



*Woodland Management Services
Green Certified Resource Managers*

MID-MAINE FORESTRY

Barbara E. Brusila • Mitchell W. Kihn
Licensed Professional Foresters

1320 Western Road • Warren, Maine 04864
(207) 273-4046

email: mid-maine_forestry@juno.com

FOREST MANAGEMENT PLAN

for the
Town of Appleton

Appleton town office
2915 Sennebec Road
Appleton, Maine 04862

properties located in:
Appleton, Maine

Collamore lot - Tax Map 9, Lot 21
Collins & Pert lot - Tax Map 12, Lots 2 & 3
Lamont lot - Tax Map 3, Lots 14 & 15
McLaughlin lot - Tax Map 8, Lots 5 & 15
Mid-Coast Properties lot - Tax Map 8, Lot 1-13

Prepared by:

Mitchell Kihn
LPF #3206

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TABLE OF CONTENTS

	<u>Page</u>
CHAPTER 1 - GENERAL OVERVIEW	
Introduction	1
Management Objectives	1
Location/Topographic Map	1a & 1b
Soils	2
- Soils Map	2a & 2b
- Soil Ratings	3
Boundaries	4
Timber Resource	4
Insects, Disease And Weather Influences	6
Wildlife	6
Legal Restrictions	7
Markets	8
Commercial Harvest Of Wood Products	8
CHAPTER 2 - COLLINS & PERT LOT	
Property Description And Land Use History	10
Topography And Accessibility	10
Boundaries	11
Timber Resource	11
Insects, Disease And Weather Influences	13
Wildlife	14
Recreation	14
Legal Restrictions	14
Estimates of Timber Volumes and Values By Species	15
Property Map	15a
Stand Descriptions And Management Recommendations	16
Conclusions	29

CHAPTER 3 - MID-COAST PROPERTIES LOT

Property Description And Land Use History	30
Topography And Accessibility	30
Boundaries	31
Timber Resource	31
Insects, Disease And Weather Influences	33
Wildlife	34
Recreation	34
Legal Restrictions	34
Estimates of Timber Volumes and Values By Species	35
Property Map	35a
Stand Descriptions And Management Recommendations	36
Conclusions	48

CHAPTER 4 - GROVER McLAUGHLIN LOT

Property Description And Land Use History	49
Topography And Accessibility	49
Boundaries	50
Timber Resource	50
Insects, Disease And Weather Influences	51
Wildlife	52
Recreation	52
Legal Restrictions	52
Estimates of Timber Volumes and Values By Species	53
Property Map	53a
Stand Descriptions And Management Recommendations	54
Conclusions	64

CHAPTER 5 - LAMONT LOT	
Property Description And Land Use History	65
Topography And Accessibility	65
Boundaries	66
Timber Resource	66
Insects, Disease And Weather Influences	68
Wildlife	68
Recreation	68
Legal Restrictions	68
Estimates of Timber Volumes and Values By Species	69
Property Map	69a
Stand Descriptions And Management Recommendations	70
Conclusions	77
CHAPTER 6 - HERB COLLAMORE LOT	
Property Description And Land Use History	78
Topography And Accessibility	78
Boundaries	79
Timber Resource	79
Legal Restrictions	80
Insects, Disease And Weather Influences	81
Wildlife	81
Recreation	81
Estimates of Timber Volumes and Values By Species	82
Property Map	82a
Stand Descriptions And Management Recommendations	83
Conclusions	90
GLOSSARY	91
ADDITIONAL SOURCES OF ASSISTANCE	93

CHAPTER 1 - GENERAL OVERVIEW

INTRODUCTION

This plan presents an evaluation of five parcels owned by the town of Appleton, in Appleton, Maine and suggestions for its management. It will inform the reader of the nature of the forests, their various attributes and their potential to achieve expressed ownership objectives. It will also discuss management options for different areas and suggest a schedule of activities.

Forest management is a long-term endeavor. The recommendations given here are a first step towards achieving the stated goals. As time passes and the recommendations are implemented, this plan will need updating, typically at 10-year intervals. This will allow incorporation of changes arising from human and natural, non-human influences.

The plan begins with a statement of management objectives. It then provides general information about soils, boundaries, timber resources, legal restrictions on management activities, as well as market conditions and commercial harvesting suggestions. In separate chapters, each parcel is then described in more detail regarding its history, topography, soils, timber, and wildlife resources. Legal restrictions, if any, are mentioned, plus a table of estimated wood volumes and values. Accompanied with a map, forest stands in each parcel are described in more detail and specific management recommendations are presented. A table lists the high priority activities for each parcel, with income/cost estimates. The plan concludes with a glossary of forestry terms and a listing of sources available for further assistance.

The 5 parcels are:

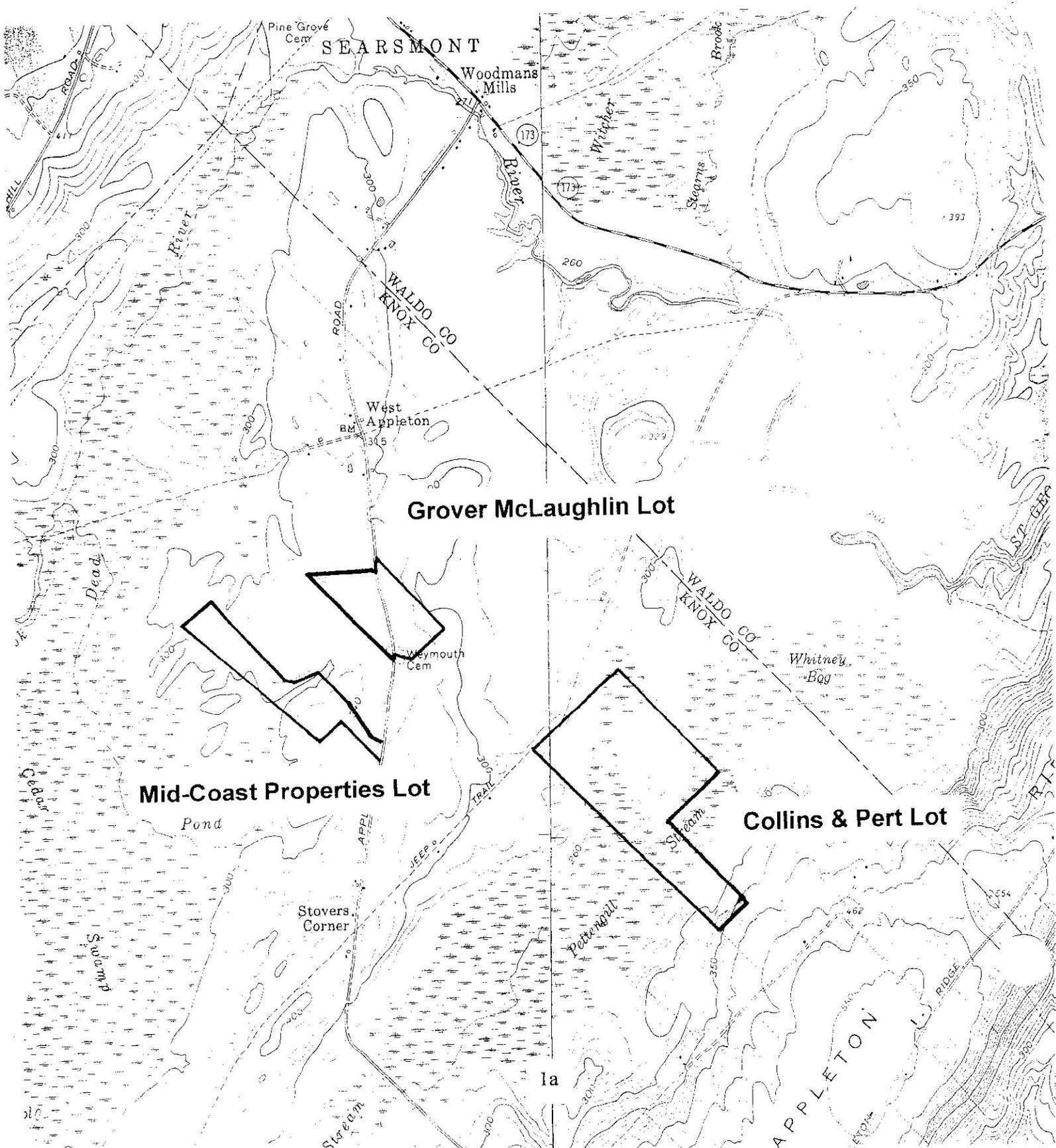
Lot	Acres	Location	Tax Map #	Lot #
Collins & Pert	125	Lower Road	12	2 & 3
Mid-Coast Properties	45	W. Appleton Road	8	1-13
McLaughlin	34	W. Appleton Road	8	5 & 15
Lamont	52	Collinstown Road	3	14 & 15
Collamore	42	Johnson Pond Trail	9	21
Total:	298			

MANAGEMENT OBJECTIVES

Timber production for income over the long term and providing recreational opportunities are the primary goals of the town of Appleton. Protection of wildlife habitat and soil & water quality are secondary goals. Cutting to attain the above objectives should strive to improve the growth, health, stocking, and species composition of the forest. Any activity performed in the parcels should be neat and not detract from the aesthetics of a managed forest.

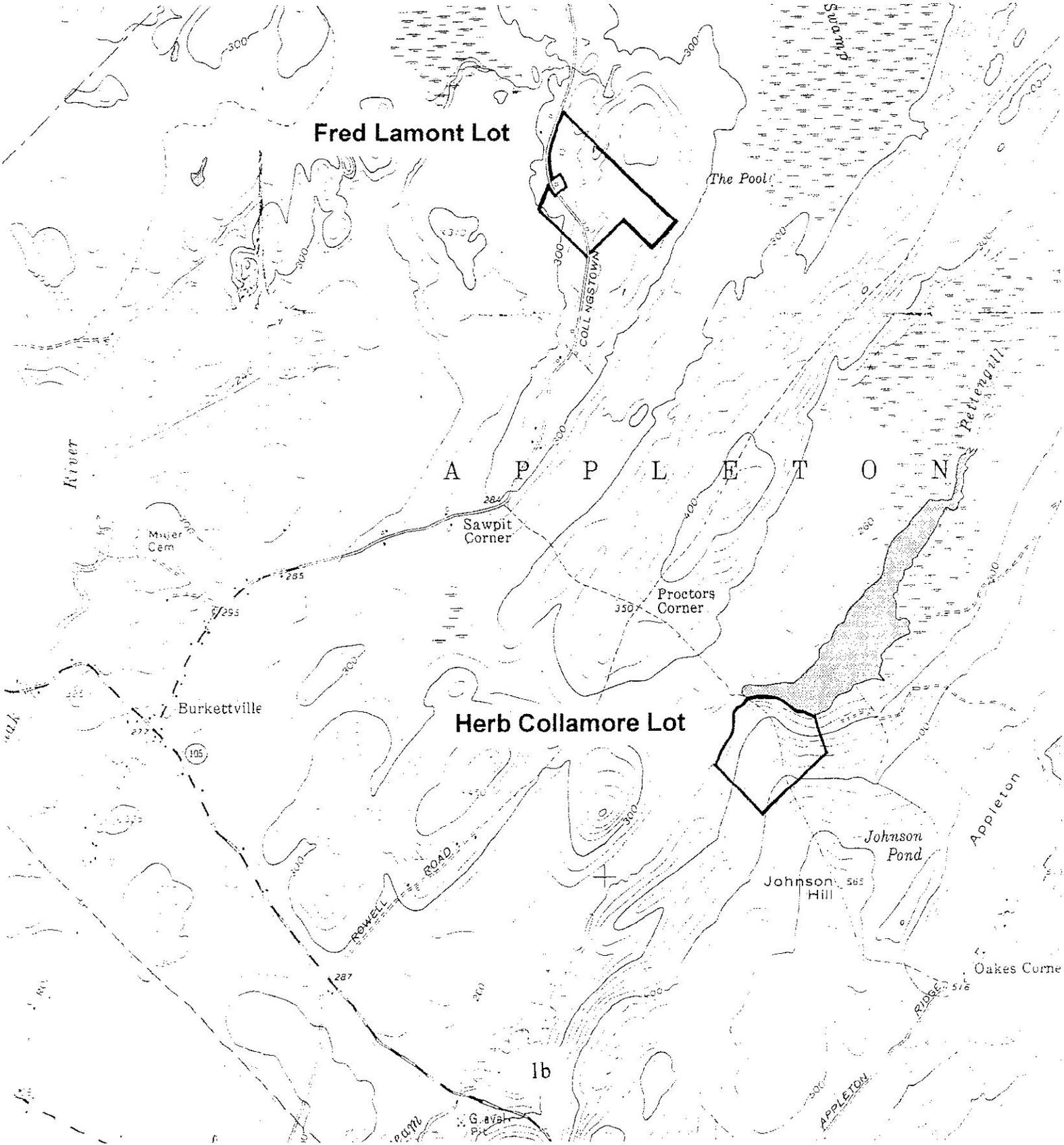
LOCATION / TOPOGRAPHIC MAP

Town of Appleton



LOCATION / TOPOGRAPHIC MAP

Town of Appleton



SOILS

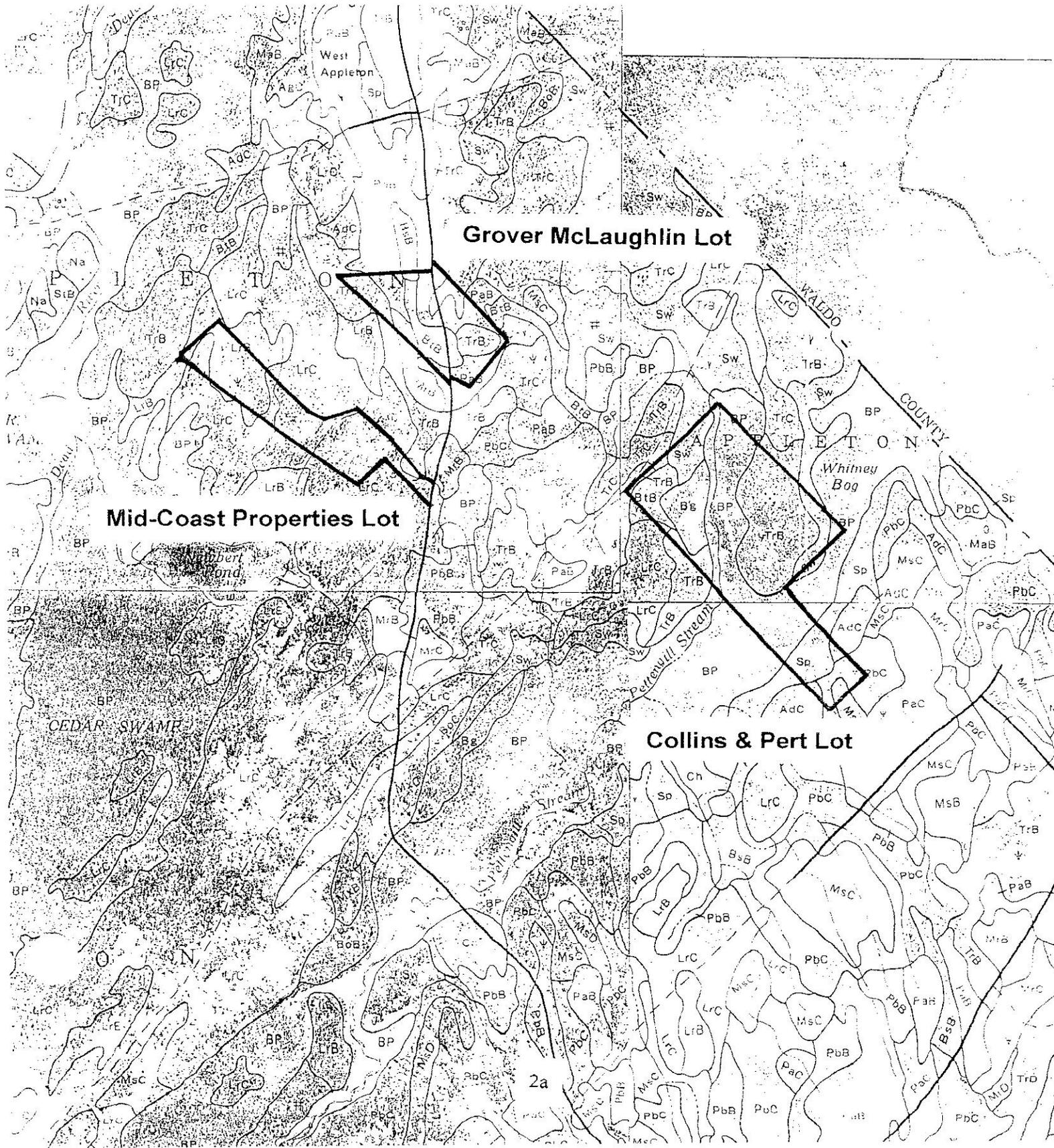
Refer to the soils maps on the following pages. There is a wide range of soils represented on the 5 town lots. The swamps contain very poorly drained organic soils while dry, excessively drained areas have soils that are shallow to bedrock with some exposed ledge. The following legend summarizes basic characteristics of the soils mapped on the lots.

SOILS LEGEND

- AdC - Adams loamy fine sand, 8-15% slopes; deep; somewhat excessively drained.
- Bg - Biddeford mucky peat, 0-3% slopes; deep; very poorly drained; high water table most of the year.
- BP - Borosapristis, level; deep; very poorly drained; often ponded; seasonal high water table.
- BsB - Brayton, fine sandy loam, 0-8% slopes; shallow to hardpan; somewhat poorly to poorly drained; seasonal high water table.
- BtB - Brayton, very stony fine sandy loam, 0-8% slopes; shallow to hardpan; somewhat poorly to poorly drained; seasonal high water table.
- LrB - Lyman - Rock outcrop - Tunbridge complex, 3-8% slopes; moderately deep to shallow to bedrock; well drained to somewhat excessively drained.
- LrC - Lyman - Rock outcrop - Tunbridge complex, 8-15% slopes; moderately deep to shallow to bedrock; well drained to somewhat excessively drained.
- MrB - Marlow fine sandy loam, 3-8% slopes; deep to hardpan; well drained.
- MsC - Marlow very stony fine sandy loam, 8-15% slopes; deep to hardpan; well drained.
- MsD - Marlow very stony fine sandy loam, 15-25% slopes; deep to hardpan; well drained.
- PaB - Peru fine sandy loam, 3-8% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- PbB - Peru very stony fine sandy loam, 3-8% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- PbC - Peru very stony fine sandy loam, 8-15% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- Sp - Searsport mucky peat; 0-1% slopes; deep; very poorly drained; high water table, at or above soil surface for most of the year.
- Sw - Swanville silt loam, 0 - 3% slopes; shallow to hardpan; poorly drained; high water table most of the year.
- TrB - Tunbridge - Lyman complex, fine sandy loam, 3-8-% slopes; moderately deep to shallow to bedrock; well drained to excessively drained.
- TrC - Tunbridge - Lyman complex, fine sandy loam, 8-15% slopes; moderately deep to shallow to bedrock; well drained to excessively drained.

SOILS MAP

Town of Appleton



SOIL RATINGS *

The following table lists the various productivity ratings and factors affecting management for the pertinent soil types. This can be referenced to the soils maps for each town parcel, on which the soil types are delineated. The letter codes pertain to the particular soil types, as identified in the legend.

<u>Soil Series</u>	<u>Site Quality</u>			
	White <u>Pine</u>	Red <u>Spruce</u>	Red <u>Oak</u>	Northern <u>Hardwood</u>
AsC	good	poor	--	fair
Bg, BP	--	--	--	--
BsB, BtB	excellent	fair	--	good
LrB, LrC - Tunbridge	excellent	good	excellent	good
LrB, LrC - Lyman	excellent	poor	--	fair
MrB, MsC, MsD	excellent	fair	excellent	excellent
PaB, PbB, PbC	excellent	good	excellent	good
Sp	good	--	--	fair
Sw	good	poor	--	fair
TrB, TrC - Tunbridge	excellent	good	excellent	good
TrB, TrC - Lyman	excellent	poor	--	fair

<u>Soil Series</u>	<u>Factors Affecting Management</u>			
	Erosion <u>Hazard</u>	Equipment <u>Limitation</u>	Seedling <u>Mortality</u>	Windthrow <u>Hazard</u>
AsC	slight	slight	moderate	slight
Bg, BP	slight	severe	severe	severe
BsB, BtB	slight	severe	moderate	severe
LrB, LrC - Tunbridge	slight	slight	slight	moderate
LrB, LrC - Lyman	slight	slight	moderate	severe
MrB, MsC	slight	slight	slight	moderate
MsD	moderate	moderate	slight	moderate
PaB, PbB, PbC	slight	slight	slight	moderate
Sp	slight	severe	severe	severe
Sw	slight	severe	moderate	severe
TrB, TrC - Tunbridge	slight	slight	slight	moderate
TrB, TrC - Lyman	slight	slight	moderate	severe

* from Soil Survey of Knox and Lincoln Counties, Maine. 1987.
USDA, Natural Resources Conservation Service.

BOUNDARIES

Property boundary lines should be permanently delineated, especially before any cutting occurs. Ideally, the line is cleared for unobstructed viewing and boundary trees are painted and/or blazed (scarred with an ax). All boundary lines should be reblazed and painted every ten years to preserve current boundary evidence and to protect against timber trespass.

TIMBER RESOURCE

For purposes of describing the forest and setting management priorities, different forest stands were identified. These are found in the Stand Description section and on the Property Map for each of the 5 parcels. Stands are denoted by a number, but if composed of 2 non-contiguous units, each unit is also denoted by a lower case letter. Inventory data were taken at variable radius plots, with the goal of 1 plot representing 2 acres. The data was processed using the INVENT Forest Inventory Program from the University of New Hampshire. Each of the 5 parcels was processed separately.

Three factors determine forest type: 1) the dominant tree species or species group in the canopy; 2) canopy height; and 3) canopy density (also referred to as crown closure). Determination of dominance is based on basal area in the canopy, not the raw number of trees or wood volume. Basal area expresses the amount of growing space a species is utilizing in the stand. The breakdown is as follows:

SOFTWOOD = S = 75%+ softwood

HARDWOOD = H = 75%+ hardwood

MIXEDWOOD = M = both hard- and softwood 25%+

SOFT/HARDWOOD = SH = 50-75% softwood and 25-50% hardwood

HARD/SOFTWOOD = HS = 50-75% hardwood and 25-50% softwood

Stocking level is determined by the basal area per acre and average tree diameter of the canopy trees. Therefore, the suppressed trees in the understory are excluded, usually the saplings less than 5" in diameter. Canopy height is classified into 3 levels: 1 = low = <30'; 2 = moderate = 30-60'; and 3 = high >60'. Canopy density also comes in 3 levels: A = high = >70% crown closure; B = moderate = 40-70%; and C = low = 10-40%. An area with less than 10% crown closure is not considered a forested stand. Growth rate is expressed as volume per acre per year. Volumes are expressed as board feet for sawtimber and as cords for pulpwood and boltwood. The standard conversion between board feet and cords is 1,000 board feet (1 mbf) = 2 cords.

Together, the 5 lots contain 287 wooded acres. Shrub swamps and an abandoned town road make up the remaining 11 acres. The Mixedwood type accounts for nearly 2/3 of the total acreage. The distribution of the 3 broad timber types among the 5 lots are:

Type	# of acres	% of total
Softwood	51	18
Mixedwood	180	63
Hardwood	<u>56</u>	<u>19</u>
	287 acres	100%

The total volume of the 5 lots is estimated to be 700,000 board feet and 7,060 cords. This is an average volume per acre, with 2,440 board feet and 25 cords per acre. The lots' total worth is estimated to be \$114,400. This works out to \$399/acre, which is below average. At an average growth rate of 0.4 cord/acre/year, about 115 cords of wood can grow annually on the entire ownership. A typical harvest frequency of a stand is 15 years. After 15 years, 1,725 cords will have grown. Averaged across the wooded acreage, this means that an average of 6 cords per acre can be sustainably harvested.

Sustainability (of wood products) can be expressed in a variety of spatial and temporal scales. The larger the scales, the easier it is to average or spread out the volumes. A clearcut of a 10 acre stand, for example, is not sustainable over 20 years since no commercial wood will have grown back in that time. However, it can be sustainable over a period of 60+ years (with thinnings yielding wood volume over time). Achieving sustainability levels is a mid- to long-term proposition. It should be remembered that the baseline from which sustainability is measured should be the volume per acre at the recommended stocking level for the respective forest type. Often for a highly stocked stand, the volume recommended for harvest (to reduce stocking from current to recommended levels) exceeds the sustainable amount. A harvest volume in a certain stand that is more than the calculated sustainable volume is certainly justified if it is in an appropriate context of reaching stocking level or regeneration goals. The stand level is, nevertheless, quite small and cumbersome for sustainability concerns; it is more appropriately addressed on a forest ownership basis.

Not much timber harvesting is recommended for the next 10 years. This is because of either lack of silvicultural need or other objectives and considerations, such as wetlands protection or difficult access. The last little bit of marked wood in the Lamont Lot should be finished up soon. The only other unconditional harvest recommendation is for the McLaughlin Lot within the next 5 years. It would yield a gross income of about \$2,900. Two other potential harvests (on the Collins & Pert Lot and the Collamore Lot) should be done only after the Selectmen give them due consideration and decide to proceed. For the Collins & Pert Lot, it is stand 5 that is uphill of the Pettengill Stream but needs a 1,300' R-O-W access. It can be left to protect the wetlands below and to allow a stand of big trees to remain and develop. Stands 2 & 3 of the Collamore Lot have plenty of available wood, but the entire lot has an access problem. Also, it is an "island" of bigger and older trees in between heavily cut neighboring lots. Existing circumstances in each case are persuasive enough to not recommend harvests. But that's not to say the wood can't be harvested if the political will is strong enough.

All lots should have their boundary lines blazed and painted. Trail establishment is recommended for the Collins & Pert Lot and Mid-Coast Properties Lot.

INSECT, DISEASE AND WEATHER INFLUENCES

In general, a forest can be considered healthy despite poor health of individual trees as long as the ecological processes still function. These include food production and the cycling of water and nutrients. Trees with wounds, hollows, seams or are under stress often contain any one of many fungal infections which slowly rot the trees' wood. This is caused by overcrowding or age, which limits tree growth and vigor and makes them more susceptible to fungal infection. The presence of these wood decaying fungi is a normal part of a natural forest.

The properties were inspected for damage from the 1998 Ice Storm. No damage greater than spotty trace amounts occurred on any of the properties. In general, any tree that suffered stem breakage or tearing, large top breakage, or loss of more than 75% of its crown, should be cut. A wait-and-see approach should be applied to less damaged trees.

WILDLIFE

Certain trees should be retained in the forest to benefit wildlife, although they may not have sawtimber value. These include den trees (live hollow) and snags (standing dead). Birds and small mammals primarily use these 2 types of trees. Snags should not be cut unless they pose a safety hazard during logging. According to *A Forester's Guide to Managing Wildlife Habitats in Maine*, a guideline is to leave a minimum of four wildlife (den or snag) trees greater than 6" in diameter per acre. It is recommended that for a 10-acre area, the following wildlife trees should be present:

- 6-14" dbh -- 20 - 25 trees
- 15-18" dbh -- 10 - 15 trees, and
- >18" dbh -- 4 - 5 trees.

These ten-acre numbers are averages; designated wildlife trees may be clumped into areas such as along streams or woodland edges. *Biodiversity in the Forests of Maine* recommends retaining 1 tree >24" dbh and 3 trees >14" dbh per acre. In addition to current wildlife trees, potential future ones should be identified and allowed to grow old and die naturally (such as mature declining aspen and birch). Leaving large downed tree stems >12" dbh and over 6' long is desirable to provide coarse woody debris used as habitat by small mammals, salamanders, etc. Slash, both scattered and piled, provides cover, nesting and forage sites. The edges of the semi-openings and roads present an interface of habitat for both food and cover for animals such as deer, moose, partridge, fox and rabbit.

Food for animals is provided through seeds of the softwoods, birch and alders, beech-nuts, oak acorns and fruit from the occasional black cherry or apple tree. Aspen buds are an important food for partridge

Vernal pools are depressions that fill with water from snow melt and spring runoff and typically dry out later in the season. The best time to look for vernal pools is in the spring. The absence of fish in these pools makes them ideal breeding and feeding areas for local amphibian populations. Any activity which impacts a pool directly or the water regime of a vernal pool indirectly may affect the survival of these amphibians. Maine is currently working on best forestry management practices for conserving vernal pool habitats. Maine Audubon Society's 1997 publication, *Maine Citizen's Guide to Locating and Describing Vernal Pools*, addresses forestry activity near vernal pools. In brief, within 500' of the pool's edge, one should 1) minimize disturbance to the forest's organic layer, 2) maintain coarse woody debris of various sizes and decay classes, and 3) provide partial shade from residual vegetation. Specifically, a 25' no-cut buffer should be kept around vernal pools.

Harvesting can be used as a way to create or maintain age and structural diversity (both vertical and horizontal) within the forest ecosystem. This in turn will create habitats that are more varied. Any timber cutting should avoid sensitive habitats and wetter areas and be timed to minimize disruption of the important nesting and young rearing seasons in spring and early summer. Seeding of log yards and roads after use with conservation mix will improve forage opportunities for many species. Opportunities for viewing wildlife will be improved by an extended trail network, either as a result of harvesting or a separate project. If desired, wildlife trees and shrubs such as mountain ash, highbush cranberry, hawthorne, serviceberry, or staghorn sumac could be planted in openings or along woods roads.

LEGAL RESTRICTIONS

The state-mandated Shoreland Zoning Ordinance was designed for the protection of wetlands. The Shoreland Zone designation that affects some of the Appleton town parcels is the Resource Protection Zone. In this zone, which is 250' wide from the wetland edge, no timber harvesting is allowed within the first 75' of the wetland. Harvesting is allowed between 75' and 250' but is limited to no more than 40% of the timber volume in any 10-year period. A well-distributed stand of trees must remain, with canopy openings no larger than 10,000 ft². Harvesting activity must not result in ground disturbance. Accumulation of slash is not allowed to be higher than 4' nor within 50' of any waterbody.

During a harvest operation, procedures outlined in the Maine Forest Service's Best Management Practices Field Handbook (July 1995 reprint) should be followed regarding working in and around wetlands and streams. Maine's Natural Resources Protection Act (NRPA) regulates activities in wetlands. Forest management in forested wetlands is exempt as long as it meets the following criteria:

- 1) meets minimum stocking requirements under the Forest Practices Act;
- 2) meets "permit-by-rule" standards for any road crossing of a stream, or for any soil disturbance adjacent to great pond, river or stream and DEP is notified prior to starting the activity;
- 3) the area is not a forested wetland mapped as a significant wildlife habitat; and
- 4) the road construction is not used to access development, but is primarily used for forest management activities.

Before any commercial harvesting occurs, landowners (or their agent) must file a harvest notification form with the Maine Forest Service. Year-end reports of harvested volumes and stumpage prices are a part of this requirement.

For areas greater than 10 acres, all boundary lines within 200' of cutting must be clearly marked. It is highly recommended that these lines be marked even if the harvest area is less than 10 acres. During harvesting operations of any size all slash must be removed at least 25' from adjoining properties.

MARKETS

All wood greater than 6" dbh is currently marketable. Pulpwood would most likely be trucked to one of four mills - International Paper Co. in Bucksport or Jay, SAPPi in Hinckley, or Madison Paper in Madison. Firewood could be sold to local dealers, homeowners. There are quite a few sawmills in the mid-coast area. The largest local sawmill is Robbins Lumber in Searsport. The N.C. Hunt sawmill, in Jefferson, is a good market for hemlock and short and low-grade pine. Depending on the logging contractor and/or trucker, logs would be sold to one of these local mills or to companies operating concentration yards. White birch is commonly sold as 4' bolts (down to 8" diameter) and trucked to Solon, ME. Oak, too, can be sold in bolt length to a local mill in West Rockport. Oak boltwood offers 3 times the price for this size wood than if sold for firewood. Wood markets fluctuate in price, product specifications, and demand. Current market conditions should be assessed as part of a timber harvest.

COMMERCIAL HARVESTS OF WOOD PRODUCTS

Properly done, commercial harvests are one part of an environmentally sound, multiple-use forest management system. Through cutting, a forester manipulates the vegetative structure within a forest stand to attain stated objectives. Timber can often be harvested while enhancing wildlife habitat and recreational opportunities. Typically, the long-term goal is the production of high value wood products, such as grade white pine and spruce saw logs as well as oak veneer and sawlogs. To this end, low quality and unhealthy trees and/or mature individuals are chosen for removal. This allows faster growth to occur in the more valuable, vigorous, immature trees. It also favors the release or establishment of natural regeneration of desired species. The regeneration is part of the property's long-term potential. Thus, proper harvesting not only generates immediate income for the owner but, over time, can also improve the health and quality of the timber and wildlife resources of the property. Forest canopy openings, however, should be limited to no greater than $\frac{1}{4}$ acre.

Commercial harvesting should be conducted on a marked tree or species designation basis and under the supervision of a licensed professional forester. This will ensure that the selection of trees for cutting is in the best short- and long-term interest of the owner, and leaves a desirable residual stocking of trees. In addition, the forester supervises harvesting operations (usually weekly) to ensure proper utilization, minimal felling and skidding damage to residual trees, and to help assure accurate payment for harvested wood products.

Sales should be conducted on a competitive bid basis or by direct negotiation with reputable contractors. The timing of specific sales is dependent on economic and silvicultural considerations, as well as seasonal ground conditions. To prevent rutting and preserve the integrity of the soil's organic mat, harvesting should be done when ground is either frozen or dry so that it is stable enough to hold up heavy machinery. Low impact machinery, such as a forwarder (usually in combination with a cut-to-length system) is recommended for its ability to drive the wood out to the landing instead of dragging it. Other preferred alternatives to skidders include horses and 4-wheel drive tractors with winches.

Recreational and aesthetic concerns and wildlife needs should be given appropriate emphasis during timber marking and while supervising harvesting jobs. Yards and skid roads should be located to minimize soil erosion and visual impact, as well as to improve interior access. Cutting along existing roads, trails, streams and vistas may need to be modified to maintain an aesthetically pleasing appearance. Appropriate numbers of wildlife trees and other critical areas should be left to provide both cover and food, especially along wetlands.