

**Forest Management Plan for the
Twenty Mile Brook Lot aka The Parkhurst Wild Lot**

33 acres

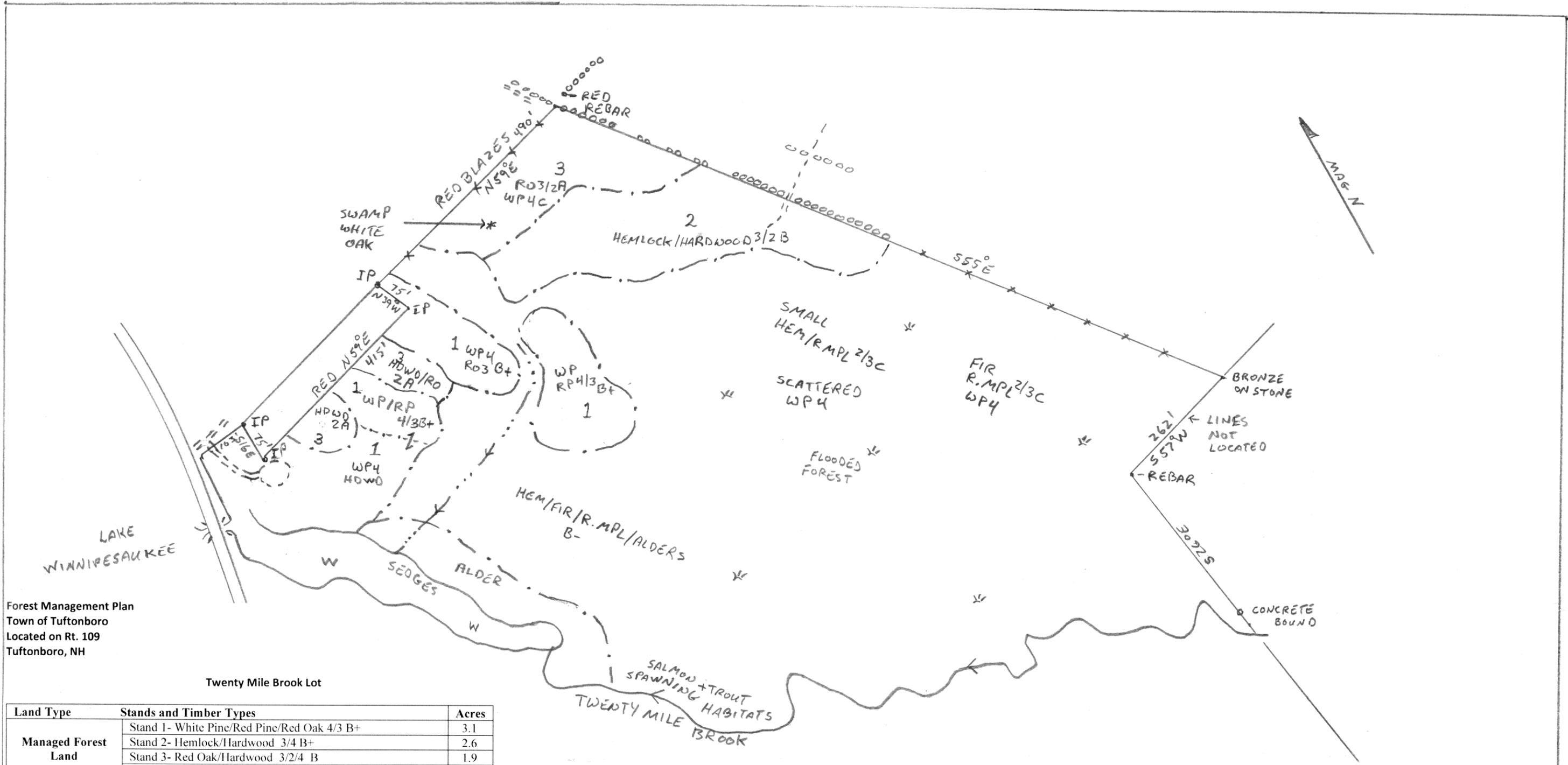
Rt. 109

Center Tuftonboro, NH

January 2021

Daniel A. Stepanauskas
Licensed Forester NH #138
135 High St.
Silver Lake, NH 03875
603 367-8111
norfor@roadrunner.com

Daniel A. Stepanauskas Date



Forest Management Plan
 Town of Tuftonboro
 Located on Rt. 109
 Tuftonboro, NH

Twenty Mile Brook Lot

Land Type	Stands and Timber Types	Acres
Managed Forest Land	Stand 1- White Pine/Red Pine/Red Oak 4/3 B+	3.1
	Stand 2- Hemlock/Hardwood 3/4 B+	2.6
	Stand 3- Red Oak/Hardwood 3/2/4 B	1.9
	Total Forest Acreage	Subtotal 7.6
Other	Forested Wetlands, Marsh, Riparian Forest	25.25
	Access Road, Parking Lot	.15
Total Acreage		33

TREE SIZE CLASSES

- 1. Saplings
- 2. Poles 2-8 in Diameter Breast Height (DBH)
- 3. Small Sawtimber 8-14 in DBH
- 4. Large Sawtimber 16+ in DBH

TREE DENSITY

- A. Overstocked
- B. Adequately stocked
- C. Understocked

Prepared by: Daniel Stepanauskas, NH Forester #138
 135 High St.
 Silver Lake, NH 03875
norfor@roadrunner.com
 603-367-8111

Dan Stepanauskas
 FORESTER

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- Vernal Pool - VP
- Timber Type Line - - - - -
- Permanent Stream - - - - -
- Intermittent Stream - - - - -
- Wetland *
- Stone Wall ooooo
- Wire Fence x-x-x
- Trail - - - - -
- Truck Road =====
- Log Landing Area L
- IP- Iron Pipe (boundary line corner)

Map Key

TIMBER TYPES

- WP- white pine
- RO- red oak
- HM- hemlock
- HDWD- hardwood species
- SFTWD- softwoods

Tree Density

- A. Overstocked
- B. Adequately stocked
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Ex. WP/RO 3A

Scale: 1 inch = 200 +/- ft.

Twenty Mile Brook Forest Management Plan 2022

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Introduction

This forested property is identified in the Tuftonboro town tax maps as Map- 28, lot- 2-5. The parcel is 33 acres in size, and is owned by the Town of Tuftonboro.

The Twenty Mile Brook Lot provides an opportunity for the public to view forests of high quality, old pine, a vigorous stand of tall mixed hardwood forest, as well as a productive wetland ecosystem. In previous decades, old forests, such as this, were common in the Lakes Region of New Hampshire. This property is well suited for the public to view how our New Hampshire forests can develop. The property's readily accessible parking area, which provides both a trailhead and kiosk, make this lot well suited for educational and recreational use.

Management Objective

- The primary goal for this tract is to manage the array of ecosystems and forest diversity on this land to ensure that it continues to provide for the benefit of all native species of plants, fish, and wildlife.
- Forest management of this land shall be limited to the harvest of trees that are imperiled by pathogens. There will also be limited timber stand improvement in the understory of the forest for habitat improvement.
- These objectives shall be carried out while ensuring that the public has continued access to view old, undisturbed forest ecosystems.

History

A small timber harvest took place here 25 to 30 years ago, when the neighboring property was being harvested. This harvest concentrated on mature white pine trees, and primarily resulted in hardwood regeneration. In Stand 1 there were white pines harvested, with the red pines left in place. Ten years ago, a Town parking area and Kiosk were constructed between the Feeley property (tax lot 28 lot 3) and Rt 109.

Location

This land is located on the east side of Rt. 109 in the Town of Tuftonboro, NH. The property's long southern boundary is the thread of Twenty Mile Brook.

Recreation

The property is not posted, and is open to the public for walking, skiing, snowshoeing, fishing and hunting. There is a trail on this property, which begins at a kiosk in the small parking area on just off Rt. 109.

Topography

The land gently slopes down to both Rt 109 and to Twenty mile Brook. There are no significant slopes present on the property, although the gentle elevation slope between the wetland to the forest creates a moist, gradual forest edge.

Boundaries

The western line, which parallels Chandler Road, has a bearing of N 59 E. It is well blazed with red paint. The longest boundary line runs for 2200 feet at N 55 W along a stone wall which ends in a large stone pile, after which the line continues with stone piles, or wire fencing. This line needs to be re-painted. The opposite side, being the southern line, is along the thread of Twenty Mile Brook. This circuitous line is 2600 ft.+/- long. Corner markers were found in all locations on these lines. The eastern lines along the former Union Wharf lot (tax lot 42-1-5) is where neither of the boundary lines, nor the corners, were located by the forester. This line was last documented in 1972, when the corners were set. This line should be located and painted soon. Please see the enclosed forest type map for more information on this.



Twenty Mile Brook-above the marsh

Wetlands and Waterbodies- 25.25 acres

Twenty Mile Brook provides Lake Winnepesaukee. A short distance upstream from the brook's crossing with Rt 109, the brook begins to have a slope with moving water, which helps provide a well oxygenated water source to the lake. The wide wetland along the shoreline of Twenty Mile Brook provides major forested and shrub wetlands on this property. This extensive seasonally flooded landscape provides a wealth of habitat for neo-tropical songbirds, snowshoe hares, accipiters, and all manner of mammalian predators. The alder swamp, which extends into the wooded wetland in

patches, was particularly rich with wildlife sign. All wetlands in the State of NH are under the auspices of the NH Wetlands Board.

Forest Protection

The Twenty Mile Brook lot is, and will continue to be, owned by the Town of Tuftonboro. This is the only forest protection that this land currently has in place. However, this land has inherent land protections in place. Much of the property has a high water table, and so development does not seem feasible here, due to NH's excellent wetland regulations. The 30 or so feet of frontage on Rt 109 is very wet limiting access to the land.

Access

The property's access to Rt 109, is via a shared driveway with a house, presently owned by Jeremiah Feeley. This narrow drive crosses two culverts, and turns sharply to access the small parking area with a trailhead and kiosk. This limited access would not suffice for any timber work on the property. Access for this purpose would have to be arranged via a right-of-way from Chandler Road through the abutting lot (Map 28 lot 3). There is a light distribution of glossy buckthorn growing at the parking area which must be cut back yearly to prevent its spread (see Activities Schedule).

Cultural Resources

The predominant cultural resources on the land are its stone walls, and wire fences. There were no other cultural resources found by the forester on the land.

Forest Health & Invasive Species

A recent finding of the southern pine beetle in Ossipee poses a distinct threat for the long-term health of our hard pines, red pine and pitch pine. We do not yet know how significantly outbreaks of cold weather, such as we have had in January 2022 (-15F), will delay this insect's population growth. Regardless, low temperatures are not a long-term solution, and the infestation bears watching (See Climate). Red pine trees in NH are also subject to the red pine scale which is firmly established just south of the Lakes Region, in the area around Concord, NH, and as far north as Milton, NH. This small insect kills all of the red pines once it arrives. Both of these insects are native to the US, and have arrived from the south, due to climate change.

An invasive plant found on this tract was a small population of glossy buckthorn adjacent to the parking lot. The invasive plants which currently pose the greatest threat to forest ecology in NH are the European buckthorn species, both the glossy and the common buckthorn. The buckthorns shrubs should all be cut off yearly to prevent their spread on this parcel. It is important that this shrub never become firmly established here, for it can form an understory canopy which is able to prevent the growth of any ground vegetation, trees seedlings, or shrubs. There is a population of Asian bittersweet entrenched on a neighboring lot. This species is very damaging, and can climb into the crowns of tall

pine trees. It does not thrive in a closed canopy forest, however, it should be cut off wherever it is found on Town lands. The invasive hemlock wooly adelgid exists in Tuftonboro, and will begin to cause our hemlock trees to gradually decline and perish over time. The forester had a long discussion with NH's Forest Pathologist Kyle Lombard, while preparing to write management plans for the Town of Tuftonboro. Kyle spoke to the fact that the hemlock wooly adelgid seems to have reached its current northern-most point where it can cause serious damage in northern Strafford County or southern Carroll County. Our current winter low temperatures (-5 f) being cold enough to kill 95% of the adelgid population. As the climate continues to warm, this control mechanism will become less effective. However, there is hope, as biological controls have been implemented in NH. A few species of Asian black beetles have been released throughout NH. The beetles have been found to prey solely upon the Asian hemlock wooly adelgid, and they hold promise. The western silver fly, native to the pacific coast, holds even greater promise for long-term adelgid population control if it imitates the biological controls of the adelgid for western hemlock on the US West Coast.

The ash trees on this property have already been infected with the emerald ash borer. Non-stinging wasps are being introduced to lay eggs into the larvae of the ash borers. The small ash trees, not yet having developed the ash's corrugated bark, and may not be affected by the borer. These trees may live to see the biological controls lead to a reduction in the borers impacts. There are white ash on this property, although the population level is insignificant.

Aesthetics

The trail proceeds from the kiosk in a NNE direction until it crosses the northern boundary line into Map 28 lot 2-3. The trail passes through a forest with some large white pines, along with a rich moist forest with tall red maple, red oak and sugar maple trees. The wetland is close by, east of the trail. It is likely that there are rich populations of both forest and wetland birds present in this forest, and also in and along the wetland.

Rare and Endangered Species

The NH Heritage Bureau (see Addendum) conducted a data check found four species on this property that are rare, threatened or endangered either on this land, or close by. There are two plant species that are ranked as endangered in NH, the dragon's mouth orchid, and the northern sweet coltsfoot. There are also two birds cited, the pied billed grebe, and the marsh wren. Grebes are interesting aquatic birds, with narrow short bills, that swim and dive to catch aquatic insects, and small fish. The species addressed in the Report must be protected from disturbance. No activities carried out on the property will negatively impact the species cited here.



The Base of a Large Swamp White Oak



A Swamp White Oak Crown- in need of release

Wildlife

The Twenty Mile Brook parcel has a large wetland on it, along with interesting bands of diverse forest types along its western and northern edges. In the alder swamp patches there was sign of mink, deer and snowshoe hares. A wonderful, large swamp white oak tree is present close to the western boundary line in Stand 3. These rare trees exist in the Winnepesaukee and Squam Lakes watersheds. Swamp white oaks trees are rare and grow on sites with a high water table, most often either adjacent to or on the edge of a wetland. Their acorns are among the sweetest to be found in the northeastern United States, and are therefore a favorite for wildlife species. White oak acorns fall earlier than the red oak, and are higher in fat and caloric content. This tree has a broad healthy crown. This crown condition should be monitored to ensure the continuing vigor of this rare tree, which is so valued by wildlife (see Stand1). There is a small stand of healthy, tall red oak trees situated along the Feeley property line. All mast (nut bearing) trees greatly benefit a multitude of wild creatures such as deer, bear, grouse, and turkeys, along with a large number of smaller birds and mammals. The release of trees with strong mast production allows for the development of large, super-canopied trees. Deer use the alder swamps along Twenty Mile Brook extensively during the winter, where low-level wetland shrubs provide a good source of available browse. A relatively short distance upstream from Rt 109 Twenty Mile Brook becomes a free-flowing brook flowing over a stone bottom, which would likely qualify for the NRCS's program of adding woody material to streams to improve the habitat for brook trout.

Timber stand improvement can encourage the growth of soft mast (fruit) in the forest. A forester shall teach an individual how to identify and release suitable trees and shrubs in order to increase production of fruit, nuts and browse, and softwood regeneration. Good sources of soft mast include black cherry, serviceberry (colloquially known as sugar plums), Rubus species (raspberry, blackberry, dewberry, and thimbleberry), blueberry, apple, hobblebush, viburnum, partridgeberry, bearberry and wintergreen etc. The soft mast sources on this property include partridgeberry, raspberry, serviceberry and black cherry. A mature well-managed forest provides ample food sources for our native wildlife and birds. This forester has seen sign of white tailed deer, turkey, grouse, and snowshoe hare on this tract.

Forests for the Birds

The forested wetland is the largest land type on this property. Birds that depend upon this forest type for breeding habitat include the Canada warbler, and the yellow-bellied flycatcher. These birds rely upon the hummocks, root balls and downed woody debris that are common in forested wetlands due to the taller trees being readily blown over. The ferns, shrubs and low tree canopy in these sites contribute to the habitat requirements for these birds.

The sedge and shrub swamps at the lower end of Twenty Mile Brook provide habitat for the alder flycatcher and the American woodcock. Cavity nesting bird habitat is dependent upon trees that can be easily excavated into nesting cavities. Senescent (easily excavated) tree species such as aspens, white pine, basswood, and red maples are all well-suited for cavity excavation by birds. There are large

standing, dead white pines, and now white ash, to fulfill this need. The birds and mammals using these habitats include kingbirds, flickers, woodpeckers, nuthatches, wrens, flycatchers, tufted titmice, barred and saw-whet owls, along with flying red squirrels, and fishers.

The old hemlock trees in Stand 2 are a particularly desirable habitat for many forest birds. These include the black throated green warbler, magnolia warbler, and Blackburnian warblers, along with blue headed vireos and ovenbirds. There are some old white pine trees on the property, particularly along the eastern boundary line, for bird roosting and nesting. The development of multi-layered tree and shrub canopies greatly enrich bird habitats, along with the ability to sequester a higher amount of carbon dioxide per acre. Additional softwood regeneration will be a goal on this property, which will improve habitats for the Canada warbler, the black-throated blue warbler, the wood peewee, along with the bats.

Woody debris

Large downed woody material is referred to as coarse woody debris. There is a good supply of this material in areas of this property due to its wet soils causing trees to blow over, along with some old white pine trees falling over. Nearly all of this forest has ample wood on the forest floor, which is a significant feature for the maintenance of biodiversity in a forest. It provides habitat for a wide array of organisms from insects and amphibians, to bears, and drumming locations for ruffed grouse. The goal is to leave woody debris (slash)* throughout this forestland. Coarse woody debris is large chunks of naturally fallen trees. These large pieces last a long time and are valuable as den sites, shelter, and habitat for mammals, birds, reptiles, insects, and amphibians. Bears and woodpeckers use them extensively for feeding on grubs, they serve as drumming locations for ruffed grouse, and provide direct and indirect food sources for all manner of forest creatures. Large woody debris is also very beneficial as a repository of miccorrhizal fungi, which provide a symbiotic relationship with tree roots. The fungi provide minerals and soil nutrients to the roots, while the trees return the favor by providing carbohydrates to the fungal mycelium. There are numerous natural relationships of forest organisms that are inherent in older, multi-aged forests, and most of these relationships are not readily apparent. These benefits provide many important reasons to maintain our forests in this condition.

Vertical Structure and Crown Closure

Vertical structure is the layering of both live and dead, woody plant crowns within a forest stand. One goal of management, with regard to vertical structure, is to maintain diverse age classes and to have varying degrees of crown closure* throughout the forest. Over much of this forest the structure is rich with snags, along with some shade tolerant old hemlock trees in Stand 2, providing perches for forest birds on their dead lower limbs. These uneven age older forests are well stratified with layers of limbs and understory trees which support a far greater array of plant and animal species than even-age stands or younger trees do. Typical late successional (shade tolerant) overstories in north-central NH are composed of hemlock, spruce, beech, yellow birch, sugar maple, and red maple along with red oak, and basswood. In this forest, red oak and red maple are the predominant large hardwoods present in the stands.

Uneven-age management, which encourages the growth and layering of vertical crown structure, is important to the habitat requirements of many mid-story songbirds. In Stand 2, there is an uneven distribution of old hemlocks and hardwood trees, along with a good mid-story vegetation layer. Hemlocks have deep crowns due to their shade tolerant limbs' ability to stay alive. If a timber harvest were to take place in this forest due to imminent mortality from the hemlock woolly adelgid, one goal would be the regeneration of an understory having both desirable future canopy tree species, along with a layer of shade tolerant shrub layers with species such as the maple leaf viburnum, hobblebush, and hophornbeam. Tree species such as red spruce, hemlock, beech, and sugar maple are shade tolerant and can survive for many years in the understory (advance regeneration). These saplings have the ability to begin rapid growth whenever a timber harvest or a natural disturbance allows the sunlight to penetrate to the forest floor.

Climate Change

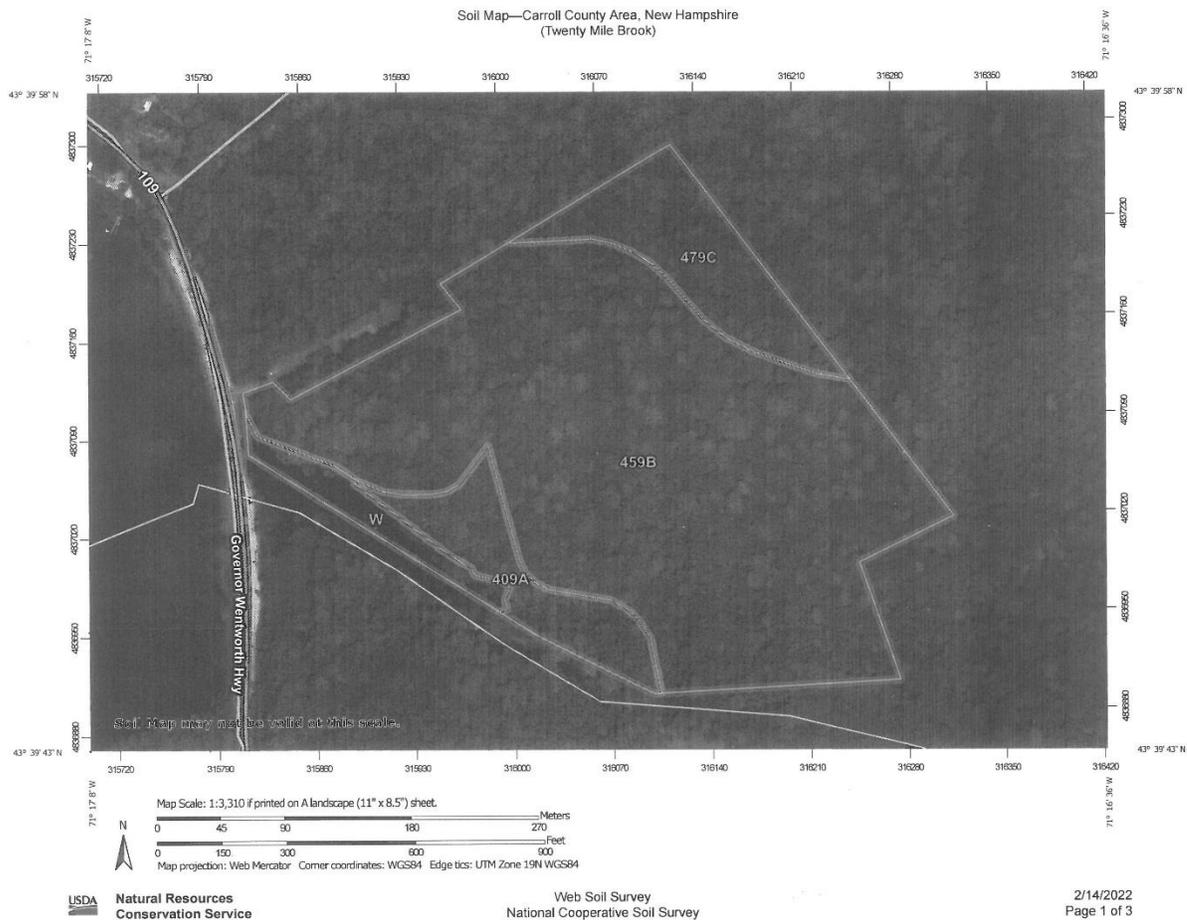
Currently, a leading consideration for our forests is the warming of our climate. Most of our trees take 85+ years to mature. There is a wide range of species projected to decline in the warming trend, fir, spruce, paper birch, aspens, etc. along with the hemlocks, and red pine due to invasive species that are arriving due to our warming climate. The species that we wish to regenerate on the land will be those trees possessing a genotype and phenotype projected to endure or thrive in the warming weather scenarios. The US Forest Service's projections are that red and white oaks, maples, and white pines will do well in our changing climate, while our other softwood species will all be challenged. In NH, with our extensive softwood soil sites, we must pay close attention to these trends and start now to adapt our forest compositions accordingly. This is silviculturally accomplished by the harvest or retention of selected tree species, the season of harvest to aid in softwood regeneration, the size of harvest openings, and the years chosen for harvest coinciding with the seed production of the tree species you wish to regenerate. A forester can silviculturally provide a gentle nudge to the species composition to proportionally increase those species that are projected to thrive in the future. Even so, maintaining a diversity of species along with maintaining high stocking levels remains a safe mechanism.

Certain trees have already begun to decline, both due to the reduction of calcium levels in the soils as a result of acid precipitation, along with the introduction of alien insects and pathogens. Paper birch and white ash, even prior to the ash borer, have no longer been living as long as they once did due to soil acidification, drought cycles, and climate change (research by Cornell University).

Fieldwork

A forest inventory was not conducted on this property, as the area which could be managed for timber resources is too small. A systematic point sampling was conducted, where at each point location an assessment was made of forest conditions, land history, habitat features, species present, tree health, tree pathogens, bird and wildlife sign.

Soils & Descriptions



The soils data below is useful in deciding how to manage this land. Soils are the basis of terrestrial life, and have immense value in determining which tree species to encourage and propagate on the land.

409 Limerick- silt loam 3.1 acres- The silt inherent in this floodplain soil would provide a high site index for the growth of hardwood trees were it not for its high water table. As it is, there are areas in Stand 2 that are elevated above the floodplain and do provide this high site index.

459 Metacomet- sandy loam 21.9 acres - Metacomet soil is well suited to the growth of white pine and red oak, although the trees will be a bit shorter due to its reduced site index. The coarse soil particles here lead to lower available water capacity, and nutrient levels. The soil is best suited to the growth of softwood trees.

479C Woodbridge- fine sandy loam 4.4 acres - This area of Woodbridge soil has a high water table within a soil with a good supply of available nutrients due to its basic rich composition. It also has a high surface ratio within its fine particles allowing tree roots to come into direct contact with the mineral surfaces, and thereby directly absorb nutrients from the soil.

General Silviculture and Forest Health

On the Twenty Mile Brook parcel there are stands of large trees. Maintaining these intact stands is a priority. Stands such as the old white and red pines present here have become rare in our region due to overharvesting, in which a short-term view has been taken for a long-lived biological and economic resource. This has in turn led to a future in which our forests are now growing the wrong species of trees on ill-suited soils generations to come. It would seem that the time has arrived for a paradigm shift in how we manage our forests.

The forests in northern New England are diverse in both age class and species distribution. Therefore, written silvicultural prescriptions are but generalizations, as the composition of each location in a forest stand varies considerably. Only by careful selection of when, if, and how to manage, can the best decisions be made for the management and regeneration of our heterogeneous forests. Higher site index locations, with their good moisture levels, rich soils, and favorable slope positions, allow timber to be maintained at higher stocking levels, while conversely, lower site indexes, should be maintained at lower ranges of the allowable stocking levels in order to encourage trees to grow at a healthy rate. During any large stand thinning there must be areas in each stand which are not included in the harvest area. There are numerous benefits to leaving exclusion zones in any harvest area. Wildlife are drawn of these uncut areas for shelter, nesting, and feeding. There is also the benefit of full crown closure increasing the proportion of standing snags* in these excluded zones to the benefit of numerous bird and mammal species. Light harvests allow for an on-going sustainable yield in a forest stand for a long period of time. A general rule of thumb is to leave a basal area of 90-110 ft²/acre in a harvested hardwood stand with 120 ft²/acre in softwood stands.

Timber

Timber harvesting is a low priority for this property. The small acreage of manageable forest land, along with the lack of access for this purpose, makes economic timber harvesting impractical. However, there may be special circumstances that would warrant it, (see Stands below).

A general prescription in these forest stands would be to have a person conduct timber stand improvement. This goal of this work will be to release desirable tree regeneration, along with shrubs and trees to improve wildlife habitat and to control invasive species. The forester spending time with the person hired to conduct the work, could orient the contractor to achieve these specific objectives.

*see glossary



Large White and Red Pine in Stand 1



A Patch of Dense Red and White Pines Growing in Stand 1

Stand 1- White Pine, Red Pine, Red Oak 4/3 B/A- 3.1 acres

Stand Description

These small stands of large white pine, red pine, and red oak trees contain some very old trees. There are red pines in stand 1 that are very old, along with white pines are nearly as old. There are also younger red oak sawtimber trees present. Sawtimber* refers only to the size class and potential use of a tree.

*see glossary

Prescriptions

The majority of the high canopy in this stand is composed of white and red pines. Tall white pine trees adjacent to Lake Winnepesaukee can provide roosting and perhaps nesting sites for our large aquatic raptors, bald eagles and ospreys. Despite their ages, these trees are not showing signs of any broad-based decline. Some trees do have significant decay, and as their bases continue to decay the trees will be blown over, and will then add to the land's richness in ecological attributes. There are also some good quality red oak sawlog trees in the stand, along with some larger hemlocks. The oldest red pines in this stand could be as old as 250 years, or older. These trees should not be harvested. A reason to sway from this prescription would only occur if one of the entomological threats that are due to arrive for red pine, or hemlock, become imminent threats to their survival (see Forest Health). These two native climate related threats are the red pine scale, and the southern pine beetle (see Forest Health). If this occurs, the logs in these trees, which have very narrow growth rings, would be an irreplaceable asset for the Town to immortalize. This could perhaps take place in a building belonging to the Town of Tuftonboro, with a label informing the public about the log, or timbers, their age and source.

Softwood stands of this age develop a unique forest floor which cannot be replicated by any other means than very long periods of time without disturbance.



Moist Soils Growing Red Oak, Red Maple and Hemlock in Stand 2

Stand 2- Hemlock/Red Maple/Red Oak/ White Pine 3/2/4 B- 2.6 acres

Description

This stand is primarily situated where the land begins its descent towards the Twenty Mile Brook bottomlands, where the forest gradually transitions to a wooded swamp. This transition is irregular with islands of other forest types in the stand. The timber type line drawn on the type map shows where the forester feels timber harvesting should no longer take place, due to the high water table. The western portion of the stand is a manageable forest. Within the limitations posed by soil moisture levels, this stand is fully stocked.

The forest in this stand is dominated by two species. The first is the eastern hemlock, followed by the red maple. These two species encompass 80% of the forest's tree stocking levels. There are also red oak, white pine, dying white ash, red spruce, and balsam firs present in the stand.

Prescriptions

This stand is also best left unmanaged for timber. The public can see what this untouched forest offers. It is good to visit during the winter. Any timber harvesting in this stand shall be limited to a special circumstance situation, where access would be granted over the neighboring property, that being Map 28 lot 3, to Chandler Road. A timber harvest in this stand, would likely be precipitated by the decline of the hemlock, due to the hemlock wooly adelgid. A Harvest using a small cut-to-length operation would be the preferred harvest method. These operations have machinery with large tread mounted rubber tires that have the lowest pounds/square foot impact on the soil. They can thereby work on moist soils more effectively than any other timber harvesting machinery. The post-harvest average basal areas will be maintained at 90 or above, to encourage softwood cover in the stand. The high water table at the edge of the riparian zone is best maintained with a softwood overstory to alleviate the sun's warming of the ground and water during the longer periods of leaf-off conditions due to our lengthening autumns. When the hemlock begins to decline, other softwood species such as red spruce, white pine and balsam fir must be encouraged to take the place of the shade previously offered by the hemlocks. This softwood overstory is important for keeping the ground and open water temperatures low. Timber stand improvement can offer a preemptive move in this direction, by releasing the other softwood species.



Sugar Maple and Red Oak in Stand 3

[Stand 3-Red Oak/Sugar Maple/White Pine 3/4A - 1.9 acres](#)

Description

This is a well-stocked stand primarily composed of 10– 16" DBH red oaks. The stand also has a significant stocking of red maples, sugar maples, dying white ash, along with some large white pines. The southern portion of the stand is overstocked with good quality, tall red oaks. The dying white ash trees will provide a light thinning in portions of this stand. The stand quality and stocking levels decrease, in the northern portion of the stand, where a high water table causes an increase in the proportion of red maples along with a decrease in the stand density. The star of this stand is the

wonderful swamp white oak in the south end of the stand, which does need to have its crown released (see Wildlife and Activities Schedule).

Prescriptions

This small stand is best left alone for the public to see how quality hardwood trees can develop to grow into tall, clear stemmed trees. Patience is the key to the growth of a high quality forest.

Activities Schedule

Both the long NW boundary line needs to be re-painted, while and the angled eastern line needs to be located, blazed and painted ASAP (see Boundaries).

The glossy buckthorn at the edge of the parking area should be eliminated, by repeated yearly cuttings during the second week of September (see Access).

Low level timber stand improvement (TSI) will be carried out in sections of all three stands in this forest. The goal will be to release softwood regeneration and trees and shrubs which provide soft and hard mast*. This activity will improve bird and wildlife habitats by increasing soft and hard mast trees and shrubs, while creating additional browse (see Timber). TSI will also be employed to release the swamp white oak tree's crown in Stand 3.

*see glossary

New Hampshire Natural Heritage Data Check



New Hampshire Natural Heritage Bureau

DNCR - Division of Forests & Lands
 172 Pembroke Road, Concord, NH 03301
 Phone: (603) 271-2214 Fax: (603) 271-6488

To: Daniel Stepanauskas
 Northern Forest Resources
 135 High Street
 Silver Lake, NH 03875

From: NH Natural Heritage Bureau

Date: 2021-12-07

Re: Review by NH Natural Heritage Bureau of request dated 2021-11-19

NHB File ID: 3801

Town: Tuftonboro, NH

Project type: Landowner Request

Location: Map 41 Lot 6; Town of Tuftonboro

We have searched our database for records of rare species and exemplary natural communities on the property(s) identified in your request. Our database includes known records for species officially listed as Threatened or Endangered by either the state of New Hampshire or the federal government, as well as species and natural communities judged by experts to be at risk in New Hampshire but not yet formally listed.

NHB records on the property(s): **None**

NHB records within one mile of the property(s):

	Last Reported	Listing Status		Conservation Rank	
		Federal	NH	Global	State
Plant Species					
northern sweet-coltsfoot - <i>Petasites frigidus</i> var. <i>palmaris</i>	2015	--	E	T5	S1
dragon's-mouth - <i>Arethusa bulbosa</i>	2015	--	E	G5	S1
Vertebrate Species					
Pied-billed Grebe - <i>Podilymbus podiceps</i>	2020	--	T	G5	S2B
Marsh Wren - <i>Cistothorus palustris</i>	2016	--	--	G5	S3B

Listing codes: T = Threatened, E = Endangered, SC = Special Concern

Rank prefix: G = Global, S = State, T = Global or state rank for a sub-species or variety (taxon)

Rank suffix: 1-5 = Most (1) to least (5) imperiled, "--", U, NR = Not ranked, B = Breeding population, N = Non-breeding, H = Historical, X = Extirpated.

A negative result (no record in our database) does not mean that no rare species are present. Our data can only tell you of known occurrences, based on information

NOTE: This review cannot be used to satisfy a permit or other regulatory requirement to check for rare species or habitats that could be affected by a proposed project, since it provides detailed information only for records actually on the property.



New Hampshire Natural Heritage Bureau

DNCR - Division of Forests & Lands
172 Pembroke Road, Concord, NH 03301
Phone: (603) 271-2214 Fax: (603) 271-6488

gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.



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Glossary and Acronyms

basal area (of a tree) - the cross-sectional area of the trunk 4 1/2 feet above the ground; (per acre) the sum of the basal areas of the trees on an acre; used as a measure of forest density.

BMPs - Best Management Practices: a set of guidelines to protect water quality. BMPs focus on careful road construction and maintenance, careful timber harvesting, minimal impact site preparation and protection of streamside management zones and wetlands.

board foot - a unit for measuring wood volume in a tree, log, or board. A board foot is commonly 1 foot by 1 foot by 1 inch, but any shape containing 144 cubic inches of wood equals one board foot.

browse - parts of woody plants, including twigs, shoots, and leaves, eaten by forest animals.

canopy - the continuous cover formed by tree crowns in a forest.

cord - a unit of wood cut for fuel that is equal to a stack 4 x 4 by 8 feet or 128 cubic feet. A cord is the legal measure of fuelwood volume in Maine and New Hampshire.

diameter at breast height (dbh) - standard measurement of a tree's diameter, usually taken at 4 1/2 feet above the ground.

DBH – tree diameter breast height

even-aged stand - a stand in which the age difference between the oldest and youngest trees is minimal, usually no greater than 10 to 20 years. Even-aged stands are perpetuated by cutting all the trees within a relatively short period of time.

forest types - associations of tree species that have similar ecological requirements. Northern New England forest types include white pine, spruce-fir, hemlock, northern hardwood, oak-pine, and others.

group selection - a process of harvesting patches of trees to open the forest canopy and encourage the reproduction of un-evenaged stands.

herbaceous vegetation - low-growing, non-woody plants, including wildflowers and ferns, in a forest understory.

high grading—The practice of removing only the biggest and best trees from a stand during a harvest operation and leaving only the poorest, lowest quality culls to dominate the site.

intolerance - a characteristic of certain tree species that does not permit them to survive in the shade of other trees.

landing - a cleared area within a timber harvest where harvested logs are processed, piled, and loaded for transport to a sawmill or other facility.

MBF - Thousand board feet. A unit of measure for tree volume or sawed lumber.

marking timber - indicating by paint or other means which trees are to be cut or otherwise treated. It is advisable to mark trees to be harvested twice—once at eye level and once on the stump.

mast - Fruits or nuts used as a food source by wildlife. Soft mast includes most fruits with fleshy coverings, such as persimmon, dogwood seed or black gum seed. Hard mast refers to nuts such as acorns and beech, pecan and hickory nuts.

overstocked - the situation in which trees are so closely spaced that they compete for resources and do not reach full growth potential.

pole timber - trees 4 to 10 inches dbh.

precommercial treatments - forestry operations that require landowner investment, such as cleaning or weeding stands to remove trees that have little or no cash value.

pruning - the act of sawing or cutting branches from a living tree. In forest management, pruning is done to promote the growth of clear, valuable wood on the tree bole.

pulpwood - wood suitable for use in paper manufacturing.

regeneration - the process by which a forest is reseeded and renewed. Advanced regeneration refers to regeneration that is established before the existing forest stand is removed.

regeneration cut - a timber harvest designed to promote natural establishment of trees.

release - to remove overtopping trees that compete with understory or suppressed trees.

residual stand - the trees remaining intact following any cutting operation.

sapling stand - a stand of trees whose average dbh is between 1 and 4 inches.

sawlog - a log large enough to be sawed economically on a sawmill. Sawlogs are usually at least 8 inches in diameter at the small end.

seed-tree harvest - the felling of all the trees in an area except for a few desirable individuals that provide seed for the next forest.

seep- where water comes to the surface of the ground at the head of drainage-ways. This most often occurs in rich forest soils settings.

selection harvest - the harvest of all individual trees or small groups at regular intervals to maintain an uneven-aged forest. Selection harvests are used to manage species that do not need sunlight to survive.

shelterwood harvest - the harvest of all mature trees in an area in a series of two or more cuts, leaving enough trees of other sizes to provide shade and protection for forest seedlings.

significant wildlife habitat – habitats identified and mapped by the Maine Inland Fisheries and Wildlife Department and afforded special protection including deer wintering areas, bald eagle nests, shorebird nesting areas, etc., or identified by NH Fish & Game's Wildlife Action Plan. However, the NH Action Plan provides no special protection for these critical areas.

site index - a measure of the quality of a site based on the height of dominate trees at a specified age (usually 25 or 50 years), depending on the species.

stocking level – the density of trees by species or timber type in a particular area

slash - branches and other woody material left on a site after logging.

slope – a measure of steepness of terrain and a feature that can limit equipment use; it is the vertical gain (rise) divided by the horizontal distance cover (run).

snag - a dead tree that is still standing. Snags provide important food and cover for a wide variety of wildlife species.

stand - a group of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes.

stand density - the quantity of trees per unit area, usually evaluated in terms of basal area, crown cover and stocking.

stocking - the number and density of trees in a forest stand. Stands are often classified as understocked, well-stocked or overstocked.

stumpage - the value of standing trees in a forest.

thinning - a partial cut in an immature, overstocked stand of trees used to increase the growth of existing trees by concentrating on individuals with the best potential, no regeneration results

tolerance - a tree species' capacity to grow in shade.

understocked - a stand of trees so widely spaced, that even with full growth potential realized, crown closure will not occur.

understory - the level of forest vegetation beneath the canopy.

uneven-aged stand - Three or more age classes of trees represented.

well-stocked - the situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.