TWO TREES FORESTRY

FOREST MANAGEMENT PLAN

Planning Period 2020-2030

Winslow Town Forest

Winslow, Kennebec County, Maine
Map 12 Lots 28, 29, 29A
494 acres total – 440 acres wooded

Town of Winslow
114 Benton Ave.
Winslow, ME 04901
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BACKGROUND

The 494+/- acre Winslow town forest sits along the Winslow/Albion town line, accessed by the Albion Road roughly 4 miles east of its intersection with the Garland Road in Winslow. Topographically the property has two major zones, with northwestern and southeastern ends of the property perched on mild to moderately sloping ridgelines rising from central flats, which make up roughly half of the property. Higher merchantable stocking and a more valuable and stable mix of timber – mainly oak, pine, and red maple – predominates on the sloping ground, which is also the better drained ground, capable of withstanding equipment pressures during most of the year. Central areas typically feature less desirable, shorter-lived species such as fir, grey birch, and popple in both the overstory and understory and the ground is seasonally wet, requiring frozen conditions for responsible active management. The property surrounds and abuts several large open wetlands, diversifying habitat offerings and providing enduring natural features, which help define likely management units. As well, the property is split by a wide high-voltage transmission corridor running North-Northwest, separating the eastern third of the property from its main body. Historically most of the land was utilized as pasture, as evidenced by the numerous old wire fences along property lines and within the lot, but most of the ground has been forested for an extended duration. The town acquired the majority of the land in the 1930s in lieu of back taxes. During the town's ownership the forest has been managed primarily for commercial timber production while providing for primitive recreational use. Forest management has been semi-industrial in nature, and loggers have worked on nearly every acre of forestland at least once in the past twenty years, leaving the property with very low stocking (averaging 14 cords of merchantable wood per acre), but harvesting has retained large, older trees on all acres and created diverse, multi-aged conditions that are favorable for wildlife habitat. Currently the property holds 800,000 to 900,000 board feet of sawtimber and 6,000 to 8,000 cords of pulpwood worth between $210,000 to $275,000 in gross stumpage.

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WINSLOW TOWN FOREST

Town of Winslow
Winslow, Kennebec County, Maine
Map 12, lots 28, 29, & 29A

2018 aerial photo

Legend

blazed line	stone monument
stonewall	building
unverified line	cellar hole
wire fence	stream - NRPA
flagged line	stream - SZ
iron rod	trail
pipe	Paved road
cemetery	Gravel road
shoreland zoning	yard

MN - 18 degrees west

N

0 165 330 660 990 1,320 1,650 Feet

1 inch = 1,000 feet

Two Trees Forestry
Consulting Foresters
Winthrop, Maine
JL Doty, LF 3983 - February 2020

Map detail from MEGIS geographic & GPS data, town tax records, and field reconnaissance.
Contour interval is 20'.
NOT A LEGAL BOUNDARY SURVEY.

The property has not been surveyed in recent history, but boundary lines are generally well marked with blazed and painted trees along nearly the entire perimeter. Markings have faded over time and some perimeter trees have fallen over, making stretches of the line occasionally hard to notice. Town records indicate these lines were last painted in 2012, which seems likely given the current condition/visibility of the line. We walked the entire perimeter with GPS, and documented specific locations of physical evidence on the attached map. Town tax records place the property size as 535 acres, although evidence from our reconnaissance suggests the figure may be closer to 494.

Access to the property is provided by the Albion Road as well as two private woods roads – one on either side of the transmission corridor – which enter the property via the Albion Road and span much of its length. These roads have served as the primary access for forest management in past harvesting, but to the best of our understanding the town has no legal rights to use either of these roads, and must ask for permission prior to use. The road west of the transmission corridor crosses two properties owned by Bessey Development Company before terminating just north of Wilson Brook; the land east of the transmission corridor crosses land owned by Amasa and Manley Shores before entering the town forest. Log landings are located at strategic locations along these road to accommodate logging operations within reasonable skidding lengths. These roads are generally unimproved, and in places cross areas of soft ground or contain extensive tire ruts suggesting dry summer or more likely frozen conditions will be necessary before they are capable of supporting passage of loaded logging trucks.

MANAGEMENT OBJECTIVES

The Town of Winslow would like to transition forest management towards lighter, less intensive harvesting, and explore options to increase public use of the property by developing access and recreational trails on the town forest. As such they would like forest management to carry higher average stocking and focus upon growing large diameter, high quality sawtimber, and all harvesting should be conducted with sensitivity to promoting the scenic beauty of the property, diversifying habitat offerings, and preserving the integrity of the soil and water features. The town would like also forest management to be more transparent and educational, and future timber harvesting should incorporate public tours and possibly interpretive signage, amongst other such aspects of a demonstration forest.

SOIL AND FOREST RESOURCES

The woodlot contains four primary topographic features: ridges, rolling slopes, upland flats, and lowlands. A soils map and site suitability chart are included on page 21.

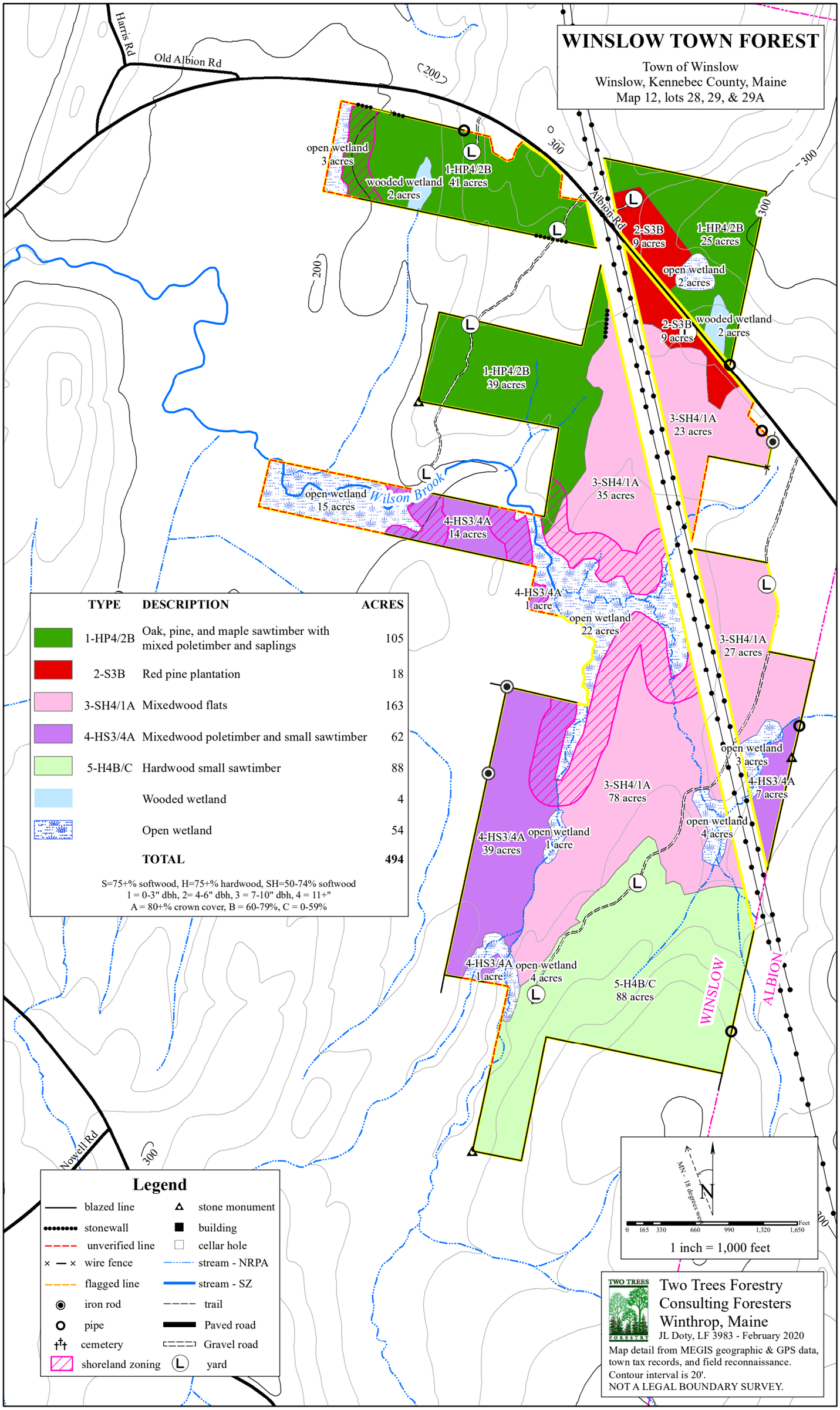
- Ridges – The soils on the southern ridge are shallow, ledgey Hollis rock outcrop. These soils are poorly productive due to their lack of depth and associated issues with droughtiness and windthrow. They are best suited to growing pine and spruce. Operability could occur at almost any time due to rapid drainage.

- Rolling slopes – Gently sloping upland soils are Paxton and Scio fine sandy loams. Paxton soils are well drained soils formed from glacial till, Scio soils are moderately well drained soils composed of lacustrine or marine sediments. Woodland productivity on both is exceptional, best suited for hardwood growth. Operability should be restricted to dry summer or when soils are frozen.

- Upland flats – Central flats – along both sides of the transmission corridor – sit on Scantic silt loams. These soils are deep and poorly drained, and formed from marine or lacustrine sediments. Woodland productivity is low, best for white pine, spruce, fir, and cedar, although restricted rooting depth results in a moderate windthrow hazard. These areas should only be harvested when soils are frozen.

- Lowlands – Lowland soils are deep, very poorly drained Vassalboro fibrous peat. They are not suited to commercial timber production due to slow tree growth and are only operable when soils are frozen solid, if ever.

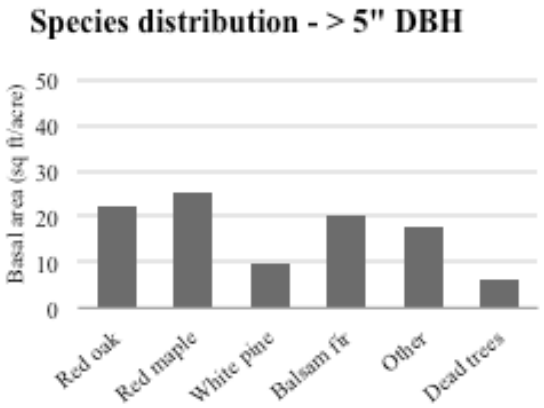
For management purposes, the wooded areas were divided into five stands. All stocking and volume figures list a range of values, based on sampling at a 67% confidence interval.

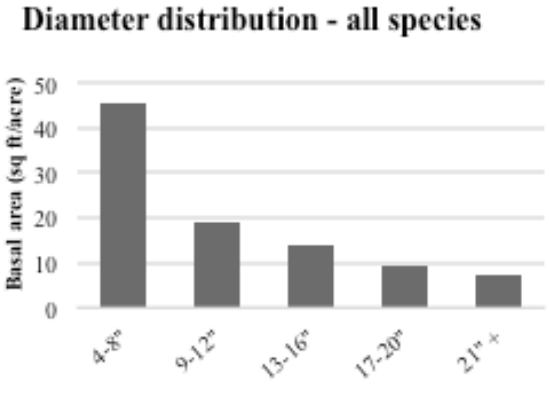


TYPE	DESCRIPTION	ACRES
1-HP4/2B	Oak, pine, and maple sawtimber with mixed poletimber and saplings	105
2-S3B	Red pine plantation	18
3-SH4/1A	Mixedwood flats	163
4-HS3/4A	Mixedwood poletimber and small sawtimber	62
5-H4B/C	Hardwood small sawtimber	88
	Wooded wetland	4
	Open wetland	54
	TOTAL	**494**

S=75+% softwood, H=75+% hardwood, SH=50-74% softwood
1 = 0-3" dbh, 2= 4-6" dbh, 3 = 7-10" dbh, 4 = 11+"
A = 80+% crown cover, B = 60-79%, C = 0-59%

Stand 1. Oak, pine, and maple sawtimber with mixed poletimber and saplings (HP4/2B – 105 acres) Northerly areas of the property – along both sides of the Albion Road – feature a multi-aged forest, with a partial overstory of red oak, white pine, and red maple sawtimber, typically 16" to 20" in diameter and 70' to 80' in height, a midstory of shorter oak, fir, red maple, ash, and popple and occasional sugar maple and white pine poletimber, growing above a patchy understory of maple, oak, pine, fir, and hemlock saplings, currently 15' to 25' in height. Loggers partially harvested this area in the early 2000s, removing a significant component of the overstory, which led to the regeneration or release of advance regeneration in the understory. While overstory stocking tends to be modest, when considered in conjunction with younger midstory and understory trees, this area is very well vegetated. Stem form is good here, most overstory pine have 32' feet or more of sawtimber quality material while oak average closer to 16' of such stem quality. We found no evidence of damage from insects or diseases, but found invasive honeysuckle widely dispersed but uncommon all but the far west of the property, typically occupying less than 1% of the ground area. Underlying terrain is rolling and ledgy, typically well drained, and should be capable of supporting equipment pressure during most times, except periods of excessive moisture. Current timber volumes likely average 3,000 to 4,000 board feet of sawtimber and 10 to 15 cords of pulpwood per acre. With good stocking of desirable species in the understory and midstory, managers should consider removing most of the overstory trees with sawtimber quality from this area in order to release the younger growth to ascend into the main canopy.





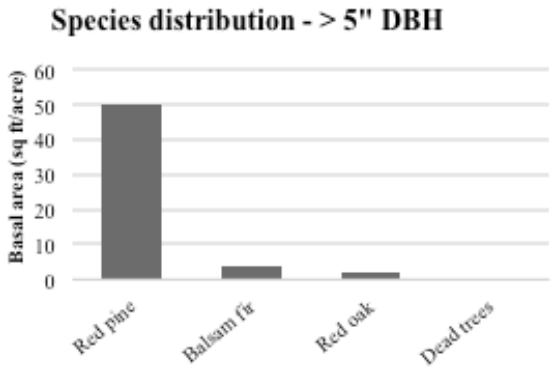
Suitability analysis:

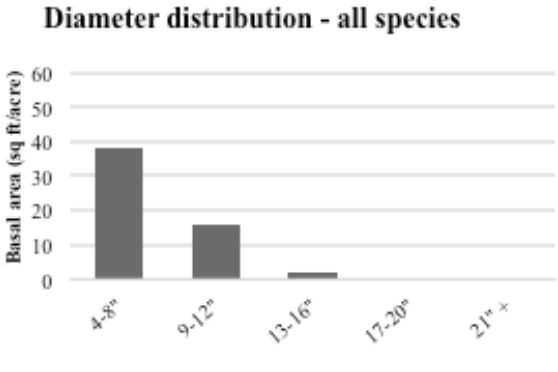
Timber production: Dominated by long-lived, high timber value species – many with excellent stem form; good seed source and established regeneration of desirable species; very productive soils; good equipment operability.

Recreational use: Legally guaranteed access; close to public road; well-drained soils ease trail building and maintenance efforts; rolling slopes with typically mild to moderate grade.

Wildlife habitat: Multi-aged forest with layered canopy; mature oak for production of hard mast; tall pines for perching/singing sites; good cover in understory; nearby wooded/open wetlands.

Stand 2. Red pine plantation (S3B – 18 acres) Old fields flanking the Albion Road were planted to red pine in the 1980s, which today stand 35’ to 45’ in height and average 6” to 10” in diameter. Stem form is good; trees tend to be almost uniformly straight. Loggers row thinned these areas roughly a decade ago, providing trees in the residual stand ample room for crown expansion, thus growth and vigor are good here. Some popple and pine saplings became established in the understory following this harvest, which today stand 5’ to 15’ in height. Unfortunately harvesting also encouraged the growth of invasive honeysuckle shrubs which likely colonized the stand during its reversion to wooded growth; these plants currently occupy less than 5% of the ground area but are mature and seed producing. We found no evidence of damage from insect or diseases here. Underlying ground is high and dry, capable of withstanding equipment pressures during most times, and soils are smooth and rock free. Current timber volumes likely average no sawtimber and 12 to 18 cords of pulpwood per acre. Managers should give this area time to grow before eventually conducting another thinning, to keep trees free to grow.





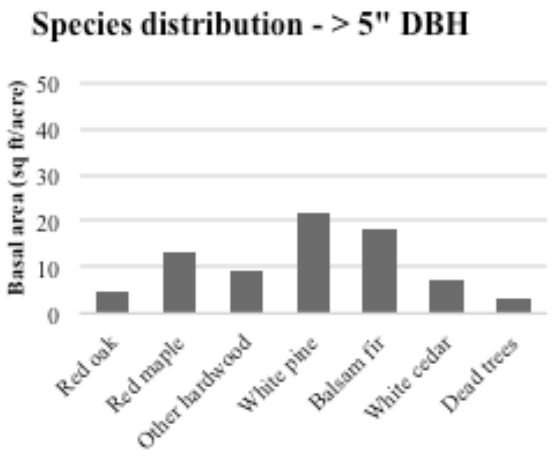
Suitability analysis:

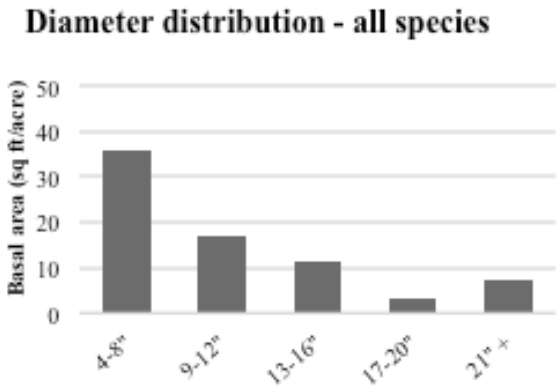
Timber production: Dominated by fast growing species with modest timber value; monoculture – highly susceptible to host-specific pests/pathogens/environmental problems; species well suited to soils; well-drained modestly productive sandy soils with good equipment operability.

Recreational use: Legally guaranteed access; close to public road; well-drained soils ease trail building and maintenance efforts; rolling slopes with typically mild to moderate grade.

Wildlife habitat: Single-aged monoculture forest – lacks diversity when considered in isolation but diversifies property-wide habitat offerings; poor understory cover; understory partially occupied by invasive forest shrubs; nearby wooded wetlands.

Stand 3. Mixedwood flats (SH4/1A – 163 acres) Low, somewhat poorly drained areas along both sides of the transmission corridor feature a partial overstory fir, red maple, spruce, hemlock, and popple poletimber typically 6" to 10" in diameter and 40' to 50' in height with scattered much larger pine and oak sawtimber growing above an often dense understory of 15' to 25' tall fir, gray birch, popple, and red maple saplings. These areas were last harvested in the early 2000s, when loggers cut somewhat heavily, regenerating the current understory. We found no evidence of damage from insects or diseases here, but found a few invasive honeysuckle shrubs growing in the understory, occupying less than 1% of the ground area. Growth is poor in these areas, limited by the high soil moisture content and the poor stocking of merchantable sized timber. Operability is also poor; soils are often saturated except during the driest times in the summer and several extensive series of old ruts from logging equipment evidence the need for caution when working these areas, except when soils are frozen solid. Current timber volumes likely average 2,000 to 3,000 board feet of sawtimber and 8 to 12 cords of pulpwood per acre. These areas should be given significant time to rebuild stocking before any future management action.





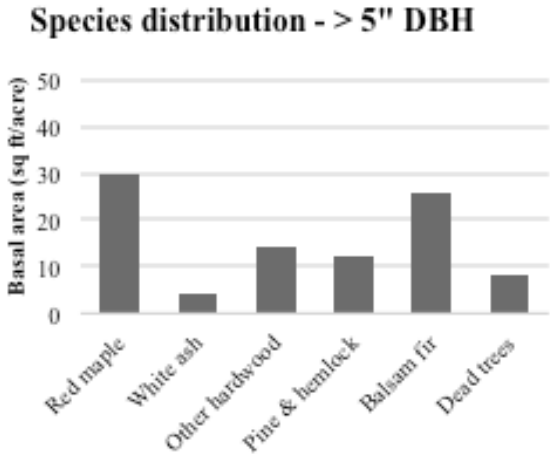
Suitability analysis:

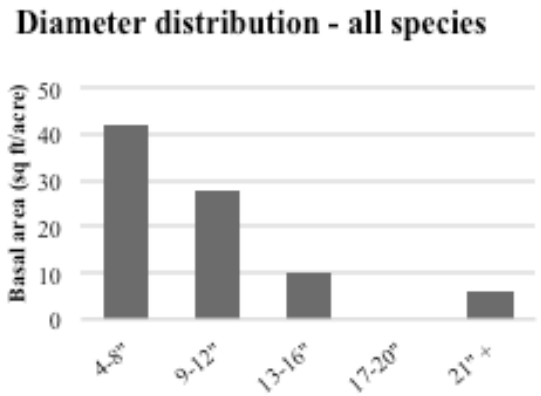
Timber production: Understory/midstory dominated by short-lived low timber value species; scattered larger older pine and oak provide good seed source of long-lived high valued species; multiple age classes on site; poorly drained flat soils with significant seasonal operational limitations and low productivity.

Recreational use: Only northern areas contain legally guaranteed access; often far from public road; poorly drained soils which will require significant material/labor cost to make usable during non-winter months; flat ground with frequent ruts from previous timber harvesting.

Wildlife habitat: Multi-aged diverse forest; good understory cover; adjacent to shrub/scrub ecosystem provided by powerlines as well as several wooded/open wetlands; softwood cover may provide wintering area for deer.

Stand 4. Mixedwood poletimber and small sawtimber (HS3/4A – 62 acres) Areas on the eastern and western fringes of the woodlot, in its south, were heavily harvested in the 1960s, and have not seen active management since. Currently they are well stocked with a mix of 8" to 12" diameter 60' to 70' tall red maple, balsam fir, white ash, popple, and hemlock, growing above a generally open understory – though stocking is somewhat patchy, and in areas there are small canopy openings (<.25 acres) with beech, fir, maple, and spruce saplings. Stem form is quite variable, but trees with well-formed stems are distributed throughout the area. Growth is good, but slowing in these areas, as increasing competition is beginning to factor negatively in average tree growth and vigor. We found no evidence of damage from insects or disease, nor the presence of any invasive species here. Underlying soils are gently rolling and in places ledgy, and tend to be moderately well to well drained, capable of supporting equipment pressure during dry times in the summer or when soils are frozen in winter. Current timber volume likely averages 1,000 to 2,000 board feet of sawtimber and 12 to 18 cords of pulpwood per acre. Managers should eventually remove short-lived white birch, popple, and fir from these areas, and selectively thin to promote high quality but less common species such as oak, spruce, pine, and yellow birch – as well as red maple where no better options exist. Also included in this stand is an area in the west-center of the property, bisected from the main body of the property by Wilson Brook, which features a similar timber type but more recent harvesting, and thus contains lower average stocking.





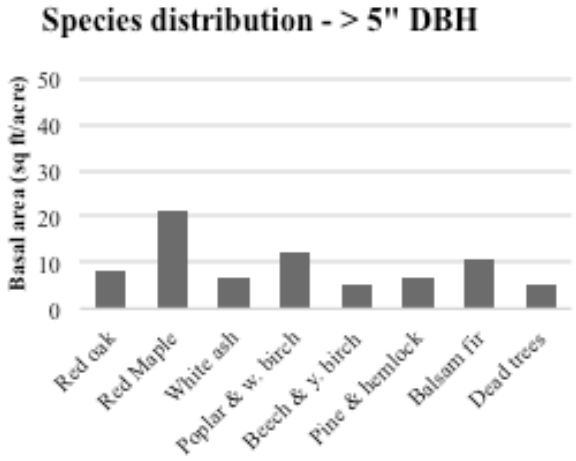
Suitability analysis:

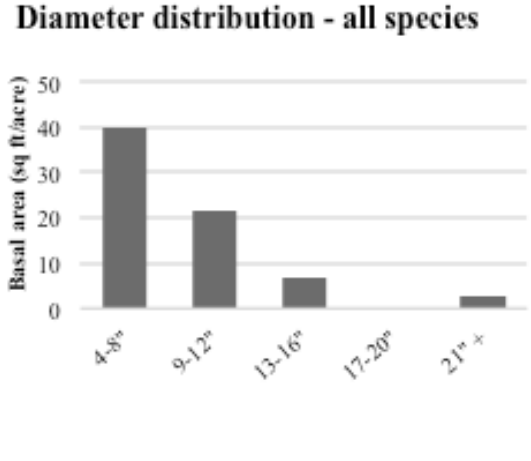
Timber production: A mix of long/short lived species across spectrum of timber value; primarily middle-aged forest with desirable species well-distributed; modestly productive soils; decent equipment operability.

Recreational use: No legally guaranteed access; very far from public road; moderately well-drained soils ease trail building and maintenance efforts; rolling slopes with typically mild to moderate grade.

Wildlife habitat: Single/two-aged forest with closed canopy; some oak/beech for hard mast; little to no cover in understory; nearby wooded/open wetlands/transmission corridor for edge effects.

Stand 5. Hardwood small sawtimber (H4B/C – 88 acres) Red maple, red oak, poplar, white ash and fir 10" to 14" in diameter and 60' to 70' in height dominate an area of higher ledgy ground west of the transmission corridor in the southern end of the property. Loggers thinned this area – in places somewhat heavily – roughly 20 years ago, stimulating the regeneration of oak, maple, pine, and beech saplings, typically 15' to 25' in height. Stocking is typically low, with wide spacing between trees and large openings in the main canopy, though in places there are clumps of well-spaced trees. Underlying soils pose a major limitation to stand growth here, as the site tends to be quite shallow to ledge. Oak stem form is good, most trees have at least 8' of sawtimber quality material, and a few have as much as 24'. We found no evidence of damage from insects or diseases here, but found a few invasive honeysuckle shrubs, mainly along the road and near the yard. Operability is quite good here, underlying terrain is gently sloping and rolling and very well drained, and should be able to support equipment pressure during most times, except during the spring melt. Current timber volumes likely average 1,000 to 2,000 board feet of sawtimber and 10 to 15 cords of pulpwood per acre.





Suitability analysis:

Timber production: Mix of long-lived, high timber value species and short-lived moderate value species – many with excellent stem form; good seed source and established regeneration of desirable species; modestly productive soils; excellent equipment operability except in areas of steep slopes (typically only short pitches of slope).

Recreational use: No legally guaranteed access; very far from public road; excessively drained soils ease trail building and maintenance efforts and allow almost year-round use; rolling slopes with typically mild to moderate grade.

Wildlife habitat: Multi-aged forest with layered canopy; mature oak for production of hard mast; tall pines for perching/singing sites; good cover in understory; nearby wooded/open wetlands.

BIODIVERSITY AND AREA LANDSCAPE FEATURES

Maine's Department of Inland Fisheries and Wildlife (IF&W) considers the open wetland in the center of the property to be significant habitat for inland waterfowl and wading birds. To best protect the value of this habitat, they suggest managers buffer the area with a 250' wide protective buffer, cutting nothing within 75' of the water, and utilizing only selective harvesting within the rest of the buffer. As well, they consider areas in the south of the property to be a potential deer wintering area. Though its actual use has not been confirmed, protecting the softwood cover will best ensure the value of such habitat. The evergreen needles of these trees intercept falling snow and provide thermal cover, facilitating deer winter travel and bedding locations. Finally, they believe that the property is part of a broad area which contains valuable habitat for brook trout. To promote these conditions, harvesting should retain forested buffers along riparian areas and cross streams only when necessary, implementing measures to minimize any sediment runoff into streams. Maine's Natural Areas Program has no record of any rare or endangered species, and it is unlikely that any are present, as such there are no limitations on the activities recommended in this Plan based on the Endangered Species Act.

Maximizing the variety of tree species and age yields the greatest diversity of habitat, increasing the potential for use of the woodlot by myriad species. Features of the property, as well as the surrounding landscape, provide a variety of important wildlife habitats, including a large area of relatively unfragmented woodland cover, forests with layered canopies, streams, ponds, and wetlands, mast producing oak and beech, and scattered large old trees – both dead and alive. Large downed woody debris and late successional forest types are important habitat features that are generally lacking from the area.

Though a woodlot of this size is generally used by transient critters, which range over an area much larger than just this woodlot, featuring and maintaining important habitat components, such as snags, cavity trees, nut producers, and multiple canopy layers benefit many wildlife for short or long periods.

The chart below – adapted from Maine Audubon's *Focus Species Forestry* – lists the current distribution of major forest ecosystem types and age classes[1]. This may help visualize the woodlot's current state, and help plan and guide decisions relating to ecological diversity. Maximizing the number of forest ecosystem types and ages generally increases the diversity of wildlife utilizing the property by guaranteeing a broad suite of habitats. As shown, most of the property is in an intermediate condition – with mature trees scattered throughout most acres - and four major ecosystem types present. While little can be done to expand representation of ecosystems, large group selection and/or small clearcuts can help diversify development stages, and thus increase habitat.

Forest Ecosystems																									**Special Value Habitats**	
Aspen-Birch				Northern Hardwoods					Oak-Pine					Hemlock			Spruce-fir					N. White Cedar			Riparian Forest	Vernal Pool
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

[1] See chart of age-classes. R=regeneration, S=sapling, I=intermediate, M=mature, and L=late successional

LONG TERM MANAGEMENT DIRECTION

The woodlot should be managed in a way that meets the towns evolving goals: maximizing public opportunities upon the land, developing varied recreational opportunities through trail-building, protecting the native vegetation, soil integrity, and water quality, creating and maintaining varied wildlife habitat, and sustainably managing timber for long-term growth – maintaining a higher stocking than prior forest management actions, utilizing more thinnings and uneven-aged forest silvicultural systems.

From a recreational standpoint, the property contains both significant obstacles and opportunities for development and use. In its favor are the large contiguous acreage that the property covers and its lack of nearby development. This is a place with a natural and remote feel, where one can easily get immersed in the wild. Its diverse habitats and large unfragmented forest provides for numerous and often less common wildlife species, allowing users to experience real nature within a short drive from a significant population center. But while there is enough land to develop a large length of trails throughout the property, the central 40% of the property is dominated by either poorly drained forest soils or open wetlands that are permanently saturated, and pose a significant barrier for access, trail development and maintenance, and which will lead to elevated costs for trail construction should managers wish trails to be usable during frost-free times, and with no guarantee that the recreating public has interest in hiking or biking that far into the property. Furthermore, there is no legally guaranteed road access to the southern half of the property, and even if such a guarantee for access was obtained, the road itself is unimproved and constructed on the same poorly drained soils, and will require significant work to ditch, build up, surface, and shape. With all of these factors in mind, we propose bisecting the property into its northern and southern halves – utilizing the central open wetlands as the dividing line – and focusing recreational development within northern areas, while designating the southern half as a more primitive, backcountry recreation area, not altogether different from the Kennebec Highlands, wherein most all non-motorized uses are permitted, and the current snowmobile trail allowed, but no investment in infrastructure planned.

Invasive plants – mainly honeysuckle – pose a resource concern. These plants not only outcompete and inhibit natural regeneration of native species, dense interconnected clumps of shrubs can obstruct travel throughout the woods. Although these plants are currently uncommon on the property, given time they may become problematic. Tackling the issue as early as possible will increase the odds of success, and require significantly less effort to contain the spread and eradicate their presence. To this end, we suggest implementing a monitoring program to identify the problem's extent; it appears that most shrubs are growing within the red pine plantation stand (2-S3B). Once located, managers should focus on stopping its spread, before then working back toward the problem's center.

From a timber management standpoint, the forest tends to be poorly stocked with merchantable timber. Previous forest management actions have relied on even-aged forest management via the shelterwood system, which utilizes an *establishment cut* with moderate to high harvest levels to encourage regeneration of new growth, a subsequent *overstory removal* upon documented establishment of this new growth to remove overtopping vegetation, and then a significant period of rest and regrowth before restarting the cycle. With establishment cuts/overstory removals having occurred on virtually the entire property in the past two decades, timber volumes are quite low, and much of what this forest needs moving forward is time to grow. Fortunately, though harvesting was heavy, previous forest managers also took care to maintain forest complexity by retaining scattered large, older trees, benefitting the habitat value of the town forest. This complexity is a legacy that should not be ignored, and perhaps elements of this previous strategy may be considered on the less visible, less usable southern half of the property.

Once this period of rest and regrowth has ended – roughly 15 to 20 years hence – evidenced by higher average stocking and closed canopy conditions where competition begins leading to declining growth and vigor, managers should begin a series of periodic harvesting, rotating throughout the property with a regular time interval, such that the same acre is treated once every twenty years. While questions of legal access make it hard to predict which acres should be considered for management, working from the optimistic perspective that the Besseys/Shores allow continued use of the woods roads, we foresee the following strategy. Seven primary woodyard locations exist on the property (really there are eight, but two are located within very close geographic proximity to each other – in the far northwest of the property along the southwestern side of the Albion Road – and offer no symbiotic benefits from a timber management perspective, and thus we suggest allocating the more easterly of these two woodyards to be a parking lot for recreational access). By rotating harvesting between woodyards and working the land best accessible from that location (minimizing skidding distance and utilizing operation barriers such as streams/wetlands/and the transmission corridor to best determine which wood will be accessed from where) we propose a strategy of harvesting timber once every three years in relative perpetuity. This should ensure all acres are treated within a timely interval, keep timber harvesting in the public eye, and make management actions and income streams predictable and regular.

From a silvicultural standpoint, without active management, long-lived, shade tolerant species, including spruce, hemlock, and northern hardwoods will likely dominate the woodlot, although these changes will occur over a long horizon. Long-term management should for the most part mimic, but speed this natural tendency while favoring other valuable species, such as white pine and oak. Given the town's preference for lighter harvesting moving forward, we envision a strategy of thinnings staggered in space and time, aimed at incrementally shifting stand composition towards longer-lived and higher-valued species, while maintaining a relatively continuous forest canopy and a well-wooded aesthetic.

As the town will rely on natural regeneration, managers should look ahead many decades to consider the forest's next generation. As the current overstory matures they may opt to create patches in the overstory of 0.3 to 0.7 acres (two to three tree lengths in diameter) to enable sunlight to reach the forest floor and tree seeds to contact mineral soil directly. Timing these harvests in the summer months, when soils are dry and unfrozen, should allow equipment to scarify soils while minimizing rutting. Such will enable a variety of trees to become established, diversifying the timber types and development stages present. Later, harvests would remove nearby and overtopping trees to enlarge the regenerated gaps.

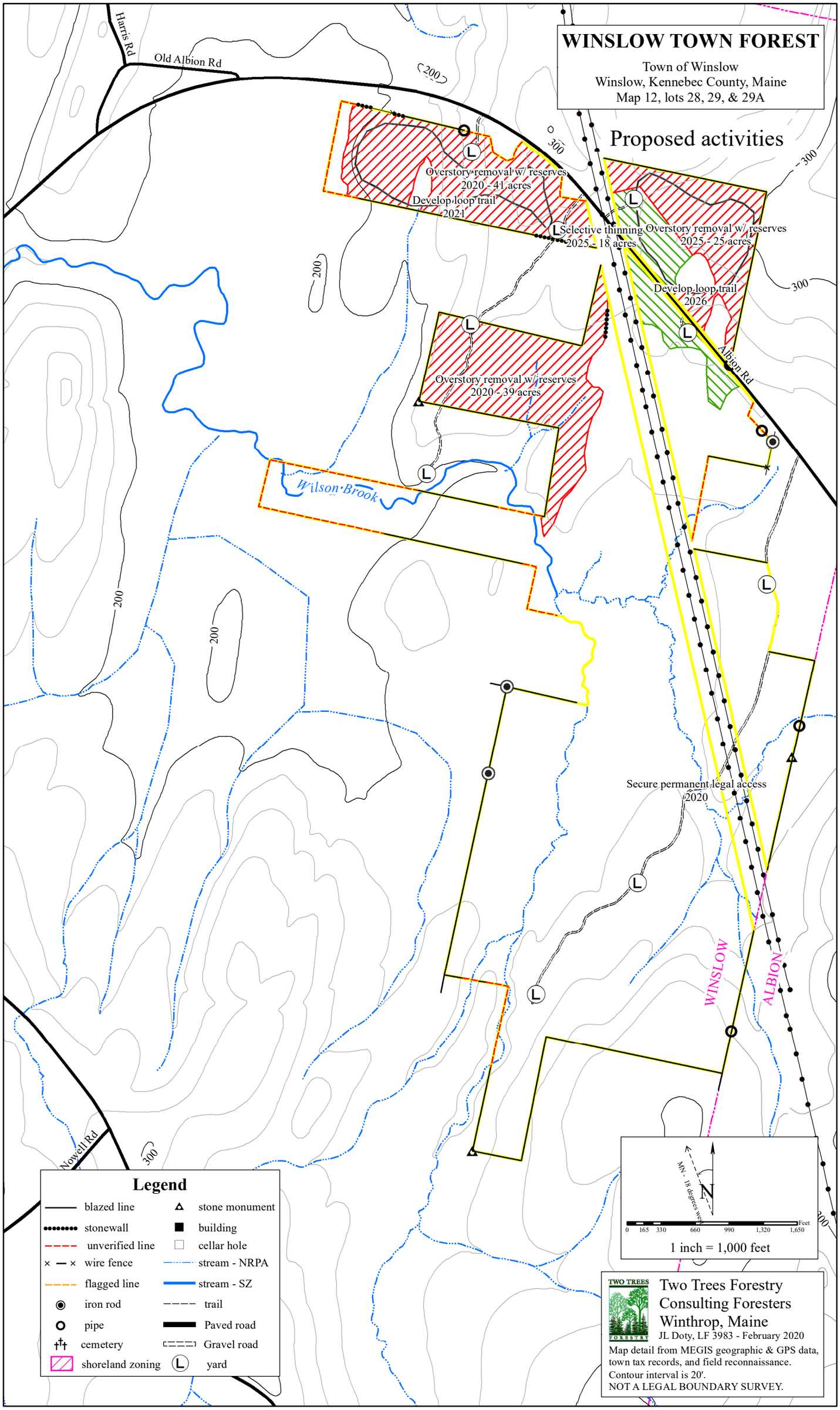
This general notion of expanding the size of openings, while retaining blocks of uniformly large trees, will ultimately create a forest comprised of multiple age classes, tree sizes, and heights. Such forests provide the diversity that best resists insect and disease problems, benefits a multitude of wildlife, and provides a solid foundation for a regular income stream. Thus the woods should be managed to produce large diameter (14" to 22" dbh), high value trees, under gradually developing uneven-aged conditions, with some 24+" trees retained indefinitely. Harvest levels should be set to ensure that total harvest volumes do not exceed volumes grown, and for at least the next two decades harvest levels be set significantly lower than annual growth, which is currently 180 to 220 cords per year[2].

Finally, maintaining woodlot infrastructure is an important means of protecting and simplifying management. Well-delineated boundaries and serviceable trails and roads all protect the property from potential timber trespass, illegal dumping, and soil erosion. Given that legal access is not guaranteed through Bessey and Shores' properties, and that these access are critical for long-term management, the town should approach these landowners about obtaining a legal right-of-way, perhaps only for timber management use, but also considering the potential for recreation use. As well, prior to harvesting, managers should identify and buffer the waterways, and direct if and where logging equipment should cross streams or wetland corridors. Generally keeping logging equipment 25' away from ephemeral brooks and streams should help keep sediments from washing into the water, while these parallel wooded buffers can serve as a permanent reserve, growing large old trees and snags. These forest reserves, when considered in concert with open and wooded wetlands, total 79 acres, or 15% of the total land area of the property that will be maintained in an unmanaged state.

SHORT TERM MANAGEMENT RECOMMENDATIONS

The top management priorities during this planning period are to 1). Maintain or improve property infrastructure by securing guaranteed legal access and reblazing and painting boundary lines, 2). develop a plan for improving recreational uses of the property, 3). allow much of the forestland time to grow and build stocking, 4). implement the final stage of shelterwood harvesting on oak, pine, and maple sawtimber with mixedwood poletimber and saplings stand (1-HP4/2B), 5). Selectively thin the red pine plantation (2-S3B), and 6). consider options for invasive species control.

[2] Based upon statewide growth averages of the species and volumes on this property.


WINSLOW TOWN FOREST
Town of Winslow
Winslow, Kennebec County, Maine
Map 12, lots 28, 29, & 29A
Proposed activities
Harris Rd
Old Albion Rd
Overstory removal w/ reserves
2020 - 41 acres
Develop loop trail
2021
Selective thinning
2025 - 18 acres
Overstory removal w/ reserves
2025 - 25 acres
Develop loop trail
2026
Albion Rd
Overstory removal w/ reserves
2020 - 39 acres
Wilson Brook
Secure permanent legal access
2020
WINSLOW
ALBION
Nowell Rd
200
300
MN - 18 degrees west
N
0 165 330 660 990 1,320 1,650 Feet
1 inch = 1,000 feet
Legend
blazed line
stonewall
unverified line
wire fence
flagged line
iron rod
pipe
cemetery
shoreland zoning
stone monument
building
cellar hole
stream - NRPA
stream - SZ
trail
Paved road
Gravel road
yard
TWO TREES FORESTRY
Two Trees Forestry
Consulting Foresters
Winthrop, Maine
JL Doty, LF 3983 - February 2020
Map detail from MEGIS geographic & GPS data, town tax records, and field reconnaissance.
Contour interval is 20'.
NOT A LEGAL BOUNDARY SURVEY.

Perhaps the most important action during this planning period is to secure legal access on the eastern woods road (which is owned by XXXXXXXXX). More than 55% of the manageable acres on the property will be effectively useless (at least from a forest management standpoint) if this access is ever denied. And while no problems have arisen yet from asking permission on a case-by-case basis, the future owners of the property may not be as accommodation. Purchasing, at a minimum, legal right-of-way for forest management uses would enable and ensure that 240 acres of managed forestland remains productive and usable.

Also, highlighting boundaries and maintaining visible markings along the entire perimeter is the town's best protection against timber trespass, accidental or intentional. Blazed and brightly painted line-trees provide good visibility and durability. Currently boundary evidence is quite good along all lines, though certain stretches of the property line – especially in the east – have not been recently maintained and boundary line visibility is intermittently poor. Managers should plan for routine maintenance to refresh the paint about every 10 years. Therefore we suggest boundary lines along the entire upland perimeter be refreshed, mainly just by repainting old blazes, but adding new blazes in places along the line wherein markings are currently insufficient. Such a treatment should not be nearly as expensive as past work, as much less axe work/time is necessary.

In order to increase and diversify the public uses of the property, we suggest developing a recreational trail network on the northern half of the town forest, beginning with forested areas closest to the road, including the oak, pine, and maple sawtimber with mixed poletimber and saplings stand (1-HP4/2B) and the red pine plantation stand (2-S3B). These areas have good access, well-drained soils, rolling and interesting terrain, and attractive and diverse forestland, and are most likely to be used by the average member of the public. While eventually managers may wish to expand trail offering further across the property and include more offerings for different modes of recreation (i.e. fat-tire biking, horseback riding, cross country skiing, ATVing, snowmobiling, etc.) and while initial planning should consider these options, the primary focus should be upon creating solid infrastructure for access, and a well-constructed and thoughtful trail network. Funding is available to help the town pay for such recreational development, primarily through the Maine Bureau of Parks and Land's Recreational Trails Program, which has an annual grant submission deadline of late September, and possibly through the Maine Outdoor Heritage Fund, which has biannual grant submission deadlines in the fall and spring.

In designing a trail network, managers should attempt to showcase the full diversity of the property, enabling visitors to encounter a broad range of wildlife and appreciate the natural and historical features, while also giving some consideration to how best link the property with other nearby conserved lands. Loop trails tend to provide the most bang-for-your-buck, generally located near (but not directly along) the property's perimeter, maximizing linear distance while not forcing hikers to retrace their steps. Given that these areas are bisected by the Albion Road, initially I propose a loop trail on either side of the road, creating a figure-8 design for the initial trail. Such a trail network would span roughly 2 miles in length, and would be cleared to a width of four to six feet and to a height of 10' to 12', to ensure that snow-laden branches don't block the trail during winter. We see no need for surface materials, though there may be short stretches of wet terrain that could be improved with bog bridges.

From a timber management standpoint, the treatment recommended across much of the property is to give the forest a break from harvesting. Stocking is very low on average, especially considering that not timber harvesting has occurred during the past decade. Very few areas on the property contain "at-risk" timber, i.e. areas of mature examples of short-lived species, areas with trees that have been in closed-canopy conditions for an extended period, areas of diseased trees or concentrations of species targeted by host-specific forest pests or pathogens, and growth is still rebounding following previous timber harvesting operations. Therefore, for over 75% of the property we suggest no management action during this planning period.

Elsewhere, managers should complete the final stage of shelterwood harvesting in the oak, pine, and red maple sawtimber with mixedwood poletimber and saplings stand (1-HP4/2B). This final stage (known as an overstory removal) was set in motion by previous forest managers over the past few harvest entries. These previous harvests created suitable conditions to regenerate new young growth of a desirable species mix – as many of Maine's best commercial forest species require partial shade conditions to regenerate new seedlings (called advance regeneration), and require advance regeneration to be present prior to overstory removal in order to be competitive with less desirable species upon release from overtopping vegetation. With the desired advance regeneration established and growing well, we recommend removing much of the mature timber from the overstory – retaining scattered larger trees and most high-quality but smaller diameter sawtimber trees – to allow the younger growth to inherit the stand, whilst preserving the multi-aged characteristics of the forest, maintaining the seed source in case of unforeseen damages to understory vegetation either now or moving forward, and to sell the large diameter, valuable timber present before it is lost to pest/pathogen problems, internal rot, or other causes. All white oak should be preserved in harvesting, as it is an uncommon species with significant wildlife value. Post-harvest this area would appear a patchwork of harvest trails and clumps of young forest, dominated by areas of 15' to 25' tall sapling growth, sometimes with larger poletimber around or throughout, and periodic larger pine and oak.

In conjunction with this harvest, managers should also thin the red pine poletimber stand (2-S3B). While these areas were thinned somewhat recently, red pine thrives under a regime of frequent thinning, and can easily stagnate if not consistently nursed along. Therefore we suggest another thinning aimed at spacing those trees with the best form and crown health, in order to provide these trees with full sunlight conditions. Managers should select and release these designated crop trees on 3 to 4 sides of their crown, aiming to create a stand of relatively uniform spacing, dominated by healthy, attractive red pine.

Necessary Best Management Practices (BMPs): The main resource concern is to protect the water quality in streams and wetland features. Scheduling harvesting when soils are dry or frozen should mitigate erosion risk. Managers should avoid crossing streams wherever possible, and determine the best possible crossing location if necessary – aiming for places with high firm banks and rocky/gravelly beds, and should utilize slash to stabilize skid trails and install waterbars on any steep slopes to retire trails after the harvest. Consideration may be given to seeding the retired skid trails with winter rye to ensure soil stability and provide additional wildlife habitat.

In order to spread harvesting out over time - keeping forest management in the public eye and creating predictable periodic income from the property – we suggest breaking up the recommended harvesting into two separate entries (one in 2020 and one in 2025) utilizing the transmission corridor as the dividing line between harvest blocks. In 2020 we recommend treating the westerly 80 acres of oak, pine, and red maple sawtimber with mixedwood poletimber and saplings stand (1-HP4/2B), cutting 160,000 to 180,000 board feet of sawtimber and 400 to 500 cords of pulpwood, likely worth $40,000 to $50,000 in gross stumpage. The subsequent and similar thinning east of the powerline (though of smaller acreage and involving the lower valued red pine plantation) should cover 43 acres and remove 50,000 to 60,000 board feet of sawtimber and 250 to 325 cords of pulpwood, likely worth $12,000 to $15,000 in gross stumpage. We recommend that such harvesting be completed prior to any trail-building endeavors, as even in the best managed harvest there is potential for conflict between trail users and loggers, and damage or disturbance to trails. Plus, designing the trail after logging will allow managers to showcase the more attractive areas and aspects of the harvesting, and align interpretive signage relating to logging/forestry practices in appropriate locations. As well, funds from timber harvesting can be used to help offset trail construction costs. Should managers wish to accelerate the timeline on trail construction, these harvests could easily be batched into a single operation. Prior to any such harvest we recommend, we offer to lead a public tour to more widely describe the logistics and implications of such a harvest.

Prior to these harvests commencing the town, or its agent, must submit a Forest Operations Notification (FON)[3], which are valid for two years and are available from the Maine Forest Service, to the MFS. A confidential landowner report of harvesting activities will be mailed to each owner with an active FON, to be completed and returned to the MFS by the end of January.

Finally, to mitigate the threat caused by invasive species, priority should be directed towards containing their spread. We noted shrubs mostly along the understory in the red pine plantation (2-S3B). Fortunately these shrubs have not fully colonized the understory, making control efforts easier and more likely to succeed. Monitoring, to determine the problem's extent, can most easily be done during early spring or late fall as the invasives tend to leaf out much earlier and retain their leaves much later than other vegetation. Once a problem perimeter has been located, control efforts will be most beneficial if begun from there, with subsequent efforts employed to push the outbreak back to the field. Given the size of these shrubs chemical control is most likely the best option for their eradication. Managers should contract with a licensed pesticide applicator to develop a plan/proposal for the strategy and costs of removal efforts. Conducting the treatment prior to any timber harvesting (as well as budgeting for a follow-up treatment one year post-harvest) should be the best way to ensure that control efforts are successful and that timber harvesting does not become a vector for spreading these plants deeper into the woodlot.

[3] MFS Chapter 26 rules, see:
http://www.maine.gove/dacf/mfs/publications/rules_and_regs/chap_26_rules.pdf

This management plan does not recommend any harvesting that would leave an area five acres or greater with less than a minimum stocking of trees – a legal clearcut[4]. There should be no reason to update this plan prior to 2030 unless a natural disturbance intervenes or landowner objectives change significantly.

MANAGEMENT PRIORITIES
2020 – 2030

year	location	activity and extent	net income/cost
2020	eastern woods road	Solicit/purchase deeded legal access	($?)
2020	perimeter	Blaze and paint boundary (7.0 miles)	($2,000 to $2,500)[5]
2020	2-S3B	Eradicate invasive honeysuckle (18 acres)	($?)
2020	1-HP4/2B (west)	Overstory removal (80 acres)	$40,000 to $50,000
2025	1-HP4/2B (east) 2-S3B	Overstory removal/selective thinning (43 acres)	$12,000 to $15,000
2020-30	all	Develop loop trail (2 miles)	($?)

[4] MFS Chapter 20 rules, see:
http://www.maine.gov/dacf/mfs/publications/rules_and_regs/chap_20_rules_05012014.pdf

[5] Contractor cost; work could likely be complete much less expensively by the landowner.

WOODLOT SUMMARY BY WOOD PRODUCT

Winslow Town Forest
Winslow, Maine – February 2020

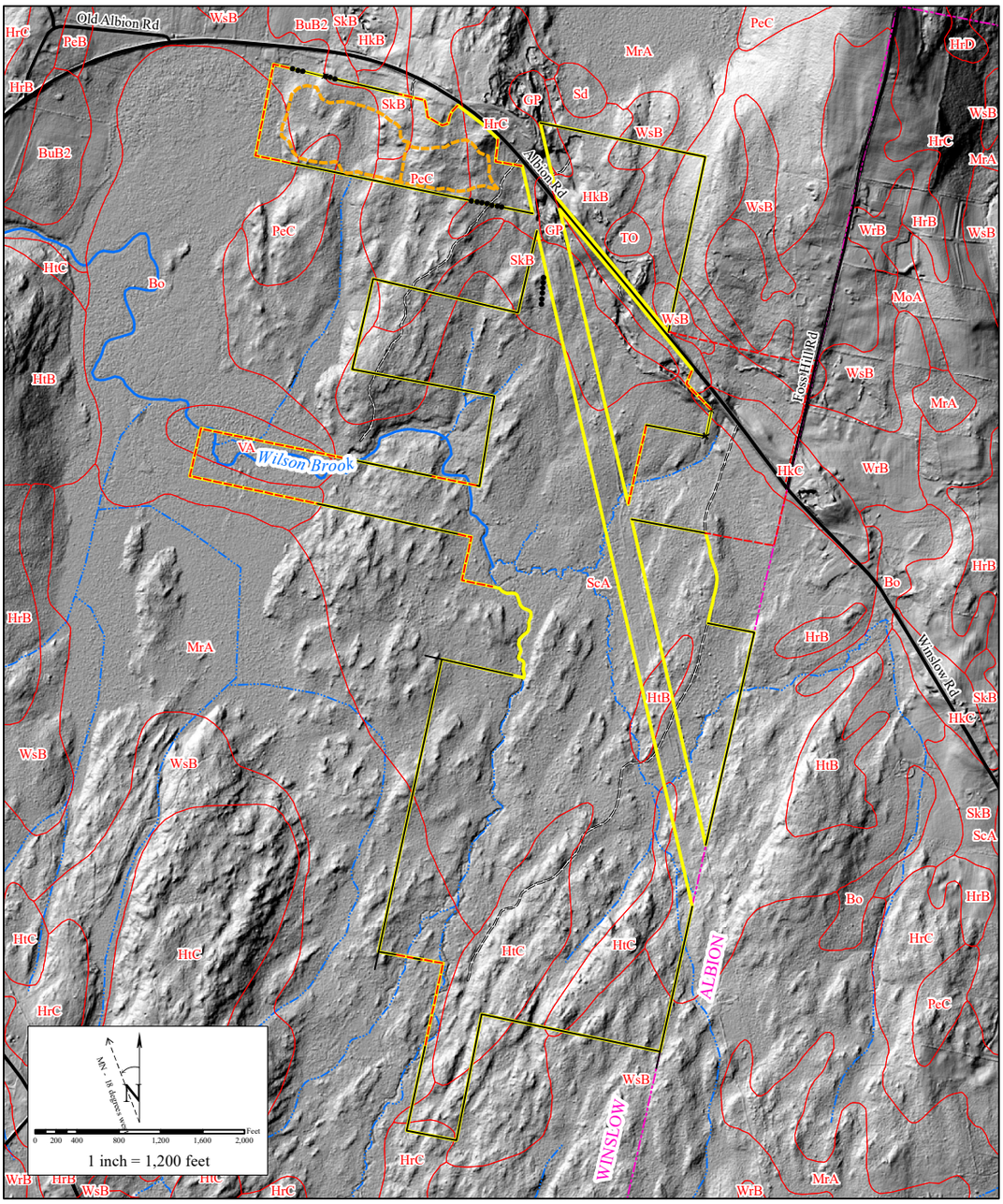
Product		Volume	Stumpage Rate	Value
Sawtimber (10" minimum top diameter)		(MBF)	($/MBF)	
White pine - grade		420	$180	$75,600
Red pine		25	$50	$1,250
Hemlock		25	$50	$1,250
Spruce		15	$100	$1,500
Balsam fir		15	$100	$1,500
Red oak		260	$300	$78,000
Red maple		80	$120	$9,600
	total MBF	840		
Pulpwood (3" minimum top diameter)		(Cords)	($/Cord)	
White Pine		555	$7	$3,885
Red pine		225	$7	$1,575
Hemlock		220	$7	$1,540
Spruce		70	$7	$490
Balsam fir		1,165	$7	$8,155
Cedar		260	$7	$1,820
Red oak		435	$20	$8,700
White birch		140	$20	$2,800
Yellow birch		45	$20	$900
Red maple		1,380	$20	$27,600
White ash		320	$20	$6,400
Beech		50	$20	$1,000
Popple		375	$20	$7,500
Other hardwood		145	$20	$2,900
	total cordwood	5385		

Total Estimated Volume in Cords 7,065
Statistical range 6,000 – 8,125 cords

Likely total stumpage Value $210,000 to $275,000

ABOUT THE CRUISE: The woodlot summary values were derived from a field cruise of 87 variable radius plots, on systematically located transect lines, using a 20 BAF prism. Data was processed using QuickCruise, a rapid timber cruise program providing estimates for Maine, which is the copyrighted property of L.E. Caldwell, LLC(2012). Sawtimber volumes use the International 1/4" Log Rule, which converts to cordwood at a ratio of one MBF to two cords. Cordwood volumes include topwood of sawtimber trees.
ABOUT STATISTICS: The sampling error of the estimate of total volume is 14.3% within a 67% confidence interval. That means that if the woodlot were recruised, new volume estimates would fall within the above stated statistically significant range 15 times in 20. Individual product numbers have higher sampling errors than those for total volume, and are much less reliable.
ABOUT STUMPAGE RATES: Rates are derived from research data collected by Two Trees Forestry during the course of business. The value stated may not represent a legal liquidation value, given that regulatory restrictions may not allow all the timber on the lot to be removed at one time.

Soils Map



Soils Legend

Symbol	other slopes	Name	Ordination number	WP	Site RO	index SM	RM
Bo		Biddeford mucky peat	5w				50
BuB2	C	Buxton silt loam, eroded	4o	55		48	
HkB	C, D	Hinckley gravelly sandy loam	5s	55		48	
HrB	C, D	Hollis fine sandy loam	5d	55		48	
HtB	C, D	Hollis-rock outcrop complex	5x	55		48	
MrA		Monarda very stony silt loam	4w	65		55	
PeB	C, D	Paxton-Charlton very stony fine sandy loam	3o	75		63	
ScA		Scantic silt loam	5w	55		48	
Sd		Scarboro mucky peat	5w	55		48	
SkB		Scio very fine sandy loam	3o	75		55	
WsB	C	Woodbridge very stony fine sandy loam	3o	75		62	

Symbols and slopes - The first and second letters abbreviate the soil name. The third letter shows the slope (A = <3%, B = 3-8%, C = 8-15%, D = 15-25%, E = 25-45%). Soils without slope letters are nearly level. A final 2 shows that the soil is eroded.
Ordination number – Potential productivity; 3=excellent, 4=fair, 5=poor; x=stoniness. Also, w=wet, x=restricted rooting depth, o=insignificant limitations, s=sandy, r=steep
Site index – Average height growth, of listed species, in 50 years. WP=white pine, RO=red oak, SM=sugar maple, RM=red maple

LAWS IMPACTING LAND MANAGEMENT ON PROPERTIES

• **Local Ordinance** – Winslow has no local ordinances that apply to timber harvesting. Land Use Planning Commission rules also do not apply in Winslow, as it is an organized town.
• **Mandatory Shoreland Zoning Act (MSZA)** – Winslow maintains and enforces its own rules for timber harvesting in shoreland areas, and considers the areas within 250' of the large open wetland in the center and northwestern corners of the property to be such a regulated zone, as well as areas within 75' of Wilson Brook. Within those zones, landowners must leave adequate tree cover and retain a well-distributed stand of trees, if currently present. Cutting is allowed to the water's edge, within varying defined limits. By one standard, for example, loggers may not remove more than 40% of the timber (by volume) during any 10-year period, nor create cleared openings within 75' of the normal high water line. Other rules also apply but don't significantly hinder management options. The full details are available at the town office.
• **Natural Resources Protection Act (NRPA)** – NRPA regulates disturbing soil adjacent to water bodies, including all seasonal brooks including all well defined channels with exposed mineral soil, including streams with only seasonal water flows. The law requires that concerted efforts must be made to ensure that soils do not wash into the brooks. Working within guidelines described in the Maine Forest Service's Best Management Practices for Forestry should ensure compliance. Permitted activities may require permit-by-rule (PBR) or full permitting.
• **Protection and Improvement of Water Law** – The law regulates activities, which discharge or may potentially discharge materials (pollutants) into water bodies. In the context of forestry, the law addresses pollutants originating from non-point sources and addresses the impact, not the location, of an activity.
• **Erosion and Sedimentation Control Law** – The Law requires that measures be taken to prevent unreasonable erosion of soil or sediment beyond the site or into a protected natural resource, such as a river, stream, brook, lake, pond, or wetland. Erosion control measures must be installed before the activity begins, be maintained, kept in place and functional until the site is permanently stabilized.
• **Forest Practices Act** – FPA mandates adequate regeneration must be present within five years of any harvest, establishes rules relating the planning requirements, size, and spacing of clearcuts, and outlaws liquidation harvesting. All landowners must notify the Maine Forest Service prior to harvesting and then report volume and price information for any year in which harvesting occurred.
• **Liquidation Harvesting Act**[6] – Within five years of acquiring a parcel of land, Maine landowners may not harvest timber and then sell or offer to sell the land unless certain exemptions apply, including proof that statewide the landowner owns less than 100 acres, the parcel is less than 20 acres, the owner retains at least 50% of the standing timber, or the owner is legally permitted to change the land's use to something other than forest growth. As the town has owned the property for more than five years, these rules no longer apply to them on this land.

[6] See: http://www.maine.gov/dacf/mfs/publications/rules_and_regs/chap_23_rules.pdf

GLOSSARY

Clearcutting - cutting of all trees within a defined area (generally greater than 1 acre)
Commercial harvest - a timber stand improvement or harvest operation that results in a net landowner income
Cord - wood measurement statistic; 128 cubic feet, or a pile of wood four feet high, four feet wide, and eight feet long
DBH - tree measurement; diameter at breast height (4.5 feet above ground)
Decadent - overmature trees that are deteriorating in wood quality
Mature - condition of optimal tree value, after tree vigor and growth have slowed, yet before the onset of decay
MBF - log measurement statistic; one thousand board feet. One board foot equals a board one inch thick by 12 inches square
Operability - ease with which logging machinery could work a site; often limited by rockiness, steep slopes, wetness, etc.
Pre-commercial - a timber stand improvement practice that is a cost, where trees to be cut are frequently too small to be saleable
Poletimber - tree between five inches and 9.9 inches DBH
Regenerate - to establish a new stand of tree seedlings
Regeneration - seedlings of commercial tree species
Sawtimber - logs favored for lumber; generally eight to 16 feet long, straight, with small end diameter greater than eight to 10 inches
Seedling - tree greater than six inches tall but less than one inch DBH
Snag - standing dead and/or dying tree. Important habitat element for numerous wildlife species
Stand - a homogeneous unit of forestland, delineated because it supports trees of common species, age, potential, etc.
Stocking - stand measurement relative to the optimal number of trees that a unit of forestland could grow

FURTHER SOURCES OF ASSISTANCE

1. Two Trees Forestry: We can mark trees to harvest, select competent loggers, ensure a favorable timber sale contract and best market prices, and oversee harvests to meet landowners' objectives. We also maintain boundary lines and administer Federal cost-share programs. Please contact us for further assistance. P.O. Box 356 Winthrop, ME 04364. (207) 377-7196 or www.twotreesforestry.com

2. Maine Forest Service: A good source of educational material. Taxation and utilization specialists are also on staff. State House Station 22, Augusta, ME 04330. (207) 287-2791 or www.state.me.us/doc/mfs/

3. USDA-NRCS and Farm Service Agency: Informational agency for erosion control, road and trail repairs, tree planting, timber stand improvement, and management planning.
Augusta, ME 04330 (207) 622-7847 or www.me.nrcs.usda.gov

4. Maine Woodland Owners: Publish a monthly newsletter on local forestry concerns and organize educational field days regularly throughout the state. P.O. Box 926 Augusta, ME 04330. (207) 626-0005 or www.mainewoodlandowners.org