

FOREST MANAGEMENT PLAN
Danville Town Forest
Danville, NH

November 2, 2020



Prepared for:
Town of Danville Forestry Committee
210 Main Street
Danville, NH 03819

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Town of Danville Forestry Committee Date

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Joseph A DeVito 11/2/2020
Town of Danville Forestry Committee Date

Stephen Beech 1/18/22
Audubon Society of New Hampshire Date

[Signature] 11/2/20
Bryan R. Comeau, LPF#434 Date

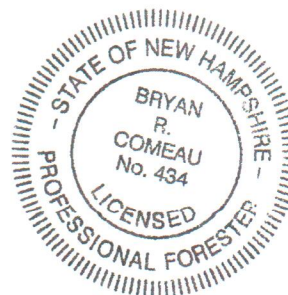


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INTRODUCTION

Purpose and Intent

The purpose of this Forest Management Plan is to provide an update to a previously written and accepted stewardship plan titled “Danville Town Forest Stewardship Plan” dated September, 2008 written by Ellen Snyder of Ibis Wildlife Consulting and a previously written report titled “Forest Management Plan for the Danville Town Forest, prepared by licensed forester Charles Moreno, dated March 25, 2002. Several sections of this updated Forest Management Plan will refer to the two previous plans and, in some cases, utilize the previously written information where updates are not necessary. An existing survey was used to delineate the parcels completed by Doucet Survey, Inc. of Newmarket, New Hampshire recorded at the Rockingham County Registry of Deeds on October 27, 2006 as Plan D-34246.

The Town of Danville Forestry Committee has requested that a Forest Management Plan be prepared to provide critical data, mapping, and management recommendations to the Town of Danville Forestry Committee and the citizens of Danville to help identify and guide long-term natural resource uses and management goals in accordance with the standards stated in the Grant of Conservation Easement Deed. This plan will serve as a working document for the Town of Danville and will satisfy the Conservation Easement requirements of having an updated Forest Management Plan every 10 years.

The parcels referred to as the Danville Town Forest are subject to the terms and conditions described in the Grant of Conservation Easement Deed dated December 18, 2009, held by the Audubon Society of New Hampshire. The easement encompasses 398 total acres and includes valuable wildlife habitat including approximately 84 acres of open wetlands and hydric soils.

The Easement is granted exclusively for the following conservation purposes:

- A. To protect, conserve, and manage: wildlife habitats; wetlands and the quality of groundwater and surface water resources; and the ecological processes that sustain natural heritage features; and
- B. To provide public access on the Property, which will allow the general public to hike, hunt, cross-country ski, observe wildlife, and participate in other low-impact, non-motorized outdoor recreational and educational activities; and
- C. To protect and conserve cultural resources and the historic artifacts of early settlement especially within the Historic District; and
- D. To provide for agricultural use of the soils of agricultural significance if in the future that use is a desired part of a stewardship plan; and
- E. To retain the Property in perpetuity as a tract of land for the production of timber, pulpwood, and other forest products utilizing sustainable forestry management and practices otherwise consistent with the foregoing Purposes of this Easement; and
- F. To retain and protect the scenic quality of the Property as viewed from the Historic District, public waterways, great ponds, public roads, or public trails.

These Purposes are in accordance with NH RSA 79-A which states: “It is hereby declared to be in the public interest to encourage the preservation of open space, thus providing a healthful and attractive outdoor environment for work and recreation of the state’s citizens maintaining the character of the state’s landscape and conserving the land, water, forest, agricultural and wildlife resources.”

Property Description

The Danville Town Forest totals 398 acres located in the northwest section of Danville, north of the center of town. The Town Forest is composed of fourteen individual parcels, twelve of which are contiguous lots situated west of Route 111A, with two parcels contiguous with each other, but disjunct from the larger block, located on Happy Hollow Road to the east of Route 111A. Primary access for the Town Forest is via Route 111A including a gravel parking lot with a kiosk and map of the existing recreational trails. Tuckertown Road is an old town road that intersects with Route 111A and runs east/west through the Town Forest. This road has since been gated and designated a class A trail that restricts public vehicle access but remains accessible to the public for non-motorized recreation. There are additional access points for the public off from GH Carter Drive where a powerline easement bisects the parcels and some soccer fields were created, along with a recent right-of-way established along the western boundary of the Town Forest through a new development being created off from Caleb Drive.

The Town Forest is a combination of upland forests, mostly white pine, red oak, and hemlock, with rolling and undulating terrain interspersed with a variety of wetland types including large open water ponds, marshes and beaver activity, forested wetlands, and vernal pools. The powerline easement that bisects the Town Forest accounts for the only “young forest” or “early successional” habitat, and the neighboring soccer fields are the nearest open grasslands.

Acquisition & Management History

New Hampshire statute gives towns and cities the ability to establish a Town Forest with a main purpose “to encourage the proper management of timber, firewood and other natural resources through planting, timber stand improvement, thinning, harvesting, reforestation, and other multiple use programs consistent with the forest management program, any deed restrictions and any pertinent local ordinances or regulations (RSA 31:111). (Snyder, 2008)

The Town of Danville and its residents designated the land that is now the Danville Town Forest, and enacted the Forestry Committee in 2001. Following the establishment of the Danville Town Forest, the first Forest Management Plan was prepared by licensed forester Charles Moreno in 2002. In 2008 a second document was prepared, titled the Danville Town Forest Stewardship Plan, by Ellen Snyder. Each of these plans included a comprehensive natural resource inventory, and recommendations for how to implement best management practices for the Town Forest. Neither of these plans resulted in actual implementation of the recommendations presented.

In 2003 the Town voted to convey a conservation easement on the Town Forest, in 2009 the conservation easement was in place and held by the Audubon Society of New Hampshire.

A detailed description of how each individual parcel was acquired is available via town records, the Danville Town Forest Stewardship Plan by Ellen Snyder, and in the 2002 Forest Management Plan by Charles Moreno. Below is a table that summarizes each parcel that was found in the Danville Town Forest Stewardship Plan by Ellen Snyder.

Tax Map & Lot #	Former Owner	How	Year	Income
1-54/57	Parsonage land	Land swap	1761	Parsonage Fund
2-57	Parsonage land	Land swap	1761	Parsonage Fund
1-49	Mills & Heath	Tax deed	1933	Forest Fund
1-52	Peaslee land	Tax deed	1933	Forest Fund
1-53	Mary J. Sanborn	By will	1938	Churches
1-63	Mary J. Sanborn	By will	1938	North Library
1-60	Brown land	Tax deed	1941	Forest Fund
1-56	George land	Tax deed	1954	Forest Fund
1-68/69	West land	Tax deed	1954	Forest Fund
1-62	Great Meadow	Fee purchase	1999	Forest Fund

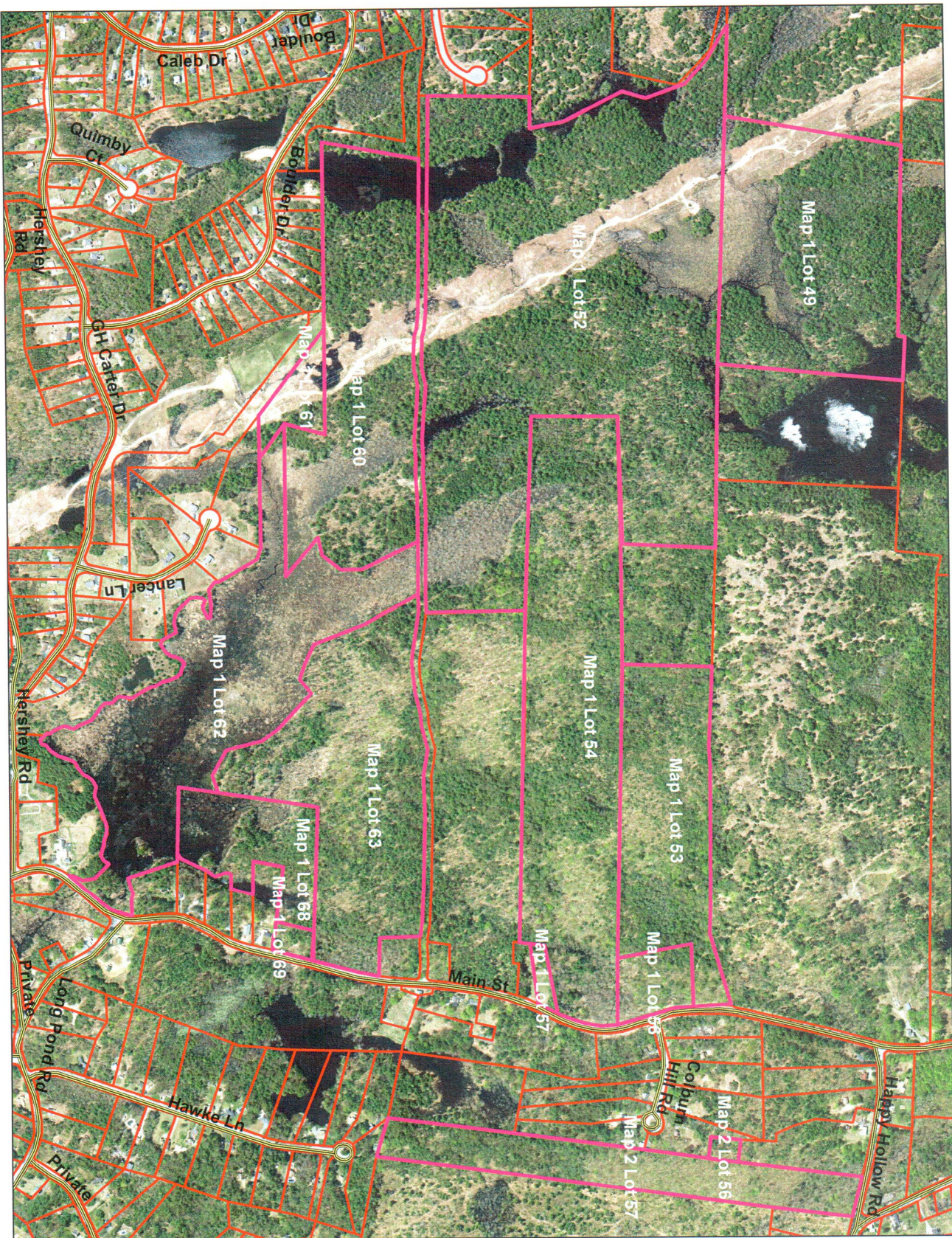
Figure 1. History of acquisition of each parcel within the Danville Town Forest (Snyder, 2008)

Historical & Cultural Resources

The landscape has a long history with evidence dating back to the 1700's and 1800's like much of New England. The stonewall boundaries, the neighboring "Ye Olde Cemetery", and the current forest conditions indicate that this land was cleared for agricultural purposes, mostly being sheep pasture. There are no indications or evidence of historic cellar holes or wells, so the homesteads were likely along Route 111A, and the land that is now the Town Forest was likely entirely farmland. Also, like much of New England, the farmland was abandoned between 1900 – 1940 due to a combination of reasons including better available farmland in the mid-west, economic impacts of the great depression, and the impacts of World War II.

A portion of the Town Forest is situated within the Town of Danville Historic District. The Historic District was established to safeguard the heritage of Danville by protecting historic structures and architectural history, foster appreciation of the town's beauty and history, protect the town's character and rural setting, and promote use of historic structures. (Snyder, 2008). The Historic District Ordinance is intended to protect the heritage of Tuckertown Road and it's surrounding lands, the Old Meeting House which is part of the National Registry of Historic Places and is recognized as the oldest original construction meeting-house in New Hampshire, and the "Ye Olde Cemetery".

It is important to note that there are no known historical documentation, or field evidence indicating that there are any historical or culturally sensitive resources within the actual Town Forest and beyond the Old Meeting House and the "Ye Olde Cemetery".



The Danville Town Forest

Tax Map 1 Lots 49 A & B, 52-54, 56, 57, 60-63, 68, 69
 Tax Map 2 Lots 56 & 57.
 Survey Plan # 34246

398 Total acres
 259 Forested acres
 116 Wetland acres
 23 Powerline acres

PARCEL OWNERSHIP MAP

- Town Forest Parcels
- Roads_DOT
- Tax Map Parcels



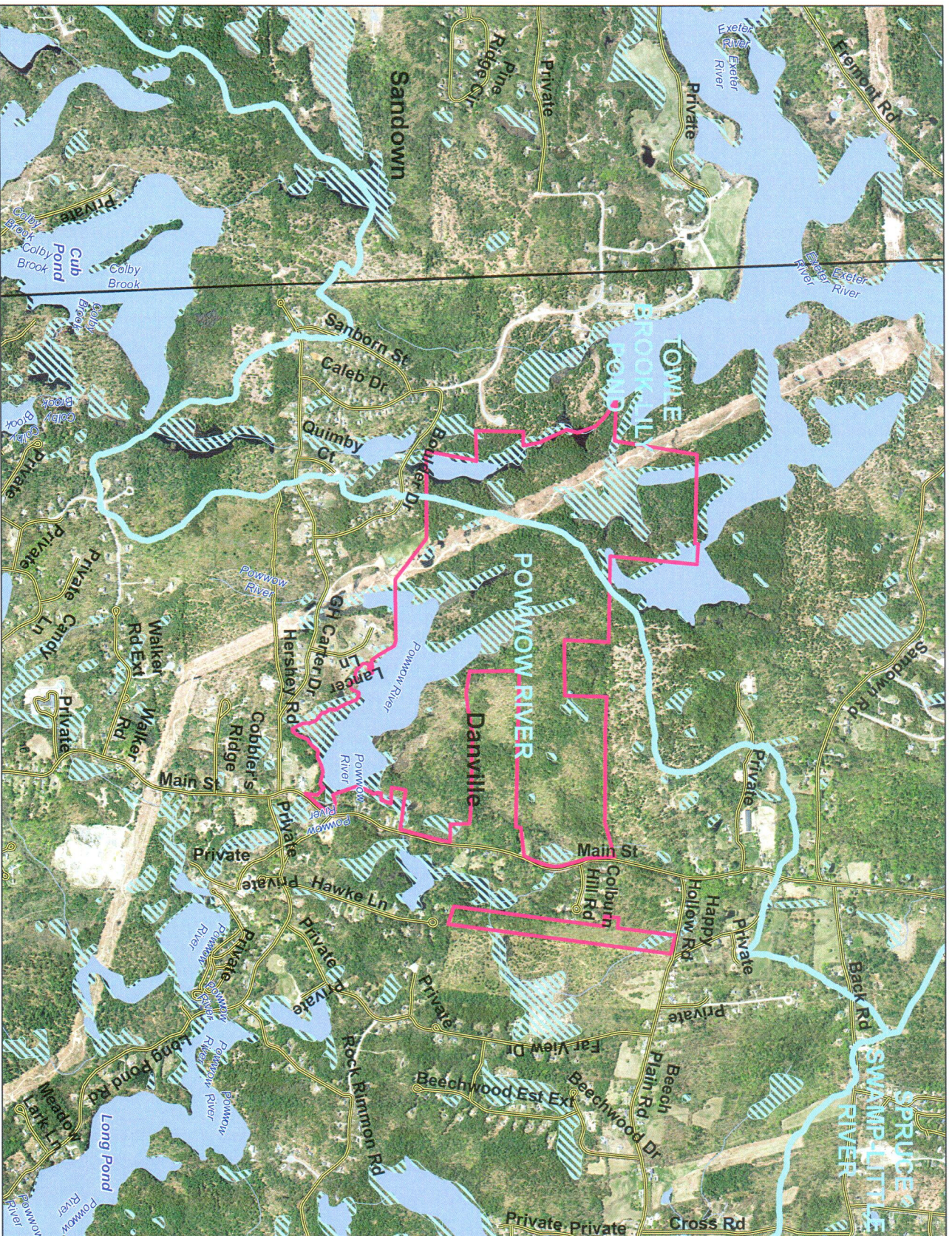
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Landscape Setting

The Danville Town Forest is located within the Gulf of Maine Coastal Plain, an area of transitional forest between the boreal forest to the north and hardwood forests to the south, and the property is within the Tidal Coastal watershed group. The Town Forest lies within two individual watersheds. The eastern portion of the property is situated within the Powwow River watershed, and the western and far norther portion of the property is within the Towle Brook-Lily Pond watershed. The streams and drainages from the Towle Brook-Lilly Pond watershed flow north eventually entering the Exeter River, and continue east into Great Bay. The hydrology from the Powwow River watershed eventually meet the Merrimack River.

The “Great Meadow” is a 56-acre wetland in the southeast corner of the Forest, with an active heron rookery, and is a prominent feature of the Town Forest. This large wetland and the other smaller wetlands located throughout the property are dynamic systems influenced by beaver activity. The importance of beaver to the wetland systems and associated wildlife is discussed in more detail below. These wetlands have open water areas that transition to emergent marsh then to scrub-shrub community and then to upland forest. The emergent marsh community includes duckweed, pond lily, and pickerelweed. Shrubs include winterberry, sweet pepperbush, highbush blueberry, and speckled alder. Standing dead trees interspersed in the open water are particularly evident in the Great Meadow. Perennial and intermittent (seasonal) streams connect many of the wetlands to one another, forming large wetland complexes. (Snyder, 2008)

In addition, the Town Forest lies within a larger 1000+-acre unfragmented block of habitat. In recent years development pressure has shrunk the unfragmented habitat. Thirty-five years ago, the Town Forest was part of a 3600+ unfragmented habitat that extended to the Cub Ponds in Sandown; by 2002 the block had shrunk to 1,200+ acres (Moreno 2002). Unfragmented forest blocks are large areas of habitat with few or no roads, houses, or other development. Large blocks of unfragmented or conserved lands serve as valuable resources for wildlife food, cover, travel, water, and reproduction, as well as timber growth, and carbon capture from regenerative green space.



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WATERSHED MAP

- Watershed Group
- Town Forest Bounds
- Roads_DOT
- Municipal Bounds
- NHD - Waterbodies
- NMI - National Wetland Inventory
- NHD - Flowline
- StreamOrder
- 1st and 2nd Order Streams
- 3rd Order Streams
- 4th and Higher Order Streams



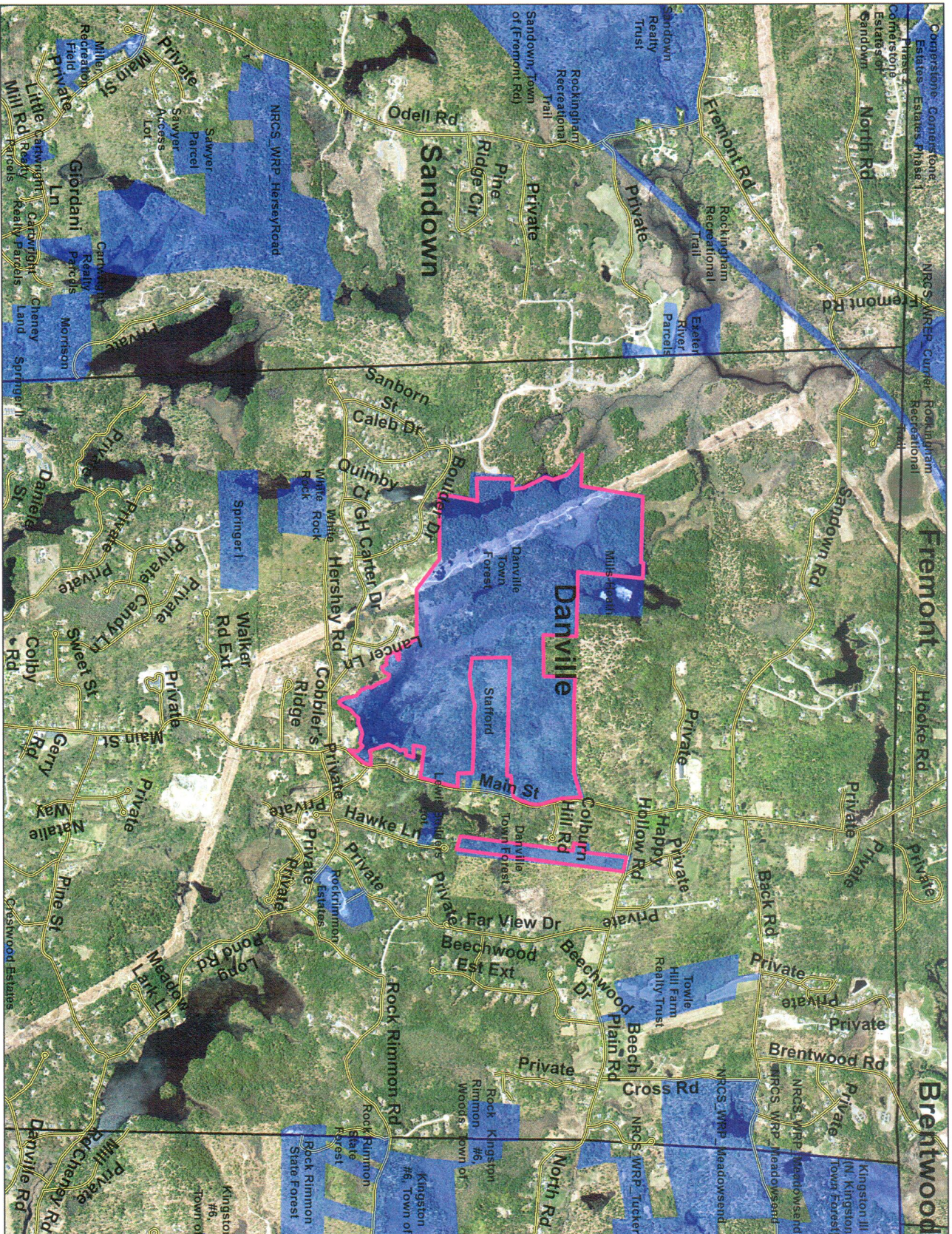
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Map Prepared by Bryan R. Comeau
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Nearby Lands of High Conservation Value

It is of critical importance for maintaining the ecological health and integrity of the landscape to not only manage an individual's property responsibly, but to ensure that responsible land management occurs across property boundaries in continuity with the surrounding landscape and ecosystem. Although individuals have little control over what neighboring lands will do in the future, it is important to create the dialogue between neighbors to share knowledge and raise community awareness of their surroundings, and the impacts their decisions may have on their individual lands as well as surrounding lands within the landscape. With this in mind, the entire landscape and watershed was assessed remotely prior to determining management recommendations for an individual property itself.

Surrounding lands include several residential homes and neighborhoods. The Town Forest parcels on Happy Hollow Road are primarily surrounded by residential homes. This is also true for the Town Forest along Route 111A, to the south along GH Carter Drive, and along the western boundary which includes Caleb Drive and the neighborhoods associated with that area. Some larger blocks of forested land are situated to the north of the Town Forest. This includes several large acreage parcels of woodlands ranging from 30-100 acres owned by a variety of private landowners. In addition, two parcels with conservation easements directly abut the Town Forest. This includes the Mills-Heath easement to the north which encompasses a large wetland complex, and the Strafford easement which is along Tuckertown Road and is surrounded by the Town forest except for the frontage along Route 111A. Large parcels of conservation land provide tremendous value to a landscape by ensuring unfragmented wildlife habitats, sustainable timber production, and healthy forests to promote clean air and water quality.



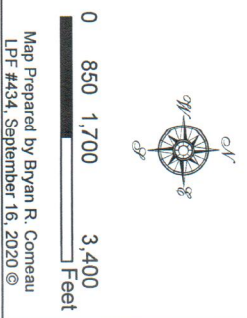
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CONSERVATION MAP

- Town Forest Bounds
- Conservation Lands
- Roads_DOT
- Municipal Bounds



MANAGEMENT OBJECTIVES

Primary objectives for the property are based on the Stewardship Goals as stated in the Conservation Easement Deed.

Goals and Objectives

1. Create, maintain, and protect biological diversity and integrity through the promotion of a forest that reflects a diversity of stand ages (including forest openings) and naturally occurring forest types in a majority of the forest, the conservation of rare and exemplary natural communities and the conservation and enhancement of native plant and animal species and their habitats including establishment and retention of a range of sizes and types of downed woody debris, snag trees, cavity trees, occasional very large/old trees, and early successional habitats.
2. Conserve unique historic archeological and cultural features; and maintain Outdoor Recreational and Natural Resource Based Outdoor-Education Activities and the integration of Outdoor-Recreation and Natural Resource Based Outdoor-Education Activities with other uses of the Property.
3. Maintain a sustainable source of timber, pulpwood, and other commodity and non-commodity forest products.
4. Maintain or improve the overall quality of forest resources through management that promotes the production of high-quality forest resources, such as sawlogs and veneer.
5. Regenerate forest stands through silvicultural practices that promote forest types suited to site capability.
6. Maintain forest health through monitoring and control of fire, disease, and insect outbreaks.
7. Maintain long-term soil productivity.
8. Monitor and control the introduction of invasive plant and animal species.
9. Maintain a forest composed predominantly of plant species native to the northeastern United States and prevention, to the extent practicable, of the introduction of non-native plant species.
10. Protect or enhance water quality and non-forested wetlands and conservation of forested wetlands, riparian areas, and aquatic habitats.

CURRENT CONDITION

Wildlife Action Plan Habitats

In addition to conducting an on-site assessment of the property, a review of NH Fish & Game's Wildlife Action Plan was reviewed to assess potential wildlife habitats and wildlife species likely to occur within the landscape.

This parcel is mapped as Appalachian oak-pine matrix forest cover types with pockets of Hemlock-Hardwood-Pine matrix forest cover types. The surrounding landscape is also consistent with these matrix forest cover types. The Appalachian oak-pine cover types have a composition of white oak, black oak, and hickory distributed with red oak, white pine, hemlock, and often black birch. Hemlock-Hardwood-Pine forest cover types are composed of white pine, red oak, hemlock, and a variety of other hardwood species dispersed throughout including red maple, sugar maple, white ash, and black birch (NHFGD, 2015).

In addition to matrix forest types mapped, finer scale habitats were also identified. Within the property and the immediate surrounding landscape several marshes, peatlands, open water ponds, and some grasslands were identified and confirmed through field mapping. The management of these habitats plays a major role in protecting soil, water, and wildlife habitat quality. Management actions on this property will also likely play a major role in maintaining the function and value of the surrounding high-value habitats. This diversity of habitats within the landscape increases the biodiversity and wildlife capacity the landscape is capable of supporting.

The matrix forests and habitats within the property are primarily ranked as Tier 3 and considered supporting landscapes. The large wetlands within the northern portion of the property and continuing onto neighboring lands are ranked Tier 1 and considered Highest Ranked Habitats in New Hampshire. Many of the smaller wetlands, along with the powerline easement are ranked Tier 2 – Highest Ranked Habitats in the Biological Region. The high ranking of the Tier 1 and Tier 2 habitats is likely a direct result of the habitat quality, along with those habitats being permanently conserved.

Rare Plants, Species, and Natural Communities

In addition to identifying forest characteristics, rare plants and exemplary natural communities were surveyed and mapped if found. The New Hampshire Natural Heritage Bureau's Data Check Tool was used to determine if any rare plants, animals, or natural communities were present within or around the individual property and surrounding landscape. The results of the Data Check Tool dated 9/17/20 identified the presence of two rare and sensitive vertebrate species.

The two vertebrate species include Blanding's turtle which is State endangered, and spotted turtle which is State threatened. Both species have been mapped and identified in association with the wetlands within the Town Forest as well as on surrounding lands. These species can be highly mobile, especially Blanding's turtle, and will travel between wetlands during the spring and mid-summer season. Seasonal restrictions for heavy equipment, and vegetative buffers around wetlands will help to protect and maintain the species and habitats they depend on.

Forest management practices shall consider federal guidelines to protect the Northern long-eared bat. Guidelines include avoiding activities that will occur within 0.25 mile of a known hibernacula or within 150 feet of known, occupied maternity roost trees during the pup season (June 1 to July 31)

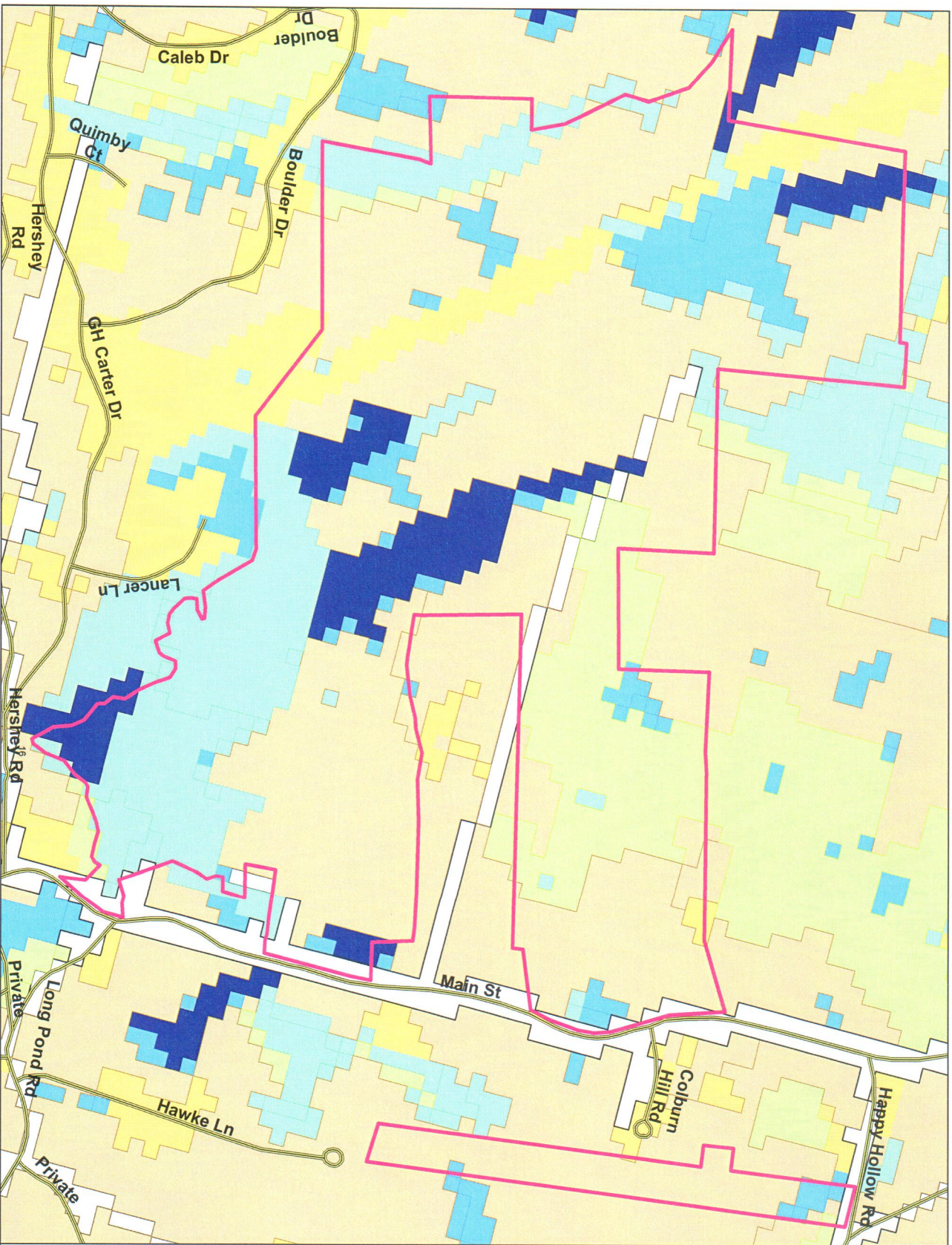
pursuant to the final 4(d) rule. Conduct tree removal activities outside of the northern long-eared bat pup season (June 1 to July 31) and/or the active season (April 1 to October 31). This will minimize impacts to pups at roosts not yet identified. Avoid clearing suitable spring staging and fall swarming habitat within a 5-mile radius of known or assumed northern long-eared bat hibernacula during the staging and swarming seasons (April 1 to May 15 and August 15 to November 14, respectively). Manage forests to ensure a continual supply of snags and other suitable maternity roost trees.

Forest Protection

At the present time there is no evidence indicating any major insect infestation within the property. Forest pests recently detected in parts of New Hampshire, and thought to be of imminent arrival, include Emerald ash borer, (infecting all species of ash), hemlock wooly adelgid, which is prominent in the surrounding area, red pine scale, and in nearby areas, Asian longhorn beetle, which impacts a variety of hardwoods including sugar maple. These forest threats all have rapid and severe impacts on their host species, and all are potential candidates for occurring within this property and landscape within the next 10 years. It is likely that Emerald ash borer and Hemlock wooly adelgid are present within the property since they have been confirmed in the general landscape. The white ash can be removed during the next timber harvest. The hemlock should be monitored and retained along wetlands where possible. The presence of hemlock provides more value for wildlife habitats and shading along the water resources than it does as a forest product. There are also a few scattered red pine trees. These trees are likely already infested with red pine scale. Since the insect has already spread through much of this region, and the presence of this tree species is so minimal, it is of a low priority to address this concern. Continuous monitoring and early detection will be the best defense for forest pests. If these insects are found, the removal of the host trees via timber harvesting is the most effective and economical control method.

In respect to forest fires, there is no imminent danger. Fire danger throughout New Hampshire is typically low. Average size of a NH forest fire is typically small in size. The natural vegetation and damp characteristics of the forest typically limit fire dangers without the need for man-made fire breaks or barriers. Natural fire breaks such as streams, wetlands, woods roads, and town roads are likely sufficient protection.

During the forest resource inventory several invasive plant species were identified and are shown on the Stand Map. Species identified are primarily European and Japanese Barberry. There were a few autumn olive and glossy buckthorn plants found beyond the property near GH Carter Drive. The highest concentration of the barberry is associated with the forested wetlands, typically near a seasonal stream channel and/or a road. These plants can spread rapidly via wildlife, wind, root sprouts, or equipment. Invasive plant control and treatments should be applied prior to any forest management activities to prevent these species from spreading into the surrounding forests. Additional monitoring and treatments will likely be necessary following any forest management until the invasive plants are controlled to a point where native tree regeneration can be established. Entire plants should be removed including root systems, or plants should be chemically treated by a licensed applicator. Invasive plant species can out-compete native tree or shrub species degrading biodiversity, forest health, and wildlife habitats.



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 Tax Map 2 Lots 56 & 57.
 Survey Plan # 34246

398 Total acres
 259 Forested acres
 116 Wetland acres
 23 Powerline acres

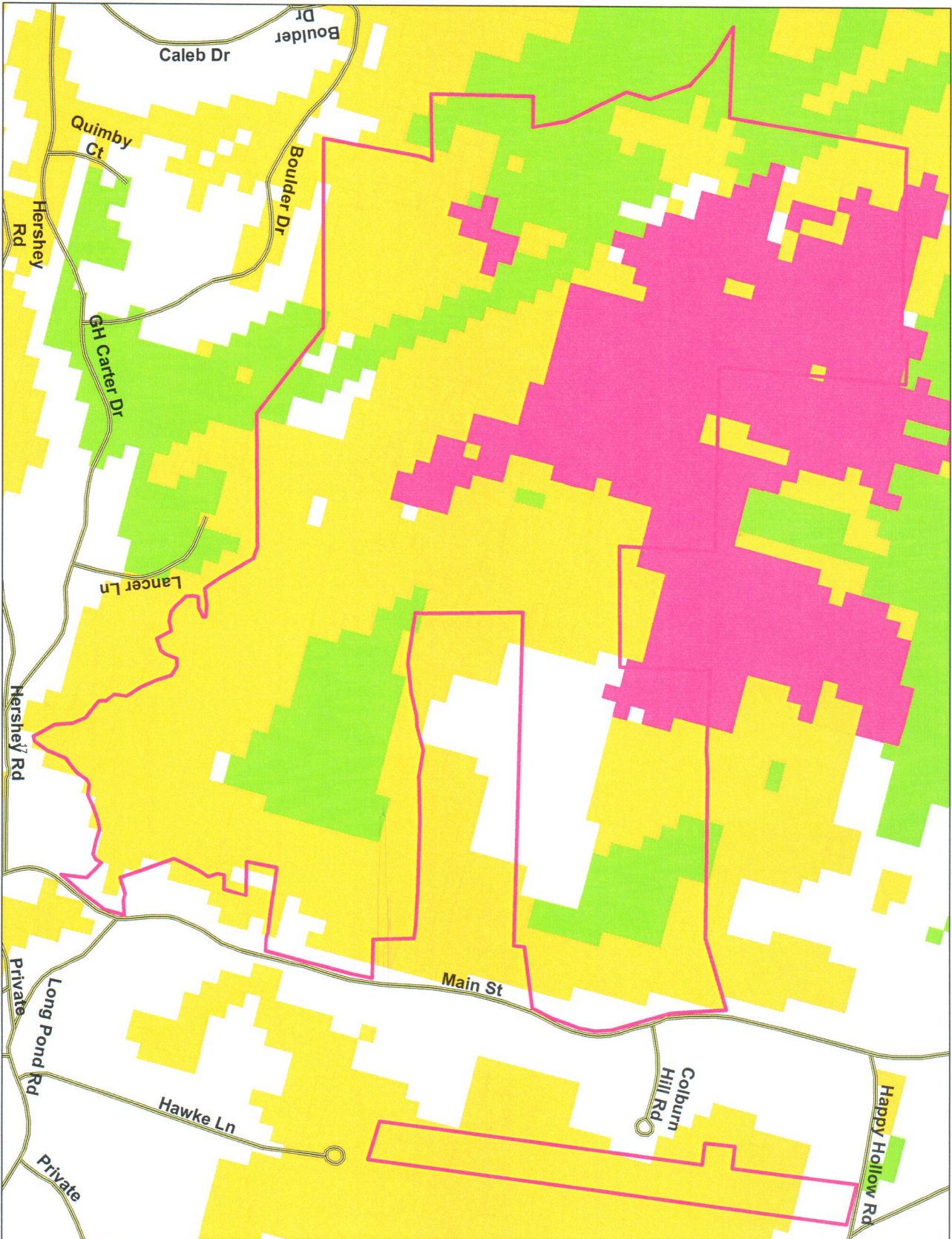
WILDLIFE ACTION PLAN HABITAT COVER TYPE

- Town Forest Bounds
- Roads_DOT
- WAPHabitat - Terrestrial
- Habitat Cover Type
- Alpine
- Appalachian oak-pine
- Cliff and Talus slope
- Coastal island
- Dune
- Floodplain forest
- Grassland
- Hemlock-hardwood-pine
- High-elevation spruce-fir
- Low-elevation spruce-fir
- NLCD Barren or Developed
- Northern hardwood-conifer
- Northern swamp
- Open water
- Peatland
- Pine barren
- Rocky ridge
- Salt marsh
- Temperate swamp
- Marsh and shrub wetland



0 300 600 1,200
 Feet

Map Prepared by Bryan R. Comeau
 LPF #434, September 16, 2020 ©



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WILDLIFE ACTION PLAN UNIQUE HABITAT VALUE

- Town Forest Bounds
- Roads, DOT
- WAPTIER
 - 1 Highest Rainfed Habitat in New Hampshire
 - 2 Highest Rainfed Habitat in Biological Region
 - 3 Supporting Landscapes

Map Prepared by Bryan R. Comeau
 LPF #434, September 16, 2020 ©

Recreational Resources & Aesthetic Values

The Danville Town Forest provides excellent opportunities for passive recreation and wildlife viewing. The most accessible areas of the Town Forest include Tuckertown Road and the parking lot off from Route 111A with the kiosk and trail map.

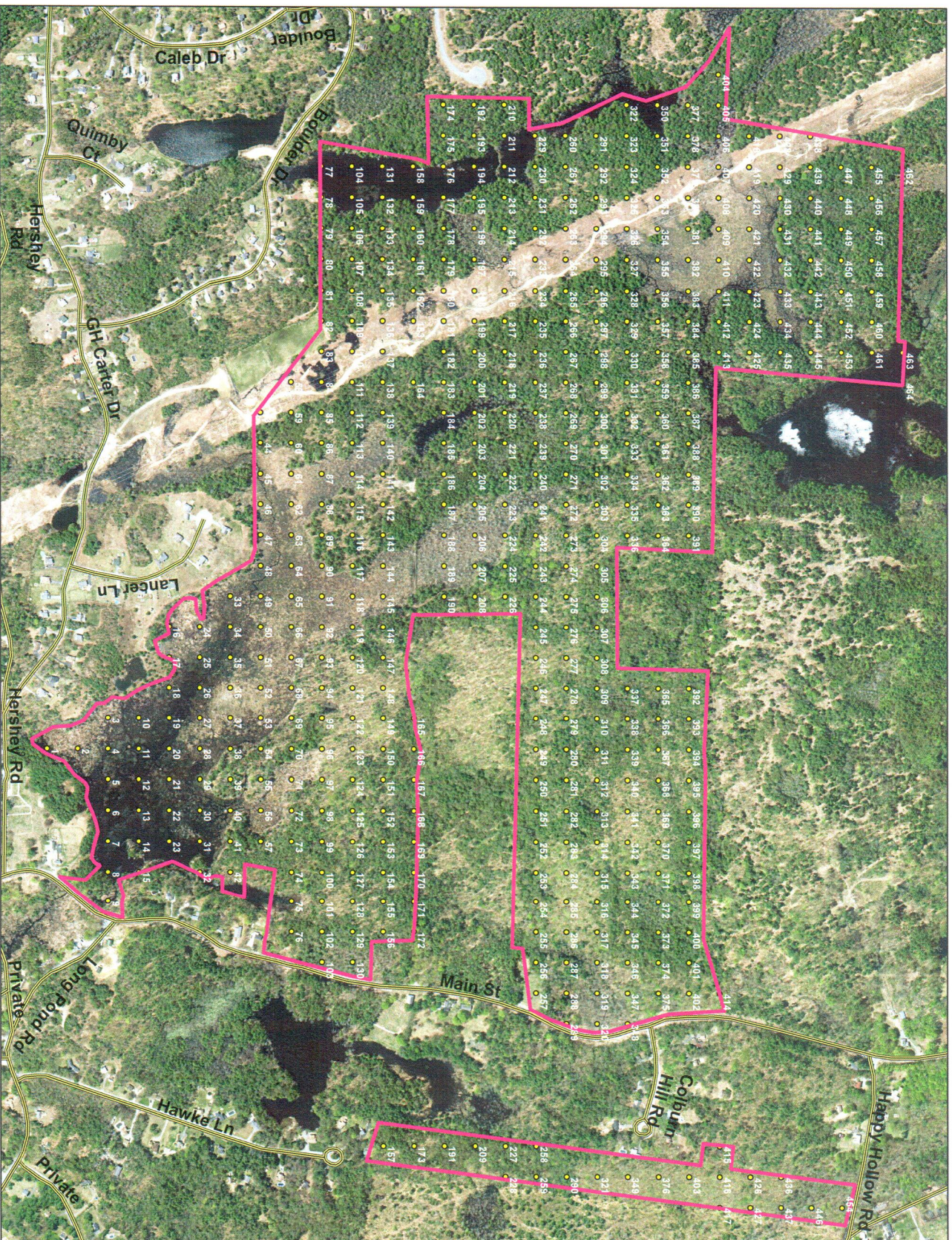
Tuckertown Road is a designated class A trail that is gated at each end. There are a few parking spots that avoid blocking the gate where Tuckertown Road meets Route 111A. This road is approximately one mile in length, but also connects to several of the interior hiking trails which are signed and delineated. The only kiosk and map indicating the trails and destination points of the Town Forest is located at the gravel parking lot approximately 1,000 feet south of Tuckertown Road along Route 111A. The trails in this area meander through the town forest providing a loop system, with a primary destination point being a viewing platform on the edge of the Great Meadow, providing views of the great blue heron rookery.

The entire Town Forest is open to hunting, fishing, carry-in boating, hiking, wildlife viewing, and any other passive non-motorized recreational use. Motorized vehicles and overnight camping are not permitted, except for motorized vehicles being allowed on the gravel road system along the powerline easement.

Forest Resource Inventory

A comprehensive forest inventory was conducted in the summer of 2020 on the entire property. A Double Point, also known as Big BAF, sampling method was used. This method uses a 20-factor prism to measure basal area, trees per acre, crown densities, and other tree stocking measurements. A second 80 factor angle gauge is used to determine which trees are measured for timber sizes, heights, volumes, and forest products. Each prism and set of measurements are taken at each sampling point containing timber products.

The forest inventory consisted of 464 total sample points that were randomly generated. Only points that fell within an upland forest stand were sampled, resulting in data being collected at 199 points. Sample points were spaced 200 feet apart along north/south and east/west gridlines. At each 200-foot interval data was collected. Data includes information describing tree stocking amongst stems and crowns, timber volumes, and information pertaining to understory species, and regeneration. Other information collected includes mapping of streams, wetlands, forest cover types, stonewalls, and any other interior features of significance. The forest inventory provides critical data in determining forest growth, structure, density, composition, health, potential, and management recommendations.



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Survey Plan # 34246

398 Total acres

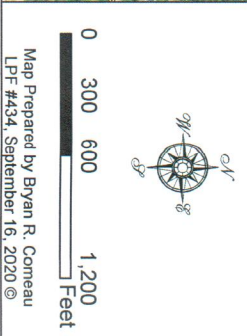
259 Forested acres

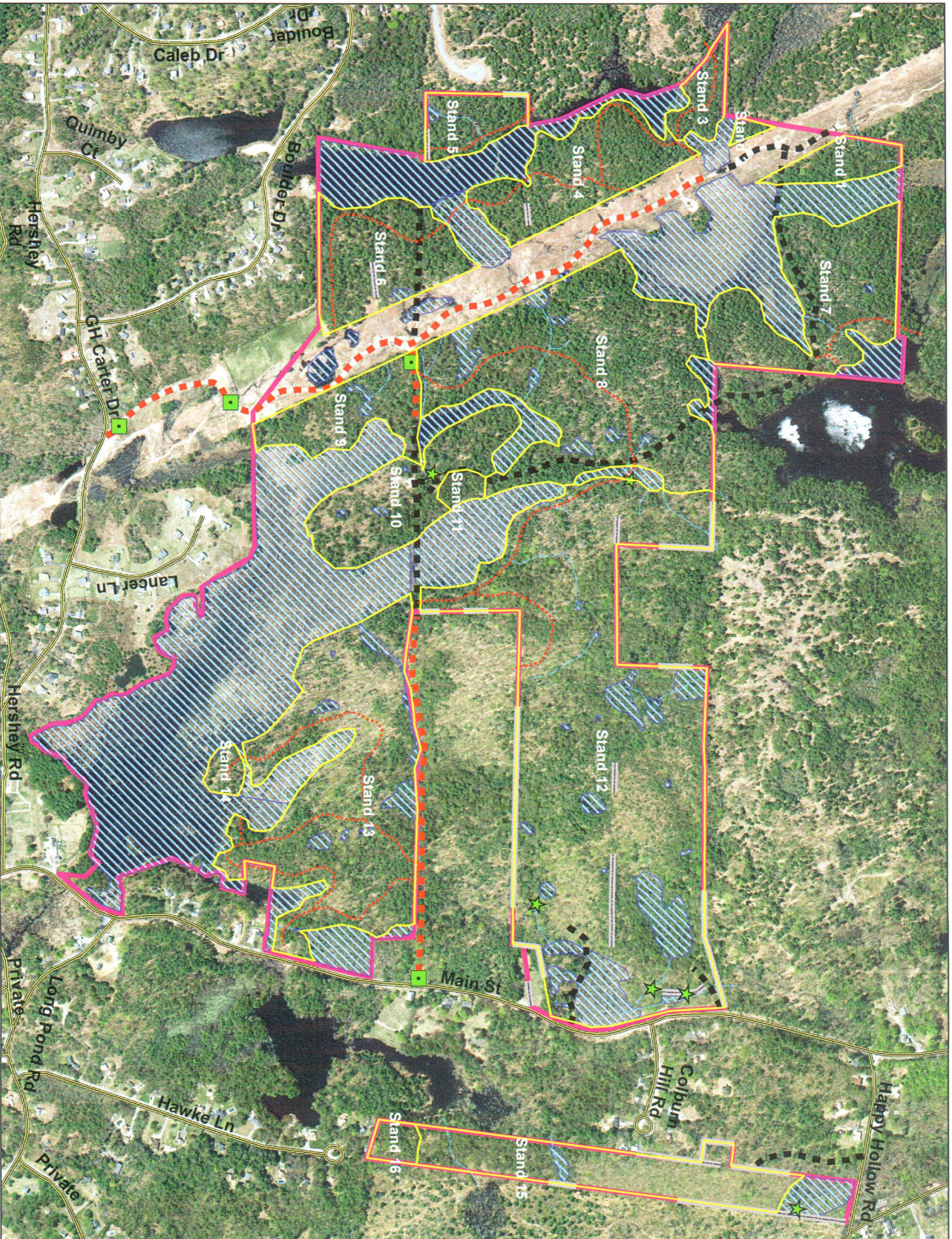
116 Wetland acres

23 Powerline acres

FOREST RESOURCE INVENTORY SAMPLE POINTS MAP

- Town Forest Bounds
- Roads_DOT
- Sample Points





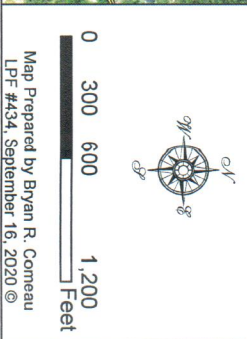
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FOREST RESOURCE INVENTORY STAND TYPE MAP

- Stand Lines
- Invasive Plants
- Gates
- Stonewall
- Rec Trail
- Woods Road/Impassable
- Woods Road/Passable
- Seasonal Stream
- Wetland
- Town Forest Bounds
- Roads_DOT



Management Units, Stand Descriptions & Special Sites

Based on the Forest Resource Inventory five management units were delineated, and within those a total of sixteen individual stands were mapped and identified based on forest cover type and suitable management strategy. A management unit is a large block of the property composed of several stands that can all be accessed and managed as one individual project. Management units are typically separated by natural features such as major streams or wetlands, or infrastructure such as roads and in this case a powerline easement. Individual forest stands are defined by their similarity in tree species, ages, soil types, and past management. Special sites are unique features or habitats within an individual stand such as a vernal pool or historic cellar hole.

Management Unit 1

Description: This management unit is located along the western most portion of the property, bound by the western property line and the powerline easement to the east. The unit is composed of five total stands which include stand 2, 3, 4, 5, and 6. Stands 2, 3, and 5 are all located adjacent to sensitive areas including open water wetlands, streams, or include difficult stream crossings that result in these three stands being a low priority for active management and primary candidates for allowing natural process to occur without manipulation.

Stands 4 and 6 are the primary stands within this management unit identified as a high priority for forestry and wildlife habitat management. These two stands total 27 acres, each directly adjacent to the powerline easement. This management unit is currently typed as even aged, with one primary age class of timber being mature sawtimber with average ages around 95 years and diameters exceeding 16 inches. The most prominent tree species is white pine, with a consistent distribution of red oak and hemlock. Additional species include a mix of hardwoods including black birch, American beech, black oak, and white oak. The timber in this management unit is of fair health, with some signs of decline due to the dense stocking and lack of forest management over the past 30+/- years. The stocking in these stands exceeds recommended thresholds, and the timber has reached or exceeded the sites carrying capacity. Rather than seeing productive timber growth, the stands are now entering a state of decline showing signs of rot and defects that slowly spread through the stems of the trees and overtime will detract from current timber values. The stands provide excellent opportunities for forest management that will aim to regenerate young tree seedlings for future growth and development, along with reducing the dense competition in the stand to allow the residual timber the opportunity to improve in health and sustainable growth.

Access: Primary access for forest management will utilize the existing woods road that enters off from GH Carter Drive and continues along the powerline easement. There is an existing log yard located on the western edge of the powerlines that was used when the powerline easement was widened. This log yard can be reused for future entries into stands 4 and 6, along with additional opportunities located within stand 4. There is a recently established access point through one of the new developments which enter from west of the property and connects to an existing recreational trail in stand 3. This access point is likely best suited for public recreation only, and not forest management.

Special sites: This management unit includes a large open water wetland with a stream channel that flows north to south bisecting the unit. Additional wetlands include surrounding forested wetlands, and some smaller tributaries associated with the large open water wetland. There were not any wetlands identified as vernal pools ins this area.

The management unit also includes a portion of the old Tuckertown Road which has some short sections of stonewall along the road, and there are two disjunct short sections of stonewall within stands 4 and 6. There are no additional historical or cultural resources identified in the management unit. Also, within the unit are some well-established recreational trails. These trails are not signed, or clearly marked, but are evident and clearly receive consistent recreational uses including ATV's.

This management unit also contains a variety of other habitat features such as snags, cavities, and down logs. There are scattered stems of mature timber likely dating back to when the parcel was entirely agricultural land. These scattered "older growth" stems contain large cavities, and have expansive crowns producing significant hard mast. Most of these stems are red oak, white oak, or white pine. These unique interior features provide great ecological and wildlife habitat values to the property and surrounding wetlands. All the unique and special features within the property will require vegetative buffers to maintain their unique and valuable habitat features and qualities.

Management Objectives: This management unit is best suited for long term even-aged management to promote single aged stands using silviculture treatments including clear cuts of 5-20 acres to regenerate young forests for future generations of timber growth along with creating young forest habitats for wildlife directly adjacent to the powerline easement. Intermediate entries include shelterwood cuts, crop tree release, and thinning to reduce competition between mature tree crowns, enhance white pine cones and red oak acorn production, and establish regeneration for sustainable timber growth. Silvicultural recommendations apply to stands 4 and 6, leaving stands 2, 3, and 5 as unmanaged forest stands allowing natural succession to promote "old growth" forest characteristics. All forest management will incorporate wildlife habitat management and will implement appropriate buffers along wetlands, cultural resources, and other sensitive areas using recommended practices stated in Good Forestry in the Granite State.

Stand Data:

Stand 2, 3, 5 – No timber data. Leave as unmanaged natural succession.

Volume

A PRODUCT OF THE
FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Stand	4	0
Acres	14.0	
# of BA Pts.=	13	
22-Sep-20		

Stocking Diagnostics

Stocking Diagnostics							
Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EW P	1	44.4	66.9	38%	16.3	20.6	86%
HE M	3	41.6	43.1	29%	13.8	19.9	38%
RM	7	6.2	6.2	4%	13.6	4.9	60%
NRO	16	21.6	27.7	19%	16.4	24.2	67%
WO	17	11.1	9.2	6%	12.3	7.6	83%
BO	22	3.1	4.6	3%	16.6	3.6	67%
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
Total		127.9	147.7	100%	14.5	81	67%

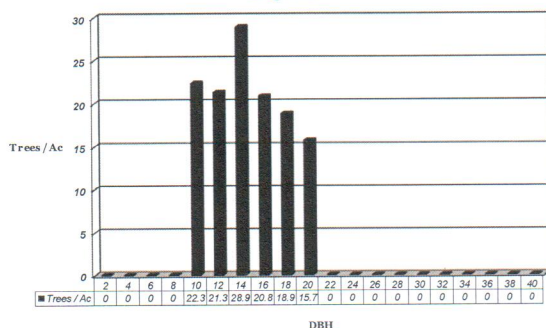
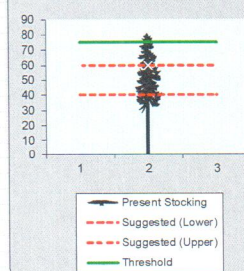
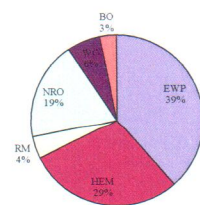
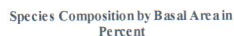
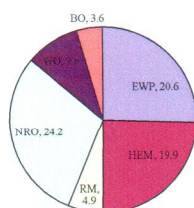
Median Stand Diameter >>>	16.0	81	<<- Estimated Relative Density
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Last Modified		July 6, 2009	
Type	POH		
Size Class	5		
Cruise Date	1/0/1900		
Deg. Of Conf.	0		
Student's t_{4n}	0.000		

PRINT

Analytical Charts

DS Cruiser Version 2013



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Danville TF	
Stand	4
Acres	14.0
# of BA Pts.=	13
22-Sep-20	

Last Modified: 07/06/09

Volume

A PRODUCT OF THE
FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Last Modified July 6, 2009

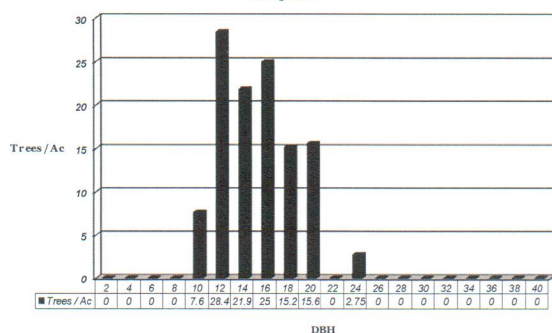
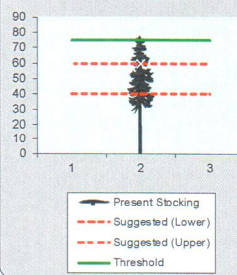
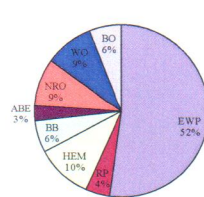
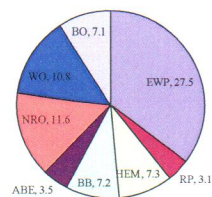
PRINT

Stocking Diagnostics

	100 %	15.5	78	15 %
Median Stand Diameter >>>		16.6	78	<<< Estimated Relative Density

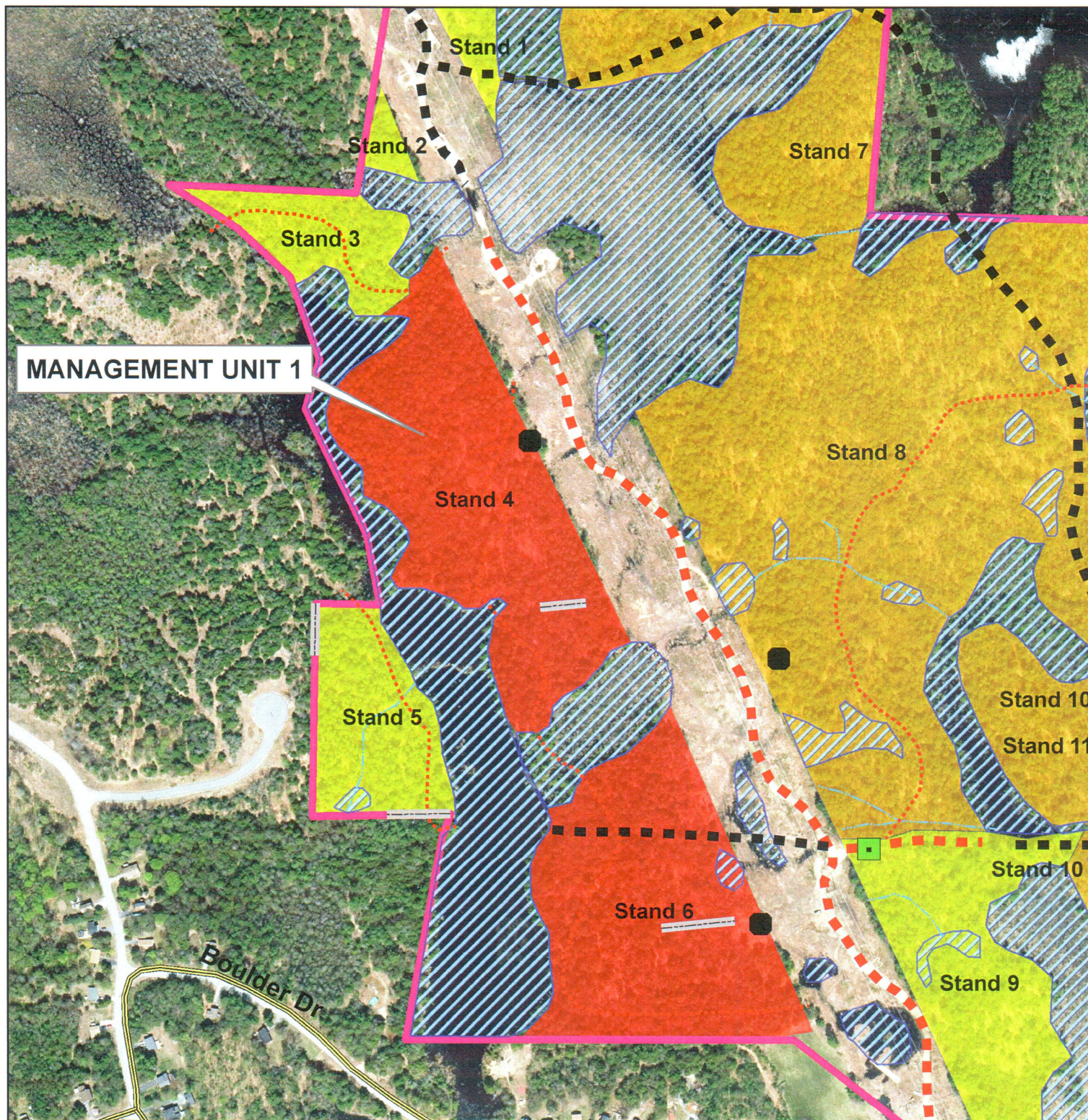
Analytical Charts

DS Cruiser Version 2013

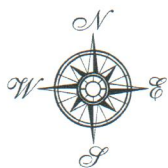


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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Last Modified	07/06/09
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The Danville Town Forest



0 212.5 425 850 Feet

Map Prepared by Bryan R. Comeau
LPF #434, September 16, 2020 ©

● Potential Log Yard

★ Invasive Plants

■ Gates

— Stonewall

... Rec Trail

■ Woods Road/Impassable

■ Woods Road/Passable

... Seasonal Stream

Wetland

— Roads_DOT

□ Town Forest Bounds

Management Units

1

2

3

4

5

No Cut

Management Unit 2

Description: This management unit is located along the eastern side of the powerline easement and west of the large wetland complex that bisects that Town Forest and floods Tuckertown Road. The unit is composed of five total stands which include stand 7, 8, 9, 10, and 11. Stands 1 and 9 are located at the far north and south end of the unit and are situated adjacent to sensitive areas including open water wetlands, streams, or include difficult stream crossings that result in these two stands being a low priority for active management and primary candidates for allowing natural process to occur without manipulation.

Stands 7, 8, 10 and 11 are the primary stands within this management unit identified as a high priority for forestry and wildlife habitat management. These stands total 74 acres and are currently typed as even aged, with one primary age class of timber being mature sawtimber with average ages around 95 years and diameters exceeding 16 inches. The most prominent tree species is white pine, with a consistent distribution of red oak and hemlock. Additional species include a mix of hardwoods including black birch, American beech, black oak, and white oak. The timber in this management unit is of fair health, with some signs of decline due to the dense stocking and lack of forest management over the past 30+/- years. The stocking in these stands exceeds recommended thresholds, and the timber has reached or exceeded the sites carrying capacity. Rather than seeing productive timber growth, the stands are now entering a state of decline showing signs of rot and defects that slowly spread through the stems of the trees and overtime will detract from current timber values. The stands provide excellent opportunities for forest management that will aim to regenerate young tree seedlings for future growth and development, along with reducing the dense competition in the stand to allow the residual timber the opportunity to improve in health and sustainable growth.

Access: Primary access for forest management will utilize the existing woods road that enters off from GH Carter Drive and continues along the powerline easement. The most likely location for a log yard will be within stand 8, adjacent to the powerline easement. There is an existing log yard opportunity in an old gravel pit located in stand 10 accessed via Tuckertown Road, but there is a section of Tuckertown Road that would require improvements, including widening the road and installing a culvert. It may not be economical to invest in this improvement since the majority of the timber in this unit is best accessed via the powerline easement utilizing a log yard situated within stand 8.

Special sites: This management unit includes multiple large open water wetlands, several seasonal streams, forested wetlands, and some small high-bush blueberry wet pockets that are likely utilized as vernal pools. The management unit also includes a portion of the old Tuckertown Road, however there are no stone walls and no historical and cultural resources. Also, within the unit are some well-established recreational trails. One trail is signed and labeled the Timberlane trail. This is a single track, non-motorized trail. An old woods road runs through the unit starting at the gravel pit off Tuckertown Road and continues north through the unit eventually connected back to the powerline easement at the far norther end of the Town Forest. This trail is not signed, or clearly marked, but is evident and clearly receives consistent recreational uses including ATV's.

This management unit also contains a variety of other habitat features such as snags, cavities, and down logs. There are scattered stems of mature timber likely dating back to when the parcel was entirely agricultural land. These scattered "older growth" stems contain large cavities, and have expansive crowns producing significant hard mast. Most of these stems are red oak, white oak, or white pine. These unique interior features provide great ecological and wildlife habitat values to the

property and surrounding wetlands. All the unique and special features within the property will require vegetative buffers to maintain their unique and valuable habitat features and qualities.

Management Objectives: This management unit is best suited for long term uneven-aged management to promote a diversity of size and age classes within the larger stands. Each individual stand will use a combination of thinning, shelterwood, single tree selection, and group selection for long term stand replacement. Group selection, or group cuts, is a regeneration method which removes all the stems in a delineated area, typically between ½ an acre up to 2 acres in size. The group openings will introduce full sunlight to the forest floor, stimulating the growth of new trees by native seed sources, stump sprouts, or root suckering. Thinning, shelterwood, and single tree selection are intermediate cutting methods periodically applied to enhance the health and growth of a forest stand that is not yet mature, and not yet appropriate for a complete regeneration harvest, although these methods may establish desired regeneration beneath the mature forest canopy. The combination of thinning, shelterwood, single tree selection, and group cuts are all uneven-aged techniques designed to maintain healthy and sustainable forest growth, in addition to establishing the desired regeneration and diversity of age classes within the stand for future timber development and wildlife habitats.

Silvicultural recommendations apply to stands 7, 8, 10, and 11, leaving stands 1 and 9 as unmanaged forest stands allowing natural succession to promote “old growth” forest characteristics. All forest management will incorporate wildlife habitat management and will implement appropriate buffers along wetlands, cultural resources, and other sensitives areas using recommended practices stated in Good Forestry in the Granite State.

Stand Data:

Stand 1 and 9 – No timber data. Leave as unmanaged natural succession.

Volume

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FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Danville TF	0
Stand	7
Acres	19.0
# of BA Pts. =	12
22-Sep-20	

Last Modified July 6, 2009

Type	POH
Size Class	5
Cruise Date	1/0/1900
Deg. Of Conf.	0
Student's "t"	0.000

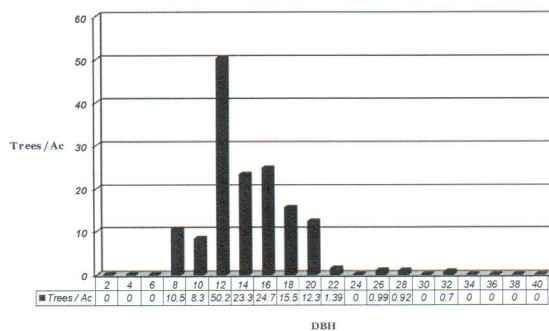
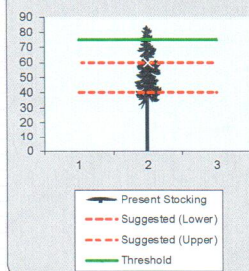
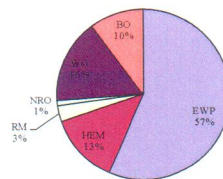
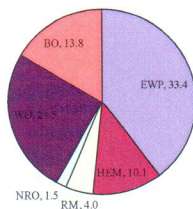
PRINT

Stocking Diagnostics

	100%	14.3	84	95%
Median Stand Diameter >>>		16.4	84	<<< Estimated Relative Density

Analytical Charts

DS Cruiser Version 2013



**Fox DS Cruiser
Version 2013**



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FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Species	POH	Stand	7
Size Class	5	Acres	19.0
		# of BA Pts.=	12
		22-Sep-20	

Last Modified 07/06/09

Stand 8 –

Volume

Spp	Spp Code	Sawlog Bf/Acre	Pulp Cords/Acre	Sawtimber Mean Ht (logs)	Total Bf (Stand)	Total Cords (Stand)	Topwood Cords (Stand)
EWP	1	11,117	6.20	2.9	455,817	254.2	63
RP	2	0	0.37		0	15.1	
HEM	3	1,786	2.78	1.7	73,226	114.0	42
RM	7	86	2.41	1.0	3,531	98.8	4
ASP	9	0	0.18		0	7.6	
WB	11	0	0.00		0	0.1	
BB	12	53	0.38	0.5	2,158	15.5	4
YB	13	0	0.33		0	13.4	
NRO	16	758	0.45	1.0	31,058	18.6	32
WO	17	160	0.21	0.8	6,565	8.6	9
BO	22	246	1.26	0.8	10,076	51.6	14
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
Total		14,206	14.57		582,432	597.3	168

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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Danville TF	0
Stand	8
Acres	41.0
# of BA Pts.=	36
22-Sep-20	

Last Modified July 6, 2009

Stocking Diagnostics

Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EWP	1	75.9	87.2	55%	14.5	31.7	79%
RP	2	1.3	1.1	1%	12.5	0.5	0%
HEM	3	22.5	29.4	19%	15.5	13.7	51%
RM	7	15.9	10.0	6%	10.7	8.2	11%
ASP	9	0.5	0.6	0%	14.6	0.3	0%
WB	11	0.9	0.6	0%	10.7	0.5	0%
BB	12	2.5	2.8	2%	14.3	2.2	40%
YB	13	4.5	1.7	1%	8.2	1.4	67%
NRO	16	11.7	12.2	8%	13.8	10.7	95%
WO	17	4.9	3.9	2%	12.0	3.2	71%
BO	22	8.7	8.3	5%	13.3	6.8	67%
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
Total		149.3	157.8	100%	13.9	79	68%

Median Stand Diameter --> 16.1 79 <<- Estimated Relative Density

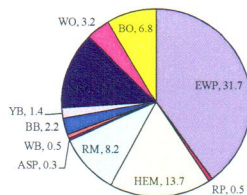
Type	POH
Size Class	5
Cruise Date	1/0/1900
Deg. Of Conf.	0
Student's "t"	0.000

PRINT

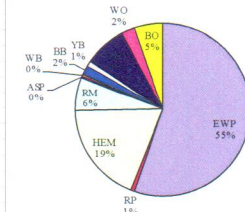
Analytical Charts

DS Cruiser Version 2013

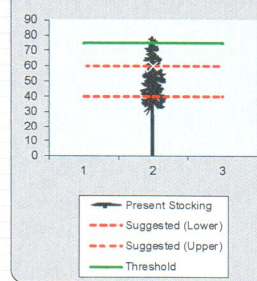
Species Composition by Relative Density



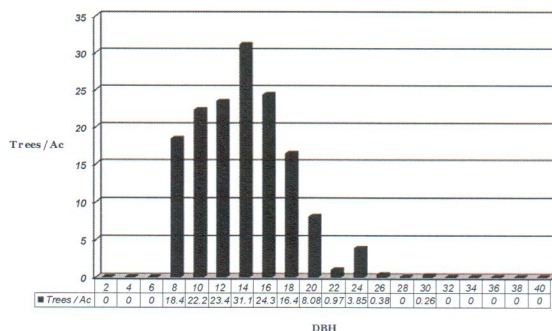
Species Composition by Basal Area in Percent



Stand Stocking (Rel.Den.)



Distribution of Diameters
All Species



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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Species	POH	Stand	8
Size Class	5	Acres	41.0
		# of BA Pts.=	36
		22-Sep-20	

Last Modified 07/06/09

Volume

A PRODUCT OF THE
FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Last Modified July 6, 2009

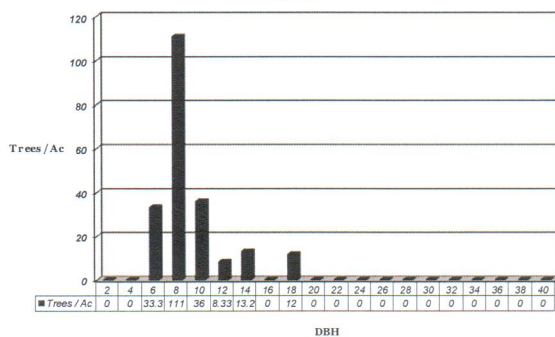
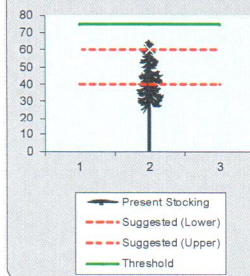
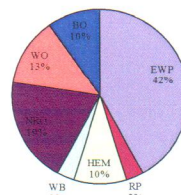
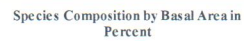
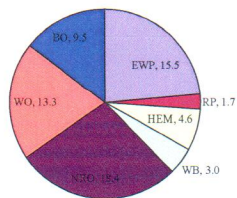
Stocking Diagnostics

Type	POH
Size Class	4
Cruise Date	1/0/1900
Deg. Of Conf.	0
Student's "t"	0.000

Median Stand Diameter ->	11.3	66	<- Estimated Relative Density
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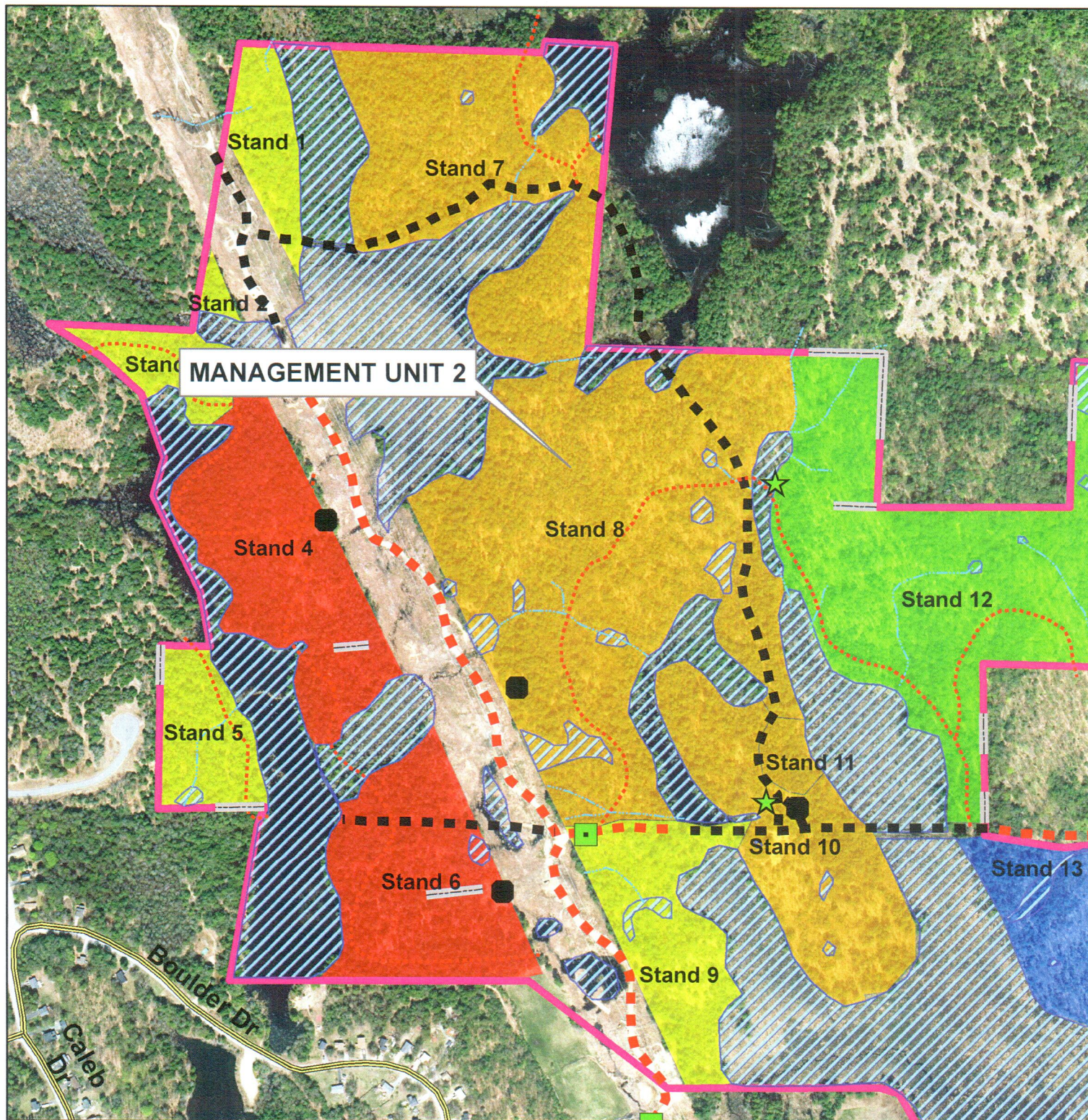
Analytical Charts

DS Cruiser Version 2013

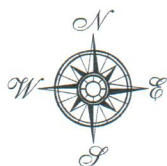


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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Last Modified	07/06/09
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The Danville Town Forest



0 275 550 1,100
Feet

Map Prepared by Bryan R. Comeau
LPF #434, September 16, 2020 ©

- Potential Log Yard
 - Invasive Plants
 - Gates
 - Stonewall
 - Rec Trail
 - Woods Road/Impassable
 - Woods Road/Passable
 - Seasonal Stream
 - Wetland
 - Roads_DOT
 - Town Forest Bounds
- Management Units**
- 1
 - 2
 - 3
 - 4
 - 5
 - No Cut

Management Unit 3

Description: This management unit is composed entirely by stand 12, which is bound to the north by the Town Forest property line, the large wetland complex which bisects the property to the west, and is bordered to the east by Route 11A. Stand 12 totals 80 acres available for management, with a variety of interior wetland pockets including forested wetlands, seasonal streams, and vernal pools.

This management unit is currently typed as even aged, with one primary age class of timber being mature sawtimber with average ages around 95 years and diameters exceeding 15 inches. The most prominent tree species is red oak, with a consistent distribution of white pine and hemlock. Additional species include a mix of hardwoods including black birch, American beech, black oak, and white oak. The timber in this management unit is of fair health, with some signs of decline due to the dense stocking and lack of forest management over the past 30+/- years. The stocking in these stands exceeds recommended thresholds, and the timber has reached or exceeded the sites carrying capacity, specifically in the red oak which shows many defects including mineral stain, frost cracking, and spider heart. Rather than seeing productive timber growth, the stands are now entering a state of decline showing signs of rot and defects that slowly spread through the stems of the trees and overtime will detract from current timber values. The stands provide excellent opportunities for forest management that will aim to regenerate young tree seedlings for future growth and development, along with reducing the dense competition in the stand to allow the residual timber the opportunity to improve in health and sustainable growth.

Access: Primary access for forest management will utilize the existing woods road that enters off from Route 111A. There are two separate woods roads that enter this stand from past logging operations 30+/- years ago. Each of the woods roads would require some improvements to gain access into the unit, including culverts for stream crossings and stone fords in low, wet depressing's. The old log yards used in past logging were small and have grown back to young black birch saplings and pole timber. A new log yard would need to be constructed for future entries. It is likely that one new log yard is adequate for all future management needs, rather than have two separate woods roads and landings like how the parcel was previously managed.

Special sites: This management unit includes several small, forested wetland pockets, some seasonal streams, and a few scattered wet pockets that are likely utilized as vernal pools.

There are some sections of stonewall associated with the lot lines marking historic boundary lines, and this stand abuts the historic "Ye Old Cemetery", but there are no additional historical or cultural resources identified in the management unit. Also, within the unit is one short section of the single track Timberlane recreational trail.

This management unit also contains a variety of other habitat features such as snags, cavities, and down logs. There are scattered stems of mature timber likely dating back to when the parcel was entirely agricultural land. These scattered "older growth" stems contain large cavities, and have expansive crowns producing significant hard mast. Most of these stems are red oak, white oak, or white pine. These unique interior features provide great ecological and wildlife habitat values to the property and surrounding wetlands. All the unique and special features within the property will require vegetative buffers to maintain their unique and valuable habitat features and qualities.

Management Objectives: This management unit is best suited for long term uneven-aged management to promote a diversity of size and age classes within the larger stand. Management in this stand will use a combination of thinning, shelterwood, single tree selection, and group selection for long term stand replacement. Group selection, or group cuts, is a regeneration method which removes all the stems in a delineated area, typically between ½ an acre up to 2 acres in size. The group openings will introduce full sunlight to the forest floor, stimulating the growth of new trees by native seed sources, stump sprouts, or root suckering. Thinning, shelterwood, and single tree selection are intermediate cutting methods periodically applied to enhance the health and growth of a forest stand that is not yet mature, and not yet appropriate for a complete regeneration harvest, although these methods may establish desired regeneration beneath the mature forest canopy. The combination of thinning, shelterwood, single tree selection, and group cuts are all uneven-aged techniques designed to maintain healthy and sustainable forest growth, in addition to establishing the desired regeneration and diversity of age classes within the stand for future timber development and wildlife habitats.

All forest management will incorporate wildlife habitat management and will implement appropriate buffers along wetlands, cultural resources, and other sensitives areas using recommended practices stated in Good Forestry in the Granite State.

Stand Data:

Stand 12 –

Volume

Spp	Spp Code	Sawlog Bf/Acre	Pulp Cords/Acre	Sawtimber Mean Ht (logs)	Total Bf (Stand)	Total Cords (Stand)	Topwood Cords (Stand)
EWP	1	2,169	1.11	2.5	173,484	89.1	40
HEM	3	328	2.47	1.2	26,252	197.3	28
SM	6	45	0.19	1.0	3,586	15.3	4
RM	7	125	1.09	1.2	9,964	86.9	8
WA	8	0	0.08		0	6.3	
WB	11	21	0.00	1.0	1,718	0.1	2
BB	12	62	1.73	0.7	4,969	138.4	8
YB	13	0	0.13		0	10.6	
ABE	14	130	0.45	1.0	10,422	36.1	11
NRO	16	4,904	5.12	1.3	392,313	409.4	275
WO	17	0	0.25		0	20.0	
BO	22	285	1.39	1.2	22,623	111.4	18
HICKORY	28	41	0.12	1.0	3,288	9.9	3
		0			0		
		0			0		
		0			0		
		0			0		
Total		8,110	14.14		648,819	1,131.0	398

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FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Danville	0
Stand	12
Acres	80.0
# of BA Pts.=	74
22-Sep-20	

Last Modified July 6, 2009

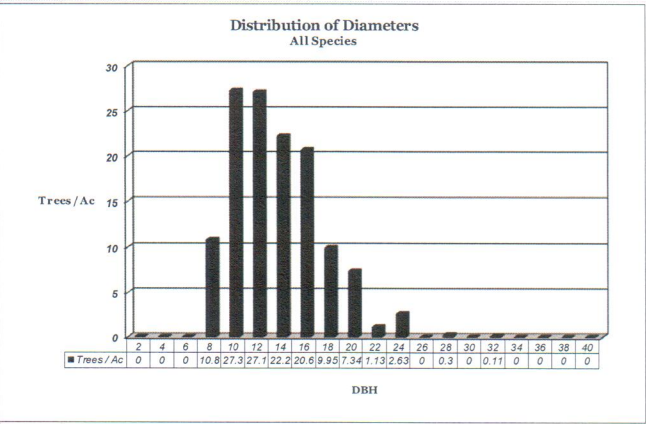
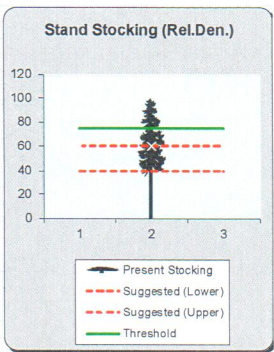
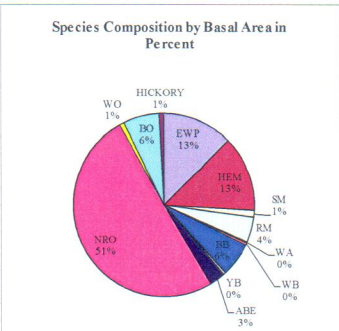
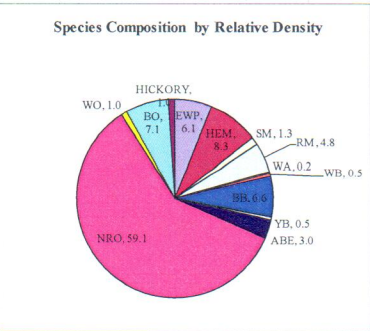
Type	POM
Size Class	5
Cruise Date	1/0/1900
Deg. Of Conf.	0
Student's "t"	0.000

PRINT

Stocking Diagnostics

Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EWP	1	14.9	16.8	13%	14.4	6.1	81%
HEM	3	14.4	17.8	13%	15.1	8.3	20%
SM	6	1.5	1.6	1%	14.3	1.3	100%
RM	7	7.7	5.9	4%	11.9	4.8	23%
WA	8	0.5	0.3	0%	9.8	0.2	0%
WB	11	0.6	0.5	0%	13.0	0.5	50%
BB	12	11.8	8.1	6%	11.2	6.6	53%
YB	13	1.3	0.5	0%	8.8	0.5	100%
ABE	14	5.0	3.8	3%	11.8	3.0	43%
NRO	16	57.2	67.6	51%	14.7	59.1	72%
WO	17	2.5	1.1	1%	8.9	1.0	50%
BO	22	9.7	8.6	6%	12.8	7.1	53%
HICKORY	28	2.4	1.1	1%	9.2	1.0	50%
		0.0					
		0.0					
		0.0					
Total		129.4	133.8	100%	13.8	99	61%

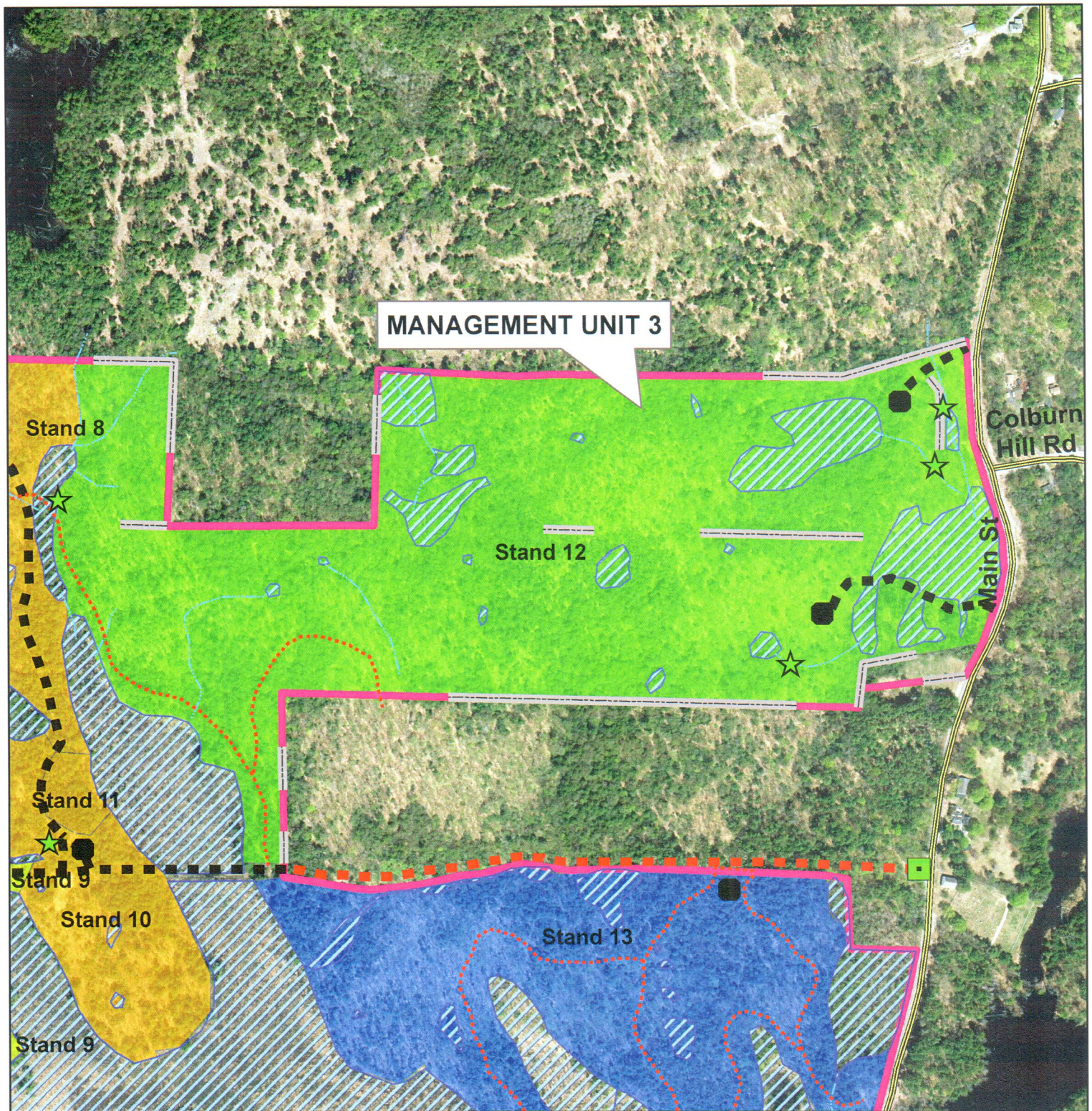
Median Stand Diameter --> 15.7 <<- Estimated Relative Density



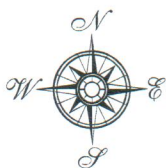
A PRODUCT OF THE
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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Species	POM	Stand	12
Size Class	5	Acres	80.0
		# of BA Pts.=	74
		22-Sep-20	

Last Modified 07/06/09



The Danville Town Forest



0 250 500 1,000 Feet

Map Prepared by Bryan R. Comeau
LPF #434, September 16, 2020 ©

- Potential Log Yard
 - Invasive Plants
 - Gates
 - Stonewall
 - Rec Trail
 - Woods Road/Impassable
 - Woods Road/Passable
 - Seasonal Stream
 - Wetland
 - Roads_DOT
 - Town Forest Bounds
- Management Units**
- 1
 - 2
 - 3
 - 4
 - 5
 - No Cut

Management Unit 4

Description: This management unit is located south of Tuckertown Road, west of Route 111A, and bound by the large open water wetland to the west and south. The unit is composed of two total stands which include stands 13, and 14. Stand 14 is a small upland pocket surrounded by wetlands and situated adjacent to sensitive areas including open water wetlands, streams, and include difficult stream crossings that result in this stand being a low priority for active management and a primary candidate for allowing natural process to occur without manipulation. Stand 13 totals 38 acres suitable for sustainable forest management.

This management unit is currently typed as even aged, with one primary age class of timber being mature sawtimber with average ages around 95 years and diameters exceeding 16 inches. The most prominent tree species is red oak, with a consistent distribution of white pine and hemlock. Additional species include a mix of hardwoods including black birch, American beech, black oak, and white oak. The timber in this management unit is of fair health, with some signs of decline due to the dense stocking and lack of forest management over the past 30+/- years. The stocking in these stands exceeds recommended thresholds, and the timber has reached or exceeded the sites carrying capacity, specifically in the red oak which shows many defects including mineral stain, frost cracking, and spider heart. Rather than seeing productive timber growth, the stands are now entering a state of decline showing signs of rot and defects that slowly spread through the stems of the trees and overtime will detract from current timber values. The stands provide excellent opportunities for forest management that will aim to regenerate young tree seedlings for future growth and development, along with reducing the dense competition in the stand to allow the residual timber the opportunity to improve in health and sustainable growth.

Access: Primary access for forest management will utilize the Tuckertown Road that enters off from Route 111A. The neighboring parcel to the north of this stand was recently accessed in this same way for a forest management operation. A similar log yard can be constructed on the Town Forest in an area along Tuckertown Road across from the neighboring log yard.

Special sites: This management unit is adjacent to the large open water wetland and includes several small, forested wetland pockets, some seasonal streams, and a few scattered wet pockets that are likely utilized as vernal pools.

There are no historical or cultural resources identified in the management unit. This section of Tuckertown Road is not bordered by stonewall, and no interior features were identified. This management unit has the highest concentration of recreational trails. In 2008 a local boy scout group added signage, markings, and a viewing platform of the wetlands. All the trails in this unit are single track, non-motorized public trails.

This management unit also contains a variety of other habitat features such as snags, cavities, and down logs. There are scattered stems of mature timber likely dating back to when the parcel was entirely agricultural land. These scattered “older growth” stems contain large cavities, and have expansive crowns producing significant hard mast. Most of these stems are red oak, white oak, or white pine. These unique interior features provide great ecological and wildlife habitat values to the property and surrounding wetlands. All the unique and special features within the property will require vegetative buffers to maintain their unique and valuable habitat features and qualities.

Management Objectives: This management unit is best suited for long term uneven-aged management to promote a diversity of size and age classes within the larger stand. Management in this stand will use a combination of thinning, shelterwood, single tree selection, and group selection for long term stand replacement. Group selection, or group cuts, is a regeneration method which removes all the stems in a delineated area, typically between ½ an acre up to 2 acres in size. The group openings will introduce full sunlight to the forest floor, stimulating the growth of new trees by native seed sources, stump sprouts, or root suckering. Thinning, shelterwood, and single tree selection are intermediate cutting methods periodically applied to enhance the health and growth of a forest stand that is not yet mature, and not yet appropriate for a complete regeneration harvest, although these methods may establish desired regeneration beneath the mature forest canopy. The combination of thinning, shelterwood, single tree selection, and group cuts are all uneven-aged techniques designed to maintain healthy and sustainable forest growth, in addition to establishing the desired regeneration and diversity of age classes within the stand for future timber development and wildlife habitats.

Silvicultural recommendations apply to stand 13, leaving stand 14 as an unmanaged forest stand allowing natural succession to promote “old growth” forest characteristics. All forest management will incorporate wildlife habitat management and will implement appropriate buffers along wetlands, cultural resources, and other sensitives areas using recommended practices stated in Good Forestry in the Granite State.

Stand Data:

Stand 14 – No timber data. Leave as unmanaged natural succession.

Stand 13–

Volume

Spp	Spp Code	Sawlog Bf/Acre	Pulp Cords/Acre	Sawtimber Mean Ht (log)	Total Bf (Stand)	Total Cords (Stand)	Topwood Cords (Stand)
EWP	1	9,622	2.49	2.9	365,631	94.8	53
HEM	3	103	1.01	2.0	3,927	38.3	2
SM	6	0	0.25		0	9.4	
RM	7	125	0.46	1.0	4,736	17.6	5
WB	11	0	0.19		0	7.4	
YB	12	0	0.03		0	1.2	
ABE	14	64	0.30	1.0	2,426	11.5	2
BW	15	0	0.39		0	14.9	
NRO	16	4,327	3.02	1.4	164,441	114.6	108
WO	17	739	1.71	1.1	28,063	64.9	26
BO	22	175	0.41	1.6	6,652	15.6	3
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
Total		15,155	10.27		575,875	390.2	199

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Hillsborough, NH
Developed by K. Desmarais & M. Robblee

Danville TF	0
Stand	13
Acres	38.0
# of BA Pts.=	25
22-Sep-20	

Last Modified July 6, 2009

Stocking Diagnostics

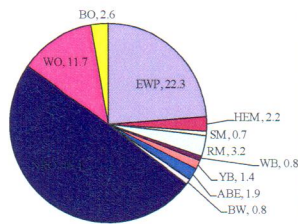
Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EWP	1	48.7	62.4	42%	15.3	22.3	88%
HEM	3	4.1	4.8	3%	14.6	2.2	17%
SM	6	1.5	0.8	1%	9.7	0.7	100%
RM	7	4.9	4.0	3%	12.2	3.2	40%
WB	11	0.9	0.8	1%	12.7	0.8	0%
YB	12	4.0	1.6	1%	8.6	1.4	50%
ABE	14	2.4	2.4	2%	13.5	1.9	33%
BW	15	2.1	1.6	1%	11.7	0.8	0%
NRO	16	35.3	53.6	36%	16.7	46.4	79%
WO	17	14.9	14.4	10%	13.3	11.7	61%
BO	22	4.2	3.2	2%	11.8	2.6	50%
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
Total		123.2	149.6	100%	14.9	94	75%

Median Stand Diameter ->> 16.9 94 <<- Estimated Relative Density

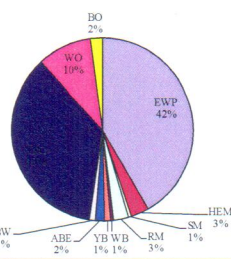
Type	POM
Size Class	5
Cruise Date	1/0/1900
Deg. Of Conf.	0
Student's "t"	0.000

PRINT

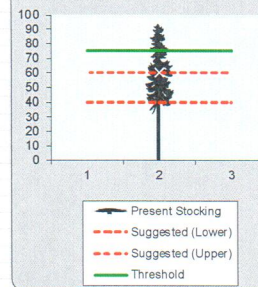
Species Composition by Relative Density



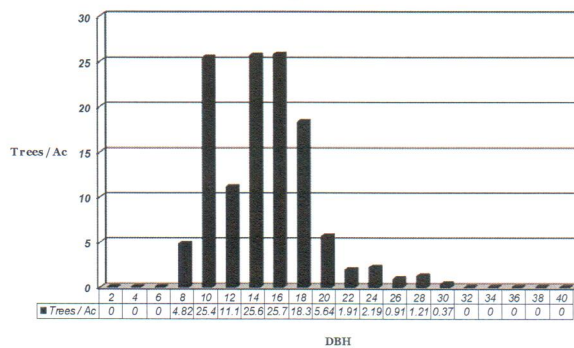
Species Composition by Basal Area in Percent



Stand Stocking (Rel.Den.)



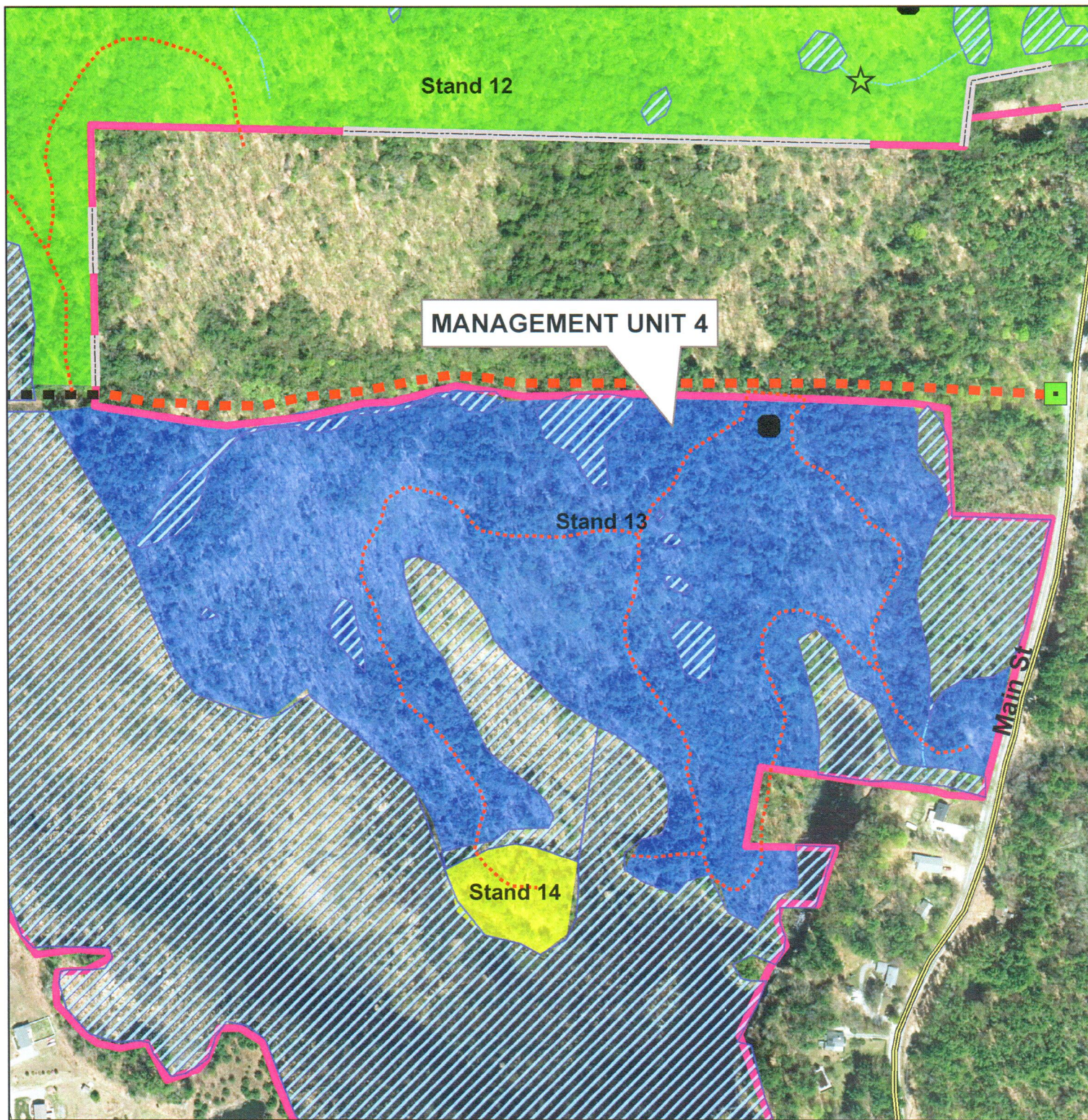
Distribution of Diameters
All Species



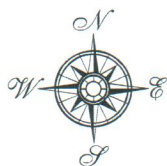
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FOX RESEARCH FOREST
Hillsborough, NH
Developed by K. Desmarais & M. Robblee
Danville TF

Species	POM
Stand	13
Size Class	5
Acres	38.0
# of BA Pts.=	25
22-Sep-20	

Last Modified 07/06/09



The Danville Town Forest



0 165 330 660
Feet

Map Prepared by Bryan R. Comeau
LPF #434, September 16, 2020 ©

- Potential Log Yard
- Invasive Plants
- Gates
- Stonewall
- Rec Trail
- Woods Road/Impassable
- Woods Road/Passable
- Seasonal Stream
- Wetland

- Roads_DOT
- Town Forest Bounds
- Management Units**
- 1
- 2
- 3
- 4
- 5
- No Cut

Management Unit 5

Description: This management unit is the disjunct parcel located off from Happy Hollow Road. The unit is composed of two total stands which include stand 15 and 16 totaling 16.5 acres suitable for forest management. The remainder of the unit consists of two interior forested wetlands including the large red maple swamp along Happy Hollow Road restricting access into the management unit.

Stands 15 and 16 are both identified as a high priority for forestry and wildlife habitat management. This management unit is currently typed as even aged, with one primary age class of timber being mature sawtimber with average ages around 95 years and diameters exceeding 15 inches. The most prominent tree species is red oak, with a scattered distribution of white pine and hemlock. Additional species include a mix of hardwoods including black birch, American beech, black oak, and white oak. The timber in this management unit is of fair health, with some signs of decline due to the dense stocking and lack of forest management over the past 30+/- years. The stocking in these stands exceeds recommended thresholds, and the timber has reached or exceeded the sites carrying capacity. Rather than seeing productive timber growth, the stands are now entering a state of decline showing signs of rot and defects that slowly spread through the stems of the trees and overtime will detract from current timber values. The stands provide excellent opportunities for forest management that will aim to regenerate young tree seedlings for future growth and development, along with reducing the dense competition in the stand to allow the residual timber the opportunity to improve in health and sustainable growth.

Access: Primary access for forest management will require the use of an existing right-of-way which currently passes through private lands off from Happy Hollow Road. The right-of-way is an existing woods road for part of the way, but does not actually connect to the Town Forest, and is not clearly deeded for management access. The Town of Danville Forestry Committee is currently exploring available options for securing this right-of-way.

Special sites: This management unit has two forested wetlands, one being a large red maple swamp, and the second is a seasonal stream with an area of hemlock forested wetlands.

There are some sections of stonewall associated with the lot lines marking historic boundary lines, but there are no additional historical or cultural resources identified in the management unit. In addition, there are no recognized recreational trails within this unit, likely due to the absence of any public access or parking.

This management unit also contains a variety of other habitat features such as snags, cavities, and down logs. There are scattered stems of mature timber likely dating back to when the parcel was entirely agricultural land. These scattered “older growth” stems contain large cavities, and have expansive crowns producing significant hard mast. Most of these stems are red oak, white oak, or white pine. These unique interior features provide great ecological and wildlife habitat values to the property and surrounding wetlands. All the unique and special features within the property will require vegetative buffers to maintain their unique and valuable habitat features and qualities.

Management Objectives: This management unit is best suited for long term even-aged management to promote single aged stands using silviculture treatments including clear cuts of 5-20 acres to regenerate young forests for future generations of timber growth along with creating young forest habitats for wildlife directly adjacent to the powerline easement. Intermediate entries include shelterwood cuts, crop tree release, and thinning to reduce competition between mature tree crowns,

enhance white pine cones and red oak acorn production, and establish regeneration for sustainable timber growth. All forest management will incorporate wildlife habitat management and will implement appropriate buffers along wetlands, cultural resources, and other sensitive areas using recommended practices stated in Good Forestry in the Granite State.

Stand Data:

Stand 15 –

Volume		Sawlog	Pulp	Sawtimber	Total	Total	Topwood
Spp	Spp Code	Bf/Acre	Cords/Acre	Mean Ht (logs)	Bf (Stand)	Cords (Stand)	Cords (Stand)
EWP	1	493	0.53	2.3	7,394	7.9	2
HEM	3	853	5.14	2.0	12,800	77.0	6
SM	6	0	0.77		0	11.5	
RM	7	0	1.03		0	15.5	
BB	13	0	0.53		0	7.9	
ABE	14	0	0.32		0	4.8	
NRO	16	7,894	5.65	1.6	118,407	84.7	58
WO	17	0			0	7.8	
BO	22	184	0.52	1.5	2,756		2
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
		0			0		
Total		9,424	14.49		141,357	217.3	67

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FOX RESEARCH FOREST
 Hillsborough, NH
 Developed by K. Desmarais & M. Robblee
Danville TF
 Stand 15
 Acres 15.0
 # of BA Pts. 12
 22-Sep-20

Last Modified July 6, 2009

Type RO
 Size Class 5
 Cruise Date 1/01/900
 Deg. Of Conf 0 %
 Student's T 0.000

PRINT

Stocking Diagnostics

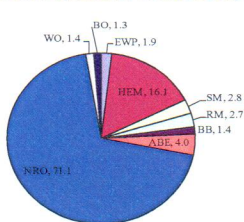
Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EWP	1	4.9	5.0	4%	13.7	1.9	67%
HEM	3	38.5	35.0	25%	12.9	16.1	19%
SM	6	5.9	3.3	2%	10.1	2.8	50%
RM	7	3.9	3.3	2%	12.5	2.7	0%
BB	13	2.7	1.7	1%	10.7	1.4	100%
ABE	14	8.5	5.0	4%	11.8	4.0	0%
NRO	16	60.2	81.7	59%	15.8	71.1	80%
WO	17	2.3	1.7	1%	11.6	1.4	0%
BO	22	1.4	1.7	1%	14.5	1.3	100%
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
Total		126.4	138.3	100%	14.2	103	58%

Median Stand Diameter --> 15.5 << Estimated Relative Density

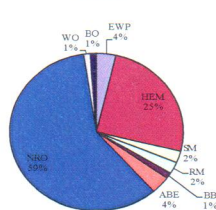
Analytical Charts

DS Cruiser Version 2013

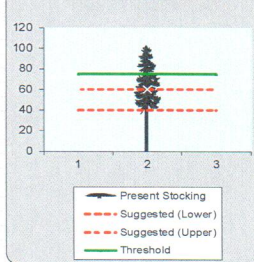
Species Composition by Relative Density



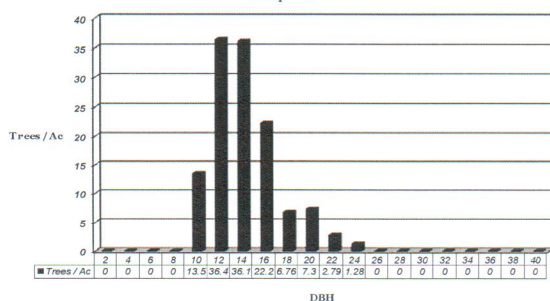
Species Composition by Basal Area in Percent



Stand Stocking (Rel.Den.)



Distribution of Diameters
 All Species



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FOX RESEARCH FOREST
 Hillsborough, NH
 Developed by K. Desmarais & M. Robblee
Danville TF
 Species RO
 Size Class 5
 Stand 15
 Acres 15.0
 # of BA Pts. 12
 22-Sep-20

Last Modified 07/06/09

Volume								
Spp	Spp Code	Sawlog Bf/Acre	Pulp Cords/Acre	Sawtimber Mean Ht (logs)	Total Bf (Stand)	Total Cords (Stand)	Topwood Cords (Stand)	
EWP	1	19,104	8.25	3.0	28,656	12.4		4
ABE	14	0	9.98		0	15.0		
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
		0			0			
Total		19,104	18.22		28,656	27.3		4

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Danville TF 0

Stand	16
Acres	1.5
# of BA Pts.=	1
22-Sep-20	

Last Modified July 6, 2009

Type	WP
Size Class	5
Cruise Date	1/0/1900
Deg. Of Conf	0
Student's T	#NUM!

%

PRINT

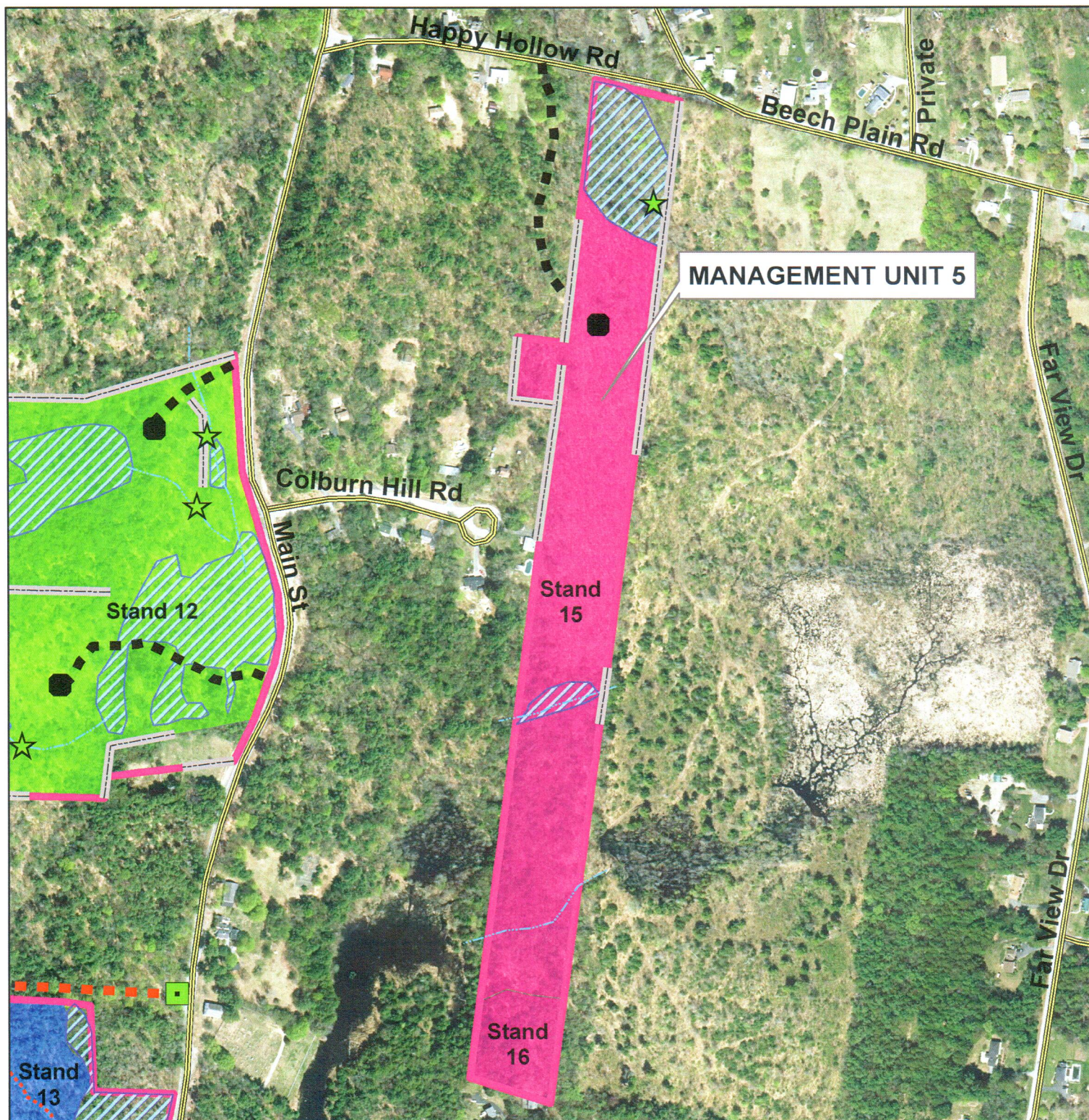
Spp	Spp Code	Total Trees/Acre	Total BA/Acre	% BA/ac by Spp	QMD	Rel Density	% AGS
EWP	1	96.2	120.0	75%	15.1	43.5	83%
ABE	14	43.4	40.0	25%	13.0	32.1	0%
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
		0.0					
Total		139.6	160.0	100%	14.5	76	63%

Median Stand Diameter >>> 14.0 76 <<- Estimated Relative Density

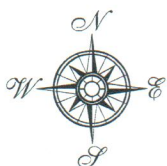
Analytical Charts

DS Cruiser Version 2013





The Danville Town Forest



0 212.5 425 850 Feet

Map Prepared by Bryan R. Comeau
LPF #434, September 16, 2020 ©

- | | | | |
|--|-----------------------|-------------------------|--------------------|
| | Potential Log Yard | | Roads_DOT |
| | Invasive Plants | | Town Forest Bounds |
| | Gates | Management Units | |
| | Stonewall | | 1 |
| | Rec Trail | | 2 |
| | Woods Road/Impassable | | 3 |
| | Woods Road/Passable | | 4 |
| | Seasonal Stream | | 5 |
| | Wetland | | No Cut |

Summary of All Stands

A breakdown of the forest structure and habitat distribution within the property is described in the figures below. A more balanced distribution of structure and habitat types within a landscape results in greater biodiversity.

Stand	Type	Acres	Basal Area/Acre	Trees/Acre	Mean Stand Diameter	% Relative Density	Board Feet/Acre	Cords/Acre	% Acceptable Growing Stock
1	Pine-oak-hemlock	4	200	136.9	18	115	14,323	25.33	65
2	Pine-oak-hemlock	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	White pine	3	120	95.2	15.6	48	14,021	10.63	75
4	Pine-oak-hemlock	14	147.7	127.9	16	81	11,571	13.99	67
5	White pine	5	186.7	156.4	16.1	73	18,996	17.85	71
6	Pine-oak-hemlock	13	148.9	116.4	16.6	78	14,701	12.35	73
7	Pine-oak-hemlock	19	165	148.9	16.4	84	14,109	15.34	63
8	Pine-oak-hemlock	41	157.8	149.3	16.1	79	14,206	14.57	68
9	Pine-oak-hemlock	9	120	80	17.9	70	10,193	6.81	72
10	Pine-oak-hemlock	13	103.3	213.7	11.3	66	4,853	11.96	81
11	Red pine	1	220	137.4	18	96	29,384	13.87	82
12	Pine-oak-maple	80	133.8	129.4	15.7	99	8,110	14.14	61
13	Pine-oak-maple	38	149.6	123.2	16.9	94	15,155	10.27	75
14	Pine-oak-maple	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	Red oak	15	138.3	126.4	15.5	103	9,424	14.49	58
16	White pine	1.5	160	139.6	14	76	19,104	18.22	63
Wetlands		116							
Powerlines		23							
Total Property Acres		398							

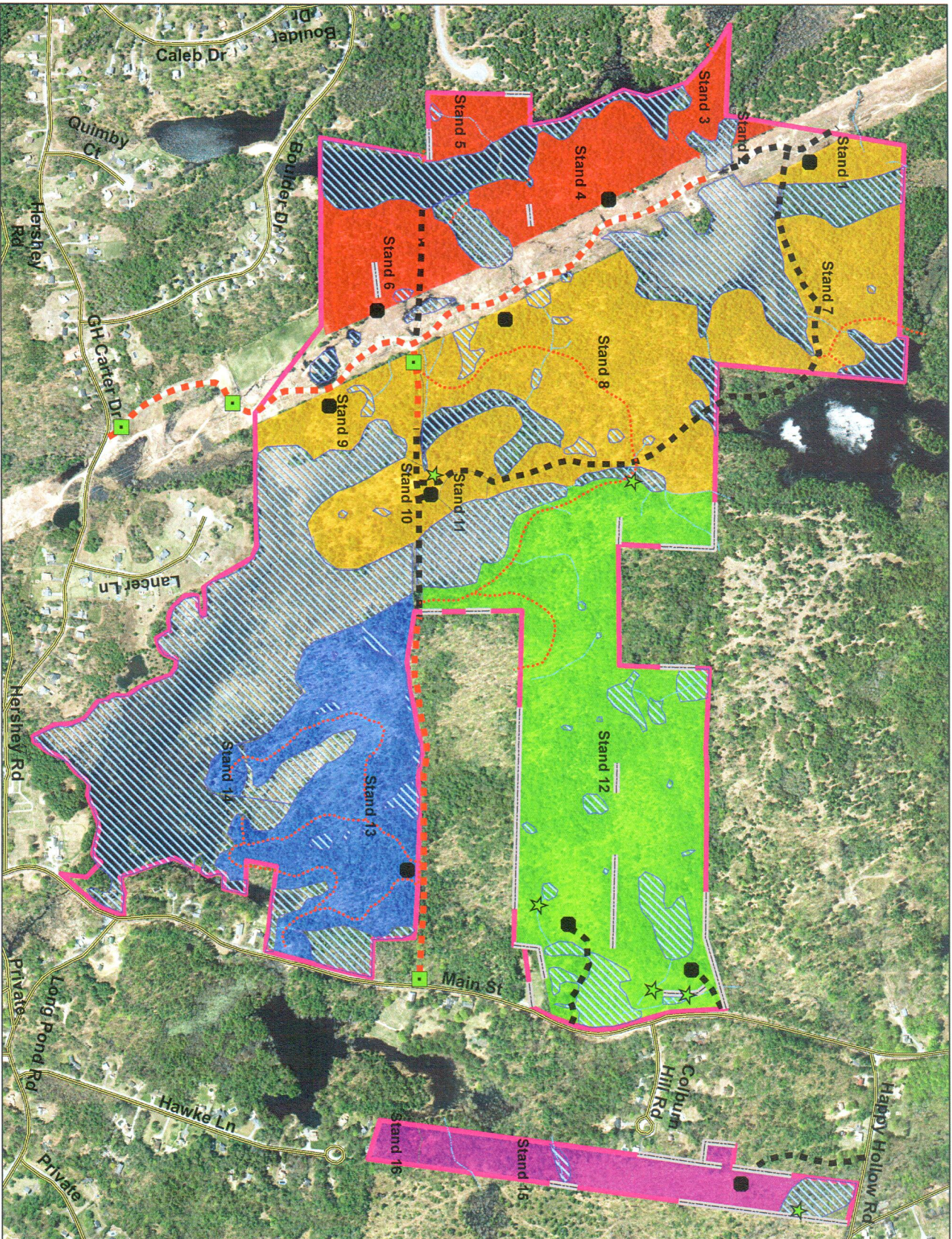
Figure 2: Summary of all Stands.

Cover Type	Acres	Percent of Total Property
Wetlands	116	29%
Powerlines	23	6%
Natural Succession	23.5	6%
Managed Softwood Forest	2.5	0.5%
Managed Hardwood Forest	15	3.5%
Managed Mixed-wood Forest	218	55%

Figure 3: Current habitat distribution.

COMPOSITION	CURRENT CONDITION	DESIRED CONDITION
<i>SIZE CLASS DISTRIBUTION</i>		
Seedling/Sapling	0%	10%
Pole Timber	3%	20%
Sawtimber	56%	29%
Natural Succession	6%	6%
Powerline Easement	6%	6%
Wetlands	29%	29%

Figure 4: Habitat distribution goals.



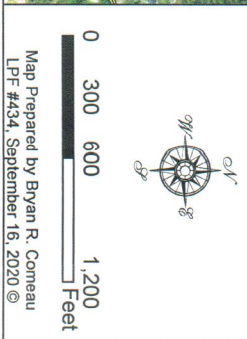
The Danville Town Forest

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398 Total acres
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 23 Powerline acres

MANAGEMENT UNIT MAP

- Potential Log Yard
- Invasive Plants
- Gates
- Stonewall
- Rec Trail
- Woods Road/Impassable
- Woods Road/Passable
- Seasonal Stream
- Wetland
- Roads_DOT
- Town Forest Bounds
- Management Units



Property Soils

Soils play an important role in the health of forests, wildlife habitats, and biodiversity. Soils provide nutrients, water, and stability to trees and plants and soil characteristics have a significant influence on where plant species grow. NRCS generates and updates soils maps for each state. The USDA NRCS Web Soils Survey was utilized to determine the soil types and characteristics for this property (USDA NRCS, 2013). This parcel is composed of twelve primary soil types including upland and wetland soils.

The most common soil present is Chatfield-Hollis-Canton complex. This soil is found within stands 4, 5, 6, 8, 9, 12, 13, and 15 and composes 33% of the total property. This soil has slopes that range from 3-8%, 8-15%, and 15-35%. These soils are very stony, not considered prime farmland, are well drained, derive from glacial till, and are part of Important Forest Soil Group IB. Soils within this group are sandy or loamy over sandy textures. Soil moisture is adequate and favorable for good tree growth. Successional trends are typically towards hardwoods such as American beech and northern red oak. Forest stands commonly compose a variety of hardwood species including black birch, red maple, and white ash in combinations with white pine and hemlock.

The next most common soil type is Greenwood Mucky Peat. This soil type is associated with many of the open water ponds and wetlands. This soil composes 25% of the total property and is very poorly drained and all hydric.

Canton gravelly fine sandy loam compose 23% of the total property. This soil is very stony with slopes ranging from 3-8%, 8-15%, and 15-25%. This soil is found in stands 7, 9, 12, 13, 15, and 16. This soil is derived from glacial till, well drained, and not considered prime farmland, except for those with slopes ranging from 3-8%. The soils considered farmland of local importance are found within stands 12, 13, and 15. This soil type is part of Important Forest Soil Group IB. Soils within this group are sandy or loamy over sandy textures. Soil moisture is adequate and favorable for good tree growth. Successional trends are typically towards hardwoods such as American beech and northern red oak. Forest stands commonly compose a variety of hardwood species including black birch, sugar maple, red maple, and white ash in combinations with white pine and hemlock.

Hinckley fine sandy loam makes up only 7% of the entire property, but is found in several stands including 1, 2, 3, 4, 6, 9, 10, and 11. This soil has slopes that range from 0-3%, 3-8%, and 8-15%. This soil is not considered prime farmland, it's excessively drained, consists of stratified sandy and gravelly outwash, and is part of Important Forest Soil Group IC. These soils are typically sandy outwash and most conducive for softwood growth, especially white pine.

The next soil type is Ossipee Mucky Peat. This soil type is associated with many of the wetlands. This soil composes 3% of the total property and is very poorly drained and all hydric.

Scarboro Muck composes 2% of the total property and is another soil associated with wetlands and is very poorly drained and all hydric.

Walpole very fine sandy loam composes 2% of the total property. This soil is very stony, with slopes ranging from 3-8%. The soil is poorly drained, partially hydric, not considered prime farmland, and part of Important Forest Soil Group IIB. Successional trends are typically towards shade tolerant softwoods, such as hemlock. These soils have a seasonally high-water table, and due to poor drainage,

forest management and timber production is limited. On this parcel the Walpole soils are associated with forested wetlands or stream drainages.

Pipestone sand has similar characteristics to the previous Walpole soils. The Pipestone soils compose 2.5% of the total property, has slopes ranging from 3-8%, is poorly drained, partially hydric, not considered prime farmland, and part of Important Forest Soil Group IIB. Successional trends are typically towards shade tolerant softwoods, such as hemlock. These soils have a seasonally high-water table, and due to poor drainage, forest management and timber production is limited.

Chocorua Mucky Peat composes 1.5% of the total property and is another soil associated with wetlands and is very poorly drained and all hydric.

The next soil is Scituate-Newfields complex which only makes up 0.5% of the total property. This soil has slopes ranging from 3-8%, is moderately well drained, and not considered prime farmland. This soil is part of Important Forest Soil Group IA, which are the most favorable and suitable soils for quality timber growth. This soil is found in a small pocket of stand 15, and successional trends are typically towards hardwoods such as sugar maple, red oak, and American. Forest stands commonly compose a variety of hardwood species including black birch, red maple, and white ash in combinations with white pine and hemlock.

Greenwood and Ossipee, Ponded is the final wetland soil composing only 0.25% of the total property. This soil is associated with the open water pond to the far north of the Town Forest.

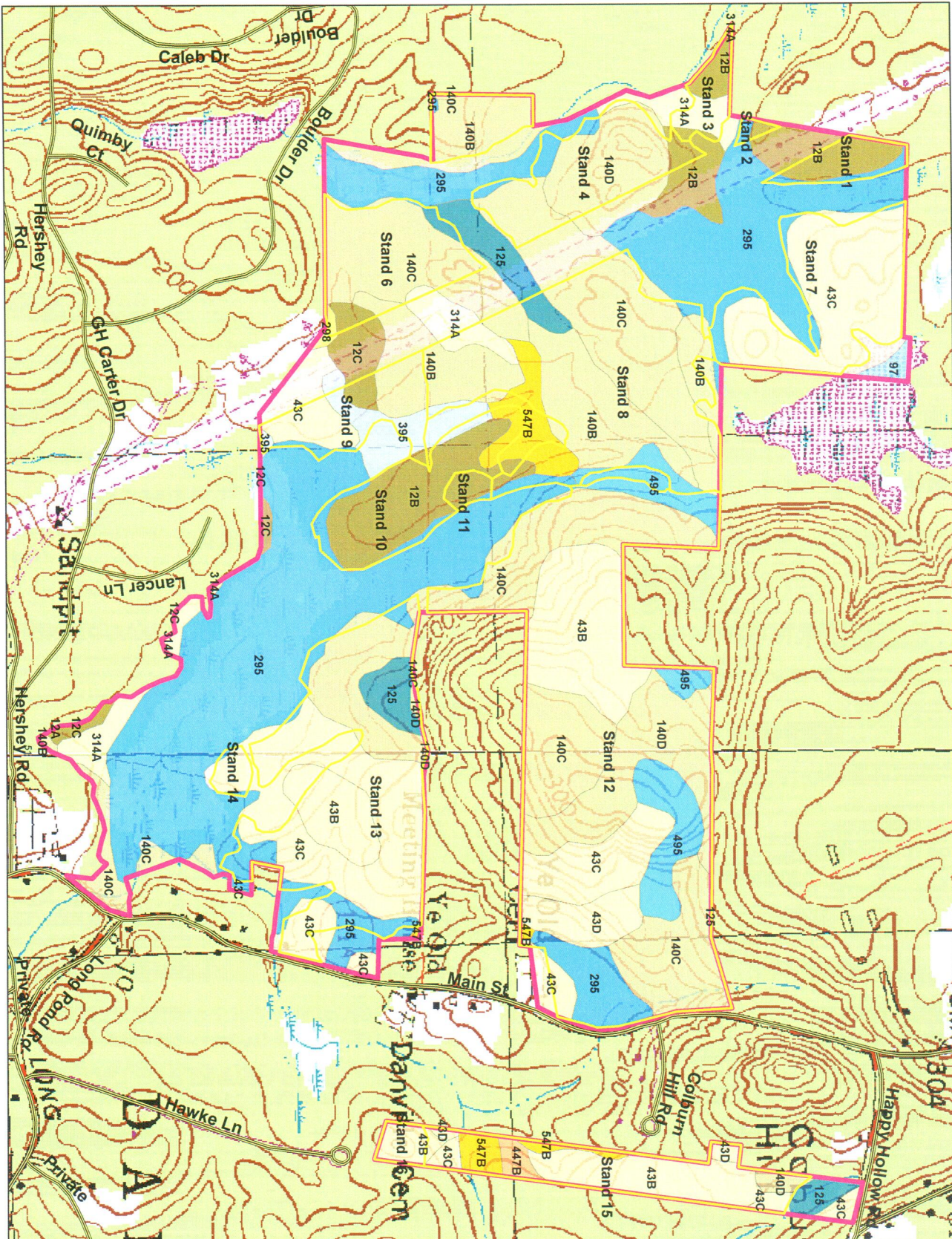
The final soil within the property is Pits, Sand and Gravel. This soil makes up the final 0.25% of the property and is mapped on the edge of the powerline easement. This soil type is not classified as a forest soil or associated with any wetlands.

Soil	Stand #	MuSym*	IFSG*	Drainage Class	Forest Trends	Percent of Property
Chatfield-Hollis-Canton complex	4, 5, 6, 8, 9, 12, 13, 15	140B 140C 140D	IB	Well drained	Hardwood	33%
Greenwood Mucky Peat	Wetlands	295	NC	Very poorly drained	N/A	25%
Canton	7, 9, 12, 13, 15, 16	43B 43C 43D	IB	Well drained	Hardwood	23%
Hinckley	1, 2, 3, 4, 6, 9, 10, 11	12A 12B 12C	IC	Excessively drained	Softwood	7%
Ossipee Mucky Peat	Wetlands	495	NC	Very poorly drained	N/A	3%
Scarboro Muck	Wetlands	125	NC	Very poorly drained	N/A	2%
Walpole	8, 12, 15	547B	IIB	Poorly drained	Softwood	2%
Pipestone	3	314A	IIB	Poorly drained	Softwood	2.5%
Chocorua Mucky Peat	Wetland	395	NC	Very poorly drained	N/A	1.5%
Scituate-Newfields Complex	15	447B	IA	Moderately well drained	Hardwood	0.5%
Greenwood and Ossipee, Ponded	Wetland	97	NC	Very poorly drained	N/A	0.25%
Pits, Sand & Gravel	Powerlines	298	NC	N/A	N/A	0.25%

*MuSym – map unit symbol (each soil type is represented by a unique symbol)

*IFSG – important forest soil group (a description of forest productivity)

Figure 5: Soil characteristics by stand.

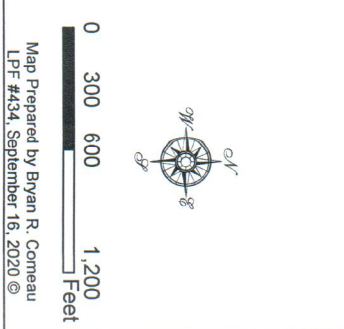


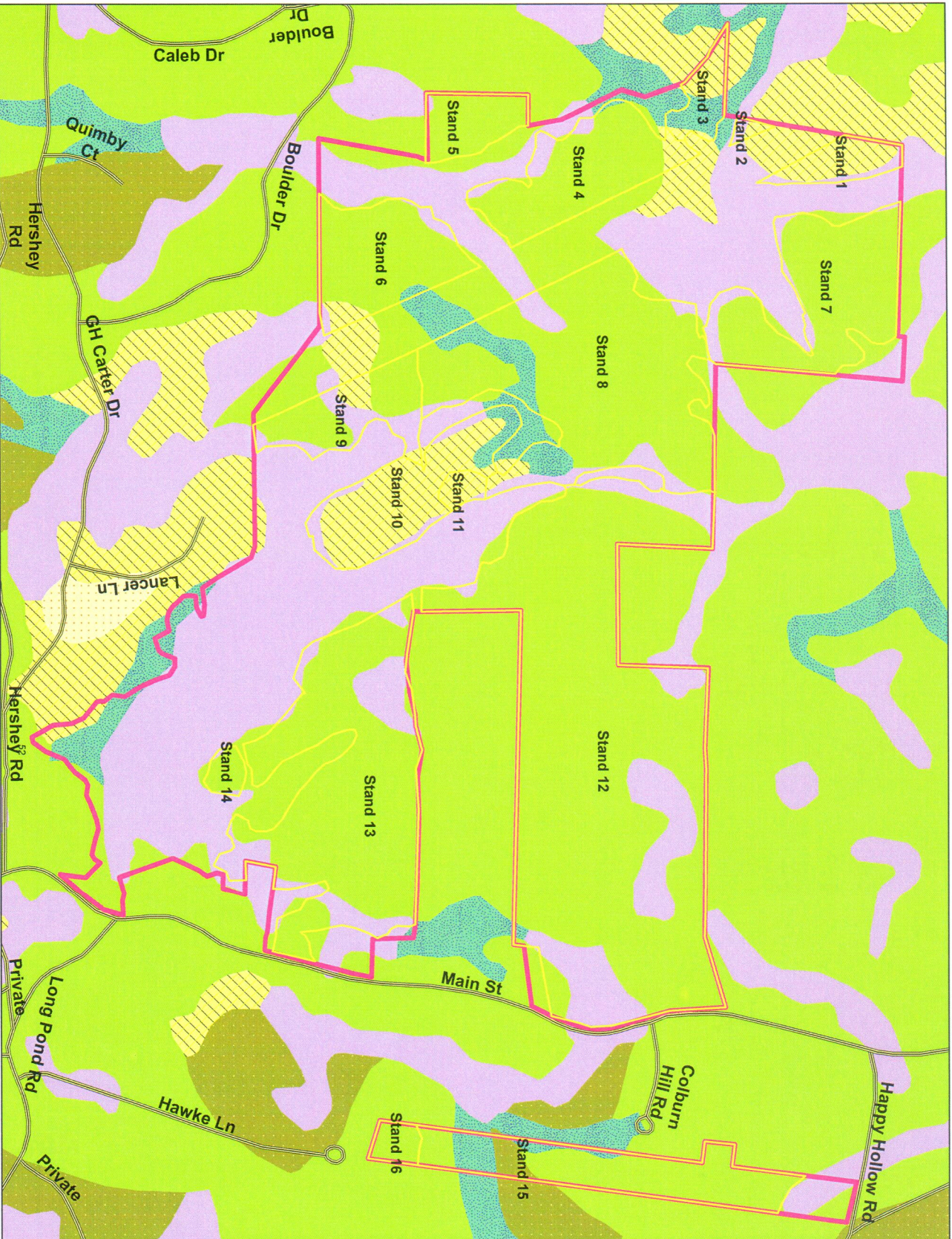
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SOIL TYPE MAP

- Stand Lines
 - Town Forest Bounds
 - Roads, DOT
 - Roads, Private
- Soil Type**
- Canton gravelly fine sandy loam, 15 to 25 % slopes
 - Canton gravelly fine sandy loam, 3 to 6 % slopes
 - Canton gravelly fine sandy loam, 8 to 15 % slopes
 - Chertfield-Holles-Canton complex, 15 to 35 % slopes
 - Chertfield-Holles-Canton complex, 3 to 8 % slopes
 - Chertfield-Holles-Canton complex, 8 to 15 % slopes
 - Chocoma mucky peat
 - Greenwood and Osippee soils, ponded
 - Greenwood mucky peat
 - Hickory fine sandy loam, 0 to 3 % slopes
 - Hickory fine sandy loam, 3 to 8 % slopes
 - Hickory fine sandy loam, 8 to 15 % slopes
 - Hickory fine sandy loam, 8 to 15 % slopes
 - Ossipee mucky peat
 - Pipestone sand, 0 to 5 % slopes
 - Pile, sand and gravel
 - Sedgwick muck, very stony
 - Schulte-Newfields complex, 3 to 8 % slopes
 - Walpole very fine sandy loam, 3 to 8 % slopes





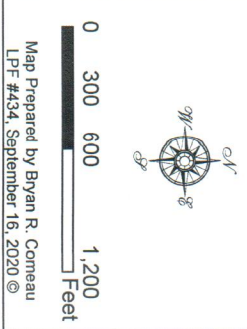
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SOILS MAP **IMPORTANT FOREST SOIL GROUP**

- Important Forest Soil Groups**
- Group IA
 - Group IB
 - Group IC
 - Group IIA
 - Group IIB
 - Not Classified (Wetland)
- Town Forest Bounds**
- Stand Lines**
- Roads_DOT**



CURRENT MANAGEMENT RECOMMENDATIONS

Forest Management

It has been several decades since the stands that make up the Danville Town Forest have seen any forestry or wildlife habitat management. The entire property is in a similar condition, and all areas would benefit from silvicultural treatments in the immediate future. Prioritizing the order and timeframe in which each management unit should be treated is based on feedback from the Town of Danville Forestry Committee, ease of access, age and health of the forest, current timber markets, and recommendations stated below based on forest stocking and composition data resulting from the forest resource inventory.

A general philosophy of larger openings to promote young forest or early successional habitats is recommended on the outer edges of the Town Forest, referred to as even-aged management. This includes patch cuts ranging from 2-3 acres in size, seed tree, overstory removal, or clear cuts of 5-15 acres, along with intermediate harvesting to promote sustainable timber growth including thinning, crop-tree release, and shelterwoods to establish desired regeneration.

The interior of the property is recommended to be managed with a “lighter” touch using uneven-aged management. Silvicultural treatments are similar for intermediate harvesting but differ when it comes time to regenerate an area to establish young forest habitats and new timber growth. Uneven-aged management promotes a mosaic of multiple ages and sizes of trees within a single large stand. A typical uneven-aged stand contains a mature sawtimber canopy, a younger mid-story of intermediate pole-sized timber, and thirdly areas of established regeneration to one day replace the mature stems as the next generation of that forest. Uneven-aged management relies on “group selection” for regeneration. Groups are small clear cuts only ranging from ¼ acre up to 2 acres. Target group openings are typically between ½-1 acre.

Even-aged Silviculture

Management Unit 1 & 5

Even-aged silviculture is recommended for the upland forest stands located in management unit 1 and 5. This includes stands 4, 5, 15, and 16. These two units are situated on the outskirts of the property and are best suited for even-aged management based on location and proximity to existing habitat features, current and long-term forest conditions, and immediate and long-term wildlife habitat goals. Management unit 1 borders the powerline easement to the west, and management unit 5 is the disjunct parcel located off Happy Hollow Road. Even-aged silviculture is a management regime which promotes forest stands of one or two age classes, typically a mature sawtimber canopy in combination with established regeneration to one day replace the mature stems as the next generation of that forest. Even-aged management is best suited for the growth and establishment of white pine and red oak stands. These two species are most prevalent in these two management units, and have excellent growth potential based on soils, site conditions, and existing seed sources.

Short term or immediate recommendations for the stands are to implement a shelterwood timber harvest with primary objectives to increase the health and growth of the mature forest stand in combination with establishing white pine and red oak seedlings for future timber growth. A shelterwood harvest will remove 30-50% of the mature canopy, depending on the current stocking of the stand, to stimulate crown expansion, growth, and seed productivity. Target residual stocking after

a shelterwood harvest is a basal area of 80-100 square feet per acre, and a relative density, or crown closure, of 50%. These treatments are recommended during dry, bare ground conditions in the summer or fall months. Appropriately timed treatments this will scarify the soils, deter hardwood stump sprouting, and prepare a suitable seed bed for the establishment of white pine and red oak seedlings. Follow up treatments typically occur 10-20 years following the initial harvest. Once sufficient regeneration is established and advanced, an overstory removal can be applied or new clear cuts can be installed if undesired regeneration is present.

Uneven-aged Silviculture

Management Unit 2, 3 and 4

Uneven-aged silviculture is recommended for the majority of the Danville Town Forest. The interior of the property contains the most sensitive natural resources including large open water wetlands, forested wetlands, streams, vernal pools, and recreation trails. This includes management unit 2, 3, and 4, and includes stands 7, 8, 10, 11, 12, and 13. These stands serve as valuable wildlife habitat for hard mast production, potential for woody browse, snags and cavities, large down woody material, winter cover, travel corridor, and water resources. Uneven-aged silviculture is a management regime which promotes a mosaic of multiple ages and sizes of trees within a single large stand. This approach opposed to even-aged management, will provide a lighter impact, and will enhance and protect the existing characteristics of the stands and habitats. A typical uneven-aged stand contains a mature sawtimber canopy, a younger mid-story of intermediate pole-sized timber, and thirdly areas of established regeneration to one day replace the mature stems as the next generation of that forest. Uneven-aged management is well suited for the growth and establishment of moderately shade tolerant species such as hemlock, white pine, red oak, and mixed-wood stands. These stands do not present the opportunity for early successional habitat management. The lack of aspen and paper birch, along with the soil characteristics presents a challenge to truly establish the early successional species. Regeneration will create young forest habitats of red oak, white oak, black birch, and white pine with similar stem densities and habitat qualities.

Long term cutting guidelines for the stand shall use a combination of thinning, shelterwood, single tree selection, and group selection for long term stand replacement. Group selection, or group cuts, is a regeneration method which removes all the stems in a delineated area, typically between ½ an acre up to 2 acres in size. The group openings will introduce full sunlight to the forest floor, stimulating the growth of new trees by native seed sources, stump sprouts, or root suckering. Thinning, shelterwood, and single tree selection are intermediate cutting methods periodically applied to enhance the health and growth of a forest stand that is not yet mature, and not yet appropriate for a complete regeneration harvest, although these methods may establish desired regeneration beneath the mature forest canopy. The combination of thinning, shelterwood, single tree selection, and group cuts are all uneven-aged techniques designed to maintain healthy and sustainable forest growth, in addition to establishing the desired regeneration and diversity of age classes within the stands for future timber development and wildlife habitats.

Short term or immediate recommendations are to implement the first stage of group selection with single tree removal in areas between or adjacent to the group openings. Establishing groups of regenerating forest will work to accomplish sustainable harvesting and habitat composition goals.

Sustainable Harvest Limits

Long term forest structure and habitat composition goals have been calculated for the Danville Town Forest based on an assessment of operable and accessible terrain, Good Forestry in the Granite State (2010) wetland buffers, current forest structure, as well as desired structure and composition. A generalized rotation age of 100 years is recommended with management entries approximately every 20 years. This will result in 5 total commercial harvests over the life of the 100-year growing rotation. Since the Town Forest has been divided into five individual management units, each unit is recommended to be treated during each 20-year entry interval. This results in forest management occurring on the Town Forest every four years. The first management unit treated, will then be re-entered 20 years later after the other four management units have each be entered one time spaced four years apart.

Area regulation was used to determine the sustainable harvest limits for regeneration. There are 235.5 total upland forest acres suitable for management across the entire Town Forest. Since harvest treatments are scheduled every 4 years, this results in approximately 9.5 acres to be targeted for regeneration with each entry, not to exceed 47 acres every 20-year cutting cycle.

Area regulation formula to calculate sustainable regeneration targets:
(groups, patches, clear cuts, overstory removal)

100 year growing rotation / 20 year cutting entries = 5 total harvests.

235.5 total acres / 5 total harvests = 47.1 acres regenerated per 20 years

5 management units to be treated / 20 year cutting entries = 4 years between treatments.

47.1 acres to regenerate / 5 management units = 9.4 acres regenerated per 4 years.

Intermediate harvesting using shelterwood, crop-tree release, thinning, or single tree selection is recommended in the areas of the management unit not being treated with a regeneration technique. The additional areas stocked with white pine, hemlock, and hardwoods should be managed with a target residual stand stocking basal area of 80-100 square feet per acre and a relative density of 50-60%. Based on the current stocking conditions of each individual stand, this may result in harvesting anywhere from 25-50% of the total stocking with the first entry in combination with the 9.5 acres of regeneration to establish young forest habitats and timber growth. This recommendation describes the maximum amount to be harvested. A harvest of a smaller scale following the same principle guidelines is also acceptable and beneficial.

Target regeneration for the Danville Town Forest is primarily mast producing hardwoods including red oak, white oak, and hickory. These hardwoods in combination with white pine and hemlock will provide a balance of future forest products along with valuable wildlife features. To meet regeneration goals, the timing and intensity of harvesting will be a determining factor. The soil characteristics present severe hardwood regeneration competition via stump sprouting and root suckering, specifically with American beech and black birch. Forestry treatments are recommended to be appropriately timed with a seed year, primarily for red oak and white pine. Many times, years that are productive seed years for red oak are also productive years for white pine, white oak, hickory, and hemlock. Timing a harvest with a seed year, in combination with soil scarification during dry bare ground periods, and the appropriate amount of sunlight being introduced to the forest floor will result in the most successful chances for meeting regeneration goals. Management activities and scheduling should also be designed to avoid conflicts, impacts, and disruption to sensitive habitats and wildlife species of concern.

Wildlife Habitats

Woodland Habitats

Wildlife habitats in these stands can primarily be a byproduct of the future forest management activities. Forest management in these stands will continue to maintain a diverse mix of wildlife habitats, including young forest and regeneration, intermediate and pole-sized stems, and mature timber growth. In addition, it will maintain softwood cover, travel corridors, feeding, nesting, and breeding opportunities. Management should specifically look to enhance hard and soft mast production where available. Existing and potential cavity trees, snags, and large down coarse woody material will be left intact to provide denning, foraging, and hibernating opportunities for several wildlife species including salamanders, and several bat species. If whole tree harvesting is used and large diameter coarse woody material is lacking within the stand, some stems of unacceptable growing stock will be felled and retained. To further enhance habitat for bats and other species who require snags and cavities, the following guidelines will be followed:

- All snags and downed woody debris will be retained on site and allowed to decompose naturally.
- At least 6 snags or cavity recruitment trees (One exceeding 18" d.b.h & three exceeding 12" d.b.h) will be retained per acre.
- Dead and dying trees within/near wetlands will not be harvested or removed.

Wetland Habitats

All wetlands, steams, vernal pools, and other potentially sensitive areas shall be protected and buffered to maintain their current condition including water quality, soil characteristics, vegetative cover, and unique habitat features specifically for Blanding's turtle, spotted turtle, Jefferson salamander, and blue-spotted salamander. Vegetative buffers will be retained along all wetland edges. The wetland and water features within the property provide a valuable and essential component for several wildlife species throughout the entire landscape. Timber harvesting laws shall be adhered, Best Management Practices for Erosion Control on Timber Harvesting Operations (2016) shall be followed, and Good Forestry in the Granite State (2010) shall be used as a guide for appropriate vegetative buffers along streams, wetlands, and ponds.

Invasive Plants

Several invasive plants were identified and mapped as part of the forest resource inventory. The primary species identified was European and Japanese barberry. These plants were typically found in clusters and located along the edge of wetlands or within stream channels. These plants can spread rapidly via wildlife, wind, root sprouts, or equipment. Invasive plant control and treatments should be applied prior to or the year following any forest management activity to prevent these species from spreading into the surrounding forests. Additional monitoring and treatments will likely be necessary following any forest management until the invasive plants are controlled to a point where native tree regeneration can be established. Entire plants should be removed including root systems. Mechanical methods such as hand pulling, cutting, or machine stumping is recommended to address the concern of these plants spreading throughout the property and landscape. Invasive plant species can out-compete native tree or shrub species degrading biodiversity, forest health, and wildlife habitats.

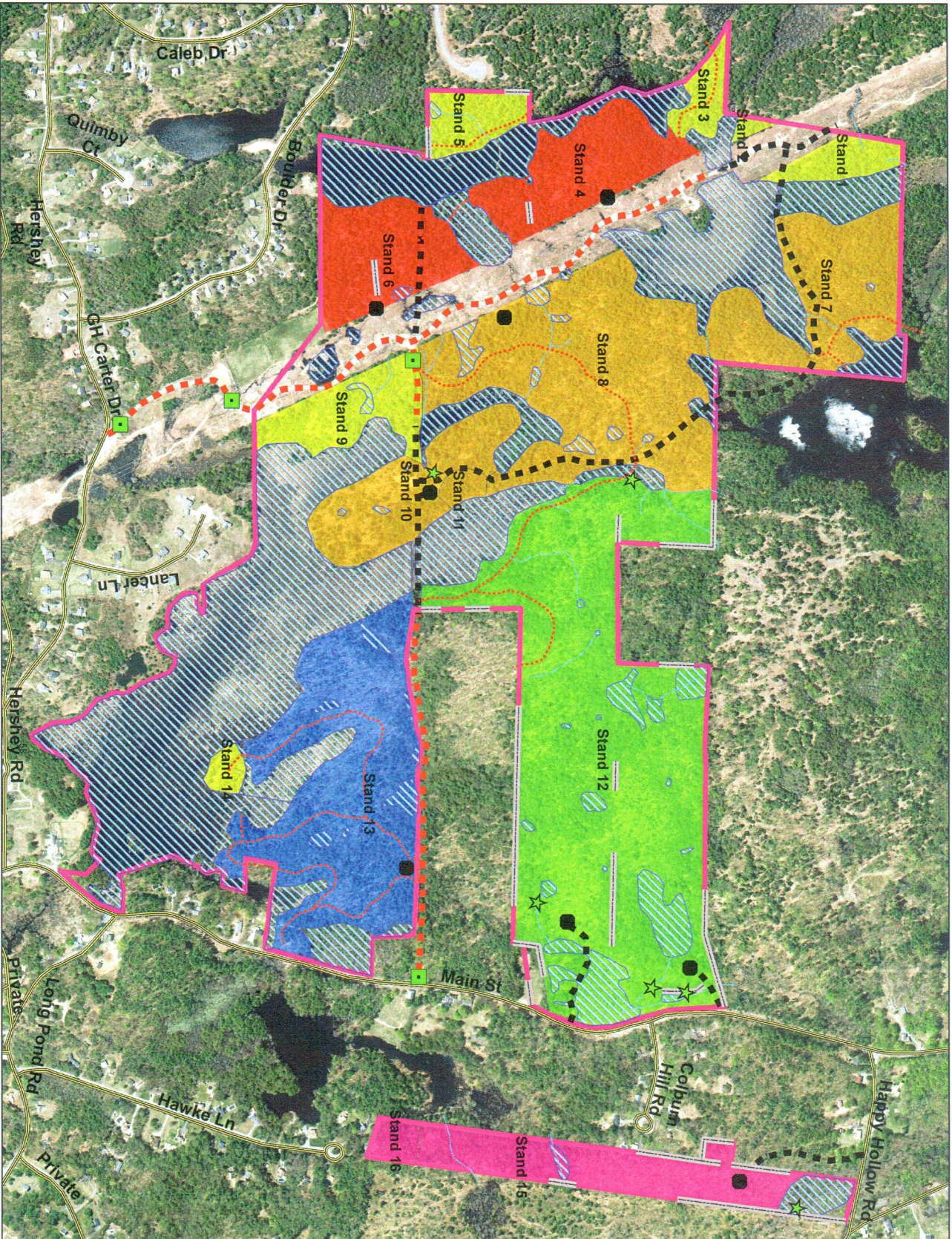
Infrastructure

Access Roads, Forest Trails and Landings

It is recommended to construct, improve, or maintain access roads, trails, and log yards in conjunction with forest management entries associated with those management units and infrastructure. It is most efficient and cost effective to have any road and/or log yard work completed as part of the forest management entry, and the costs incurred can be itemized and deducted from timber values harvested from that particular access point. Each management unit can be accessed utilizing an existing woods road or trail system. None of the management units have existing log yards that can be re-used without significant expansion and improvements. Many of the existing woods roads or trails need some maintenance and improvements. Several stream crossings should be installed, areas of erosion should be restored, and stabilizing devices installed. Permanent wetland crossings for woods roads can be included on the same Forestry Notification wetlands application that the scheduled timber harvest in that management unit will require for the temporary skid trail crossings of seasonal streams. These specific areas will be determined as part of the planning and preparation of scheduled forest management entries. All access roads, forest trails, and log yards should follow Best Management Practices for Erosion Control on Timber Harvesting Operations (2016).

Boundary Lines

It is recommended to maintain and monitor the Danville Town Forest boundary lines to prevent encroachment, trespassing, and dumping. The Town Forest contains approximately 7.2 miles of perimeter boundary lines that require continuous maintenance. This does not include interior lots lines that delineate different tax map parcels, which do not require delineation or maintenance. Doucet Survey, Inc completed a boundary survey of the Town Forest in 2006 which is registered in the Rockingham County Registry of Deeds as plot plan #D-34246. This survey provides all the information necessary to now refresh or establish hatchet blazes and paint so you can readily identify the boundary while on or adjacent to the Town Forest. This is particularly important when implementing timber harvesting and laying out trails to ensure that these activities are kept entirely within the boundaries of the Town Forest. It is typically recommended to maintain the paint and brushing of the boundary lines every 10-20 years to clearly identify and acknowledge where the property begins and ends. In this case, it is likely most efficient and cost effective to establish and maintain the boundary lines in a particular management unit as part of the planning and preparation of forest management entries in that unit. In addition, it is recommended to walk the perimeter of the property on an annual basis to monitor any disturbances that may be occurring that do not comply with the accepted uses of the property.



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PROJECT SCHEDULE MAP

- Potential Log Yard
 - ★ Invasive Plants
 - Gates
 - Stonewall
 - Rec Trail
 - Woods Road/Impassable
 - Woods Road/Passable
 - Seasonal Stream
 - Wetland
 - Roads_DOT
 - Town Forest Bounds
- Treatments**
- 1-even-aged 2033
 - 2-uneven-aged 2021
 - 3-uneven-aged 2037
 - 4-uneven-aged 2029
 - 5-even-aged 2025
 - No Cut

SCHEDULE OF IMPLEMENTATION

All financial statements are estimates based on current market conditions and average rates at the time this report was written. Actual financial figures will vary at the time of implementation. Costs associated with boundary lines will become significantly lower after the initial entry of blazing and painting. Future entries will likely only require a refreshing of the paint, and this task could potentially be completed by volunteers. Costs associated with access roads and log yards will be a one-time expense. Once access is established for each management unit that infrastructure can be re-used for all future forest management. The actual order of priority is subject to change based on timber markets, desired seed production, financial needs, or political decisions. Regardless of order, the general philosophy and management approach will remain the same.

2021 – Management Unit 2

- Blaze and paint boundary lines. Estimated costs \$550.00.
- Utilize existing road along the powerline easement. Establish access road and log yard in Stand 8 for forest management. Estimated costs \$3,500.00
- Group and single tree selection harvest in stands 7 and 8. Target residual stocking of 100 square feet of basal area per acre and establish 9.5 acres of groups for young forest regeneration. Estimated revenue \$45,000.00
- Mechanically treat any invasive plants found in Management Unit 2, including wetlands. Estimated costs – use volunteers to hand pull invasive plants.
- Re-enter management unit 2 in 2041 to implement next series of group selection establishing another 9.5 acres in regeneration.
- Example of 2021 financial summary:
 - Revenue + \$45,000
 - Forester Services (15%) - \$6,750
 - Boundary lines - \$550
 - Access road and log yard - \$3,500
 - Balance \$34,200.00

2025 – Management Unit 5

- Blaze and paint boundary lines. Estimated costs \$750.00.
- Establish access road off from Happy Hollow Road and log yard in Stand 15 for forest management and public access and parking. Estimated costs \$5,500.00
- Shelterwood harvest in stands 15 and 16. Target residual stocking of 80 square feet of basal area per acre and/or 50% relative density (crown closure). Estimated revenue \$20,000.00
- Mechanically treat any invasive plants found in Management Unit 5, including wetlands. Estimated costs – use volunteers to hand pull invasive plants.
- Re-enter management unit 5 in 2045 to implement overstory removal or clear cut.
- Example of 2025 financial summary:
 - Revenue + \$20,000
 - Forester Services (15%) - \$3,000
 - Boundary lines - \$750
 - Access road and log yard - \$5,500
 - Balance \$10,750.00

2029 – Management Unit 4

- Blaze and paint boundary lines. Estimated costs \$750.00.
- Utilize 800 feet of Tuckertown Road off from Route 111A. Construct a log yard in Stand 13. Estimated costs \$2,500.00
- Group and single tree selection harvest in stand 13. Target residual stocking of 100 square feet of basal area per acre and establish 9.5 acres of groups for young forest regeneration. Estimated revenue \$40,000.00
- Mechanically treat any invasive plants found in Management Unit 4, including wetlands. Estimated costs – use volunteers to hand pull invasive plants.
- Re-enter management unit 2 in 2049 to implement next series of group selection establishing another 9.5 acres in regeneration.
- Example of 2029 financial summary:
 - Revenue + \$40,000
 - Forester Services (15%) - \$6,000
 - Boundary lines - \$750
 - Access road and log yard - \$2,500
 - Balance \$30,750.00

2033 – Management Unit 1

- Blaze and paint boundary lines. Estimated costs \$550.00.
- Utilize existing road along the powerline easement. Establish access road and log yard in Stand 4, utilize existing log yard on the edge of the powerline easement in Stand 6. Estimated costs \$3,500.00
- Shelterwood harvest in stands 4 and 6. Target residual stocking of 80 square feet of basal area per acre and/or 50% relative density (crown closure). Estimated revenue \$20,000.00
- Mechanically treat any invasive plants found in Management Unit 5, including wetlands. Estimated costs – use volunteers to hand pull invasive plants.
- Re-enter management unit 1 in 2053 to implement overstory removal or clear cut 9.5 acres.
- Example of 2033 financial summary:
 - Revenue + \$20,000
 - Forester Services (15%) - \$3,000
 - Boundary lines - \$550
 - Access road and log yard - \$3,500
 - Balance \$12,950.00

2037 – Management Unit 3

- Blaze and paint boundary lines. Estimated costs \$750.00.
- Improve old woods road off from Route 111A and construct log yard in Stand 12 for forest management. Estimated costs \$7,500.00
- Group and single tree selection harvest in stand 12. Target residual stocking of 100 square feet of basal area per acre and establish 9.5 acres of groups for young forest regeneration. Estimated revenue \$45,000.00
- Mechanically treat any invasive plants found in Management Unit 3, including wetlands. Estimated costs – use volunteers to hand pull invasive plants.

- Re-enter management unit 3 in 2057 to implement next series of group selection establishing another 9.5 acres in regeneration.
- Example of 2025 financial summary:
Revenue + \$45,000
Forester Services (15%) - \$6,750
Boundary lines - \$750
Access road and log yard - \$7,500
Balance \$30,000.00

SUMMARY OF TIMBER VOLUMES

<i>SPECIES</i>	<i>PRODUCT</i>	<i>UNIT</i>	<i>VOLUME</i>
White Pine	Sawlog	MBF	1,821.719
Red Pine	Sawlog	MBF	27.912
Hemlock	Sawlog	MBF	160.867
Red Oak	Sawlog	MBF	745.365
White Oak	Sawlog	MBF	95.670
Black Oak	Sawlog	MBF	67.116
Hickory	Sawlog	MBF	3.288
Red Maple	Sawlog	MBF	24.155
Sugar Maple	Sawlog	MBF	3.586
Black Birch	Sawlog	MBF	10.482
White Birch	Sawlog	MBF	1.718
American Beech	Sawlog	MBF	14.989
Softwood Totals	Sawlog	MBF	2,010.499
Hardwood Totals	Sawlog	MBF	966.369
Softwood Totals	Pulp	TON	4,248.51
Hardwood Totals	Pulp	TON	6,644.42
<i>All Sawlog Totals</i>		<i>MBF</i>	<i>2,976.868</i>
<i>All Pulpwood Totals</i>		<i>TON</i>	<i>10,892.93</i>

Figure 6. Summary of Timber Volumes for the Danville Town Forest.

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