Some Economic and Logistical Considerations for Timber Management In a Parcelized Landscape

July 12, 2018
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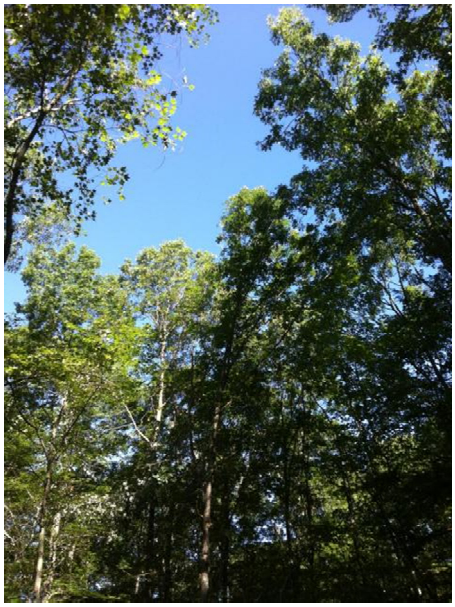
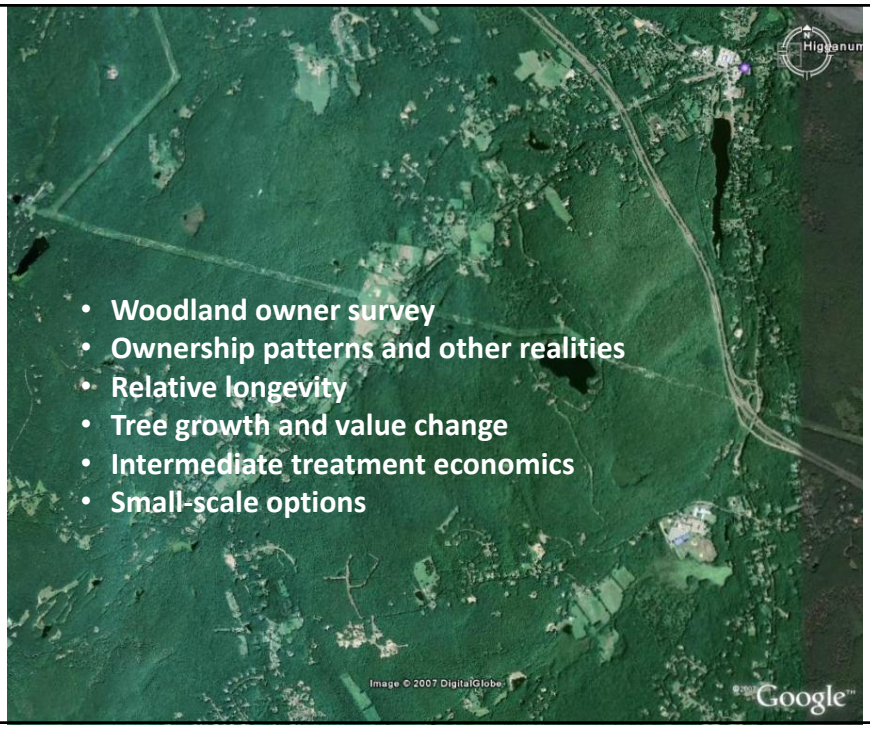
UCONN
COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES





- Woodland owner survey
- Ownership patterns and other realities
- Relative longevity
- Tree growth and value change
- Intermediate treatment economics
- Small-scale options

Results from the 2011 National Woodland Owner Survey Connecticut Woodland Owners

Mary Tyrell – Yale School of Forestry and Environmental Sciences

Survey Results – The Basics

- 384 respondents out of 728 surveys
- 53% response rate
- 330 family owners
- 54 other types of owners
  land trusts, clubs, corporations, churches

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Starting with the numbers.....

138,800 family woodland owners

Own 856,500 acres of forest

~ 47% of Connecticut's forestland

Average parcel size 6.2 acres

9,000 families (6%) own more than 25 acres; represents 56% of family-owned forestland

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Backyards vs. woodlands

Parcel Size (acres)	Owners		Acres		% of CT Forest	Average parcel size	# Respondents
1 - 9	122,100	88%	281,100	33%	15 – 16 %	2.3 acres	106
10+	16,700	12%	575,400	67%	30 – 32%	34 acres	217

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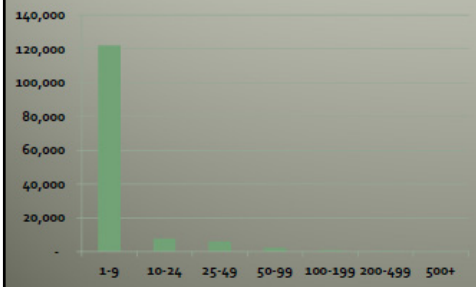
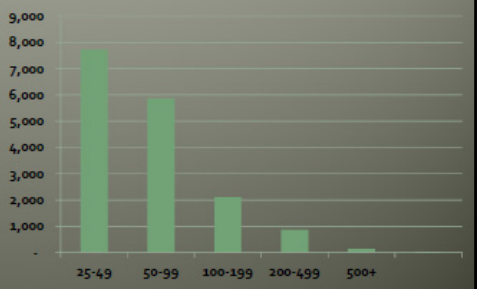
Parcel size distribution





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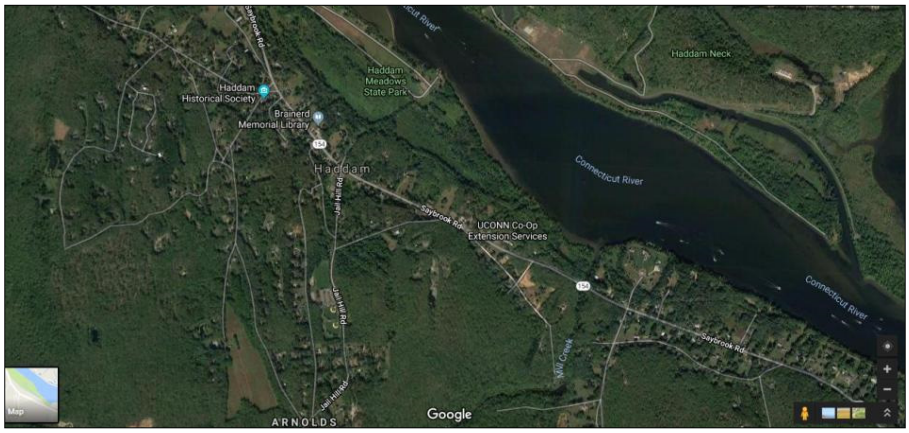
Woodland Ownership

- Half the forest resource is private/family owned
- Family and other ownerships smaller than 25 acres occupy almost half of the private forest acreage in CT.
- Timber value is low on the priority list, (for most woodland owners) until…
- The concept of a 100-year rotation? irrelevant
- High-production mechanized harvesting operations?
  also irrelevant for many folks
- None of that means that tree values are not important

Other Realities

- Thousands of acres of oak mortality, and partial canopy loss.
- Dead trees do not produce seed nor do they sprout.
- Deer and invasive shrubs exist in the real world.
- Tariffs?



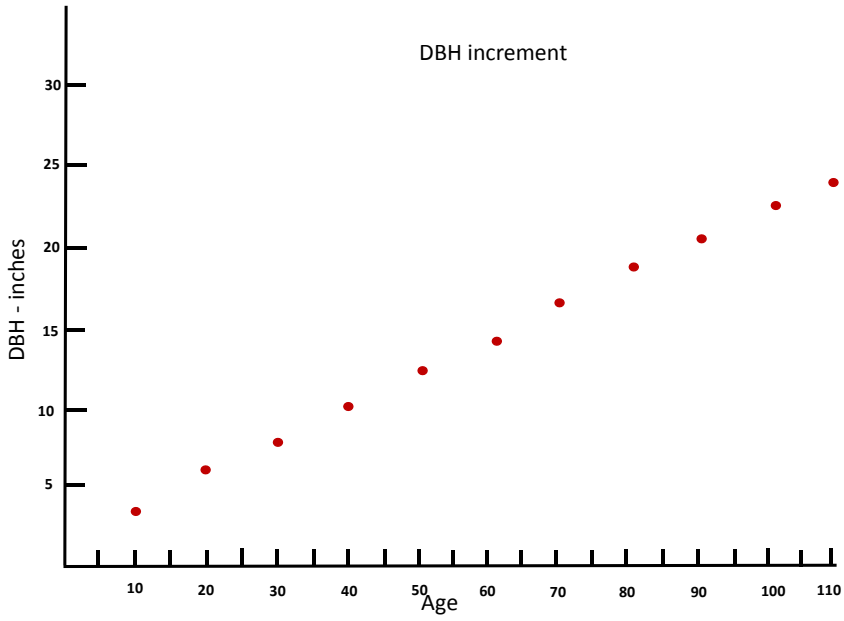
Relative Longevity

- Age of oak trees on my property in Higganum are estimated to be 108 years; charcoal-harvest-sprout origin, **even-aged**…
- Black and scarlet oaks there are old trees (125)
- Red oaks there are middle-aged trees (250)
- White oaks there are relatively young trees (400)

A nice red oak…

26” DBH; 90 ft total ht;
2.5 logs merch ht; 600 bf tree scale

At stumpage value of $200.00/mbf
tree value = $120.00



Log Price Comparisons - red oak logs

Label	Specification			$$$/MBF
• Veneer 1	22” dib; lengths 8’6”, 9’6”, 10’6”; 4 cf			$1900
• Veneer 2	14 to 21”dib	same lengths;	4 cf	$1300
• Prime	16”+ dib;	8’6” to 16’4”	3 cf	$ 800
• Select	13 to 15” dib	8’6” to 16’4”	3 cf	$ 700
• Number 1	12” + dib	8’6” to 16’4”	3 cf	$ 550
• Number 2	12” + dib	8’6” to 16’4”	2 cf	$ 400
• Number 3	10” + dib	8’6” to 16’4”	sound	$ 225

Tree Value (as logs)

26” DBH; 90 ft total ht; 2.5 logs merch ht; 600 bf tree scale
At stumpage value of $200.00/mbf tree value = $120.00

Logs (roadside, truckload quantity):
1. 12 ft; 4 cf; 22 in dib 260 bf @ $1900 = $494.00
2. 10 ft; 2 cf; 16 in dib 110 bf @ $ 400 = $ 44.00
3. 10 ft; sound 12 in dib 55 bf @ $ 225 = $ 12.38
4. 8’6”; sound 10 in dib 30 bf @ $ 225 = $ 6.75

Total:	$557.13
Minus logging expense @ $150.00/mbf -	$ 90.00
Roadside value:	$467.13

This is the exception.

It is the reason we have high-grading.

But it is also the reason we should grow trees to the next best grade.

A Reminder about Geometry:

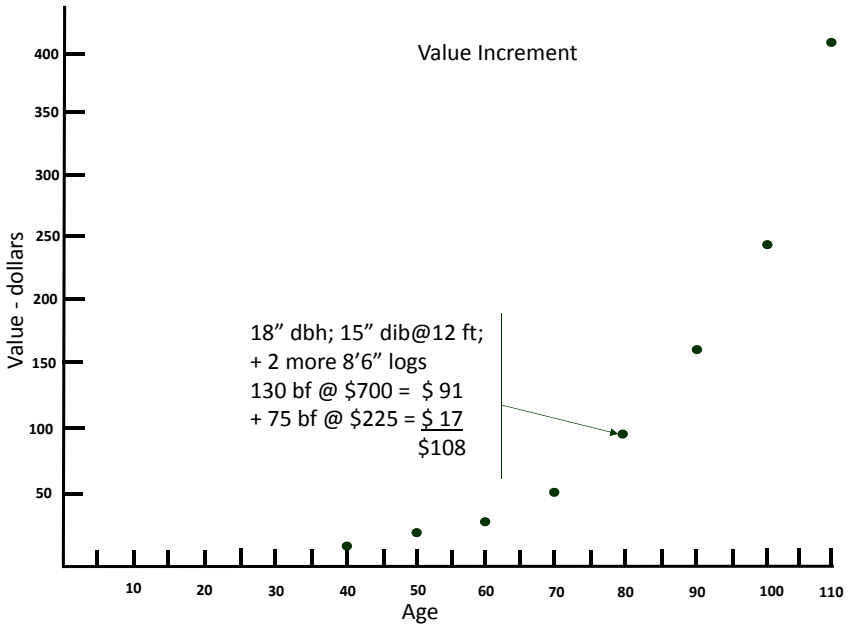
Volume increases with the square of the diameter:

Average annual increment has been about .225 inches.

14.000 dbh = 1.069 sq ft ba
14.225 dbh = 1.104 sq ft ba

20.000 dbh = 2.181 sq ft ba
20.225 dbh = 2.231 sq ft ba

Along with price jumps…



Defects

22", 12-foot log, 3 cf; 260 bf @ $800 = $208

22", 8'6" log, 4 cf; 170 bf @ 1900 = $ 323.

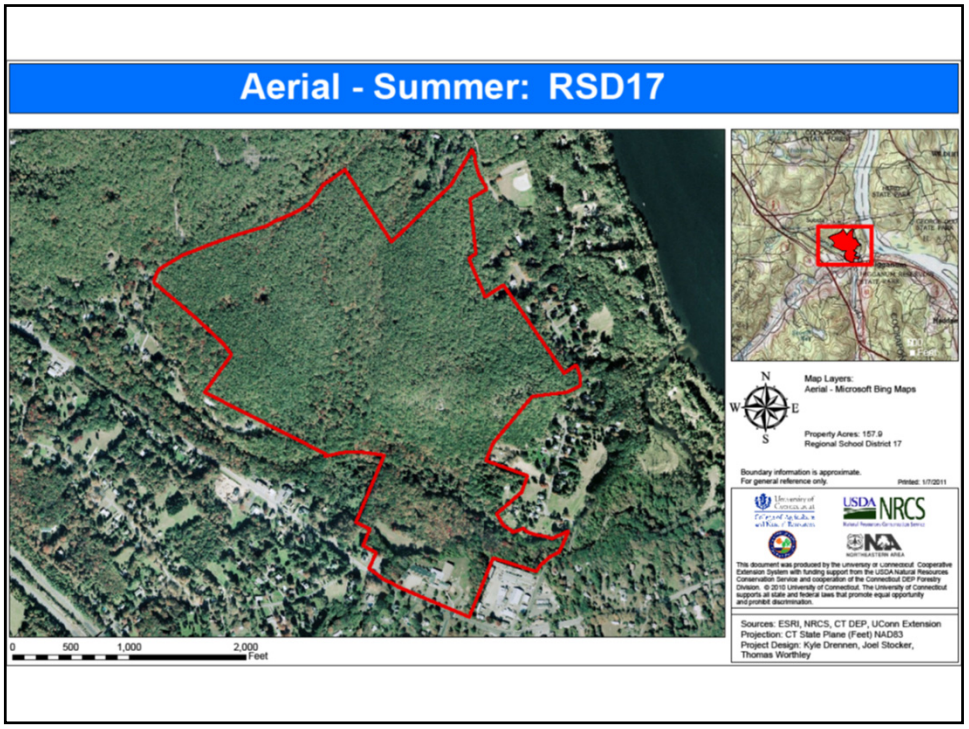
Seamed base will be removed.

"Grade Index": (?)
Number of clear faces on the best 10 feet of the first log.

Forest Products Scenario: RSD 17

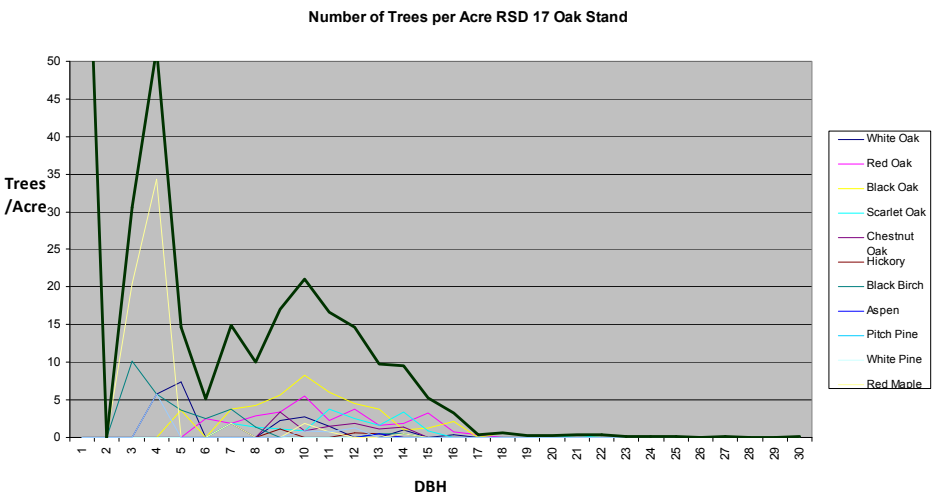
Goal expressed:

Periodic harvests for continuous supply of oak lumber for HKHS technical arts program (~500 bf/yr).


Aerial - Summer: RSD17
0 500 1,000 2,000 Feet
N
W
E
S
Map Layers:
Aerial - Microsoft Bing Maps
Property Acres: 157.9
Regional School District 17
Boundary information is approximate.
For general reference only.
Printed: 1/7/2011
USDA NRCS
Sources: ESRI, NRCS, CT DEP, UConn Extension
Projection: CT State Plane (Feet) NAD83
Project Design: Kyle Drennen, Joel Stocker, Thomas Worthley

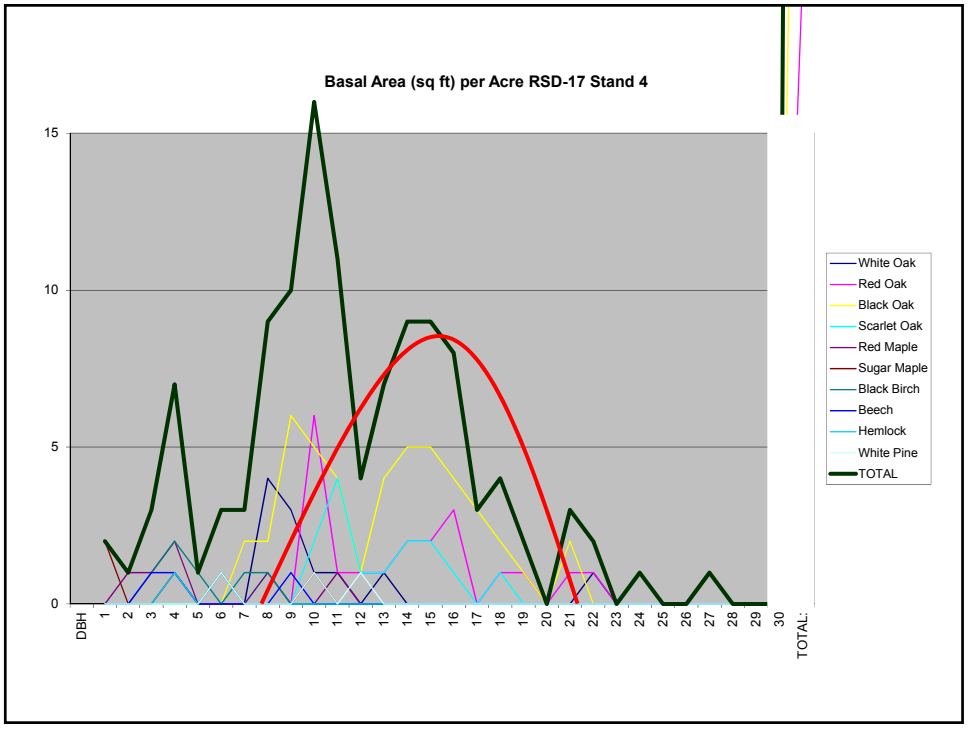
Stand Table (number of trees/acre by diameter and species)

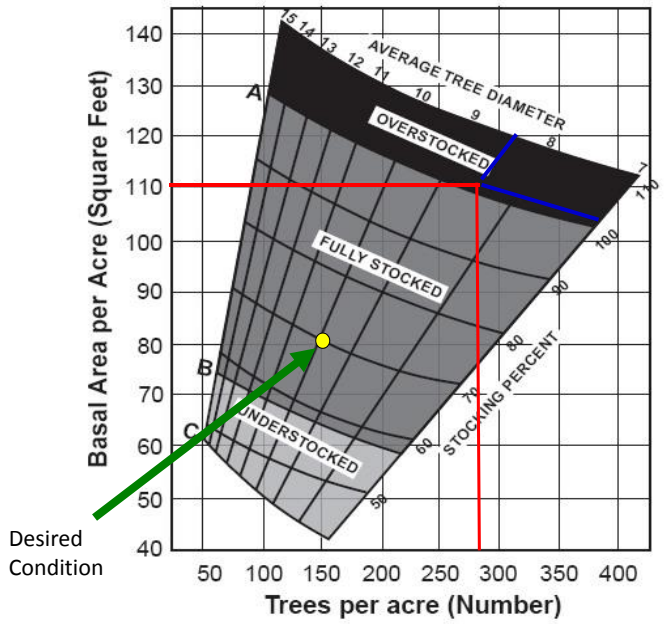
Species / DBH	White Oak	Red Oak	Black Oak	Scarlet Oak	Red Maple	Sugar Maple	Black Birch	Beech	Hemlock	White Pine	TOTAL
1						367					367
2					46	0					46
3					20	0	20	20			61
4					23	11	23	11	6		75
5							7				7
6						5			5		10
7			7				4				11
8	11		6	3	3		3				26
9	7		14					2			23
10	2	11	9	4		2				2	29
11	2	2	6	6	2						17
12		1	1	1						1	5
13	1	1	4	1							8
14		2	5	2							9
15		2	4	2							7
16		2	3	1							6
17			2								2
18		1	1	1							2
19		1	1								1
20											0
21			1								1
22											1
23											0
24			.5								0
25											0
26											0
27			.3								0
28											0
29											0
30											0
TOTAL:	23	22	64	20	94	385	57	34	17	8	714



Basal Area Table (basal area/acre by diameter and species)

Species DBH	White Oak	Red Oak	Black Oak	Scarlet Oak	Red Maple	Sugar Maple	Black Birch	Beech	Hemlock	White Pine	TOTAL
1						2					2
2					1						1
3					1		1	1			3
4					2	1	2	1	1		7
5							1				1
6						1			1		2
7			2				1				3
8	4		2	1	1		1				9
9	3		6					1			10
10	1	6	5	2		1				1	16
11	1	1	4	4	1						11
12		1	1	1						1	4
13	1	1	4	1							7
14		2	5	2							9
15		2	5	2							9
16		3	4	1							8
17			3								3
18		1	2	1							4
19		1	1								2
20											0
21		1	2								3
22	1	1									2
23											0
24			1								1
25											0
26											0
27			1								1
28											0
29											0
30											0
TOTAL:	11	20	48	15	6	5	6	3	2	3	118





Goal expressed:

Periodic harvests for continuous supply of oak lumber for HKHS (~500 bf/yr).

Objective statement desired condition:

To address the goal of growing a wood supply for the future: Stand 4 is ideally stocked with 150 trees per acre of acceptable mixed oak growing stock, at 80 square feet of basal area per acre and average DBH of approximately 10 inches.

Recommendations or Prescriptions

The list of actions necessary to take what you have to work with and produce the desired condition –

"In Stand 4 a thinning on approximately 10 acres at 5-year intervals is prescribed. Harvest approximately 110 stems per acre targeting undesirable growing stock, smaller diameter stems trees over 20 inches and non-oak species. Leave a minimum of two snags per acre, preferably cavity trees, and place brush in piles.
The recommended activity will produce an estimated 2000 board feet of lumber or small logs per acre and two cords of fuelwood."

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4					2	1	2	1	1		7
5							1				1
6						1			1		2
7			2				1				3
8	4		2	1	1		1				9
9	3		6					1			10
10	1	6	5	2		1				1	16
11	1	1	4	4	1						11
12		1	1	1						1	4
13	1	1	4	1							7
14		2	5	2							9
15		2	5	2							9
16		3	4	1							8
17			3								3
18		1	2	1							4
19		1	1								2
20											0
21		1	2								3
22	1	1									2
23											0
24			1								1
25											0
26											0
27			1								1
28											0
29											0
30											0
TOTAL:	11	20	48	15	6	5	6	3	2	3	118

92

Stand Table (number of trees/acre by diameter and species)

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15		2	4	2							7
16		2	3	1							6
17			2								2
18		1	1	1							2
19		1	1								1
20											0
21			1								1
22											1
23											0
24			.5								0
25											0
26											0
27			.3								0
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29											0
30											0
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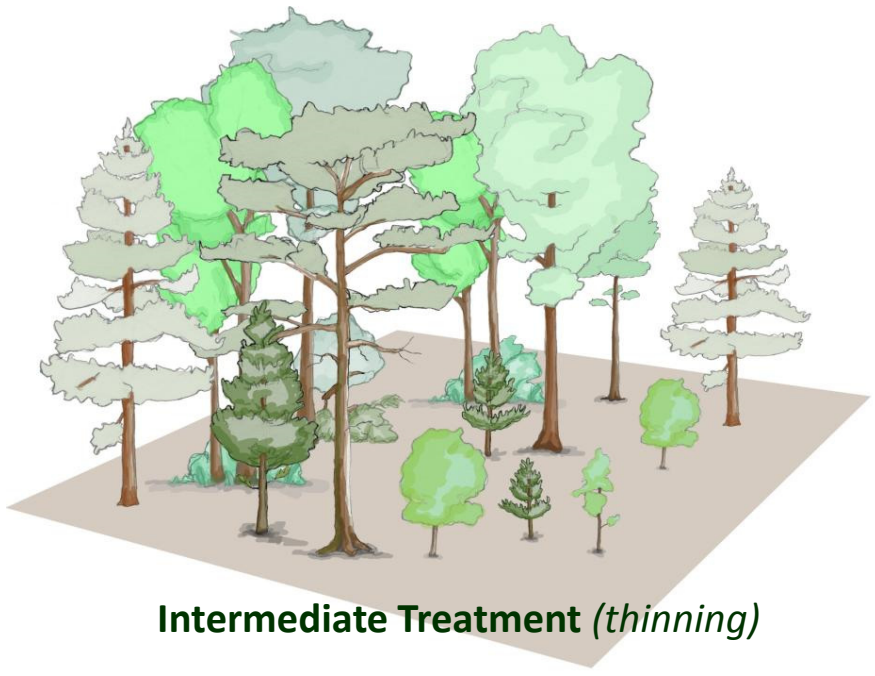
100

50

135



Intermediate Treatment *(thinning)*

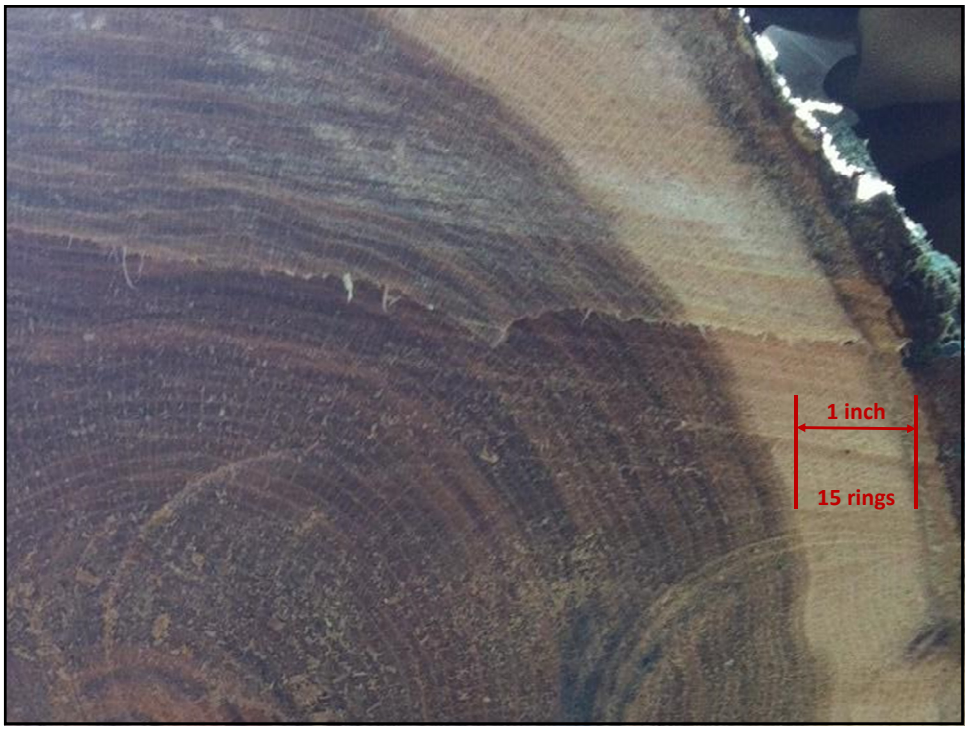
Board Foot Volume Table (board feet/acre by diameter and species)

Species DBH	White Oak	Red Oak	Black Oak	Scarlet Oak	Red Maple	Sugar Maple	Black Birch	Beech	Hemlock	White Pine	TOTAL
1											
2											
3											
4											
5											
6											
7											
8											
9											
10	66	396	330	132		66				66	1056
11	70	70	279	279	70						768
12		74	74	74						74	296
13	73	80	291	80							524
14		200	501	200							901
15		212	525	212							949
16		387	546	129							1062
17			391								391
18		180	260	180							620
19		200	200								400
20											
21		262	275								537
22	318	318									636
23											
24			350								350
25											
26											
27			400								400
28											
29											
30											
TOTAL:	527	2379	4117	1286	70	66				137	8445

UGS 500

1500

- 2000



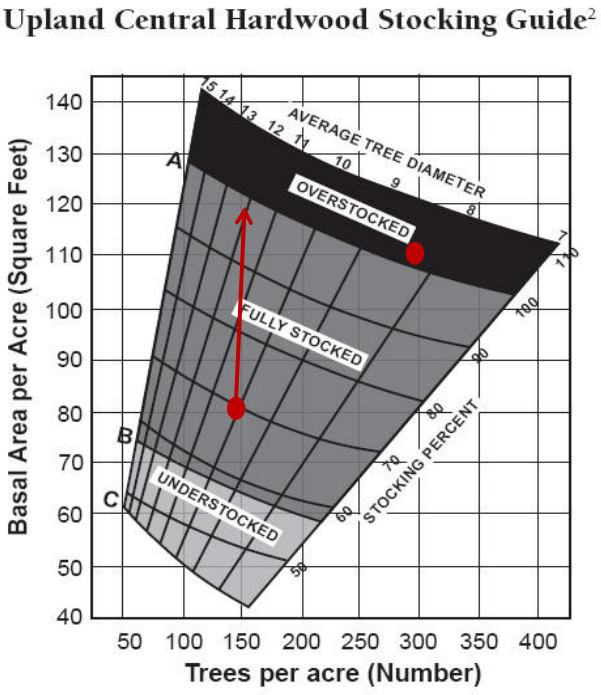
Trees Grow.

Pre-harvest:
8.5 inches avg. dbh; 8500 bf/acre
15 rings per inch = 3.3% growth rate

10 years later: 8500 bf/acre board feet = 11475 bf/acre (ha!)

Post-treatment:
10 inches avg. dbh; 6500 bf/acre; 80 sq ft ba/acre
11 growth rings per inch = 4.2% growth rate

10 years: 6500 bf/acre = 9800 bf/acre; 80 sq ft ba/acre = 120



2000 board feet/acre sold at $110.00/mbf = $220.00/acre

You invest these funds in something safe….

Let's assume an investment at apr of 2%.

$220.00 = $268.40

Timber value:
size matters, quality matters, volume matters

Tree Value Grows.

Pre-harvest:
8.5 inches avg. dbh; 8500 bf/acre
At $150.00 per mbf = $1275.00/acre

10 years later: 8500 bf/acre board feet = 11475 bf/acre
At $160.00 per mbf = $1836.00/acre *(9000/$1260)*

Post-treatment:
10 inches avg. dbh; 6500 bf/acre;
10 years: 6500 bf/acre = 9800 bf/acre
At $200.00 per mbf= $1960.00/acre

Plus the $268.00 you have been saving…

Stand Value Grows.

Trees with space to grow are healthier trees.

Trees with fewer defects are more valuable trees.

Larger trees are more valuable trees – to a point.

Invest management on the best sites.

Incorporate multiple objectives.

Faster growing trees sequester more carbon.

Small Scale Approaches: *Some UConn Experiences*

Small Scale Approaches:

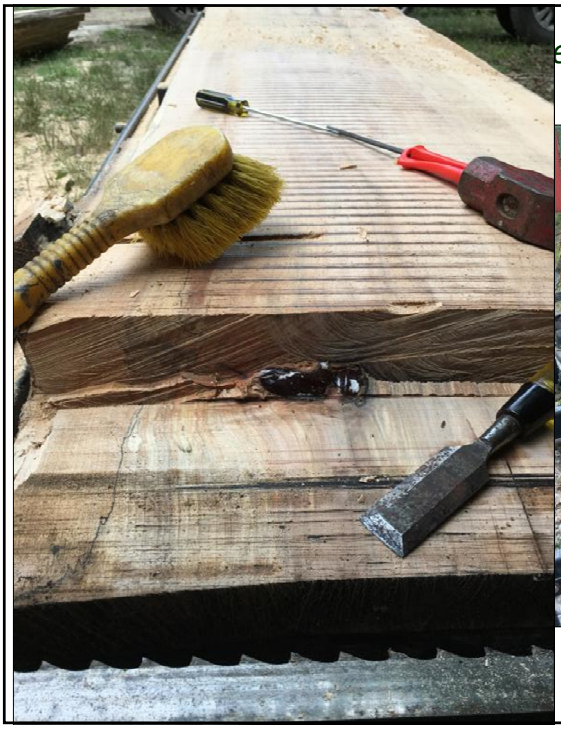
ideas for small acreages?

- Scale appropriate equipment
- Right training (technique!!)
- Knowledgeable forester
- More detailed marking tally
- Foster small-scale contractors
- Log-making 101
- What works on 5 acres
  will also work on 5 of 50 acres

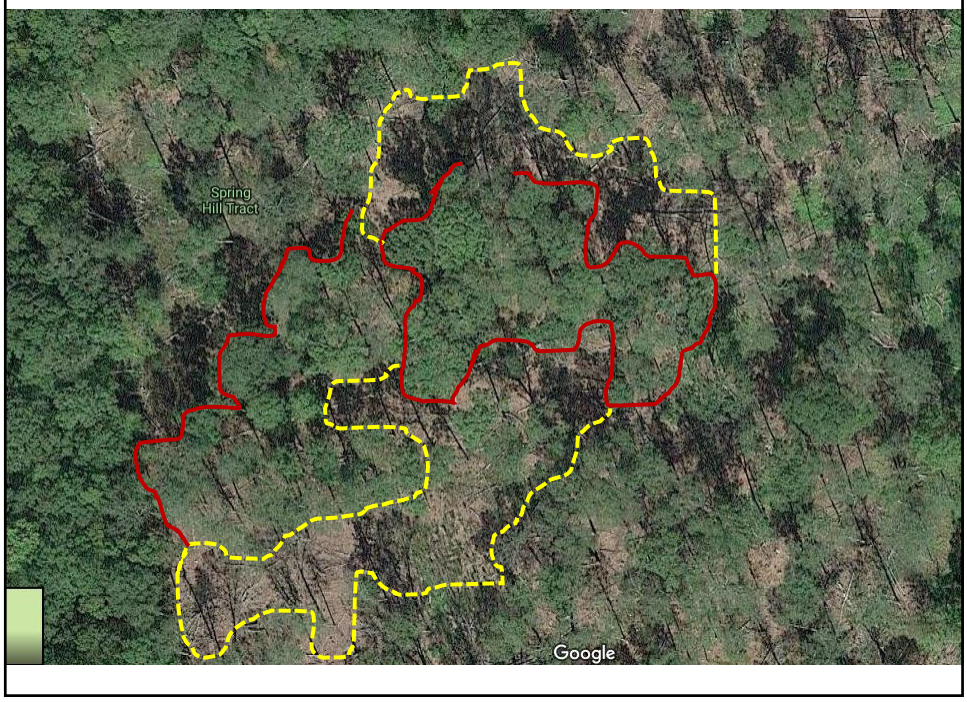
Small Areas:

How does a forester get paid?

- Time rate
- Creative marketing
- Enlist neighbors
- Invest inventory time
- Value-add?
- What works on 5 acres can also work on 5 of 50 acres



e UConn Experiences



Thank you