TIMBER MANAGEMENT FOR QUALITY PROPERTIES AND QUALITY DEER

Importance of Proper Timber Management

- Major driver of overall habitat quality (sunlight, seed source, wind break, successional transitions, etc.)
- Enhance huntability
- Likely the only significant revenue generator on the property

Habitat Management - The Basics

- Provide a diversity of stand types (species composition)
  - Pine
  - Hardwood
  - Open/Field
- Provide a diversity of age classes
- Smaller is generally better; higher diversity of age classes is better
- Habitats well interspersed

A Deer's Diet

1. Hard Mast Species

- Beechnuts - very sporadic
- Acorns
  - White Oak
  - Red Oak
- Hickory – overrated?
- Hardwoods - if it won't make a nut, then make fruit or salad

2. Soft Mast Equally Important… or More So

- Blackberry
- Raspberry
- Black raspberry
- Elderberry
- Blueberry
- Grape
- Rose hips
- Crabapple
- Honeylocust
- Blackgum
- Black Cherry

Collectively, VERY important

3. Forbs - The Backbone of Quality Nutrition

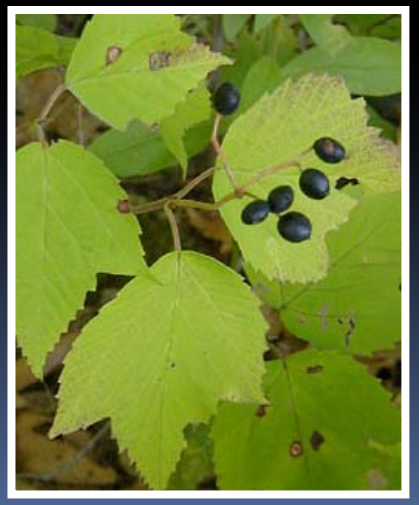
Too many to list:

- Goldenrod
- Hawkweed
- Ragweed
- Native legumes
- Meadowsweet
- Jack-in-the-pulpit
- Trillium
- Dog-tooth violet

4. Vines & Shrubs - Very Important

- Honeysuckle
- Greenbrier
- Poison Ivy

- Hobblebush
- Maple leaf viburnum
- Wild raisin
- Hazelnut



5. Hardwood Browse Plants

- Red maple
- Sugar maple
- Dogwoods
- Oaks
- Birches
- Poplar (aspen)
- Willow
- White ash

6. Softwood Browse Plants

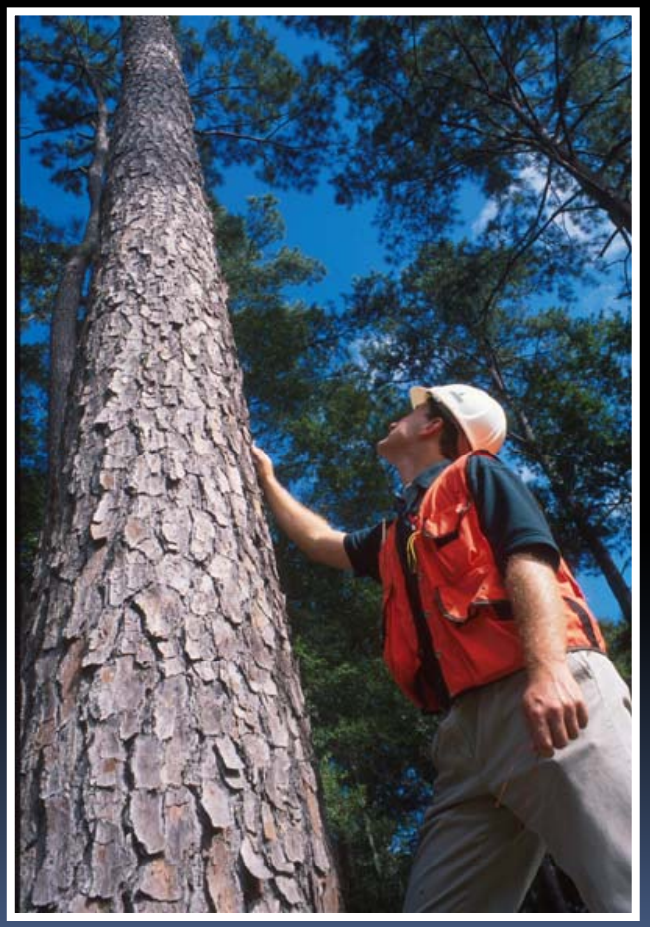
- Northern white cedar
- Hemlock
- Balsam fir

KISS- Timber Mgmt Rules of Thumb

- Develop a plan
  - Define objectives
  - Assess (before you act or before you buy)
  - Develop your vision
  - Develop goals/timelines
- Involve a professional !!

KISS- Timber Mgmt Rules of Thumb

- Understand timber markets/outlets
  - Example: poles vs pulp
  - High quality (veneer) hardwood sawtimber
  - Timing (season)
  - Sustained yield
- Keep practices operationally viable (follow BMP's and your state's wetland regulations)

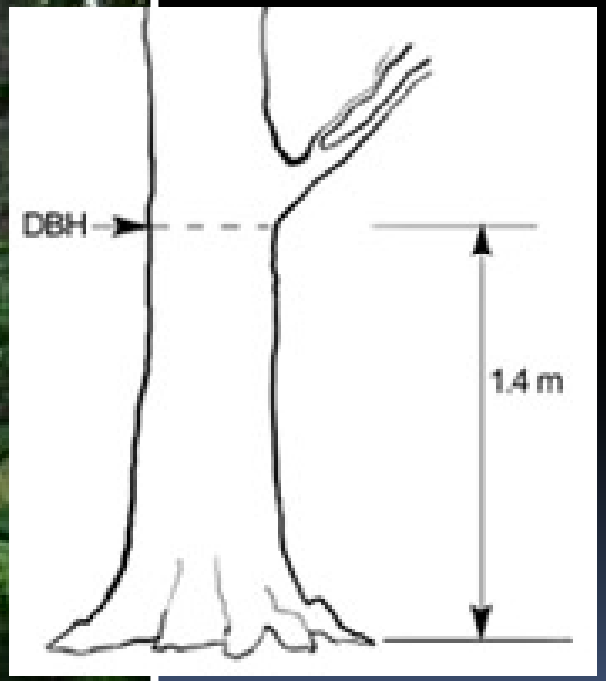


KISS- Timber Mgmt Rules of Thumb

- Manage pines and hardwoods, but management styles may differ
- Pine stands- manage intensively for **winter cover**; AND/OR target forbs, vines and soft mast
- Hardwoods- aesthetics are nice, but mast and browse (aka food) is priority

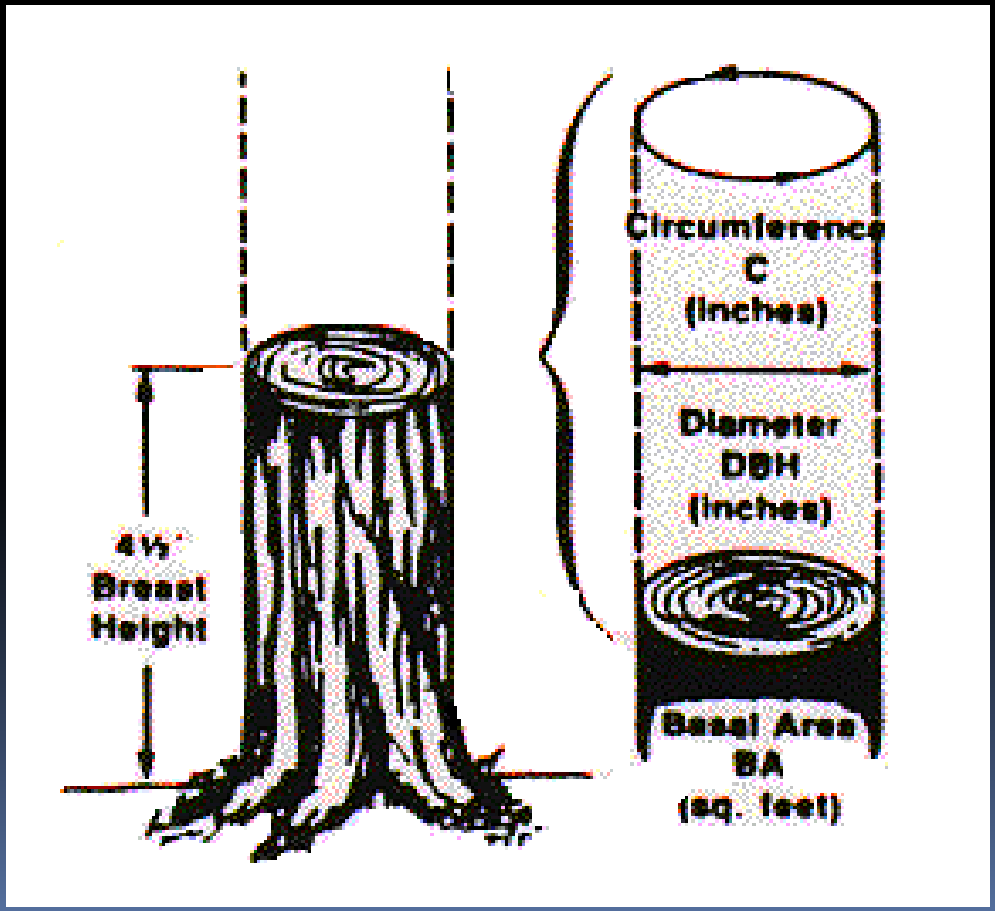
Some simple definitions…

- Diameter at Breast Height (DBH)



Some simple definitions…

- Basal Area (BA)



DBH (inches) = C ÷ 3.14

BA (square feet) =

DBH^2 x 0.005454

Some simple definitions…

- Crown Dominance

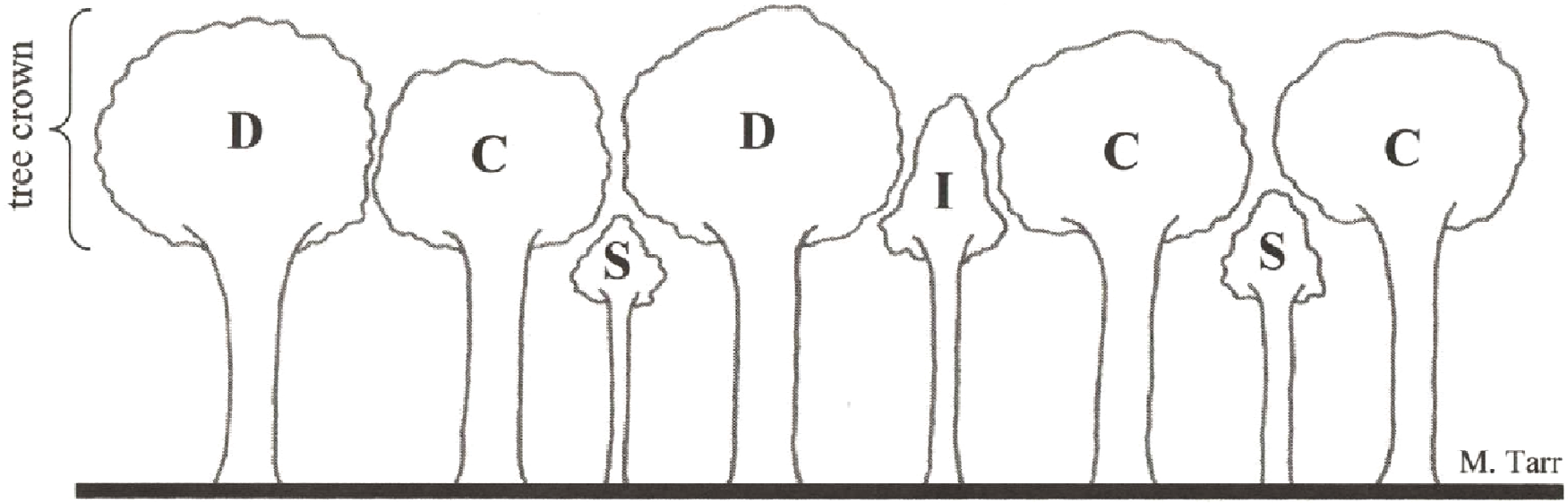


Figure 1. Tree crown position as it relates to dominance in a forest stand.
D = Dominant, C = Codominant, I = Intermediate, S = Suppressed

Some simple definitions…

- Conventional vs. Mechanical Logging

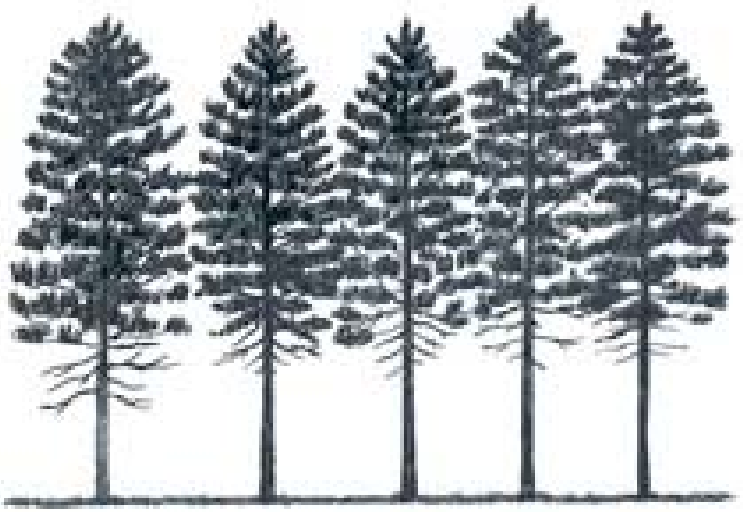
Some simple definitions…

- Log Size Classes

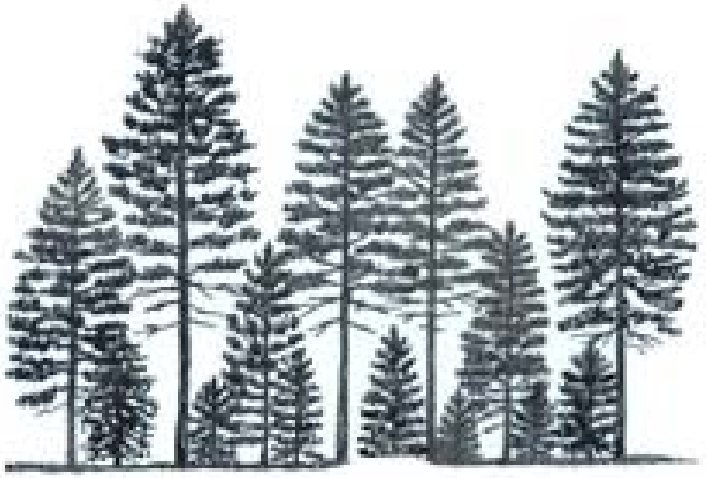
Seedling/Sapling	< 4” DBH
Pulp (soft or hardwood)	
Pole-timber	4 – 10”
Small Sawlog	10 – 18”
Large Sawlog	18” +

Some simple definitions…

- Even-aged vs. Uneven-aged



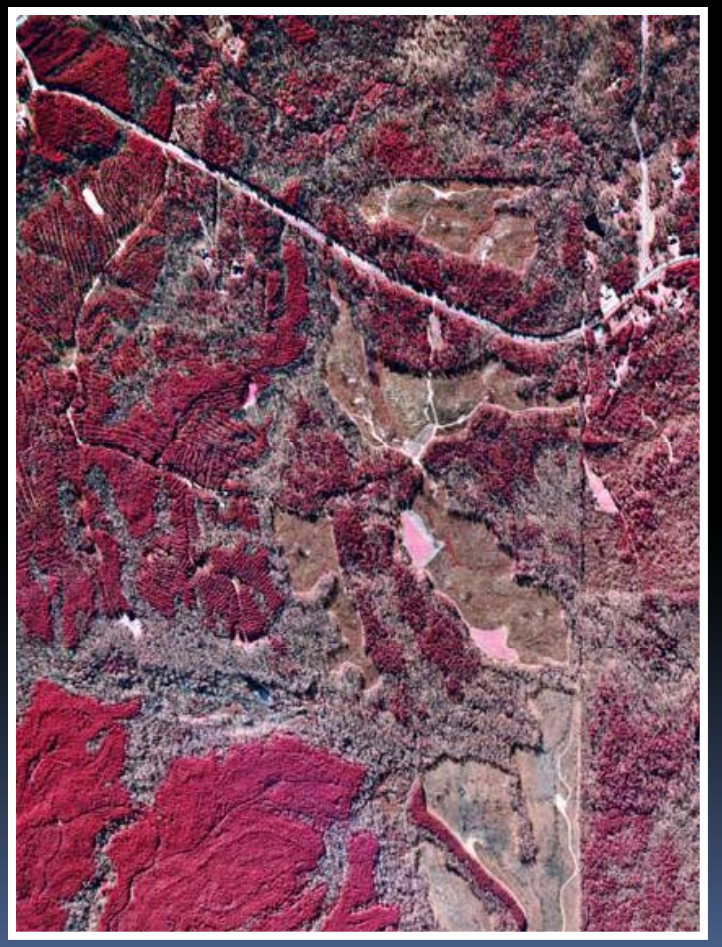
Even-aged: a stand composed of a single age class of trees in which the range of tree ages is usually plus or minus 20% of the rotation age.



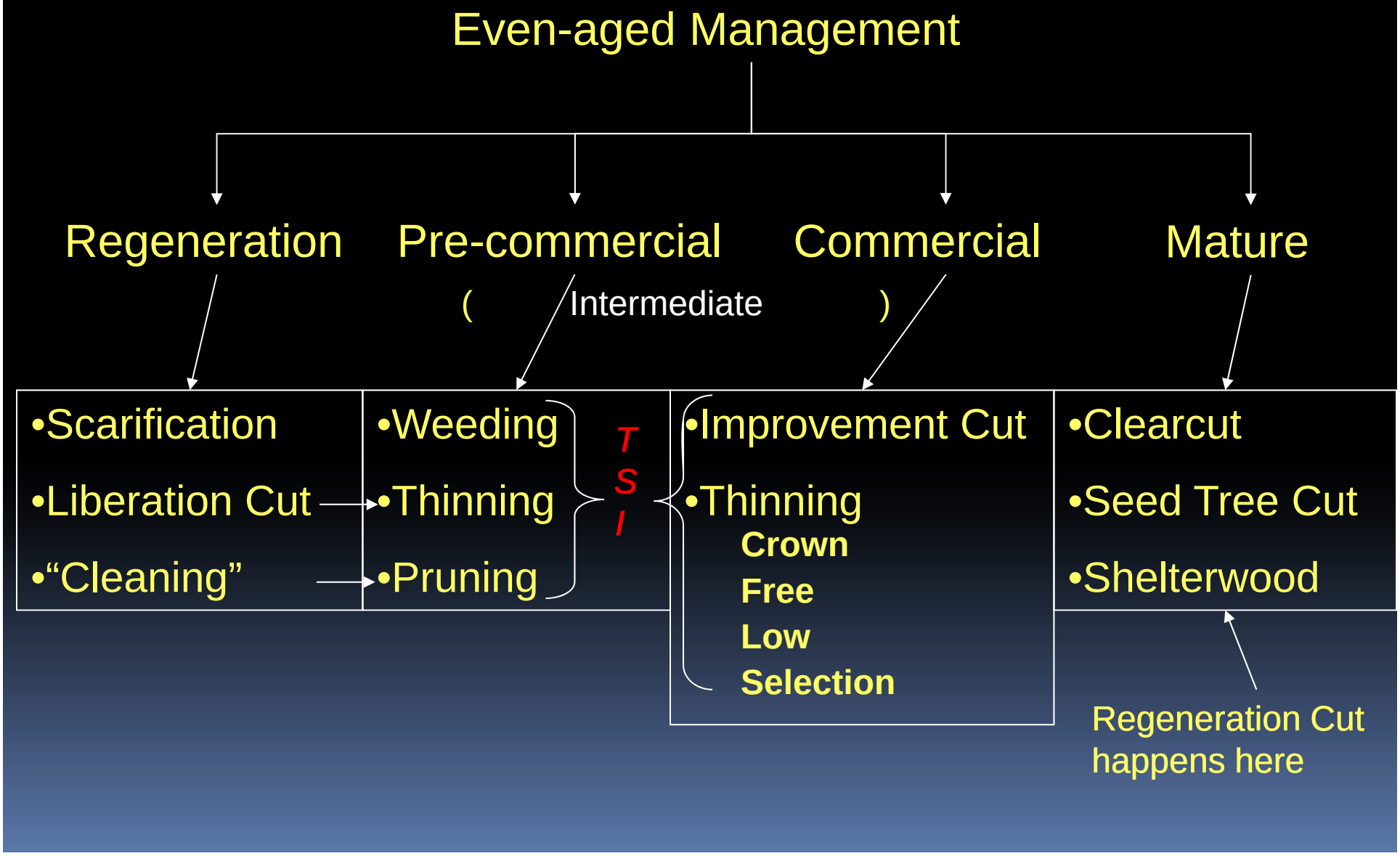
Uneven-aged: a stand with trees of three or more distinct age classes, either intimately mixed or in small groups.

General Considerations In Harvesting Timber

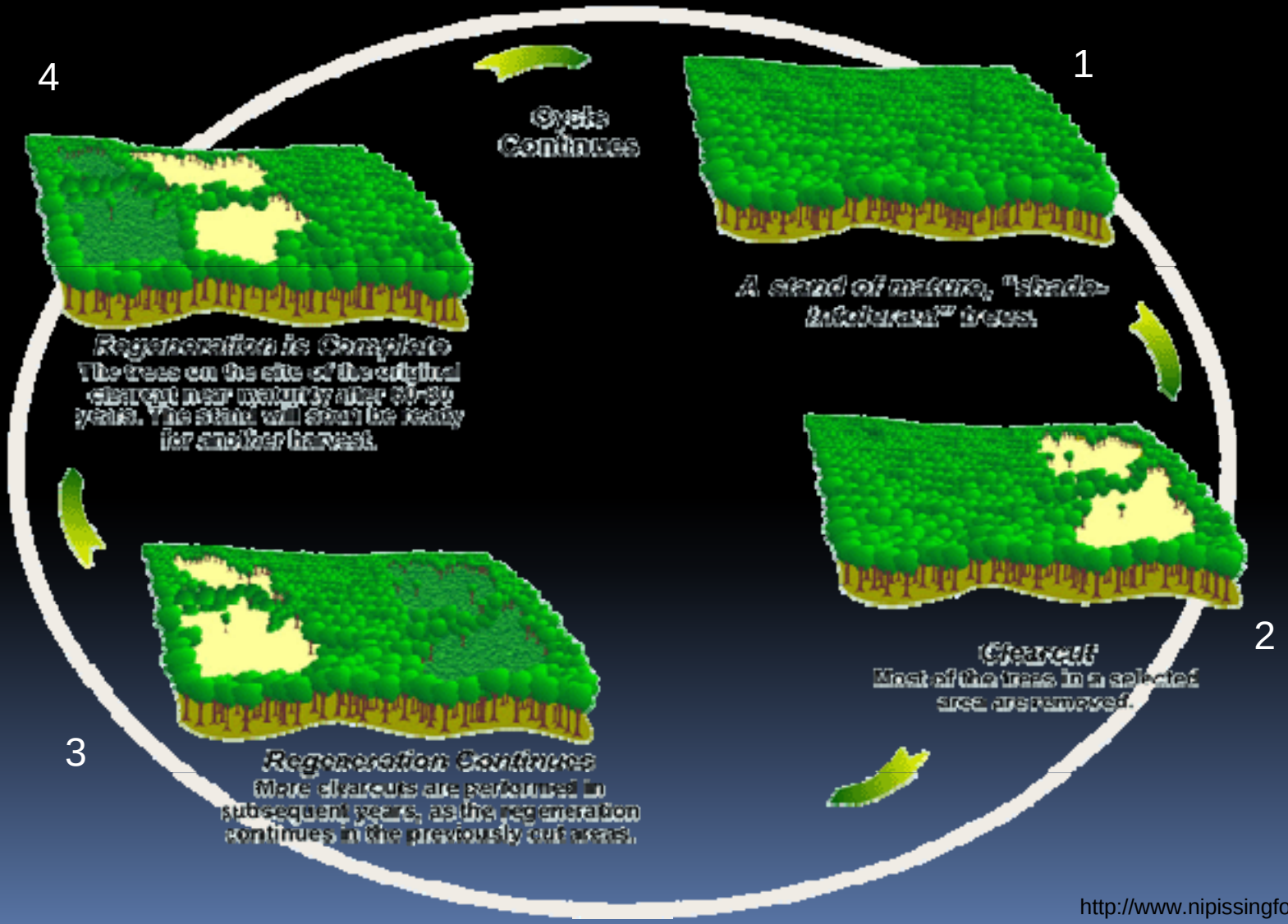
- Measure twice, cut once
  - Well planned/designed
  - Identify features you want to leave or features you want to create
    - Funnels
    - Food plots
    - Tree plots



Even-aged Vs. Uneven-aged

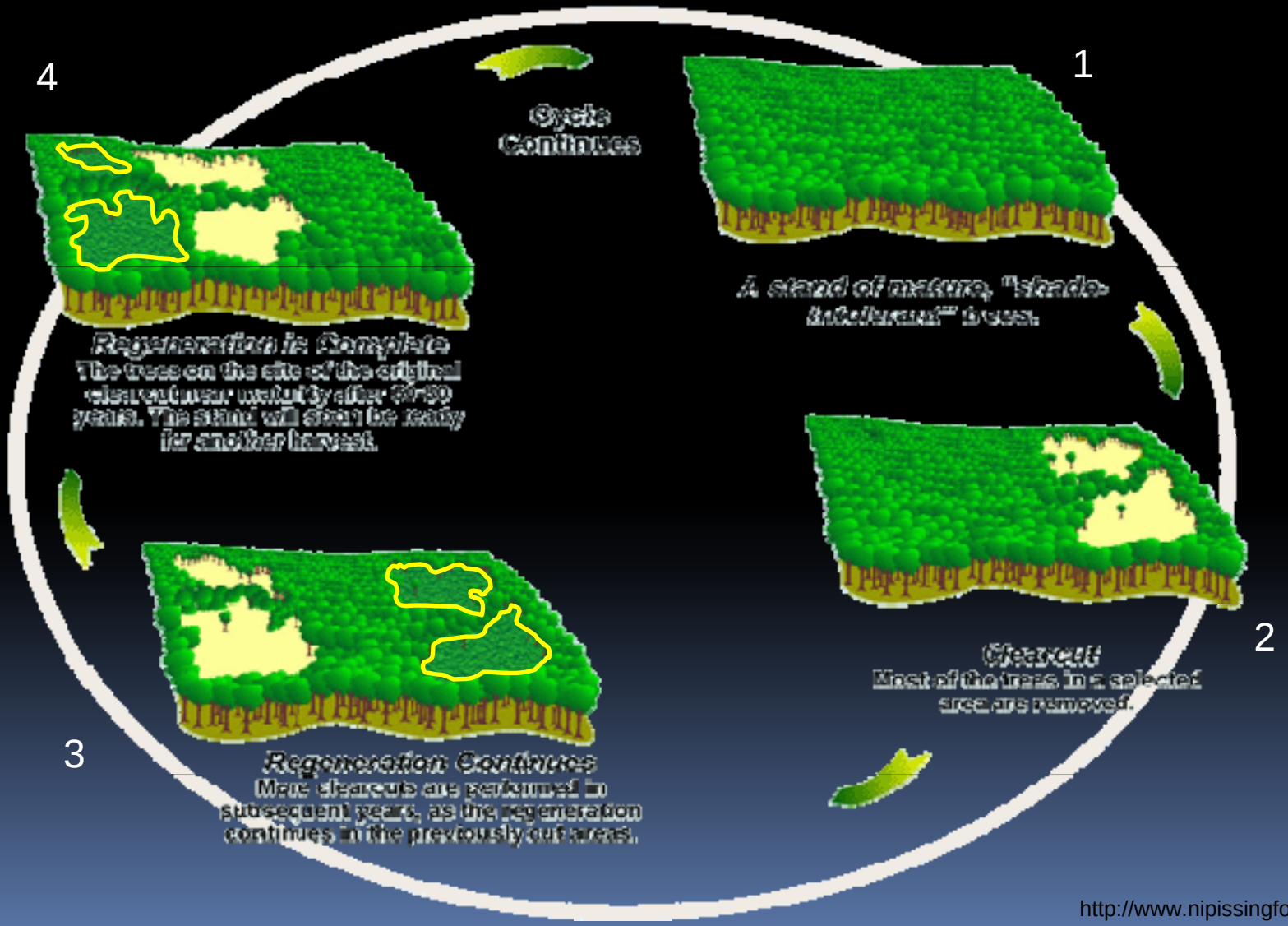


The Clearcut system…



http://www.nipissingforest.com

The Clearcut system…



http://www.nipissingforest.com

Clearcut method…

Hardwood and pine forests

Increased browse 1 – 5 years

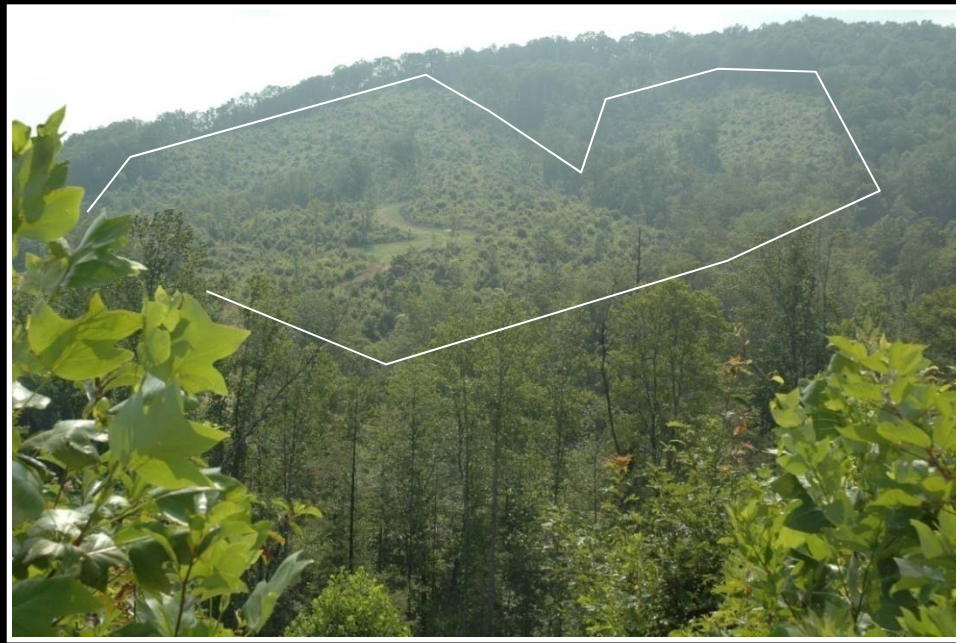
~ 1,000 lbs / acre

Increased soft mast 2 – 5 years

Decrease in hard mast

High stem density / escape cover

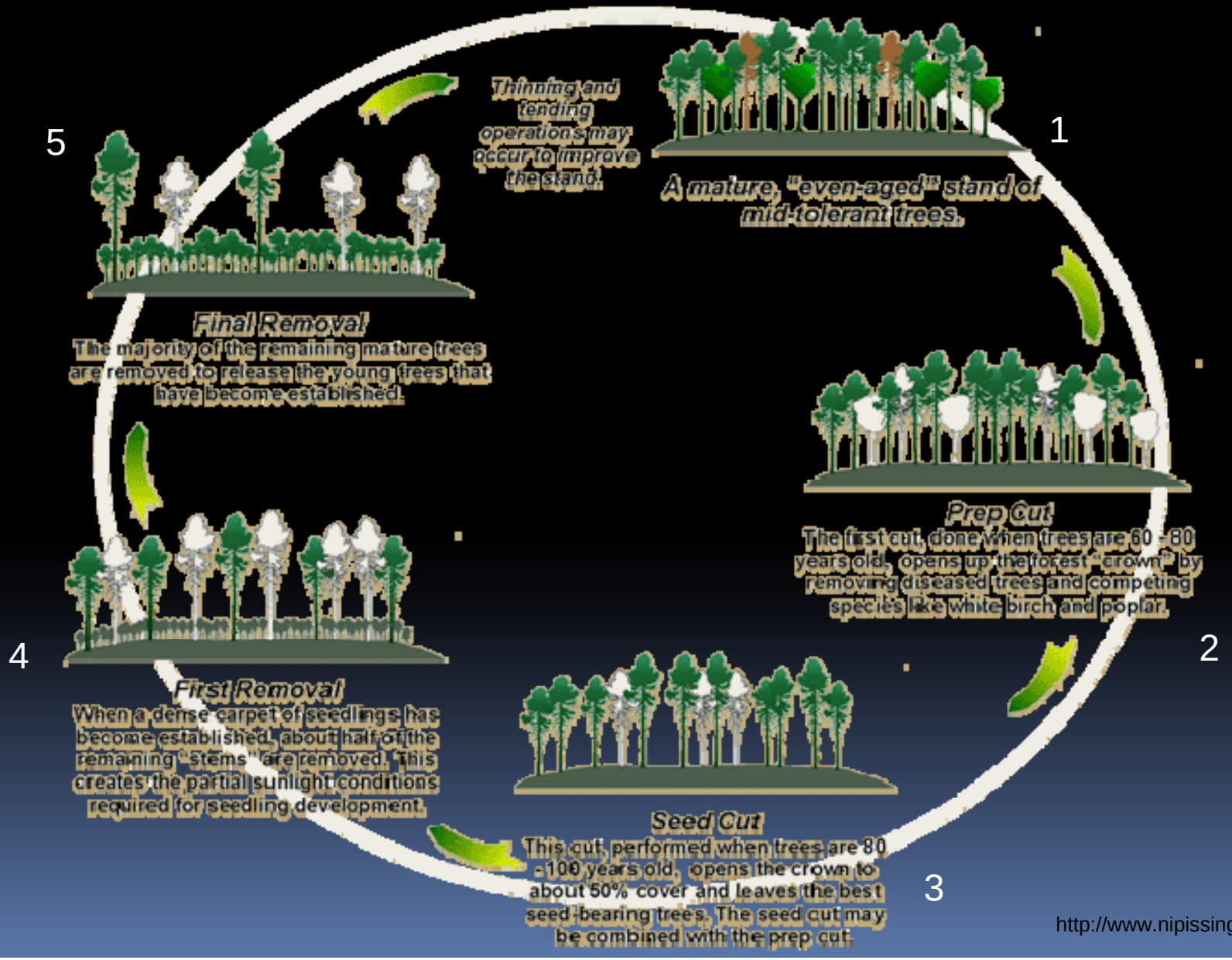
10 – 25-acre cuts recommended



1-year-old clearcut

20-year-old clearcut

The Shelterwood system…



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Shelterwood method…

Hardwood forests (primarily)

Increased browse 1 – 5 years

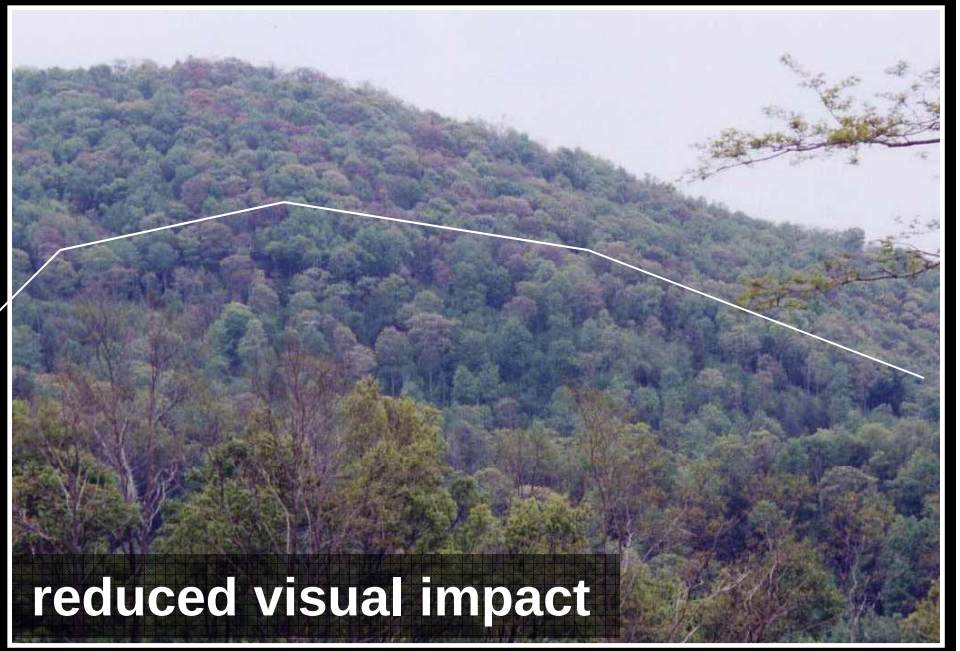
- on avg, similar to clearcut

Increased soft mast 2 – 5 years

Hard mast retained 6 – 8 years

- according to spp and ba

High stem density / escape cover


reduced visual impact


2-year-old shelterwood

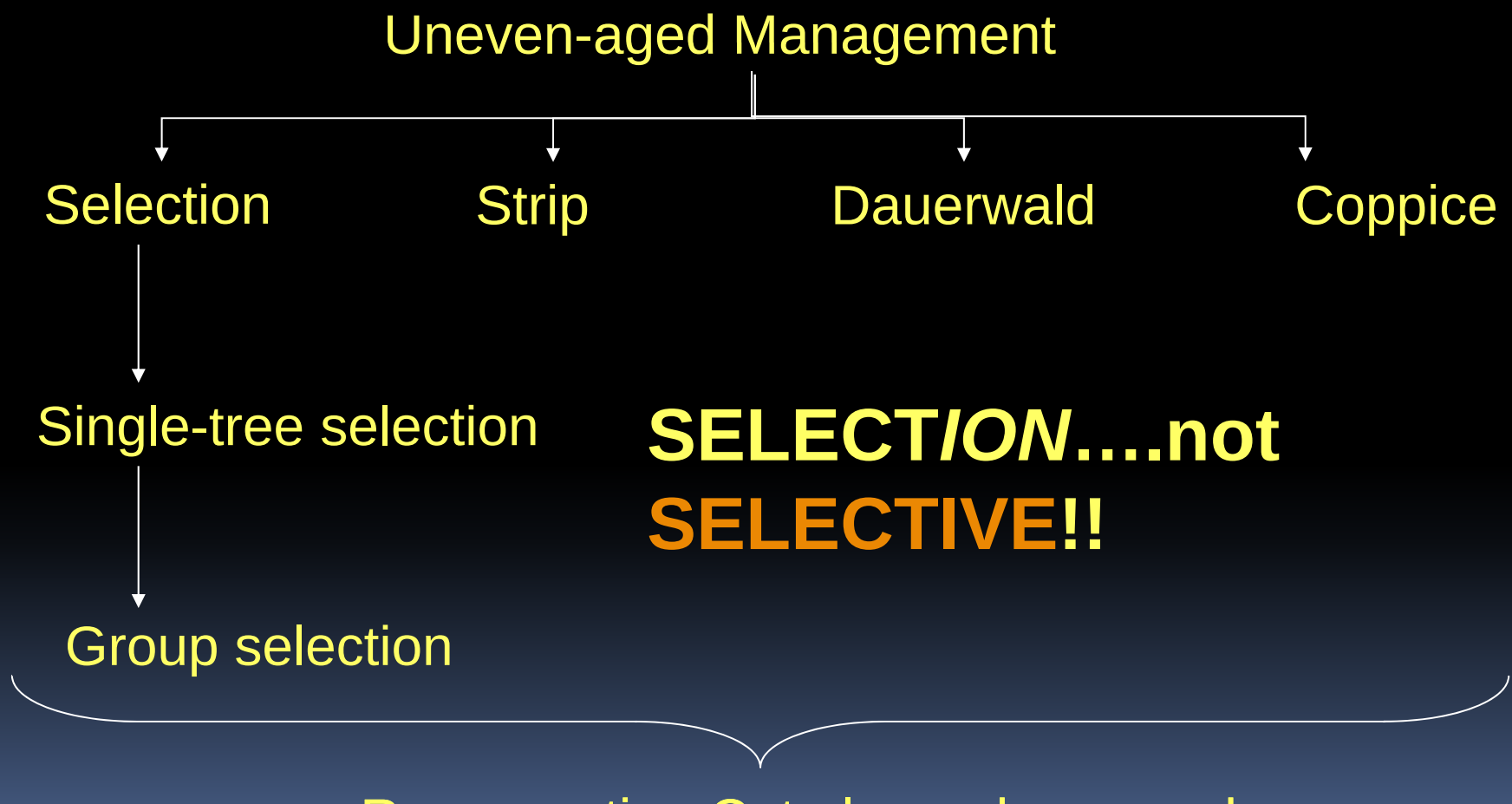

8-year-old shelterwood

2-aged management…

- Same characteristics as clearcut and shelterwood
- Retain *quality* mast producers
- "Overwood" retained longer
- Best to retain ≥ 40 years
- Provides food *with* cover
- 10 – 25 acres recommended

8-year-old shelterwood with reserves

Even-aged Vs. Uneven-aged



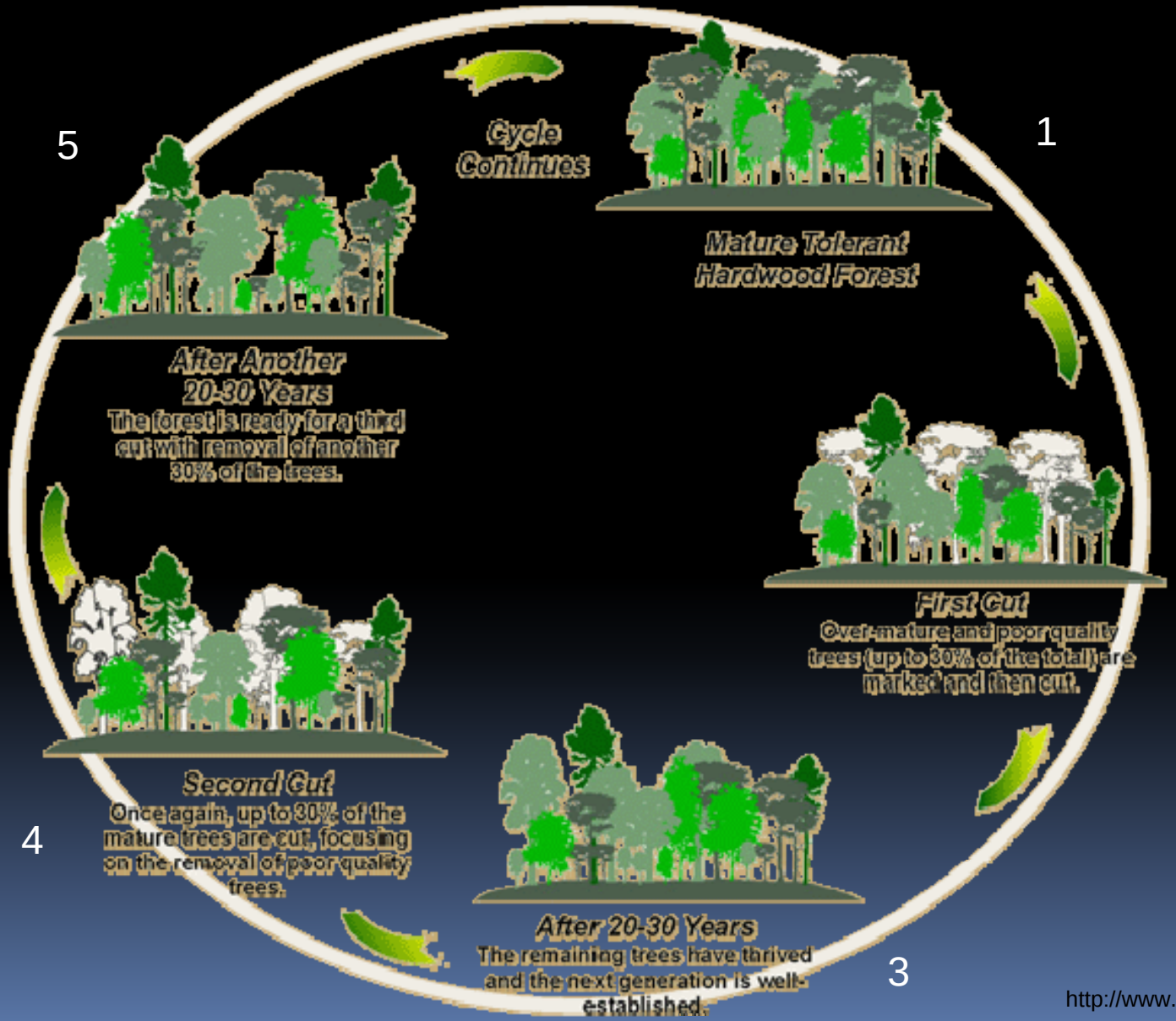
What about “select” cuts?

Do you want to ruin your forest?

Avoid *diameter-limit harvests*!

- **preferred species decline**
- **genetically superior trees removed**
- **mast production may be eliminated**
- **little hope for stand improvement**

The Selection system…



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Timber Stand Improvement (TSI)

Thinning —cuttings to decrease stand density

Release operation —regulate composition of young stands

Improvement cutting —improve older stands

Prescribed fire —to control fuel, structure, & composition

Influence composition

- release favored species
- kill undesirable species

Influence structure

- stimulate understory
- increase available nutrition

retention cut for wildlife

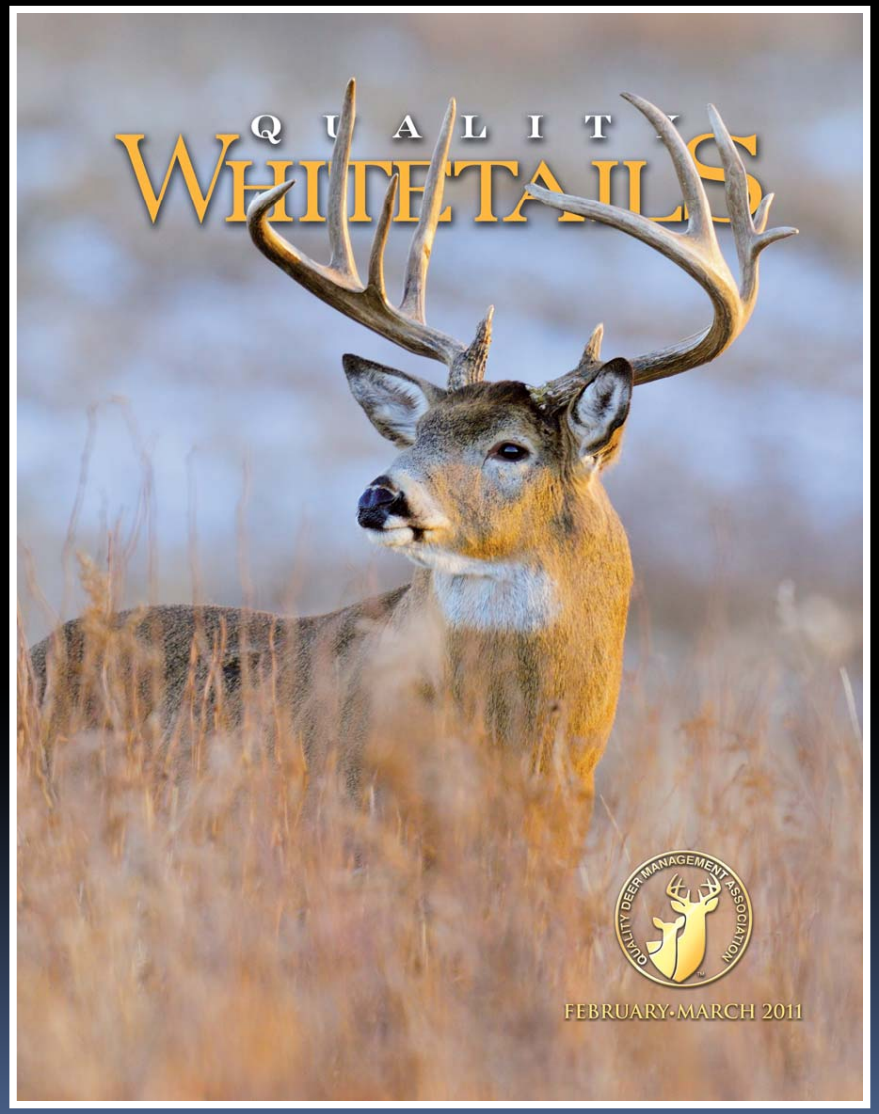
Timber Stand Improvement (TSI)

Retention Cut for Wildlife (aka Crop Tree Release)

- **Cut-and-fell**
- **Girdle-and-spray**
- **Hack-and-squirt**

- **<u>Reduce canopy cover to ~ 60%</u>**
- **Release favored crowns**
- **Stimulate understory**

25% Arsenal AC OR 50% Garlon-4



TSI Article – QDMA Website

http://www.qdma.com/what-we-do/articles/certification-program-readings/what-is-tsi/

Home>Articles> Certification Page

Do your woods look like this?

They don’t have to!

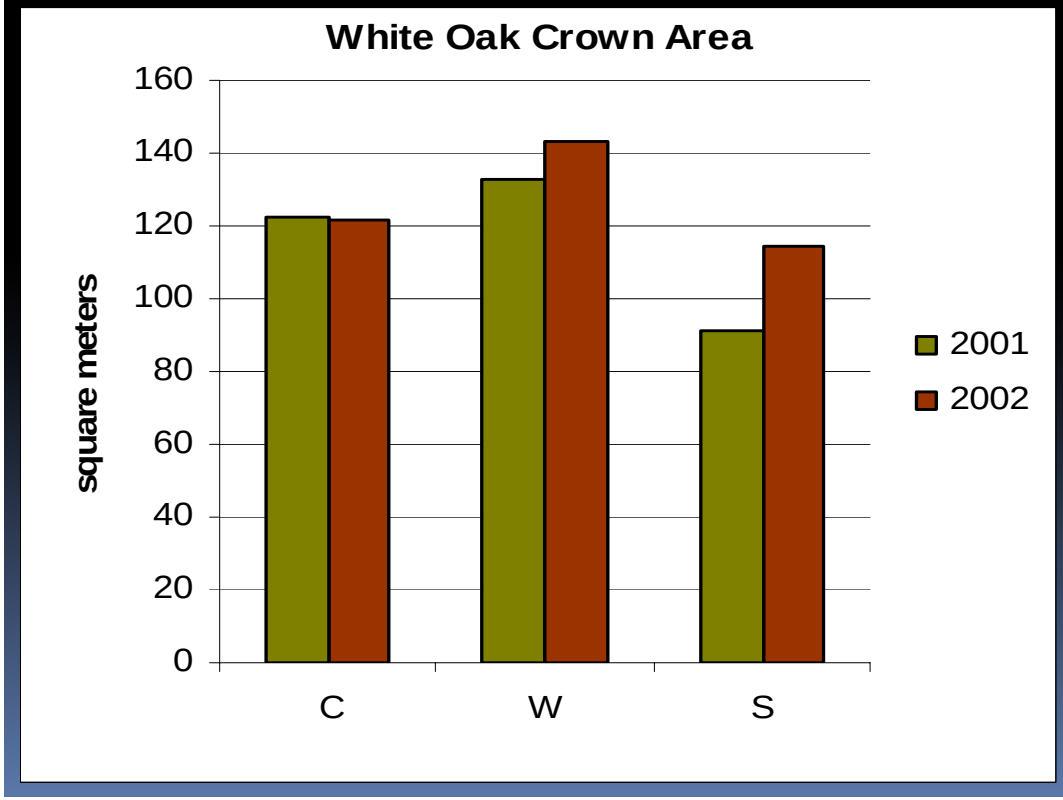
More mast potential

More sunlight = larger crowns

More mast potential

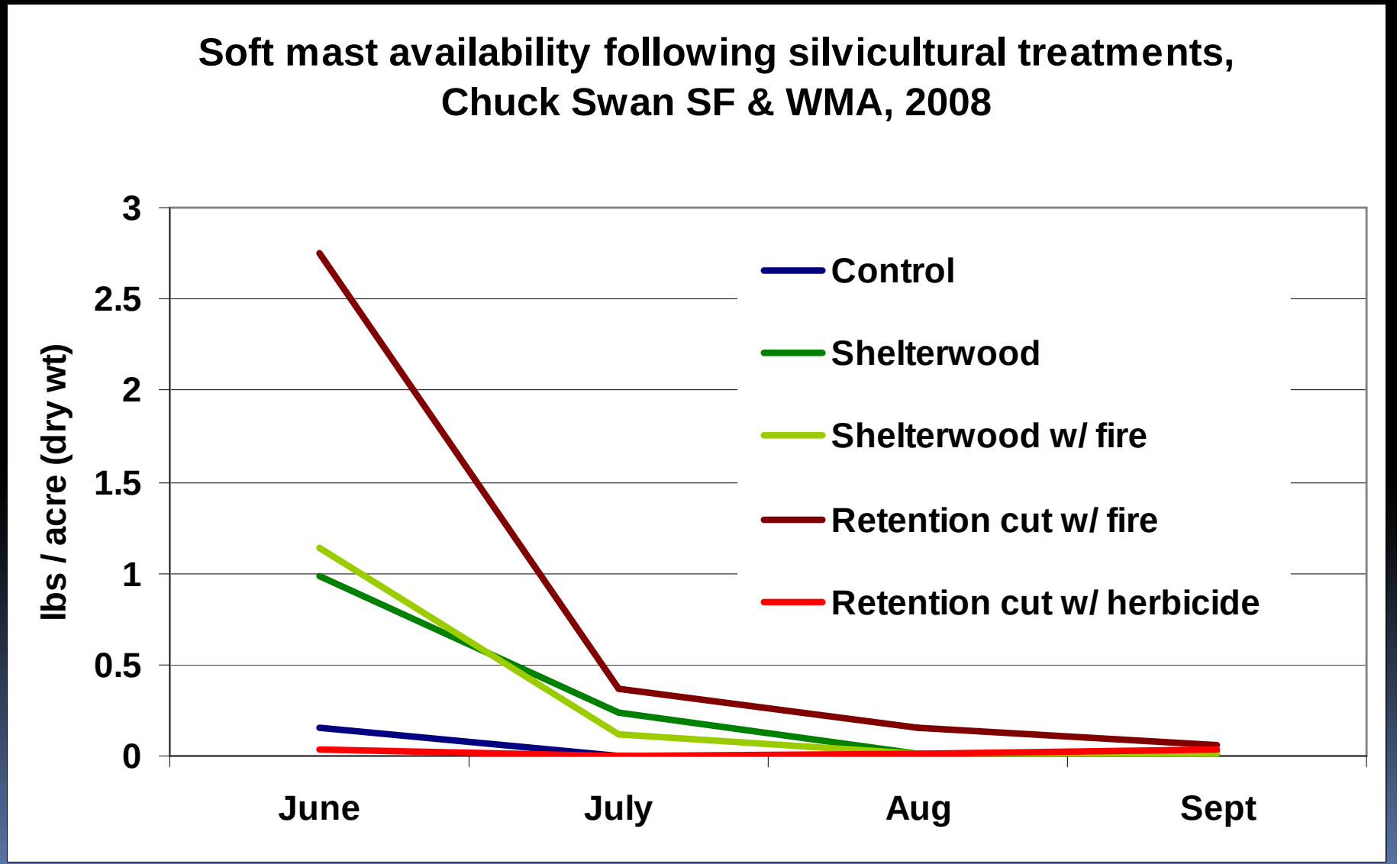
Larger crowns = more acorns

Fertilization ~~=~~ more acorns



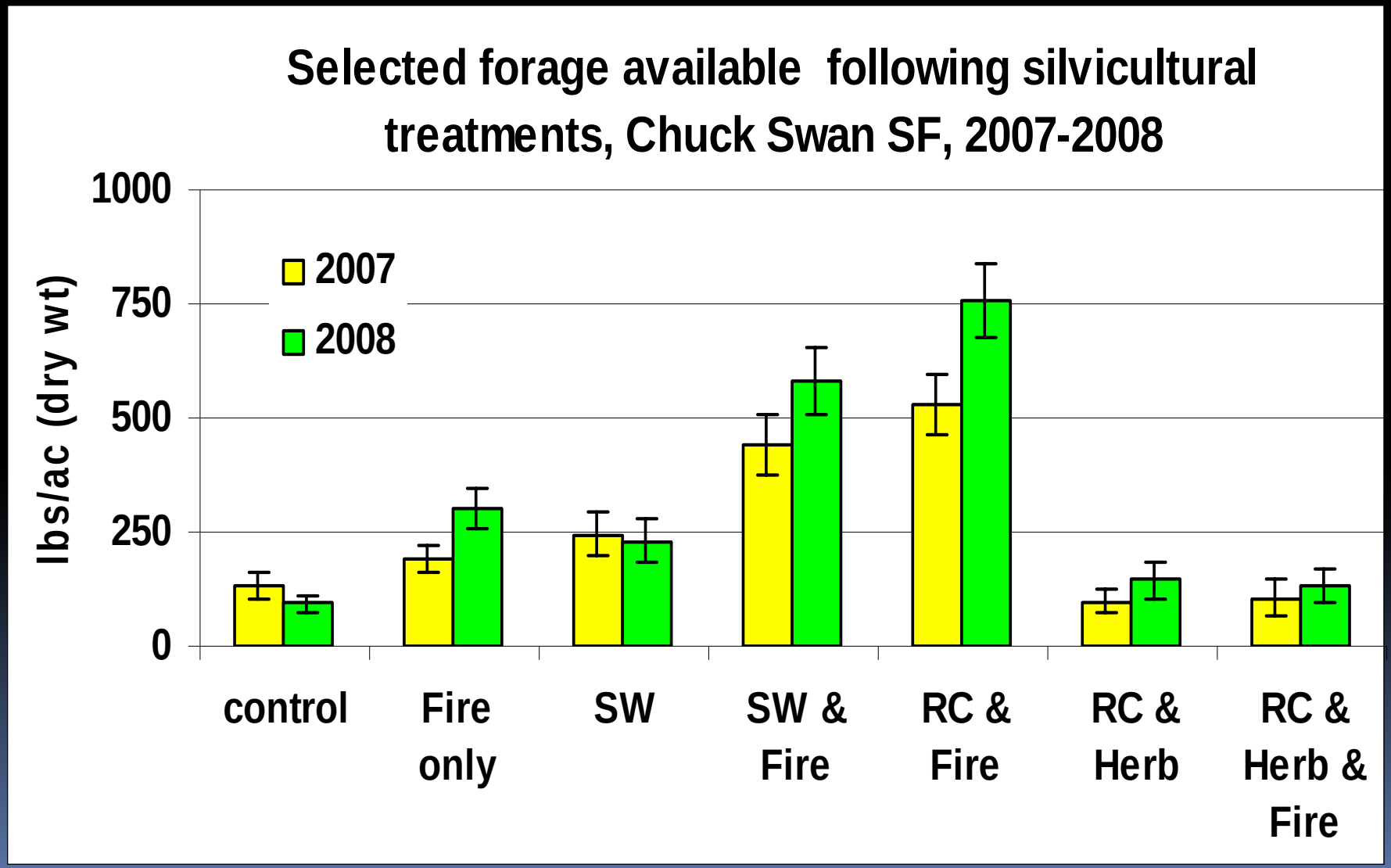
Increased soft mast

This data courtesy of Dr. Craig Harper



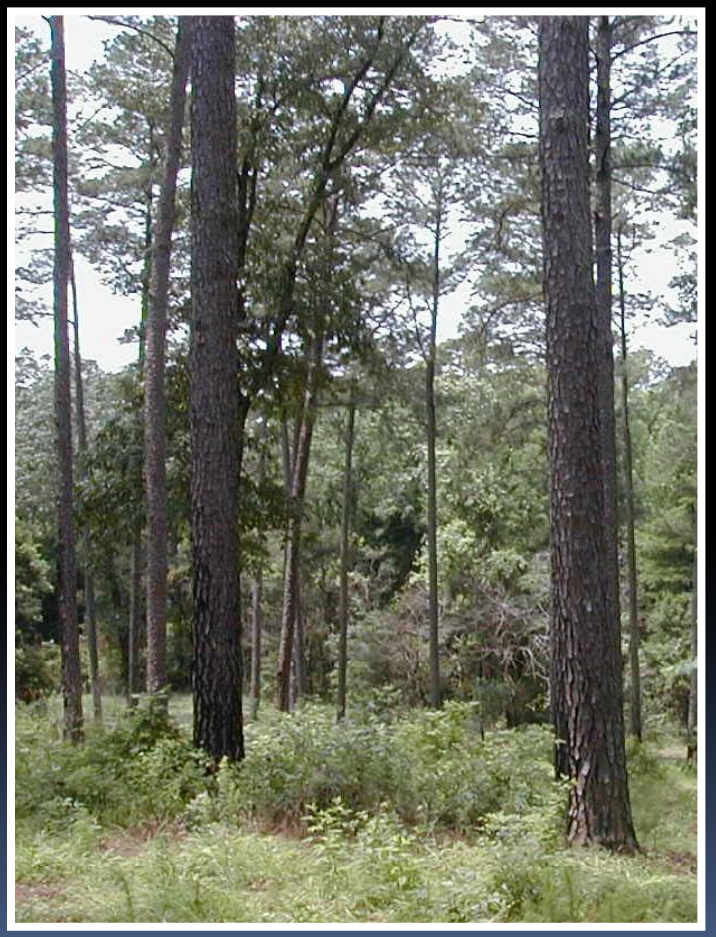
Increase forage availability

This data courtesy of Dr. Craig Harper



Pine Stand Management - Establishment of New Stands

- Must be planned before harvest
- **Natural Regeneration**:
  - Shelterwood (leave 20-40 trees per acre)
  - Seed tree (leave 6-10 trees per acre)
  - Rely on natural seeding
  - Limited control over stocking/spacing
  - Often requires pre-commercial thinning



Pine Stand Management - Establishment of New Stands

- **Artificial Regeneration**:
  - Site Preparation (chemical, mechanical, combination, fire)
  - Tree planting or direct seeding (species selection)

Pine Stand Management - Artificial or Natural Regeneration…Which is Best?

- The ability to provide better genetics and control over spacing and stocking are advantages to artificial regeneration
- For the average forest landowner with small acreage, this is typically not a necessary practice
- North v South? Most desired timber species ($) regenerate naturally and are either shade tolerant or intermediate (except white pine)

Advanced Regeneration

When thinning hardwood or pine stands, keep your eyes open to what the forest “wants” to grow and/or for opportunities to help it realize its future

Note the abundant white pine seedlings that could be released to improve year-round, ground-level cover, and will be your next stand

Advanced Regeneration

Young softwoods provide ideal cover in otherwise open stands

Cut poor-quality hardwoods to release this entire group of young pines

Look for opportunities to remove over-topping trees to encourage small softwoods to grow into the stand

Mid-rotation Pine Stand Management- Thinning

- Thinning Benefits
  - $ sooner
  - Anticipate mortality
  - Improve habitat
  - Leave best performers
- What is the correct thinning intensity
  - Rules of thumb-BA
  - Rules of thumb-sunlight

Managing pine stands for wildlife

Thinning and herbicides

Pre-commercial thinning

- thin to <300 trees / acre

Commercial thinning (12 – 20 yrs)

- thin to ~ 70 sq ft / ac

Kill undesirable hardwood stems

- imazapyr (Arsenal / Chopper)

Managing pine stands for wildlife

Managing pine stands for wildlife

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Managing pine stands for wildlife

Managing to sawtimber

Maintain ba ~ 60 – 80 sq ft / ac

- **deer/wild turkey/forest songbirds**
- **burn on 3 – 4-yr rotation**

Maintain ba ~ 40 – 50 sq ft / ac

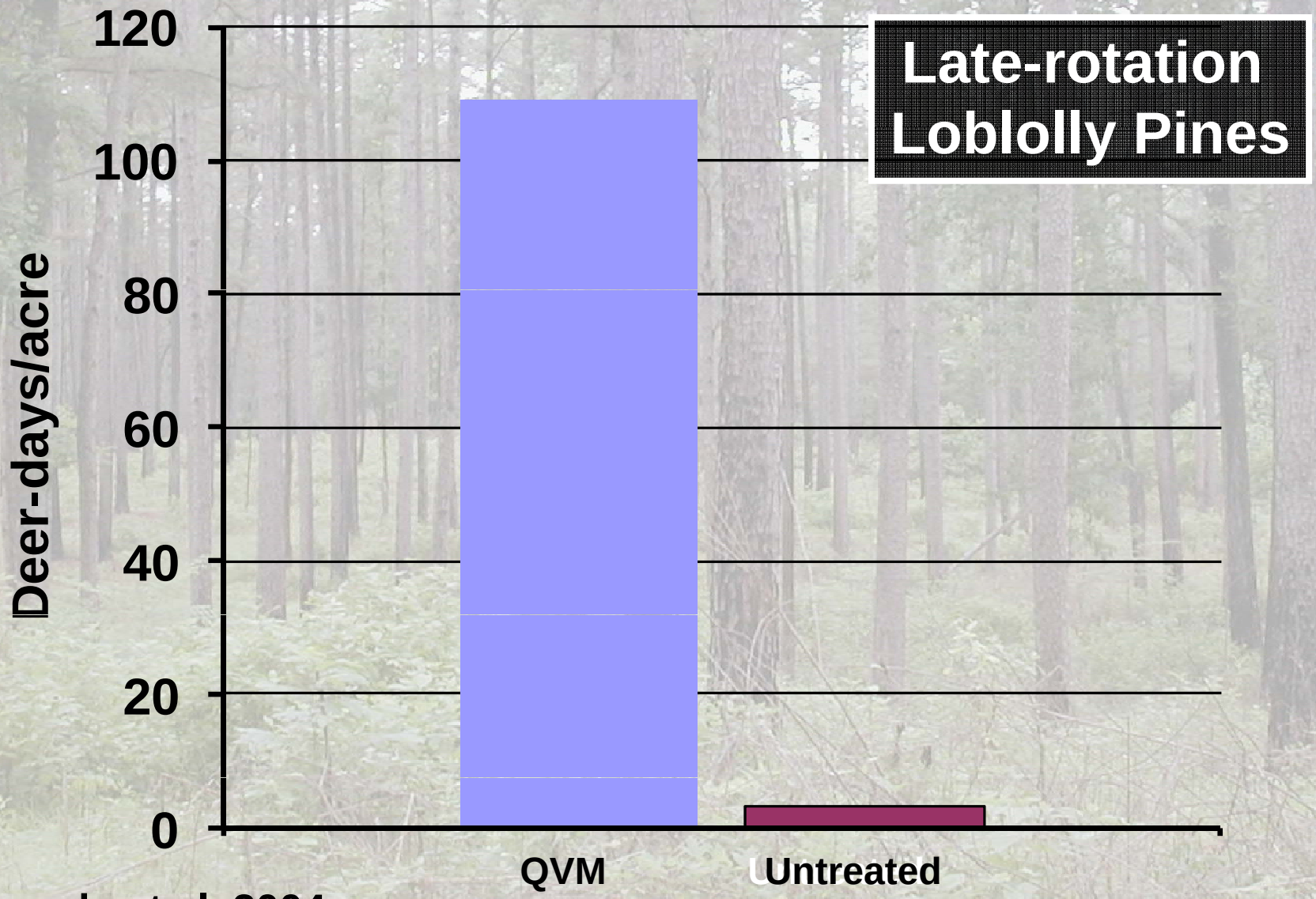
- **bobwhite / scrub-shrub birds**
- **burn on 2 – 4-yr rotation**

Herbicides to control woody spp.

- **imazapyr (Arsenal / Chopper)**

Nutritional Carrying Capacity

Number of days 1 deer can be supported on 1 acre



Edwards et al. 2004

Hardwood Management

- Can serve an aesthetic purpose
- If deer is priority, hard mast should be a priority
- Important to remember, if it's not producing mast there are still benefits from coppice and root sprouts from some hardwoods

Hardwood Management

- Decision Criteria
  - Do you have proper stocking of crop trees to release them (desirable species, codominants, 70-80 BA of crop trees)?
  - If so, crop tree release
  - If not, then plan for regeneration or conversion to other types

Hardwood Management

- Uneven-aged Management
  - Single-tree selection
  - Group Selection: ½ -2 acre openings
  - Oaks are shade intermediate, needs lots of sunlight for regeneration

Hardwood Management

- Even-aged Management
  - Clearcut (up to BA= 5-20 sq. ft. left)
  - Patch/strip clearcut (2-10 acres)
  - Seed tree (6-12 tpa)
  - Shelterwood (BA=20-30 sq. ft. left)

“How do I mark my stand”?

LOOK UP, NOT DOWN!

- retain favorable species
- retain trees with good form
- retain trees with good crowns

Money is *NOT* the object!

“How do I burn my woods?”

With care!

With low intensity!

With experienced help

Prepare written plan

Obtain burning permit

Contact local fire dept

Only under correct conditions

Only with adequate firebreak

When and how often?

Growing-season fire

- September – October
- reduces woody understory
- stimulates herbaceous cover
- best adapted to drier sites
- every 3 – 5 years

Dormant-season fire

- reduces litter
- stimulates woody sprouting
- dry or relatively moist sites
- every 3 – 4 years

“Won’t I kill my trees?”

Fire may damage hardwoods

Fire may damage pines also!

Low intensity is key!

Don’t burn to mineral soil

Burn with moist duff layer

Move debris from around trunk

Special Considerations

- Early Successional Habitat Areas
  - Areas dedicated to maximum native forage production.
  - Often not stocked with trees; allows for use of all chemical and mechanical treatment tools

Special Considerations

- Deer Wintering Areas (DWA's)

  Deer in northern regions require areas of dense softwood cover during the winter

Managing Winter Cover for Deer

Specifically, they require stands of:

- Hemlock
- Cedar
- Spruce/fir
- Pine

In general:

- hemlock and cedar provide better cover than spruce & fir
- spruce & fir provide better cover than pines

Managing Winter Cover for Deer

Northern deer require softwood stands that have:

- trees that are at least 35 feet tall
- softwood crown-closure of at least 65-70%...

…means that when you're in the stand and look up, at least 65% of the sky will be blocked by live softwood branches

Managing Winter Cover for Deer

Softwood stands greater than 10 acres in size are especially important as winter cover because they provide the best protection from wind and cold temperatures

- often referred to as deer “wintering areas” or “deer yards”
- high quality wintering areas will be used by deer for decades

However:

Softwood stands as small as an acre or less are often used by deer during the winter for cover

Managing Winter Cover for Deer

When managing winter cover for deer your two main goals are to:

- maintain or increase the amount of dense softwoods on your property
- improve food availability immediately adjacent to winter cover

This stand is too open and the crowns are too thin to provide good winter cover

A new browse opening immediately adjacent to good winter cover

Managing Winter Cover for Deer - Maintaining Softwood Cover

On small-acreage properties:

removal of any softwoods from a wintering area generally results in at least a temporary loss of winter cover …

Crown-closure in this pine stand is already low, removal of any trees will further reduce this stand's ability to provide adequate winter cover for deer

Managing Winter Cover for Deer - Maintaining Softwood Cover

Instead of cutting softwoods I try to remove poor-quality hardwoods from within and along the edges of a wintering area to:

- increase softwood cover in the stand (softwoods often grow into the small openings you create)

- improve food availability to deer (stump sprouts)

Removal of hardwoods results in little or no loss of thermal cover in the winter

Managing Winter Cover for Deer - Maintaining Softwood Cover

Remove hardwoods as single trees or in small groups (2-5 trees) adjacent to mature softwoods to encourage softwood regeneration…

•ideally, softwoods will seed into the openings and eventually grow into the gaps you create

•exposing the mineral soils with logging equipment (removing the leaf layer) will further encourage good softwood regeneration

To encourage softwoods (rather than hardwoods) in your openings:

- •Openings to regenerate spruce/fir should be no larger than 20 to 40 feet in diameter
- •Openings to regenerate hemlocks should be no more than ½ the height of the surrounding dominant trees

Managing Winter Cover for Deer - Maintaining Softwood Cover

Usually, the most successful way to increase softwood cover is to…

Remove small groups of hardwoods that are over-topping pockets of softwood regeneration

Managing Winter Cover for Deer – Improving Food Availability

Create browse openings immediately adjacent to softwood cover

Make your openings so all browse is within 200 feet of softwood cover

Means deer won't have to travel far from cover to get food

Managing Winter Cover for Deer – Improving Food Availability

Whenever possible:

Remove competing hardwoods rather than softwoods to release oaks in a wintering area

Release oaks within and immediately adjacent to deer wintering areas to provide acorns within or close to the wintering area

Special Considerations

Locate log decks
on potentially good sites for food plots

Special Considerations

Convert log decks to food plots in a variety of soil types to allow a diversity of cultivars across the property

Special Considerations

Log decks can be cleared for food plots with “arms” extending into thinned pines

Special Considerations

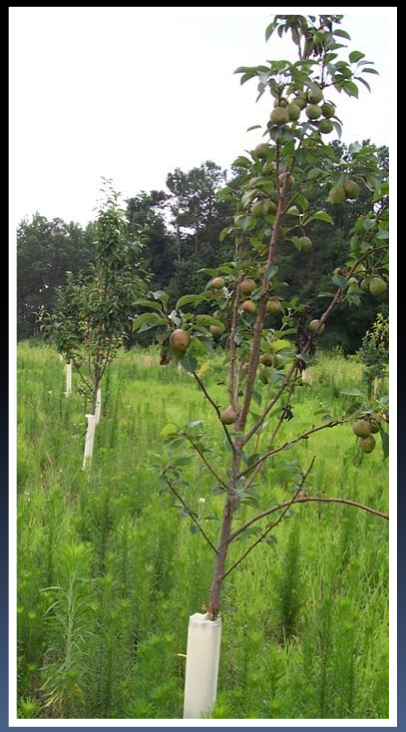
Create food plots along roads in conjunction with timber harvest operations

Special Considerations

Establishment of long,
linear wildlife openings
following a 5th-row pine thinning

Special Considerations

Plant soft and hard mast trees in log decks, food plots, along roads and in other openings



The End

Special thanks to Dr. Craig Harper at UT (for photos and data)

Quality Deer Management Association

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