of-Way's

There is a gas pipeline right-of-away that runs through this block of forestland (compartment 20, stand 5 & compartment 21, stand 8). This is the Algonquin gas pipeline, managed by Enbridge. It is required to obtain authorization from Enbridge to cross the gas pipeline with forestry equipment during forest management activities.

There are no other right-of-way agreements within the Diamond Lake Block at this time. However, there is a school bus turn around on Windham Road. There is no formal agreement between the school district and the State for this turn around, however, it is allowed because the turnaround area, which is specifically labeled as such, is not being significantly impacted by its use.

Boundary Conditions, Issues & Total Miles to Maintain

There are a total of 25.17 miles of boundary lines in the Diamond Lake Block of Meshomasic. A large portion of this forest block is located behind residential houses, making the boundary lines complex due to their ever changing course. Aside from minor forest encroachment issues, the forest does not have any known boundary issues.

D. Special Use Areas

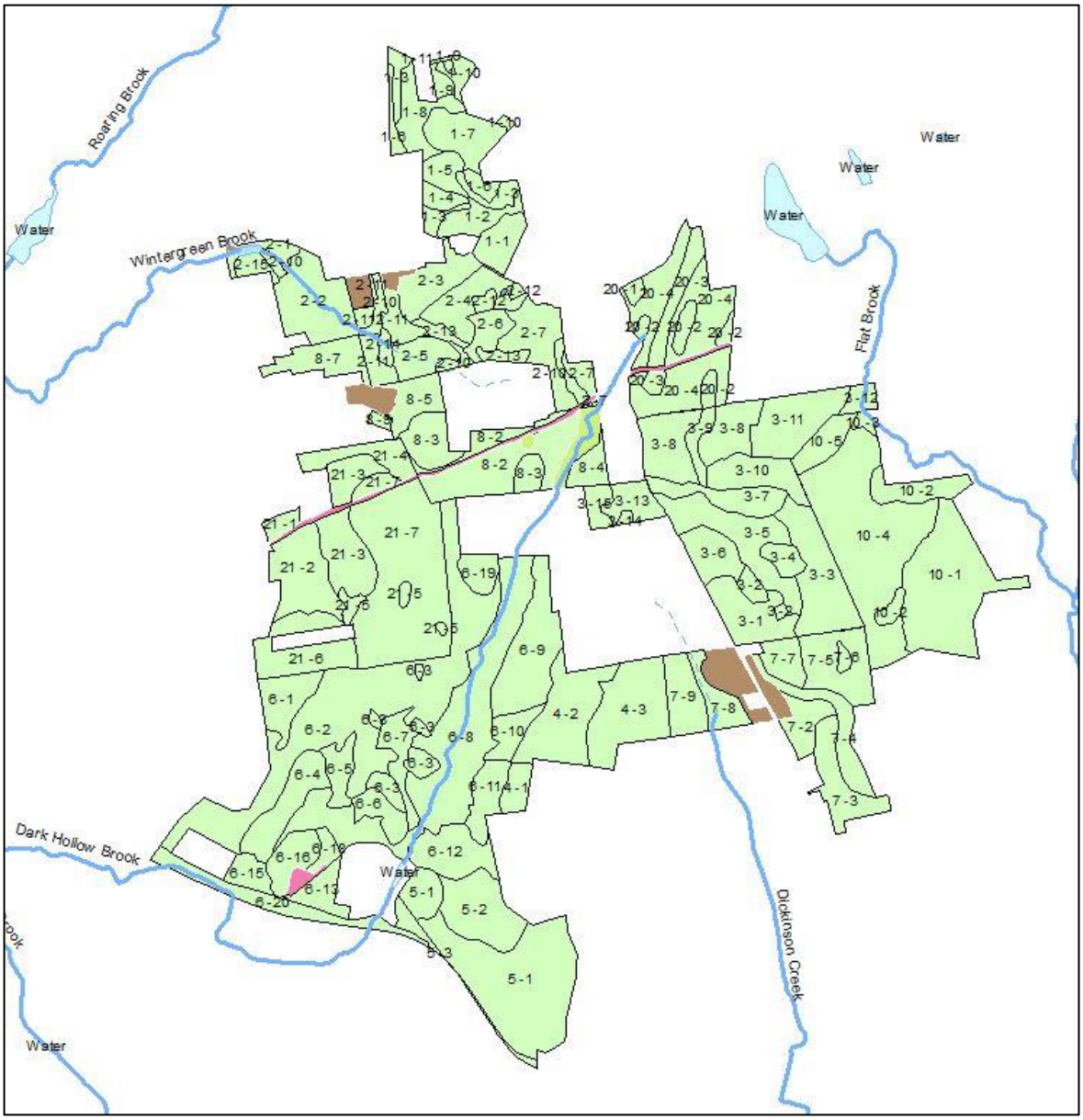


Figure 1.2. Map showing the watercourses within the Diamond Lake Block.

Lakes and ponds

There is only one pond located within the Diamond Lake Block and that is the Williams Pond (compartment 2, stand 9). Williams Pond is 1.18 acres in size and is located in the northwestern corner of the block. Wintergreen Brook flows in and out of Williams Pond. Due to its small size and relatively shallow waters that support a moderate density of aquatic plants, the pond is rarely used for recreational purposes. However, the pond creates excellent habitat for a variety of wildlife species that rely on wetland areas for survival.

Rivers & Streams

There are several major watercourses that flow through the Diamond Lake Block. Dark Hollow Brook which begins in a red maple dominated wetland area within compartment 20 in the northeastern section of the forest and flows in a southwesterly direction, bisecting the southern section of the forest before crossing underneath CT Route 2 and into the Mountain Block. Flat Brook flows in an easterly direction out of the hills within compartments 3 and 10 on the eastern most side of the forest. Dickinson Creek flows in a southerly direction, out of compartment 7, running parallel with Windham Road on the eastern side of the block. Wintergreen Brook flows in a northwesterly direction out of the hills within compartment 2, in the western section of the block.

Cultural Sites

There are no National Heritage sites or areas within this block of state forestland. There are no specific sites that have significant cultural importance. However, the many stone walls that can be found through this block are cultural reminders of our not so distant past, a past where farmers cleared land and deposited excess stone in walls to rid the land of them and establish their land ownership boundaries. Although cultural landscape elements such as stone walls are common place throughout Connecticut, they shall not be forgotten nor destroyed. During forest management operations all actions necessary should be made in order to avoid the destruction of stone walls in order to preserve these cultural landmarks within the state forest.

Recreation & Scenic Sites – Trails & Signs

The Connecticut Blue-Blazed Shenipsit Trail runs through the Diamond Lake Block, starting off of CT Route 2 by exit 11 (Thompson Street) and following Toll Gate Road into the forest. The Blue-Blazed Trail follows Toll Gate Road until just east of Dark Hollow Brook, where it then turns in a northeasterly direction through forests of oak, northern hardwoods and mountain laurel before eventually exiting the state forest in the northeastern most corner of the block. This trail is the only public use trail in the forest and it is maintained by the Connecticut Forest and Park Association (CFPA). Information regarding the Connecticut Blue-Blazed Hiking Trail System can be obtained by contacting the CFPA; http://www.ctwoodlands.org.

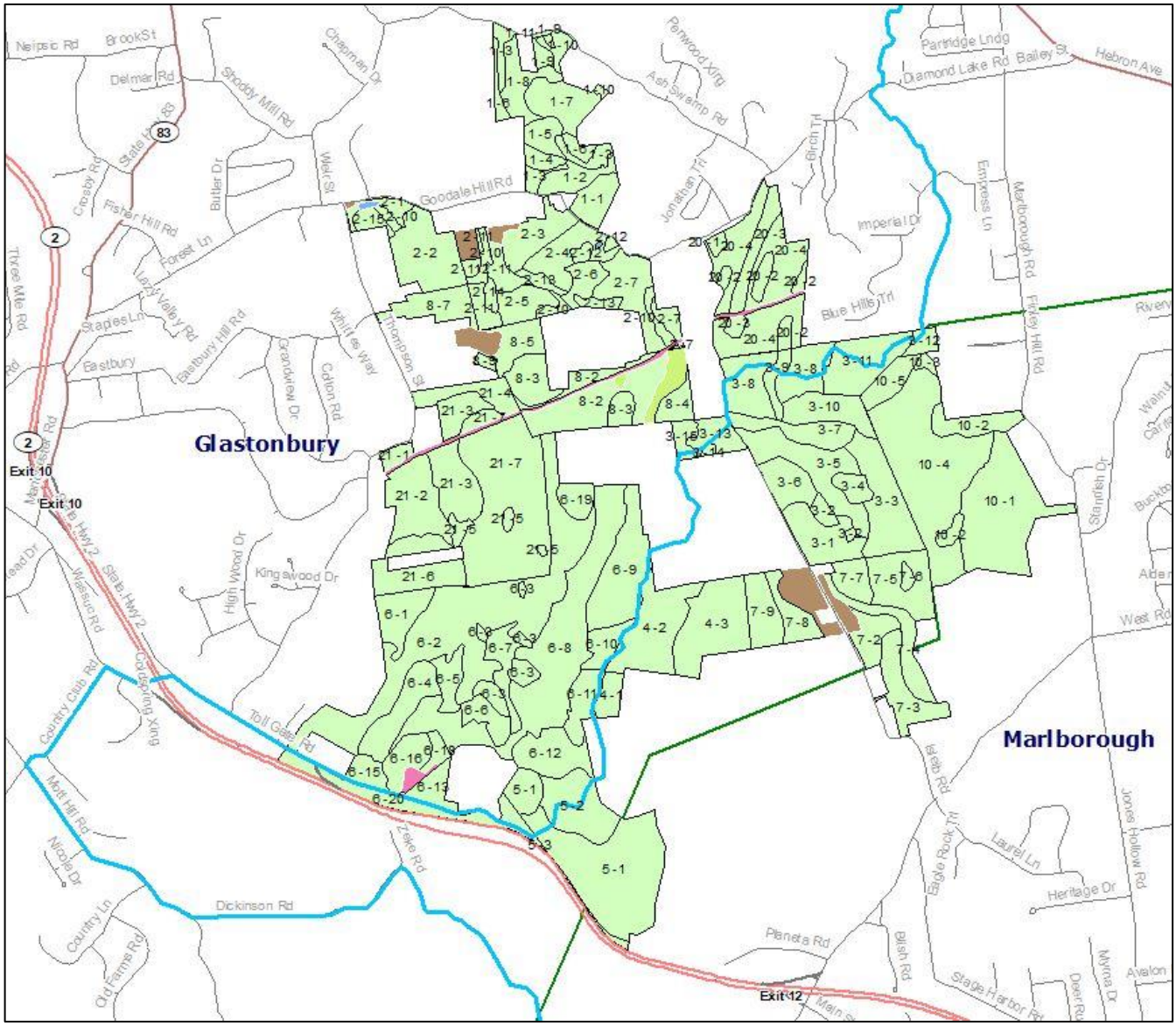


Figure 1.3. Recreational trail system in the Diamond Lake Block. The CFPA Blue-Blazed Shenipsit Trail is the trail colored in blue. Notice that the blue blazed trail in this area features an on road section in order to cross CT Route 2. Currently, there is no trail that crosses CT Route 2 within the forest.

There are numerous other trails located throughout the forest which are used for recreation such as hiking and mountain biking. However, these trails are not authorized and therefore are not maintained. Some of these non-maintained trails, as well as the Blue-Blazed Trail, are used illegally with motorcycles and All-Terrain Vehicles (ATV's). Motorcycles and ATV's are not permitted in the state forest unless registered with the Department of Motor Vehicle and then they are only permitted on forest roads open to all motor vehicles, something the Diamond Lake Block does not have. If illegal activity is observed by the general public, they are encouraged to report the incident to ENCON at (860) 424-3333.

Critical Habitat (State listed rare or endangered plants and animals)

The entire Diamond Lake Block falls within the vicinity of known occurrences of six state and/or federally-listed threatened, endangered or of special concern species as well as one natural community. As a result, forest management activities in this block will be largely influenced by these species in an effort to preserve and enhance their critical habitat. These efforts will be made in the form of preserving habitat as is, through Old Forestland Management Sites, and harvesting trees in strategic areas. Timber harvesting activity can increase habitat diversity and structure for a variety of species.

Natural Areas

No state-designated natural areas are present within the Diamond Lake Block.

Old Forestland Management Sites

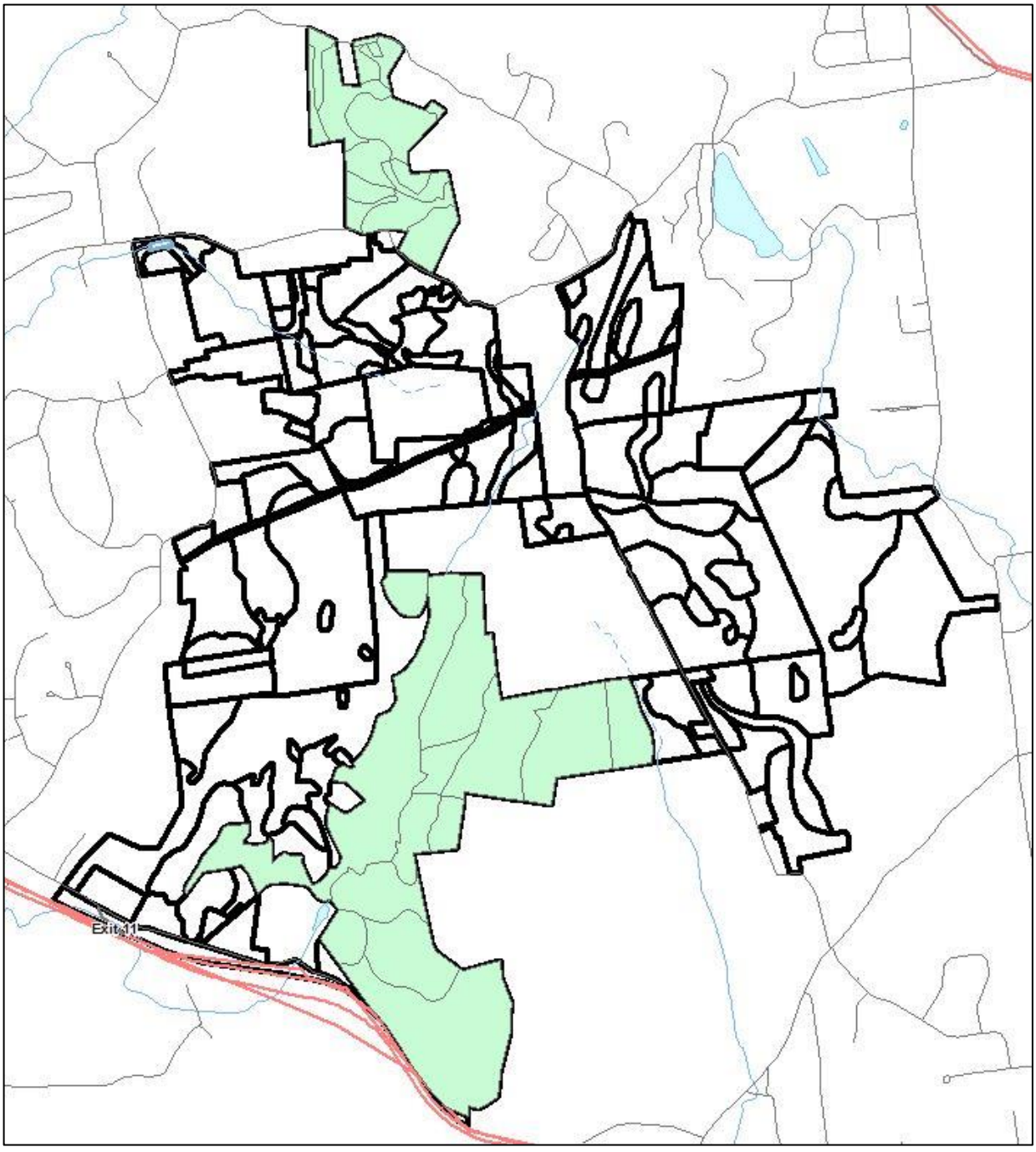


Figure 1.4. Map showing the location of old forestland management sites (shaded in turquoise) within the Diamond Lake Block.

The old forestland management site land classification has been enacted in order to set aside a portion of land to allow for the natural processes of forest stand development to occur without the influence of active forest management.

Two separate old forest management sites have been established. 120.90 acres in the northern end of the block, within Compartment 1, have been identified as an old forest management site. This area is characterized by steep slopes, ridgetops and rocky soils. The other old forest management site is a 477.60 acre section in the southern end of the block (within compartments 4, 6 & 7). This area, bound by Dark Hollow Brook to the west, Dickinson Creek to the east and CT Route 2 to the south, is characterized as mature oak, hickory and northern hardwood forests. This area is already exhibiting the signature signs of an old forest such as the presence of wind thrown trees, tipped root structures and downed coarse wood debris making it an excellent portion of the block to put into this land use category.

Research Areas

Several research permits have been issued to various agencies and academic institutions within the last decade. Research topics within the Diamond Lake Block have included the biology of native birds, reptiles and insects. Studies have also been conducted on oak mortality due to gypsy moth defoliation and southern pine beetle and its effect on pitch pine.

Miscellaneous Uses

A special use permit has been issued for a local maple syrup producer to use a section of the Diamond Lake Block to tap maple trees, during the spring months, for their sap. On other state properties permits have been issued to maple producers to collect sap with buckets, however, this was one of the first special use permits negotiated with a producer allowing them to install tubing and use an area for maple production for a five year period. The producer committed to the first five years of use and has since updated their special use permit to use the area for an additional five years. In the last several years the area being used has yielded approximately 500 taps.

E. Extensive Areas of Concern

Trails/Signs & Unauthorized/ Illegal Activity

As stated, the CFPA maintained Blue-Blazed Trail is the only recognized trail in the Diamond Lake Block and this trail is intended for hikers. Illegal, unauthorized use, such as motorized vehicle use, has resulted in rutting, soil compaction and erosion in heavily trafficked areas. The area most effected is on the steep slopes adjacent to CT Route 2 at the Dark Hollow Brook crossing. Actions need to be taken to stop this illegal use.

Wetlands

Areas that are considered wetlands or consistently have wet, saturated soils will be restricted from timber harvesting activities. Twenty-two acres are considered to be wetlands within the Diamond Lake Block. Additionally, 132 acres are considered red maple lowlands with wet, poorly drained, saturated soils. All of these areas are adjacent to the several streams, brooks and creeks that traverse the block which are the Dark Hollow Brook, Dickinson Creek, Flat Brook and Wintergreen Brook. Water quality and protection of these wetland areas is vital. Therefore, all forest management activities that take place adjacent to these areas will maintain buffers of a minimum of 100 feet. No timber harvesting, woods road construction, landing construction or other intensive management activities shall take place within buffer strips.

F. Wildlife Habitat

Forestry, wildlife and fisheries management traditionally are complimentary functions. The abundance and distribution of wildlife associated with forest ecosystems is determined by the composition, structure and diversity of the forest habitat. Wildlife management objectives for Meshomasic State Forest have focused on the maintenance of forest interior habitat, the protection and enhancement of habitat for timber rattlesnakes and access for wildlife-based recreation. Meshomasic State Forest, in its entirety, is a large forested area containing wetlands, small headwater streams, areas of mature forest, areas of young forest, stands of conifers, stands of deciduous trees and grassy open land areas. All of these elements make for a diverse forest structure that provides vital habitat for many species of songbirds such as the black-throated green warbler in conifer forests, wood thrush in deciduous and mixed forest, eastern towhee in young forest, willow flycatcher in shrubby areas, tree swallow in open habitat, reptile and amphibian species, generalist species such as the red-tailed hawk, fish species such as brook trout as well as for popular game species such as white-tailed deer and turkey.

Fisheries Resources

Major streams within the Diamond Lake Block of Meshomasic State Forest include Dickinson Creek, Dark Hollow Brook, Flat Brook and Wintergreen Brook. The headwaters or upper portions of these streams begin in the Diamond Lake Block, protecting them from future development. Headwater sections of streams serve to provide clean, unpolluted waters to downstream areas of their watersheds, which aids in maintaining and supporting a diversity of aquatic organisms. All of these streams support a coldwater fish community, primarily comprised of wild brook trout, which are native to Connecticut. Wintergreen Brook and Dark Hollow Brook, in areas just outside the immediate boundaries of the Diamond lake Block are known to support slimy sculpin, a fish species that is currently classified as a Species of Special Concern pursuant to Connecticut General Statutes (CGS) Chapter 495. Slimy sculpin inhabit swift coble/gravel dominated streams. Their distribution is limited, especially in Eastern Connecticut. Slimy sculpin habitat has been correlated with cold summer water temperatures dominated by groundwater inflows, thus this species along with wild brook trout are species indicative of cold, clean and unpolluted waters. While these streams are open to public fishing, the headwaters rarely receive significant fishing pressure except for niche anglers that target wild brook trout and practice catch and release.

Forest Wildlife Features

Adjacent to the four streams that originate within the Diamond Lake Block there are riparian areas that include many small wetland areas. These small wetland areas create habitat features essential to numerous wildlife species, providing them with water, food and cover/protection. A few species that are commonly found in stream side riparian areas and/or wetlands are mink and salamanders.

Openings within a forest or areas where tree cover is absent from a small area provides diverse habitat structure which can consist of young seedling and sapling sized trees and/or herbaceous plants adjacent to mature forest. Openings also create edge habitat, where there is an edge between an opening and a different type of habitat such as a mature stand of trees. Areas such as these, and their associated edge habitat, are very important to many wildlife species such as white-tailed deer, meadow voles, eastern box turtles and garter snakes. There are numerous openings of various sizes within the Diamond Lake Block. These openings can be as small as individual trees blown over during a storm or as large as a whole forest stand that has been recently harvested in order to regenerate a new age class of trees within the area.

The entire Meshomasic State Forest is considered an Important Bird Area (IBA). The IBA program, implemented by the Audubon Society, strives to integrate science, education, public policy and land management expertise to ensure the continued existence of quality breeding habitat for avian species. An IBA is defined as a large, intact land area that provides important habitat features for a variety of bird species identified as endangered, threatened, or of special concern in Connecticut, as well as other birds of high conservation priority. An IBA area could consist of grasslands, shrub lands, wetlands, forestland or a combination of these habitat types. Meshomasic State Forest is an IBA due to its diverse forest habitat that spans across thousands of acres within Hartford and Middlesex counties.

Silvicultural activities prescribed in this management plan will address habitat concerns and will aim to protect, as well as diversify the forest structure to support the variety of bird species that rely on this large tract of forestland.

Structure

58% of the Diamond Lake Block is considered to be in the sawtimber size class, featuring trees with an average diameter of twelve inches or greater. Portions of the block in this category represent a forest that is maturing and that is providing the greatest amount of carbon sink or storage. Mature forest provides vertical habitat structure with a closed upper tree canopy and a mid-story level canopy of suppressed, overtopped and/or understory tree species. As forests mature trees naturally die from a combination of biotic and abiotic factors. When they do they become snags and down woody debris. This structurally diverse forest with naturally occurring snags and down woody debris provides excellent habitat for a variety of wildlife species such as flying squirrels and barred owls.

21% of the block is comprised of forestland in a transitional phase between pole timber (6-11 inch diameter trees) and sawtimber (12 inches or greater). These areas represent stands that are growing, sequestering carbon and will develop into mature timber, however, their trees per acre density is typically higher than mature forests in the sawtimber category. As a result, these areas provide good cover while the forests vertical structure is starting to develop under nearly full canopy closure. Forests of this age class are required by numerous songbirds including the scarlet tanager and red-eyed vireo.

17% of the forest is in the pole size class, with tree diameters ranging between six and eleven inches in diameter. Stands in the pole size class are growing and sequestering carbon in their transitional phase between seedlings/sapling stands (1-5 inch diameter trees) and sawtimber (12 inches or greater). In a pole sized stand the forest canopy closes above a forest dense with young trees. Canopy closure in stands of this age class (canopy closure occurs approximately 20 feet above the forest floor in these stands) produces micro-climates within the forest as well as vertical structure conditions required by most amphibians and small mammals.

The seedling/sapling stage of forest development represents the youngest age class of forests, featuring trees that are one to five inches in diameter. Only four percent of this Block of forestland is considered to be in the seedling/sapling stage. Forests of this age class are created through dramatic disturbances such as hurricanes, tornados or timber harvesting. The four percent of the Diamond Lake Block that fall into this category were created through timber harvesting that took place in the mid-1990's. Areas in this stage of development generally have lower carbon sequestration rates and more carbon loss due to accelerated decomposition of down woody debris created through the disturbance that allowed light to penetrate to the forest floor, initiating the establishment young trees on the site. Seedling/sapling forest stands feature early successional vegetation and structure, creating essential habitat for species such as the chestnut-sided warbler, black and white warbler and ideal feeding areas for white tailed deer. These areas also create excellent cover and foraging habitat for woodcock.

The structure of the forests, and their associated habitat features, within the Diamond Lake Block are representative of much of the forests across Connecticut. Much of the forest is mature or approaching maturity and young forests and early successional habitat is lacking. Only 82 acres of this block are in the seedling/sapling stage of forest development and an additional 74 acres are non-forested areas that are open/early successional habitat in the form of wetlands, old fields and grassy right-of-way corridors. Many neo-tropical migratory birds that are shrub land obligate bird species are in decline as a result of dwindling early successional habitat. As a result, silvicultural activity prescribed in this plan will make efforts to increase early successional forest structure in order to restore a more balanced forest habitat structure.

Deer Impact

White tailed deer are one of the most sought-after and highly prized animals in the forests throughout North America, for their meat as well as their antlers and the challenge they give the sportsman in pursuit of them. The annual deer hunting season, which takes place during the autumn months, is important to keep deer densities at a sustainable level. Deer impact is a function of deer density, expressed in deer per square mile, and forage availability such as young trees, acorns and agricultural crops. When deer density is high, they can have a negative impact on the forest by browsing young seedling and sapling sized trees. Once these young trees are browsed they will then grow with a poor form and will be stunted from their full potential. Deer densities greater than 20 deer per square mile can have significant negative impacts on forest regeneration.

The impact of white tailed deer in the Diamond Lake Block is moderate. During the forest inventory analysis conducted within this block of forestland it was observed that deer prefer to browse certain tree species including the various oaks. However, deer density has not reached the point where less palatable species such as black birch are being browsed.

Hunting

The Diamond Lake Block is open to public hunting (archery and firearms) of small game, turkey and deer. Public access maps for the Diamond Lake Block are available for viewing or printing on the DEEP Public Hunting Areas in CT Webpage which can be found by following this link https://www.ct.gov/deep/cwp/view.asp?a=2700&q=323414&deepNav_GID=1633. These maps may also be obtained by contacting the Eastern District Headquarters in Marlborough. Trapping is also allowed in Meshomasic under the stand land trapping permit system. For additional information pertaining to hunting and trapping regulations, seasons and fees visit the DEEP Hunting and Trapping Webpage which can be found by following this link https://www.ct.gov/deep/cwp/view.asp?a=2700&q=323414&deepNav_GID=1633.

G. Vegetative Condition

Silviculture

The Diamond Lake Block of Meshomasic is comprised of a diversity of different forest types. Oak and hickory is the most dominant forest cover found throughout the block. However, stands of northern hardwoods, red maple lowlands, upland chestnut oak, scarlet oak and white pine are also common in this tract of land. There are also notable stands of pitch pine and scrub oak in the southern portion of this block, particularly adjacent to CT Route 2, which is of importance because it is considered one of the most imperiled ecosystems due to land development, degradation and forest succession (Gluck, 2015). Within these different forest types there are young stands of approximately 20 years old and there are others that are mature and are likely 100 or more years old. Forest stocking, or density, varies greatly with forest type, age, site conditions, soil types and a complex of past and present forest health issues. As a result, the silvicultural treatments recommended in this plan will be tailored to each stand as appropriate. Treatments will also focus on areas where access could be improved to the forest through timber harvesting.

In an effort to foster the growth of and regenerate shade intolerant and intermediate shade tolerant species such as red oak, black oak, white oak and scarlet oak this plan will focus primarily on even aged silvicultural techniques. In stands where there may be a high density of quality stems, commonly referred to as Acceptable Growing Stock (AGS), to grow into the future, thinning's will be implemented in order to improve growing space and capture natural mortality that occurs through competition. In stands where the dominant trees are mature, over-mature or are of very poor quality, referred to as Unacceptable Growing Stock (UGS), regeneration harvests will be implemented in order to allow enough sunlight to reach the forest floor to stimulate the establishment of a new cohort of young trees. Even aged management will use 100 year rotations. During this plan period 474 acres of forest will be scheduled to receive even aged silvicultural treatments.

In stands where the long term objective is to maintain a diversity of age classes and trees in all canopy positions, un-even aged silvicultural techniques will be utilized. These treatments will largely be focused on implementing selection harvesting practices beneficial for wildlife, such as daylighting. Daylighting is the practice of cutting selected trees within the forest in order to release vegetation, increase sunlight to the forest floor and encourage the growth of shrubs and herbaceous vegetation that many species of wildlife rely on. Un-even aged treatments will use 15 year cutting cycles. During this plan period 50 acres of forest will be scheduled to receive un-even aged silvicultural treatments.

Desired Future Conditions & Long Term Planning

Within the next 10 year planning cycle, management actions will be taken on sections of the forest that were acquired since the last forest management plan was written and follow up treatments will be made on previously treated areas where applicable. Employing this strategy provides the opportunity for recently acquired parcels, that may have previously gone unmanaged or had been poorly managed, to be set on a long term path of sustainable management and previously treated areas will receive the attention needed so they may continue on a long term path of sustainable management. By the end of

this 10 year planning cycle 317 acres will have been treated using even aged regeneration techniques, the shelterwood in particular, 157 acres will have been thinned, focusing on crown thinning, and 50 acres will have been treated using un-even aged methods with the emphasis on achieving wildlife goals. Therefore, 23 % of the total land area in the block will be receiving direct attention. Through intensive management, such as timber harvesting, mixed with passive management, such as conducting no activities in designated areas, the Diamond Lake Block with contain a mosaic of forest age classes that are both sequestering and storing carbon. This management plan also aims to be adaptive in the next 10 years. The remaining portions of the block, not actively managed, will be actively monitored. If conditions arise, that are unforeseeable at this time such as destructive weather events or insect outbreaks that pose a significant detrimental effect to the forest resource, silvicultural options will be assessed and emergency actions will be taken as necessary.

The following 10 year planning cycle (2030 through 2040) will aim to continue the strategy outlined above. Areas that were harvested using even aged regeneration techniques during the late 1980's and 1990's, according to the 1986 management plan, will have developed to the stage where thinning could be considered in order to foster the growth of the best quality individuals in those areas. Areas that were harvested using even aged regeneration techniques, as prescribed in this management plan, will have regenerated a mixture of species. Intermediate treatments, such as release or general timber stand improvement will be employed in order to favor the best quality individuals of the most desirable species. Also, areas that were thinned, as prescribed in this management plan, may have developed into stands favorable for regeneration harvests in order to continue producing the next generation of forests. During the next 10 year planning cycle each stand will once again be put under the management planning micro-scope and intensive management will be brought to stands previously left to grow where it would be advantageous to do so.

Our current forest is a direct by-product of management actions taken, insect and disease problems arising, herbivore browsing and competing vegetation being present within the last 100 years. All management actions taken, insect and disease problems arising, herbivore browsing and competing vegetation being present from European settlement to current day has produced the forest as we now know it. With there being more and more insect and disease issues plaguing forests, a steady demand for forest products ever present, and a rising climate change issue the forest resource is under greater stress than ever. The next 100 years of management will be critical. Due to the near eradication of fire on our forest landscape, continual deer browsing and the competitiveness of black birch, American beech and red maple it is likely that our forests will transition into a mixed hardwoods forest type and away from an oak/hickory forest type. Also, as average annual temperatures rise due to global warming some tree species may become less prominent due to a shifting in their native range. Extreme weather events that can cause severe damage to forest ecosystems such as ice storms and hurricanes may also become more frequent. However, through sustainable management practices that will continually choose desired phenotypic traits, representing several age classes and a diversity of species, over undesirable traits and monocultures, our forests will be as resilient and as diverse as they can possibly be, making them able to not only survive but thrive over the next 100 years.

Forest Type, Size Class & Conditions of Areas to be Managed

To aid in forest management decision making a full forest inventory of the block was completed. This inventory collected information on trees throughout the area such as species, diameter, merchantability, health and quality. This data was analyzed using NED II forestry software. In an effort to see how much of the block is considered mature forest, young forest, or anywhere in between, average size class was calculated for each stand. Size classes are divided into the following diameter ranges.

- Seedling/Sapling: 1 inch – 4.5 inches
- Pole Timber: 4.6 inches – 10.5 inches
- Saw/Pole Timber: 10.6 inches – 13.5 inches
- Saw Timber: 13.6 inches +

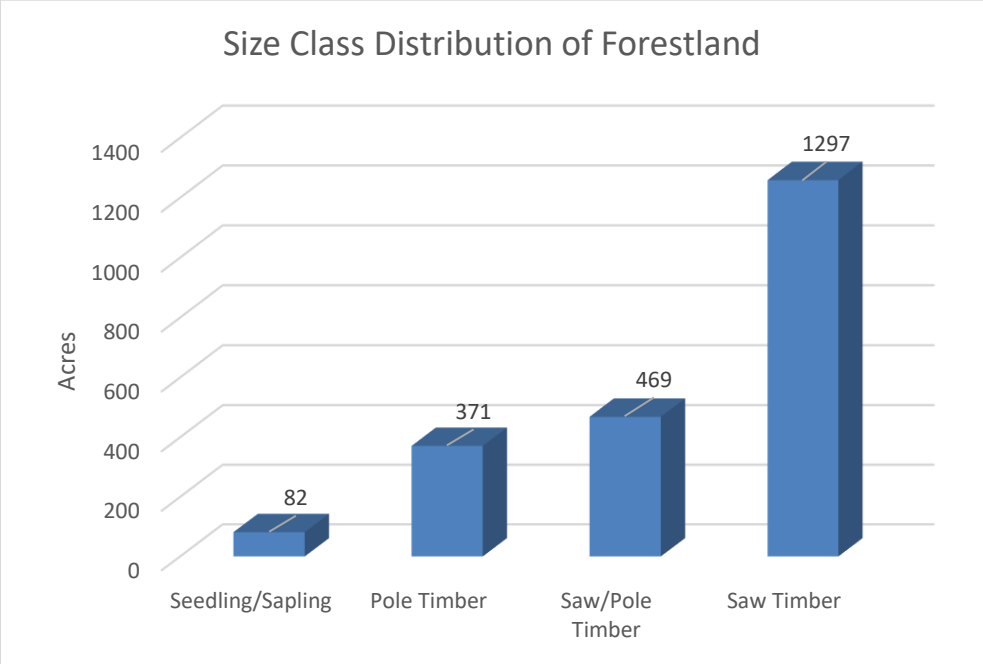


Figure 1.5. Size class distribution of forestland within the Diamond Lake Block. This chart excludes areas of the block which are considered developed, non-forested, wetlands or right-of-ways.

Acres of Forestland by Size Class & Forest Type					
Forest Cover Group	**Seedling/Sapling**	**Pole Timber**	**Saw/Pole Timber**	**Saw Timber**	**Total**
Aspen-Birch	6	0	0	0	6
Elm-Ash-Red Maple	0	59	24	50	133
Maple-Beech-Birch	0	0	0	42	42
Oak-Hickory	76	283	440	1164	1963
Oak-Pine	0	23	2	19	44
Pinyon-Juniper	0	3	0	0	3
White-Red-Jack Pine	0	3	3	22	28
				Grand Total Acres	**2219**

Table 1.1. Acres of forestland by size class and forest type. This chart excludes areas of the block which are considered developed, non-forested, wetlands or right-of-ways.

Aspen-Birch

The aspen-birch group makes up 0.27% of all the forestland in the block with only 6 acres falling into this category. These 6 acres were areas that were harvested in the 1990's using the shelterwood or clear-cut silvicultural methods. As a result, a young forest regenerated, dominated by quaking aspen, big tooth aspen black birch and paper birch. These stands have advanced beyond a seedling stage and are now saplings of approximately 20 years old.

Elm-Ash-Red Maple

The Elm-Ash-Red Maple group makes up 5.99% of all the forestland in the block with 133 acres falling into this category. These areas are characterized as having wet, saturated or poorly drained soil and, as a result, grow tree species that do well in wet conditions such as American elm, black ash and red maple. These areas are mostly adjacent to the several streams and brooks that traverse the block. Due to these areas being adjacent to streams or brooks and having poorly drained soils, no management activities will take place within this forest type.

Maple-Beech-Birch

The Maple-Beech-Birch group makes up 1.89% of all the forestland in the block with 42 acres falling into this category. These areas are dominated by sugar maple, American beech, yellow birch and black birch. A portion of this forest type is being used for maple sap and syrup production under a special use license. As a result, the primary use for this area throughout the next 10 year planning cycle is for maple sap and syrup production.

Oak-Hickory

The Oak-Hickory group makes up the largest portion of the block, 88.47% of all the forestland, with 1963 acres falling into this group. The dominant species found within this group are red oak, black oak, scarlet oak, chestnut oak, shagbark hickory, pignut hickory, black birch and red maple. Within this group there are a few sub-groups, referred to as forest types or stand types that are commonly found in the block. These forest types are upland oak, characterized by a poor quality upland site growing mostly chestnut oak and scarlet oak, and mixed upland hardwoods, characterized as a medium quality sites growing all the species found within the oak-hickory group. A large portion of this group is considered mature forest or is approaching maturity with 59% of the group being considered in the saw timber size class. As a result, there are excellent opportunities for active forest management within the oak-hickory group.

Oak-Pine

The Oak-Pine group, 1.98% of the total forestland in the block covering 44 acres. This group consists of forestland dominated by eastern white pine, pitch pine, red oak, black oak and scarlet oak. This forest type adds diversity to the landscape, with dense conifer canopies providing cover and the hard mast producing oak species creating an abundance of acorns for wildlife to forage on. All of the land within the oak-pine group falls within old forestland management sites or is in areas that are considered inoperable due to steep terrain. Therefore, no active forest management will be done within this group.

Pinyon-Juniper

The Pinyon-Juniper is the least represented group within the block, making up only 0.14% of the total forestland. There is only one stand that is categorized into this group, compartment 2, stand 11. This area was a field, used for agricultural purposes. When it was abandoned from farm use the area started to revert back to forestland. Eastern red cedar, white pine and a mix of deciduous species such as black birch and paper birch were the first to populate the area. Due to the high amount of eastern red cedar, which regardless of its common name is actually a juniper and not a cedar, is why this stand is categorized as pinyon-juniper. Currently this stand in the pinyon-juniper category has matured to the point where the trees are 40 to 50 feet tall and the canopy has closed. Eastern red cedar is considered an early successional species that is shade intolerant. If no management is completed in this stand, other species such as black birch will begin to out-compete the red cedar, eventually shading it out. Therefore, in order to sustain this forest and habitat type within this block all 12 acres of this forest type will be treated using a combination of mowing, invasive species herbicide treatment and tree harvesting.

White-Red-Jack Pine

The White-Red-Jack Pine group makes up 1.26% of all the forestland in the block with 28 acres falling into this category. All of the stands that fall into this category are dominated by white pine. Conifer stands are not common in this block of state forest, but are of great value due to the cover they provide for wildlife. As a result, no active management is prescribed for stands within this group in the next 10 year management cycle in order to maintain this habitat type on the landscape as is.

Acres to be Managed through Even Aged Techniques			
Forest Cover Group	**Regenerate Clear cut/Seed tree/Shelterwood**	**Thinning Free/Crown/Low/ Mechanical/Selection**	**Intermediate Treatment Cleaning/Weeding/Timber Stand Improvement**
Aspen-Birch	0	0	0
Elm-Ash-Red Maple	0	0	0
Maple-Beech-Birch	0	0	0
Oak-Hickory	305	157	0
Oak-Pine	0	0	0
Pinyon-Juniper	12	0	0
White-Red-Jack Pine	0	0	0
Total Acres	**317**	**157**	**0**

Table 1.2. Acres to be managed through even aged silvicultural techniques. Of the 317 acres scheduled to be regenerated via even aged management, 39 of those acres are considered Saw/Pole Timber and the remaining 278 acres are considered to be in the saw timber size class. All 157 acres scheduled to be thinned are considered in the saw timber size class.

Acres to be Managed through Un-even Aged Techniques		
Forest Cover Group	**Regenerate Single Tree or Group Selection**	**Intermediate Treatment Cleaning/Weeding/Timber Stand Improvement**
Aspen-Birch	0	0
Elm-Ash-Red Maple	0	0
Maple-Beech-Birch	0	0
Oak-Hickory	50	0
Oak-Pine	0	0
Pinyon-Juniper	0	0
White-Red-Jack Pine	0	0
Total Acres	**50**	**0**

Table 1.3. Acres to be managed through un-even aged silvicultural techniques. All planned silvicultural treatments will be in stands in the saw timber size class.

Forest Health: Disease

Chestnut blight, a fungal infection caused by the *Cryphonectria parasitica* fungus and accidentally introduced to the United States from nursery stock from Asia, was first identified in the adjacent Mountain Block in 1910 and quickly after its identification it became evident that the mortality of the chestnut species as a whole was imminent. The fungus causes diffuse cankers to form underneath the bark of chestnut trees, ultimately cutting off the flow of water and nutrients up and down the stem of affected trees. The American chestnut likely once constituted a large portion of all the trees present in the Diamond Lake Block. The loss of this species from this disease was a tremendous set back to the growth of the forest in this area.

Nectria canker, caused by *Nectria galligena* fungus, is another common disease found in this block of land, often creating what are known as "target cankers" on black birch individuals. Nectria fungus typically does not result in the mortality of affected individuals, however, it does significantly affect the quality of wood products produced from trees with it.

Armillaria fungus (*Armillaria mellea*) can be found sporadically throughout this block. This disease is often called "shoestring root rot" because the fungus has a shoe string like appearance growing on the roots of affected trees. Branch dieback and crown thinning are common symptoms. Affected trees will typically not die from this fungus alone, however, it does act as a secondary pathogen which will develop on trees already under stress from a variety of other biotic and abiotic factors.

Forest Health: Insects

Gypsy moth caterpillar (*Lymantria* dispar) is a non-native moth introduced to North America that defoliates many tree species, oak species in particular. Successive years of gypsy moth caterpillar defoliation and drought like conditions in 2016 and 2017 has resulted in the mortality of thousands of trees across Connecticut. Damage varies greatly by locality. In the Diamond Lake Block, gypsy moth effects vary greatly by species and site location. Although white oak, red oak, black oak, chestnut oak and scarlet oak all have been heavily affected, the mortality of white oak seems to be the highest. Also, ridgetops and hilltops generally have a higher proportion of mortality, likely due to the trees already being drought stressed. Individuals that may have been partially defoliated are more susceptible to secondary pathogens such as two-lined chestnut borer and shoe string root rot. Overall, gypsy moth has had a major impact on the Diamond Lake Block, however, the area does not show signs of wide spread mortality that is common in many other forests throughout eastern Connecticut. Silvicultural treatments will aim to salvage gypsy moth killed individuals where possible.

Two-lined chestnut borer (*Agrilus bilineatus*) is an insect that is common from southern Canada through the eastern United States. The insect bores galleries underneath the bark of many species of oaks. These galleries can eventually cut off the flow of water and nutrients up and down the stem of a tree, thereby resulting in its mortality. Tree mortality rarely occurs due solely from the efforts of two-lined chestnut borer. The insect primarily attacks trees that are weakened by drought, defoliation, soil compaction or any number of other stressors. Two-lined chestnut borer, in combination with other stressors is what results in mortality. Silvicultural treatments will aim to thin overstocked stands to increase vigor and capture natural mortality caused by competition. These actions are the best ways, on a landscape scale, to prevent excessive two-lined chestnut borer damage.

Emerald ash borer (*Agrilus planipennis*) is present in the state forests throughout Connecticut. This beetle, native to northeastern Asia, feeds on all species of ash. Females lay eggs in the bark of ash trees and larvae feed underneath the bark until they mature into adults. Once they mature into adults they bore through the bark, fly to another host tree and the cycle continues. Signs of the emerald ash borer are horizontal galleries underneath the bark created by the larvae feeding as well as D shaped holes in bark created when adults bore through the bark. The larvae feeding underneath the bark cuts off the flow of water and nutrients to the rest of the tree and results in the mortality of the affected tree. Salvaging affected trees during timber harvesting operations is the only way to minimize the spread of this insect on a state forest wide scale. Fortunately, ash species makes up a very low percentage of all the trees present within the block. So the overall effect of this beetle in this block is expected to be minimum.

In areas dominated by white pine the white pine weevil (*Pissodes strobi*) has had an effect on their quality. This insect lays its eggs in the top most bud of white pine individuals. These eggs hatch and the larvae feed on the bud, thereby killing it and causing other branches to take over as the terminal leader. This results in a tree with three or more main stems. The quality of white pine with multiple stems due to this insect is typically degraded from sawlog quality to no more than pulpwood quality. This insect prefers high sunlight conditions. As a result, open grown trees are the most affected. The white pine stands in the interior of the forest that regenerated under partial shade are much less affected.

Beech bark disease is also commonly found on American beech individuals within the block. The disease results when the beech scale insect (*Cyptocuoccus fagisuga*) punctures the bark of a beech tree to feed, which creates a wound where the nectria fungus (*Neonectra faginata*) can enter the tree. Once the nectria fungus is within the tree the fungus causes cankers to form, ultimately resulting in the mortality of the tree. To compound the issue, American beech sprouts prolifically from cut stumps and from roots. Furthermore, American beech is very shade tolerant, meaning it grows well in high shade conditions such as the forest floor. Therefore, as American beech individuals succumb to disease they sprout new stems from their roots and continue the cycle of growth and disease. For long term forest management, the difficulty is establishing desirable regeneration such as red oak in an understory already dominated by disease prone beech sprouts. Silvicultural treatments will focus on even aged management techniques which will allow high amounts of sunlight to the forest floor, thereby favoring shade intolerant and intermediate shade tolerant species over the shade tolerant beech. Treating beech stumps in recently harvested areas with an herbicide to prevent re-sprouting may be recommended as another way to favor the regeneration of more desirable species.

Forest Health: Invasives

Invasive species such as multi-flora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), Japanese stilt grass (*Microstegium vimineum*), oriental bittersweet (*Celastrus orbiculatus*) and burning bush (*Euonymus alatus*), sometimes called "winged euonymus" due to its twigs having a winged appearance, are commonly found in the Diamond Lake Block. Invasives can threaten to displace native understory vegetation and can overtop young trees, suppressing their growth. The native mountain laurel (*Kalmia latifolia*) is also a common understory shrub found throughout the block and can act in much the same way as non-native invasive species. These shrubs tend to be most dense on roadsides, property boundary lines and field edges with a lower density being present in the interior of the forest under the canopy of trees. Unfortunately, invasive species are so common throughout Connecticut and the rest of the northeast that eradication is not a realistic goal. However, efforts can and should be made to reduce invasive species density. Therefore, each timber harvest that is prescribed in this management plan will address invasive species. If levels are considered high enough to hinder the establishment of regeneration or will overtop advance regeneration, an herbicide treatment of the invasives in that particular area will be warranted prior to completing the silvicultural activity.

Forest Health: Abiotic Factors

The primary abiotic factor that has a significant effect on forest health is weather. Extreme weather events such as tornados, hurricanes, ice storms and micro-bursts cannot be planned for. However, this management plan aims to be adaptive. After significant weather events areas that were heavily affected will be re-assessed and if any immediate action would be advantageous to mitigate forest health impacts, those actions will be taken at that time.

H. Landscape Context – Forestry – adjacent land uses

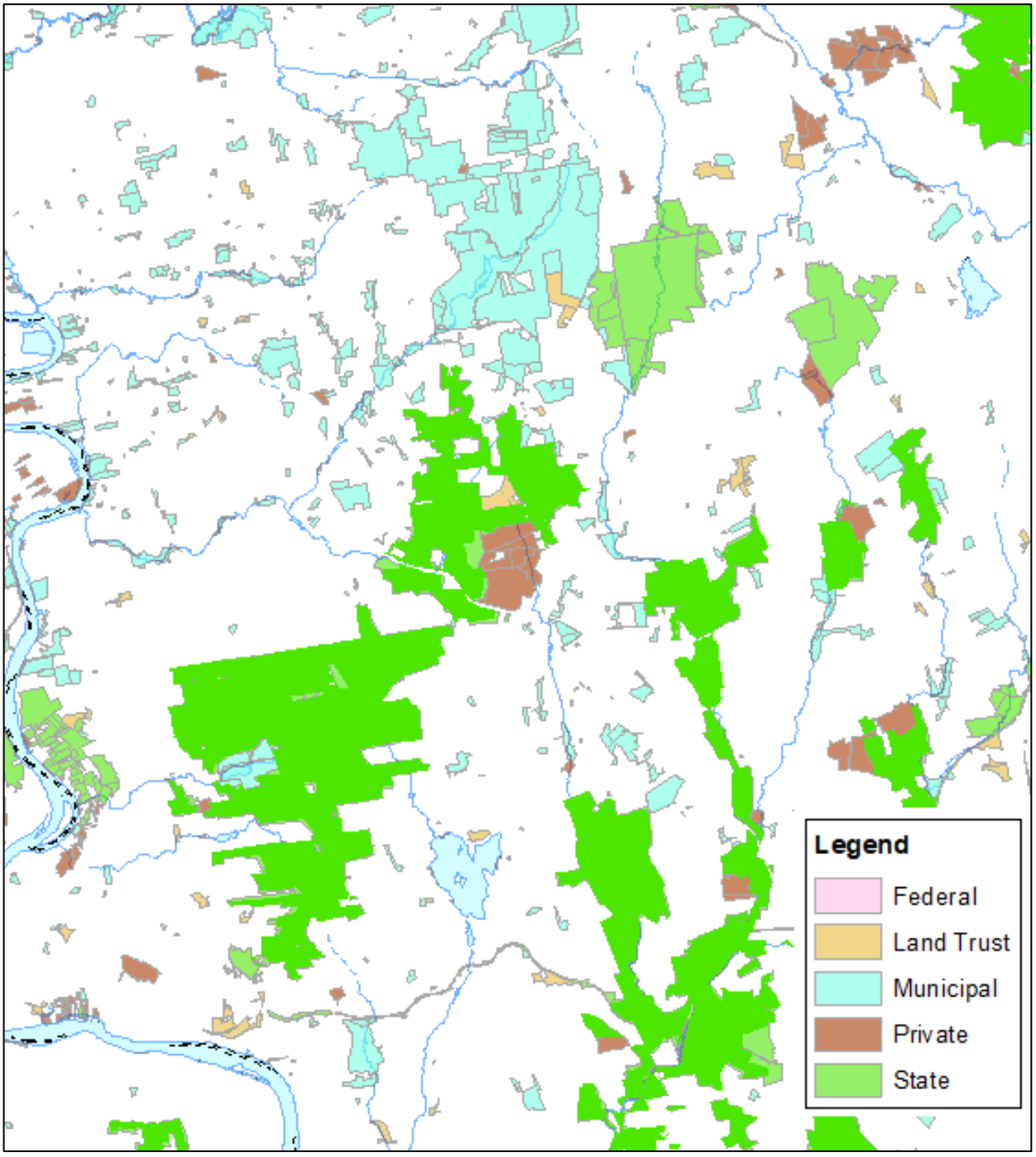


Figure 1.6. Location map showing federal, land trust, municipal, private and state protected lands in the vicinity of the Diamond Lake Block.

The Diamond Lake Block is nestled within one of the many bedroom communities outside of the metropolitan center of Connecticut, Hartford. Therefore, this forestland is of significant ecological value. Suburban sprawl has developed a large portion of the landscape that encompasses the Meshomasic State Forest area. However, efforts to protect land at the federal, state, municipal and private level have protected thousands of acres of land adjacent to the state forest and in nearby communities. The present day conditions are recognized as good landscape level habitat, with a diversity of cover types including forestland of varying age classes, actively managed agriculture land and open land containing a diversity of herbaceous plants. A much greater amount of land in this landscape is unprotected and may increasingly be under the stress of development. Therefore, management strategies of the Diamond Lake Block will need to be reviewed on a ten year cycle to ensure habitat goals are met as landscape habitat is lost due to development.

I. Specific Acquisition Desires

Future acquisition efforts should be prioritized by the following three guidelines:

1. All interior parcels should be acquired if made available to the state. This will reduce boundary line maintenance as well as strengthen DEEP forest use policies.
2. Any parcel which currently abuts the forest on two or three sides. Acquisition of properties such as these would allow the forest to expand along its bounds, reducing maintenance issues, strengthening DEEP forest use policies and will create a larger protected forest corridor.
3. Any parcel which may provide improved access to existing town roads should be acquired for management and emergency access purposes.

J. Public Involvement

Public involvement and receiving stakeholder input are critical aspects of public lands management. Therefore, a preliminary draft of this forest management plan was shared with the towns that this forest resides within, the Town of Marlborough and the Town of Glastonbury, as well as the Connecticut Forest and Parks Association (CFPA) and Audubon Connecticut. These municipalities and organizations are considered major stakeholders in the management of this forest because collectively they represent the constituents of the community the forest is located within, recreational opportunity and trail stewardship and the conservation of vital wildlife habitat. These stakeholders were asked to review the plan, over a month long period, and provide any comments or concerns they might have. Comments, concerns and/or recommendations were then incorporated into the plan prior to the completion and publication of the document. Based on comments received from CFPA, edits were made to the map and description of the Blue-Blazed Shenipsit Trail to accurately represent this recreational resource and suggestions were given to aid in the stopping of non-authorized forest use. Audubon Connecticut shared comments on bird habitat enhancement efforts such as avoiding working in the forest during the critical nesting season (April through July), creation of soft transitional edges when timber harvesting to reduce negative impacts to forest interior bird species, maintaining oak species for their important mast crop, creation of early successional forest habitat and the importance

of hunting to reduce the over browsing of understory vegetation by deer. Where applicable, these comments and suggestions will be incorporated into future forest operation plans that are prepared prior to the implementation of any silvicultural activity within the forest. During the development of forest operation plans wildlife staff will be consulted and best management practices will be developed, based on the seasonality of the operation, in order to protect wildlife while harvesting operations are taking place. Confirmation was received that the draft management plan was received by the towns of Marlborough and Glastonbury, however, no comments were submitted from either of the municipalities.

This plan will be made available to the public. State forest management plans are published on the CT DEEP website and can be found by following the tab entitled “Forest Health, Fire and Management” and then clicking on the “Forest Management on State Lands” link. Comments and questions regarding the plan are always encouraged, especially from adjacent landowners. Also, this plan may serve as a resource for local municipalities and nonprofit organizations that are actively planning for open space protection.

K. Adaptive Management

The Division of Forestry understands the nature of forest management as it occurs as part of a dynamic landscape. Management actions are often affected by outside variables which influence the outcome of resource decisions. The Division of Forestry reserves the right to reasonably change our management approach as environmental change and resource needs warrant. Some of these changes may be associated with biological factors such as insect and disease, or population outbreaks. Increased unauthorized motorized recreation which erodes trails and roads may require action unforeseen during the composition of this plan. Additionally, environmental conditions such as hurricanes or record-breaking precipitation may additionally affect resource condition and work requirements. The Division of Forestry and our colleagues in Parks, Wildlife, Fisheries, and Agency Support, evaluate circumstances and use an adaptive-management philosophy and additionally reserve the right to address unforeseen circumstances should they arise during the tenure of this forest management plan.

L. 10 Year Goals

- Create a sustainable forest and ecosystem
- Address unauthorized and illegal use of the forest
- Establish 598.50 acres of Old Forestland Management Sites
- Maintain areas of mature forest to serve as carbon storage
- Create young forest and early successional habitat to diversify wildlife habitat
- Create young forest to increase the rate of carbon sequestration
- Protect and enhance significant and/or critical habitat
- Improve access to the forest for forest management operations
- Control invasive species, particularly in actively managed areas, to prevent them from suppressing regeneration and to avert their establishment throughout the forest
- Implement sustainable silvicultural practices
- Utilize adaptive management principles in the event that damage to the forest is caused by events that are unforeseen at this time such as adverse weather and insect or disease infestations

M. Work Plans

Road Maintenance

There are only two interior forest roads within the Diamond Lake Block, Toll Gate Road and Windham Road. Toll Gate Road, located in the southern portion of the block, has a firm base because it was originally established to be trafficked by cars. Currently, the road is used primarily for recreational purposes, as this road is also part of the Blue Blaze Hiking Trail. However, the initial 2500 feet of this road beyond the gate is also frequently trafficked by vehicles because it leads to the Glastonbury Shooting Range. As a result, portions of the road beyond the shooting range are in good condition for its intended use and it does not need any maintenance at this time. However, the portion of the road up to the shooting range could use some improvements to prevent rutting, muddy conditions and to ensure there will always be good access to the shooting range. Therefore, grading fresh gravel onto this portion of the road and installing water drainage structures are recommended. The other forest road, connecting Windham Road to Diamond Lake Road, is in very poor condition due to 20 years of rain events eroding its surface with no maintenance being done to it. The entirety of this road will not be used during the management activities prescribed in this plan. Therefore, restoring the entire road is not feasible at this time. However, it will be necessary to restore 1,200 feet of this road north of Windham Road due to there being a scheduled timber harvest adjacent to this road in that area. Road improvements in this area will include adding a new gravel surface and installing water drainage structures such as water bars where necessary.

Road Construction, Gates & Signs

No new road construction projects are deemed to be necessary for the management of the Diamond Lake Block. Gates are already present at the beginning and ends of each forest road. Signs are already placed where necessary to give visitors the information they need, most notably at the Range access gate on Toll Gate Road. Therefore, no new gate or sign construction is considered to be essential at this point in time.

Boundary Maintenance

Boundary line maintenance consists of repainting blazes on boundary line trees, putting up new state forest signs on boundary line trees and collecting data on boundary line features such as stone walls, barbed wire fencing and corner pins. This was last completed in the Diamond Lake Block approximately 10 years ago. As a result, the paint is now fading and the boundary lines around new land acquisitions have not been done. Therefore, all boundary lines will be revisited in the next 10 year management cycle to ensure they are marked clearly. In the future, boundary lines will be maintained every 10 years to ensure that markings are accurate and data is as up to date as possible.

Stream Improvement

No stream improvement plans are scheduled for this management period.

Cultural Site Maintenance

No cultural site maintenance is planned for this management period.

Recreation Site Improvement

Consideration will be given to develop and improve three parking areas, located on Windham Road, Thompson Street and near the Range access gate on Toll Gate Road, to improve public access to the forest and Blue-Blazed Trail.

General maintenance of the Glastonbury Shooting Range will consist of keeping the area clean, safe and accessible (i.e., trash pick-up, refreshing range boundary with paint and signs, repairing/replacing and weather-coating and staining the wooden structures, range grading, road maintenance). A lead abatement project is being planned for implementation during this planning period, based on surveys.

Trail Maintenance

The Blue-Blazed Trail will continue to be maintained by CFPA. The kiosk on Toll Gate Road at the Blue-Blazed Trailhead will continue to be maintained by the State. Maintenance of this kiosk will involve ensuring that it is in good condition and that the information it displays is current and pertinent. The State does not have the resources to manage all of the other trails that can be found within the block. Therefore, efforts will be focused on keeping illegal use to a minimum. The primary illegal use is motorcycle and ATV use. The primary entry point of motorcycles and ATV's is the culvert that crosses under CT Route 2 from Meshomasic's Mountain Block to the Diamond Lake Block. A planning meeting will be held between law enforcement and land managers to collaborate on solutions to reduce illegal use.

Wildlife Habitat Improvement

Efforts will be made to enhance habitat conditions for state listed species. The primary practice used to improve habitat will be in the form of group selection harvesting that will allow sunlight to reach the forest floor in small areas within the forest. In the context of wildlife, this practice is also known as daylighting. Daylighting is the practice of cutting selected trees, or groups of trees, within the forest in order to release vegetation, increase the amount of sunlight penetrating to the forest floor and encouraging the growth of shrubs and herbaceous vegetation that many species of wildlife rely on.

Furthermore, silvicultural activity will create a greater diversity of wildlife habitat. This will be done through regeneration harvests that will create early successional habitat, an element that is lacking within this block of forestland.

There are several fields located adjacent to Windham Road (Compartment 7, Stand 1), off of Thompson Street (Compartment 8, Stand 6) and south of Goodale Hill Road (Compartment 2, Stand 8). All of these fields are overgrown with herbaceous vegetation. It is desired to keep these areas open, rather than letting them revert back to forest, in order to maintain this habitat type. This will be done by periodic mowing. Mowing should be completed every three years during the late fall or winter months.

Adjacent to the overgrown fields south of Goodale Hill Road there is a young stand of eastern red cedar and mixed hardwoods with a high density of invasive species in the understory. This habitat type is unique because it is the only area within the block with these qualities. Currently this stand has matured to the point where the trees are 40 to 50 feet tall and the canopy has closed. Eastern red cedar is considered an early successional species that is shade intolerant. If no management is completed in this stand, other species such as black birch will begin to out-compete the red cedar, eventually shading it out. Therefore, in order to sustain this habitat type within this block the stand will be treated, if funds are available, using a combination of mowing, invasive species herbicide treatment and tree harvesting.

Wildlife Population Management

Hunting and trapping is permitted within the Diamond Lake Block. These activities aid in the management of wildlife populations. Hunting and trapping rules and regulations are created by CT DEEP, Wildlife Division, and are made based on current wildlife population data.

Silviculture

Fiscal Year	Compartment	Stand	Acreage	Activity
2021	8	2	50.00	Group Selection
2021	8	5	15.99	Thinning
2021	8	7	20.73	1st Shelterwood
2021	2	2	39.03	1st Shelterwood
2023	3	1	26.68	2nd Shelterwood
2023	3	3	42.15	2nd Shelterwood
2023	7	5	29.62	Thinning
2023	2	11	12.00	Seed Tree
2025	21	3	38.62	1st Shelterwood
2025	21	2	34.52	1st Shelterwood
2025	21	1	4.66	Thinning
2027	10	1	75.57	Irregular Shelterwood
2027	10	4	107.20	Thinning
2029	2	7	27.04	1st Shelterwood
Total Acreage			**523.81**	

Table 1.4. Table of the silvicultural activities scheduled for the next 10 years within the Diamond Lake Block.

Timber Stand Improvement/Invasive Control

No timber stand improvement work is considered necessary at this time. However, silvicultural regeneration efforts in the next 10 years will likely result in an abundance of black birch and red maple regeneration. It is probable that timber stand improvement will be necessary in harvested areas in the next management cycle in order to foster the growth of whatever oak regeneration is available at that time.

It is imperative that invasive plants be treated so they do not suppress regeneration efforts. Invasive species are common and well established across the landscape. Eradication is not a realistic goal. Therefore, invasive control efforts will be concentrated to areas where harvesting is scheduled. Fortunately, in the majority of the upland forest stands where harvesting has been scheduled the density of invasives is low or non-existent. Invasive control will focus on areas where invasives are the most prevalent, along boundary lines and access points. Invasive treatments will control their densities in those areas, allowing young trees and native herbaceous plants to become established while preventing invasives from spreading into core interior forestland. Chemical treatment, such as the use of herbicides, is the preferred invasive treatment method. This is because chemical treatments can target individual plants or large groups and they are effective at killing an entire plant above and below ground. Also, from a time and economic management perspective, herbicide treatments are quite efficient.

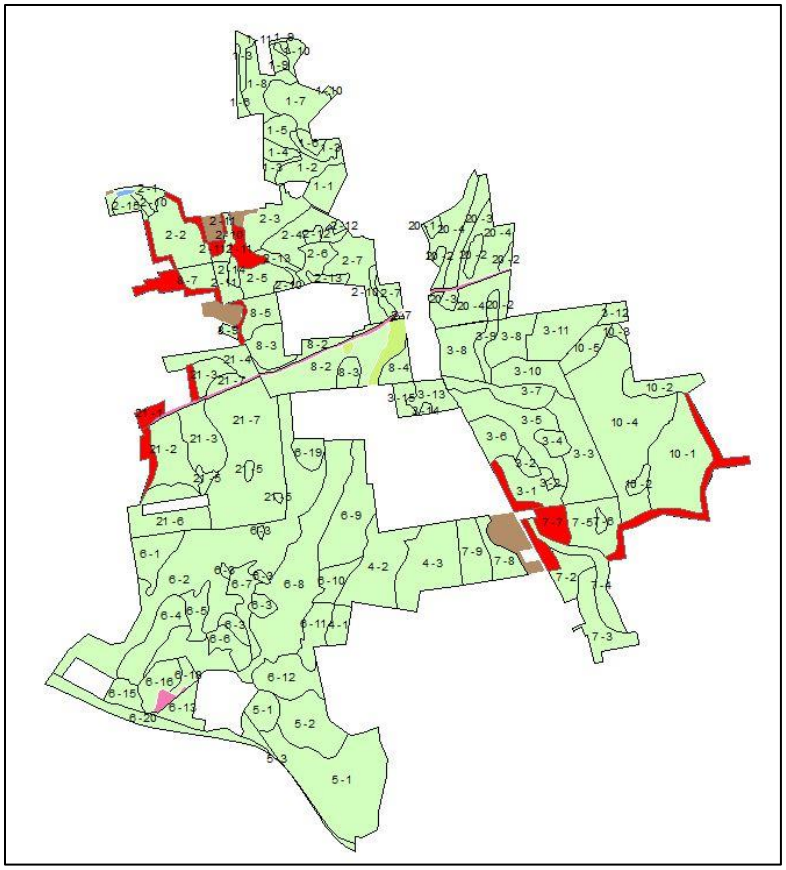


Figure 1.7. Map of the Diamond Lake Block showing the areas where invasives will be treated. Areas shaded in red are the areas that will be treated.

Fiscal Year	Compartment	Stand	Acreage
2021	8	7	12.00
2021	8	5	2.50
2021	2	2	8.00
2023	3	1	6.50
2023	7	5	3.50
2023	7	7	12.00
2023	7	1	6.00
2023	2	11	12.00
2025	21	1	5.25
2025	21	2	6.50
2027	10	1	21.00
Total Acreage			**95.25**

Table 1.5. Table describing where, when and how much land will be treated for invasives.

Meshomasic Diamond Lake Block Work Plan by Year

Fiscal Year	Scheduled Activity	Forest Compartment	Forest Stand	Restrictions	Area
2021	Group Selection	8	2	Seasonal	50 Acres
	Field Mowing	2	8	Seasonal	9 Acres
	Field Mowing	7	1	Seasonal	20 Acres
	Field Mowing	8	6	Seasonal	9 Acres
	Boundary Line Maintenance			None	13 Miles
	Law Enforcement Meeting to Address Illegal & Unauthorized Forest Use			None	
	Invasive Treatment	8	7	Seasonal	12 Acres
	Invasive Treatment	8	5	Seasonal	3 Acres
	Invasive Treatment	2	2	Seasonal	8 Acres
	Thinning	8	5	None	16 Acres
	1st Shelterwood	8	7	None	21 Acres
	1st Shelterwood	2	2	None	39 Acres
2022	Toll Gate Road Improvements			Seasonal	2500 Feet
	Boundary Line Maintenance			None	12 Miles
2023	Invasive Treatment	3	1	Seasonal	7 Acres
	Invasive Treatment	7	5	Seasonal	4 Acres
	Invasive Treatment	7	7	Seasonal	12 Acres
	Invasive Treatment	7	1	Seasonal	6 Acres
	2nd Shelterwood	3	1	None	27 Acres
	2nd Shelterwood	3	3	None	42 Acres
	Thinning	7	5	None	30 Acres
	Seed Tree	2	11	None	12 Acres
	Invasive Treatment	2	11	Seasonal	12 Acres
	Field Mowing	2	8	Seasonal	9 Acres
	Field Mowing	7	1	Seasonal	20 Acres
	Field Mowing	8	6	Seasonal	9 Acres

Meshomasic Diamond Lake Block Work Plan by Year

Fiscal Year	Scheduled Activity	Forest Compartment	Forest Stand	Restrictions	Area
2025	Invasive Treatment	21	1	Seasonal	5 Acres
	Invasive Treatment	21	2	Seasonal	7 Acres
	1st Shelterwood	21	3	None	39 Acres
	1st Shelterwood	21	2	None	35 Acres
	Thinning	21	1	None	5 Acres
2026	Field Mowing	2	8	Seasonal	9 Acres
	Field Mowing	7	1	Seasonal	20 Acres
	Field Mowing	8	6	Seasonal	9 Acres
2027	Invasive Treatment	10	1	Seasonal	21 Acres
	Irregular Shelterwood	10	1	None	76 Acres
	Thinning	10	4	None	107 Acres
2029	1st Shelterwood	2	7	None	27 Acres
	Field Mowing	2	8	Seasonal	9 Acres
	Field Mowing	7	1	Seasonal	20 Acres
	Field Mowing	8	6	Seasonal	9 Acres
2030	Re-inventory Forest			None	2219 Acres
2031	Update Forest Management Plan			None	2293 Acres

N. Appendix

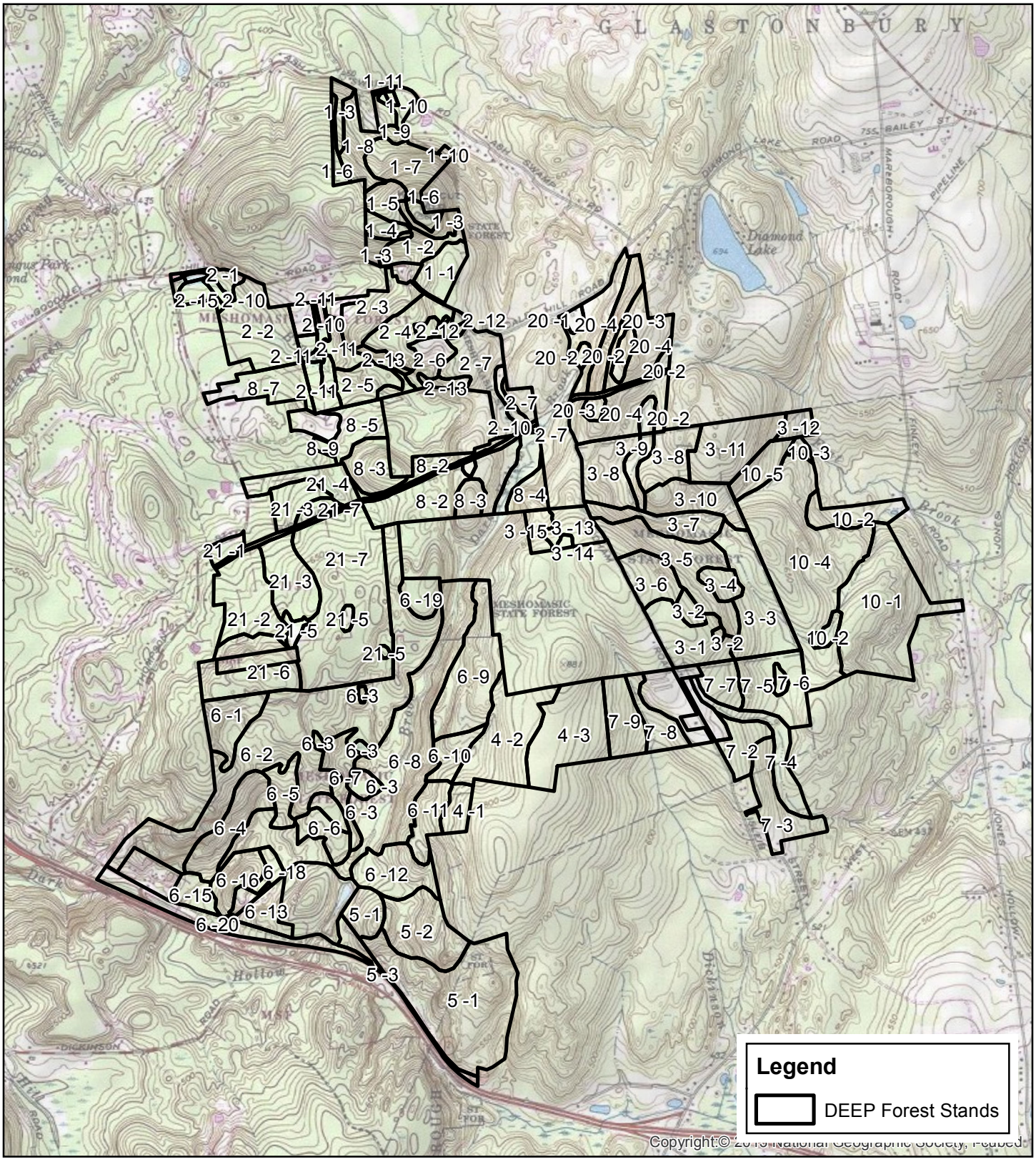
Map A - Topographic
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

December 10, 2019

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

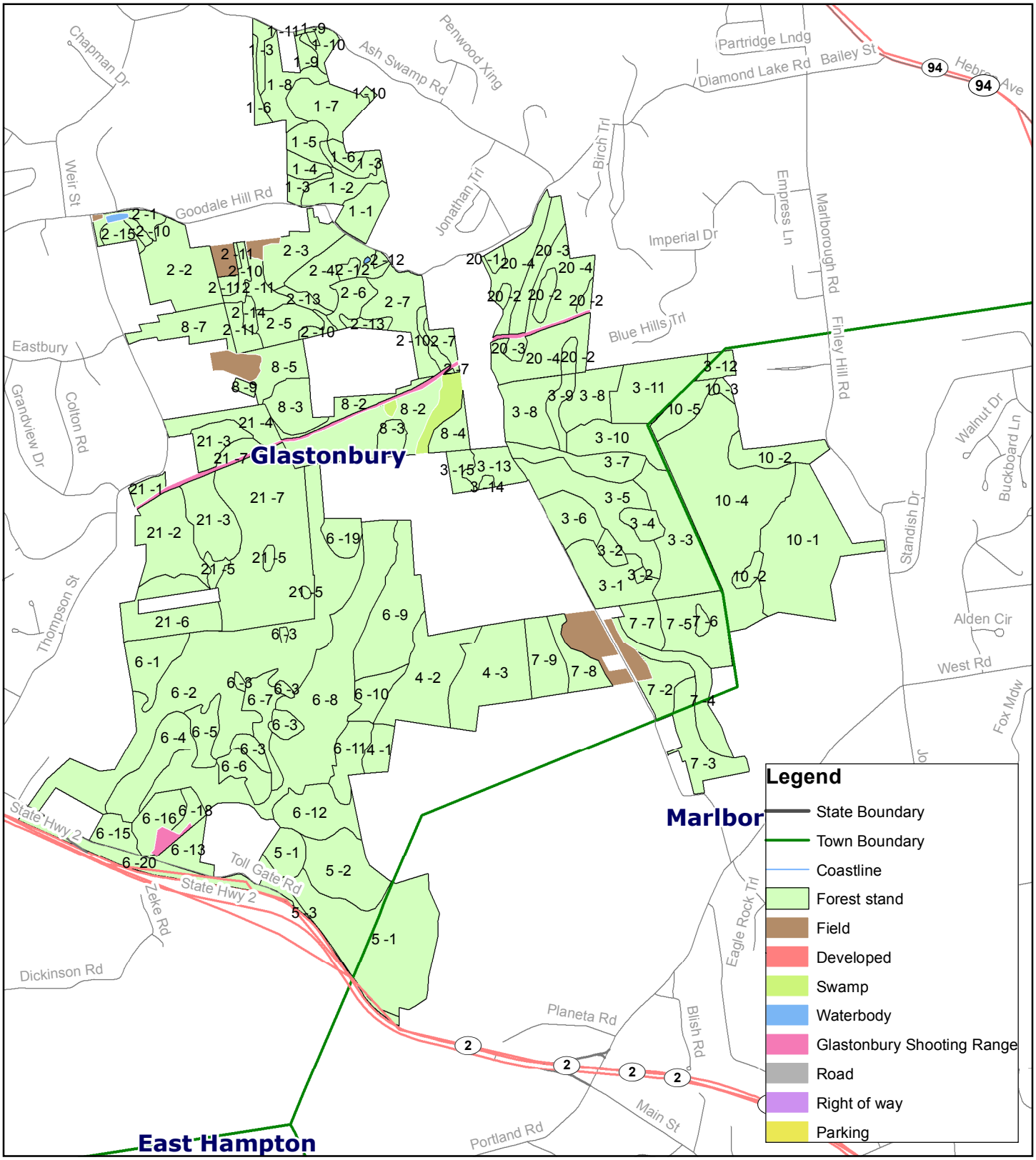
Map B - Base
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

January 10, 2020

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

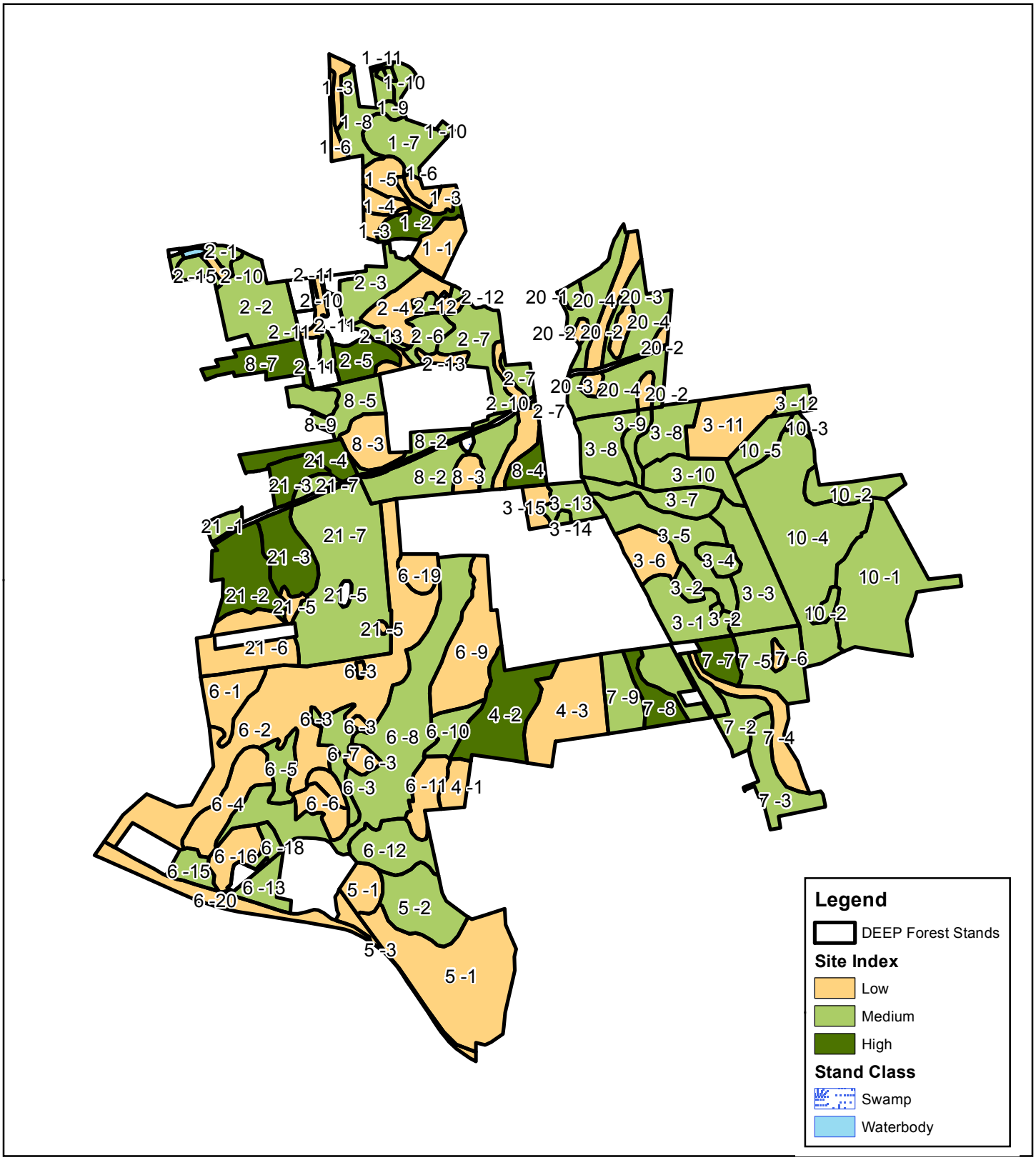
Map C - Site Quality
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

December 10, 2019

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

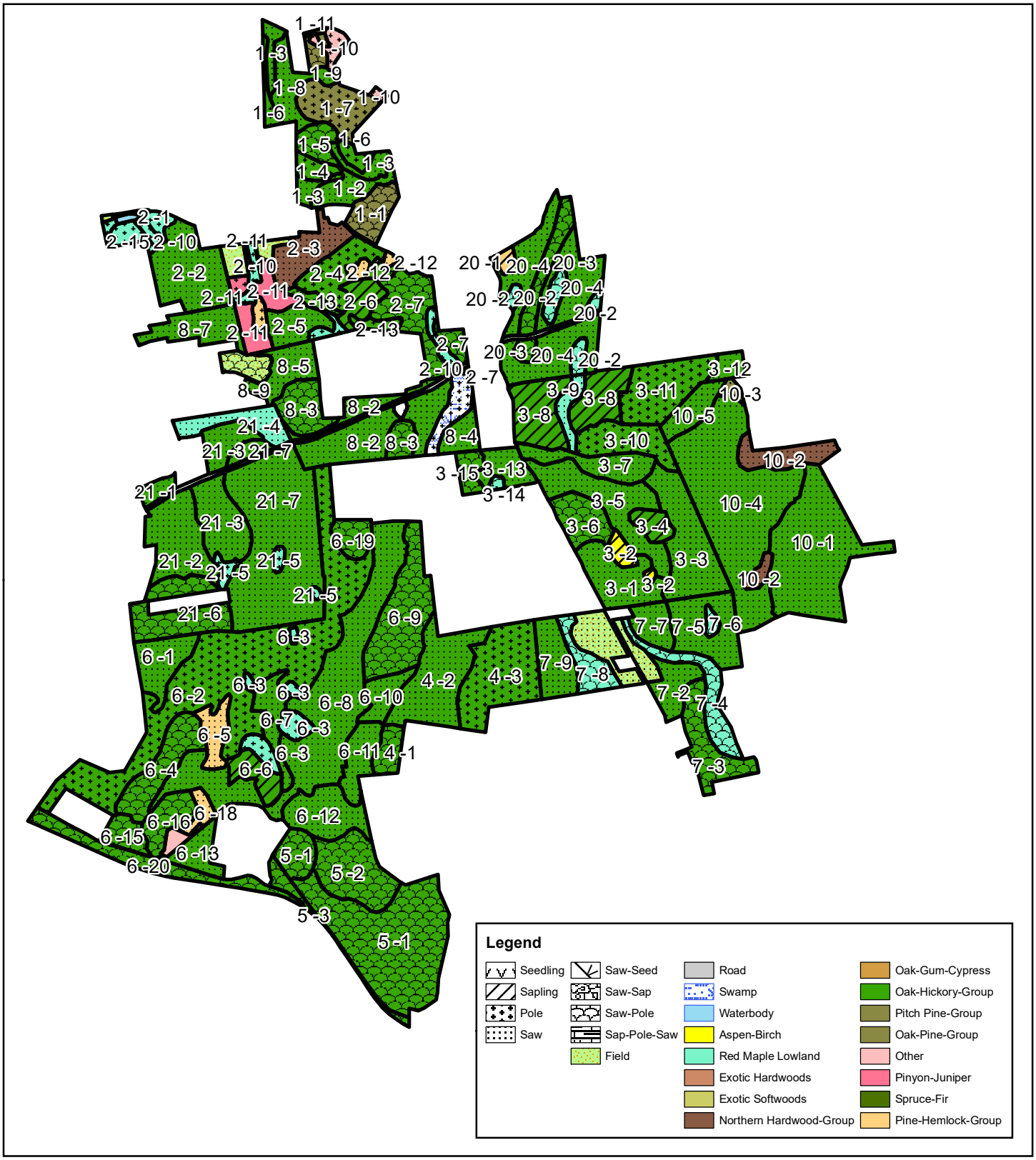
Map D - Forest Type & Size Class
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

December 10, 2019

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

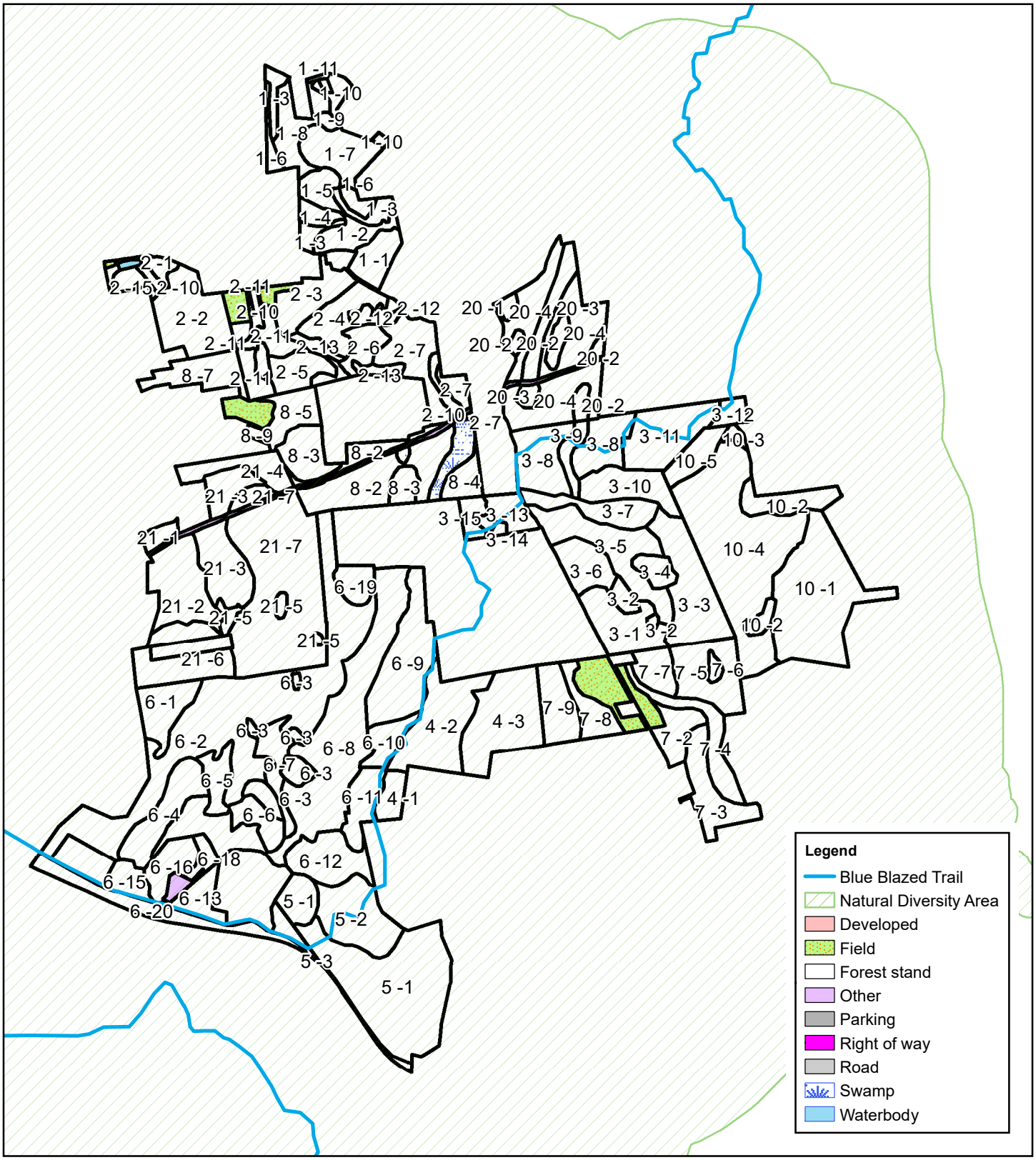
Map E - Special Features
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

December 10, 2019

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

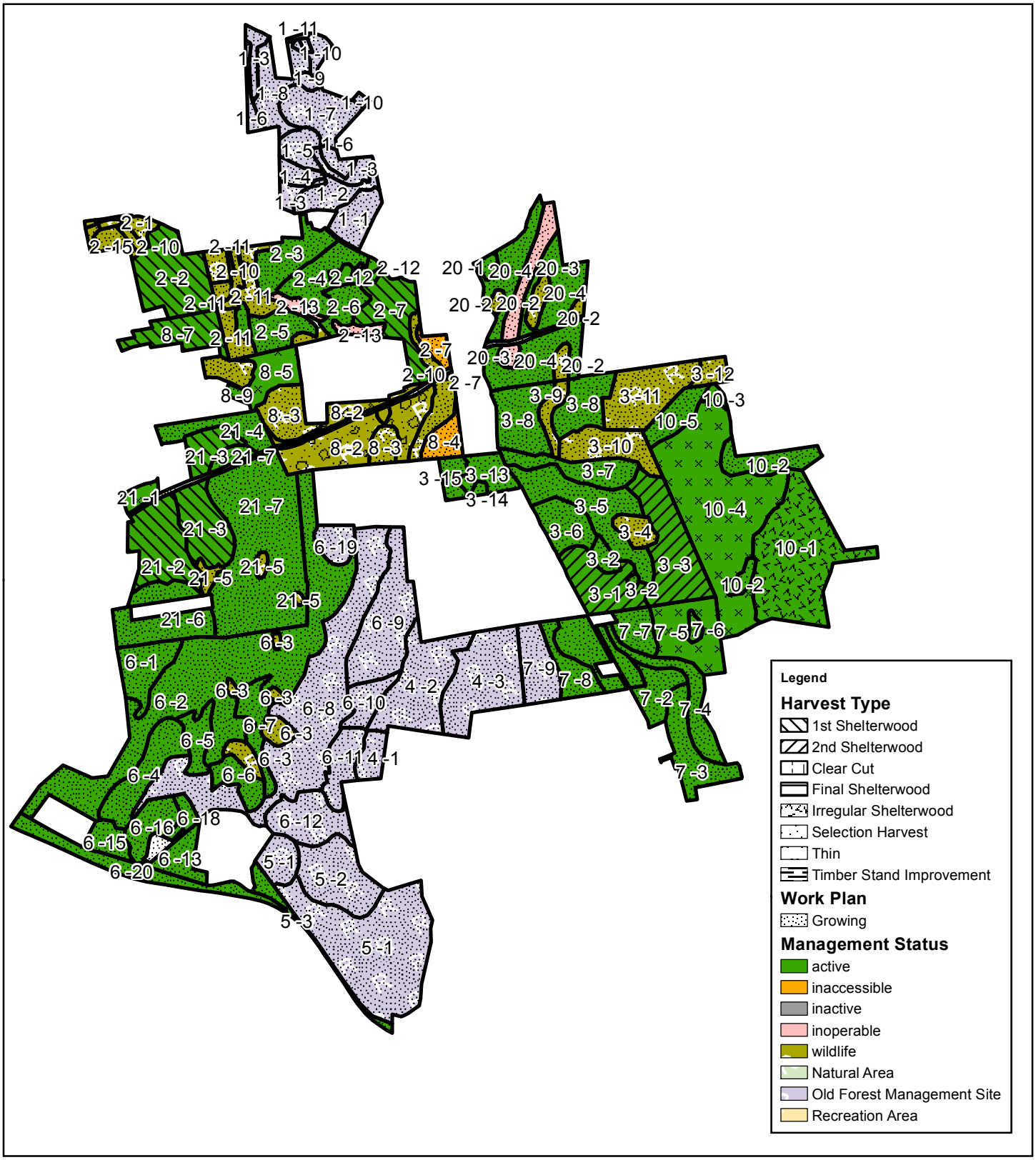
Map F - Work Plan
Meshomasic State Forest: Diamond Lake Block

Glastonbury & Marlborough, Connecticut
2,293 Acres

December 10, 2019

Map Scale: 1 inch = 2,500 feet

0 1,250 2,500 5,000 Feet



Coordinate System: NAD 1983 State Plane Connecticut FIPS 0600 Feet

Projection: Lambert Conformal Conic

List of Tables & Figures

From: Piche, Nathan
To: "richard.johnson@glastonbury-ct.gov"
Subject: Meshomasic State Forest Management Plan
Date: Tuesday, March 10, 2020 10:05:41 AM
Attachments: Mesh_SF_Diamond Lake Block Plan_2020.pdf
image003.png

Good morning,

My name is Nathan Piché and I am the state lands forest manager for Meshomasic State Forest. One of my primary responsibilities is to take inventory of the our state land resources and develop management plans describing our forests and how we plan to manage them for the next 10 year period. Recently I've been working on developing a forest management plan for a section of Meshomasic State Forest that we call the Diamond Lake Block, which encompasses 2,293 acres of state forestland north of Route 2. A large portion of this block of forestland falls within the Town of Glastonbury, making the town an important stakeholder in our forest management planning process. Therefore, I've attached a draft of this forest management plan and ask that you review it and provide me with any comments and concerns that the Town of Glastonbury may have. If you have any colleagues in the town government that would like to read and review this plan, please feel free to forward it to them. Also, if you would like me to present the plan at a planning meeting and respond to questions or concerns in person, I am willing to do so. Please respond with any questions, comments or concerns there may be by Friday April 10th.

Thank you,

Nathan Piché
Forester 1
State Lands Management Program
Division of Forestry
Connecticut Department of Energy and Environmental Protection
209 Hebron Road, Marlborough, CT 06447
P: 860.424.4036 | F: 860.306.9597 | E: nathan.piche@ct.gov

www.ct.gov/deep

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Ensuring a clean, affordable, reliable, and sustainable energy supply.

From:	Piche, Nathan
To:	"planning@glastonbury-ct.gov"
Subject:	Meshomasic State Forest Management Plan
Date:	Tuesday, March 10, 2020 10:17:56 AM
Attachments:	Mesh_SF_Diamond Lake Block Plan_2020.pdf image002.png

Good morning,

My name is Nathan Piché and I am the state lands forest manager for Meshomasic State Forest. One of my primary responsibilities is to take inventory of our state land resources and develop management plans describing our forests and how we plan to manage them for the next 10 year period. Recently I've been working on developing a forest management plan for a section of Meshomasic State Forest that we call the Diamond Lake Block, which encompasses 2,293 acres of state forestland north of Route 2. A large portion of this block of forestland falls within the Town of Glastonbury, making the town an important stakeholder in our forest management planning process. Therefore, I've attached a draft of this forest management plan and ask that you review it and provide me with any comments and concerns that the Town of Glastonbury may have. If you have any colleagues in the town government that would like to read and review this plan, please feel free to forward it to them. Also, if you would like me to present the plan at a planning meeting and respond to questions or concerns in person, I am willing to do so. Please respond with any questions, comments or concerns there may be by Friday April 10th.

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From:	Piche, Nathan
To:	"firstselectman@marlboroughct.net"
Subject:	Meshomasic State Forest Management Plan
Date:	Tuesday, March 10, 2020 10:24:38 AM
Attachments:	Mesh_SF_Diamond Lake Block Plan_2020.pdf image003.png

Good morning,

My name is Nathan Piché and I am the state lands forest manager for Meshomasic State Forest. One of my primary responsibilities is to take inventory of the our state land resources and develop management plans describing our forests and how we plan to manage them for the next 10 year period. Recently I've been working on developing a forest management plan for a section of Meshomasic State Forest that we call the Diamond Lake Block, which encompasses 2,293 acres of state forestland north of Route 2. A large portion of this block of forestland falls within the Town of Marlborough, making the town an important stakeholder in our forest management planning process. Therefore, I've attached a draft of this forest management plan and ask that you review it and provide me with any comments and concerns that the Town of Marlborough may have. If you have any colleagues in the town government that would like to read and review this plan, please feel free to forward it to them. Also, if you would like me to present the plan at a planning meeting and respond to questions or concerns in person, I am willing to do so. Please respond with any questions, comments or concerns there may be by Friday April 10th.

Thank you,

Nathan Piché
Forester 1
State Lands Management Program
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Connecticut Department of Energy and Environmental Protection
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From: Piche, Nathan
To: "info@ctwoodlands.org"
Subject: Meshomasic State Forest Management Plan
Date: Tuesday, March 10, 2020 10:41:33 AM
Attachments: Mesh_SF_Diamond Lake Block Plan_2020.pdf
image002.png

Good morning,

My name is Nathan Piché and I am the state lands forest manager for Meshomasic State Forest. One of my primary responsibilities is to take inventory of our state land resources and develop management plans describing our forests and how we plan to manage them for the next 10 year period. Recently I've been working on developing a forest management plan for a section of Meshomasic State Forest that we call the Diamond Lake Block, which encompasses 2,293 acres of state forestland north of Route 2. The Connecticut DEEP Division of Forestry considers CFPA an important stakeholder in our forest management planning process. Therefore, I've attached a draft of this forest management plan and ask that you review it and provide me with any comments and concerns that CFPA may have. Please respond with any questions, comments or concerns there may be by Friday April 10th.

Thank you,

Nathan Piché
Forester 1
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From: Piche, Nathan
To: "ct@audubon.org"
Subject: Meshomasic State Forest Management Plan
Date: Tuesday, March 10, 2020 10:35:30 AM
Attachments: Mesh_SF_Diamond Lake Block Plan_2020.pdf
image002.png

Good morning,

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Thank you,

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Glossery

Acceptable Growing Stock: Saleable trees that are of good form, species and quality and would be satisfactory as crop trees.

Adaptive Management: A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used to modify management on a continuing basis to ensure that objectives are being met (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Adverse Regulatory Actions: Written warning, citations or fines issued by law enforcement or regulatory bodies.

Aerial Photo: Photo taken from an elevated position like on an aircraft.

Afforestation: The establishment of a forest or a stand in an area where the preceding vegetation or land was not forest. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Age Class: A distinct aggregation of tree that originated at the same time, from a single natural event or regeneration activity or a grouping of trees (e.g. ten year age class) as used in inventory or management. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Aspect: The direction that a slope faces (north, south, etc.).

Basal Area: The cross-sectional area of a tree, in square feet, at 4.5 feet from the ground (at breast height). When the basal area of all the trees in a stand are added together, the result is expressed as square feet of basal area per acre, which is a measure of a stand's density.

Biomass: A renewable energy source of biological materials derived from living, or recently living organisms, such as wood, waste, and crop residues.

Biodiversity: The variety and abundance of life forms, processes, functions and structures of plants, animals and other living organisms, including the relative complexity of species, communities, gene pools and ecosystems at spatial scales that range from local through regional to global (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Board Feet: A unit for measuring wood volumes. It is commonly used to express the amount of wood in a tree, sawlog, or individual piece of lumber. A piece of wood 1 foot long, 1 foot wide, and 1 inch thick (144 cubic inches).

Broadcast: To spread or apply seed, fertilizer, or pesticides more or less evenly over an entire area. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Canopy: The more or less continuous cover of branches and foliage formed collectively by the tops, or crowns of adjacent trees.

Carbon Sequestration: The incorporation of carbon dioxide into permanent plant tissue. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Chip: A small piece of wood used to make pulp or wood composite or fuel. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Clearcut:

1. A stand in which essentially all trees have been removed in one operation – note depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration.

2. A regeneration or harvest method that removes essentially all trees in a stand. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Contour Map: A map where each line represents a change in elevation.

Crop Tree: A tree identified to be grown to maturity for the final harvest cut, usually on the basis of its location with respect to other trees and its timber quality.

Cull: A tree, log, lumber or seedling that is rejected because it does not meet certain specifications for usability or grade. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Culvert: A device used to channel water. It may be used to allow water to pass underneath a road, railway, or embankment for example. Culverts can be made of many different materials; steel, polyvinyl chloride (PVC) and concrete are the most common. Formerly, construction of stone culverts was common.

Cutting Cycle: The time interval between harvesting operations when uneven-aged methods are employed using group or single tree selection.

Den Tree: A living tree with a cavity large enough to shelter wildlife.

Desired Species: Those species of flora and fauna designated in the landowner's management plan and not known to cause negative impacts on the local environment.

Diameter Breast Height (DBH): The diameter of a tree at 4.5 feet above the ground.

Endangered Species: Any species of plant or animal defined through the Endangered Species Act of 1976 as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Even-Aged Management: Forest management with periodic harvest of all trees on part of the forest at one time or over a short period to produce stands containing trees all the same or nearly the same age or size.

Forest Owner: Landowner or designated representative such as, but not limited to, professional resource manager, family member, trustee, etc.

Forest Product: Any raw material yielded by a forest. Generally defined in Forest Acts or Ordinances, and subdivided conventionally into major forest products, i.e. timber and fuelwood, and minor forest products, i.e. all other products including leaves, fruit, grass, fungi, resins, gums, animal parts, water, soil, gravel, stone and other minerals on forest land (F. C. Ford –Robertson, Terminology of Forest Science Technology, Practice, and Products, Society of American Foresters, 1971).

Forest Stand Improvement: See timber stand improvement.

Forest Type: A category of forest usually defined by it trees, particularly its dominant tree species as based on percentage cover of trees, e.g. spruce fir, white pine, northern red oak.

Forest vitality: The health and sustainability of a forest.

Fuel Management: The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Group Selection: Trees are removed and new age classes are established in small groups. The width of groups is commonly approximately twice the height of the mature trees with smaller openings providing microenvironments suitable for tolerant regeneration and large openings providing conditions suitable for more intolerant regeneration. The management unit or stand in which regeneration, growth and yield are regulated consists of an aggregation of groups. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Girdling: Completely encircling the trunk of a tree with a cut that severs the bark and cambium of the tree. Herbicide is sometimes injected into the cut to ensure death of the tree.

GPS (Global Positioning System) Coordinates: A commonly hand held, satellite based navigational device that records x, y, z coordinators and other data allowing users to determine their location on the surface of the earth. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Hack-n-Squirt: A tree treatment method where an axe or hatchet is used to make “hacks” (injections) into the tree’s cambium layer. A plastic “squirt” bottle is used to spray a specific amount of herbicide into the cuts placed around the tree.

Harvesting: The felling skidding, on-site processing, and loading of trees or logs onto trucks. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

High conservation value forests (HCVF): Forests of outstanding and critical importance due to their environmental, social, biodiversity or landscape values. Due to the small scale and low-intensity of family forest operations, informal assessment of HCVF occurrence through consultation with experts or review of available and accessible information is appropriate.

High-Grading: Cutting only the high-value trees from a forest property, leaving a stand of poor quality with decreased future timber productivity.

Incentive Programs: State and federal agencies will offer landowners the opportunity to apply for incentive programs that will provide support and financial assistance to implement forestry and agroforestry related practices through conservation programs. Assistance can also provide for multi-year and permanent easements to conserve forest land to meet program goals.

Integrated Pest Management: The maintenance of destructive agents, including insects, at tolerable levels by planned use of a variety of preventative, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Intermediate Cut: Removing immature trees from the forest sometime between establishment and stand harvest to improve the quality of the remaining forest stand. Contrast this technique with a harvest cut.

Invasive species: Non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112 (Feb. 3, 1999). Invasive Species: is a species that is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., insects, microbes, etc.). Human actions are the primary means of invasive species introductions. (Invasive Species Definition Clarification and Guidance White Paper Submitted by the Definitions Subcommittee of the Invasive Species Advisory Committee (ISAC), Approved by ISAC Apr 27, 2006.)

Landings: A cleared are in the forest to which logs are yarded or skidded for loading onto trucks for transport. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Landowner: Entity that holds title to the property for which the management plan is being written.

Large Woody Debris: Any piece(s) of dead woody material, e.g. dead boles, limbs and large root masses, on the ground in the forest stands or in streams. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Log Rules: A table showing estimated amount of lumber that can be sawed from logs of given lengths and diameters. The log rule commonly used in Connecticut is the International ¼ -inch Rule. The International ¼-inch Rule is a formula rule allowing 1/2 – inch taper for each 4 feet of length and 1/16-inch shrinkage for each one-inch board. This measure approximates the actual sawmill lumber tally.

Management Plan: Documents that guide actions and that change in response to feedback and changed conditions, goals, objectives and policies. Management plans may incorporate several documents including, but not limited to, harvest plans, activity implementation schedules, permits and research.

Mast: Nuts of trees, such as oak, walnut, and hickory, that serve as food for many species of wildlife.

Mature Tree: A tree that has reached the desired size or age for its intended use.

MBF: Abbreviation for 1,000 board feet.

Noxious Plant (weed): A plant specified by law as being especially undesirable, troublesome and difficult to control (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Nutrient Cycle: The exchange or transformation of elements among the living and nonliving components of the ecosystem. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Overstocked: A forest stand condition where too many trees are present for optimum tree growth.

Overstory: That portion of the trees in a stand forming the upper crown cover.

Overstory Removal: The cutting of trees constituting an upper canopy layer to release trees or other vegetation in an understory. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Pesticide: Pesticides include chemicals commonly known as herbicides and insecticides.

Pole Timber: Trees from 6 inches to 12 inches in diameter at breast height.

Prescribed Burn/Fire: To deliberately burn natural fuels under specific weather conditions, which allows the fire to be confined to a predetermined area and produces the fire intensity to meet predetermined objectives. A fire ignited by management to meet specific objectives (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Pruning: Removing live or dead branches from standing trees to improve wood quality.

Pulpwood: Wood cut primarily for manufacture of paper, fiberboard, or other wood fiber products.

Qualified Contractor: Forest contractors who have completed certification, licensing, recommended training and education programs offered in their respective states.

Qualified Natural Resource Professional: A person who by training and experience can make forest management recommendations. Examples include foresters, soil scientists, hydrologists, forest engineers, forest ecologists, fishery and wildlife biologists or technically trained specialists in such fields.

Rare species: A plant or animal or community that is vulnerable to extinction or elimination.

Reforestation: The reestablishment of forest cover either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting) – note reforestation usually maintains the same forest type and is done promptly after the previous stand or forest was removed. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Regeneration: The number of seedlings or saplings existing in a stand. The process by which a forest is renewed by direct seeding, planting, or naturally by self-sown seeds and sprouts.

Regeneration Cut: Any removal of trees intended to assist regeneration already present or to make regeneration possible.

Release: To free trees from competition by cutting, removing, or killing nearby vegetation.

Riparian: Related to, living or located in conjunction with a wetland, on the bank of a river or stream but also at the edge of a lake or tidewater – note the riparian community significantly influences and is significantly influenced by, the neighboring body of water. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Riparian Zone: The area adjacent to or on the bank of rivers and streams.

Rotation Age: The age at which a stand is considered ready for harvest under the adopted plan of management or the culmination of mean annual increment.

Sapling: Trees from 2 inches to 6 inches in diameter at breast height.

Sawtimber: Trees at least 12 inches in diameter at breast height from which a sawed product can be produced.

Scale: The extent of forest operations on the landscape/certified property.

Seedling: A young plant.

Seed-Tree Harvest: A harvest and regeneration method where nearly all trees are removed at one time except for scattered trees to provide seed for a new forest.

Selection Harvest: Harvesting trees to regenerate and maintain a multi-aged structure by removing some trees in all size classes either singly or in small groups.

Shelterwood Harvest: A harvesting and regeneration method that entails a series of partial cuttings over a period of years in the mature stand. Early cuttings improve the vigor and seed production of the remaining trees. The trees that are retained produce seed and also shelter the young seedlings. Subsequent cuttings harvest shelterwood trees and allow the regeneration to develop as an even-aged stand.

Single Tree Selection: Individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Site Index: An expression of forest site quality based on the height of a free-growing dominant or co-dominant tree at age 50 (or age 100 in the western United States).

Skid: 1. To haul a log from the stump to a collection point (landing) by a skidder. 2. A load pulled

by a skidder. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Skid Trail: A road or trail over which equipment or horses drag logs from the stump to a landing.

Skidding: Pulling logs from where they are cut to a landing or mill.

Slash: The residue, e.g., treetops and branches, left on the ground after logging or accumulating as a result of storm, fire, girdling, or delimbing. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Snag: A standing, generally un-merchantable dead tree from which the leaves and most of the branches have fallen – note for wildlife habitat purposes, a snag is sometimes regarded as being at least 10 inches in diameter at breast height and at least 6 feet tall; a hard snag is composed primarily of sound wood, generally merchantable, and a soft snag is composed primarily of wood in advanced stages of decay and deterioration. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Soil Compaction: The process by which the soil grains are rearranged, resulting in a decrease in void space and increasing bulk density. Can occur from applied loads, vibration or pressure from harvesting or site preparation equipment. Compaction can cause decreased tree growth, increased water runoff and soil erosion. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Soil Map: A map showing the distribution of soils or other soil map units in relation to prominent physical and cultural features of the earth's surface. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Special Sites: Those areas offering unique historical, archeological, cultural, geological, biological or ecological value.

Special Sites include:

A. Historical, archaeological, cultural and ceremonial sites or features of importance to the forest owner;

B. Sites of importance to wildlife such as rookeries, refuges, fish spawning grounds, vernal ponds and shelters of hibernating animals;

C. Unique ecological communities like relic old-growth, springs, glades, savannas, fens and bogs; and

D. Geological features such as terminal moraines, cliffs and caves.

Stand: A group of trees with similar characteristics, such as species, age, or condition that can be distinguished from adjacent groups. A stand is usually treated as a single unit in a management plan.

Stand Density: A measure of the stocking of a stand of trees based on the number of trees per area and diameter at breast height of the tree of average basal area.

Stand Management Recommendations: The recommended management activities that should be done in that stand, based on the landowner's goals and objectives.

Stand Structure: The horizontal and vertical distribution of plants in the forest, including the height, diameter, crown layers, and stems of trees, shrubs, understory plants, snags and down woody debris. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

State Forestry Best Management Practice(s) (BMPs): Forestry BMPs are generally accepted forest management guidelines that have been developed by state forestry agencies with broad public stakeholder input.

Stocking: An indication of the number of trees in a stand in relation to the desirable number of trees for best growth and management.

Sustainability: The capacity of forests, ranging from stands to ecoregions, to maintain their health, productivity, diversity and overall integrity, in the long run, in the context of human activity (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Sustainable Forest Management: The practice of meeting the forest resource needs and values of the present without compromising the similar capability of future generations (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998). Note – AFF's Standards of Sustainability reflect criteria of sustainability based on the Montreal Process, 1993, and the PanEuropean Operational- Level Guidelines (PEOLGs).

Thinning: A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality. Types of thinning include: chemical, crown, free, low, mechanical, selection. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Threatened Species: A plant or animal species that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future. A plant or animal identified and defined in the Federal Register in accordance with the Endangered Species Act of 1976. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Timber Stand Improvement (TSI): A thinning made in immature stands to improve the composition, structure, condition, health, and growth of the remaining trees.

Undesirable Growing Stock (UGS): Trees of low quality or less valuable species that should be removed in a thinning.

Understocked: Insufficiently stocked with trees.

Understory: All forest vegetation growing under an overstory. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Uneven-Aged Management or Stand: A stand of trees containing at least three age classes intermingled on the same area.

Visual Quality Measures: Modifications of forestry practices in consideration of public view, including timber sale layout, road and log landing locations, intersections with public roadways, distributing logging residue, tree retention, timing of operations and other factors relevant to the scale and location of the project.

Volume: The amount of wood in a tree, stand of trees, or log according to some unit of measurement, such as board foot, cubic foot, etc.

Watershed: The area of land where all of the water that is under it or drains off of it goes into the same place. For example, the Mississippi River watershed includes all the land that drains into the Mississippi River. This watershed is the fourth largest in the world and includes water from 31 states.

Wetland: A transitional area between water and land that is inundated for periods long enough to produce wet soil and support plants adapted to that environment. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

Wolf Tree: A very large, over-mature tree that is or was open grown. These trees tend to have large full crowns and numerous branches.

Woody Debris: Any piece(s) of dead woody material (e.g. dead tree trunk, limbs, large root ball) on the ground in the forest or in streams. (Helms et al, The Dictionary of Forestry, Society of American Foresters, 1998).

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