

# Wood Fuel and Woodlots



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Subtitle:

When you go to the woods, what are  
your firewood choices?



# When you go to the woods, what are your firewood choices?

- Dead and Down
- Standing Dead
- Live Trees



# Dead and Down (perceptions)

- Dry
- Improves the woodlot
- Cleans things up



# Standing Dead (perceptions)

- Dry
- Improves the woodlot
- Improves safety
- Cleans things up



# Live Trees



# What are your firewood choices and the disadvantages of each choice?

## ▶ Dead and Down

- Reduced Habitat
- Reduced Biodiversity
- Reduced Structure

## ▶ Standing Dead

- Reduced Habitat
- Reduced Biodiversity
- Reduced Structure

## ▶ Live Trees

- Wet Wood
- Heavier
- Cutting a Growing Tree
- Tough Decisions





# Silviculture

The theory (science) and practice (art) of positively controlling forest establishment, composition, structure, and growth.





How does cutting dead “stuff” help you practice silviculture?

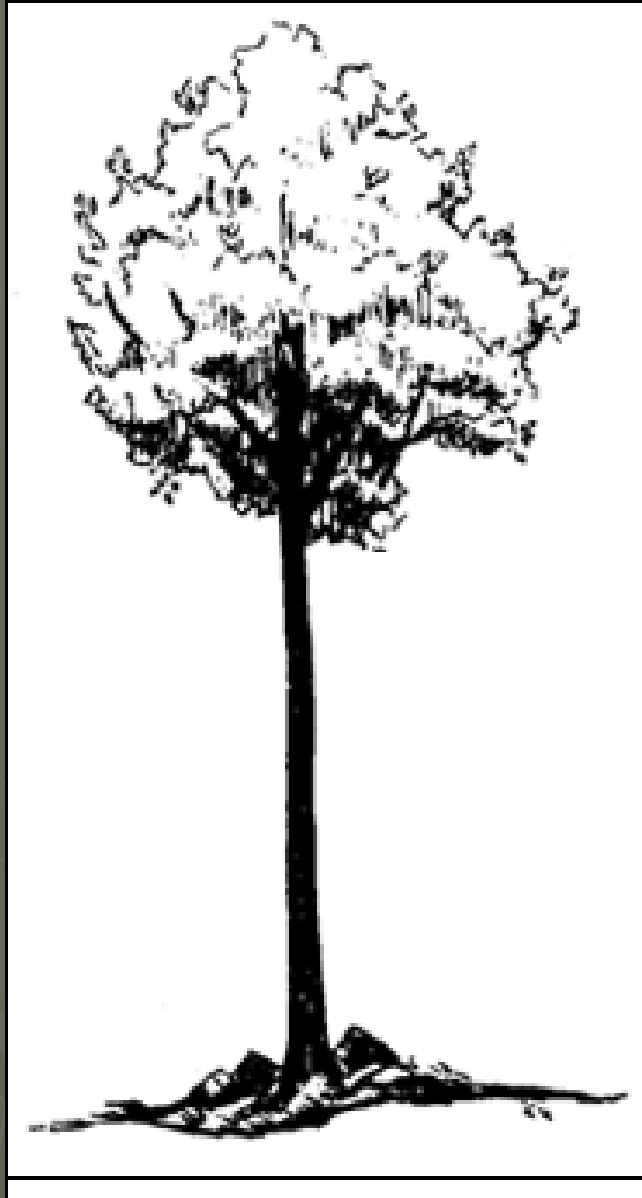
# Hardwood Firewood

## Species – Does it Matter?

<u>Species</u>	<u>lb/cd</u>	<u>Million BTUs</u>
Ash	3,940	23.6
Basswood	3,360	14.7
Am. Elm	2,870	20.1
Bl. Locust	4,010	28.1
R. Oak	3,609	25.3
W. Oak	3,863	27.0
S. Maple	3,570	25.0
R. Maple	3,000	20.8
Bl. Birch	4,000	28.0

# Hardwood Firewood

- ▶ Species – Does it Matter?
  - 7,000 BTUs/”Pound for Them All”
- ▶ Living Trees Compete for Resources
  - To survive all trees must (should?) get larger
  - Trees are nasty to each other
  - One or another will win the battle for resources
  - You get to decide



What do your trees  
need to grow?

Light

Water

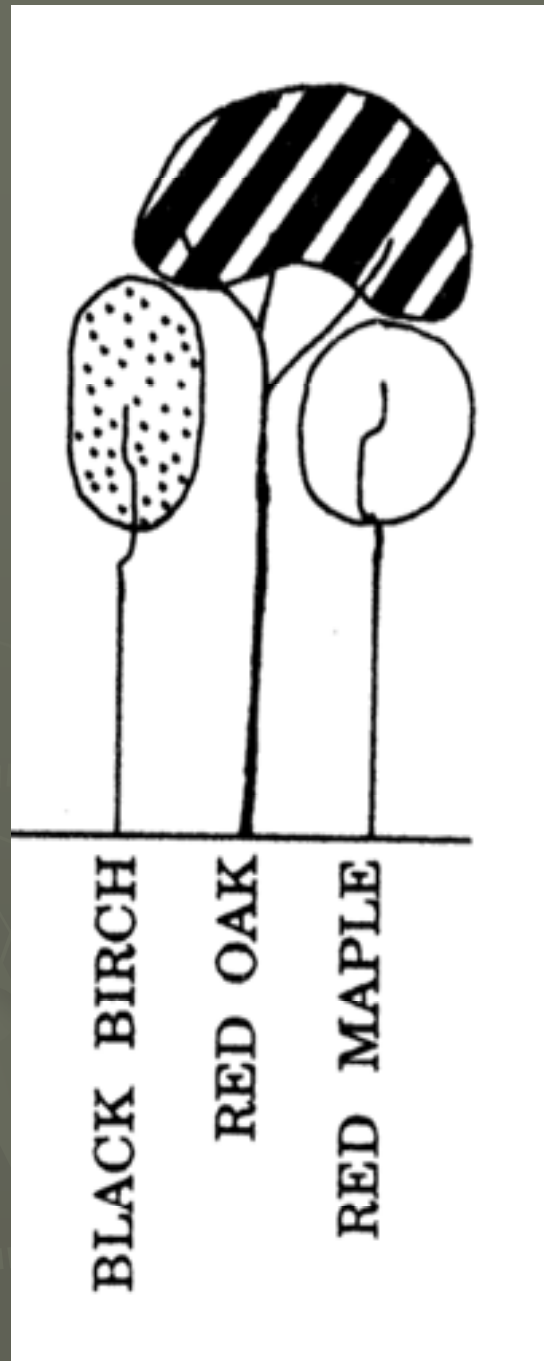
Nutrients

Space









# Stand Development

Oliver and Larson 1996





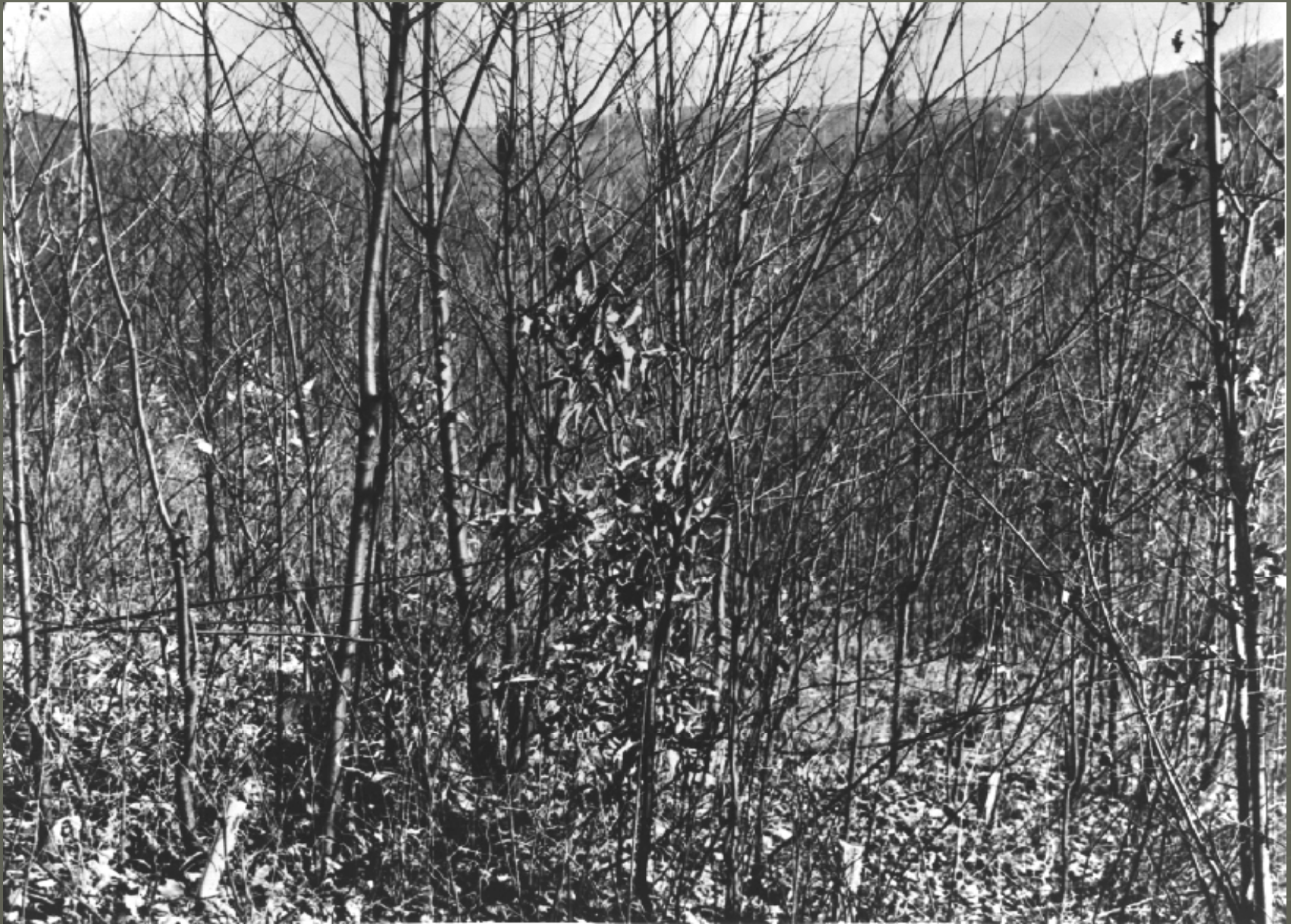
1927

US Forest Service



1928

US Forest Service



1937

US Forest Service



1947

US Forest Service



1958

US Forest Service



1968

US Forest Service



1978

US Forest Service



1988

US Forest Service





1998

US Forest Service



2008

US Forest Service

# Simply Silviculture Is:



What you leave  
**The Residual**

What you establish  
**The Regeneration**



# Hardwood Quality

- Interior
- Species
- Size
- Surface
- Survivability

AGS – Acceptable Growing Stock

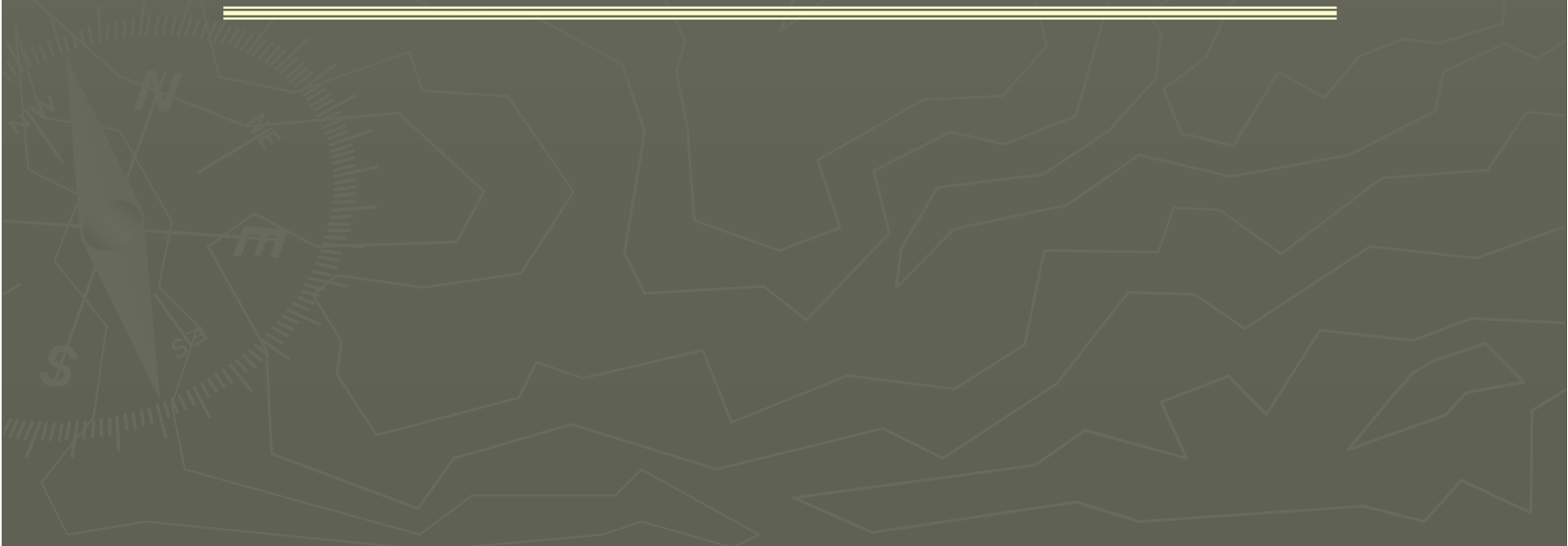
UGS – Unacceptable Growing Stock



# The Role of Cutting

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# Cutting:

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- ▶ Removes Competition
- ▶ Controls Light
- ▶ Redistributes Growth
- ▶ Controls Species Composition
- ▶ Meets Objectives
- ▶ Produces Income
  - Firewood
  - Money
  - Other values







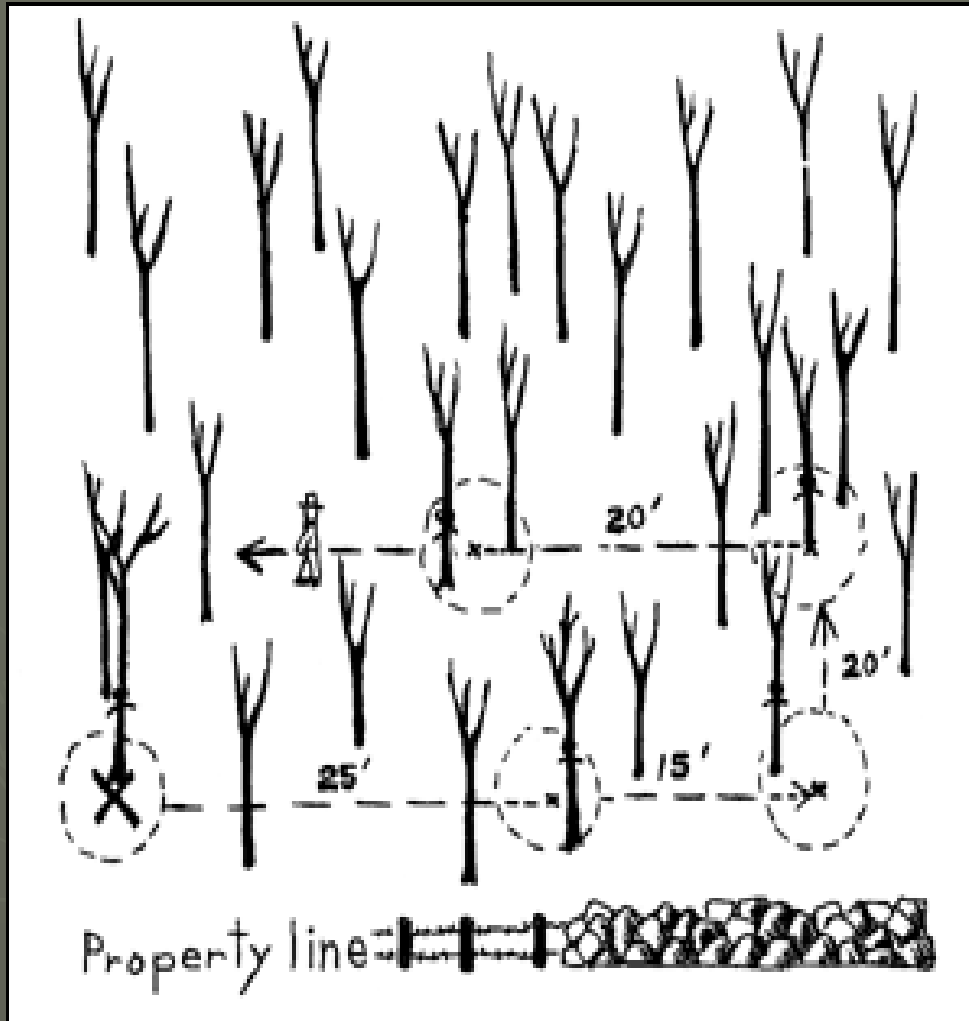






Where do you start?





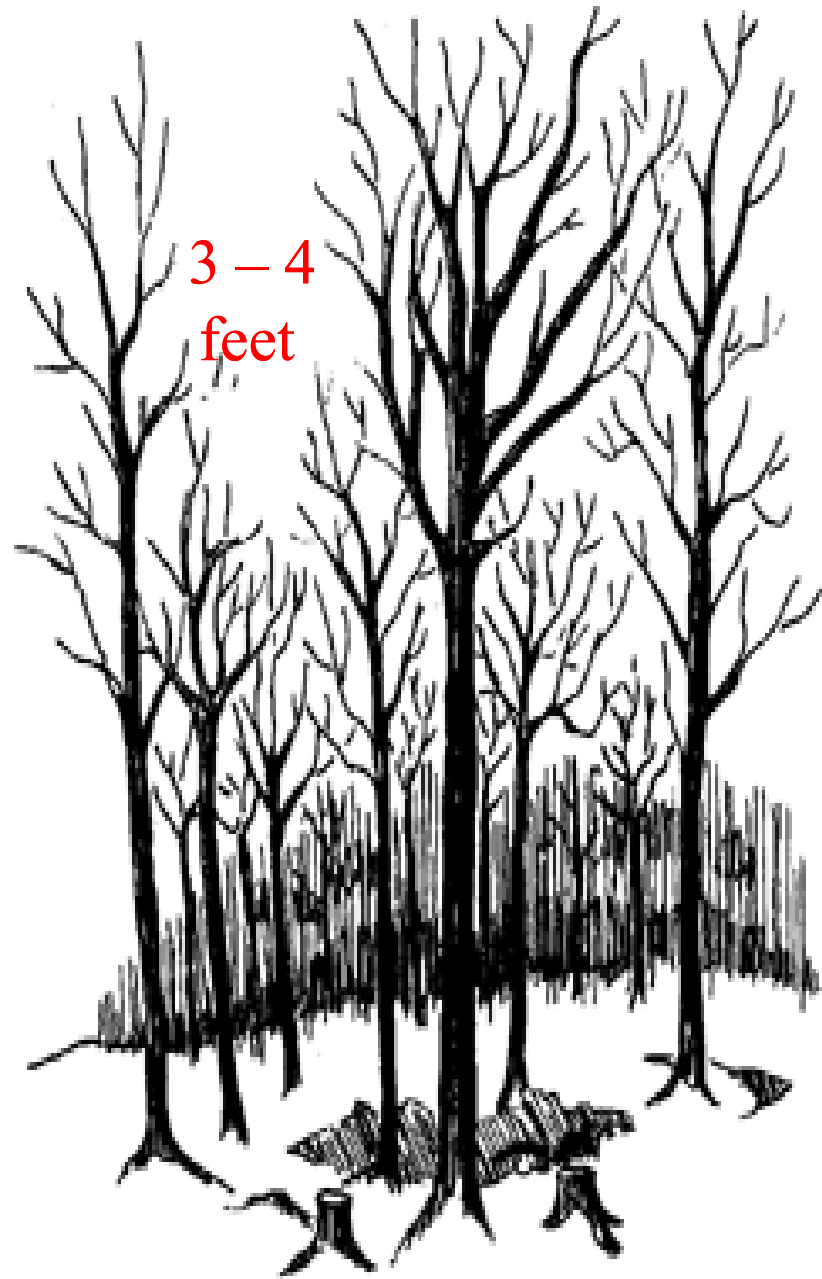
## Selecting Keepers

Average 14 inch DBH  
80 to 120 stems/acre

# How Much Is Out There?

DBH	Trees/Acre	Cord Volume/Tree	Trees/Cord
6	509	0.04	25
8	286	0.07	14
10	183	0.10	10
12	127	0.18	5.5
14	94	0.24	4.2

Start young with  
caution



















# Stump Sprouts



# Thin to Two

- ▶ Clean stem
- ▶ Low origin
- ▶ Treat top as one



# Low Origin

- ▶ Independent
- ▶ Multiple buds
- ▶ Resilient/Light





# High vs. Low Origin



“V” vs. “U”

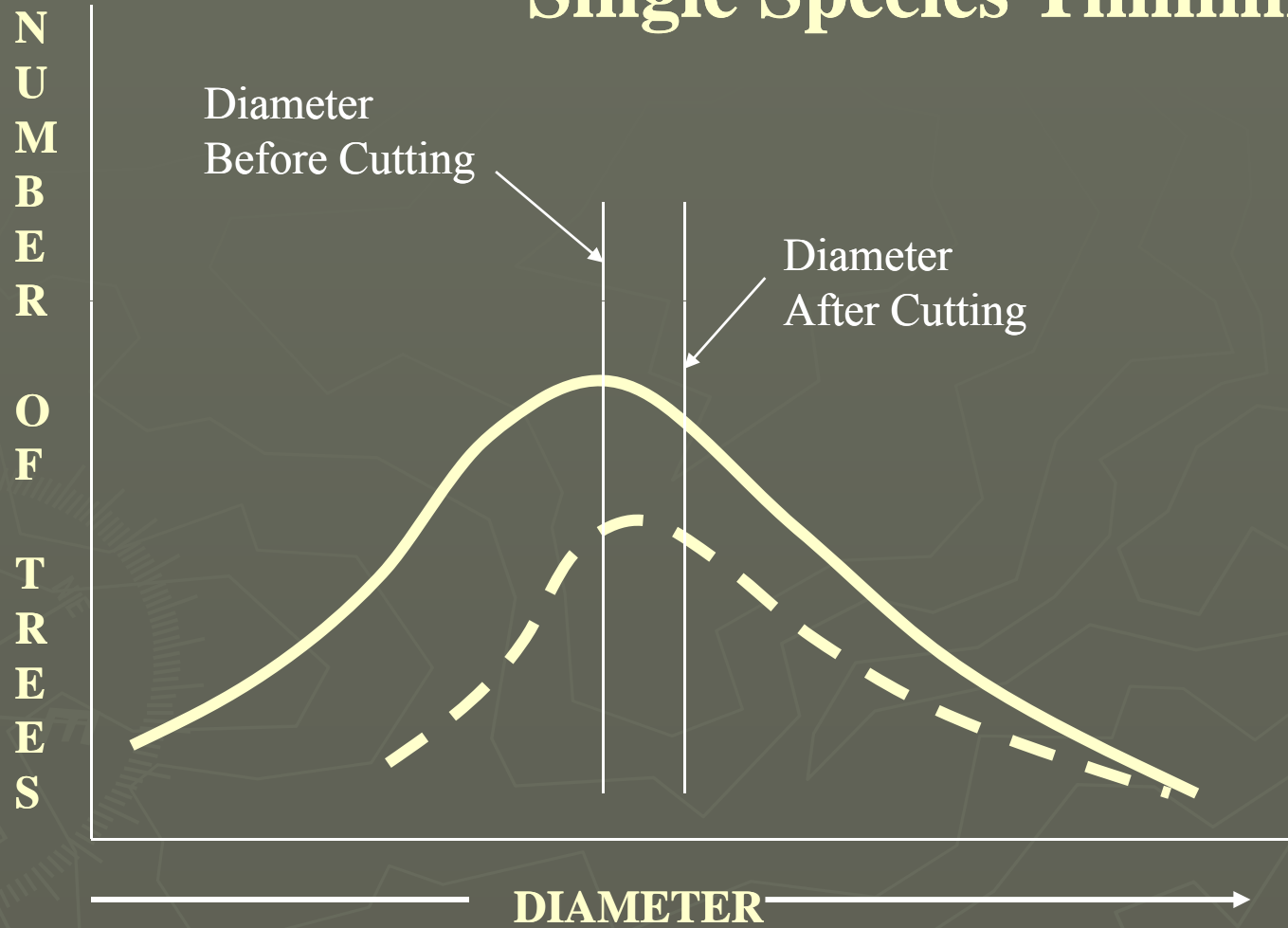


# Growing Quality – Focus on Retention



- ▶ Species
  - Site
  - Diversity
  - Markets
- ▶ Condition
  - Quality
  - Crown
- ▶ Competition
- ▶ Risks

# Single Species Thinning





# High-Graded Stands

- ▶ Consider Seed Source Over Quality
- ▶ Thin in Residual Pockets
- ▶ Control Pockets of Competing Plants
- ▶ Use Tops for Protection
- ▶ Consider Prevailing Wind
- ▶ Consider Establishing Small Exlosures





Chris Nowak





Chris Nowak

# Mixed Hardwood Sustainability

- ▶ **EVERY** harvest has reforestation and sustainability consequences
- ▶ Regeneration is a process; not an event



# An *ASID* test



## ▶ Advance regeneration

- Do you have it? Is it abundant?



## ▶ Seed source for desirable species

- Regen cut or not, this matters



## ▶ Interfering plants

- Present? Will your harvest help them?



## ▶ Deer

# Seven Questions



## Regeneration: What is . . .

1. the role of interfering plants?
2. the condition of existing advance regeneration?
3. the impact of deer?

## Residual Trees: What happens to . . .

1. species composition?
2. seed source?
3. residual tree quality?
4. average stand diameter?



# Summary

- ▶ Harvesting as a tool
  - Species
  - Condition
  - Competition
  - Risk
- ▶ Residual and Regeneration





# Forests Function as Systems











# Improving Your Woodlot by Cutting Firewood



# Rules for Cutting Your Own Firewood

1. Never park downhill of a tree you are cutting
2. When in doubt, park twice as far from the tree as it is tall
3. Just because you live within driving distance of a forest, does not make you a Lumber Jack
4. Always use the neighbors truck





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Web Resources:

[RNRExt.cas.psu.edu](http://RNRExt.cas.psu.edu)

# Web Seminar Calendar

2009 – 2010

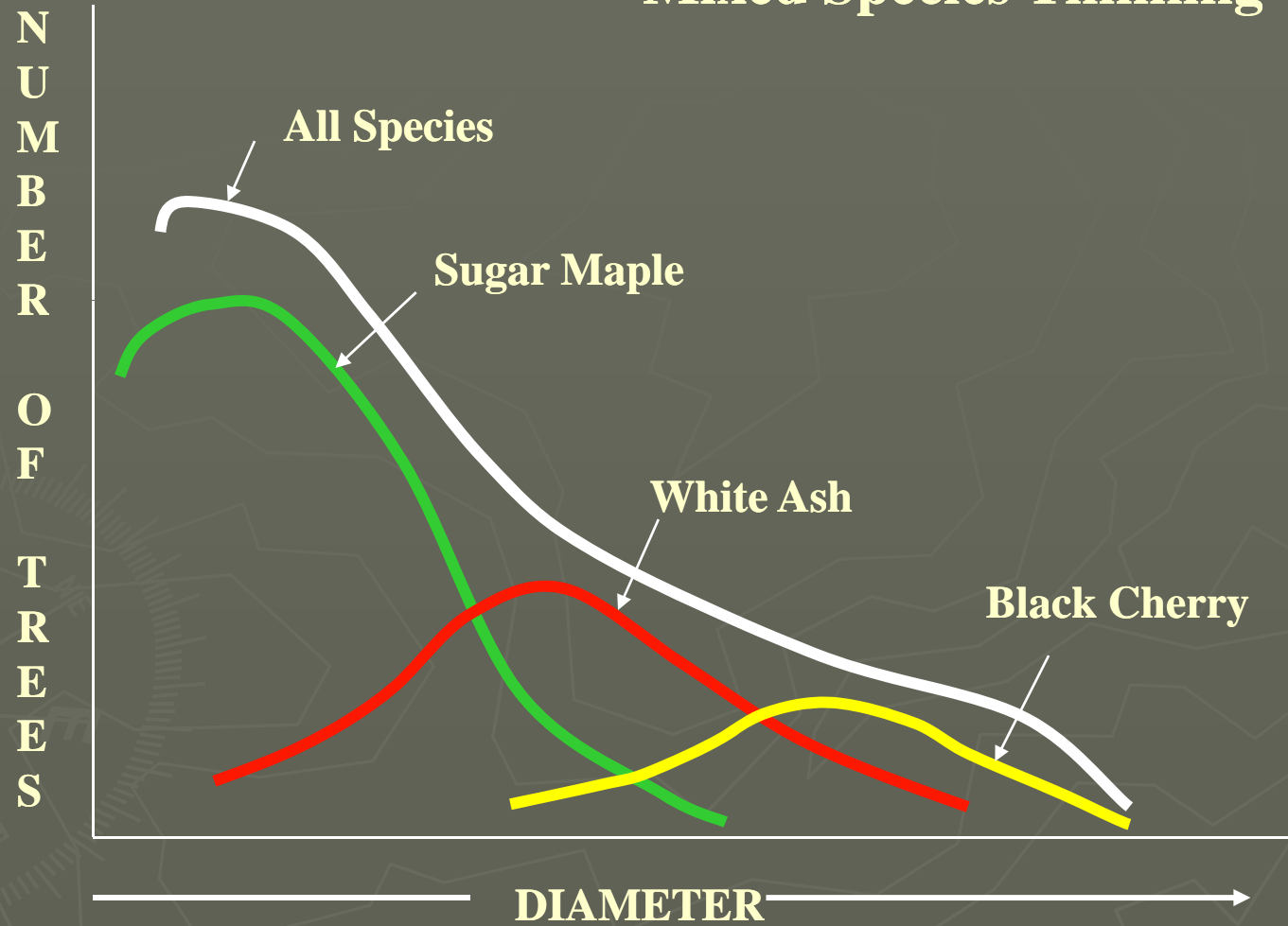
Noon and 7:00 p.m.

- |         |  |
|---------|--|
| Oct. 13 | Protecting Water Resources on Your Property                                  |
| Nov. 11 | Forest Management and Regeneration   |
| Dec. 8  | Urban and Community Forestry   |
| Jan. 12 | Maple Syrup  |
| Feb. 9  | Regenerating Hardwood Forests: Managing<br>Competing Plants, Deer, and Light |
| Mar. 9  | Deer Habitat Management  |
| Apr. 13 | Lyme Disease   |

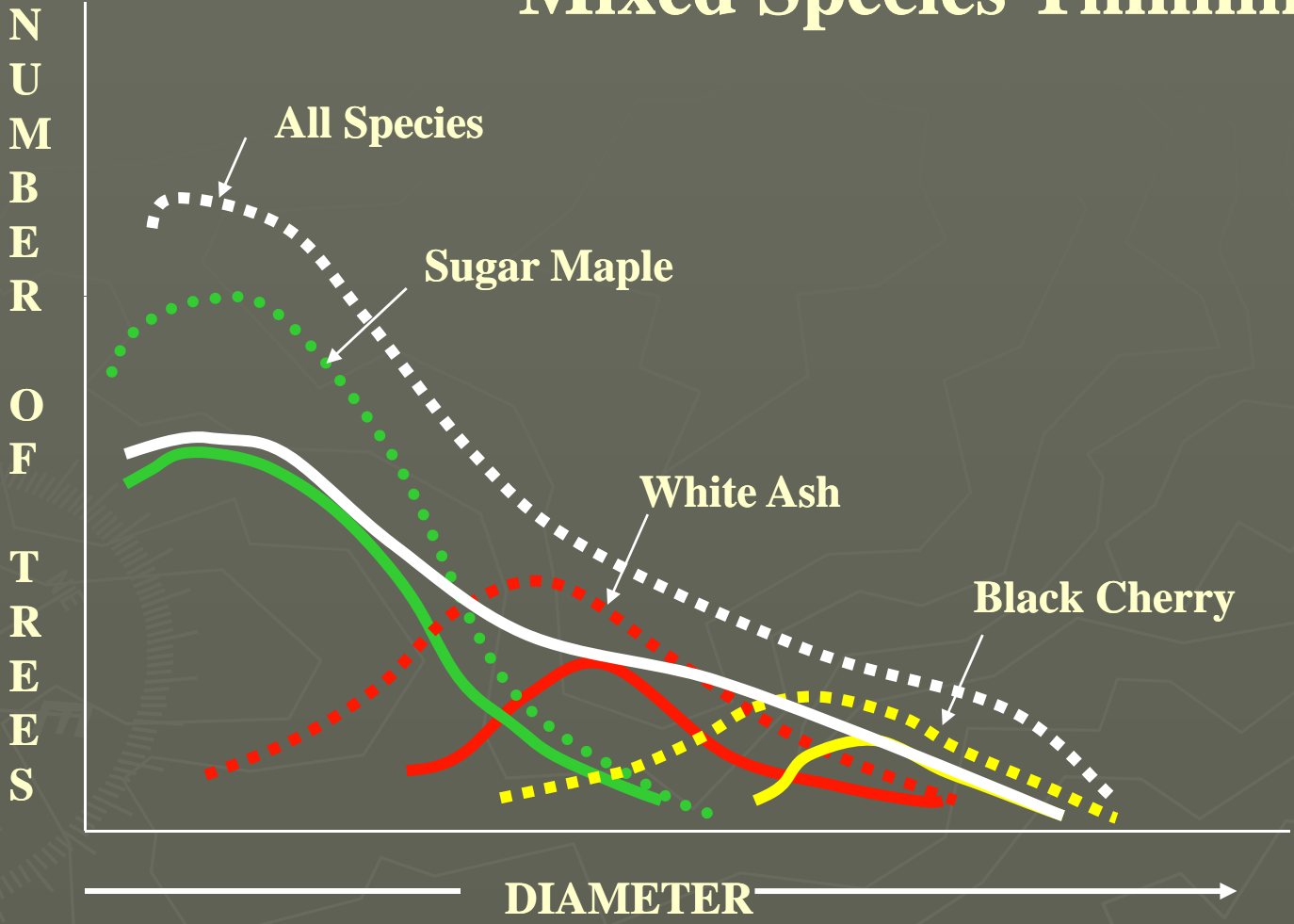
<http://rnrext.cas.psu.edu/PaForestWeb/default.html>



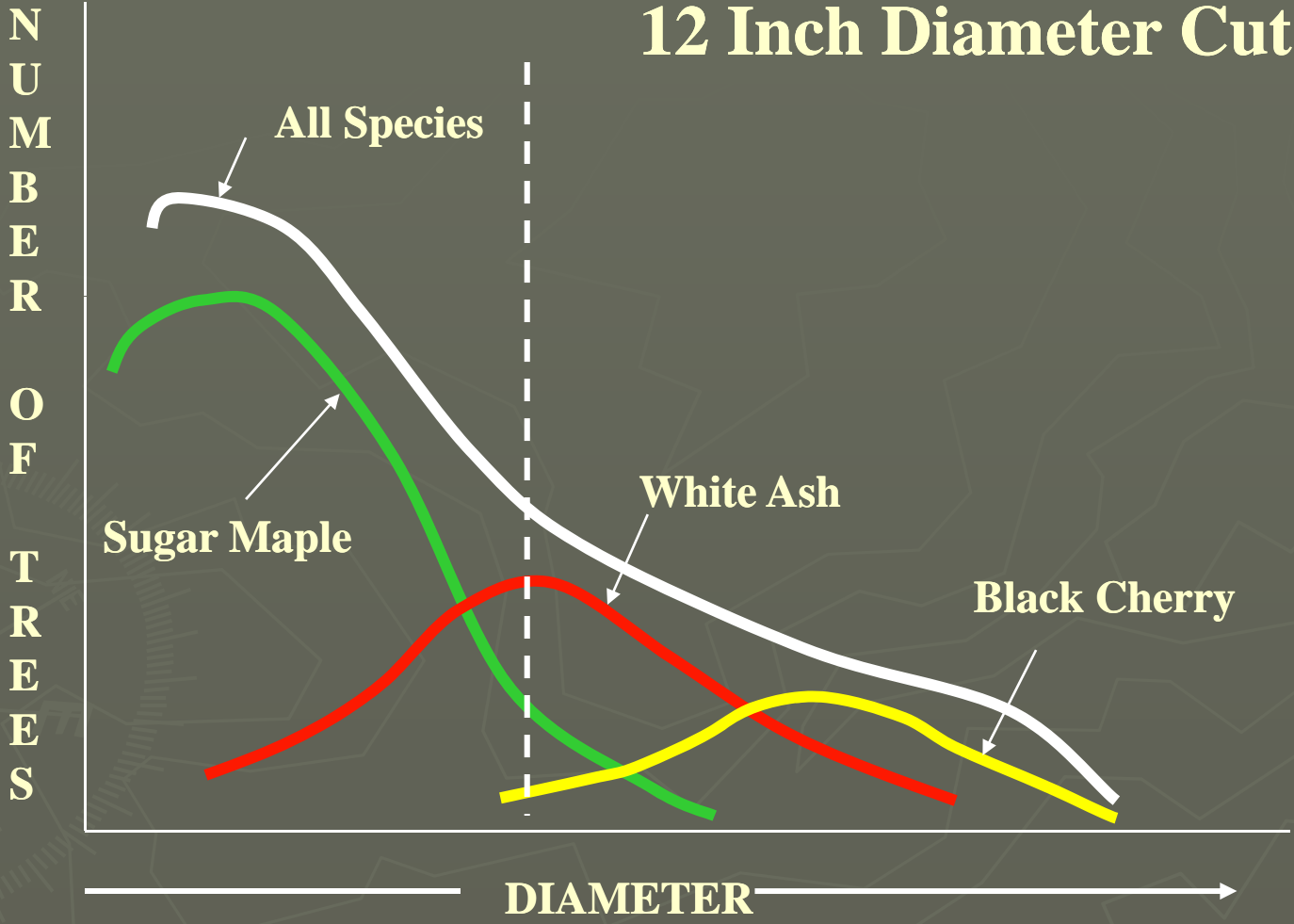
# Mixed Species Thinning



# Mixed Species Thinning



# 12 Inch Diameter Cut



# Diameter and Age





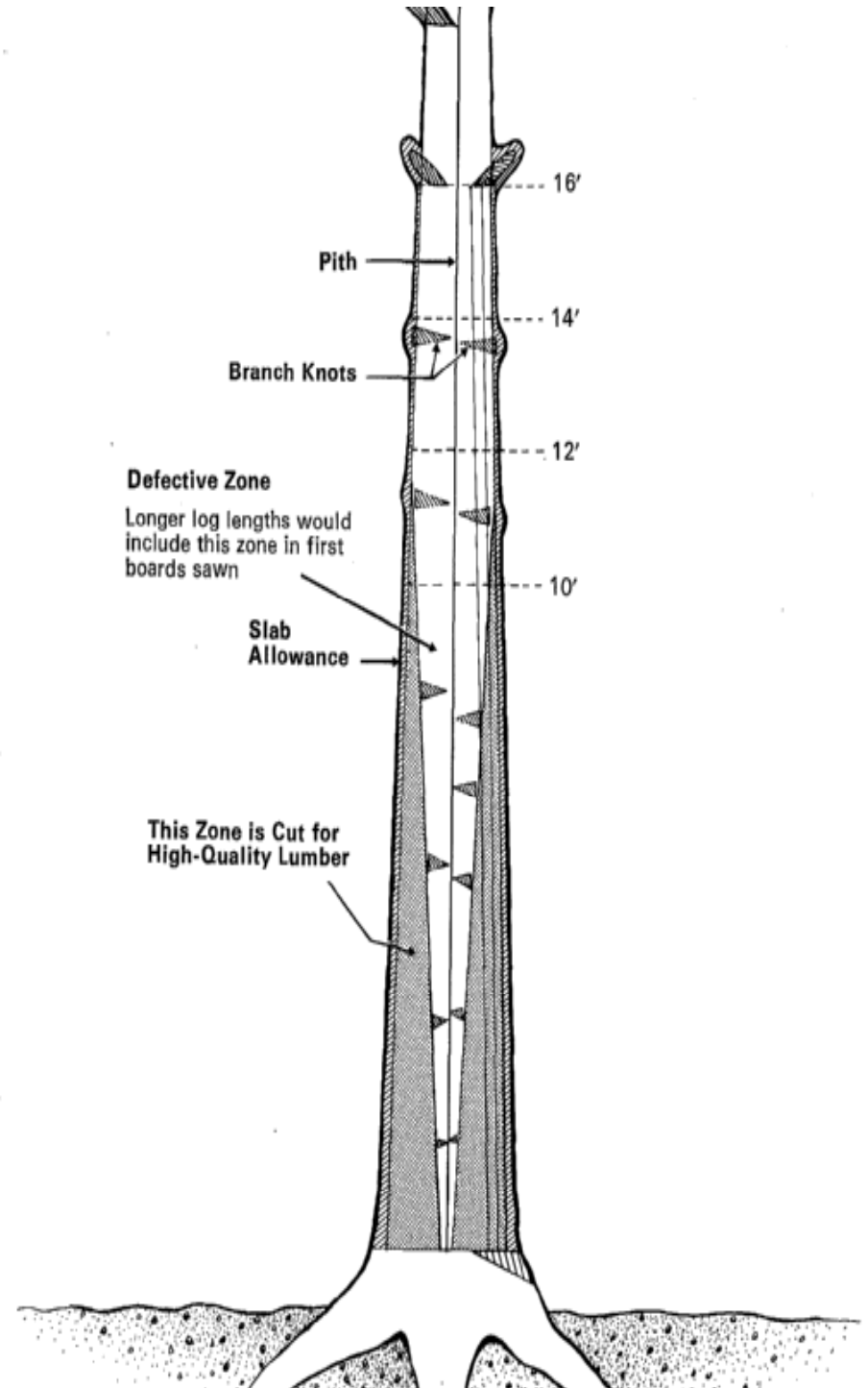


What are your firewood choices and what perceived advantages to you see for each choice?



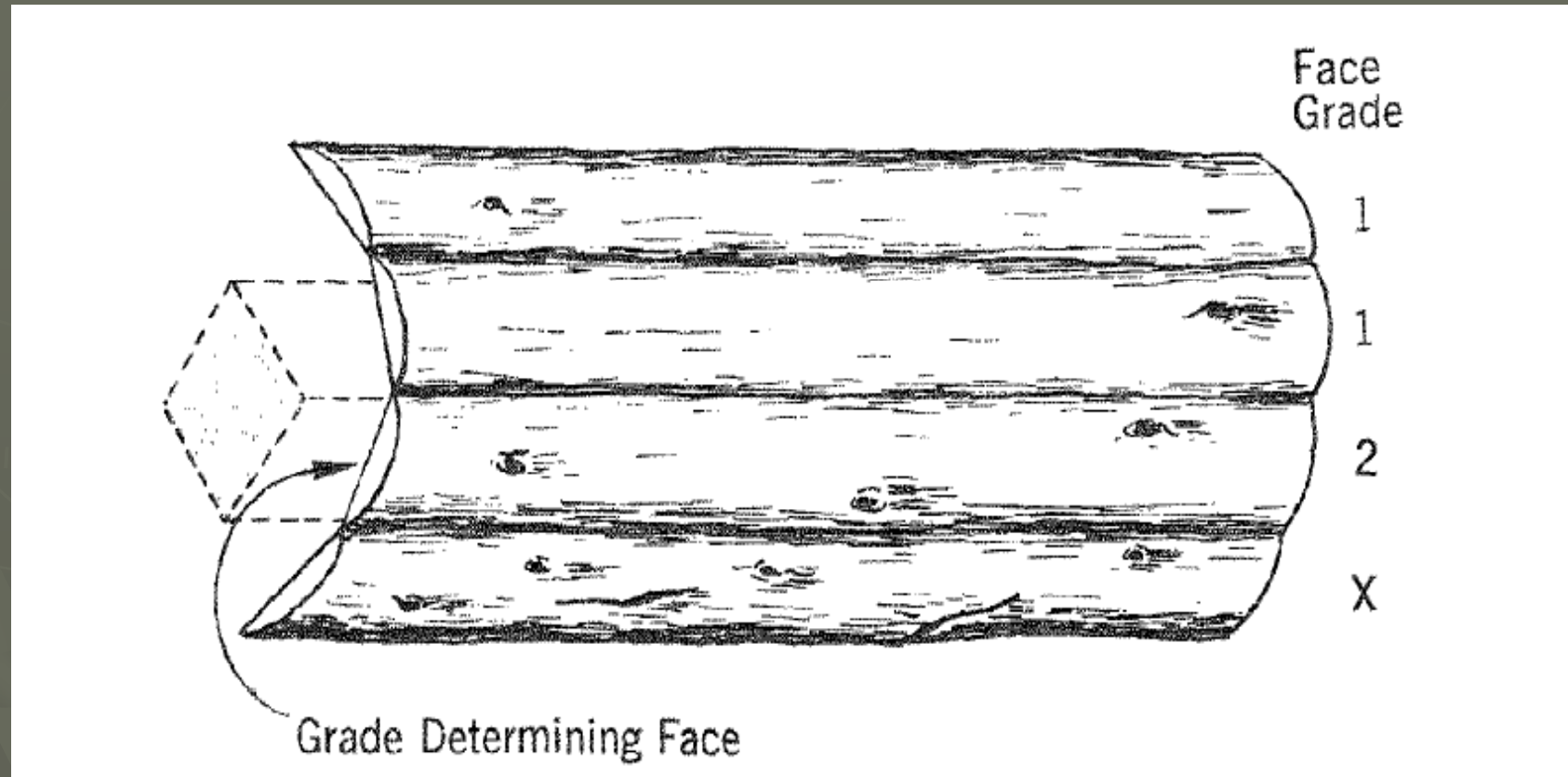
# Quality

- Interior Condition
- Log Position





# Grading Face



What are your firewood choices and what disadvantages are there for each choice?

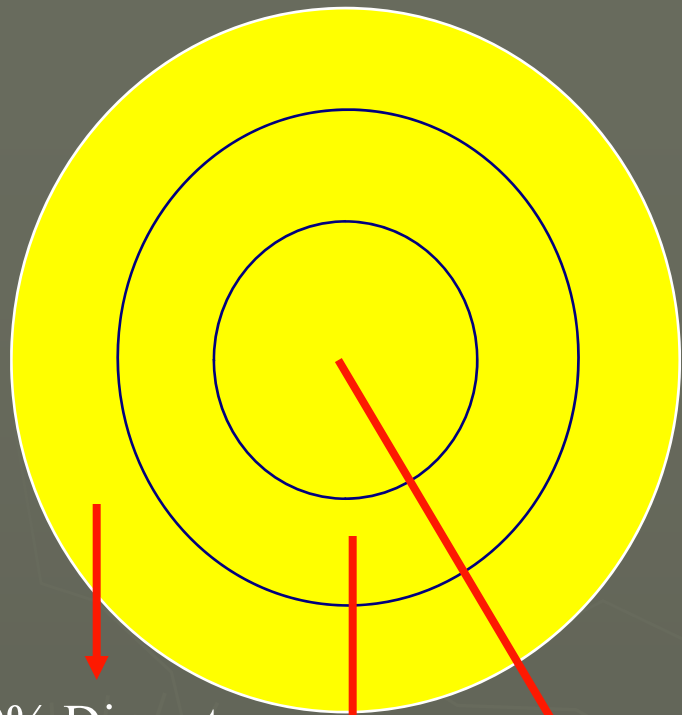




***A knotty log-any lumber cut from it would be of very low value***



***Board cut from a knotty log.***



30% Diameter  
Outer Quality Zone

40% Diameter  
Heart Center Zone

30% Diameter  
Inner Quality Zone

