

STATE OF CONNECTICUT

DEPARTMENT OF ENERGY AND ENVIRONMENTAL
PROTECTION



Bureau of Natural Resources

Division of Forestry

FOREST MANAGEMENT PLAN
2016 through 2026

Nassahegon State Forest

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A. Executive Summary

Nassahegon State Forest consists of 1,148 acres of forest in the town of Burlington, in Hartford County, Connecticut. This includes the main contiguous 1,093-acre block and the separate 55-acre “Chippens Hill Block”, also known as Compartment 8 in this plan.

The majority of Nassahegon lies south of Route 4, east of Route 69, west of Jerome Avenue, and north of the Whigville section of Burlington. The small Compartment 8 parcel known as the Chippens Hill Block occurs between East Chippens Hill and West Chippens Hill Roads. That parcel abuts a wildlife management area, but is isolated from the rest of the state forest. It occurs near the southwest corner of Burlington, while the main block is roughly in the geographic center of Burlington.

Other DEEP property is adjacent to both blocks of Nassahegon. The state fish hatchery abuts the main block to the north, on the south side of State Route 4. This parcel is 141 acres and its property was informally considered part of the state forest from about the 1970s through the 1990s. The hatchery claims all of DEEP’s road frontage on Route 4 and most frontage on Belden Road, and the state forest occurs south of the Fisheries property. Also, Sessions Woods Wildlife Management Area, 777 acres, occurs on the west side of Route 69, and abuts the Chippens Hill Block of Nassahegon. This plan only covers the two parcels of state forest.

Nassahegon is a relatively small state forest of suburban character, in terms of nearby development pressure, frequency of encroachments, dumping, vandalism and impacts from illegal uses. At the same time, most of the sandy soils prevalent to the forest promote a medium and low average site quality. Therefore, the challenge is to produce a healthy and diverse forest in spite of the higher adverse human impacts than that found in more rural forests, and in spite of reduced growth potential.

Some primary objectives that highlight the challenges of managing this forest include use of both commercial and pre-commercial cutting and prescribed fire to preserve and expand the pitch pine component at Nassahegon. Pitch pine represents a declining species and cover type in the state that requires active management and disturbance for maintenance. Additionally, young forest and early successional habitat is currently lacking and will be expanded in consultation with the DEEP Wildlife Division. Another goal is to reduce the number of illegal trails and other unauthorized impacts that pose threats to forest regeneration, soil and water quality, and state listed species occurring on the property.

B. History

- 1. Reason for acquisition and funding sources:** The Forest was established in 1926 to provide watershed protection for the fish hatchery, at the request of John Titcomb, who was Superintendent of the State Board of Fisheries and Game. Until 1942, this Forest was known as

the “Burlington Block” of Nepaug State Forest (which lies in New Hartford). It was re-named Nassahegon State Forest (NSF; the Forest) in 1942.

- 2. Development of resource prior to and after acquisition:** There was never a forest fire lookout tower in NSF, but a tower erected on nearby Johnny Cake Mountain in 1929 overlooked the forest for decades. There was also never a Civilian Conservation Corps (CCC) camp in NSF, but considerable work on the roads and in the Forest was done by CCC workers at Camp White from Peoples State Forest.

In 1934, a Transient Camp was built and established on the premises. This camp had accommodations for 250 men, who received their board and 90 cents per week in return for 24 hours of work per week. The Works Progress Administration (WPA) took over the camp in 1936. Other agencies used the camp in the next few years, including the National Youth Administration in 1938, the War Food Administration in 1944, and the Connecticut Agricultural Extension Service in 1945 and 1946. The camp portion of Nassahegon was Federal property until turned over to the state in 1944. The camp was used as a state forest headquarters until reorganization established the Department of Environmental Protection (DEP) in 1971. Today, none of the camp buildings remain other than foundations and a chimney of the old headquarters, as well as an old Stone Jail that is nearly intact along Stone Road.

The size of the forest and presence of town roads throughout the area negated the need for an extensive forest road system. Some forest products roads were developed during the 1930s, and forest roads were created and expanded again in the 1970s in response to a strong firewood demand. Firewood permitting and sales at the Forest were extensive enough to create new stands, change stand boundaries, and impact composition and age classes.

Plantations were established in a number of stands, primarily white pine and red pine, including stands 2-2, 5-4, 7-1, 3-2, and a number of stands in Compartment 1. Red pine salvage in the 1980s harvested most of the red pine, including the entire stand 1-5.

- 3. Changes in the last 10 years:** There have been no commercial harvests at Nassahegon in the past 10 years. The most recent operation was completed in 2003. Management has been limited to fuelwood lottery permits and boundary maintenance. No comprehensive management plan for Nassahegon has been written and approved since 1986. The forest has been re-compartmentalized and stands completely renumbered and typed for this plan.
- 4. Rotations and cutting cycles used:** The most recent management plan for NSF prior to this plan prescribed property-wide uneven-aged management. This did not provide enough opportunity to expand early successional habitat and to successfully regenerate the strong oak forest component. Both even-aged and uneven-aged silviculture will be practiced at Nassahegon in the future. A 100-year rotation will be recognized for even-aged stands. The present stands may be carried past the rotation age to avoid regenerating the entire forest within a short period of time. Once stands have been regenerated, the 100-year rotation will be followed.

Intermediate harvests will thin the stands before the end of rotation. 453 acres (22 stands) will be managed even-aged.

Uneven-aged stands total 389 acres (20 stands). These stands will be put on a cutting cycle of 20 years.

C. Acres and Access

- Acres:** The total acreage of NSF is 1,148 acres, composed of 1,079 forested acres, 44 developed acres and 25 acres of swamp. The fish hatchery property on the northern boundary of the Forest is not included. However, 22 acres of hatchery ponds in stand 2-A are a part of the Forest and included in the “developed acres”. This area was added to hatchery operations at a later time and is known as the Punch Brook Ponds. The total forested area that will be under active management in this plan is 842 acres.

The forest has been evaluated and categorized into groups affected by current physical conditions, policy, or management principles. The pie chart below illustrates the forest as it exists today. The category labeled “Active” is forestland that is actively managed for timber resources which directly enhance the wildlife habitat in the forest.

“Inoperable” land contains physical features such as steep slopes, excessively rocky terrain, or wetlands that prevent active management for resource protection or operator safety. The “Inactive” category refers to land that is not considered forest (e.g. rights of way, fish hatchery ponds). Land categorized as “Recreation Area” is land that has been developed for recreational purposes such as the town-leased baseball fields in this plan.

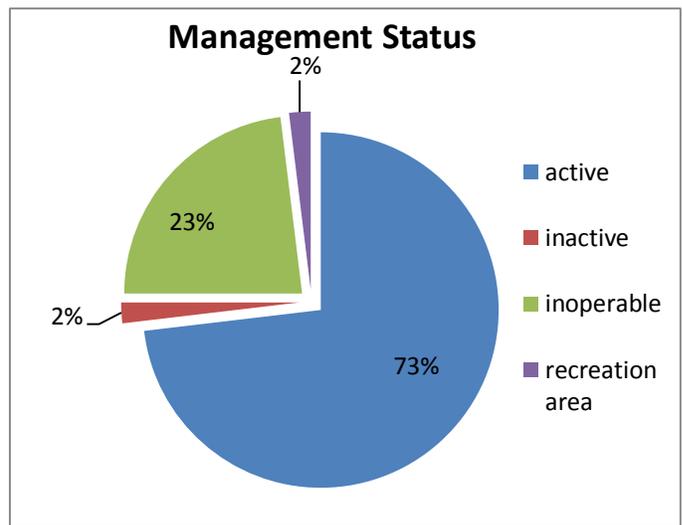


Fig. 1

- Present access:** State Route 4 is the northern boundary of the fish hatchery property, but the state forest acres are accessed entirely from Burlington town roads.

Presently, there are approximately 4.6 miles (24,400') of town roads that abut or pass through the Forest. Of this, 3.9 miles are paved roads and 0.7 are dirt/gravel roads. The latter includes approximately half-mile of Stone Road that is seasonally maintained by the town. It also includes a quarter-mile section of George Washington Turnpike that is not maintained by the town and is gated on both ends year-round. While never open for public access, combination and/or key to these gates are provided to the town for emergency access purposes.

There are no state forest roads used for public or log truck access. The existing infrastructure of forest roads are considered forest products harvest roads or trails not suitable for other than logging equipment. Drivable roads are largely restricted to short spurs from town roads to access existing landings. This is not likely to change, in consideration of modern log trucking trends of staging near public roads when possible, and due to the frequency of town roads occurring in the Forest.

There are 7 gates limiting access to trails and harvest roads in NSF. The most recent purchase and placement of gates in the Forest occurred in 1999. Most of these are on Stone Road. Three existing gates are not standard gates, and should be replaced. Addition of other gates and barricades will be outlined in the Work Plan.

3. Inaccessible areas and access potential:

- Compartment 2 (Stands 2-1, 2-2)—No practical access for management (i.e. logging, trucking); compartment is nearly surrounded by development and the fish hatchery ponds off Punch Brook. Skunk Rock Road is a discontinued town road that accesses this compartment, but there is no feasibility of reopening and improving this roadbed. The pine plantation in 2-2 needs thinning and stand 2-1 should be a stand conversion to conifers, but this is mostly pre-commercial work.
- Stand 3-2—This stand was prescribed for uneven-aged conversion (selection cutting) and white pine thinning, and includes a “High” average site quality, but was not included in the work plan due to accessibility. Although this stand has Punch Brook Road to the north and George Washington Turnpike to the south, there is no practical location to build an access and no roadside area that could serve as a landing due to steep topography and wetlands along the frontage. The only other access option that could be explored is use of the area developed by the town of Burlington for recreational fields (“Nassahegon Recreation Complex”), but discontinuance of this area of state land by the town is unlikely. In the future, harvest access via this recreation complex once per 20-year cutting cycle should be explored with the town.

4. Rights-of-Way: Parcels with known encumbrances and easements are listed below by state parcel number—

- Parcel 2a, 1926, right-of-way through lane to the highway (Stand 7-B)
- Parcel 20a & b, 1927, spring rights (Stands 2-A and 3-A)
- Parcel 24d, 1940, right to lifetime wood cutting for Carrie Louise Lindquist (Stand 1-7)—**expired**
- Parcel 25, 1943, excepting 150’ right-of-way for CL&P, subject to terms listed in Burlington Land Records Vol. 29, page 141 (southern portion of Compartment 6). This right-of-way is not being used actively and no powerlines occur on state forest.
- Parcel 33, 1951, right to maintain and repair spring (stand 2-A)
- Parcel 35, 1956, right to maintain and repair spring well (stand 5-2)

There are neither known deed encumbrances nor parcels acquired through specific funding sources that would prohibit or restrict forest management activities.

- 5. Boundary Conditions and total miles of boundary:** Nearly 100% of boundaries for the forest (approximately 14.5 miles) were marked in 2006, and were marked again in 2014/2015. Boundaries for Nassahegon should be re-marked in entirety on a rotation of approximately 7 years, due to the degree of population and development in the vicinity, and the tendency toward encroachments.
- 6. Known boundary problems:** There are missing corner monuments in areas of the forest that will be thoroughly documented and reported during the next boundary marking. In the past, the record was sporadic and incomplete. GPS coordinates will also be recorded and provided for corner monuments, as requested by DEEP's Supervisor of Surveys and Mapping. Replacements for missing monumentation will only be requested where the absence makes boundary identification uncertain or impossible. Any sections of boundary that cannot be identified and clearly marked on the ground will be reported to DEEP's Constituent Affairs/Land Management Division, as will any ongoing encroachments. There is a field office record of specific encroachments at Nassahegon, a few of which have been resolved, and some which have been active since at least the 1980s. The next boundary marking will re-examine all encroachments and thoroughly report to Constituent Affairs/Land Management and/or DEEP Law Enforcement as needed for appropriate action and resolution. Since this is a comparatively small suburban forest with few future expansion possibilities, and faces boundary pressures/encroachments from abutting development, the Forestry Division objective for encroachments during this management plan period is 100% resolution.

D. Special Use Areas

- 1. Lakes and ponds:** There are no lakes and ponds other than vernal pools and open marshes within Nassahegon. Most artificial ponds built for the fish hatchery do not occur on the provided state forest acres and will be discussed under "Cultural Sites" below.
- 2. Rivers and streams:** There are no major rivers and streams within the state forest acres— Nassahegon serves as watershed and source for several significant named streams, however. Approximately 75% of Nassahegon drains into Bradley Brook and Punch Brook, which form near the northern boundary of the forest and feed the hatchery ponds and raceways (Bradley Brook serves most of the main hatchery facilities, Punch Brook is the water source for the additional ponds on Punch Brook Road). Both of these brooks eventually flow into Burlington Brook followed by the Farmington River. Southern and eastern parts of the main block drain into Wildcat Brook and Whigville Brook, which ultimately flow into Copper Mine Brook. Copper Mine Brook eventually flows into Pequabuck River, and finally the Farmington River. The Chippens Hill Block provides a source for Negro Hill Brook on the Sessions Woods property that flows into Copper Mine Brook.

The only streams occurring near Nassahegon that are listed in the Connecticut Angler's Guide for recreational fishing are Negro Hill Brook and Copper Mine Brook, but none within the state forest.

- 3. Cultural sites:** The remains of the 1930s transient camp, which later served as the state forest headquarters, can still be seen on the northwest side of Stone Road. This includes a foundation, chimney, and other remnants in the vicinity. The only nearly intact structure still remaining is the Stone Jail from the transient camp, located on the west side of Stone Road. This small stone structure once had a wooden interpretive sign that was stolen, and the stone structure and iron rebar jail bars have been vandalized (including graffiti). But it is still a local curiosity attraction. It has even been the source of a paranormal investigation.

There are also several other cellar holes and unidentified remains at Nassahegon, as well as charcoal mounds.

The Burlington Fish Hatchery, which primarily occurs along the northern boundary of Nassahegon, is managed by the DEEP Inland Fisheries Division. It has been in operation since 1923, and is of cultural and historic significance to the state. Its published annual production is from 80,000 to 90,000 pounds of 9 to 12 inch brown and rainbow trout. Forty-five thousand brook trout in the 6 to 8 inch class are also raised annually for stocking in smaller streams. The facilities include several buildings and state gas pumps, and the main hatchery house contains an incubation area and indoor raceways. The hatchery grounds also include a variety of nursery pools, breeder pools, rearing pools, and production ponds. All of this occurs outside state forest boundaries on property originally acquired for this purpose for the former Fish and Game Commission (state forest acres were acquired for the former Forest and Park Commission). The exceptions are the previously-discussed ponds on Punch Brook Road, which are considered within the state forest.

- 4. Recreation and scenic sites:** Regulated hunting occurs throughout Nassahegon, except where limited by abutting development. Passive recreation such as bird watching occurs.

Blue-blazed trails occur in most compartments of the state forest, including Tunxis Trail and a number of connector trails managed by the Connecticut Forest and Park Association (CFPA). There is an estimated total of 8.4 miles of Blue-blazed Trails occurring within the state forest boundaries (see part E: "Trails and Signs"). These trails are by statute and CFPA rules, for foot traffic only. Cross-country skiing also occurs on trails and old forest products harvest roads within the forest when conditions are suitable.

DEEP has collaborated with the New England Mountain Biking Association (NEMBA) to develop the first approved mountain bike specific trails in Nassahegon's history. At the beginning of 2016, two phases of trails have been approved through portions of the forest, totaling 5-7 miles. Prior to DEEP review of NEMBA trails and before development of this plan, there were believed to be in excess of 40 miles of *illegal* bike trails throughout the state forest (based on early DEEP

GPS/GIS estimates), which should be eradicated or reduced as a major objective of this management plan. Bike trails are not likely to be approved in Compartment 1, closest to the hatchery facilities and its nearest watershed, but all applications will be considered individually. More will be discussed on this topic later under section D, "Unauthorized or Illegal Activity". NEMBA comments at the end of this plan should also be reviewed for mileage details and updates: NEMBA believes that this unauthorized mileage is only half (i.e. approx. 20 miles) due to approval of recognized trails and abandonment of trails near the new authorized trails.

Parking is provided by minimal roadside pull-off sites and small parking lots constructed by the Department in the past, sometimes in conjunction with neighboring timber sales. This includes a three vehicle lot on the south end of Stone Road, a larger parking area on the north end at the entrance to the former headquarters area, and a lot near the end of the maintained portion of Miller Road. Visitors also sometimes use a small spot at the junction of Route 4 and Mountain Spring Road (Tunxis Trailhead), and a pull-off area near the gate by the wooden state forest shield sign on Punch Brook Road, but these are relatively small sites that are not published as public parking locations. It is also possible for the public to park at the Punch Brook ball fields (the town's "Nassahegon Recreation Complex") across the street from the state forest sign, and then walk to the state forest, as the ball fields occur on state forest property. Other roadside parking is possible at trail crossing locations on Cornwall Road and the small field on George Washington Turnpike that is considered part of the hatchery property. While parking may be improved through adjacent timber harvests prescribed in this plan, there are no specific plans being proposed to expand parking areas or create new parking sites at this time.

The state forest's trails and roadbeds have been adopted as a popular place for neighboring landowners and other town residents to walk their dogs and explore with their families during leisure time. Developed recreational sites of any kind other than trails do not occur in this forest.

The DEEP Forestry Division maintains one approved letterbox in the Forest, currently in Compartment 1 off Punch Brook Road. Other unapproved or unofficial letterboxes or geocaches occur in the forest but none will be recognized by DEEP unless responsible parties complete and submit a "Letterbox/Geocache Placement Permit Application" to the Bureau of Outdoor Recreation and receive a permit.

As in all state forests, ATVs, motorized dirt bikes, and unregistered motorized vehicles are not permitted.

The state fish hatchery located at 34 Belden Road, on the northern boundary of the state forest acreage, is open to the public from 8:00 A.M. to 3:30 P.M., seven days a week, for self-guided tours. Individuals and groups are welcome to visit, to observe and learn. The hatchery personnel request that groups of 5 or more people contact the hatchery manager at least one week in advance if they wish to arrange for a guided tour, at (860) 673-2340.

Signs and trail markers are maintained by CFPA and NEMBA for their respective trails. A trail kiosk is located on Punch Brook Road at the state forest sign. This was an Eagle Scout project completed in consultation with Forestry and Parks in 2013.

- 5. Critical Habitat:** The DEEP Natural Diversity Database (NDDDB), records indicate that the State Species of Special Concern box turtle (*Terrapene c. Carolina*), whip-poor-will (*Caprimulgus vociferous*), broad-winged hawk (*Buteo platypterus*) and Eastern pearlshell (*Margaritifera margaritifera*) occur in this area. Current NDDDB records indicate that the State Endangered American Bittern (*Botaurus lentiginosus*) is present in the area (see Wildlife Division letters included in this plan's appendix).

The whip-poor-will is a neotropical migrant that nests on the ground in young forests or open woodlands. Harvest activities could disturb nesting, which occurs from late May through July. But the species requires early successional habitat, which is still generally lacking at Nassahegon, and harvest activities designed to create early successional habitat should improve whip-poor-will habitat in the forest and result in an increase in use of the area (In consultation with DEEP Wildlife Biologist Peter Picone, regeneration cuts in Stands 6-1, 6-2, and 7-1 will benefit whip-poor-wills and provide critical nesting habitat). Illegal trail construction and use may be more detrimental to nesting activity. While harvests are short periods of disturbance, recreational trails provide a source of frequent, year-round disturbance that can affect long-term nesting success and use of the area by ground-nesting birds. This management plan will prescribe not only creation of habitat through a harvest regime, but reduction of illegal trails through physical eradication and partnership with trail groups that maintain an approved trail system. This includes not approving application for new trail establishment or recognition of existing trails in areas that are of particular focus for early successional habitat creation, including Compartment 7 east of Stone Road.

Eastern box turtles are shown in records from Sessions Woods WMA and not specifically Nassahegon SF, but do occur in the vicinity. The species has an extremely small home range and can be found in the same area year after year. They are active from April through October, and any harvest activity occurring during this growing season is suggested to include cautionary measures such as keeping watch for turtles and searching the vicinity before proceeding daily, being particularly mindful of turtles during early morning and evenings when they are likely to bask and forage most. Recommendations also including avoiding impacts to any wetlands and removal of silt fencing as soon as the work is completed.

Timber harvesting during the growing season cannot be avoided, as the best operating conditions frequently occur during dry summer conditions. But harvests prescribed in this management plan strive to maintain or increase the type of habitat that both Special Concern species require, so positive influences should outweigh possible adverse effects on these wildlife species.

Harvest and disturbance of trees and clusters of trees with hawk nests will be avoided at all times. Information regarding other listed species which will be unaffected by harvest activities can be found in the NDDDB letter in the Appendix of this plan.

6. **Natural Areas:** There are no state-recognized Natural Area Preserves within Nassahegon.
7. **Old Forestland Management Sites:** Being a small forest in a developed area, there are no parcels set aside as Old Forestland Management Sites. Some stands are inaccessible, inoperable or wetlands. A total of 237 acres of undeveloped state forest will be left out of active management for those reasons.
8. **Research Areas:** There are no known ongoing research areas, projects, or maintained research plots in Nassahegon State Forest. There is potential to collaborate with the Connecticut Agricultural Experiment Station on the planting and research of hybrid Chestnut trees in future regeneration harvest areas. This will be further explored during the harvest operation plan writing phase.
9. **Miscellaneous:** There is an opportunity to manage forest stands by promoting growth of sugar maple trees to eventually be leased for tapping by local maple syrup producers. It is also desirable to pre-commercially thin sapling and pole stock to release pine in a number of stands, which grow competitively well on the predominantly sandy soils of the Forest. Management such as TSI, crop tree release, and invasive plant control will be achieved through DEEP staff and the Division of Forestry Homeowner Firewood Program. Nassahegon has decades of history of roadside and stand management via firewood permits, and this tradition will continue as accessibility, stand needs, and safety considerations are taken into account. There is the potential to promote commercial witch-hazel harvesting in some stands as has occurred in other state forests. Like maple sap, witch-hazel harvesting and utilization provides an historic local cultural tradition, as well as a potential tool for understory preparation for regeneration, such as in upcoming shelterwood cuts.

E. Resource Management Concerns

1. **Trails/signs:** Informational signs will be placed at all state timber harvest staging areas at the start of each harvest, as well as along authorized trails that approach harvest areas. This may include generic signs that provide an explanation of the silviculture and general objectives, as well as custom-made signage that may be appropriate for specific operations. All signs will include contact information in DEEP Forestry. Caution signs regarding harvest and trucking activity will also be used for each operation and DEEP Forestry will exercise its rights to maximize public and trail safety by closing trails that pass through or near harvests as necessary. These closures will be in cooperation with the managing organizations in relation to their respective trails (CFPA, NEMBA). The Division of Forestry's Standard Operating Procedures (S.O.P.) will be followed for all authorized hiking/biking trails, using trails as skid roads only where they coincide with an existing forest products harvest roadbed. Slash will not be left

within 25 feet of CFPA and NEMBA trails, and no more than 50% of the basal area will be removed within 100 feet of trails, unless special considerations of safety, salvage, or particular habitat needs justify otherwise and both parties (DEEP/trail provider) agree to such. Harvests will include hazard removals along sections of authorized trail passing through the cutting area. Trails that are outside harvest areas will be untouched unless necessary to cross for access.

- 2. Wetlands:** In general, harvest activity will not occur on wetland soils at Nassahegon, and any necessary crossing of such areas through use of bridging or corduroy will be made using the most current guidelines for Best Management Practices (BMP). Watershed protection for the fish hatchery was the primary motivation behind the original land acquisitions for Nassahegon State Forest, and protecting wetlands, watercourses, and water quality must always be top priority. The biggest concerns for wetlands at present are unauthorized mountain bike trails that pass through them. Any of these trails should be blocked and eradicated (see “unauthorized or illegal activity” below).
- 3. Unauthorized or illegal activity/Threats:** The primary unauthorized activity, and the most widespread threat to the natural resources within the Forest, has been the building of an extensive, unauthorized mountain bike trail system. The Division of Forestry and DEEP have been working with NEMBA to recognize mountain biking as a recreational use of the Forest, balanced by the need to authorize properly constructed forest trails that will prevent erosion and sedimentation of streams in this valuable watershed, as well as protect wildlife habitat and forest regeneration interests. Unauthorized trails not approved to be properly maintained as DEEP recreational trails will be eradicated through NEMBA members, Forestry staff, and timber harvests, or as has already occurred in some areas, will simply be reclaimed from lack of use due to recognition of a bike-specific trail system nearby.

Unrelated to many of the above mountain bike trails, construction of bike jumps, ramps and obstacle courses have occurred in the past, but have declined in the past 10 years. These structures are dismantled by DEEP Forestry and Parks staff whenever discovered to prevent injury and liability. Organized paintball games also once frequently occurred in the Forest off Stone Road, but this activity has declined in recent years due to law enforcement.

Illegal dumping of residential garbage and brush continues to be a recurring issue in the Forest, as in most State Forests. Favored dumping locations are in front of DEEP metal gates that access forest roads used for timber harvests and forest fire control on Stone Road and George Washington Turnpike. Large brush piles periodically block access to the gates and roads. Dumping is also common in public parking areas, particularly on Stone Road.

Vandalism and theft of signs and boundary tags, and vandalism of cultural sites (i.e. Transient Camp foundations and the Stone Jail) have commonly and consistently occurred in this Forest.

Unauthorized all-terrain vehicles occur within the Forest, usually in the Stone Road/Miller Road/George Washington Turnpike corridor, Compartments 5,6, and 7. Illegal dirt bike and ATV

activity has caused erosion of forest products roads and trails to the point where correcting drainage issues and establishing a new road bed may be cost prohibitive to the state considering the required frequency of use.

Other resource threats such as boundary encroachments and invasive insects and diseases are discussed elsewhere in the plan.

F. Wildlife Habitat – with Peter Picone, DEEP Wildlife Biologist

- 1. Investment in habitat improvement** – Regeneration harvests scheduled during this plan period will increase the amount of early-successional habitat required by many wildlife species experiencing population decline from lack of suitable habitat throughout the state.

There are no scheduled habitat improvement projects such as mowing or creation of permanent openings in this plan period. Controlled burns may be used as a regeneration and habitat enhancement tool, to be determined on a stand-by-stand basis during the comprehensive plan period.

Planned forestry activities at NSF will promote and improve forest stands comprised mostly of sawtimber age classes. Wildlife species that thrive on sawtimber-sized stands will continue to benefit during this ten-year plan. Forest interior bird species such as red-eyed vireo, wood thrush, pileated woodpecker, and ovenbird will find stable and improving habitat conditions. Reptiles such as eastern box turtle will benefit to meet its seasonal needs without interference of paved roads and road traffic typical of what happens in a suburbanizing landscape of Connecticut. Vernal pools are protected through the use of carefully planned harvest roads. Wildlife species such as New England cottontail (NEC), whip-poor-will, American woodcock, ruffed grouse, prairie warbler and eastern towhee that require early successional forest conditions will benefit from targeted habitat enhancements in this 10 year plan. Young forest habitat is ephemeral and declines in usefulness to its respective species in the 10 to 15 years following a clearcut. The Wildlife Division staff will work closely with the Forestry Division to seek additional funding to ensure the perpetual existence of young forest habitat patches for any local NEC populations, should goals not be met by commercial harvesting.

- 2. Existing diversity situation:** Maintaining a diverse, interconnected forested ecosystem with a variety of age classes and sizes is a great benefit to wildlife (Scanlon, 1992). An interspersed of specialized habitats such as grasslands, shrublands, wetlands, vernal pools, and young forest within a maturing forest environment is important when considering maintaining wildlife species diversity.

Total state forest acres: 1148

1. Forest Cover: 94% (1079 acres)
 - a. Sapling: 2% (20 acres)
 - b. Pole: 4% (48 acres)
 - c. Mature sawtimber: 45% (481 acres)
 - d. Mix sawtimber-pole: 43% (469 acres)
 - e. Mix sawtimber-sapling: 6% (61 acres)

- 2. Open Field/Grassland
 - a. Permanent open field (herbaceous cover): None
- 3. Wetlands: 10% (121 acres)*
 - a. Wooded Swamp: 8% (96 acres)
 - b. Open swamps/marshes: 2% (25 acres)
- 4. Leased Lands: 4% (44 acres)
 - a. Fisheries Hatchery Ponds/Land: 2% (22 acres)
 - b. Town-leased developed baseball fields: 2% (22 acres)

*Total percentages in # 1-4 add up to more than 100% because there is overlap. Some Wetlands are included in Forest Cover.

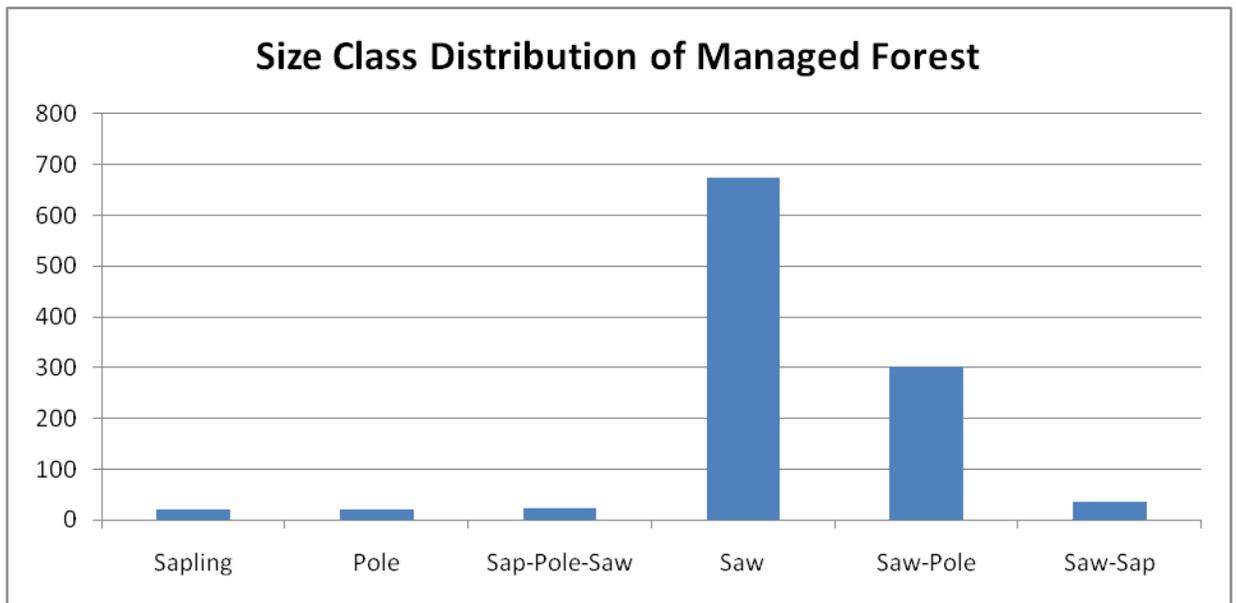


Fig. 2

Only 2 percent (20 acres) of NSF land is comprised of sapling-sized forest. It is important to consider at least tripling the amount of sapling forest in order to improve and maintain habitat conditions for NEC and its associated early-successional wildlife species. Through the collaborative efforts of the forester and wildlife biologist, science-based forest management strategies can be employed to improve the biodiversity and health of the forested areas included in NSF’s 842 actively managed acres. The landscape-level forest management planning set forth in this document, as well as the tailoring of wildlife habitat needs in individualized forest operation plans to come, will ensure that wildlife habitat will be enhanced, protected and, in some cases, created.

- 3. **Landscape context:** According to University of Connecticut Center for Land Use Education and Research (CLEAR), as of 2006, 74% of the landscape in Burlington is considered forestland. Only 12% is considered developed. The forested acreage in NSF alone accounts for 7.5% of the total forestland in the Town of Burlington.

4. **Wildlife-Based Recreation:** The Forest is open to hunting for Small Game, Waterfowl, Spring Turkey, Fall Archery (Deer/Turkey), Fall Firearms Turkey, Muzzleloader Deer, No-Lottery Deer (A-Season), No-Lottery Deer (B-Season).

G. Vegetative Condition

1. Silviculture:

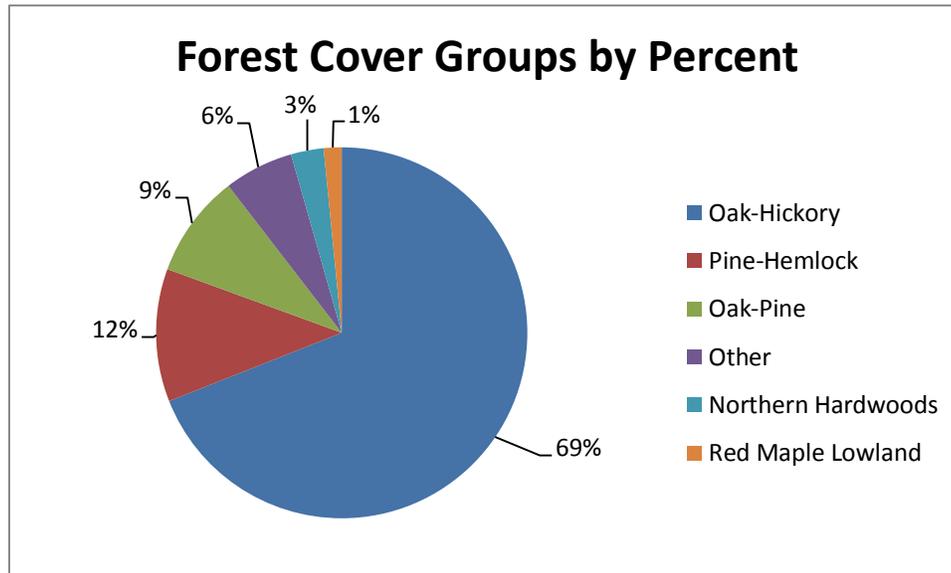


Fig. 3

A variety of silvicultural systems and harvests will be used at Nassahegon to increase diversity, with a special emphasis on disturbance-based management for pitch pine, white pine, and oak.

Based on forest stand inventory analysis from approximately 240 sample points throughout the Forest, representing each stand, 78% of NSF is categorized as oak-dominated forest types. There is a responsibility to perpetuate oak species within the forest as oaks are gradually declining at a rate of 5% per year in Connecticut. Oak species are valuable to the forest ecosystem as they provide a high-quality food source for many species of wildlife and are a highly marketable forest product. Securing future generations of oak species on state lands is a necessity as many private woodlots have been high-graded by removing the best quality of oaks and there are fewer even-aged silviculture treatments utilized on private lands to grow this shade-intolerant species. Managing suitable sites within NSF for oak regeneration can serve as an educational demonstration to the public on clearcut or shelterwood silviculture and why it is a beneficial instrument in the forester's toolbox for maintaining a variety of even-aged forest types.

Pitch pine, a native pine species to Connecticut, is a globally rare forest type only found in the northeastern United States. Pitch pine naturally depend on fire to expose the mineral soil and to release the seeds from their tightly closed, resinous cones. Due to an increase in forest fire suppression within the past century these pines rarely have an opportunity to naturally

regenerate and quickly become over-topped by more competitive hardwoods. In addition, southern pine beetle is now a new threat to pitch pine in the northeast. To maintain these species within the forest ecosystem, the Division of Forestry will apply appropriate silvicultural techniques and possibly prescribed fires where applicable.

There are multiple white pine plantations throughout the Forest. Most of the plantations are 60-80 years old and were planted by the CCCs in the 1930s. These pine stands are often very dense and overcrowded, with crowns that are slowly choking each other out. They need thinning to remove poorly formed trees and provide the most desirable trees with optimum growing space. The predominantly sandy soils of NSF favor growth and development of better quality white pine stands than oak stands, therefore management to thin and improve existing white pine and to regenerate the species is considered a priority wherever possible. When white pine occurs in mixture with pitch pine, the pitch pine will take management priority. Frequently both white pine and oak will be management objectives in stands, but the lowest oak site indices with a white pine seed source will be managed to develop the pine as priority.

Of the 842 acres under active management, 54% (453 acres) will be maintained as an even-aged system regenerated at end of rotation through shelterwood and clearcut harvesting. These areas managed for oak and pine will follow a cutting cycle on a 100-year rotation. The remaining 389 acres, or 46%, will be maintained as an uneven-aged system to create a patch mosaic of stands with different species and distributions of age classes. Uneven-aged management practices will increase the variety of forest types other than oak, ultimately enhancing the diversity of the Forest. Selection harvests under this management scheme will increase vertical stratification and diversify canopy layers within the Forest. Uneven-aged areas will have recurring harvests every 20 years, give or take a couple years to coincide with prolific seed years.

Stands in the Forest were prioritized for silvicultural treatments based on five factors; their ratio of unacceptable growing stock (UGS) to acceptable growing stock (AGS), the relative density of the stand, the relative soil-index quality, the presence of pitch pine in the canopy, and the presence or absence of desirable white pine and oak regeneration.

2. Forest size classes by forest type (total forest)

Forest Cover Type	Sapling	Pole	Sap-Pole-Saw	Saw	Saw-Pole	Saw-Sap	Total
Northern red oak				451	14	11	476
Mixed upland hardwoods	12		24	118	53	5	212
Eastern White pine				78	38		116
Eastern White pine/northern red oak/white ash	10	13			80		103
Scarlet oak		7		25	32		64
Sugar maple/beech/yellow birch					33		33
Red maple/oak						19	19
Red maple/lowlands					18		18
Eastern hemlock					17		17
Chestnut oak/black oak/scarlet oak					16		16
White oak				5			5
Total	22	20	24	677	301	35	1079

Forest type, size class and condition class on areas to be managed*

Oak-Hickory Cover Group:

Size Class	Growing	Convert**	Regenerate	Thin/TSI	Total
Sap	12				12
Pole				7	7
Saw-Sap	5		30		35
Saw-Pole		48	18		66
Saw-Pol-Sap		24			24
Saw	156	123	45	148	472
Total	173	195	93	155	616

Pine-Hemlock Cover Group:

Size Class	Growing	Convert	Regenerate	Thin/TSI	Total
Sap					
Pole					
Saw-Sap					
Saw-Pole		4	42	9	55
Saw-Pol-Sap					
Saw		51		14	65
Total		55	42	23	120

Oak-Pine Cover Group:

Size Class	Growing	Convert	Regenerate	Thin/TSI	Total
Sap				10	10
Pole				13	13
Saw-Sap					
Saw-Pole		49		31	80
Saw-Pol-Sap					
Saw					
Total		49		54	103

*Note that tables are not included for two cover groups. No “Northern Hardwoods” stands are included in active management, and only 3 acres of “Red Maple Lowland” are in active management. In the latter case, the 3 acres are Saw-Pole by size class, to be converted.

** “Convert” in the table above refers to Conversion to Uneven-Aged Management.

“Regenerate” means Unacceptable AGS, time to clearcut/shelterwood in Even-Aged Management.

“Thin/TSI” refers to overstocked stands, either intermediate cuts in Even-Aged Management or pre-commercial timber stand improvement work in any management system.

3. Forest Health

Regeneration cuts where oak is an objective will not likely be successful in the presence of beech or advance regeneration of birch and maple, as well as high site index stands where northern hardwoods are favored. Silviculture and long-term management systems were designated in each stand with these understory concerns in mind. Invasive plants are not a widespread problem at Nassahegon, but do sometimes occur in wetland areas or along some boundaries with adjacent private land. Any harvests in areas of invasive exotics that have the potential to enhance the invasives will include a plan to address and eradicate the invasives.

As of the date of this plan, the biggest insect threats at Nassahegon are emerald ash borer, elongate hemlock scale, hemlock woolly adelgid and (as of 2015), southern pine beetle (SPB). A few acres of hemlock salvage is prescribed in this plan. Ash will be addressed on a per stand basis at the time of operation planning and timber sale marking. No major changes to management outlined in this plan is expected to result from these Asian insect pests. SPB is a native insect to North America, expanding its range. It is a direct potential threat to pitch pine and DEEP Forestry’s plans to manage and enhance the declining pitch pine resource at Nassahegon. The spread and effects of the insect in stands will be monitored by Forestry annually and pitch pine stand management modified and adapted based on the latest recommendations available by the U.S. Forest Service and other state agencies, as necessary. In general, thinning and prescribed fire are major SPB damage prevention and control tools. These management tools were already considered but timing of insect concerns may expedite and necessitate these activities. Discussion of how unexpected changes in management can result

from weather events, insects and disease, and forest fire damage are addressed under “K. Adaptive Management” later in this plan. Such past changes, including tornado damage in the 1980s, straight-line wind damage and elongate hemlock scale in the late 1990s and beginning of the 21st Century, resulted in previously unplanned harvests on approximately 10% of the Forest.

H. Landscape Context – Forestry – adjacent land uses

Nassahegon is a relatively small state forest that provides a forest resource for wood supply, wildlife habitat, watershed protection, and outdoor recreation in an area where suburban sprawl has increased the value and impact of this public resource. But it will still be managed on a sustainable basis as a unit that is complementary to the active management taking place on nearby New Britain Water Dept. property and Sessions Woods Wildlife Management Area. Nassahegon alone cannot replace all declining or rare habitats and cover types of the regional landscape, but it can place greater emphasis on those types (i.e. early successional habitat, pitch pine forest) within the realm of sustainability.

New Britain Water manages via two forestry consultants, Connwood Foresters, Inc., and Ferrucci and Walicki, LLC, who write and implement management plans on behalf of New Britain. Information sharing between abutters was part of the Nassahegon management plan development, including an offer to New Britain Water’s forestry consultants to review an early draft of this plan.

I. Specific Acquisition Desires

Most of Nassahegon’s boundaries occur either along developed areas or water company land of the City of New Britain. While improved access and increased acreage would be beneficial in a number of areas of the Forest, it is generally not realistic and practical due to existing developments. On the East side of Compartment 7, additional access to George Washington Turnpike would be ideal, but in this case, inoperable terrain and a brook make that access unattainable even with additional acquired acreage. The same is true of an inholding of white pine plantation in compartment 2: It is enclosed by development and fish hatchery ponds. The only way to increase the size of the forest and improve access would be to acquire property currently owned by the New Britain Water Department. DEEP should remain open to this possibility along the southern boundaries of the main block of Forest, where increased forest management and recreational possibilities exist, as well as the benefit of coming closer to connecting with another DEEP parcel, the Sessions Woods Wildlife Management Area. While the state properties may never be fully connected, DEEP should keep a long-term objective in mind of attempting to do so. The benefits to the forest resource, wildlife habitat, and public recreational use could be greatly increased if the main block of Nassahegon, Sessions Woods, and the Chippens Hill Block of Nassahegon could all one day be connected and contiguous. Sessions Woods increased its acreage by approximately 50% from a New Britain Water acquisition in 2004.

J. Public Involvement

A copy of this management plan was provided to the Town of Burlington Conservation Commission, Burlington Land Trust, and CFPA for comment. NEMBA has also been sent a copy of the plan for information's sake. New Britain Water Department, the major abutting landowner that also actively manages its forest, was offered the opportunity to review and comment on the plan. Since New Britain uses forestry consultants for management of their property, no party has accepted responsibility for a formal review or comments. Details of the plan will be promoted and publicized on the DEEP Forestry blog maintained on the Burlington Land Trust website. A formal presentation on the plan was provided by the DEEP authoring forester to the Burlington Conservation Commission and Land Trust in a combined program. The letter of appreciation and feedback on the program and this plan are provided in a letter included in Appendix A.

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 its management approach as environmental change and resource needs warrant. Some of these changes may be associated with biological factors such as insect and disease outbreaks. Increased unauthorized motorized or nonmotorized recreation which erodes trails and roads may require action unforeseen during the composition of this plan. Additionally, environmental conditions such as hurricanes, major ice events, fire, drought or record-breaking precipitation may additionally affect resource condition and work requirements. The Division of Forestry and its colleagues in Parks, Wildlife, Fisheries, and Agency Support Services, 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. Any necessary plan or management modification should be made with continued long-term sustainability in mind.

L. 10 Year Goals

842 acres (78% of the total 1,079 acres of forested area) will eventually undergo forest management.

Uneven-aged management: 389 acres will be managed on an uneven-aged basis (46% of the total area to be managed).

In uneven-aged management, timber harvests will use single tree and small group selection techniques, where openings in the canopy will generally be less than 1 acre in size. This should allow enough sunlight to regenerate some shade-intolerant species, such as tulip-poplar, although intermediate and shade tolerant species will eventually become most abundant (such as maple, birch, beech, and hemlock).

Roughly 33% of the basal area (and approximately 33% of the timber volume) in a given stand will be removed with each harvest, to be repeated on a 20-year cutting cycle. Roughly 20% of each area cut will be regenerated with each 20-year harvest.

389 acres/20-year cutting cycle results in about ten acres per year (195 acres over ten years on a sustainable basis). During this management plan, approximately 190 acres (9 different stands) will be converted to uneven-aged management through commercial selection harvests. In this manner, one-half of the stands managed through uneven-aged management will receive a treatment during every 10-year plan period, and all stands will receive a treatment during their prescribed 20-year cutting cycle.

The uneven-aged management practices at Nassahegon will depart from textbook recommendations of using q-factors to determine a maximum allowable tree size. Rather than the classic balanced uneven-aged stands with 3 distinct age classes, a more generic irregular uneven-aged or "all-aged" stand will be the objective, most suitably in white pine and pitch pine. Particularly in any area with pitch pine, it will be considered a high priority to preserve as much of the pitch pine component as possible while also providing a disturbance regime to regenerate it. It was decided that this all-aged management system was more appropriate to provide a diversity of canopy openings and treatment on an acre-for-acre basis without the final end-of-rotation harvest necessary in even-aged management. This concept also provides for crop-tree management and TSI in different size classes simultaneously.

Even-aged management: 453 acres will be managed on an even-aged basis (54% of the total area to be managed).

In even-aged management, a 100-year cutting rotation will be used. This may include pre-commercial thinning, overstory thinning, seedtree, clearcut, and first and second stage shelterwood harvests. At the end of the rotation, the entire overstory is removed to provide full sunlight to the forest floor, stimulating the growth of shade intolerant species such as oak, hickory, and tulip poplar. Because there are stands to be managed on an even-aged basis that are already in excess of 100 years old, some will be close to 200 years at the time of final regeneration.

453 acres/100-year rotation results in about 4.5 acres per year being regenerated (roughly 45 acres every ten years). 57 acres will be regenerated within the next ten years. This is slightly higher than the sustainable average due to early successional habitat needs, and the fact that stands do not provide equal and even areas when managed as whole units. This is compensated by the final harvests projected in stands 7-1C and 6-3 in the *next* 10-year comprehensive plan, totaling 33 acres. The total acreage for the 20-year period equals 90, which provides the average of 45 every decade.

In even aged management, during the course of the rotation, intermediate treatments such as thinning are used to improve the composition and spacing of the trees. Thinning in overstocked stands (relative density over 80%) will provide optimum growing space for the higher quality trees.

During this management plan, 86 acres will be thinned, prioritized highest in the forest based on need (i.e. greatest density and/or highest quality stands and sites) and accessibility/practicality issues in relation to management projected in nearby areas.

M. Work Plans

- 1. Road maintenance (construction, gates, signs):** Roads that access forest stands scheduled for forestry operations will be improved as necessary prior to harvest. Improvements will be completed as a requirement of future timber sales, or using the Timber Harvest Revolving Fund, with the assistance of the DEEP Support Services Division.

Three separate commercial harvests off Punch Brook Road, Miller Road, and Cornwall Road will require additional gravel to improve landings and access for short distances off town roads, along with spreading stone tracking driveway aprons. Volumes of gravel and locations will be determined in more detail in respective Forest Operation Plans.

During this management plan period, a minimum of five metal gates will be installed. Two will be at new locations; on the south side of Punch Brook Road to access stand 3-4 and another on the east side of Cornwall Road to access stand 5-3. Three existing gates will be replaced in the following locations: North side of Punch Brook Road in stand 1-5, west side of Stone Road in stand 6-6 and the east side of Stone Road in stand 7-4 (see Map F1). Additional gates beyond these five foreseen during management plan development should be considered in the future to control access and protect the resource as specific needs arise.

Concrete blocks or barricades may be purchased concurrently with new gate installation, or for existing gates, to more effectively prevent unauthorized motor vehicle access by blocking either end. An estimated 44 barricades may be needed, including 14 for new gates and another 30 at existing gate and unauthorized entry locations. The exact numbers and locations are to be provided with future project requests.

There are no new road construction proposals for this plan period.

- 2. Boundary marking:** All of the Forest boundaries will be remarked at least once within the next ten years, on a remark cycle of approximately every 7 years.
- 3. Stream improvement:** The Division of Forestry has no plans for specific stream improvement projects. Forestry will be open to suggestion should this change during the plan period and will cooperate with Fisheries on any such needs that may arise. Reducing illegal trail construction and use will improve some streambeds and stream banks.
- 4. Cultural site maintenance:** There are no cultural site maintenance activities prescribed in the next ten years. Forestry would like to see a replacement of the wooden sign on the Stone Jail structure, in cooperation with Parks, but vandalism and theft continues to be a problem in the area.

5. **Recreation or scenic site work:** Parking areas for multiple users of the Forest may require additional gravel or maintenance during the next ten years. Reducing and eliminating dumping at Stone Road parking areas and other parking locations should be coordinated with the town of Burlington.
6. **Improvement of critical habitat:** Forestry operations will increase the age-class diversity of the Forest by increasing the amount of early-successional habitat. Management activities will be geared towards protecting and increasing the diversity of imperiled pitch pine forest ecosystems. Three adjacent clearcuts/shelterwoods will be established in Compartment 7, 18-25 acres each, staggered over a few years. These areas will provide young forest habitat critical to meet the goals of the DEEP Wildlife Division for early successional species such as whip-poor-will, New England cottontail, American woodcock, and eastern towhee. In addition, Forestry will complete strip clearcutting begun in two stands of Compartment 6 prior to this plan. These strips will provide approximately 150-foot wide swaths of new seedling-sapling forest between older strips previously harvested. The former strips are nearly 15 years old are nearly beyond the habitat requirements of early successional wildlife species.
7. **Trail maintenance:** DEEP has collaborated with NEMBA to authorize certain mountain bike specific trails while eradicating non-authorized, non-essential trails throughout the Forest. CFPA will continue to maintain and modify their existing Blue-blazed Trails at Nassahegon as necessary. NEMBA and CFPA will be responsible for their respective trails in the Forest, subject to approval/authorization by DEEP for any changes and additions.
8. **Wildlife habitat improvement:** The diversity of forest practices in this plan will benefit some aspects of habitat for forest-dwelling species, including forest interior, early and mid-successional, and those that use small openings frequently provided by uneven-aged management.
9. **Wildlife population controls:** Regulated hunting is permitted within NSF (See CT Hunting and Trapping Guide for details).

10. Forest Stand Harvests:

Forest stand commercial thinning (even-aged management):

Stand #	Acres
7-2	59
8-1	21
8-2	6
Total	86

Forest stand regeneration (even-aged management):

Stand #	Acres	Activity
6-1	5*	Clear cut
6-2	9*	Clear cut
7-1A	25	Clear cut
7-1B	18	First/Final Shelterwood
7-1C	20**	First Shelterwood
Total	77**	

**The acreage for stands 6-1 and 6-2 reflected above does not include total stand acreage. It includes only the estimate for the strip clearcuts being performed in this plan period. Acreage in the strips previously clearcut are not included.*

***Note that Stand 7-1C will only receive an initial shelterwood treatment during the period of this plan, and will therefore not count toward complete regeneration and early successional habitat. Stand 7-1B will receive both a first shelterwood and final shelterwood treatment during this plan period. Actual area regenerated at Nassahegon through even-aged management will be 57 acres.*

Forest stand conversion (to uneven-aged management):

Stand #	Acres	Activity
1-2	18	Selection/Pine Release
1-4	24	Selection Harvest
1-7	42	Selection Harvest
3-4	14	Selection/Pine Release
3-5	4	Salvage
5-3	21	Selection Harvest
5-4	16	Selection/Pine Release
6-10	33	Selection Harvest
7-3	18	Selection Harvest
Total	190	

Pre-commercial TSI/Crop-Tree Management*:

Stand #	Acres	Activity
1-3	12	Pine Release
1-5	7	TSI
1-9	10	TSI/Pine Release
2-1	9	TSI/Pine Conversion
2-2	2	Plantation Crop-Tree Management
6-9	22	TSI
7-4	9	TSI
Total	71	

**Prescriptions listed in the above table are non-commercial or pre-commercial in nature and can be implemented only by means other than timber sales, including staff, volunteers, and firewood permits. These stands and their acreages were not included in discussions and calculations regarding sustainability under “10 Year Goals”. Work in these stands are not as likely to occur, and will not occur on a stand-wide basis that will regenerate areas or affect feasibility of future commercial operations.*

Burning, mechanical, chemical work: Prescribed fire may be used to facilitate oak regeneration, and fire and/or mechanical site preparation will be considered as tools in pitch pine stands, both for routine pitch pine management and to reduce southern pine beetle damage. These needs will be determined on a stand basis during the operation planning phase or following an operation. Details of any controlled burn will be described in great detail in specific burn plans. Licensed vendors may be used for herbicide application to control invasive plants outside of wetlands, if necessary, but at present no such work is prescribed.

Planting: Planting will not be done by DEEP Division of Forestry staff. The Connecticut Agricultural Experiment Station may choose to plant hybrid Chestnut species resistant to the Chestnut Blight disease in clearcut areas to cross-pollinate with existing stump sprouts of American chestnut.

Forest stand rotational cutting: Roughly half the actively managed forest acres will be managed even-aged (54%) and half uneven-aged (46%) to promote a variety of canopy openings and disturbances for a greater diversity of habitat, cover types and age classes (See “10 Year Goals”). An average of 10% of the even-age managed stands, or 4.2% of the total forest, should receive an end-of-rotation regeneration cut every decade. During this 10-year period, slightly more, or 5.3%, will receive final harvest treatments.

Pre-fire suppression work: No specific work for pre-fire suppression is planned. An abundance of forest product roads and trails and proximity to town roads in many areas should provide an array of access possibilities into the Forest in event of wildfire, as well as useful fire breaks. Although many of the illegal bike trails should be eradicated, existing roads and trails created by the agency should be left open.

APPENDIX A – COMMENTS: DEEP WESTERN DISTRICT REVIEW

Support Services Division:

Skip Kearns, District Operations Supervisor, 06-19-14.

“I see no Support Services concerns with this project.”

State Parks Division:

Tammy Talbot, Parks District Supervisor, 06-02-14.

“Hi Dave...please consider this email my approval of the attached plan. Thanks for the opportunity to review.”

Richard Miska, Unit Manager-Peoples SF/Burr Pond SP, 06-11-14.

“I have no problems; looks good to me. Go ahead.”

Inland Fisheries Division:

Donald J. Mysling, Senior Fisheries Biologist, 07-09-14.

“David, I have completed my review of the Forest Management Plan that you had developed for the Nassahegon State Forest in Burlington . . . You have accurately described the aquatic resources within the forest plan bounds and I have nothing further to add. Overall the plan looks great and I have no concerns. My only request is that we work together to identify stream crossings that have been degraded due to illegal/unauthorized trail activity and to develop site-specific restoration plans.”

Richard VanNostrand, EP Program Specialist I, Fisheries, 01-05-15

“Dave, I concur with Jamie’s comments below. It appears to me that you have addressed our concerns adequately and we still have the ability to review any individual plans before implementation can occur. Move forward.”

James Hays, Burlington Fish Hatchery Manager, 01-05-15 *

*note that below is a complete transcript of e-mail comments from Mr. Hays, in response to Forestry’s e-mail summary of a detailed field meeting and discussion of hatchery concerns on December 22, 2014. This meeting and discussion was between the author, Mr. Hays, and Mr. VanNostrand.

From: Hays, James

Sent: Monday, January 05, 2015 7:26 AM

To: Irvin, David

Cc: VanNostrand, Richard

Subject: RE: Nassahegon plan

Dave,

It looks like your email covers all of the issues that we discussed, most importantly keeping with the 200ft guideline we have ask you to follow. Silt fencing and hay bales are also a necessity in areas of run-off concern. I will be accessing the tributaries we found off of Cornwall Road asap but it is safe to assume they do run into our watershed that feeds the main hatchery. Work in this area should be done during the dry season as we discussed. There is a good chance that these tributaries will be dry at that time.

Jamie

James Hays

CONNECTICUT DEPARTMENT OF
ENERGY AND ENVIRONMENTAL PROTECTION

Hatchery Supervisor

Burlington State Fish Hatchery

860-673-2340

From: Irvin, David
Sent: Wednesday, December 31, 2014 2:19 PM
To: Hays, James
Cc: VanNostrand, Richard
Subject: Nassahegon plan

Jamie:

With your final follow-up comments and consent, I will be able to send my comprehensive plan on to Hartford for final review. Keeping that in mind, as a brief recap of what we discussed in the field on Dec. 22:

I know you are very concerned about anything that could contaminate your watershed immediately above the Punch Brook ponds and main ponds fed by Belden Brook. This seems to be of greatest concern in the stands that we examined and discussed off Punch Brook Road and Cornwall Road, stands 3-4, and 5-4/5-3, respectively. These areas will have to be operated in dry summer periods or frozen winter conditions only, and a requirement for the contractor to install extensive silt fencing (and other erosion controls as necessary, such as staked haybales) between the staging areas (landings and access from public roads) and streams downhill can be a part of the contracts in those areas, as an additional safeguard above and beyond any other standard "Best Management Practices" that they would use. These issues will be addressed in appropriate detail in individual operation plans for each harvest area. Also note that whenever possible in those stands, all harvest and staging will be at least 200 feet from

the streams in question. If this is not possible in 5-3/5-4, an area where usable access for forestry purposes may not be possible more than 200 feet from a stream crossing Cornwall Road, extra measures and care will have to be taken, and in a worst-case scenario, if you are not comfortable with the situation and not prepared to approve the harvest there, I will refrain from implementing that operation completely, and without replacing it with another harvest elsewhere in the forest unless an “emergency” type salvage need exists that we don’t currently expect. In other words, I want to do my best to make you satisfied with our prevention measures and planning, but I only anticipate that the situation MAY prove insurmountable in 5-3/5-4 off Cornwall Road. I plan to leave my work plan (see attached map) intact, however, in an effort to attempt to meet forestry objectives in those areas.

Keep in mind that you will have a chance to review each and every operation plan that gets circulated for review in advance of any timber marking or harvest operations. Don Mysling normally does the reviews for Fisheries, but in the case of Nassahegon, you will also get to review separately. You will also be sent copies of the formal bid invitations when potential buyers are bidding on the sales, as an early heads-up that we are following through with approved operation plans, and will be notified before any contractors move to Nassahegon and begin work.

If I have missed anything critical, please let me know. If you are satisfied with these conditions, feel free to e-mail me your short consent and that, combined with inclusion of the conditions I wrote above, can suffice as your comments in the plan that I am still looking for. If this sounds good and saves you some time, let me know. If this doesn’t make sense or you still have questions, let me know.

Thanks, and happy New Year!

David Irvin

The following was an *earlier* e-mail approval by Mr. Hays, prior to new concerns raised, initially by a proposal for approved bike trails, and then by a closer examination of proposed harvest areas:

“I am glad we met, it clarified and resolved my concerns. Based on the areas we discussed I see no reason you can’t go thru with the project. As far as I can tell the activities across the street from our Punch Brook ponds should not affect the brook that feeds our ponds, assuming you stay to the left of the Blue Trail. As I said, I don’t know exactly how close the trail gets to the brook as it goes farther up into the woods. This I am sure will be considered once you get into the areas of interest.

As for the areas closer to the main hatchery, I don’t see any problems there.

Thanks for stopping by and keeping me in the loop as things proceed.”

Wildlife Division

Wildlife biologist Peter Picone has been involved in this plan since early development, including a field tour of some stands prior to completion of forest inventory. He contributed specific content that has been included in section “F. Wildlife Habitat”. He also contributed these comments upon review of the completed first draft:

“Dave : thanks for always considering wildlife in your plans and giving us an opportunity to have input into your forest mgt plans. On page 21 , as we discussed, it would be good to eliminate the first sentence in the paragraph in section “wildlife habitat improvements”. I highlighted it in red.”

The above recommendation has been followed for the final draft.

DEEP Law Enforcement

Captain Raul Camejo, 06-12-14

“Dave, no problem on my end other than insufficient officers to patrol it!”

COMMENTS: *NON-DEEP*

Connecticut Forest and Park Association (CFPA)

Clare Cain, Trail Stewardship Director, 06-11-14

Hi David,

Sorry for the delay. I don’t see any problem with the plan. Thanks for the opportunity to comment.

Thanks,

Clare

PS: Wow, 40-miles of unauthorized trails—yikes!

Burlington Conservation Commission/Land Trust

See letter on Town of Burlington letterhead, included with this plan.

New England Mountain Biking Association (NEMBA)

Scott Ruel, Northwest Connecticut NEMBA Vice President/Trails Committee Chair

“Dave, I did take a bit of a deeper look at your management plan. You did a nice job on it. Very detailed and informative. Your higher ups won't have to ask for any extra information, that's for sure. It's all there!! Good job!

I ran across the section where you talk about unauthorized trails and usage. This is the only area where I'd wish to comment. Some of my comments are somewhat connected to what I mentioned in emails yesterday about 3 illegal trail builders actually not even building anymore. You published the statistic of 40 miles of unauthorized trails.

A couple of questions: How did you arrive at that figure?

Did you subtract the 5 to 7 miles of newly approved trail from that figure?

I GPS every one of my rides. I have catalogued mileages for trail sections for the past 4 seasons or so. My figures for unauthorized trails in the state forest are a bit different than yours. My figures are at approximately 20.5 miles. That is still a lot, but much different than 40.

Additional commentary: Due to the retirement of the old guard of builders, at least 3 and potentially a fourth unauthorized trail has been totally reclaimed by the forest. These are old stunty trails that you would know from awhile back on the East side of Stone Road. You may have counted those. I did not count these because they are not ever ridden anymore. They're unrideable. I also did not include any authorized blue trail or existing forest road beds that were most likely authorized in past logging operations.

Here is my inventory of unauthorized trail (If there is some sections that you feel I overlooked, please let me know):

North Side of the Fields: If we ride everything except blue/white we get about 7 miles when we loop back to the lot and avoid heading down to lower Punchbrook. Of that 7 miles, you can subtract at least 1.5 miles of double track and small portions of blue that we use to access some of the trails. Those double track routes are authorized because they are forest service roads that were most likely put in with DEEP permission. **Approximate miles of unauthorized 5.5**

Stone West: Halford, B-52, Rogue's Revenge, Boneyard, Crazy eight loop, Pine Nutz, back door Pine Nutz, Stumpy, The Hessian, some moto trails that access the dirt jump pit and the dirt jump pit. This area probably **totals around 7 miles of unauthorized trail.** However, other than a few locals in the know, nobody rides the Hessian anymore and attempts to ride it last year showed

that much of it is being reclaimed by the forest...especially the end of it which is in a very fern dense location.

Stone East: A large majority of this side was built by a retired trail builder/Bristol dentist roughly 15 to 20 years ago. When we ride our entire loop including everything over here, it usually hits about 7 to 7.5 miles. But, that's counting riding at least three healthy sections of blue/red that probably total right around a mile (blue is authorized trail). Many of the downhill routes that descend to Stone Road that used to be mainstays are not actively used and haven't been for approximately 5 years. There are 2 specific routes that are not used at all and 1 that is used infrequently. Two of which, I wouldn't count as unauthorized any more because you can't even tell that there was a trail there and nobody would know to use it. Unauthorized trails include all three shelves of the dentist trails, the lollipop loop, Hunter's Ridge trail, Hobo, Northside Woods part I and II, Whopper Junior, Bail Trail (this could possibly be nixed from the list because it's an old forest bed trail that is part of the Jeep Trail climb) I don't count that, because I believe part of it is on private property at the bottom. It also is an existing jeep road that was not built to be an unauthorized mountain bike trail. **Approximate unauthorized mileage 5.5**

Scranton Mountain Zone (nearing boundary with NBWD land): When you head up towards Scranton Mountain on White trail or the newly approved white/red dot, I already accounted for much of what is unauthorized in the Stone West report. The only bit I didn't hit is that little side trail stuff off of white that somebody put in 3 or 4 seasons ago. That doesn't amount to much more than a half mile tops. He can't count the Wasteland because we've eradicated as much as we can without additional help. We'd need machines and or planting teams to plant new dense vegetation in that area to reclaim it. There's also a small section of what I call the Kitchen Alley (is upslope of Roller Derby and runs parallel to it) that is on State Land. **I'm being generous when I say that the other unauthorized mileage here may total 1.5 miles.**

Miscellaneous areas on unauthorized trails on Nassahegon State Forest land:

Mobius loop: There is a VERY short portion of the Mobius loop that cuts into state land right for a short period and then dips back into NBWD land. **Less than 1/8 of a mile.**

Poacher access: The short cut that someone put in off Miller Time to get to Poacher is less than 1/8 mile and then uses authorized blue trail to get to Cornwall Road.

Poacher: I was always under the impression that Poacher sat entirely on NBWD land. That is not entirely true. When accessing Poacher, there are markers that show you are entering state forest. I'd say this portion totals a half mile.

I will be generous again and round this up to about a mile of unauthorized trail on miscellaneous sections of where we ride.

Chippens Block: There is no unauthorized trail in this section of State Forest that I know of on this land between East and West Chippens Hill Roads.

Total unauthorized mileage is approximately 20.5 miles. This is mostly all actively used trail. I'd say 2 miles that I accounted for is very sheltered and not known to the riding public...it's a spring/summer growth period away from being unrideable because it's mostly reclaimed by the forest already. The builder of that stretch is retired.

If you have any questions about my report, let me know. If you want hard data, it'll take me some time, but I can get exact mileages. I can tell you that the numbers I gave you are going to be pretty spot on...at the worst a deviation of plus or minus a mile or two tops.”

APPENDIX B – REFERENCES

- CT DEEP, Division of Forestry, rev. 2006. Standard Operating Procedures for State Forest Management.
- CT DEP, Division of Wildlife, 2005. Connecticut’s Comprehensive Wildlife Strategy.
- DeGraaf, etal. 1992. *New England Wildlife: Management of Forested Habitats*, US Forest Service.
- Kelty, et al. 2003. “The Conversion of Even-Aged Stands to Uneven-Aged Structure in Southern New England”, *Northern Journal of Applied Forestry*.
- Picone, Peter, DEEP Wildlife Division, personal consultations, contribution to plan regarding wildlife habitat.
- Miska, Richard, DEEP State Parks Division, personal consultation regarding trails and recreational use.
- Roach, Benjamin, and S. Gingrich. Dec. 1968. *Even-Aged Silviculture for Upland Central Hardwoods*, Agriculture Handbook 355, US Forest Service.
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- Hornbeck, James W., and William B. Leak. 1992. *Ecology and Management of Northern Hardwood Forests in New England*. USDA Forest Service General Technical Report NE-159.
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- Perkey, Arlyn W. and Brenda L. Wilkins. 2001. *Crop Tree Field Guide: Selecting and Managing Crop Trees in the Central Appalachians*. USDA Forest Service publication NA-TP-10-01.
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- McClure, Mark S. *PEST ALERT: Elongate Hemlock Scale*, USDA Forest Service NA-PR-01-02.

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Rivers Alliance of Connecticut, 2001. *The Importance of Streamside Buffers*. Brochure.

Leak, William B. and Neil I. Lamson. *Revised White Pine Stocking Guide for Managed Stands*. USDA Forest Service NA-TP-01-99.

Siegert, Nate; lecture and PowerPoint on EAB and managing ash in presence of EAB, 2012.

APPENDIX C – DEFINITIONS

Size Classes

Sawtimber - hardwood trees 12-inch dbh (diameter at breast height, or 4.5 feet off the ground) and larger, and softwood trees 10-inch dbh and larger, that contain at least one 8-foot sawlog.

Poletimber- hardwood trees between 5 and 11 inches dbh, and softwood trees 5 to 9 inches dbh. These trees are too small for sawlogs, but could be sold as pulpwood, fuelwood, or other small products where such markets exist.

Saplings - trees 1 to 5 inches dbh.

Seedlings - Trees less than 1 inch dbh.

Stand - an area of trees of a certain species composition (cover type), age class or size class distribution and condition (quality, vigor, risk), usually growing on a fairly homogeneous site.

An **even-aged** stand contains trees in the main canopy that are within 20 years of being the same age. Even-aged stands sometimes are designated by age-class (e.g. a 40- year old stand) or broad size-class (e.g. seedling/sapling, poletimber, sawtimber). An **uneven-aged** stand contains trees of several 15-20 year age-classes. These stands generally contain trees of many sizes (seedlings through sawtimber) due to the range in ages and the differences in growth rates among species.

Types of Silvicultural Treatments

Clearcut- Used in even-aged management to regenerate a new forest using seeds already in the soil, seeds brought in from adjacent areas by wind or animals, and/or sprouts from stumps. All stems are removed to provide maximum sunlight for the new forest. Trees such as black cherry, yellow poplar, aspen, and paper birch often regenerate after clearcuts. Often used to create early successional wildlife habitat.

Selection cut- Used in uneven-aged management. Trees are removed singly or in small groups up to an acre in size, maintaining a fairly continuous canopy.

Selection harvests tend to favor trees that can grow in partial shade such as sugar and red maples, black and yellow birch, beech, and hemlock.

Shelterwood- Used in even-aged management. Understory and lower crown canopy trees are removed to allow the new stand to regenerate in partial sunlight. Trees to be retained are usually of the best quality to serve as a desirable source of seed. After adequate regeneration is established, the overstory is removed in one or two cuts. Shelterwoods are often used to regenerate species such as oak and white pine that have irregular crops of seed.

Forest Types (from the U.S. Forest Service)

Forest Type is based on species composition of the overstory, with the overstory defined as all trees in the 1" dbh class and larger. Species composition is based on the proportion of total stand basal area represented by each species or species group. Forest type designations are not assigned to stands until they grow out of the seedling stage into the sapling class.

Forest Types mentioned in this plan are:

Eastern white pine: Associates—pitch pine, gray birch, aspen, red maple, pin cherry, white oak, paper birch, black birch, yellow birch, black cherry, white ash, northern red oak, sugar maple, basswood, hemlock, tulip-poplar, white oak, chestnut oak, scarlet oak. Sites, wide variety, but best development on well-drained sands and sandy loams. (WHITE/RED/JACK PINE cover group)

Eastern hemlock: Associates – beech, sugar maple, yellow birch, basswood, red maple, black cherry, white ash, white pine, paper birch, black birch, northern red oak, and white oak. Sites--cool locations, moist ravines, and north slopes. (WHITE/RED/JACK PINE cover group)

Eastern white pine/northern red oak/white ash: Associates—red maple, basswood, yellow birch, bigtooth aspen, sugar maple, beech, paper birch, black cherry, hemlock, and black birch. Sites—deep, fertile, well-drained soil. (OAK/PINE cover group)

White oak: Associates—black oak, northern red oak, hickory, white ash, tulip-poplar. Sites—scattered patches on upland, loamy soils but on drier sites than the “white oak/red oak/hickory” type. (OAK/HICKORY cover group)

Northern red oak: Associates – black oak, scarlet oak, chestnut oak, and tulip-poplar. Sites--spotty distribution on ridge crests and north slopes in mountains but also found on rolling land, slopes, and benches on loamy soil. (OAK/HICKORY cover group)

Scarlet oak: Associates—black oak, chestnut oak, white oak, hickory, pitch pine. Sites—dry ridges, south or west facing slopes and flats but often moister situations probably as a result of logging or fire. (OAK/HICKORY cover group)

Chestnut oak/black oak/scarlet oak: Associates—northern red oak, white oak, shagbark hickory, pignut hickory, tulip-poplar, red maple, eastern white pine, pitch pine. Sites—dry upland sites on thin-soiled rocky outcrops on dry ridges and slopes. (OAK/HICKORY cover group)

Red maple/oak: Associates—the type is dominated by red maple and some of the wide variety of central hardwood associates including upland oaks, hickory, tulip-poplar, sassafras. Sites—uplands. (OAK/HICKORY cover group)

Mixed upland hardwoods: Associates – Any mixture of hardwood species typical of the upland central hardwood region, should include some oak. Sites--wide variety of upland sites. (OAK/HICKORY cover group)

Red maple/lowland: Associates—Most commonly ash, blackgum, yellow birch. Sites—wetland “red maple swamps”, on poorly drained to somewhat poorly drained soils. (ELM/ASH/COTTONWOOD cover group)

Sugar maple/beech/yellow birch: Associates—basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, black birch, elm, eastern hophornbeam. Type often known as “northern hardwoods”. Sites—fertile, moist, well-drained sites. (MAPLE/BEECH/BIRCH cover group)

APPENDIX D – STAND SUMMARY TABLE

NASSAHEGON STATE FOREST Stand Summary, FY 2016-2026

Stand	Acres	USFS Type	Cover Group	Mgmt. System	Size Class	Prescription	Next 10 years?	Commercial Sale?
1-1	29	103	PH	E	Saw-Pol	Irregular Shelterwood	No	No
1-2	18	510	OH	U	Saw-Pol	Selection	Yes	Yes
1-3	12	103	PH	U	Saw	TSI	Yes	No
1-4	24	520	OH	U	Saw-Pol-Sap	Selection	Yes	Yes
1-5	7	510	OH	E	Pole	TSI	Yes	No
1-6	13	401	OP	E	Pole	TSI	No	No
1-7	42	505	OH	U	Saw	Selection	Yes	Yes
1-8	15	505	OH	E	Saw	Okay	No	No
1-9	10	401	OP	E	Sap	TSI	Yes	No
1-A	13	103	PH	--	Saw	Unmanaged	No	No
2-1	9	103	PH	U	Saw-Pol	TSI	Yes	No
2-2	2	103	PH	E	Saw	TSI	Yes	No
2-A	22	--	--	--	--	N/A	No	No
3-1	22	--	--	--	--	N/A	No	No
3-2	30	103	PH	U	Saw	Selection	No	No
3-3	13	105	PH	U	Saw-Pol	Clearcut	No	No
3-4	14	510	OH	U	Saw-Pol	Selection	Yes	Yes
3-5	4	105	PH	U	Saw-Pol	Salvage	Yes	Yes
3-A	14	708	RM	--	Saw-Pol	Unmanaged	No	No
4-1	63	505	OH	U	Saw	Selection	No	No
4-2	16	515	OH	U	Saw-Pol	Selection	No	No
5-1	66	505	OH	E	Saw	Okay	No	No

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5-2	52	505	OH	E	Saw	Thin	No	No
5-3	21	103	PH	U	Saw	Selection	Yes	Yes
5-4	16	401	OP	U	Saw-Pol	Selection	Yes	Yes
5-A	33	801	NH	--	Saw-Pol	Unmanaged	No	No
6-1	11	505	OH	E	Saw-Sap	Strip Clearcut	Yes	Yes
6-2	19	519	OH	E	Saw-Sap	Strip Clearcut	Yes	Yes
6-3	13	505	OH	E	Saw	Okay	No	No
6-4	5	520	OH	E	Saw-Sap	Okay	No	No
6-5	28	520	OH	E	Saw	Okay	No	No
6-6	34	505	OH	U	Saw	Okay	No	No
6-7	12	520	OH	E	Sap	Okay	No	No
6-8	5	505	OH	U	Saw	TSI	No	No
6-9	22	401	OP	E	Saw-Pol	TSI	Yes	No
6-10	33	401	OP	U	Saw-Pol	Selection	Yes	Yes
6-11	5	504	OH	U	Saw	Thin	No	No
6-A	35	520	OH	--	Saw-Pol	Unmanaged	No	No
6-B	49	520	OH	--	Saw	Unmanaged	No	No
6-C	3	520	OH	--	Saw	Unmanaged	No	No
7-1A	25	510	OH	E	Saw	Clearcut	Yes	Yes
7-1B	18	520	OH	E	Saw-Pol	First/Final Shelterwood	Yes	Yes
7-1C	20	520	OH	E	Saw	First Shelterwood	Yes	Yes
7-2	59	505	OH	E	Saw	Thin	Yes	Yes
7-3	18	520	OH	U	Saw	Selection	Yes	Yes
7-4	9	401	OP	U	Saw-Pol	TSI	Yes	No
7-A	14	505	OH	--	Saw-Pol	Unmanaged	No	No
7-B	76	505	OH	--	Saw	Unmanaged	No	No
8-1	21	505	OH	E	Saw	Thin	Yes	Yes

8-2	6	505	OH	E	Saw	Thin	Yes	Yes
8-3	3	708	RM	U	Saw-Pol	Selection	No	No
8-A	25	--	--	--	--	Unmanaged	No	No

KEY TO SYMBOLS

I. USFS TYPES: Column 3

The numbers used in the “Type” column of the table represent U.S. Forest Service standardized types.

- 103 Eastern White Pine
- 105 Eastern Hemlock
- 401 Eastern White Pine/Northern Red Oak/White Ash
- 504 White Oak
- 505 Northern Red Oak
- 510 Scarlet Oak
- 515 Chestnut Oak/Black Oak/Scarlet Oak
- 519 Red Maple/Oak
- 520 Mixed Upland Hardwoods
- 708 Red Maple/Lowland
- 801 Sugar Maple/Beech/Yellow Birch

II. COVER GROUP: Column 4 (see maps D-1 and D-2)

- OH = Oak-Hickory Group
- PH = Pine-Hemlock Group
- OP = Oak-Pine Group
- RM = Red Maple Lowland
- NH = Northern Hardwood Group

III. MANAGEMENT SYSTEM: Column 5 (see maps H-1 and H-2)

- U = Uneven-Aged Management/All-Aged Management
- E = Even-Aged Management

IV. SIZE CLASS: Column 6 (see maps D-1 and D-2)

- “Saw” = Sawtimber stand, dominated by trees of merchantable size, 12” dbh or greater
- “Pole” = Poletimber stand, dominated by trees 6” – 10” dbh
- “Sap” = Sapling stand, trees under 6” dbh
- “Saw-Sap” = Mixed sawtimber-sapling stand; two-aged, mid-shelterwood or in conversion to uneven-aged stand.
- “Saw-Pol” = Mixed sawtimber-pole stand (Poles comprise a minimum of 1/3 of basal area, usually 40% or more)
- “Saw-Pol-Sap” = considered uneven-aged, with all three size classes represented.

III. PRESCRIPTION: Column 7 (see maps F-1/F-2, G-1/G-2)

Selection=Conversion to uneven-aged management, including single-tree and group selection openings under one acre, and “expanded-gap” openings of pre-existing group selection patches. This includes conversion to conifers through all-aged management in some stands. Cutting cycle of 20 years.

TSI=Timber stand improvement, including mostly pre-commercial crop-tree management and pine release. Can occur in both even-age and uneven-age managed stands.

Salvage=Primary objective is salvage of dying timber; in this case hemlock in decline from elongate hemlock scale attack; stand to be managed uneven-aged in long-term.

Clearcut=Silvicultural clearcut, with all stems 2” and up or 4” and up to be cut.

Strip Clearcut= All stems cut in narrow strips approximately 150 feet wide; in the case of stands 6-1 and 6-2, the remaining leave strips from the previous strip clearcuts will be removed.

Thin= Commercial thinning to the “B level” to provide more growing space for the healthiest and best quality trees.

First Shelterwood= Initial regeneration cutting in 2 or 3-phase shelterwood series, even-aged management; Approximately half of sawtimber overstory and all midstory and understory stems removed.

Final Shelterwood= Final harvest in 2 or 3-phase shelterwood series, 6-8 years after the first, even-aged management; all overstory trees remaining are removed to release the seedling-sapling regeneration established.

Irregular Shelterwood=Similar to traditional shelterwood, but with patches or corridors of leave-trees that will carry into the next generation, producing an irregularly two-aged pattern throughout the stand.

APPENDIX E – WILDLIFE CONSERVATION LETTERS



Connecticut Department of

**ENERGY &
ENVIRONMENTAL
PROTECTION**

May 16, 2016

Mr. David Irvin
CT DEEP-Bureau of Natural Resources
Division of Forestry
P.O. Box 161
Pleasant Valley, CT 06063-0161
david.irvin@ct.gov

Project: Management Plan Review for Chippens Hill Block of Nassahegon State Forest in Burlington, Connecticut
NDDB Determination No.: 201605365

Dear David,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed Management Plan Review for Chippens Hill Block of Nassahegon State Forest in Burlington, Connecticut. According to our information we have known extant populations of State Endangered American bittern (*Botaurus lentiginosus*), State Species of Special Concern whip-poor-will (*Caprimulgus vociferus*), box turtle (*Terrapene c. carolina*) and Eastern pearlshell (*Margaritifera margaritifera*).

American bittern is a secretive bird that nests in marsh complexes. If standard protocols for the protection of wetlands and watercourses are followed and maintained during the course of these forestry operations, potential impacts to this species will be reduced.

Whip-poor-wills may ultimately benefit from the earlier forest growth stages created through these timber harvests. Any forestry operation should be conducted outside of the breeding season (late May through July), so that the potential for destruction of nests, eggs, or young is reduced.

Eastern pearlshell is a freshwater mussel that has been negatively impacted by the loss of suitable habitat. To avoid serious impact on the freshwater mussels:

- harvesters should keep stream crossings to a minimum,
- no vegetation should be removed from the stream banks adjacent to watercourses (mussel habitat) since land clearing activities will affect the mussels, and
- soil and/or siltation should not be discharged into any brook

Eastern box turtles require old field and deciduous forest habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic. Box turtles hibernate on land by digging down in the soil from October to April. The time of year that the logging work will be done can negatively impact box turtles. Any land clearing and heavy vehicle use during the winter could bury and kill hibernating turtles. Box turtles are very active from June (when the females are nesting) to August (when the pairs are mating). Box turtles have been negatively impacted by the loss of suitable habitat. If timber harvesting

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follows these recommendations the harvest may benefit this species by creating additional early successional habitat.

Recommended Protection Strategies for Box Turtles:

Work should occur when these turtles are active (April 1st to September 30th) and I recommend the additional strategies in order to protect these turtles:

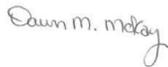
- Workers should be apprised of the possible presence of turtles, and provided a description of the species (http://www.ct.gov/dep/cwp/view.asp?a=2723&q=473472&depNav_GID=1655). I have attached a fact sheet for your files.
- Any turtles that are discovered should be moved, unharmed, to an area immediately outside of the work area, and position in the same direction that it was walking;
- No vehicles or heavy machinery should be parked in any turtle habitat;
- Work conducted during early morning and evening hours should occur with special care not to harm basking or foraging individuals

This letter is good for one year. Please re-submit an NDDDB Request for Review if the scope of work changes or if work has not begun on this project by May 16, 2017.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,



Dawn M. McKay
Environmental Analyst 3



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

May 16, 2016

Mr. David Irvin
CT DEEP-Bureau of Natural Resources
Division of Forestry
P.O. Box 161
Pleasant Valley, CT 06063-0161
david.irvin@ct.gov

Project: Management Plan Review for Nassahegon State Forest, Main Nassahegon Block in Burlington, Connecticut
NDDB Determination No.: 201605367

Dear David,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed Management Plan Review for Nassahegon State Forest, Main Nassahegon Block in Burlington, Connecticut. According to our information we have known extant populations of State Special Concern Broad-winged hawk (*Buteo platypterus*), Whip-poor-will (*Caprimulgus vociferus*) and eastern box turtle (*Terrapene carolina carolina*).

Broad-winged hawks are inconspicuous forest nesting hawks in deciduous forests. Their large bowl nests are often old crow or squirrel nests. The Broad-winged hawk breeding season is approximately from April through August and during this time it is most susceptible to disturbances in its feeding and nesting habitat. Minimizing impacts to the above-mentioned habitat during this time period will likewise minimize impacts to this species.

Whip-poor-wills may ultimately benefit from the earlier forest growth stages created through these timber harvests. Any forestry operation should be conducted outside of the breeding season (late May through July), so that the potential for destruction of nests, eggs, or young is reduced.

Eastern box turtles require old field and deciduous forest habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic. Box turtles hibernate on land by digging down in the soil from October to April. The time of year that the logging work will be done can negatively impact box turtles. Any land clearing and heavy vehicle use during the winter could bury and kill hibernating turtles. Box turtles are very active from June (when the females are nesting) to August (when the pairs are mating). Box turtles have been negatively impacted by the loss of suitable habitat. If timber harvesting is conducted with these recommendations in place, harvesting activities may benefit this species by creating additional early successional habitat.

Recommended Protection Strategies for Box Turtles

Work should occur when these turtles are active (April 1st to September 30th) and I recommend the additional strategies in order to protect these turtles:

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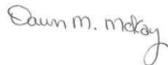
- Workers should be apprised of the possible presence of turtles, and provided a description of the species (http://www.ct.gov/dep/cwp/view.asp?a=2723&q=473472&depNav_GID=1655). I have attached a fact sheet for your files.
- Any turtles that are discovered should be moved, unharmed, to an area immediately outside of the work area, and position in the same direction that it was walking;
- No vehicles or heavy machinery should be parked in any turtle habitat;
- Work conducted during early morning and evening hours should occur with special care not to harm basking or foraging individuals.

This letter is good for one year. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by May 16, 2017.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEEP for the proposed site.

Sincerely,



Dawn M. McKay
Environmental Analyst 3

APPENDIX F – CONSERVATION COMMISSION LETTER



Town of Burlington

To Whom it May Concern:

July 10, 2014

David Irvin from the Connecticut DEEP gave a thoughtful and insightful presentation to the Burlington Conservation Commission on June 18th on the management plan for the Nassahegon Forest. We appreciate the opportunity to receive and review the plan by way of his personalized seminar. All Conservation Commission members support the plan enthusiastically as well as Dave's passion and knowledge of the subject matter. We are disseminating the information to other people in Burlington by way of a link on the Burlington Land Trust website.

Respectfully submitted

The Burlington Conservation Commission

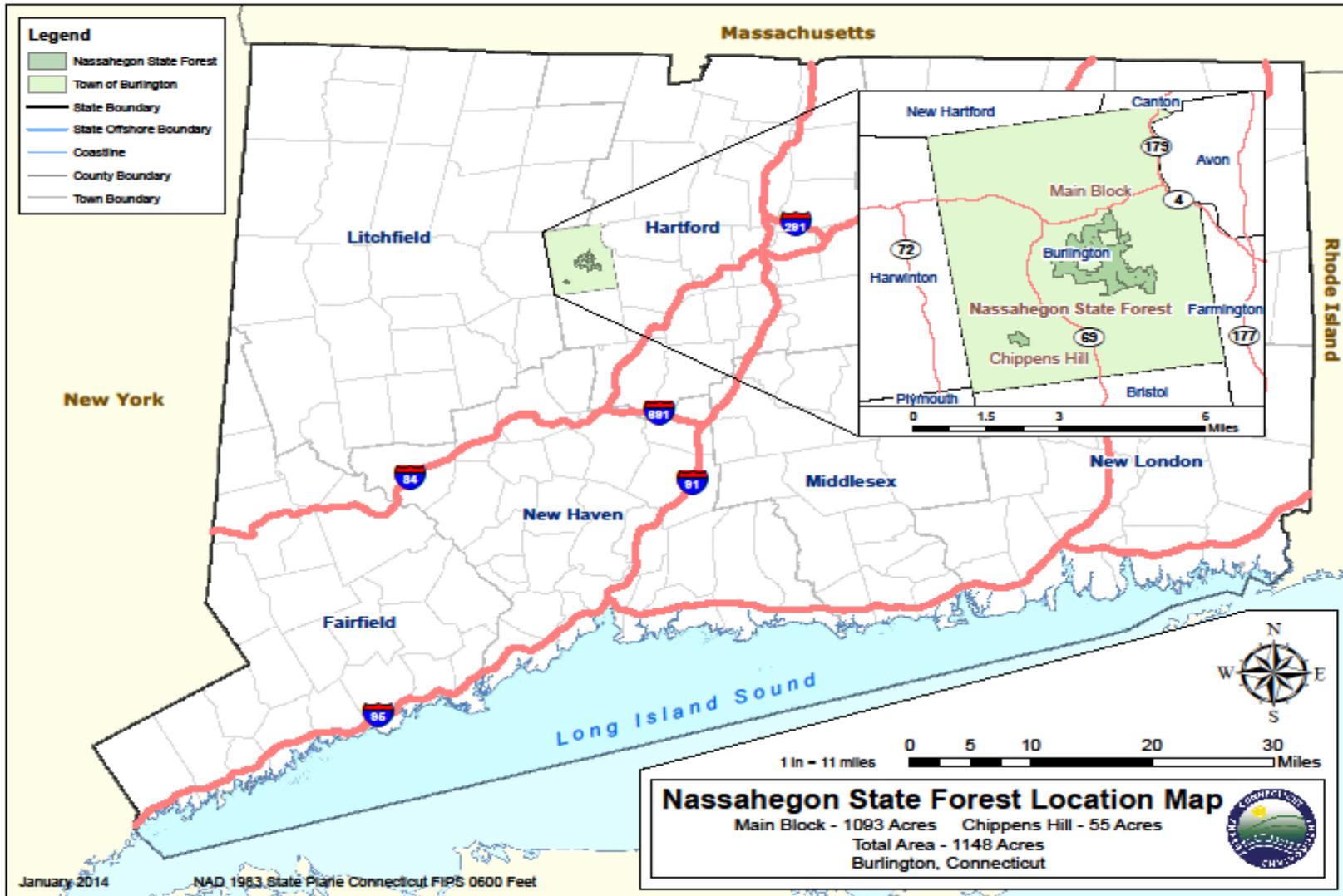
<http://www.burlingtonlandtrust.org/forestry.html>

APPENDIX G – LEASE

Forest Stand 3-, located in the main block of Nassahegon State Forest is leased to the town of Burlington and used as a recreation area. The lease agreement is on record in the Burlington Town Hall, Vol. 315 page 240.

Lease agreements are managed by the Office of Constituent Affairs/Land Management within the Department of Energy and Environmental Protection.

MAP 1 - NASSAHEGON STATE FOREST LOCATION MAP



MAP A-1 – TOPOGRAPHIC, MAIN BLOCK



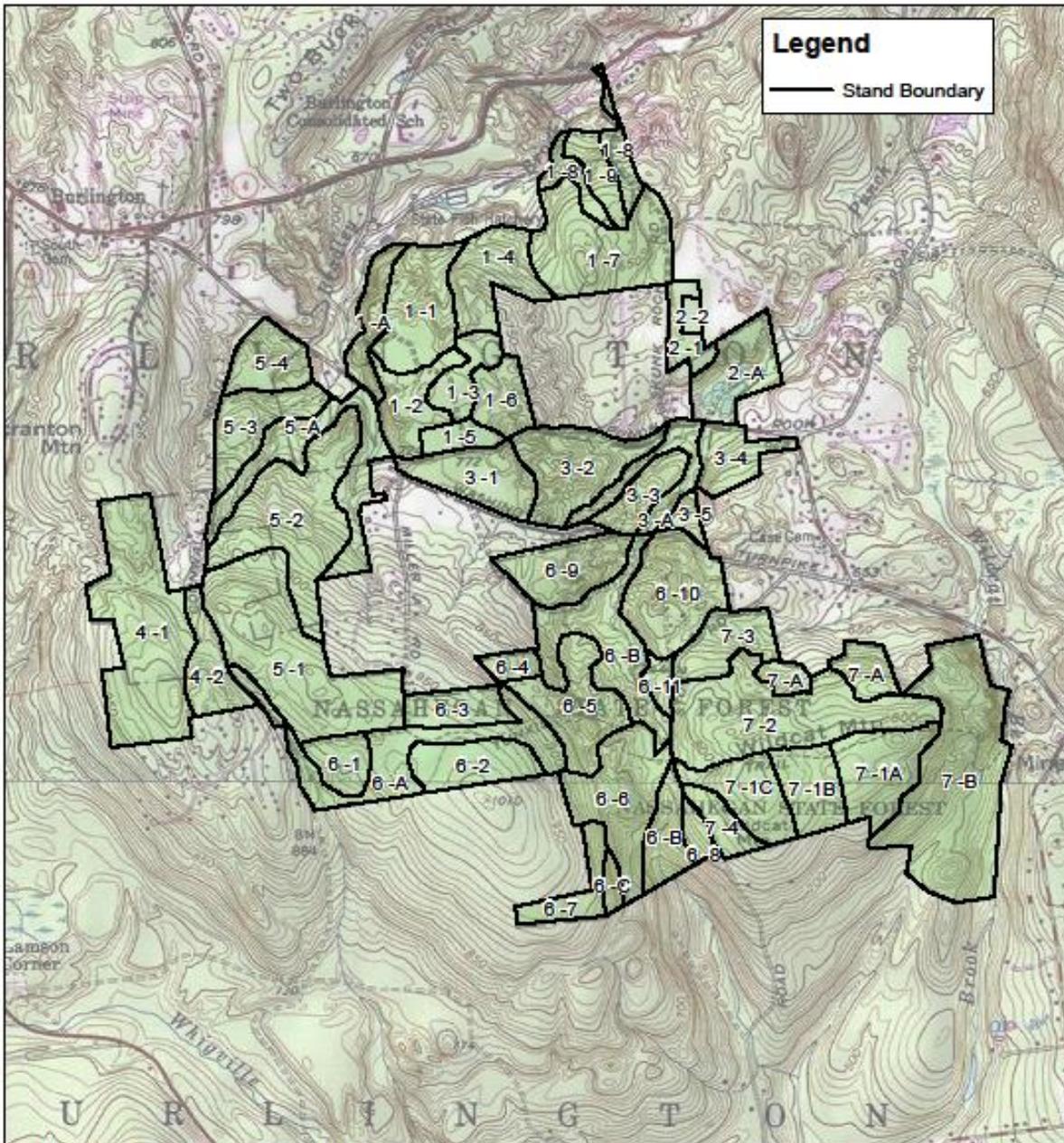
Map A - 1 Topographic Nassahegon State Forest, Main Block

Burlington, Connecticut
Total Area - 1148 Acres Main Block - 1093 Acres



0 1,000 2,000 4,000
Feet

January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 1,750 feet

MAP A-2 - TOPOGRAPHIC, CHIPPENS HILL BLOCK

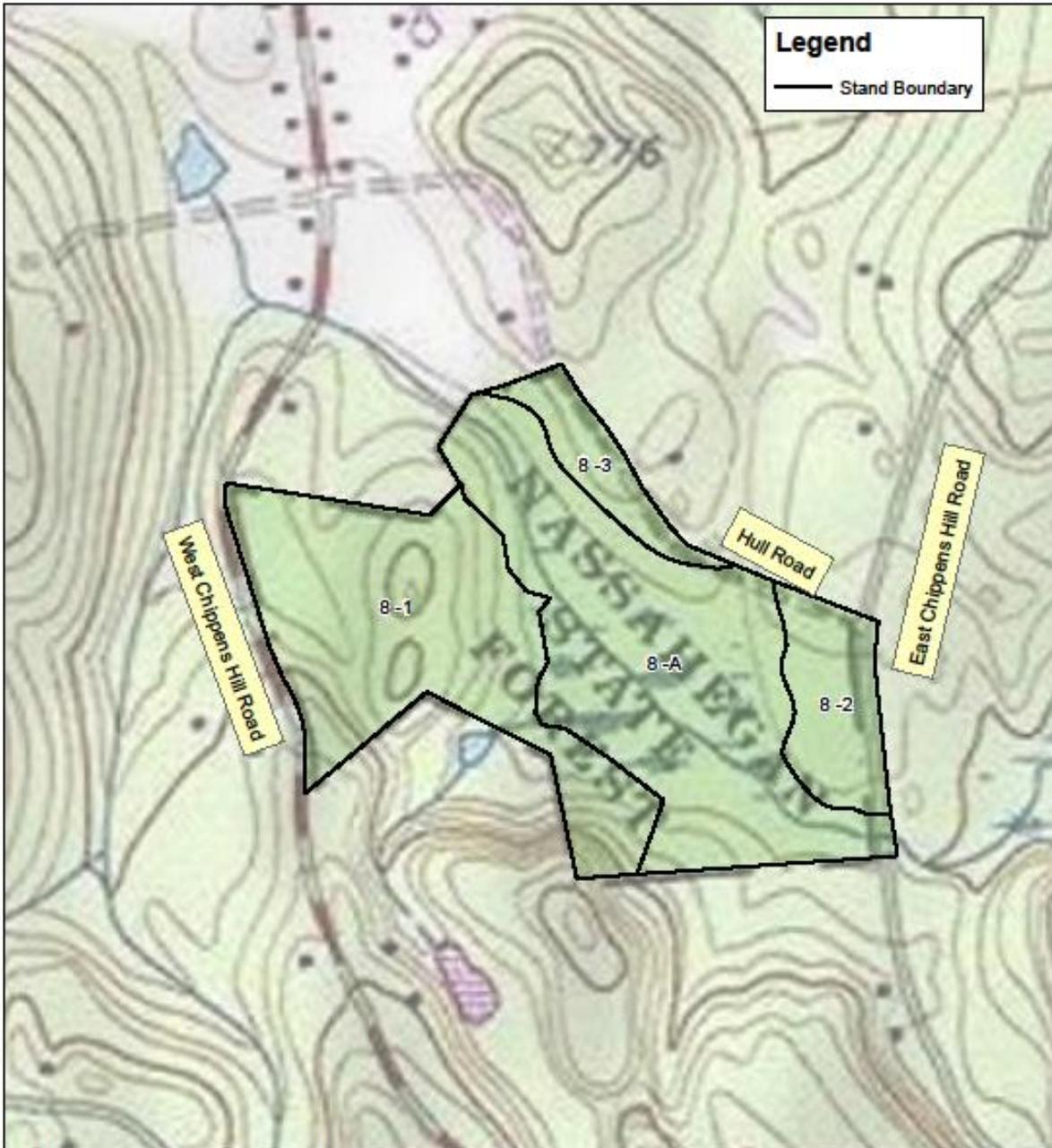
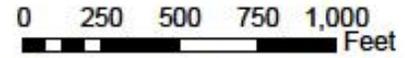


Map A - 2 Topographic Nassahegon State Forest, Chippens Hill Block

Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

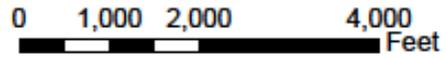
1 Inch = 500 feet

MAP B-1 - BASE, MAIN BLOCK

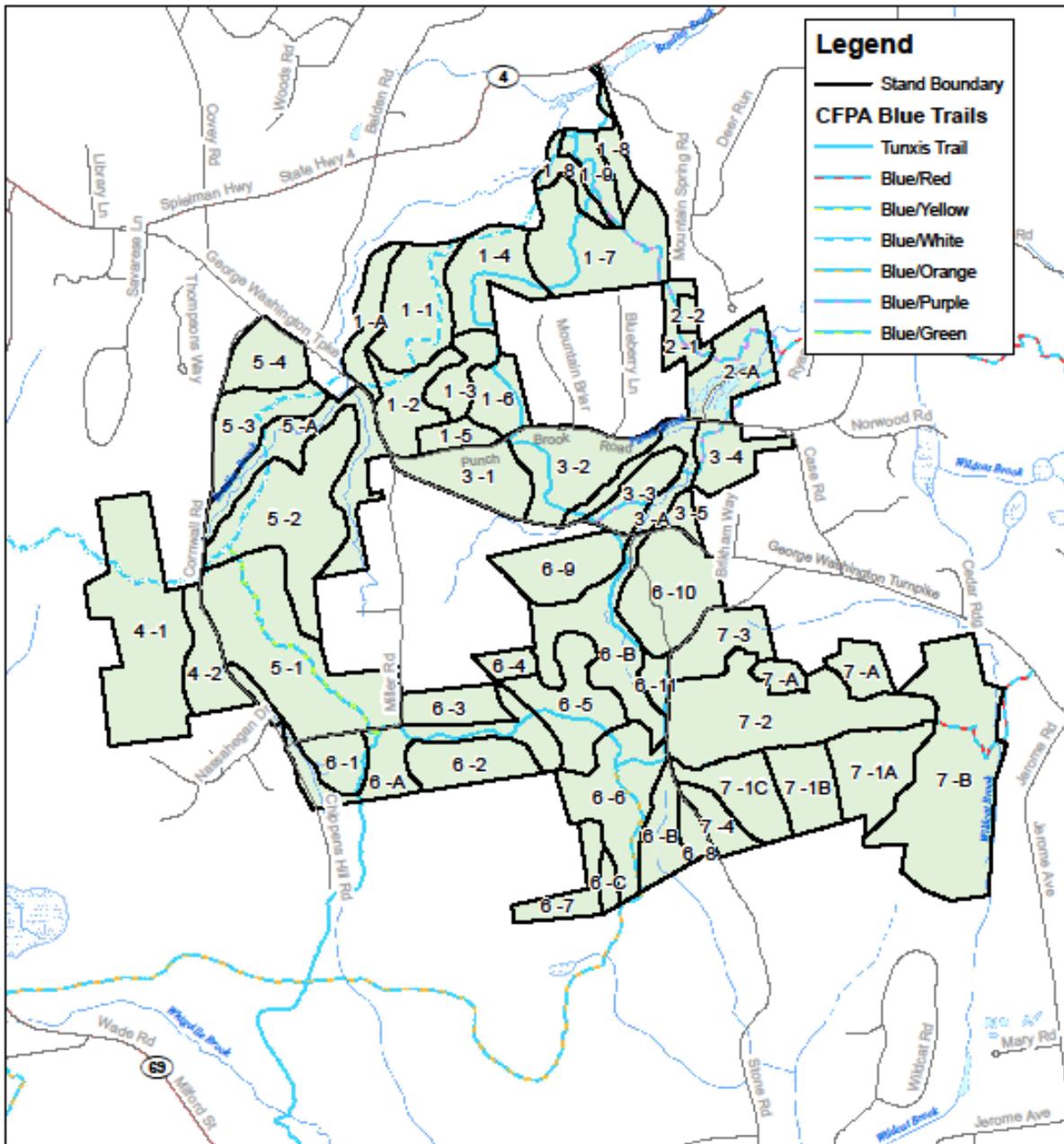


Map B - 1 Base Nassahegon State Forest, Main Block

Burlington, Connecticut
 Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 inch = 1,750 feet

MAP B-2 - BASE, CHIPPENS HILL BLOCK

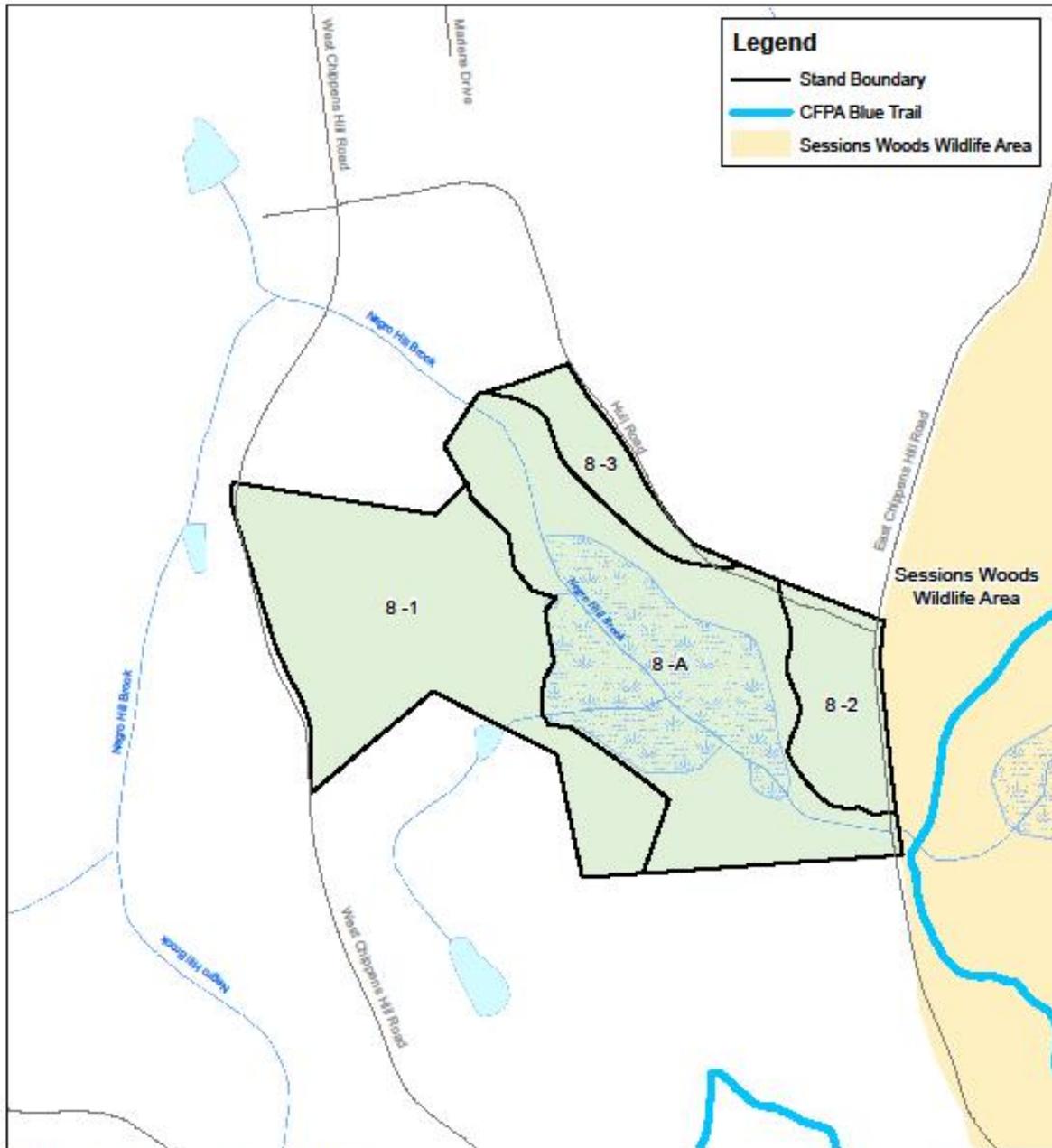
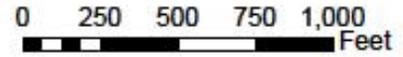


Map B - 2 Base Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres

January 2014



Legend

- Stand Boundary
- CFPA Blue Trail
- Sessions Woods Wildlife Area

NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 500 feet

MAP C-1 – SITE QUALITY, MAIN BLOCK

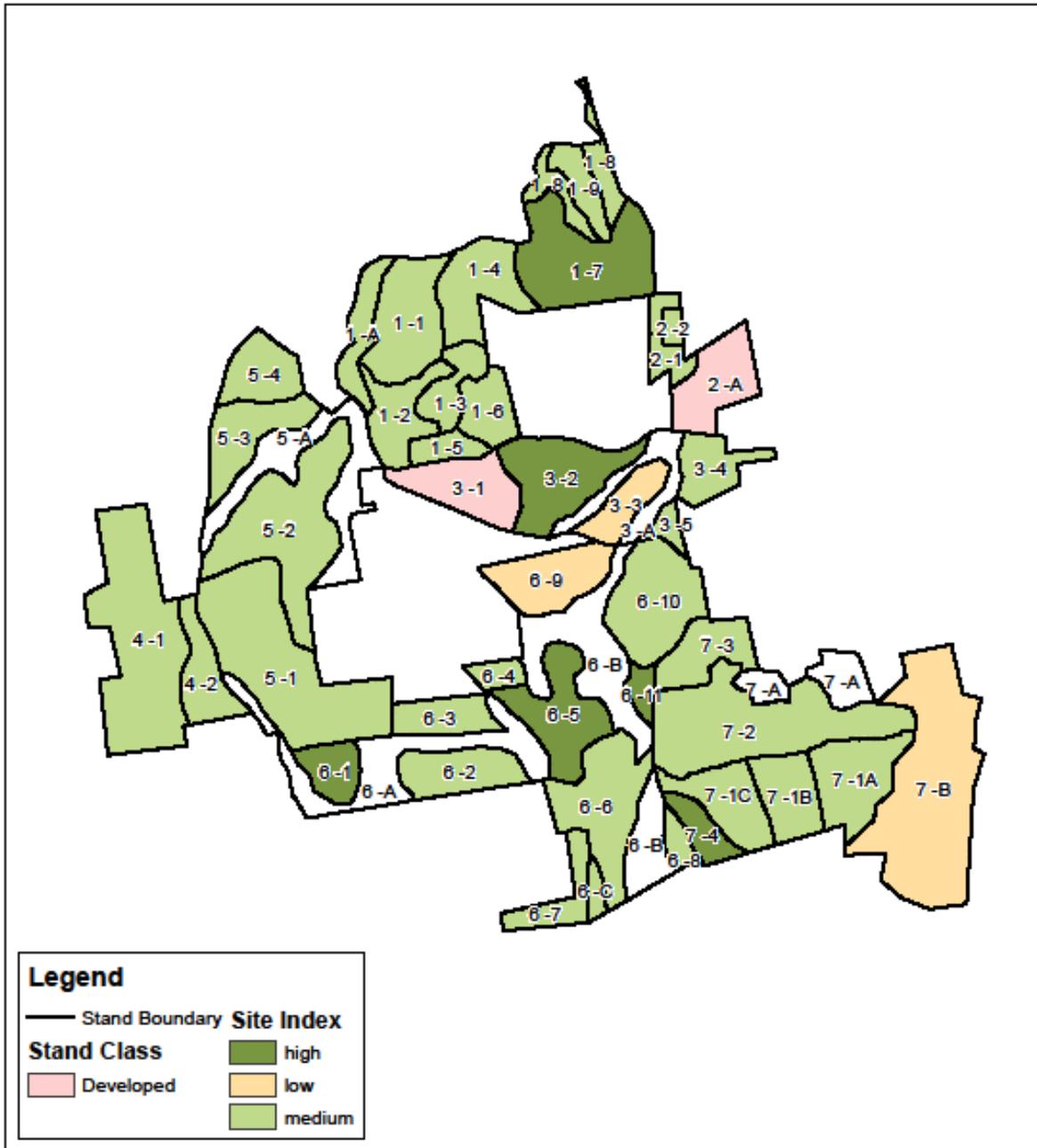
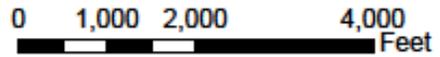


Map C - 1 Site Quality Nassahegon State Forest, Main Block

Burlington, Connecticut
 Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 inch = 1,750 feet

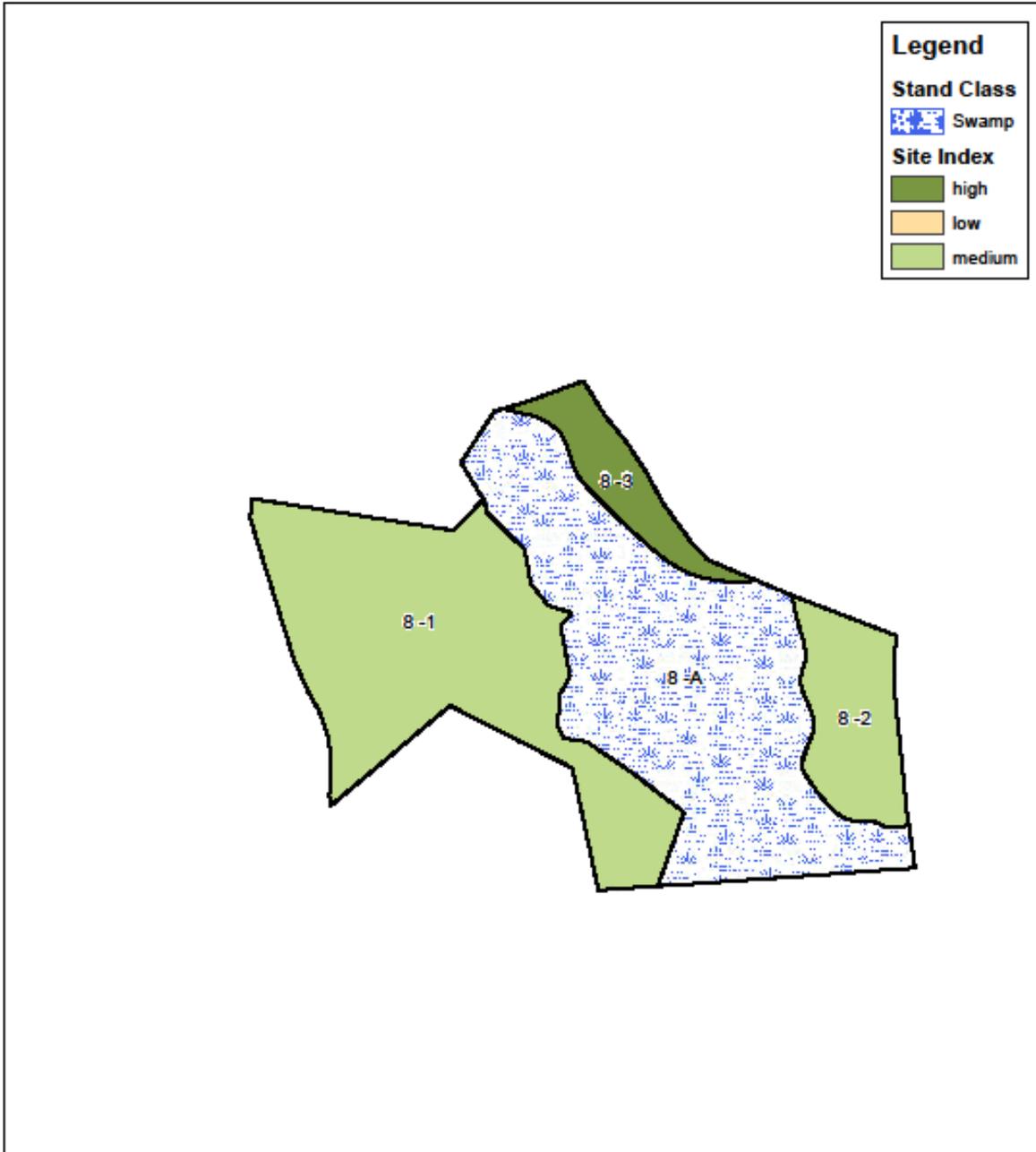
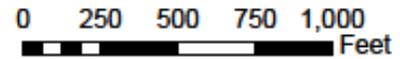
MAP C-2 – SITE QUALITY, CHIPPENS HILL BLOCK



Map C - 2 Site Quality Nassahegon State Forest, Chippens Hill Block Burlington, Connecticut Total Area - 1148 Acres Chippens Hill Block - 55 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 500 feet

MAP D-1 - FOREST TYPE & SIZE CLASS, MAIN BLOCK

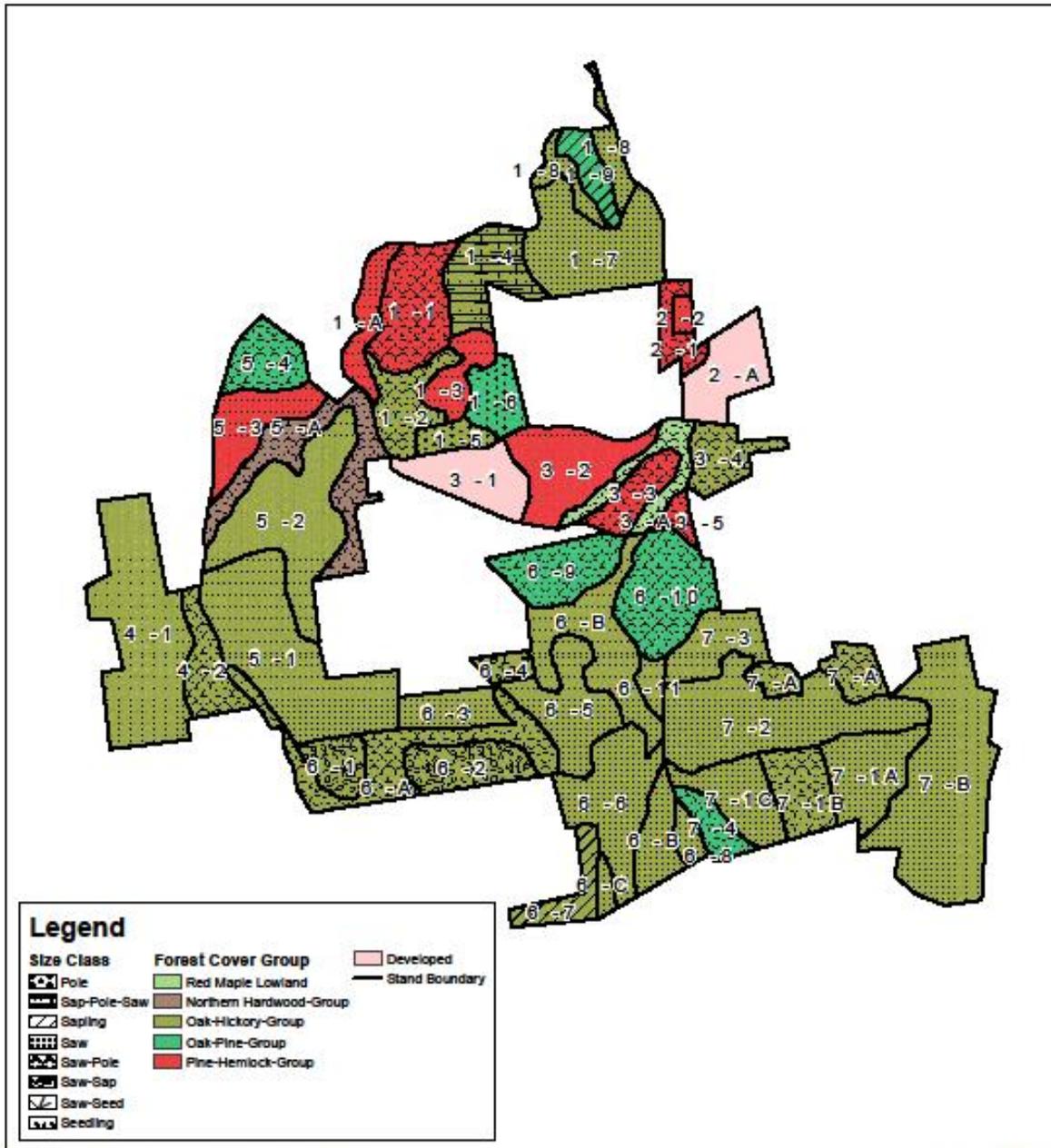
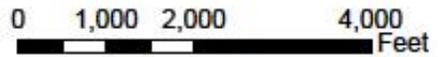


Map D - 1 Forest Type and Size Class Nassahegon State Forest, Main Block

Burlington, Connecticut
 Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



Legend		
Size Class	Forest Cover Group	Developed
[Pattern] Pole	[Color] Red Maple Lowland	[Color] Stand Boundary
[Pattern] Sap-Pole-Saw	[Color] Northern Hardwood-Group	
[Pattern] Sapling	[Color] Oak-Hickory-Group	
[Pattern] Saw	[Color] Oak-Pine-Group	
[Pattern] Saw-Pole	[Color] Pine-Hemlock-Group	
[Pattern] Saw-Sap		
[Pattern] Saw-Seed		
[Pattern] Seeding		

NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 inch = 1,750 feet

MAP D-2 – FOREST TYPE & SIZE CLASS, CHIPPENS HILL BLOCK

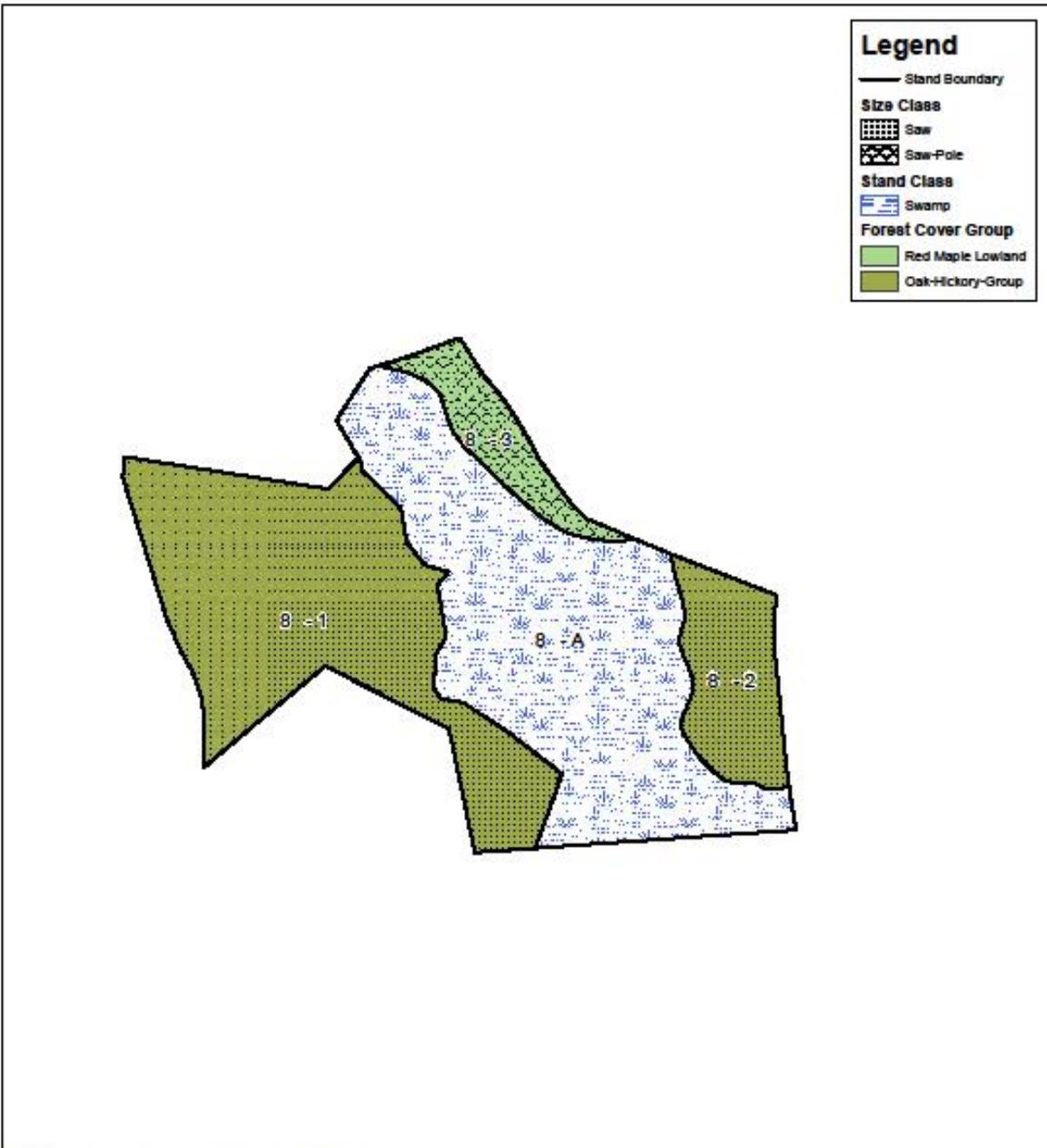
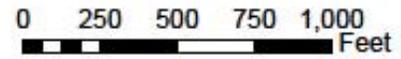


Map D - 2 Forest Type and Size Class Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres

January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

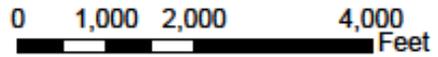
1 inch = 500 feet

MAP E-1 – SPECIAL FEATURES OVERLAY, MAIN BLOCK

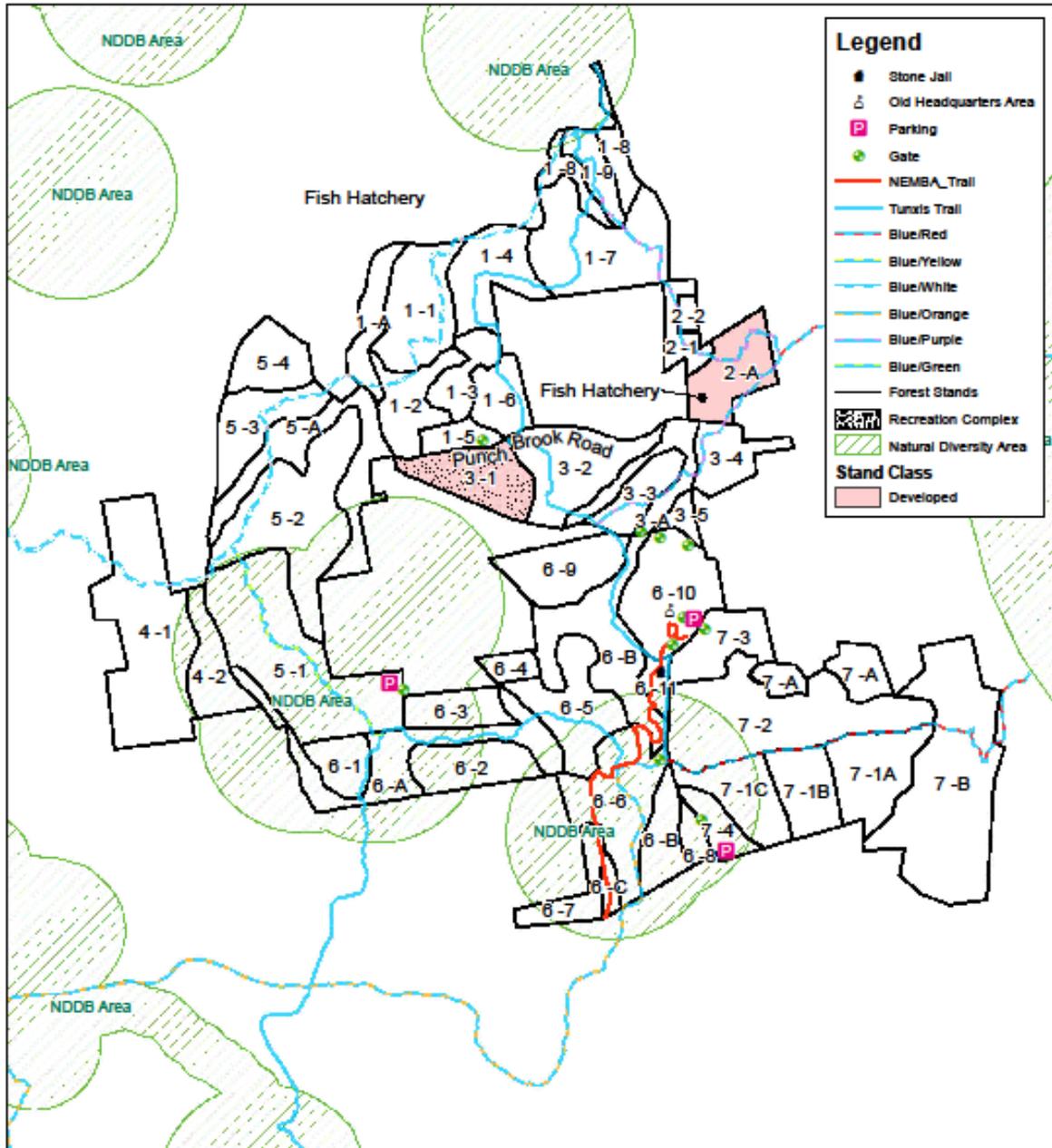


Map E - 1 Special Features Overlay Nassahegon State Forest, Main Block

Burlington, Connecticut
 Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



Legend

- Stone Jail
- △ Old Headquarters Area
- Parking
- Gate
- NEMBA_Trail
- Tunxis_Trail
- Blue/Red
- Blue/Yellow
- Blue/White
- Blue/Orange
- Blue/Purple
- Blue/Green
- Forest Stands
- Recreation Complex
- Natural Diversity Area
- Stand Class
- Developed

NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 1,750 feet

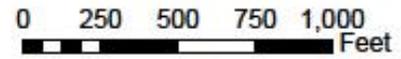
MAP E-2 – SPECIAL FEATURES OVERLAY, CHIPPENS HILL BLOCK



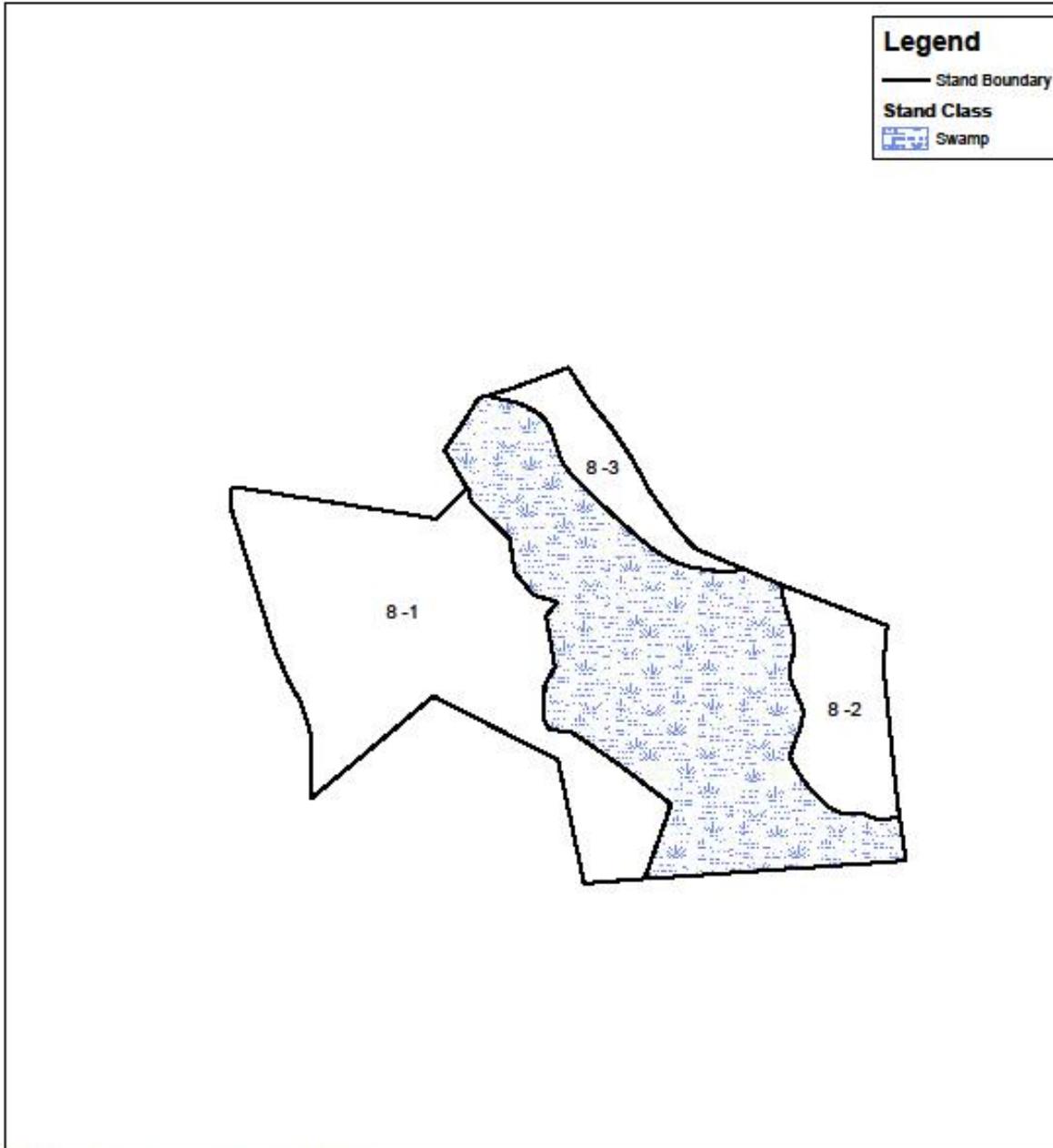
Map E - 2 Special Features Overlay Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres



January 2014



Legend

- Stand Boundary
- Stand Class**
- Swamp

NAD 1983 State Plane Connecticut FIPS 0600 Feet

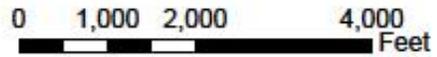
1 Inch = 500 feet

MAP F-1 – WORK PLAN, MAIN BLOCK

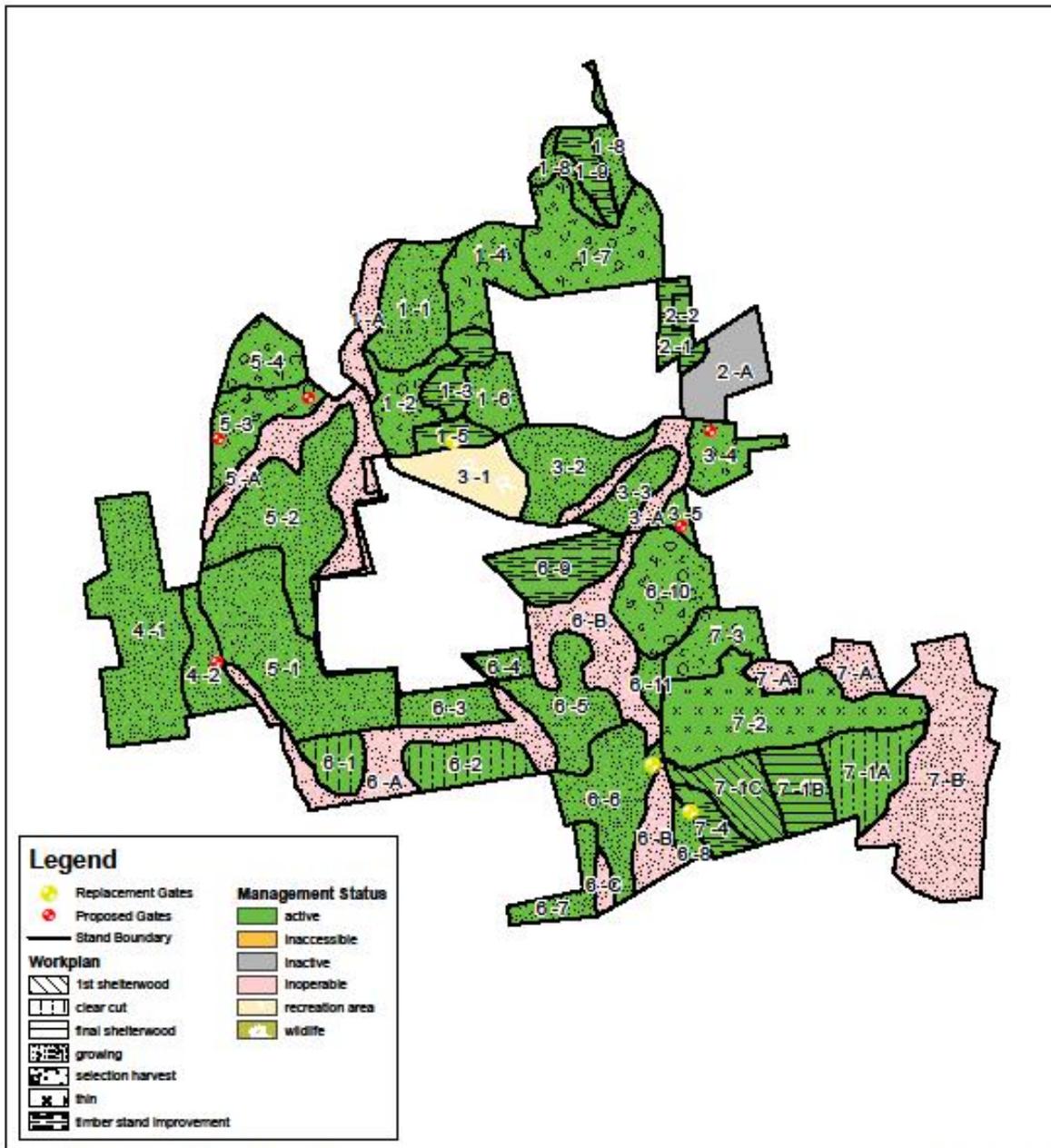


Map F - 1 Work Plan Nassahegon State Forest, Main Block

Burlington, Connecticut
 Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 inch = 1,750 feet

MAP F-2 – WORK PLAN, CHIPPENS HILL BLOCK

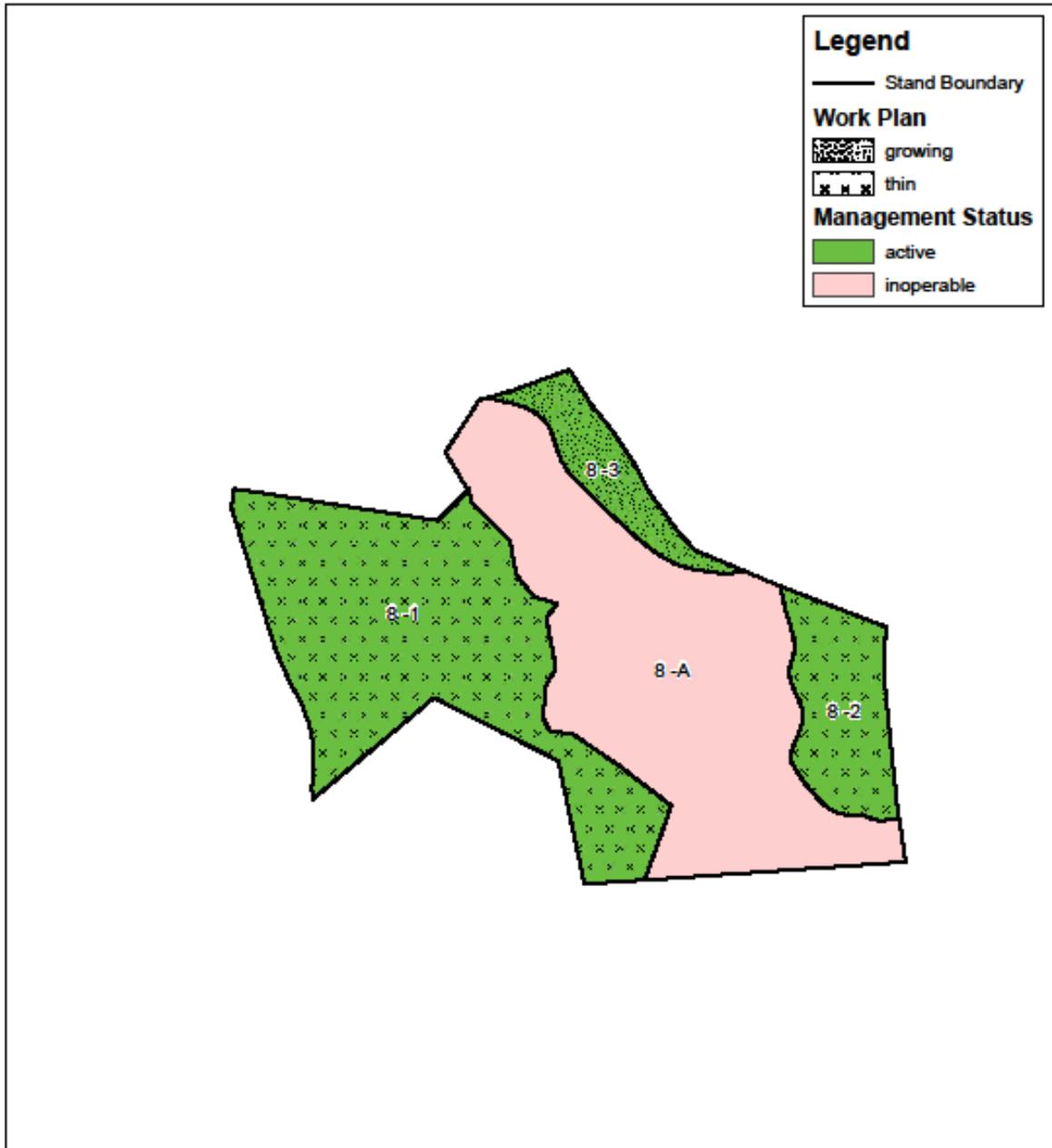
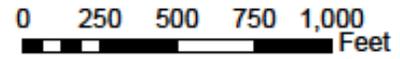


Map F - 2 Work Plan Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres

January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

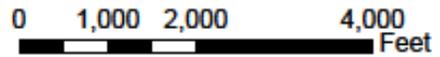
1 Inch = 500 feet

MAP G-1 – COMMERCIAL WORK PLAN, MAIN BLOCK

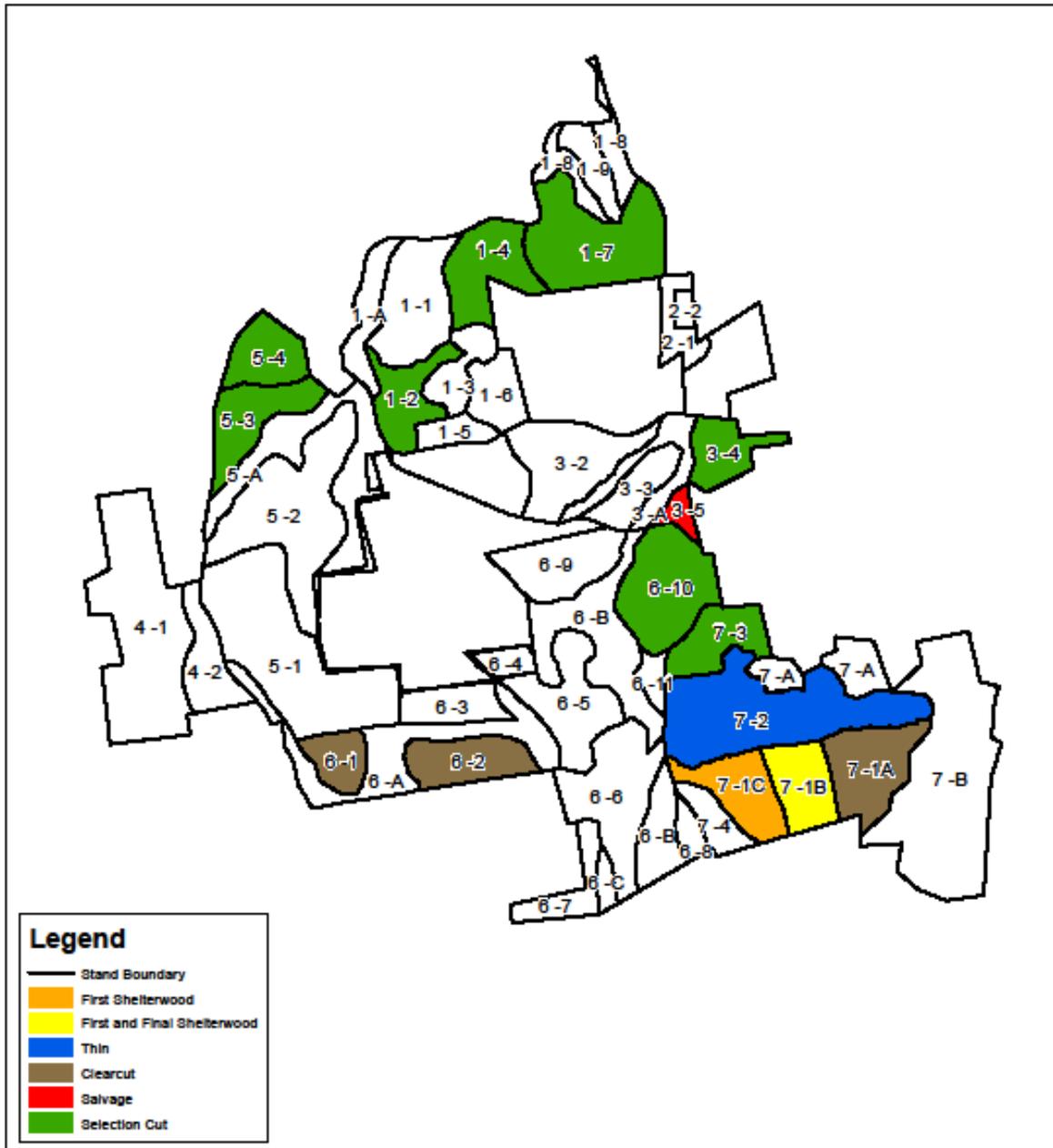


Map G - 1 Commercial Work Plan Nassahegon State Forest, Main Block

Burlington, Connecticut
Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 1,750 feet

MAP G-2 – COMMERCIAL WORK PLAN, CHIPPENS HILL BLOCK

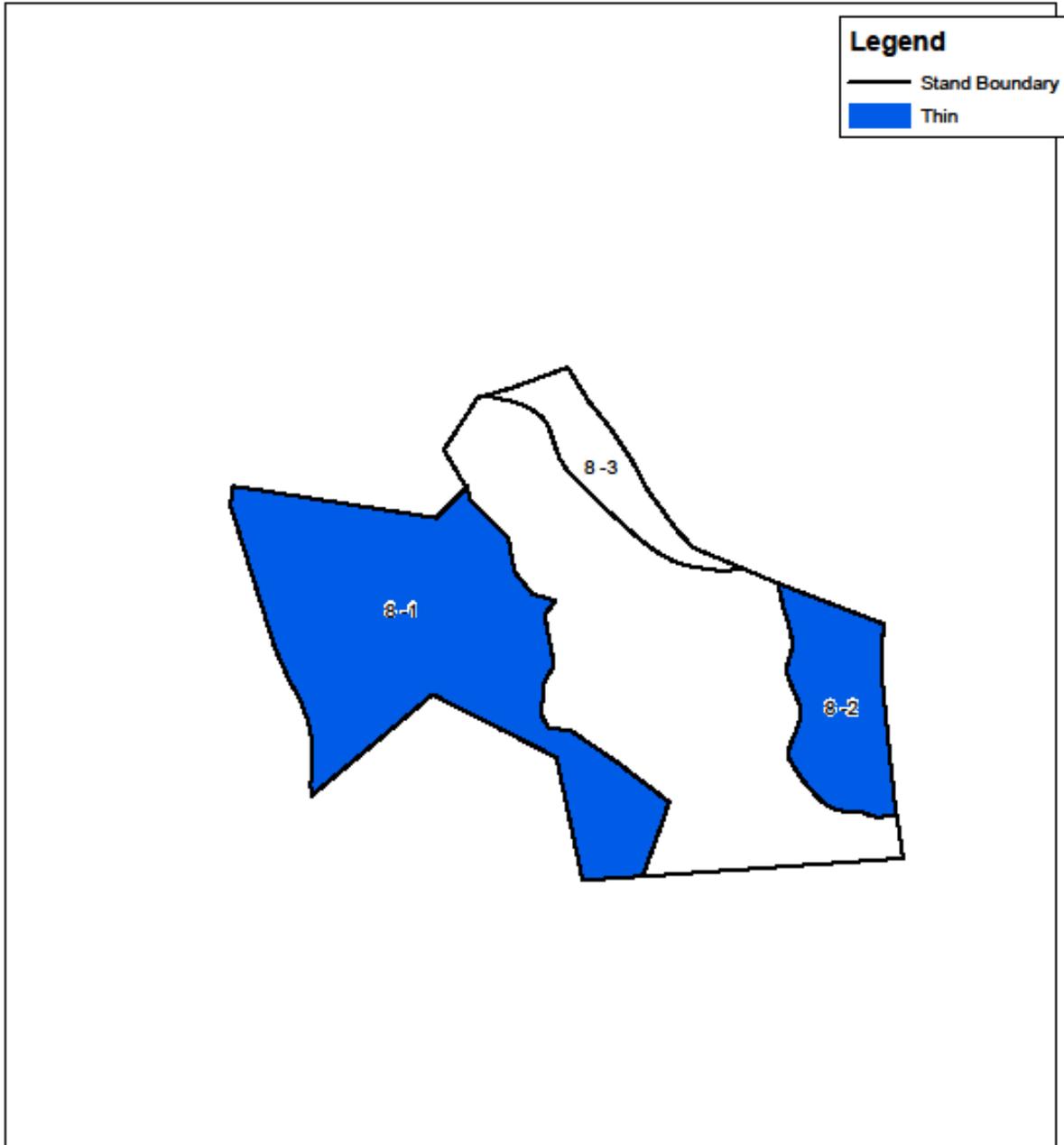
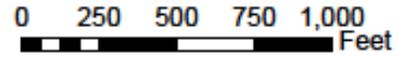


Map G - 2 Commercial Work Plan Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres

January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

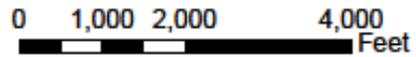
1 Inch = 500 feet

MAP H-1 - MANAGEMENT SYSTEM PLAN, MAIN BLOCK

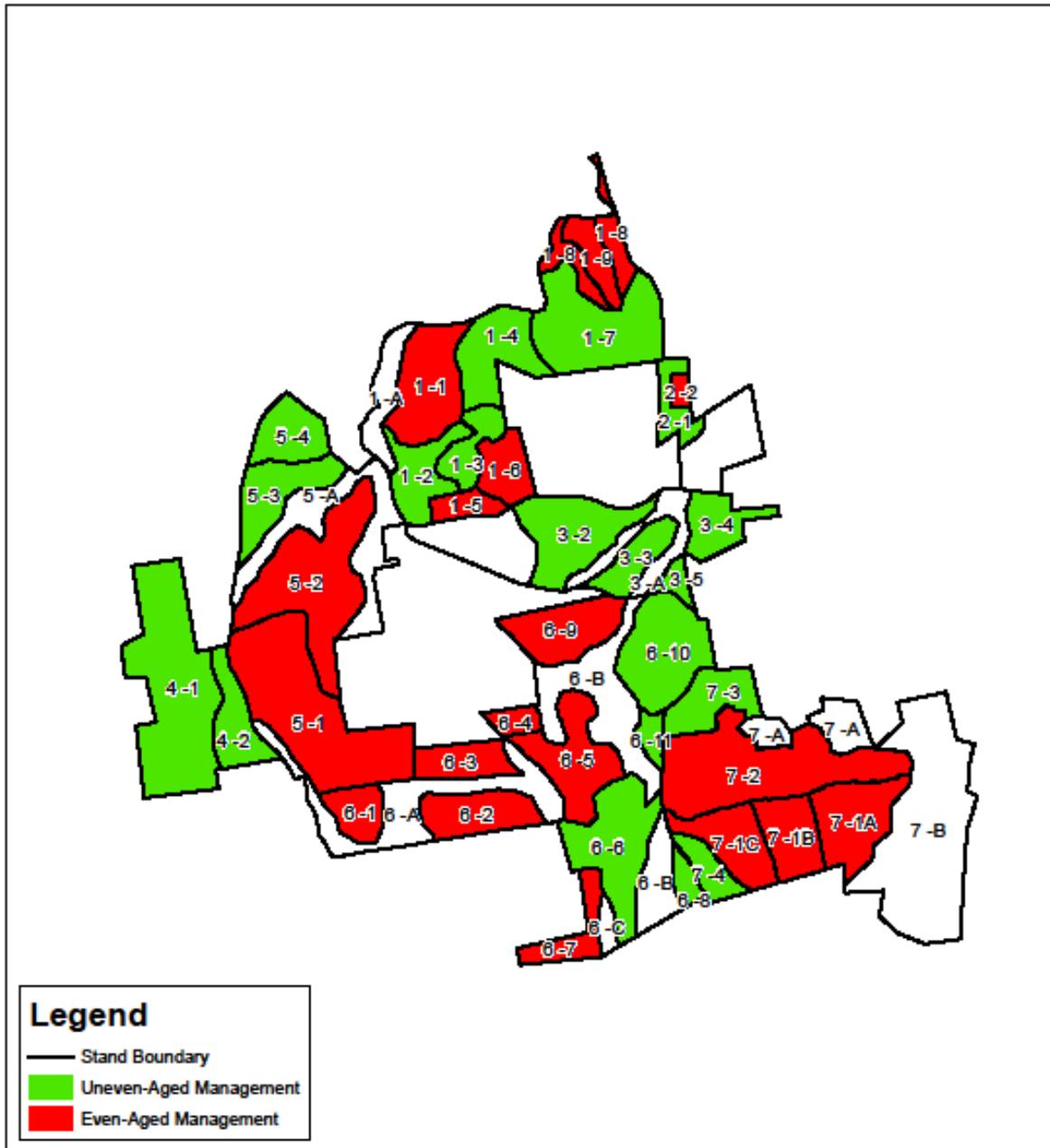


Map H - 1 Management System Plan Nassahegon State Forest, Main Block

Burlington, Connecticut
Total Area - 1148 Acres Main Block - 1093 Acres



January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 1,868 feet

MAP H-2 – MANAGEMENT SYSTEM PLAN, CHIPPENS HILL BLOCK

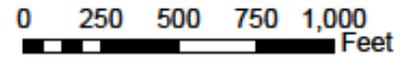


Map H - 2 Management System Plan Nassahegon State Forest, Chippens Hill Block



Burlington, Connecticut
Total Area - 1148 Acres Chippens Hill Block - 55 Acres

January 2014



NAD 1983 State Plane Connecticut FIPS 0600 Feet

1 Inch = 500 feet