Understanding the Financial Aspects of Woodland Management

WOODLAND STEWARDS
A Regional Extension Program for Landowners

February 13th, 2020

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Statements

1. Forestry can be as attractive and competitive an investment as stocks, bonds and other retirement planning strategies
2. Is it worth it to spend the money on this _____ forestry practice?
3. The market is good right now, should I be cutting my trees?

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Understanding the Financial Aspects of Woodland Management

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This Talk – We'll Explore

- Is Forestry as investment competitive with retirement accounts, stocks and bonds?
- Intensive vs Extensive Management
  - Results vary by your choices
- How to evaluate profitability of specific practices

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Is Forestry a Good Investment?

- Reforestation in the U.S. South has been a strong long-term investment
- U.S. timberland investments delivered average returns of 8.36% from 1993 - 2017, (NCREIF)

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Institutional investors

Timber Investment Indices Relative to Other Assets, 2014 – YTD 2019

Vehicle	2014	2015	2016	2017	2018	YTDD 2019
S&P 500	11.4%	-0.7%	9.5%	19.4%	-6.2%	20.6%
NAREIT All REIT Index	21.9%	-2.0%	5.0%	4.8%	-8.3%	24.6%
NCREIF Timberland Index	10.5%	5.0%	2.6%	3.6%	3.4%	1.2%
Foreisk Timber REIT (FTR) Index	5.7%		-9.3%	5.0%	-34.6%	30.1%

Sources: Forisk, NAREIT, NCREIF
Note: data thru last Friday in October; NCREIF reports quarterly, so YTD is thru Q3 2019

Smaller landowners may not realize the same returns as the institutional investors

https://forisk.com/blog/2020/01/10/timber-reits-turnaround-in-2019-and-look-to-2020/

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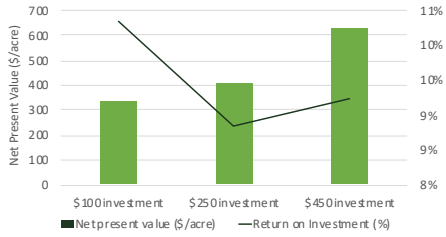
Typical Pine Plantation Investment in the South



Numbers based on
- current timber prices,
- 5% interest rate
- medium site productive land (Site Index 65 at base age 25)

Source: Parajuli et al. 2019

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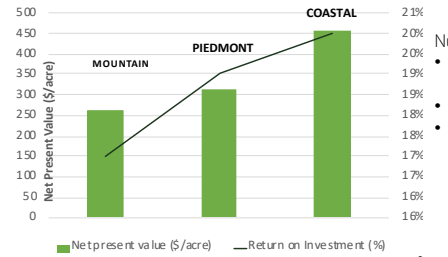
Naturally Regenerated Hardwood Stands



Numbers based on:
- current timber prices
- 4% interest rate
- 11.5 MBF yield @ 50 yrs

Source: Parajuli et al. 2019

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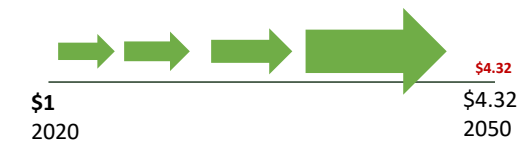
Value of dollars - Grows over time

EXAMPLE:
5% Interest rate grows a $1 by 4.32 times in a 30-year time frame



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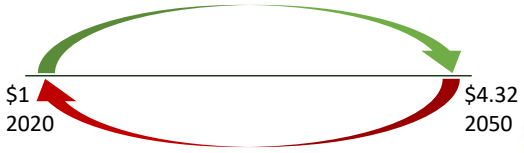
A Few Key Concepts- Today's and Future Dollars

Today's dollars - costs
- We know todays costs…..
  Planting, spraying, fertilizer

Future dollars - come from returns
- Thinning and harvest returns come later



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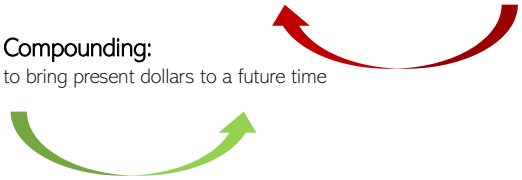
A Few Key Concepts

Discounting:

determining the present value of a payment or a stream of payments that is to be received in the future.

Compounding:

to bring present dollars to a future time



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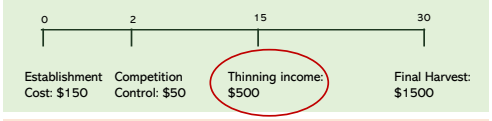
A Few Key Concepts

- Trees grow over time, so does the money (investment)
- Reforestation and other forestry practices are costly; require upfront costs, but need to wait several years to get paid back



The present value of $500 from thinning at year 15 with 5% is:

$$\$500/(1+0.05)^{15} = \$240.50$$

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Time Value of Money: Two Time Scales

FUTURE VALUE:
Determined by:

The time period	n
The discount or interest rate	i

Future value=
present value x $(1+i)^n$

PRESENT VALUE:
Money today is greater than money tomorrow

Example: What is future value of $500 thinning at year 15 @ 5%?

$500/(1+0.05)^{15}$

=$240.50

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Present Value of Future $1

Future years	3%	4%	5%
15	.64	.56	.48
30	.41	.30	.23
50	.22	.14	.08

INTERPRETATION:
Your return from a 50-year hardwood rotation will be 1/7th smaller in current dollars @ 4 % interest rate (cost to borrow)

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$1 in the Future by Interest Rate

Future years	3%	4%	5%
15	1.56	1.80	2.08
30	2.43	3.24	4.32
50	4.38	7.11	11.50

INTERPRETATION:
for a 30-year rotation you'll need to more than TRIPLE your investment to breakeven @ 4 % interest rate(cost to borrow)

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Time Value of Money

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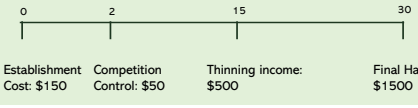

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Time Value of Money

- Hardwood example: longer rotation, less/no initial costs

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Key Elements in Time Value of Money

- Future value—(Compounding)
- Present value—(Discounting)
- Interest Rate
- Years

Which of these are flexible for you?
What are your objectives?

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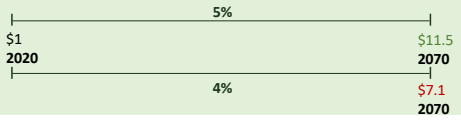
Interest Rate is Important

- It represents the cost of capital or the interest payment you need to make for your mortgage
- It captures the opportunity costs of the investment i.e. a benefit could have been received but was given up to invest in forestry. For instance, you could have invested in stock markets, but you invested in reforestation.
- Most Powerful in long-term investment analysis

Invested in forestry, but missed opportunity of investing in stock market



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Net Present Value-Decision Tool

Document Cost, Revenues - Net them at:
t= Zero: Net sum is NPV

*RULE: Invest in the project with a **positive NPV***

- Establishment cost $ Present value
- Mid-Rotation revenue $ Future Value: must discount it
- Final Harvest revenue $$ Future Value: must discount it

To compare we must adjust cash flows to a common point in time

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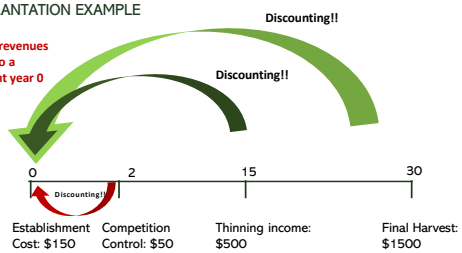
Net Present Value—Decision Tool

PINE PLANTATION EXAMPLE

All costs and revenues are brought to a common point year 0



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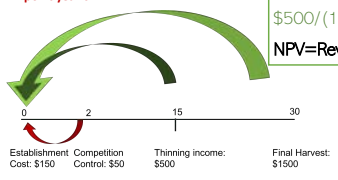
Net Present Value —Decision Tool

All costs and revenues are brought to a common point year 0



At discount rate of 5%,

Costs:

$150 + $50/(1.05)^{2}= **$195.35**

Revenues:

$500/(1.05)^{15}+ $1500/(1.05)^{30}= **$587.58**

NPV=Revenues - Costs =$392/acre

Positive NPV means GO!

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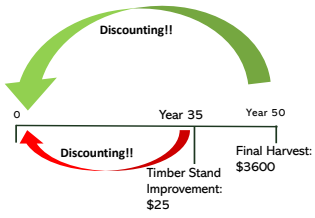
Hardwood Example



All costs and revenues are brought to a common point year 0

At discount rate of 5%,

Costs:

$25/(1.05)^{35}= **$4.53**

Revenues:

$3600/(1.05)^{50}= **$314**

Net Present Value:

Revenues - Costs = $309/acre

Positive NPV means GO!

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How Financial Decisions are made in Forestry

Used to determine **accept-reject** all financial decisions by satisfying two key principles :

- ✓Bigger is better
- ✓Now is better

Positive NPV beats the discount rate and it's a GO!

How about a Negative NPV?

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How About a Negative NPV?

- Negative NPV doesn't kill the investment directly
  - Assumptions on **discount rate and other variables**

Discount Rate (%)	NPV ($)
2%	747
4%	527
6%	333
8%	163
10%	13
12%	-119

At 4%, NPV is positive
At 12%, NPV is negative

The higher the interest rate, the lower the NPV (project becomes less attractive)

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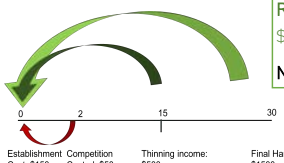
Same Pine Example with Different Interest Rate



At interest rate of **12% in place of 5%**.

Costs:

$\$150 + \$50/(1.12)^2 = \$189.86$

Revenues:

$\$500/(1.12)^{15} + \$1500/(1.12)^{30} = \$141.42$

NPV=Revenues-Costs = -$48/acre

Implies that invest your money where you get that 12%

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Financial Considerations

Every activity should have financial implications

Example: Final harvest is 10 years away for your recently thinned plantation. And you'd like to see if fertilization makes sense financially. If **fertilization** costs $100/acre, how much extra yield (in dollars) would be necessary to justify this investment?, suppose interest rate of 5%)

Now — 5% — 2030

Fertilization: $100 — Additional yield?

$100*(1.05)^{10}=\$163$

Fertilization would only make sense if you will receive additional $163/acre as a fertilization effect in 10 years!!!

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Financial Considerations

- KEY ASSUMPTIONS
  - Objectives of forest management
  - Discount rate (Risk assumptions)
  - Timber prices
  - Cost of practices
  - Length of rotation
  - Inflation

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Timberland Investment Analysis Output:

Pine Plantation

Discount Rate: 5%
Rotation Age: 30
Annual Cost: $-10

Year	Activities	Cash Flows($)
0	Site preparation	-200
1	Planting Costs	-100
15	Timber Sales	100
16	Mid-rotation Herbicide	-50
22	Timber Sales	400
30	Timber Sales	1500

Net Future Value at Rotation Age(NFV, $): 259.48
Net Present Value (NPV, $): 60.04
Internal Rate of Return (IRR, %): 5.58

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Timberland Investment Analysis

Oak Timber

Discount Rate: 5%
Rotation Age: 65
Annual Cost: $-10

Year	Activities	Cash Flows($)
1	Site preparation	-50
30	Timber Sales	300
45	Timber Sales	1000
50	Site preparation	-25
57	Site preparation	-25
65	Timber Sales	2500

Net Future Value at Rotation Age(NFV, $): 1015.98
Net Present Value (NPV, $): 42.62
Internal Rate of Return (IRR, %): 5.51

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Some tools and resources for landowners

- Familiar to most extension educators and some consultants.
- Act as a "guide" to what to expect in terms of outcomes for differing financial decisions, prices, and costs for services and management practices.
- These should not be used as absolute benchmarks. Merely approximations.

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Financial Considerations: On-site

Evaluate implications of each activity/practice before pursuing them	• Pre-commercial thinning • Herbicides treatment • Plantation vs natural regeneration • Fertilization • Prescribed burning
Understand the advantages and disadvantages of your property specifically.	• Access • Size (acres) • Species type • Quality, etc.

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Financial Considerations

- Cost-share programs to reimburse (usually) your costs of practices
  - Federal and state cost-share and financial incentive programs
  - Tax-breaks
  - Up to 60% depending on the practices and agencies
- Other Tax Considerations – Big Issue
- Seek professional assistance: Forest Service, State Agencies, NGOs, Extension Service, Consultants
- Consultant Benefits

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Two Methods of Selling

~~Do-it-yourself~~

Hire a forestry consultant

- Is it Worth It? –*What are their fees?*
  - Not a timber buyer
  - Generally paid on a commission basis
    - 4-12 percent (Texas and Louisiana)- depends on product
    - Look for graduate forester
    - Must be registered in some state
    - Experiences(learn from others- associations)

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"If I hire you to sell my timber, will I get my money's worth?"

- Sales that involved a consultant in the process—whether it was a per-unit or lump sum sale—brought higher value to the landowner.
- Sealed bid (3% for CNS and Sawtimer, 9% for pulpwood)

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"If I hire you to sell my timber, will I get my money's worth?"

- On per-unit sales (sealed bids in particular), sales that involved consultants exceeded the non-consultant sale prices by no less than 11%.
- The data also showed that consultants did equally well on lump sum sales, bringing an average increase of 12% on total bids.

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Negotiate Services

- supervise bid openings and contract signing
- supervise sale
- prepare plan for reforestation tax credits – if available in your state
- cruise timber
- prepare and mail out sales prospectus
- set up site preparation and reforestation
- help apply for cost-share

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Sales Supervision

- Monitor timber harvest to make sure logging is in compliance with contract
- May use a performance bond to encourage compliance.

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Financial Considerations – Offsite

- Know the local markets-demand of specific wood-based products
  - Sawtimber rotation age? Should be based on nearby mill specifications.
  - Pine vs. Hardwood
- Know your objectives
  - Are they clear?
  - Are they realistic?
- Understand the alternative investment options
  - Follow financial markets
  - Know other investment opportunities

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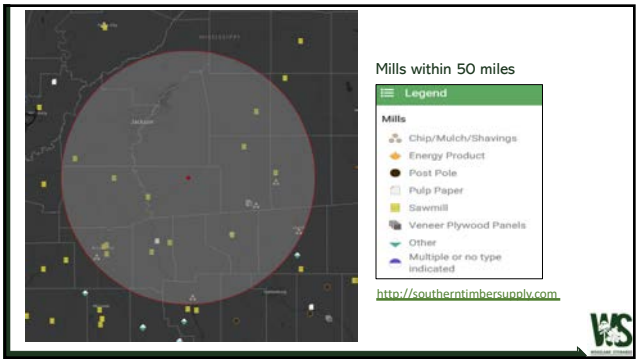
Mills within 50 miles
Legend
Mills
Chip/Mulch/Shavings
Energy Product
Post Pole
Pulp Paper
Sawmill
Veneer Plywood Panels
Other
Multiple or no type indicated
http://southerntimbersupply.com

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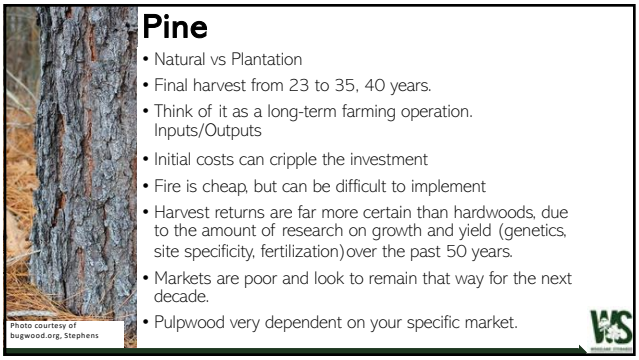
Pine
• Natural vs Plantation
• Final harvest from 23 to 35, 40 years.
• Think of it as a long-term farming operation. Inputs/Outputs
• Initial costs can cripple the investment
• Fire is cheap, but can be difficult to implement
• Harvest returns are far more certain than hardwoods, due to the amount of research on growth and yield (genetics, site specificity, fertilization) over the past 50 years.
• Markets are poor and look to remain that way for the next decade.
• Pulpwood very dependent on your specific market.
Photo courtesy of bugwood.org, Stephens

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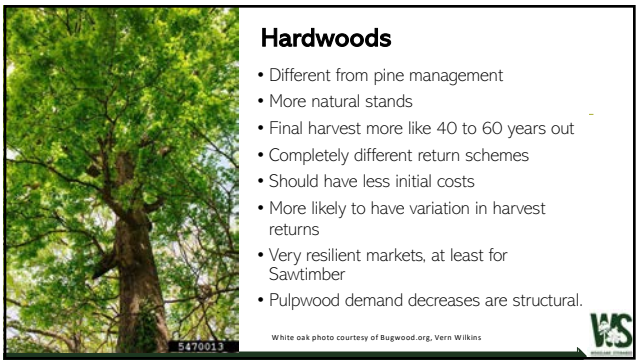
Hardwoods
• Different from pine management
• More natural stands
• Final harvest more like 40 to 60 years out
• Completely different return schemes
• Should have less initial costs
• More likely to have variation in harvest returns
• Very resilient markets, at least for Sawtimber
• Pulpwood demand decreases are structural.
White oak photo courtesy of Bugwood.org, Vern Wilkins
5470013

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So, To Conclude

Forestry can be as attractive and competitive investment option as retirement accounts, stocks and bonds	Your management objectives are always crucial
	Know your surroundings and capabilities of property (non-markets)
	Know your allies
	Before proceeding with any specific practices, evaluate whether they are economically profitable
	Know your local market situation
	Seek professional assistance

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Questions?

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