Fountains Land
AN F&W COMPANY

HARRIS TRUST FOREST

A northern Vermont forestland tract, well suited to the long term timber investor, with options for home construction or conversion to sugarbush management.

267± GIS Acres
Belvidere, Lamoille County, Vermont

Price: $330,000

Fountains Land, an F&W company, 79 River Street, Suite 301, Montpelier, VT 05602
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PROPERTY OVERVIEW

The property's highest and best use is as a long-term timber investment with the possibility of conversion to sugarbush management. Other uses, such as year-round or seasonal home development, are possible given the long road frontage and suitable terrain.

Property highlights include:

- Standing timber value of $292,700;
- 15,000± potential taps based on a recent 2017 timber inventory;
- Long town road frontage;
- Mostly gentle terrain with scenic views of the Cold Hollow Mountain Range;
- Attractive asking price set near timber value.

The forest can support long-term timber investment and/or development of a sugarbush.

LOCATION

The forest is in a scenic part of northern Vermont, with the Green Mountain Range's Long Trail 1.5 miles to the east and the Cold Hollow Mountains just to the west within view of the land. The immediate area is mountainous, rural and mostly forested, punctuated by small villages. Numerous streams and tributaries flow generally southward through the area, carving valleys along the way, to join the Lamoille River along Route 15 as it makes its way west to Lake Champlain.

Belvidere is little more than a small hamlet on a rural state highway. Montgomery Center, which has a ski town influence from nearby Jay Peak Resort, is 6 miles to the north. Johnson, Vermont, the largest nearby town is 17 miles to the south and is home to Johnson State College. Burlington, Vermont's largest city, is 56 miles to the southwest while Montreal, Canada, is 81 miles to the northwest.

Harris Trust Forest is in between the Green Mountain and Cold Hollow Ranges. Views of the Cold Hollow Mountains, as in the photo above, can be enjoyed from the property.

Five nearby state roads provide exceptional access to local, regional and Canadian forest product markets.

ACCESS

Harris Trust Forest benefits from 2,900 feet of frontage on Bog Road. Bog Road is a dirt, town-maintained road that runs 4.25 miles from the intersection of Routes 109 and 118 in the eastern part of town to Route 109 in Belvidere Center to the west. The road is populated by year-round homes on either end, where there is power. In the center section of the road, where there is no power and where the property is located, scattered, seasonal camps are tucked off the road. Power is 0.8 miles in either direction from the property boundaries.

There is a short, internal road at the land's eastern end, which ends at a large clearing, formerly served as a place for processing forest products. At the land's western end, along the road frontage, there is another small clearing.

Terrain along the road frontage is mostly gradual and well-drained.

Bog Road as it runs past the property, which is to the left.

SITE DESCRIPTION

The property rests on the lower slopes of Laraway Mountain's ridge complex. Here terrain gradually falls from the land's southern end to the road frontage to the north, producing a northern aspect. Terrain is gradual to moderately sloped, with few steep areas creating ideal conditions for forest management and sugarbush operations.

One intermittent stream courses through the land's eastern end where it passes a mixedwood stand before it leaves the forest and crosses Bog Road. The high point on the forest is at the land's south-central end with an elevation of 1,693'. The lowest point is along the road frontage at 1,240', where the stream leaves the property.

A level site near the road frontage, and an old cellar hole where a home or camp could be located.

The terrain along the road frontage is mostly gentle, with additional possible driveway cuts available beyond the two existing ones on the eastern and western ends of the property. An old cellar foundation along the road, along with apple trees and stone piles, indicate that there used to be a farm and meadows in the central section of the road frontage. Here, views after tree clearing of the opposing Cold Hollow Mountain range would be impressive.

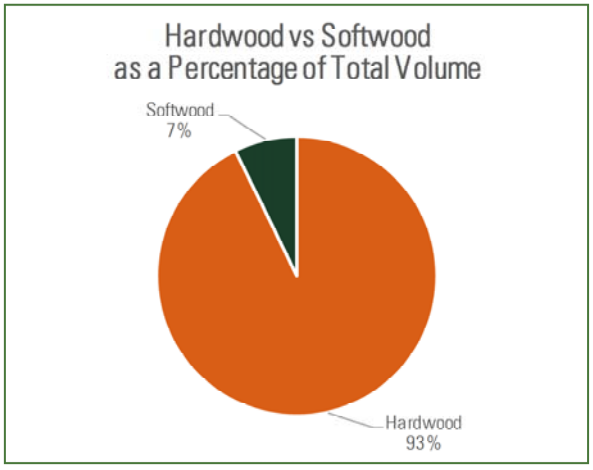
TIMBER RESOURCE

Timber data in this report are based on a comprehensive and monumented timber inventory conducted in the spring of 2017 for the purpose of establishing Capital Timber Value (CTV) and estimating potential sugarbush taps. 60 inventory points were sampled (1 plot per 4.45 acres), covering a 441' X 441' grid using a 10-factor prism. Sampling statistics are ±17.1% standard error for sawlog products and ±10.5% for all products combined at the 95% confidence interval. The timber data reveal a total sawlog volume of 1,092 MBF International ¼" scale (4.1 MBF/acre), with 4,014 pulpwood cords (15.2 cords/acre). Combined total commercial per acre volume is 23.4 cords, a figure about average for the region. Stumpage values were assigned to the volumes in June of 2017, producing a property-wide Capital Timber Value (CTV) of $292,700 ($1,097/total acre). See the Timber Valuation in this report for details.

The vast majority of the forest is hardwoods, particularly yellow birch and the maples.

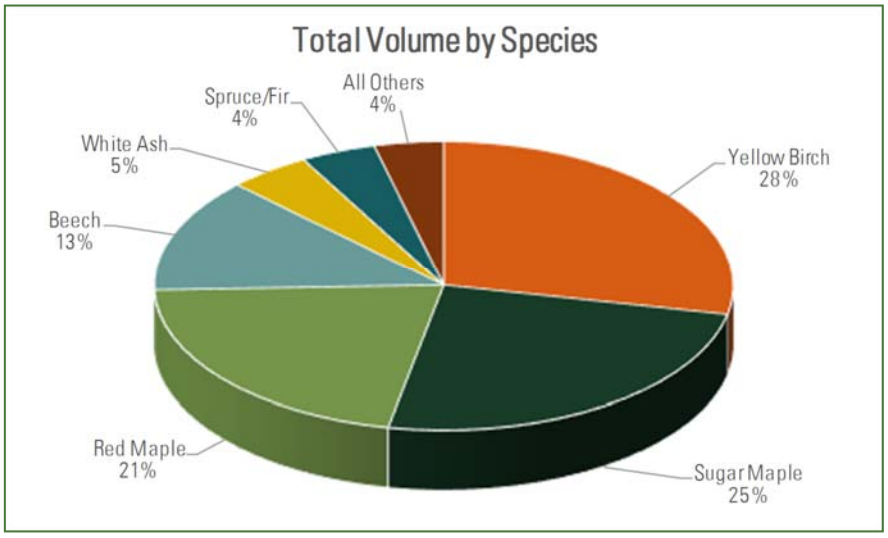
Species Composition:

The species composition is dominated by hardwoods (93%), with softwoods holding the balance (7%). Species composition for all products combined offers a diverse mix and is led by yellow birch (28%), followed by sugar maple (25%) and red maple (21%). The sawlog volume breakdown is similar, consisting of yellow birch (36%), sugar maple (28%), red maple (17%), spruce/fir (8%) and white ash (8%). The softwood species component (mostly red spruce sawlogs with larger-diameter stems) occupies a small mixedwood stand at the land's northeastern end.



Stocking and Stem Quality:

Forest density is generally represented by fully stocked stands covering most of the acreage. The exceptions are in the western and northwestern sections of the forest where stocking is still below full conditions from the last harvest. The average Basal Area (BA) is 87.3 ft^2 on 178 stems/acre. Stem quality is generally quite good; however, a diameter limit harvest occurred in 2008 on roughly half the acreage. This has moved the highest quality stems to the pole-sized growing stock and the smaller hardwood sawlog component.



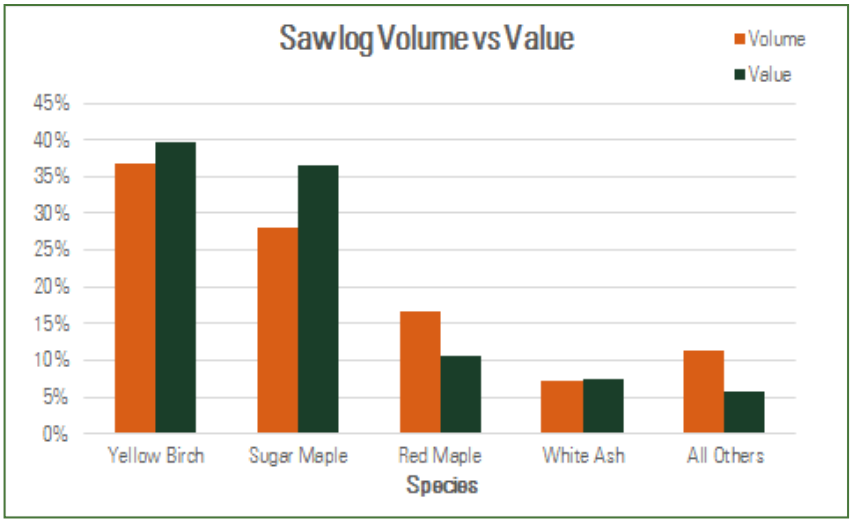
TIMBER RESOURCE (continued)

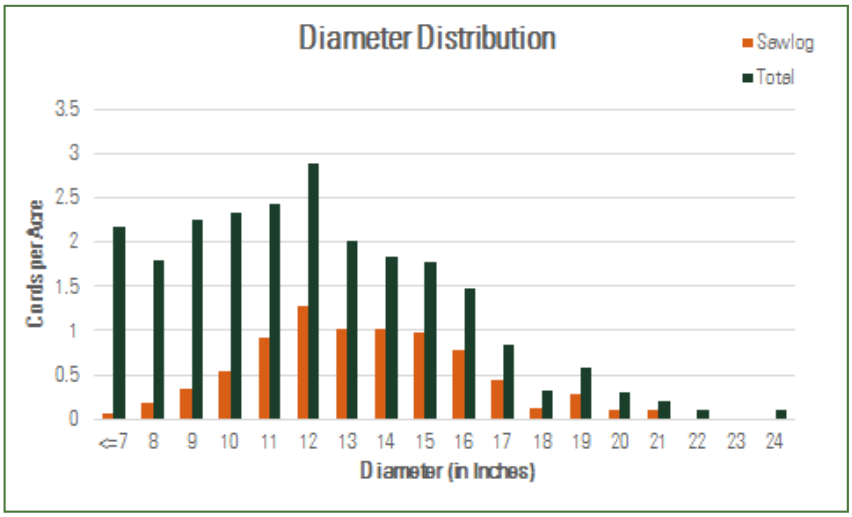
Sawlog Value/ Thinning History:
Sawlog value is largely dominated by yellow birch (40%) and sugar maple (36%), with the balance comprised of common associates for the area and soil types.

Since the tenure of the current owner began in 2012, no silvicultural activity has been conducted. Prior to 2012, a thinning occurred in 2008 by the previous ownership. Based on current stocking levels and age classes, thinning activity will likely be necessary in 10 years.

Diameter Distribution:
Average diameter for all products combined is 12", while the average sawlog diameter is nearly 13". The diameter distribution generally indicates a middle-aged forest, consisting of an older age class of roughly 75 years and a younger age class of 30-40 years. Sugar maple and yellow birch represent 40% of the growing stock volume (stems 5-10" in diameter).

Average diameter for the three major species is: yellow birch and sugar maple 13.5" and red maple 14".





TAXES, ACREAGE & TITLE

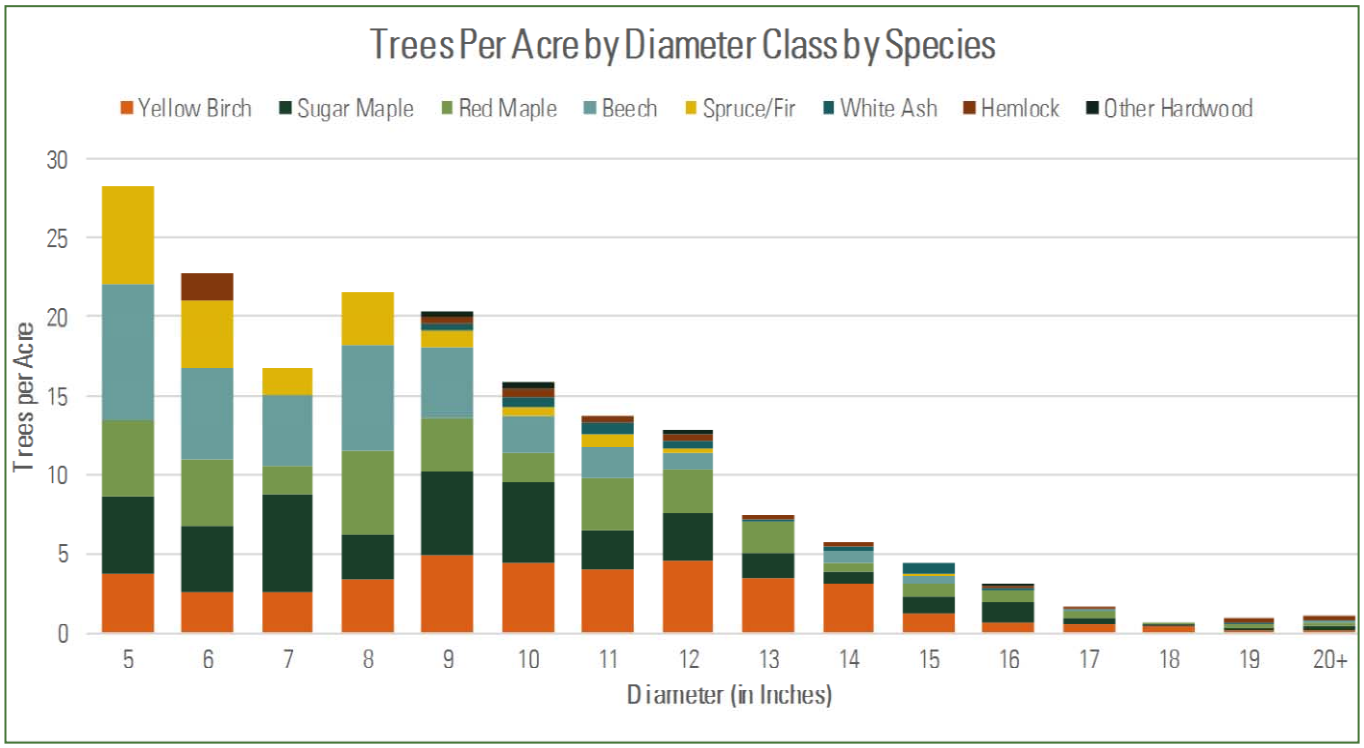
Municipal property taxes in 2015/16 were $1,177. However, this amount will be lower (closer to an annual tax burden of $750-$900) as the ownership is selling the northern 160 acres separately. The property IS enrolled in the State of Vermont's Use Value Appraisal (UVA) program (plan date 2010).

The ownership recently had the boundary lines maintained in the woods, with red paint delineating the boundaries.

The property is owned by the Philip B. Harris Declaration Trust. The deed is recorded in Book 32, Page 78 of the Belvidere land records. This deed includes the 160 acres north of Bog Road that the ownership is selling separately.

Small mixedwood stand with spruce and hemlock.

SUGARBUSH OPPORTUNITY



The property offers a potential sugarbush opportunity, given the level of maple stocking, slope factor and access. A June 2017 timber inventory indicates a potential tap count of 15,156 taps, with roughly 44% of the taps from sugar maple with the balance from red maple. Trees 9" and greater were considered, providing an average of 57 taps/acre covering 266 acres within one watershed. Also, the timber data indicates that an additional 9,174 taps may become available in the coming decades from the maple resource within the 5-8" diameter class.

Tap Estimate from Timber Data			
Commercial Acres			266
DBH Class	Stems/ac	Taps/stem	Total Taps
9-14"	32.2	1	32.2
15-20"	11.8	2	23.6
>21"	0.4	3	1.2
Total Taps/ac			57.0
Total Taps			15,156

Details of the recent June 2017 timber inventory are provided at the end of this report.

Electric power is located roughly 4,500' to the west of the land along Bog Road. A northern aspect prevails with nearly all terrain sloping directly to a single sap collection location. The town road is not plowed in the winter; thus, any operation would require plowing by the ownership.

Small vernal pool with hardwood stand located at the land's southeastern end.

Harris Trust Forest

Timber Valuation

Prepared By

F&W FORESTRY SERVICES, INCOPORATED

Belvidere, Lamoille County, Vermont
June 2017

267 GIS Acres
265 Commercial Acres

Species	Volume MBF/CD	Unit Price Range Low	High	Likely	Total Value Likely
Sawtimber - MBF (International 1/4")					
Yellow Birch	261	225.00	325.00	300.00	**78,200**
Sugar Maple	205	300.00	425.00	375.00	**76,800**
Red Maple	119	140.00	225.00	175.00	**20,800**
White Ash	69	175.00	300.00	250.00	**17,300**
Spruce/Fir	89	100.00	140.00	125.00	**11,100**
Yellow Birch Veneer	12	600.00	900.00	750.00	**8,900**
Sugar Maple Pallet	99	60.00	120.00	80.00	**7,900**
Yellow Birch Pallet	129	40.00	85.00	60.00	**7,700**
Pallet / Grade 3	93		100.00	70.00	**6,500**
Sugar Maple Veneer	2	1,000.00	1,500.00	1,200.00	**2,500**
Beech	6	30.00	100.00	80.00	**500**
Hemlock	7	30.00	60.00	45.00	**300**
Black Cherry	1	200.00	300.00	250.00	**300**
Pulpwood - Cords					
Hardwoods	3,759	10.00	16.00	14.00	**52,600**
Hemlock	175	4.00	7.00	5.00	**900**
Spruce/Fir	80	4.00	7.00	5.00	**400**

Totals			
Sawtimber Total	1,092 MBF		**$238,800**
Sawtimber Per Acre	4.091 MBF		**$895**
Sawtimber Per Comm. Acre	4.125 MBF		**$902**
Cordwood Total	4,014 Cords		**$53,900**
Cordwood Per Acre	15.0 Cords		**$202**
Cordwood Per Comm. Acre	15.2 Cords		**$204**
		Total Per Acre	**$1,097**

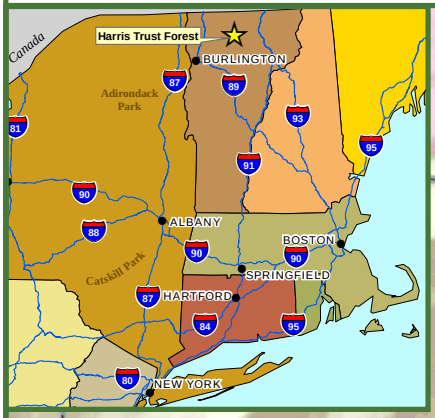
Total Value	Low	High	Likely
	$255,000	$317,000	**$292,700**

BASED ON A SPRING 2017 INVENTORY CRUISE BY F&W FORESTRY SERVICES, INC.

Volumes are based on 60 invenotry points taken on a 441' x 441' grid.
Cruise resulted in a statistical error of 17.1% for all sawlog products and 10.5% for all products combined at the 95% Confidence level
The volumes and values reflect estimated total capital value of merchantable timber.
The volumes and values are not a liquidation value.
Prices are averages for the area and are adjusted to reflect, access, quality and operability of the site.
Fountains Land is a trade name for F&W Forestry Services, Inc.

Locus Map
Harris Trust Forest
266.8 GIS Acres
Belvidere, Lamoille County, VT

Fountains Land
AN F&W COMPANY



Montgomery
Lowell
Tillotson Mill
Belvidere Mountain' 3260
Belvidere
Belvidere Center
Belvidere Junction
Laraway Mountain' 2797
Bowen Mountain' 2304
Eden
Eden
Waterville
Butternut Mountain' 2217
Bean Mountain'
Cambridge
Johnson
North Hyde Park
Ithiel Falls
Cambridge
West Settlement
Center

118
109
100C
100
15

Legend

- Harris Trust Forest
- North Lamoille Forest
- US Highway
- Interstate
- State Highway
- Primary Town Rd
- Secondary Town Rd
- Public Land
- Other Conserved Lands

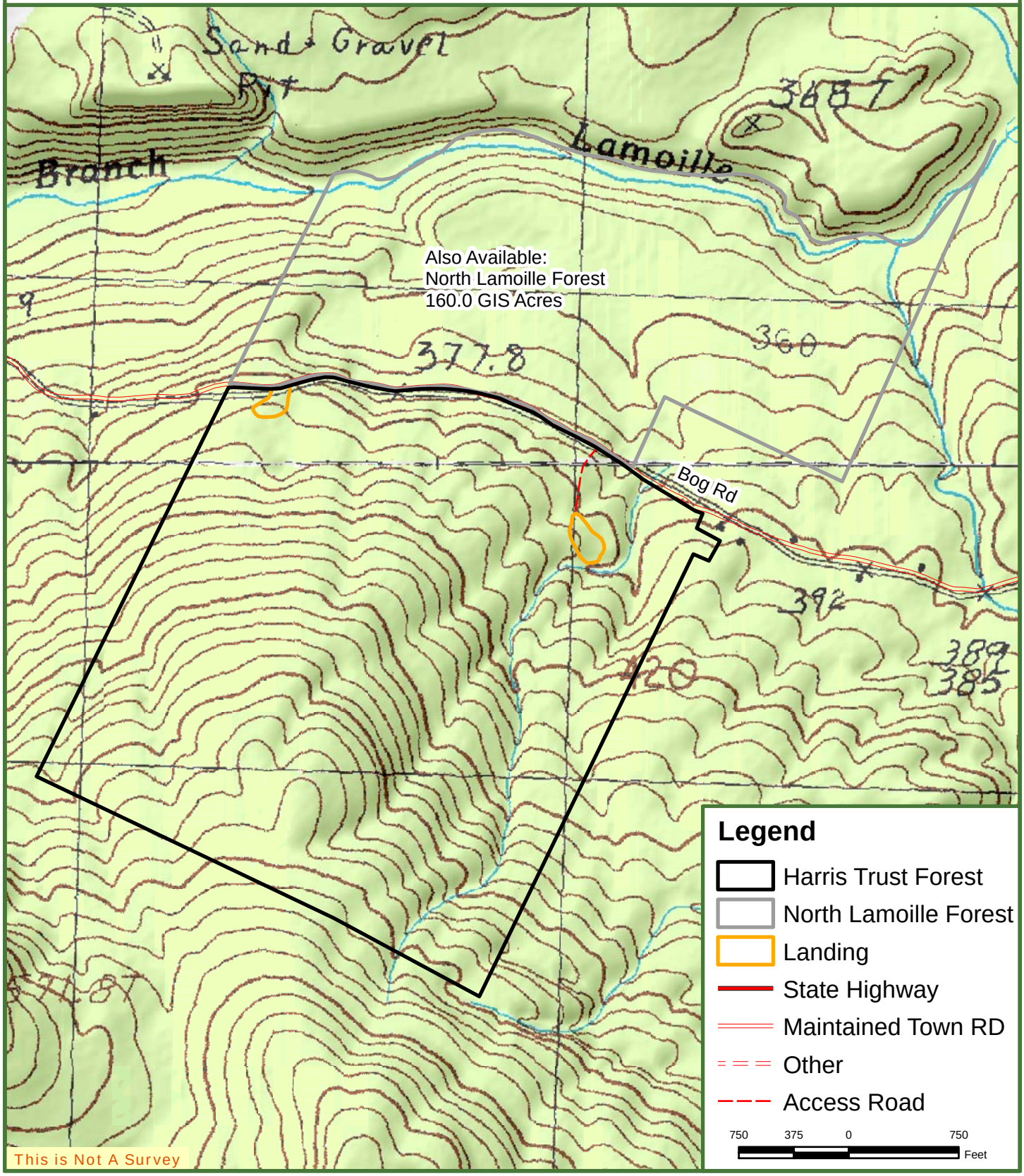
0 0.5 1 2 Miles

Harris Trust Forest

266.8 GIS Acres

Belvidere, Lamoille County, VT

Fountains Land
AN F&W COMPANY



Map produced from the best available information including town tax maps, hand held GPS data, aerial photography and reference information obtained from publicly available GIS sources, and the owner. Boundary lines portrayed on this map are approximate and could be different than the actual location of boundaries found in the field.

Harris Trust Forest

266.8 GIS Acres

Belvidere, Lamoille County, VT

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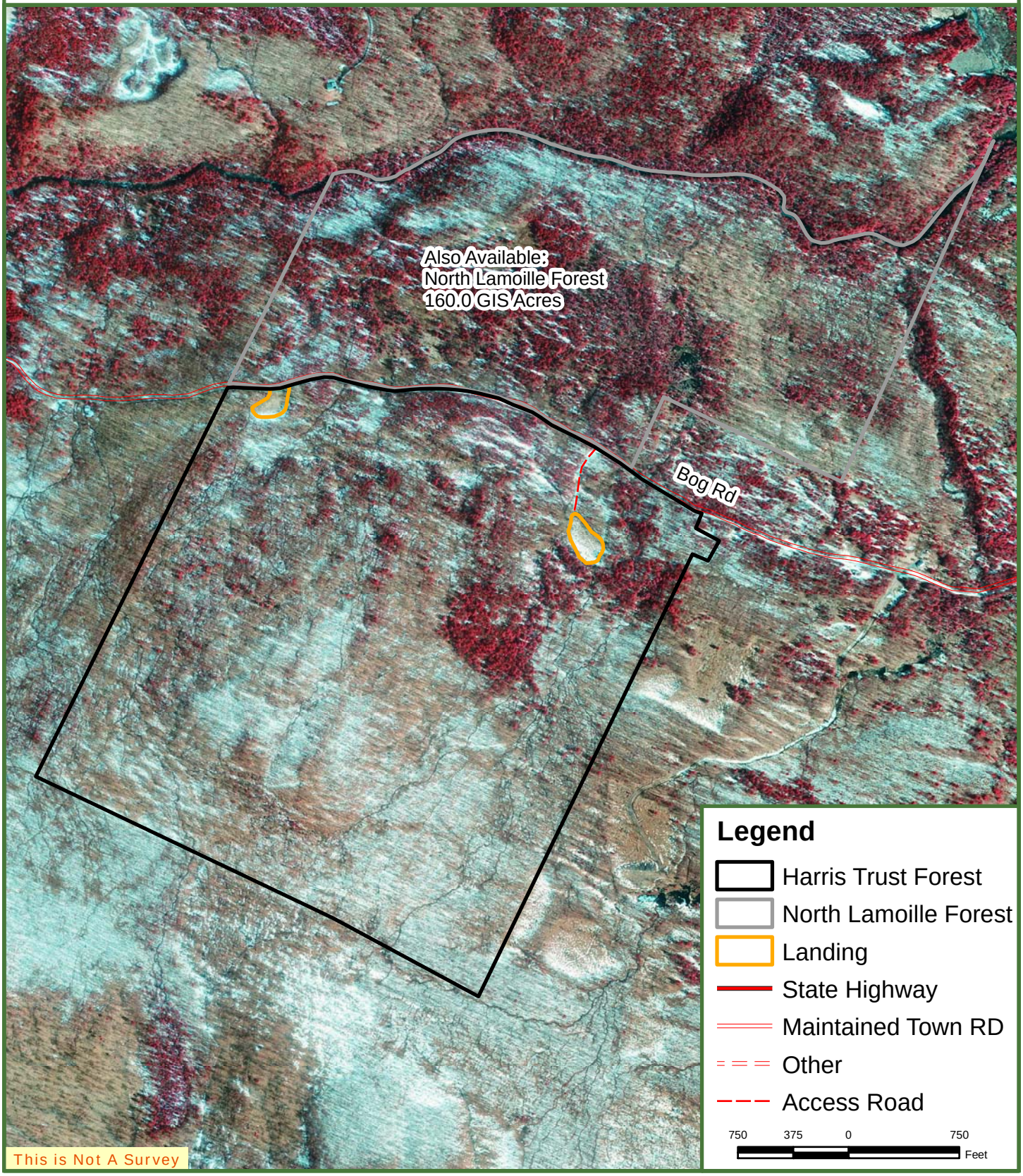

Map produced from the best available information including town tax maps, hand held GPS data, aerial photography and reference information obtained from publicly available GIS sources, and the owner. Boundary lines portrayed on this map are approximate and could be different than the actual location of boundaries found in the field.

Vermont Real Estate Commission
Mandatory Consumer Disclosure

[This document is not a contract.]
This disclosure must be given to a consumer at the first reasonable opportunity and before discussing confidential information; entering into a brokerage service agreement; or showing a property.

RIGHT NOW YOU ARE NOT A CLIENT

The real estate agent you have contacted is not obligated to keep information you share confidential. ***You should not reveal any confidential information that could harm your bargaining position.***

Vermont law requires all real estate agents to perform basic duties when dealing with a buyer or seller who is not a client. All real estate agents shall:

- Disclose all material facts known to the agent about a property;
- Treat both the buyer and seller honestly and not knowingly give false or misleading information;
- Account for all money and property received from or on behalf of a buyer or seller; and
- Comply with all state and federal laws related to the practice of real estate.

You May Become a Client

You may become a client by entering into a written brokerage service agreement with a real estate brokerage firm. Clients receive the full services of an agent, including:

- Confidentiality, including of bargaining information;
- Promotion of the client's best interests within the limits of the law;
- Advice and counsel; and
- Assistance in negotiations.

You are not required to hire a brokerage firm for the purchase or sale of Vermont real estate. You may represent yourself.

If you engage a brokerage firm, you are responsible for compensating the firm according to the terms of your brokerage service agreement.

Before you hire a brokerage firm, ask for an explanation of the firm's compensation and conflict of interest policies.

Brokerage Firms May Offer
NON-DESIGNATED AGENCY or DESIGNATED AGENCY

- **Non-designated agency** brokerage firms owe a duty of loyalty to a client, which is shared by all agents of the firm. No member of the firm may represent a buyer or seller whose interests conflict with yours.
- **Designated agency** brokerage firms appoint a particular agent(s) who owe a duty of loyalty to a client. Your designated agent(s) must keep your confidences and act always according to your interests and lawful instructions; however, other agents of the firm may represent a buyer or seller whose interests conflict with yours.

THE BROKERAGE FIRM NAMED BELOW PRACTICES
NON-DESIGNATED AGENCY

I / We Acknowledge
Receipt of This Disclosure

_____
Printed Name of Consumer

_____
Signature of Consumer Date

[ ] *Declined to sign*

_____
Printed Name of Consumer

_____
Signature of Consumer Date

[ ] *Declined to sign*

This form has been presented to you by:

Fountains Land
Printed Name of Real Estate Brokerage Firm

Michael Tragner
Printed Name of Agent Signing Below

_____
Signature of Agent of the Brokerage Firm Date

9/24/2015

TIMBER INVENTORY AND REPORT

Harris Trust

Belvidere, Lamoille County, Vermont

266.8 GIS Acres

16 June 2017

fountains land inc

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Montpelier, VT 05602

Tel: (802) 223 8644
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www.fountainsland.com

Timber Volume and Value

Purpose

The purpose of this timber inventory and valuation project is to determine the total capital value of the standing timber resources on 266.8 GIS acres owned by the Harris Trust and located in Belvidere, Vermont as requested by the owner. Capital timber value is the full market value of all the timber as it stands, reflecting all relevant access and operating considerations, but without regard to market saturation or time required for harvest. This timber report is prepared for the use of the above-mentioned individual. It is understood that it may be used by the landowner in support of decisions regarding ownership of the property.

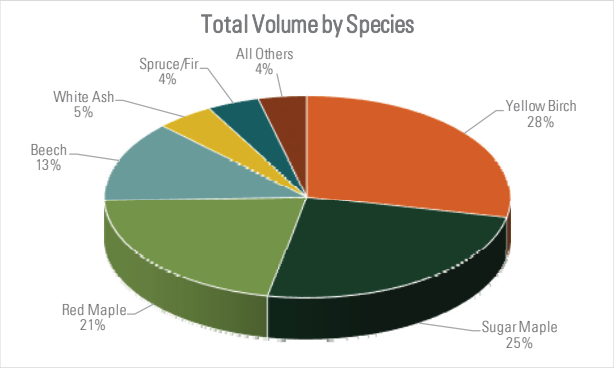
Inventory Area

This report presents a timber inventory and valuation for the Harris Trust property. The forest lies on mostly upland sites within the north-central portion of the state. The forest is depicted in GIS files recently created during the inventory project. These files are believed to be reasonably accurate and based on GPS data of the property. Most boundary lines are clear, with monumentation consisting of blazed lines and stone walls/fence lines. In many areas, boundaries have been recorded with GPS data, and the GIS files have been adjusted accordingly. The GIS files align with known boundaries on the ground.

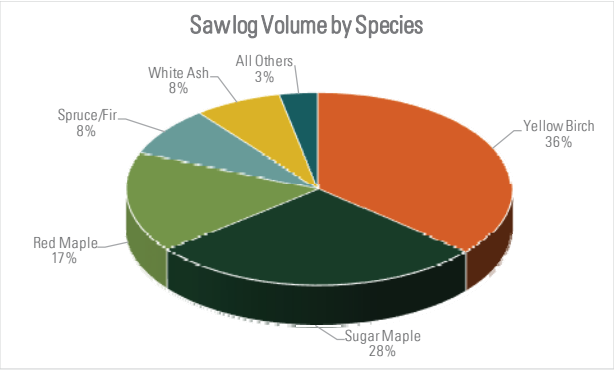
F&W Forestry has delineated various non-forest cover types on the property, including landings and roads. The remainder of the property is considered operable and productive forestland, and is the inventory area for this project. By GIS measurement, the inventory area is 264.6 acres of operable and productive forestland. The entire property measures 266.8 GIS acres. The breakdown of acreage for non-productive cover types is provided on the accompanying map and Timber Valuation sheet.

Timber Description

Timber data reveal a total sawlog volume of 1,092 MBF International ¼" scale (4.1 MBF/commercial acre) with 4,014 pulpwood cords (15 cords/commercial acre). Combined total commercial per acre volume is 22.3 cords, a total volume in line with the regional average. Stumpage values were assigned to the volumes by F&W Forestry in June 2017, producing a property-wide Capital Timber Value (CTV) of $292,700 ($1,096/total acre). See the Timber Valuation in this report for details.



Species composition leans heavily to hardwoods, representing 93% of total volume. Softwoods represent 7%. Species composition for all log products combined offers a favorable mix and is led by yellow birch (36%), followed by sugar maple (28%) and red maple (17%), with small volumes of beech, spruce/fir, white ash, black cherry and hemlock. The sawlog volume breakdown consists largely of species with historically strong demand, dominated by yellow birch.

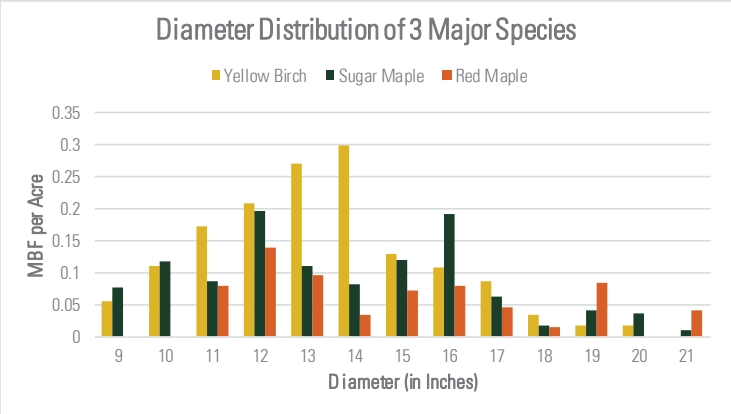


Overall, moderate to full stocking conditions

prevail. The average basal area (BA) is 87.3 ft^2 on 176.7 stems/acre. The Acceptable Growing Stock BA is 53.7 ft^2 on 92 stems/acre which represents good utilization of growing space by current and future high-quality crop trees. These numbers indicate a forest resource with overall good to very good stem quality.

Sawlog value is largely dominated by yellow birch (40%) with the balance held by sugar maple (37%), red maple (11%), and other northern hardwoods & spruce (12%).

Average diameter (quadratic mean diameter) for all trees combined is almost 12", while the mid-point of the diameter distribution of sawlog trees is just under 13", well above average given the hardwood-dominated forest types. The average diameter of yellow birch sawlog trees, the major species, is over 12.5".



The property offers an excellent potential multiple use opportunity, given the high level of stocking, slope factor and access.

Determining Volumes

The Harris Trust property was inventoried in June 2017 by F&W Forestry Services. The data were processed using a computer program called Two Dog.

Cruise design was a 441' X 441' grid. A total of 60 plots were taken on commercial ground, an average of 4.4 commercial acres per plot. At a 95% confidence interval, the inventory resulted in a standard error for all sawlog volumes of ±17.1%, and ±10.5% for the total volume of all products. This standard error is within the range that F&W Forestry considers to be the industry standard for properties of this size. The standard error is a result of the number of plots taken, and the variability of volume between those plots.

The inventory utilized a 10 factor prism. All trees were measured in one-inch diameter increments at breast height (4.5' above the ground). Merchantable forest products were tallied in 8' lengths for all trees 5" in diameter and greater.

The following products were specified to be tallied during the inventory of the property:

- Veneer
- Sawlogs (grade 2 and better)
- Pallet logs
- Pulpwood

Sawlog and veneer volumes are given in units of thousand board feet (MBF) using the International ¼" Log Rule. One board foot is the measure of a piece of wood 12" X 12" X 1". Pulpwood is given in units of cords. One cord is a stack of wood measuring 4' X 4' X 8'. Specifications for all products may be found in the *Timber Cruise Specifications* section in the Appendix.

Determining Values

Once volumes have been reasonably determined, values are assigned through an analysis including both an income and comparable sale approach.

Timber Value Influences – The price of standing timber (stumpage) is essentially the price paid at the

mill less the cost of logging and trucking. Mill prices tend to be competitive with each other and driven by the market and price of lumber. Logging and trucking costs tend to be more variable according to the specific property situation.

Mills buy timber according to species and grade. Grades are based on quality and size of individual stems. Most mill price levels are based on the availability of timber and the market for the final product. Higher grade lumber is strongly influenced by export markets. Species benefiting most from the increase in export demand include red oak, sugar maple, yellow birch, spruce/fir and black cherry.

Logging costs include felling the timber and removing it from the woods. Logging costs can vary tremendously according to the type of equipment used, distance from a suitable landing area, size and distribution of the timber to be cut, topographical features of the land, and condition of access.

Trucking costs are generally a function of distance. Landings which are inaccessible to tractor trailers may require an additional short-haul on smaller trucks and, therefore, an additional cost. A loading fee may be required in some cases.

The income approach starts with published mill-delivered prices (usually by grade) and then backs out all costs required to achieve that income, leaving a residual value, or stumpage by grade. All mills within a reasonable geographic region are surveyed for published prices and specifications. Distance to these mills from the forest is then determined and a reasonable trucking cost is estimated. The mill price less trucking costs produces a value of the timber "roadside". Based on the physical characteristics of the property, including terrain and access, and based on the distribution, quality, and size of the timber, a logging cost is determined, and subtracted from the roadside price to produce a range of stumpage values by grade from a variety of mills. From this analysis, a reasonable average unit value can be determined.

In addition to this income-based approach, considerable weight is given to comparable timber sales, primarily from F&W Forestry's own experience, and including harvests on the property. Different sales are weighted according to how directly comparable they are to the subject property in terms of a variety of factors including but not limited to terrain, distance to the road, logging chance (size, quality and distribution of the timber), type of cut (thinning versus clearcut), and distance to mills. Finally, any independent source of comparable stumpage price data is also examined.

Final determination of unit values is then a weighted and measured opinion of both the prices indicated by the income approach, and prices indicated by comparable sales. Key factors influencing these opinions include the quality of the timber, logging costs, access issues, and the current condition of markets.

Timber Value

The following table combines the volumes determined by the inventory with the unit prices developed to produce the current full capital valuation of the timber.

Harris Trust Forest

Timber Valuation

Prepared By

F&W FORESTRY SERVICES, INCOPORATED

Belvidere, Lamoille County, Vermont
June 2017

267 GIS Acres
265 Commercial Acres

Species	Volume MBF/CD	Unit Price Range Low	High	Likely	Total Value Likely
Sawtimber - MBF (International 1/4")					
Yellow Birch	261	225.00	325.00	300.00	**78,200**
Sugar Maple	205	300.00	425.00	375.00	**76,800**
Red Maple	119	140.00	225.00	175.00	**20,800**
White Ash	69	175.00	300.00	250.00	**17,300**
Spruce/Fir	89	100.00	140.00	125.00	**11,100**
Yellow Birch Veneer	12	600.00	900.00	750.00	**8,900**
Sugar Maple Pallet	99	60.00	120.00	80.00	**7,900**
Yellow Birch Pallet	129	40.00	85.00	60.00	**7,700**
Pallet / Grade 3	93		100.00	70.00	**6,500**
Sugar Maple Veneer	2	1,000.00	1,500.00	1,200.00	**2,500**
Beech	6	30.00	100.00	80.00	**500**
Hemlock	7	30.00	60.00	45.00	**300**
Black Cherry	1	200.00	300.00	250.00	**300**
Pulpwood - Cords					
Hardwoods	3,759	10.00	16.00	14.00	**52,600**
Hemlock	175	4.00	7.00	5.00	**900**
Spruce/Fir	80	4.00	7.00	5.00	**400**

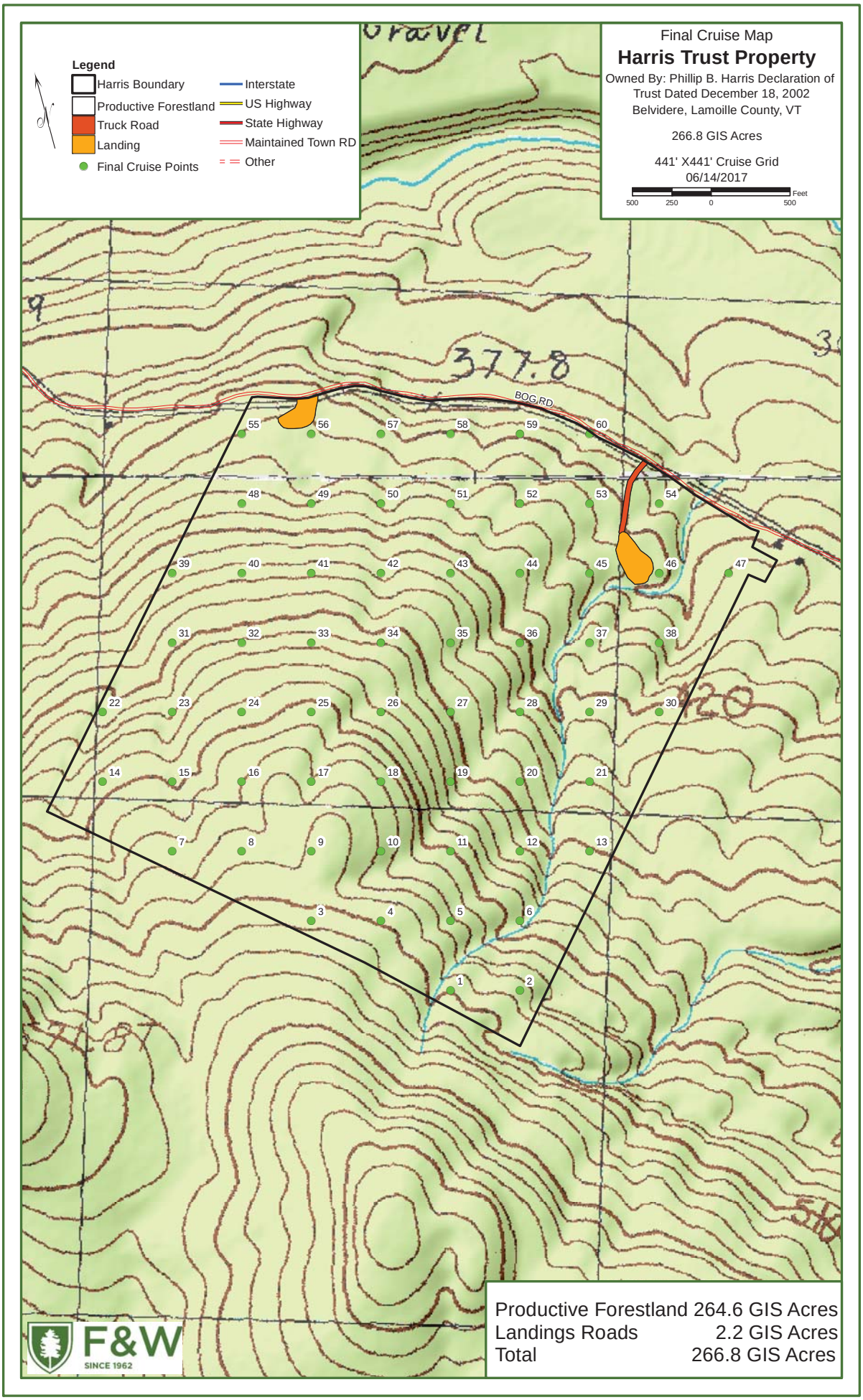
Totals			
Sawtimber Total	1,092 MBF		**$238,800**
Sawtimber Per Acre	4.091 MBF		**$895**
Sawtimber Per Comm. Acre	4.125 MBF		**$902**
Cordwood Total	4,014 Cords		**$53,900**
Cordwood Per Acre	15.0 Cords		**$202**
Cordwood Per Comm. Acre	15.2 Cords		**$204**
		Total Per Acre	**$1,097**

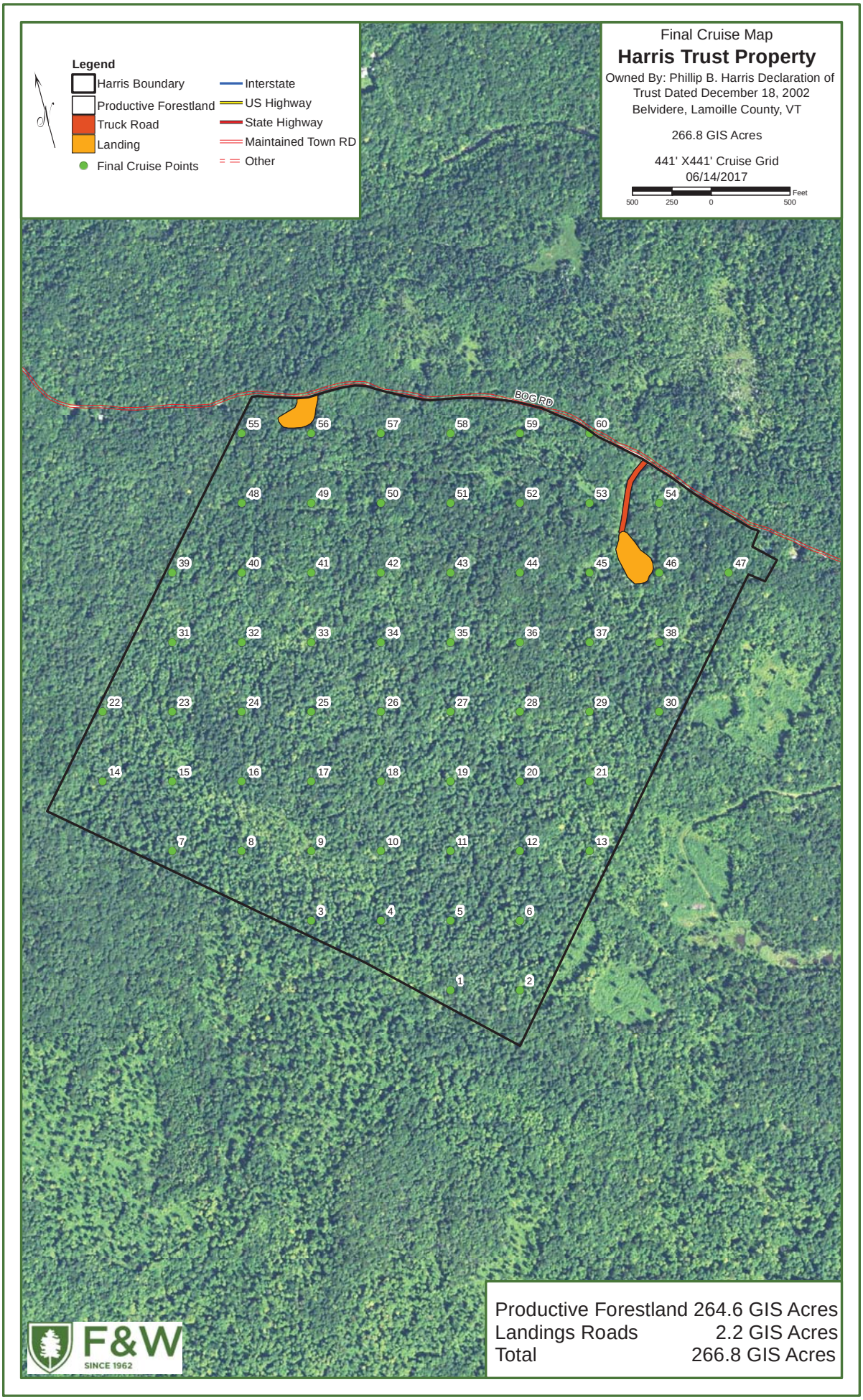
Total Value	Low	High	Likely
	$255,000	$317,000	**$292,700**

BASED ON A SPRING 2017 INVENTORY CRUISE BY F&W FORESTRY SERVICES, INC.

Volumes are based on 60 invenotry points taken on a 441' x 441' grid.
Cruise resulted in a statistical error of 17.1% for all sawlog products and 10.5% for all products combined at the 95% Confidence level
The volumes and values reflect estimated total capital value of merchantable timber.
The volumes and values are not a liquidation value.
Prices are averages for the area and are adjusted to reflect, access, quality and operability of the site.
Fountains Land is a trade name for F&W Forestry Services, Inc.

TIMBER REPORTS AND INVENTORY DOCUMENTS


Legend
Harris Boundary
Productive Forestland
Truck Road
Landing
Final Cruise Points
Interstate
US Highway
State Highway
Maintained Town RD
Other
Final Cruise Map
Harris Trust Property
Owned By: Phillip B. Harris Declaration of Trust Dated December 18, 2002
Belvidere, Lamoille County, VT
266.8 GIS Acres
441' X441' Cruise Grid
06/14/2017
500 250 0 500 Feet
BOG RD
377.8
Productive Forestland 264.6 GIS Acres
Landings Roads 2.2 GIS Acres
Total 266.8 GIS Acres
F&W
SINCE 1962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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
F&W
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55 56 57 58 59 60
48 49 50 51 52 53 54
39 40 41 42 43 44 45 46 47
31 32 33 34 35 36 37 38
22 23 24 25 26 27 28 29 30
14 15 16 17 18 19 20 21
7 8 9 10 11 12 13
3 4 5 6
1 2
F&W
SINCE 1962
Productive Forestland 264.6 GIS Acres
Landings Roads 2.2 GIS Acres
Total 266.8 GIS Acres

Tract Level Summary (Total Values)

Area: 265.9 acres

Plots: 60

All Trees

Species	All TPA		All BA		AGS TPA	AGS BA	Sawlogs BF Inter	Pallet BF Inter	Pulpwood CO MC_CO	Cull CO MC_CO	Veneer BF Inter	**Total (BF)**	**Total (CO)**
Yellow Birch	39.2	22%	24.3	28%	30.2	19.2	260,719	128,895	965		11,914	**401,528**	**965**
Sugar Maple	39.9	23%	20.5	23%	28.4	16.3	204,817	98,926	922	3	2,104	**305,847**	**925**
Red Maple	32.6	18%	17.2	20%	15.3	10.2	118,755	62,257	957			**181,012**	**957**
Beech	37.3	21%	13.5	15%	0.4	0.5	5,976	18,874	745	8		**24,850**	**753**
Spruce	14.5	8%	3.8	4%	9.8	2.8	63,465		64			**63,465**	**64**
White Ash	3.8	2%	3.2	4%	3.7	3.0	69,159	10,111	126			**79,270**	**126**
Hemlock	4.4	3%	3.0	3%	0.3	0.3	6,630		175			**6,630**	**175**
Balsam Fir	3.9	2%	1.2	1%	3.9	1.2	25,641		16			**25,641**	**16**
Basswood	0.7	0%	0.3	0%	0.0	0.0			24			**0**	**24**
Black Cherry	0.2	0%	0.2	0%	0.2	0.2	1,248	2,081	5			**3,329**	**5**
Aspen	0.1	0%	0.2	0%	0.0	0.0			15			**0**	**15**
Total	**176.7**	**100%**	**87.3**	**100%**	**92**	**53.7**	**756,411**	**321,145**	**4,014**	**11**	**14,018**	**1,091,574**	**4,025**

Stand Sawlog and Pulp Volume by Units and Diameter (per Acre Values)

Stand ID: 1 Stand#: 1

Area: 265.9 acres Quadratic Mean Diameter: 9.5 Inches TPA: 177

Plots: 60 Average Diameter: 8.9 Inches BA: 87.3 Sqr FT

All Trees

Volume Units BF

	<= 7"	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	Total
Balsam Fir	12.5	43.9		40.0																			**96.4**
Beech						8.5		53.8	19.8		11.3												**93.5**
Black Cherry						12.5																	**12.5**
Hemlock							7.6				17.3												**24.9**
Red Maple					78.5	138.6	95.9	34.3	72.0	80.0	45.1	13.4	82.9		40.1								**680.8**
Spruce	21.2	53.5	40.7		70.2	22.5			30.6														**238.7**
Sugar Maple			77.7	117.0	87.1	196.7	110.1	81.4	120.6	191.1	61.9	17.9	41.2	37.1	10.4								**1150.2**
White Ash					52.5	53.9	21.7	44.0	112.7	13.4													**298.1**
Yellow Birch			55.1	111.2	173.6	207.8	271.2	298.9	129.7	106.8	85.5	34.7	17.7	17.9									**1510.1**
Total	**33.7**	**97.4**	**173.5**	**268.3**	**462.0**	**640.4**	**506.6**	**512.3**	**485.3**	**391.3**	**221.1**	**66.1**	**141.8**	**55.0**	**50.4**								**4105.2**

Volume Units CO

	<= 7"	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28+	Total
Aspen										0.1													**0.1**
Balsam Fir	0.0	0.0		0.0																			**0.1**
Basswood			0.0	0.0																			**0.1**
Beech	0.6	0.5	0.5	0.3	0.3	0.2		0.1	0.1	0.0	0.1							0.0					**2.8**
Black Cherry						0.0																	**0.0**
Hemlock	0.0		0.0	0.1	0.0	0.1	0.0	0.1		0.0	0.0		0.1	0.1		0.1		0.0					**0.7**
Red Maple	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.1	0.2	0.2	0.1	0.0	0.1		0.1			0.0					**3.6**
Spruce	0.2	0.0	0.0		0.0	0.0			0.0														**0.2**
Sugar Maple	0.6	0.2	0.5	0.6	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.0								**3.5**
White Ash			0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0			0.1										**0.5**
Yellow Birch	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.2	0.1	0.1	0.1	0.0	0.0									**3.6**
Total	**2.1**	**1.6**	**1.9**	**1.8**	**1.5**	**1.6**	**1.0**	**0.8**	**0.8**	**0.7**	**0.4**	**0.2**	**0.3**	**0.2**	**0.1**	**0.1**		**0.1**					**15.1**

INVENTORY INSTRUCTIONS

Harris Trust

OBJECTIVE

The main objective of the cruise is to gather accurate volume data. We will be gathering information on plots laid out on a grid system designed to meet precision goals. The information gathered on each plot will be input into TwoDog software for processing. In addition to timber data collection, necessary plot specific information needs to be recorded. General comments will most certainly be appreciated.

GENERAL INFORMATION

This cruise will use a 10 Factor Prism.

Since this is a cruise for value, product calls, diameter and height are very important, as is to ensure that “in” trees are tallied and “out” trees are not.

Navigation from plot to plot will be accomplished by handheld GPS, with an accuracy of 5 meters or better. The cruiser should only resort to pacing/hip chaining from plot to plot with a handheld compass in the event of GPS failure. This method of navigation will require carefully calculating bearings and distances, using a protractor and engineer’s scale. Methods other than GPS navigation should only be used as a last resort.

When measuring trees, start at magnetic north and move around the plot in a clockwise direction.

SAMPLE POINT LOCATION

The cruise maps include the plots on a topo and photo background.

No plots were distributed in mapped non-commercial ground. If a plot shows as falling just off, or on the boundary of, the mapped non-commercial type, move the plot 1 chain in a cardinal direction away from the non-commercial type and take the plot.

It is possible that a plot may fall in a non-mapped non-forested area. Non-mapped non-commercial areas may also be encountered, and may include inoperable wetlands or steeps

and/or excessively rocky ground. Slopes above 80% with an absence of skid trails and stumps may be inoperable. Evidence of logging indicates that the area is commercial ground.

If the plot falls on a non-mapped non-forest or non-commercial area greater than 2 acres, map the area to the best of your abilities, and do not take the plot. If a plot falls just off, or on the boundary of, the non-mapped non-forest or non-commercial area greater than 2 acres, move the plot 1 chain in a cardinal direction away from the area and take the plot. Make clear notes on the map regarding any unmapped non-commercial plots, and how these issues were resolved.

If the plot falls on an unmapped non-commercial area (inoperable or non-productive) less than 2 acres, take the plot where it falls. If there are trees within the plot, those trees would be would be tallied as usual, but with a notation on the map and in the Comments section of the Pocket Dog data entry screen such as "Inoperable, less than 2 acres" . Make ample notes on the map to describe the situation and reason for calling the area Inoperable or Non-Commercial. (A judgment call will be made as to whether or not these plots will be included in the data, based on all available information.)

If a plot falls just off, or exactly on the boundary of the property, so that the proximity of the boundary will affect the plot, move the plot 1 chain in a cardinal direction away from the boundary and take the plot. Make clear notes on the map regarding how these issues were resolved.

Please record GPS location for any plot which is moved.

When in doubt, take the plot and sort it out later. It is easier to take a plot and throw it out later than it is to go back to sample one plot.

At the end of the day, summarize any thoughts you have during the day and check off the plots done during the day on the master map. Clearly transfer all your map notations to a clean copy of the cruise map.

Be sure to:

- Describe notable features on the map including cultural features, vernal pools, etc.
- Describe inoperable lands, unmapped non-forest types on the map
- Ground truth the boundaries where encountered and collecting GPS data where possible to refine the accuracy of the map.

At plot center, hang a foot long flag at eye level with plot number, date and cruiser initials written on it. Mark plot center on the ground by tying a small piece of flagging on a stick and putting it in the ground, or tying it on a sapling with a clear point of entry into the ground. The stick/sapling should be no less than 12" tall. Plot center is defined as the point on the ground at which the stick or sapling enters the ground. Therefore, the monumentation of plot center should provide an unambiguous indication of plot center. (Leaning saplings, herbaceous plants, and small sticks may result in an ambiguous plot center)

POINT DATA

At each point, please collect and record the following point data into the PocketDog comments section:

- The forest type according to the Timbervest Northeast Region Standard Typing System
    - Forest Type-Size Density
    - Strand Origin
    - Land Type
    - Harvest Restrictions
    - Land Restrictions
- Any comments, especially on regeneration. operability, ecological features, and cultural values are very helpful
- General comments are required if you change direction or move a point
- Please note any non-forest delineation changes noted in traveling to the point. Designate the changes either on the cruise map or in ArcPad on the handheld computer.

TREE DATA

Record the following information for all trees that fall within the plot as determined by the prism. Horizontal limiting distance will be measured for any tree that cannot definitely be determined to be in or out with the prism. Diameter will be measured to 0.1” with calipers or diameter tape for limiting distance calculations. Distance from plot center will be measured with a tape. Limiting distances and slope correction tables are included in the appendix for the appropriate BAF prisms. Use slope correction only if the slope exceeds 20%.

Tally trees in a clockwise sequence starting from magnetic north.

Mark each tree with a dot of spray paint at the appropriate height, and on the appropriate face at DBH.

The codes described below are contained in the appendix.

- Species codes 1-30 as on the specification sheet in the appendix. When using codes 13 (NC Hdwds.), 19 (Other Hdwd.) and 21 (Other Pine) it would be helpful later to indicate what the tree is by writing it in the margins. These are the official Fountains species codes.
- DBH is recorded in 1" size classes, i.e. a 10” tree is measured from 9.51” to 10.50. Measure, and tally products for trees at or larger than the minimum DBH for the cruise. DBH is measured at 4.5’ above the ground on the uphill side of the stem. A guide to DBH measurement location is provided at the end of this document. Calipers should be pointed exactly at plot center for diameter measurements. Deformities on the stem will require the measurement be made as far as practical up the stem to a point where the deformity no longer effects the measurement. If it is not practical to measure above the swell, then the measurement will be made at the first point below the swell that is free of the effect of the swell. Trees that fork below a point 4.5 feet from the ground on the uphill side of the tree will be treated as two trees and DBH will be measured 3.5 feet above the fork. Compensate for snow depth in the winter. Note that the determination of in/out trees is made with the prism

at DBH. If DBH is moved from its usual position of 4.5 feet above the ground (due to one of the reasons above), then the location of determination of in/out is also moved to the location of DBH measurement.

- Quality is either AGS or UGS. The specification sheet describes these. An AGS tree only needs to be able to produce a log with 2 faces clear or better now or some time in the future and be able to live for at least another 15 years.
- The intent of product calls is to enumerate real products contained within the tree. Products are called in 8 foot sections, starting at the lowest possible stump height. Trees with only one eight foot sawlog or veneer log must contain a salable sawlog (a full 8 feet plus 6" trim in the first piece). Trim allowance will be difficult to estimate above the first stick, and subsequent sticks will be tallied in 8 foot sticks. It is strongly recommended that cruisers familiarize themselves with an 8'6" height with a measured pole laid against the tree. Each 8' stick is graded individually. A tree that looks to be sawlog quality from plot center may have a very bad defect on the other side. Look at all sides of a tree before grading it. It is recommended that cruisers periodically check height calls with the aid of a clinometer or rangefinder to ensure that height estimates are consistently accurate. The specification sheet outlines the specifications for the different products.
- A single log product call (one 8 foot stick of pallet, sawlog, or veneer) indicates that the full length of the product is present in the tree. However, for log product calls of two or more sticks, and for all pulpwood calls, the cruiser will round up to the next full product, if the height/length of the last product clearly exceeds 50% of the required height/length. The cruiser will round down, if the height/length of the last product is less than or equal to 50% of the required height length.
- Recently critically damaged trees: Trees which are broken, uprooted or otherwise damaged to the point of expected mortality in the near future should be inventoried at the products no greater than pulpwood. Some cruises, especially those designed to quantify salvage volumes, may provide other specific accounting of damaged trees.

CHECK CRUISING

In-house and third party verification may be necessary, and should be assumed, in all cases. Consequently, it is important that data points be easily and unambiguously re-located, and all data collected be collected in an accurate and systematic manner.

When a cruiser is checked, the error rate may not exceed 1 error in ten trees. Errors include:

- Any tallied tree that is found to be out by more than 1.0' or any tree not tallied that is in by more than 1.0'.
- Any DBH found to be off by more than one size class.
- Any misidentified species.
- Any total height that is off by more than one 8' section.
- Significant product variances. These are defined as (1) product calls that vary from the correct call by more than one product class (i.e. sawlog to veneer is not an error but grade 3 to veneer is an error), (2) product calls that vary from the correct call by only one class and are made for a product that unambiguously meets the specifications of the

correct product and (3) product calls that do not meet the specification (i.e. calling a 10" hardwood tree a log if the specification calls for a 12" minimum DBH)

- Height variance trends in a consistent direction (total height off by only one 8' stick, but consistently too short, or too long) which effects 50% or more of the trees in any three consecutive plots. (One error per each plot).
- Ambiguous plot center (plot center which is or has become unclear due to poor choice of plot center monumentation).

All errors will be reported to the cruiser. Problem areas will be explained to the cruiser. An unacceptable error rate will result in the cruise plots being returned to the cruiser for review and correction. Plots may then be re-inspected for accuracy.

EQUIPMENT LIST

- Compass (having a spare is desirable)
- Appropriate BAF Prism (having a spare is desirable)
- 100' Loggers Tape
- Calipers or Diameter Tape
- GPS Unit capable of 5 meter accuracy or better
- Clinometer/Rangefinder
- Orange or Pink Arctic Grade Flagging
- Permanent Markers
- Pencils
- Spray Paint
- Plot Maps
- PDA or Tally Book
- Large Zip Lock Baggies

PRODUCT SPECIFICATIONS

SPECIES

Code	Species	Code	Species	Code	SPECIES
1	White Pine	11	Beech	21	Other Pine
2	Red Pine	12	Red Oak	22	Butternut
3	Spruce	13	NC Hdwds.	23	Norway Spruce
4	Fir	14	White Ash	24	Hickory spp.
5	Hemlock	15	Aspen	25	Black Ash
6	Cedar	16	Black Cherry	26	White Oak
7	Sugar Maple	17	Black Birch	27	Chestnut Oak
8	Red Maple	18	Basswood	28	Scarlet Oak
9	White Birch	19	Other Hdwd.	29	Black Oak
10	Yellow Birch	20	Tamarack	30	Elm

QUALITY

Code	Description
1	**AGS** – commercial species that has or has the potential to produce a Grade #2 sawlog or better and will survive for at least 15 years.
2	**UGS** - Live trees of any size that do not qualify as AGS. Includes live culls.
3	**UGS-Dieback –** Live sugar maple trees of any size that do not qualify as AGS because of more than 35% dieback in the crown.

PRODUCT SPECIFICATIONS

Code	Product	Species	Min. DBH*	Min. Top (IB)	Min. Length	Description
9	Veneer	Hardwood	14”	12"	8 feet	4 sides clear w/ **no** defects or rot, Straight & sound
2	Sawlogs	Hardwood	11"	10"	8 feet	2 sides clear, Straight & sound
		Spruce/Fir	7"	5"	12 feet (tally as 16)	Straight & sound, free of excessive or large knots
		White Pine,	10"	8"	12 feet (tally as 16)	Straight & sound , Free of excessive (>3") knots
		Red Pine	8"	6"	12 feet (tally as 16)	Straight & sound, free of excessive or large knots
		Hem. & other Sftwd.	10”	8”	12 feet (tally as 16)	Straight & sound, free of excessive or large knots
4	Pallet logs	Hardwood (no aspen)	11"	10"	8 feet	<2 sides clear & sound or otherwise not meeting Gr. 2 spec.
		Sugar Maple, Birches & Red Oak	9”	8”	8 feet	
		W. Pine	10"	8"	8 feet	Excessive large knots or otherwise not meeting above specs.
6	Pulpwood	All	5"	4"	16 feet	Less than above sawlog specs.
8	Cull	All	6"			Over 50% rot or void in bole

HEIGHTS RECORDED IN # OF 8' STICKS.
***MIN DBH REFERS TO THE SIZE CLASS**

HORIZONTAL LIMITING DISTANCE TABLE IN FEET

Basal Area Factor 10

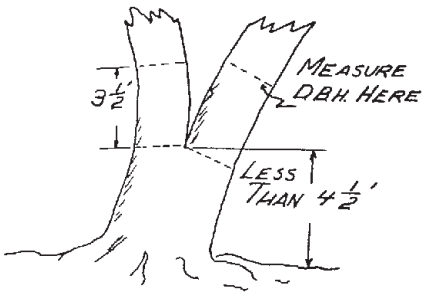
Distance in feet = DBH in inches x 2.75

DBH	DBH in tenths of inches									
In.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
3	8.3	8.5	8.8	9.1	9.4	9.6	9.9	10.2	10.5	10.7
4	11.0	11.3	11.6	11.8	12.1	12.4	12.7	12.9	13.2	13.5
5	13.8	14.0	14.3	14.6	14.9	15.1	15.4	15.7	16.0	16.2
6	16.5	16.8	17.1	17.3	17.6	17.9	18.2	18.4	18.7	19.0
7	19.3	19.5	19.8	20.1	20.4	20.6	20.9	21.2	21.5	21.7
8	22.0	22.3	22.6	22.8	23.1	23.4	23.7	23.9	24.2	24.5
9	24.8	25.0	25.3	25.6	25.9	26.1	26.4	26.7	27.0	27.2
10	27.5	27.8	28.1	28.3	28.6	28.9	29.2	29.4	29.7	30.0
11	30.3	30.5	30.8	31.1	31.4	31.6	31.9	32.2	32.5	32.7
12	33.0	33.3	33.6	33.8	34.1	34.4	34.7	34.9	35.2	35.5
13	35.8	36.0	36.3	36.6	36.9	37.1	37.4	37.7	38.0	38.2
14	38.5	38.8	39.1	39.3	39.6	39.9	40.2	40.4	40.7	41.0
15	41.3	41.5	41.8	42.1	42.4	42.6	42.9	43.2	43.5	43.7
16	44.0	44.3	44.6	44.8	45.1	45.4	45.7	45.9	46.2	46.5
17	46.8	47.0	47.3	47.6	47.9	48.1	48.4	48.7	49.0	49.2
18	49.5	49.8	50.1	50.3	50.6	50.9	51.2	51.4	51.7	52.0
19	52.3	52.5	52.8	53.1	53.4	53.6	53.9	54.2	54.5	54.7
20	55.0	55.3	55.6	55.8	56.1	56.4	56.7	56.9	57.2	57.5
21	57.8	58.0	58.3	58.6	58.9	59.1	59.4	59.7	60.0	60.2
22	60.5	60.8	61.1	61.3	61.6	61.9	62.2	62.4	62.7	63.0
23	63.3	63.5	63.8	64.1	64.4	64.6	64.9	65.2	65.5	65.7
24	66.0	66.3	66.6	66.8	67.1	67.4	67.7	67.9	68.2	68.5
25	68.8	69.0	69.3	69.6	69.9	70.1	70.4	70.7	71.0	71.2

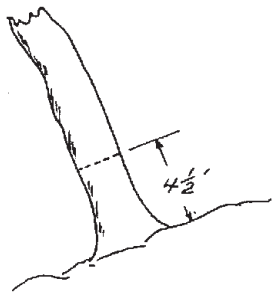
SLOPE CORRECTION FACTORS FOR SLOPE IN PERCENT

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10%	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.02	1.02
20%	1.02	1.02	1.02	1.03	1.03	1.03	1.03	1.04	1.04	1.04
30%	1.04	1.05	1.05	1.05	1.06	1.06	1.06	1.07	1.07	1.07
40%	1.08	1.08	1.08	1.09	1.09	1.10	1.10	1.10	1.11	1.11
50%	1.12	1.12	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.16
60%	1.17	1.17	1.18	1.18	1.19	1.19	1.20	1.20	1.21	1.21
70%	1.22	1.23	1.23	1.24	1.24	1.25	1.26	1.26	1.27	1.27
80%	1.28	1.29	1.29	1.30	1.31	1.31	1.32	1.33	1.33	1.34
90%	1.35	1.35	1.36	1.37	1.37	1.38	1.39	1.39	1.4	1.41
100%	1.41	1.42	1.43	1.44	1.44	1.45	1.46	1.46	1.47	1.48
110%	1.49	1.49	1.5	1.51	1.52	1.52	1.53	1.54	1.55	1.55
120%	1.56	1.57	1.58	1.59	1.59	1.60	1.61	1.62	1.62	1.63
130%	1.64	1.65	1.66	1.66	1.67	1.68	1.69	1.70	1.70	1.71
140%	1.72	1.73	1.74	1.74	1.75	1.76	1.77	1.78	1.79	1.79

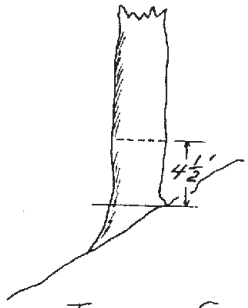
Slope distance = Horizontal distance x factor from table



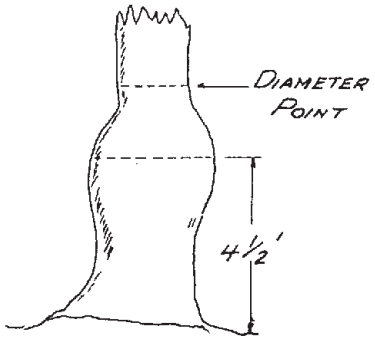
TREE FORKED AT LESS THAN 4½ FEET



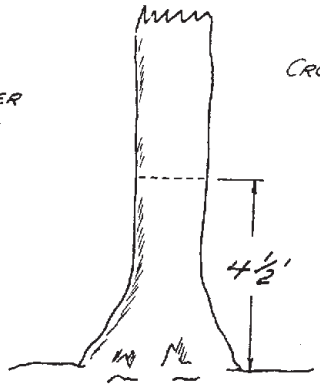
LEANING TREE



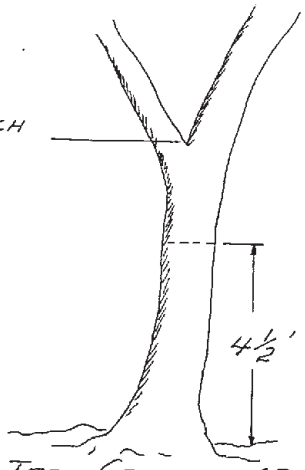
TREE ON SLOPE



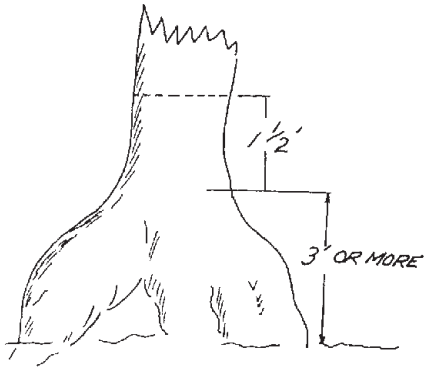
TREE WITH SWELL AT 4½ FEET



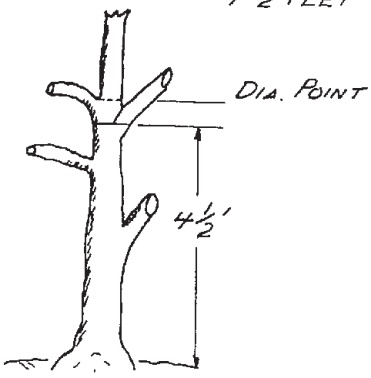
TREE ON LEVEL



TREE CROTCHED ABOVE 4½ FEET



SWELL BUTT OR BOTTLENECK



BRANCHED TREE AT 4½'