So You Want To Grow Some Oak On Your Property: A Few Low –Tech Options.

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ACKNOWLEDGEMENTS

- Very few of the ideas and techniques I'll present today are new and solely mine.
- Rather, they are a compilation of what I've learned through my career from a long list of practicing foresters, other forest landowners, and fellow forest scientists.
- I'm merely the messenger of an impressive cadre of experts, both lay and professional

OBJECTIVES

1. Highlight the values of oaks.

2. Review the basic silvics of oaks.

3. Present some ideas and techniques for enhancing and increasing oaks in private woodlots.

Why Grow Oak?

What movie?
Shawshank Redemption

Nationwide, there are about 80 species of oak

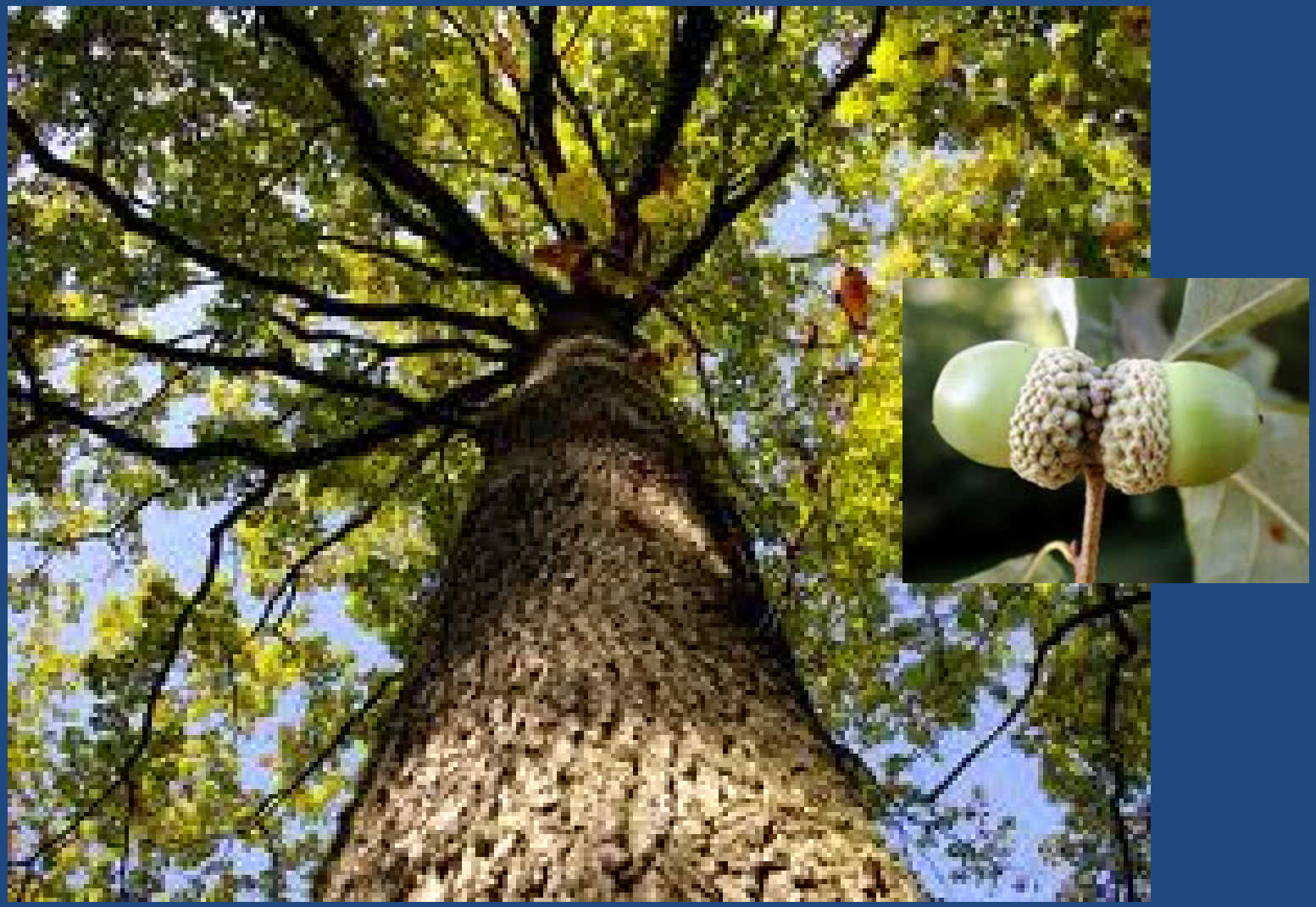
The Allure of Oak

- American society has a deep, long standing appreciation for the oaks.
- We're admire their size, strength, durability, and longevity.
- They, along with their principal associate species of chestnut and pine, have strong historical ties to the founding and growth of our nation.
- Oaks have been the subject of poetry, prose, and song.

The “Oak” is America’s National Tree according to the Arbor Day Foundation

Oak Products

TheWildlife Values of Oak



The Value of Acorns

- With the loss of the American chestnut, oaks are the primary source of hard mass.
- Beech has serious health challenges.
- Hickory and walnut are uncommon, relative to oak.

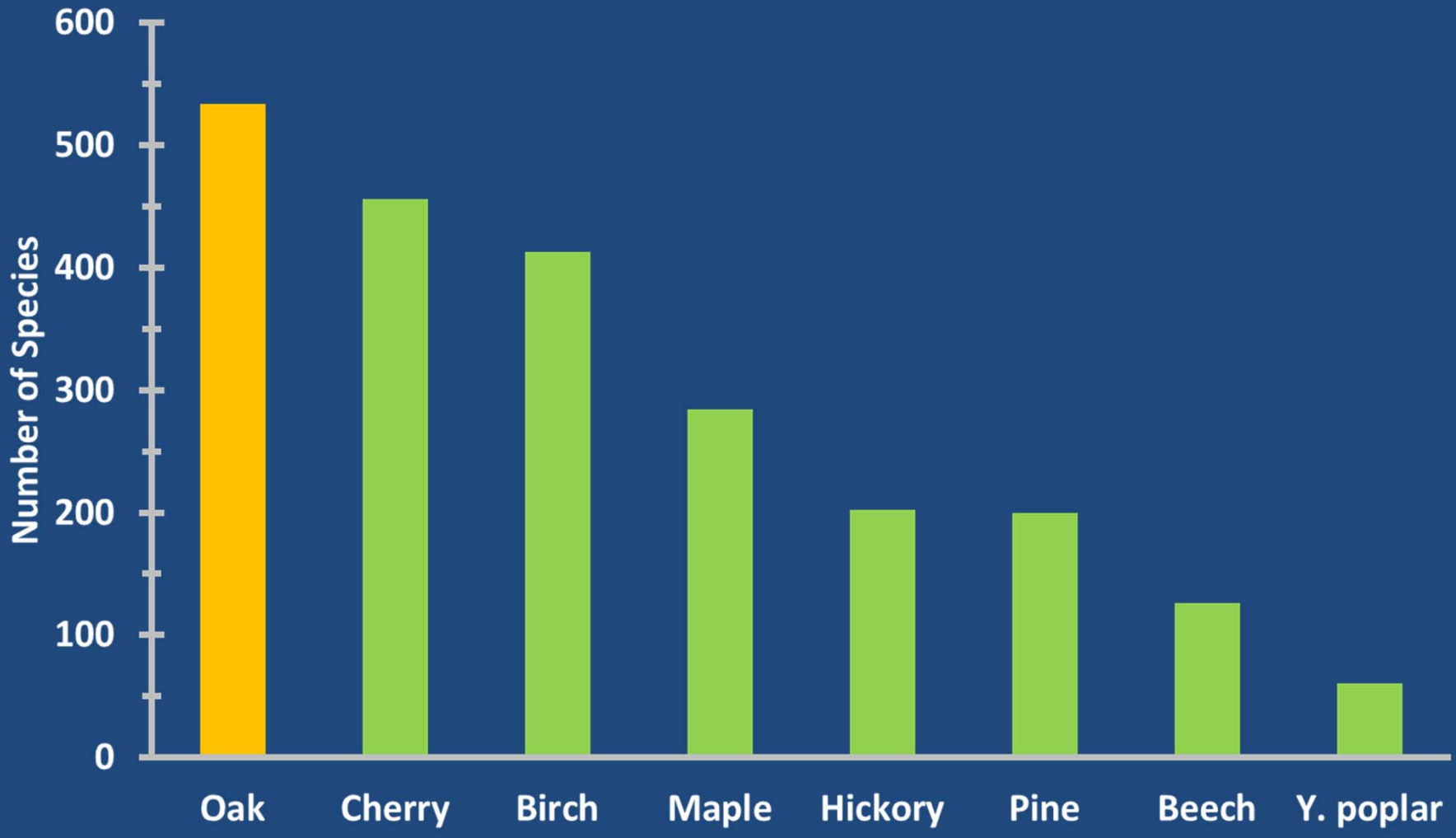
Acorns as Wildlife Food

Wildlife known to eat significant amounts of acorns:

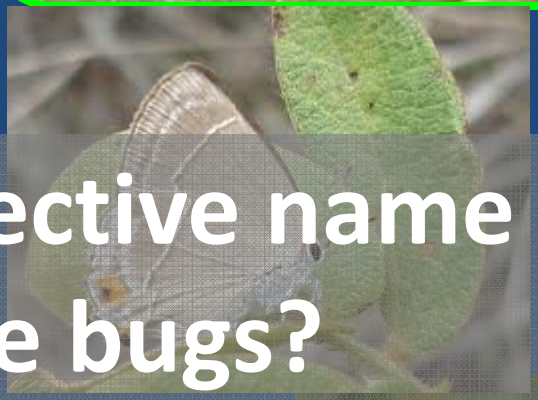
Oak Foliage

Native Butterfly/Moth Preference

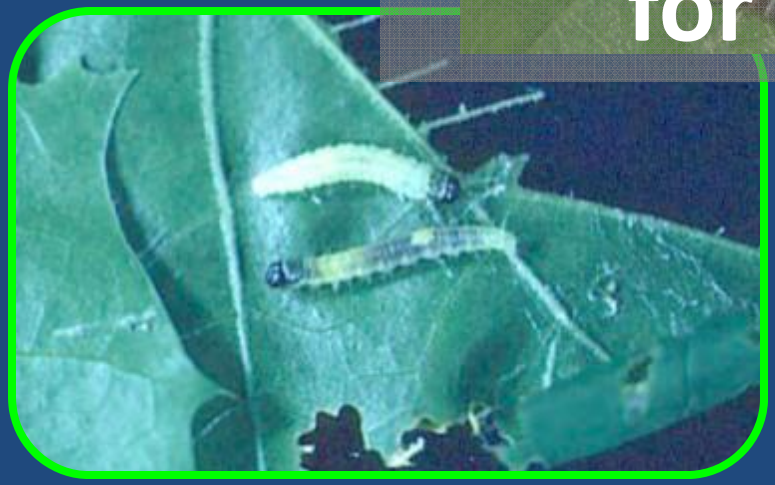
(Tallamy 2007)



Native insects that utilize oak leaves



What is the collective name for all these bugs?

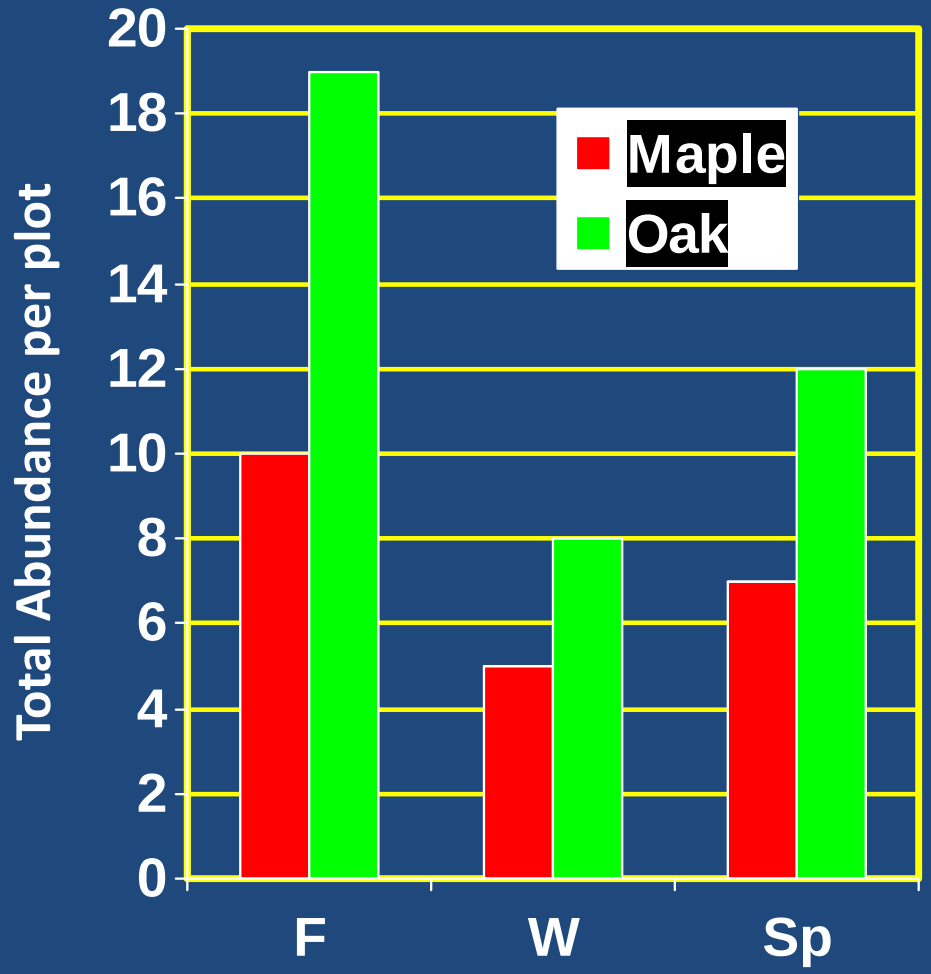


Bird Food !!!

Rough Bark > Smooth Bark

Value of Mature Oak Trees

Bird Diversity in Oak vs. Maple Forests



- Species richness higher in oak F,W,Sp
- More Spring migrants in oak
- More resident birds in oak
- 24 of 25 bird species more common in oak in all seasons

From: Rodewald & Abrams, 2002, *Forest Science* 48:267-272

The Value of Oak Leaves

- Experimentally created vernal pools w/ bottoms of oak, maple leaves
  - Litter provides almost all nutrients
- Compared growth rates of amphibian larvae raised in vernal pools

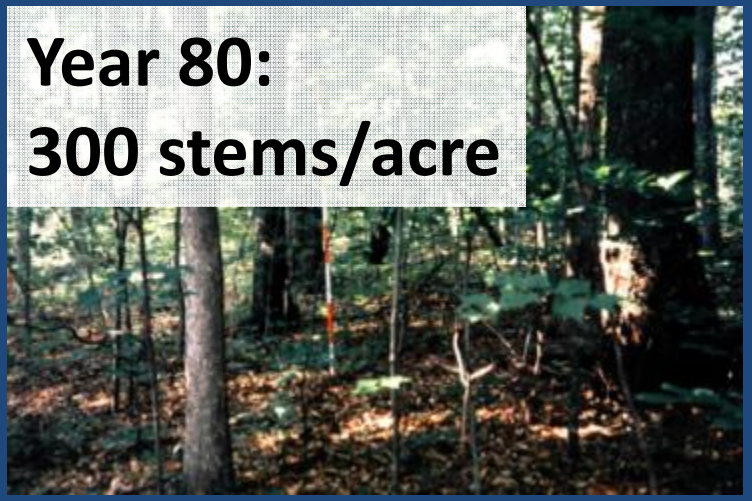
From Rubbo & Kiesecker, 2004, *Ecology* 85 (9).

Value of Decaying Oak Logs

Important Characteristics of Oak (Silvics)

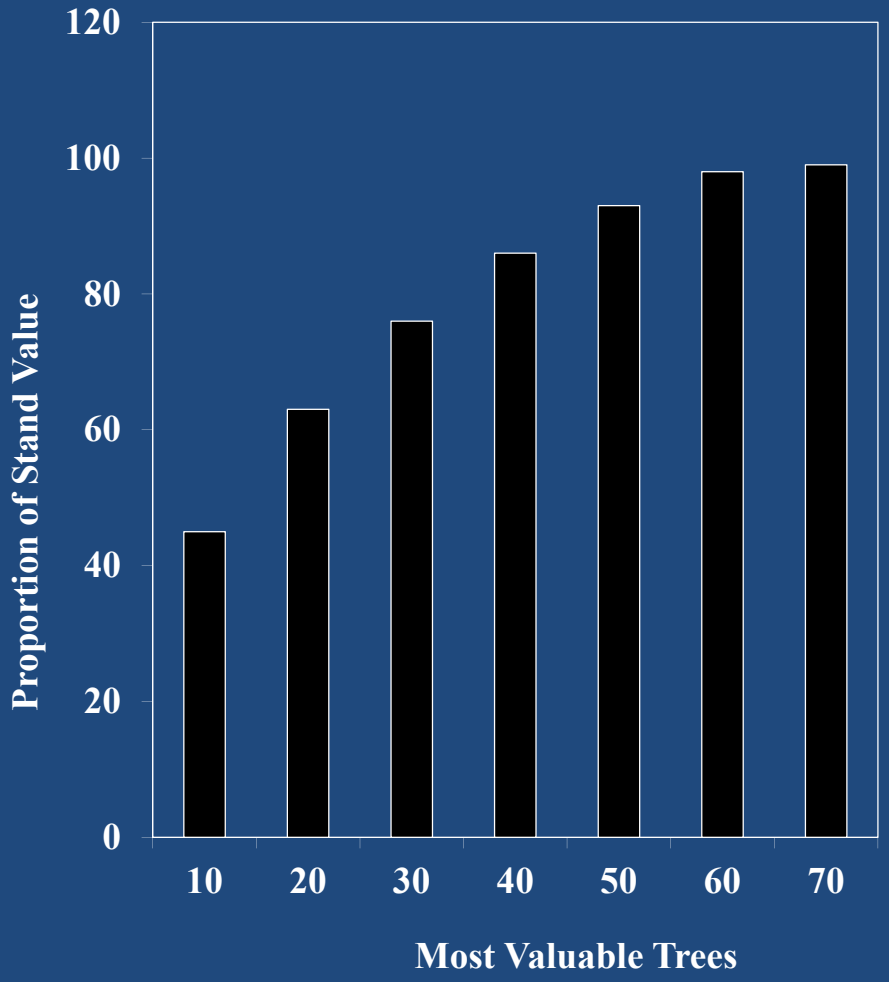
- Acorn production is sporadic.
- Buried acorns survive the best.
- Oak seedlings emphasize root development.
- Oaks do not like dense shade.
- Oaks can live for centuries.

Oak Stand Development



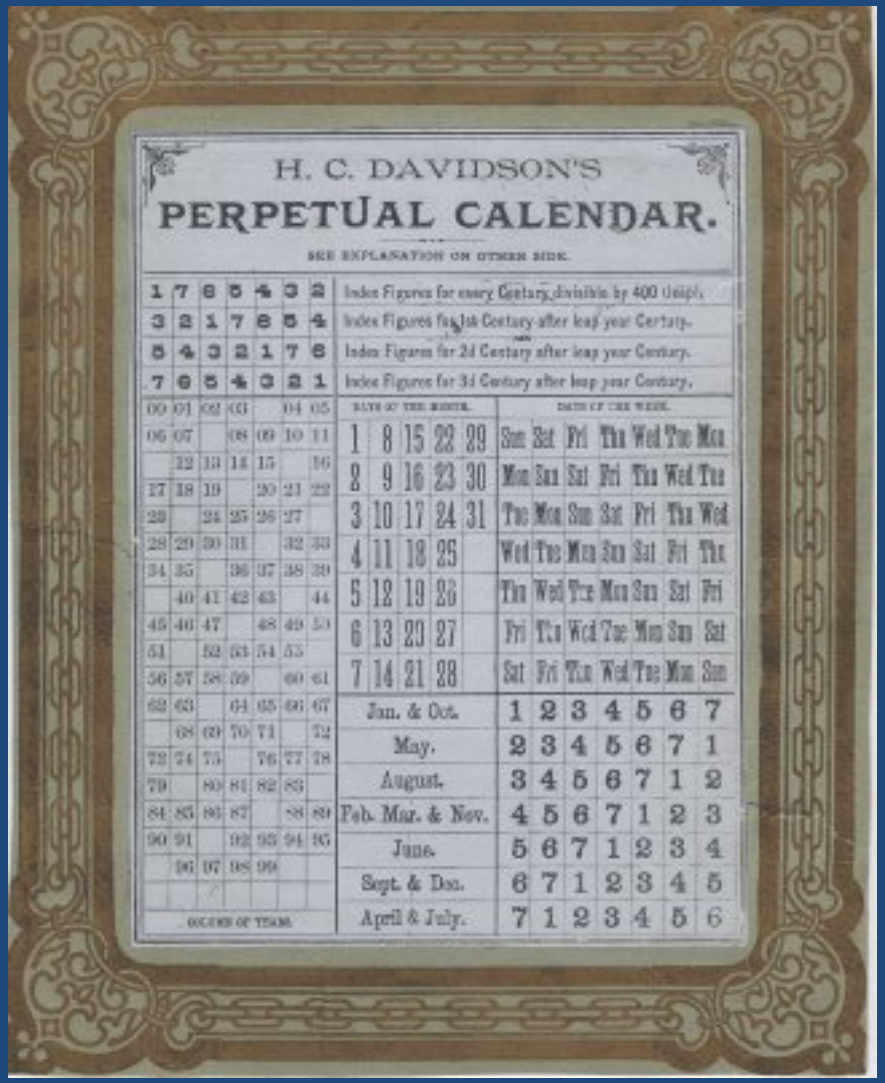
99% of the original stems will die by the time the stand is mature.

Of Those 300 Trees, How Many Are Commercially Valuable?



About 40 to 60 per acre (under best circumstances)

Other Important Points



- What is your personal timeline regarding the stand?
  - Own it for a few months or years as an investment.
  - Own and use it for the rest of your life (what is your life expectancy?)
  - Pass it on to family heirs.
- How much money and time do you have to devote to managing the oaks on your stand?
- How you answer these questions will strongly influence how you manage the stand.

Oaks in Private Woodlots

- Given that there are, at most, only 40 to 60 commercial trees per acre,
- Money and time are probably limiting factors in what you can do on your property, and
- The life spans of oaks are longer than the time you'll live or own the property.
- **THE WISEST MANAGEMENT APPROACH FOR MANY PRIVATE FOREST OWNERS IS TO *MANAGE INDIVIDUAL OAKS* RATHER THAN MANAGE THE PROPERTY ON AN AREA BASIS.**

Oaks in Private Woodlots

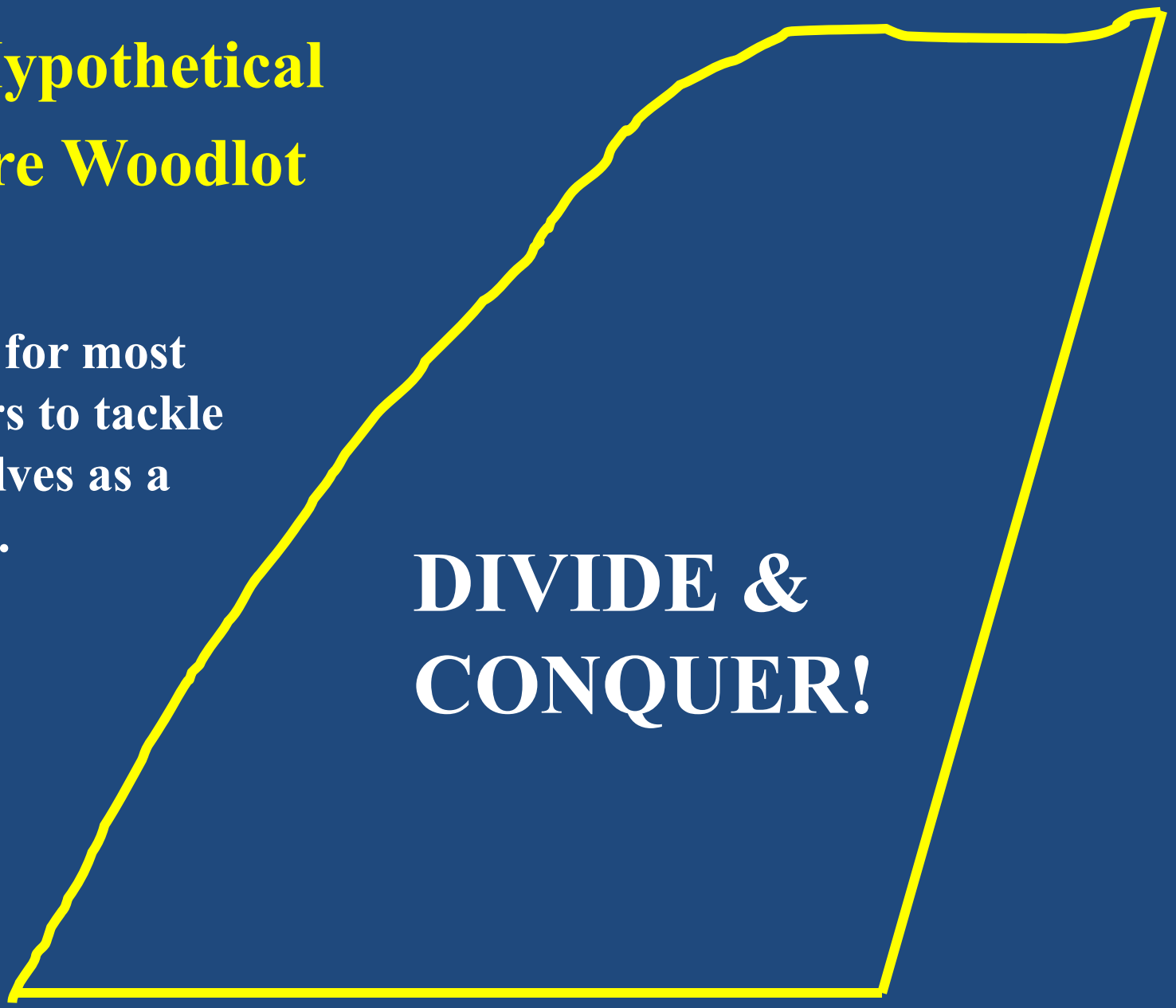
- For the rest of this presentation, I'll use a fictional stand.
- Your neighbor "Joe" has retired and is moving to Florida. He offers you the opportunity to buy his 20 acre woodlot.
- Joe is a common type of private forest owner. He knows little about trees and forestry. He managed his woodlot with benign neglect coupled with periodic abuse and exploitation.
- Once you purchase the woodlot, what do you do with it?

Oaks in Private Woodlots

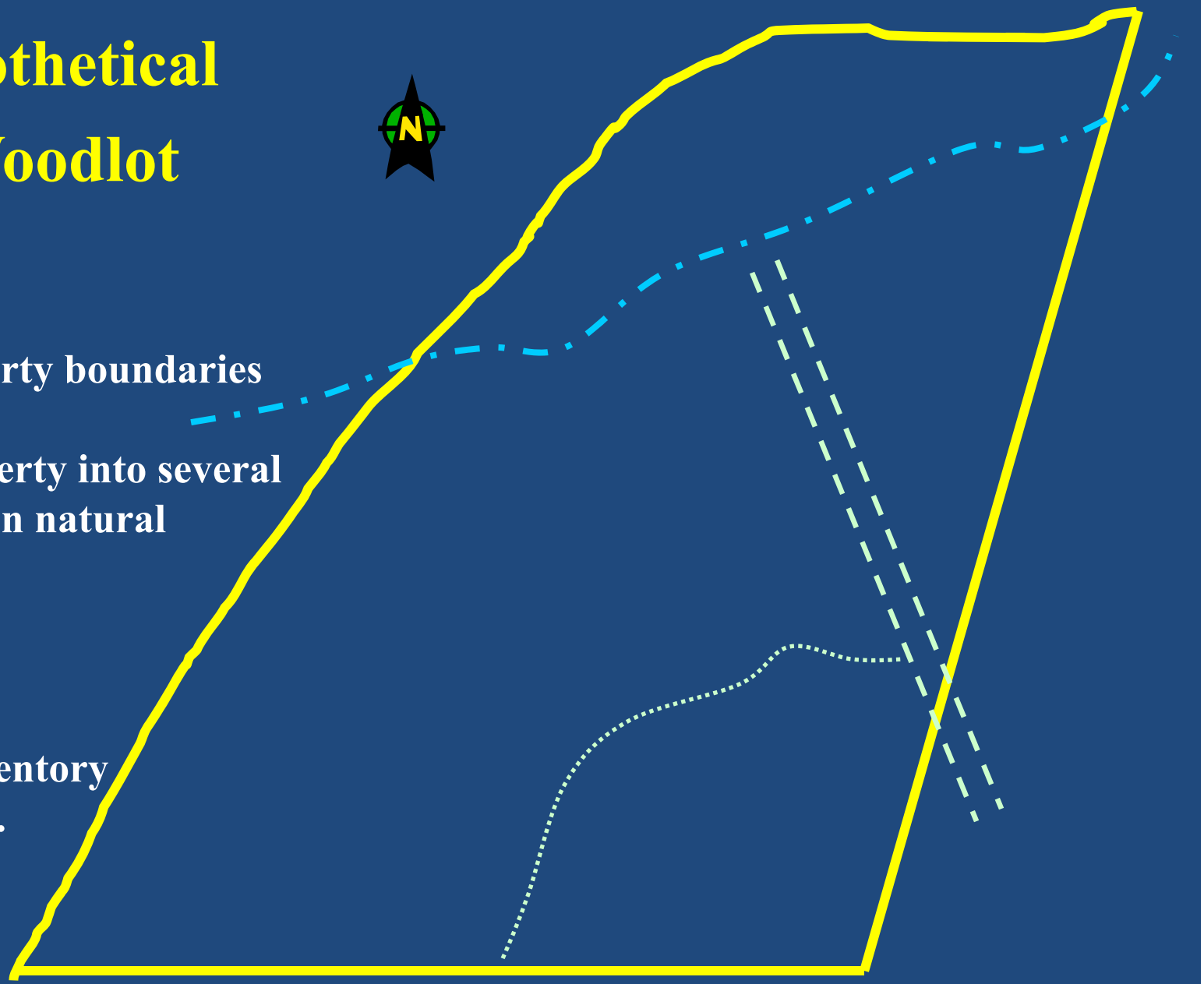
- Step #1 is to clearly establish the property boundaries.
- This may entail hiring a professional surveyor, especially if Joe's woodlot doesn't have clearly established boundaries.

Our Hypothetical 20-acre Woodlot

TOO BIG for most landowners to tackle by themselves as a single unit.



Our Hypothetical 20 acre Woodlot



Mark the property boundaries

Divide the property into several sections based on natural features.

Make a map.

Do a simple inventory for each section.

What Do I Look For? (The Good)

Find Existing Oaks

Goal

Locate those 40 to 60 oaks /other trees per acre that are merchantable

or

will be marketable in the future

or

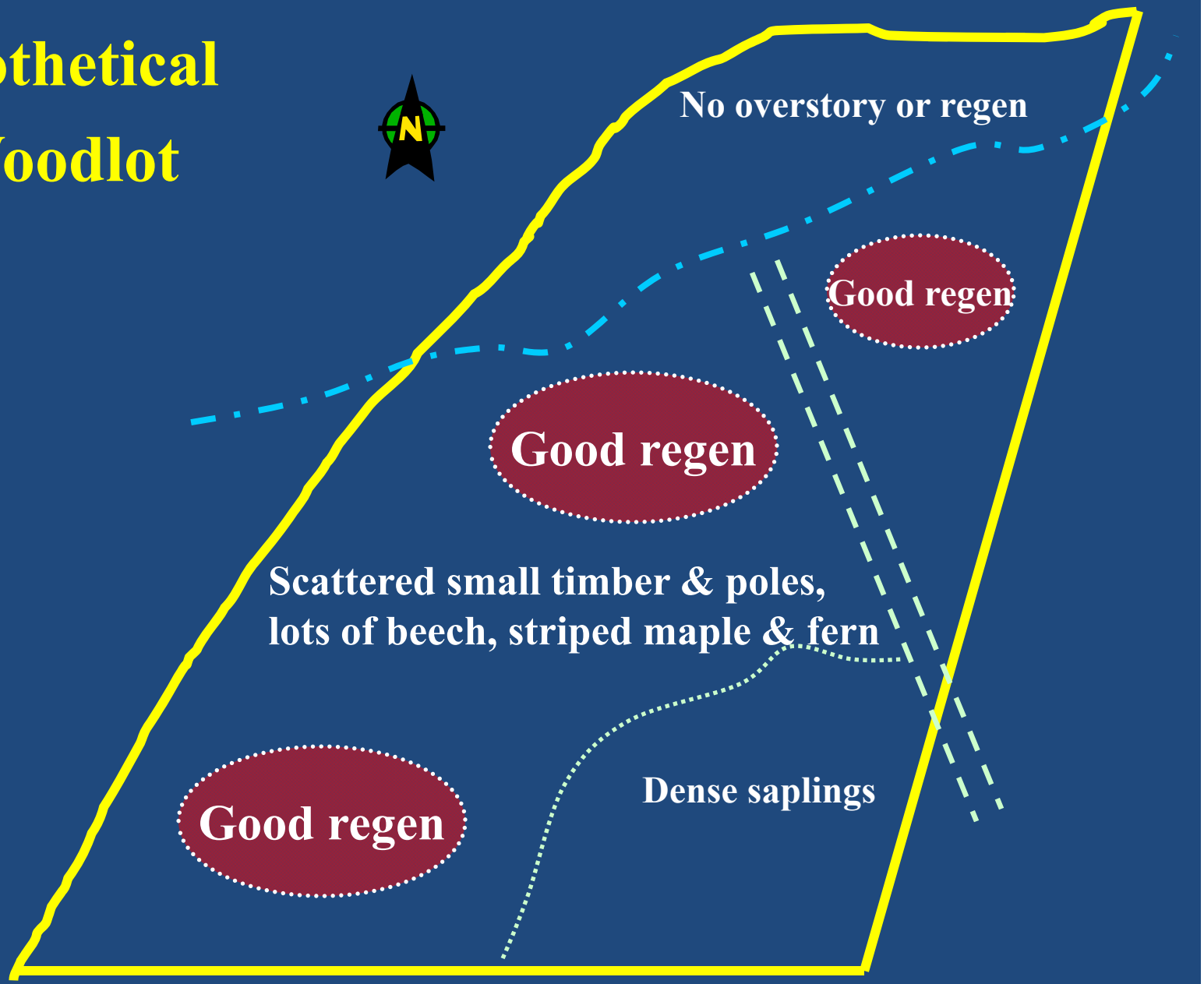
will be the source of future marketable stems.

Find Existing Oaks

- Systematically scout each part of your woodlot for oaks that are sapling size or larger.
- In stands with few oaks, this is best done in mid autumn when leaves are off most trees but still on the oaks.
- In oak-dominated stands, time of year is less critical.
- Mark the key oaks with flagging or paint.

What Do I Look For? (The Bad)

Our Hypothetical 20 acre Woodlot



A dense sapling stand that is ready for *Crop Tree Management*

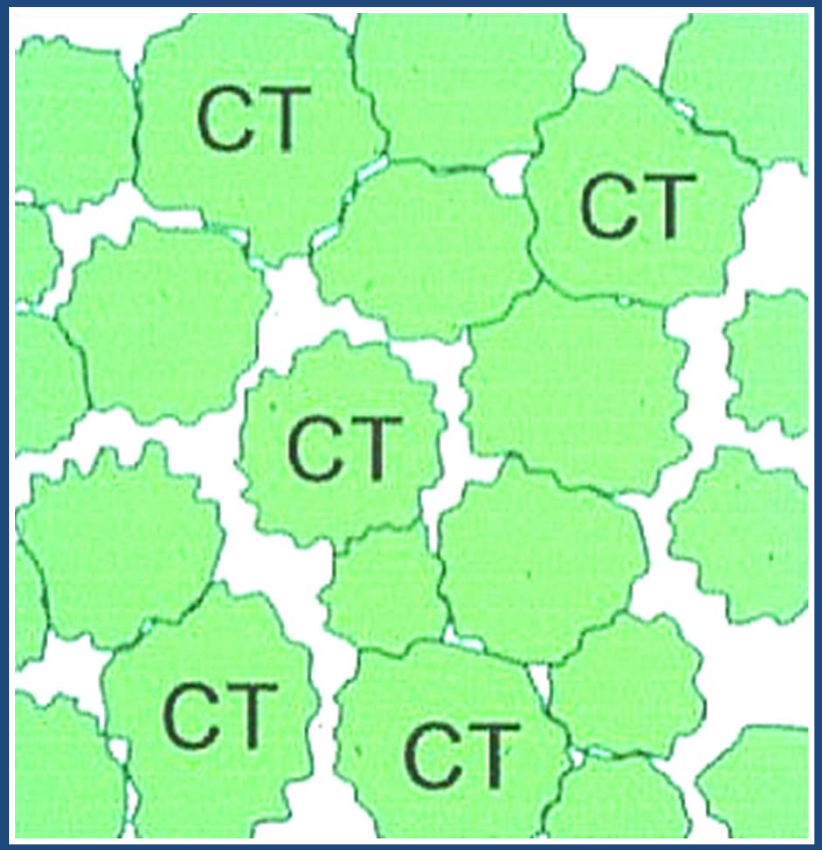
What is a Crop Tree?

- Depends on your objectives.

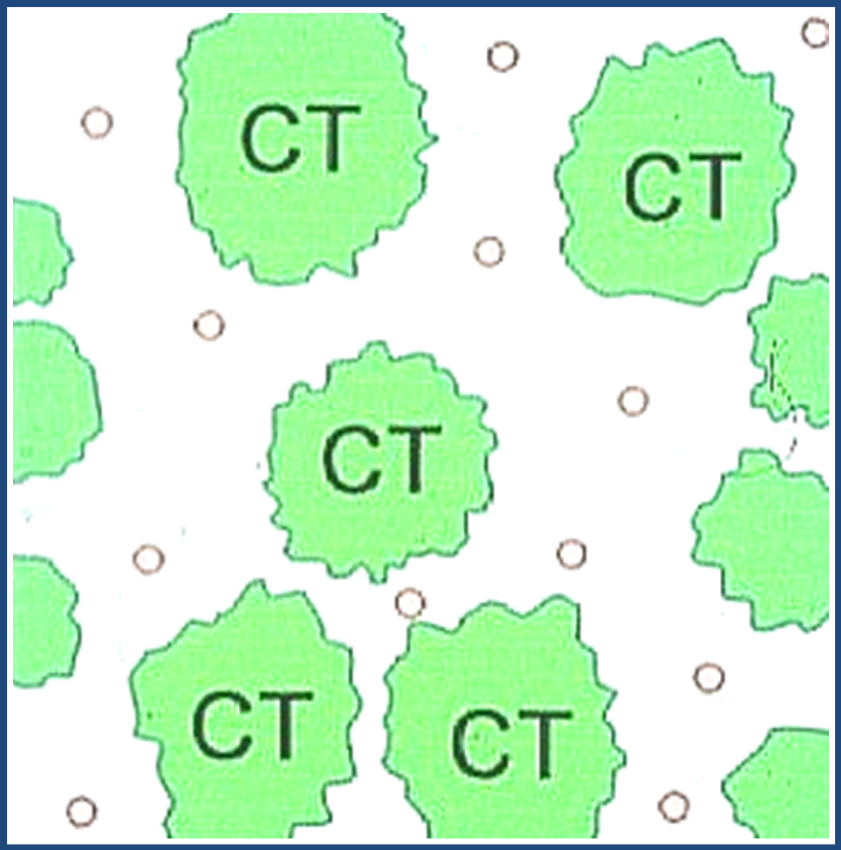
- Timber
- Wildlife
- Rare species

- Dominant or co-dominant crown.
- Good to excellent stem quality.*
- Moderate to long-lived species.

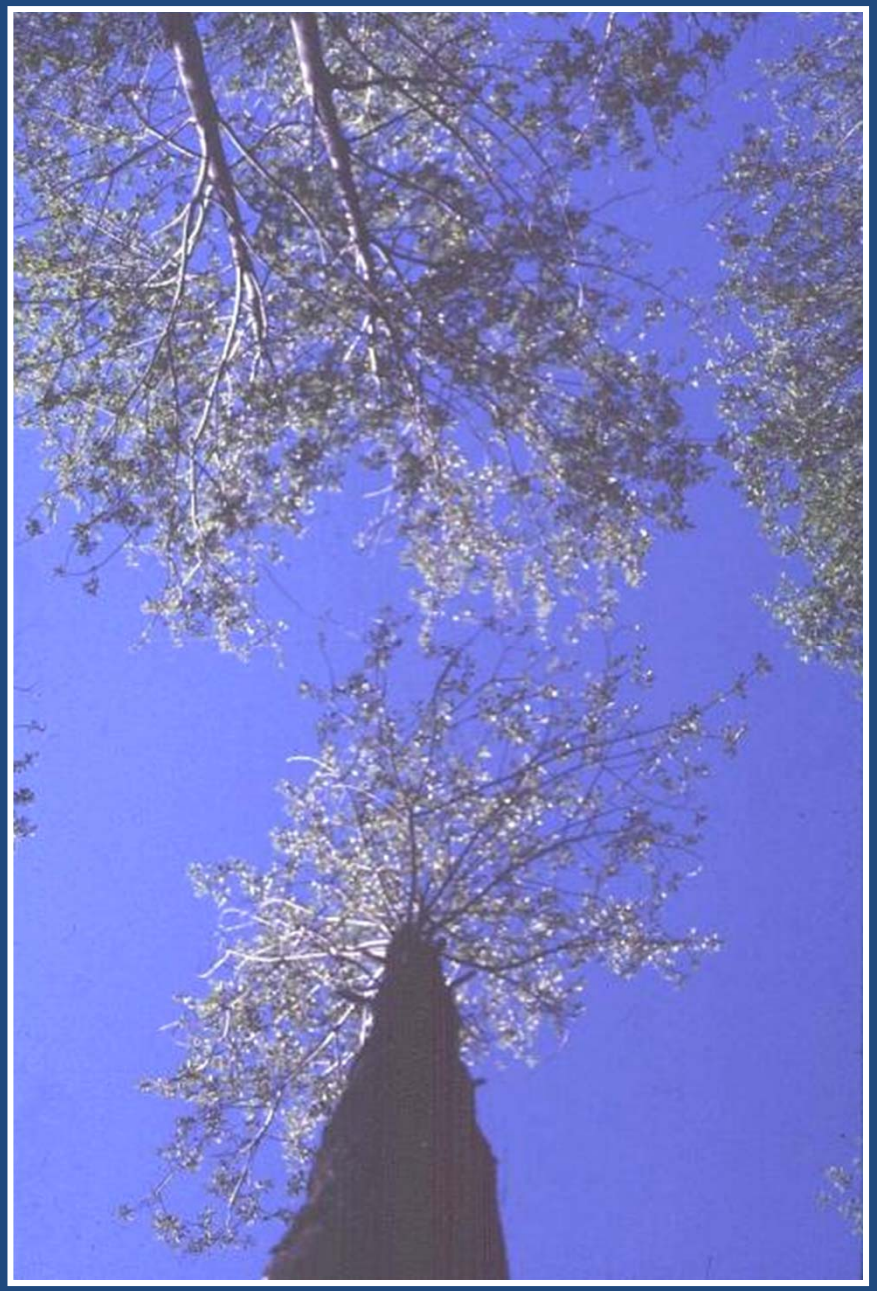
Remove adjacent trees if their crowns touch the crop tree (Crown Touching Release)



Before Treatment



After Treatment



- **Release crop trees on at least three sides.**
- **When two crop trees are side-by-side, treat them as a single tree by giving each a 3-sided release.**

Chainsaw Release – Laborious but Immediate

Herbicide Release – Easy & Effective

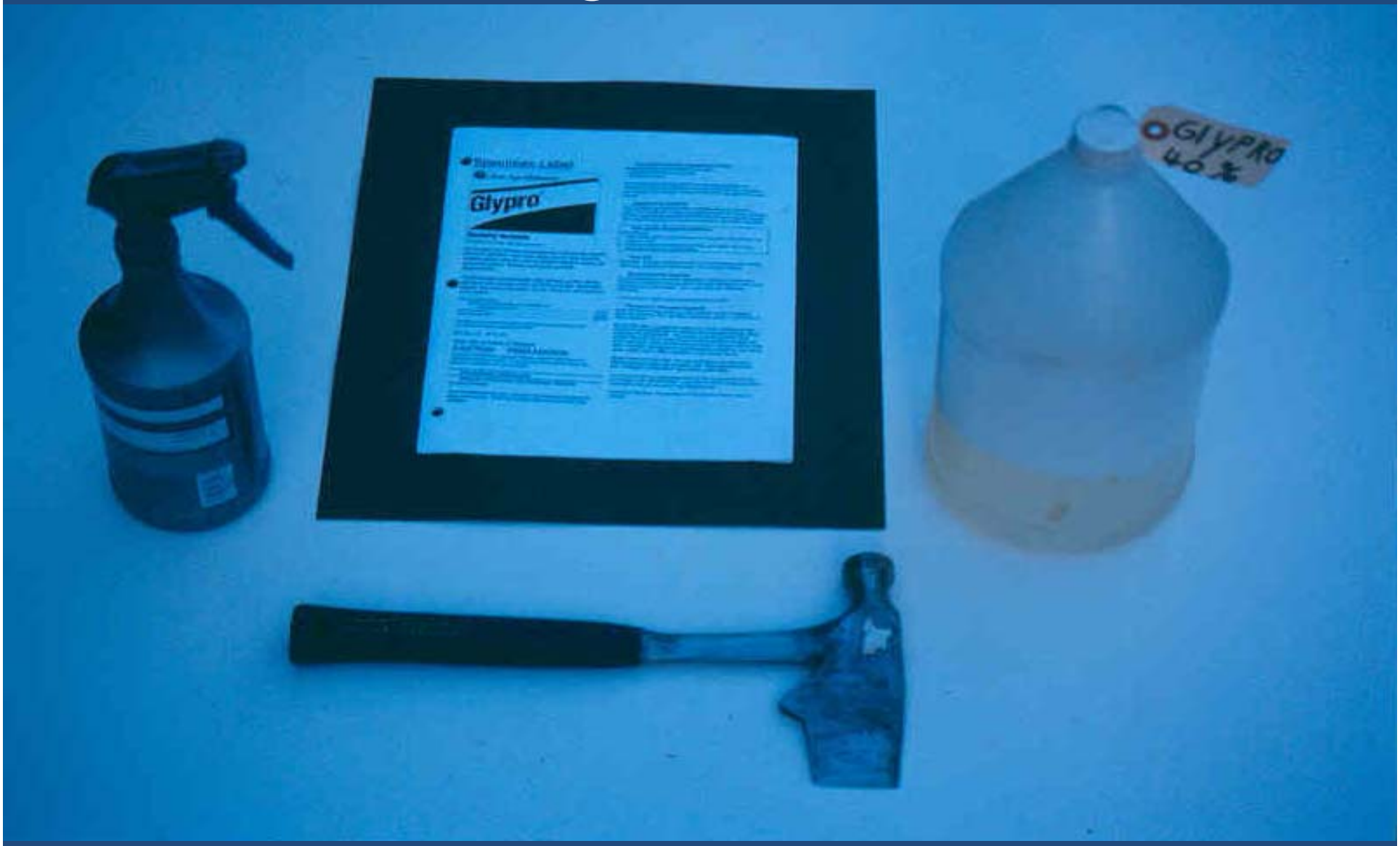
1. **Tree Injection**

2. **Basal Spray**

Tree Injection

- Undiluted Glyphosate (50% a.i.)
- 50/50 mix of Glyphosate & water (25% a.i.)
- 25% solution of Triclopyr and water or oil
- 10% solution of Imazapyr and water
- One incision per inch of dbh spaced evenly around the stem. Cut into the cambium.
- 1.0 - 1.5 ml solution per incision
- Stems > 1.0 in. dbh
- Do not apply during periods of heavy sap flow (Mar-Apr-May) nor during droughts.
- Best applied between June 1-Nov. 1

Spray bottle, herbicide label, labeled herbicide container, and hatchet with ground-down bit 1.75” wide



Injecting a cull tree using a hatchet and a spray bottle

A Potential Problem

- Some species such as red and striped maple can be difficult to kill with herbicides.
- They’re notorious re-sprouters!

Another Potential Problem

- Improper technique such as too few injections or slanted incisions.
- Leaves strips of live tissue.
- This can also happen if you inject during a drought.

Application Costs

Application method	Stems treated	Chemical and carrier cost	Labor cost	Chemical and labor cost
	(#/ac)	($/ac)	($/ac)	($/ac)
Injection (≥ 6.0 in. stems)	159	12.26	27.02	39.28

1Based on $33.21/gal for Glypro
2Based on $10.00 an hour

Basal Bark Treatments

- 5-10% solution of a Trichlophyr herbicide (Garlon 4) and an oil carrier.

- Used for treating thin barked trees generally when they are less than 6” in diameter.

Basal Bark Treatments

- Completely wet the bottom 12 to 15 inches of the stem (all sides).
- Can be done anytime the stem is dry.

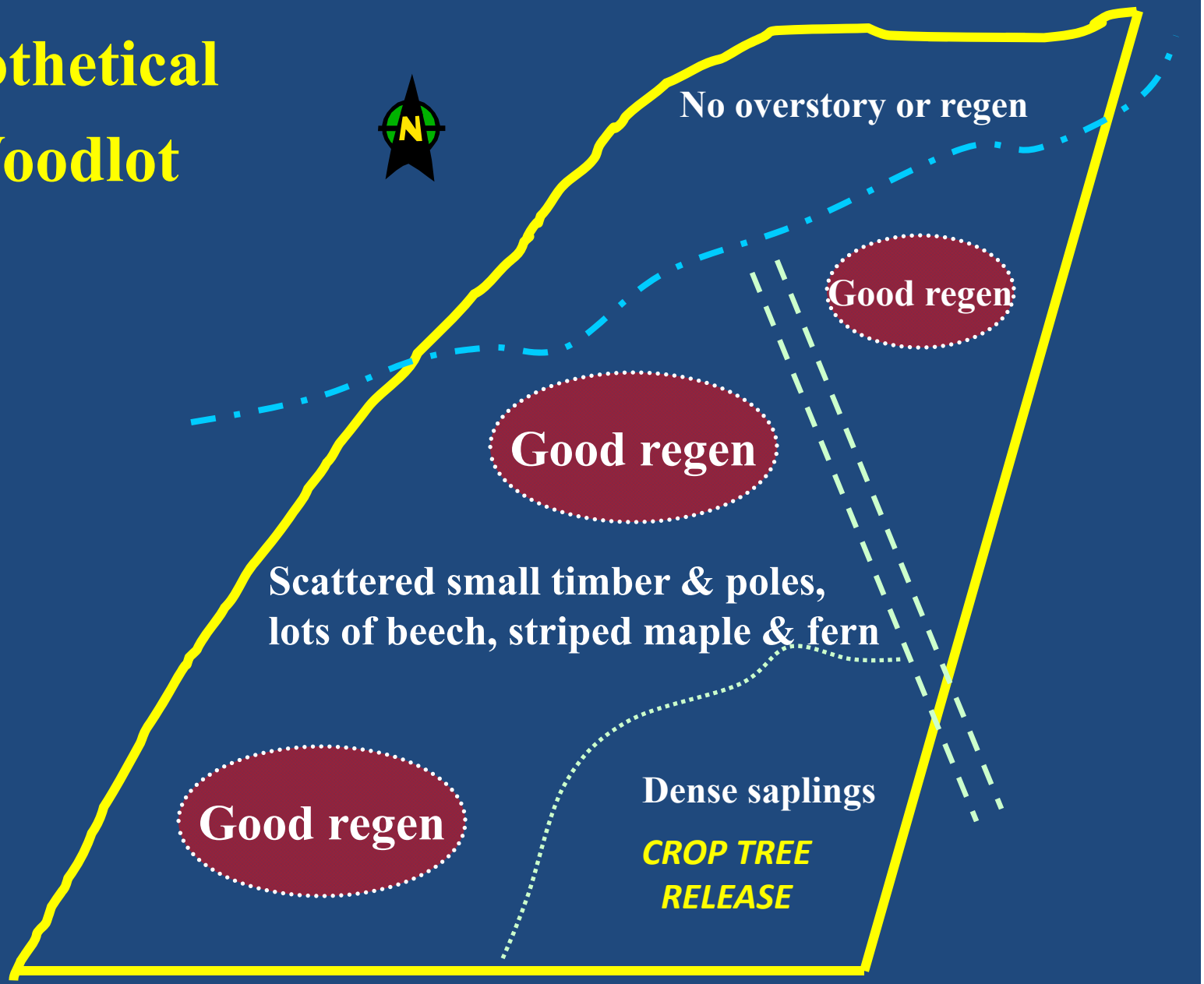
No sprouting on striped maple basal sprayed with Garlon 4

Application Costs

Application method	Stems treated	Chemical and carrier cost	Labor cost	Chemical and labor cost
	(#/ac)	($/ac)	($/ac)	($/ac)
Basal spray (1.0 in. – 5.9 in. stems)	396	60.60	19.72	80.32
Basal spray (2 ft tall – 0.9 in. stems)	3743	126.76	103.33	230.09

Control Grapevines in Young Stands

Our Hypothetical 20 acre Woodlot



Managing Existing Oaks

- **REMEMBER!** Look for 40 to 60 trees per acre.
- Mother Tree – a seed producing sawlog-size tree of a desirable species.
- Residual – a sapling or pole-size tree (< 12” DBH) of a desired species.

Mother Tree & Residual Guidelines

- Evaluate the crown. Is the Live Crown Ratio > 35%?
- Does the crown exhibit apical dominance (▲-shaped) or is it flat-topped?
- Does the foliage appear full & healthy or is it thin & chlorotic?

Mother Tree & Residual Guidelines

- Evaluate the bottom 10 to 18 feet of the tree for soundness and quality.
- Damaged oaks can survive for decades.
- OK to keep poor phenotypes (crooked, forked) as a seed source, if necessary.

Mother Tree & Residual Guidelines

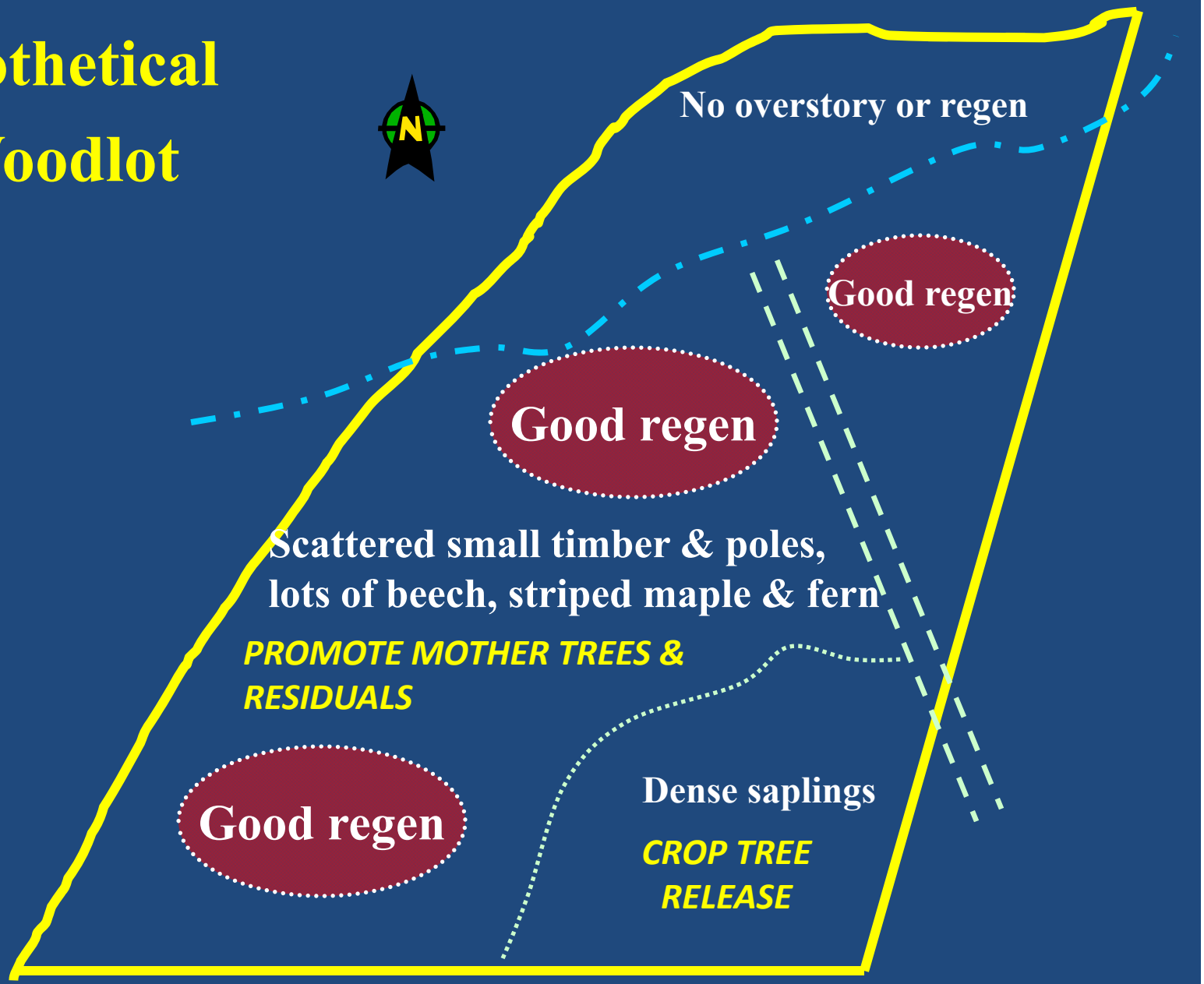
- Epicormic sprouts and low branches can be genetic or environmental in origin.
- Some species, such as chestnut and white oak, are notorious for producing epicormic sprouts.
- Carefully examine the tree. Was it suppressed and released by a previous cut?
- In some cases, pruning can be helpful in controlling environmental epicormics.

More on Pruning

- Best done on large saplings and small poles (4 to 8” dbh) that have a healthy, vigorous leader. Goal is to develop a clean 16’ butt log.
- Use the Shigo’s 3-cut technique to avoid damaging the bole of the tree.
- Work from the bottom up and never remove 10% of the crown.
- Like in fruit orchards, pruning is best done in late winter.
- There are a number of tools available for pruning.

Practice Crop Tree Management on Mother Trees and Desirable Residuals

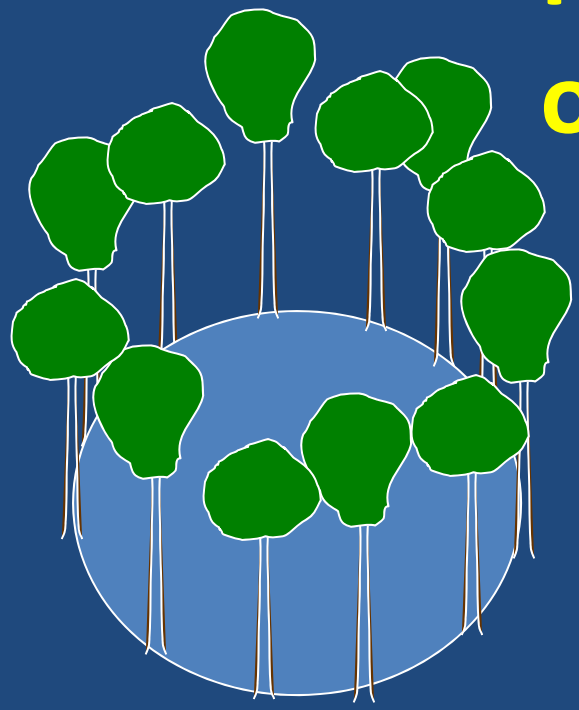
Our Hypothetical 20 acre Woodlot

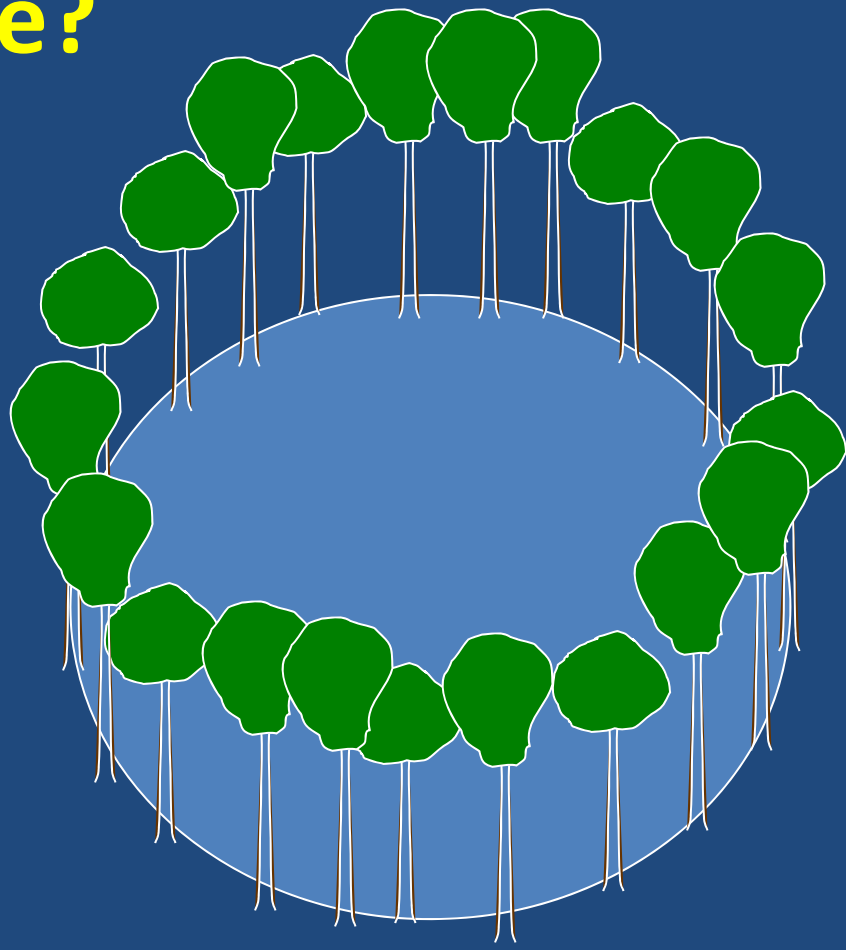


Managing Oak Seedlings & Sprouts

- Create an opening directly on top of the reproduction .
- Cut or control all the overstory and midstory stems.

How large should the opening be?





Rule-of-Thumb: 1.5 to 2x height of neighboring trees.

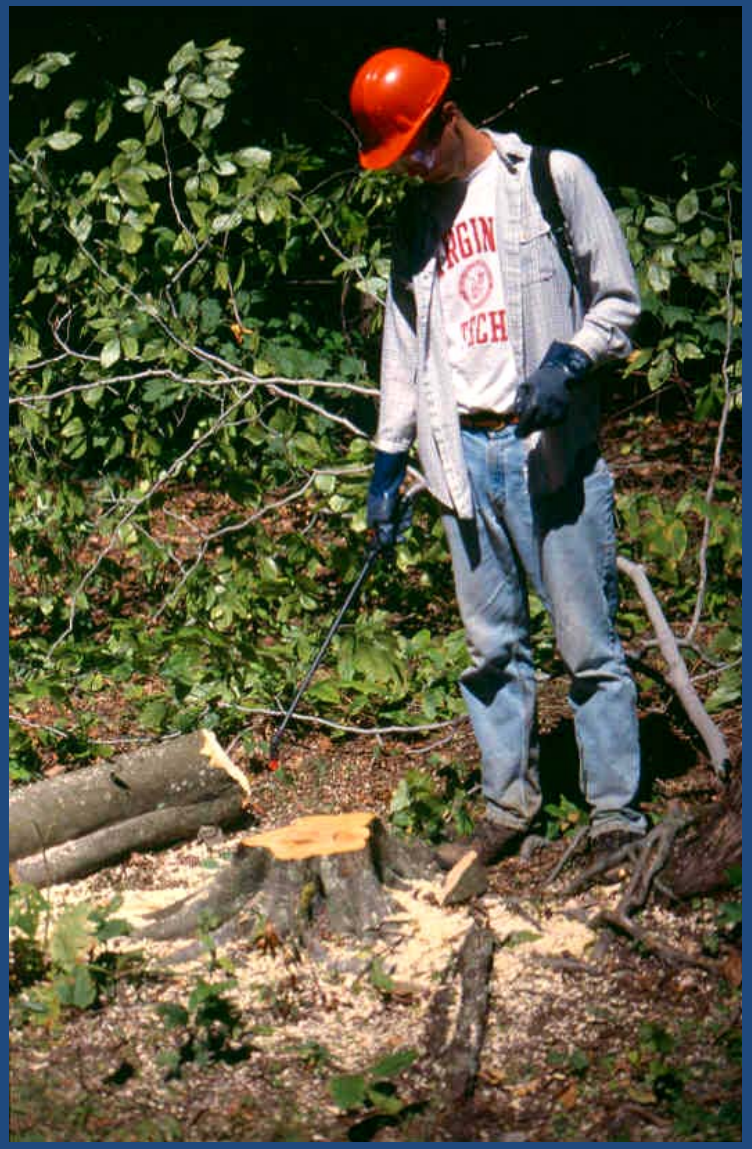
Managing Oak Seedlings & Sprouts

- Be patient, oak reproduction grows slowly.

- When working with oak reproduction, you must control interfering vegetation and deer if they are problematic.

Use Cut Stump Method to Control Woody Interference

- 50-100% glyphosate herbicide
- Treat stumps within 2 hours after cutting
- Spray outer 2 inches of stump surface
- Best applied between June 1 – Nov. 1
- Do not apply during heavy sap flow (Mar-Apr-May)



No sprouting on treated stump

Beech root sprout mortality around treated beech stumps

Application Costs

Application method	Stumps Treated	Chemical[1] and carrier cost	Labor[2] Cost	Chemical and labor cost
	(#/ac)	($/ac)	($/ac)	($/ac)
Cut stump (≥ 6.0 in. stems)	81	43.15	7.71	50.89

[1]Based on $33.21/gal for Glypro

[2]Based on $10.00 an hour

Use Foliar Spray to Control Herbaceous Interference

- 2% solution of a glyphosate product which contains a surfactant
- Mix with clean water
- Completely wet foliage
- Apply during rain-free periods
- Best results obtained in late summer
- Avoid droughts
- Using a dye helps prevent skips or accidental re-spraying

How Do I Protect Oak Seedlings?

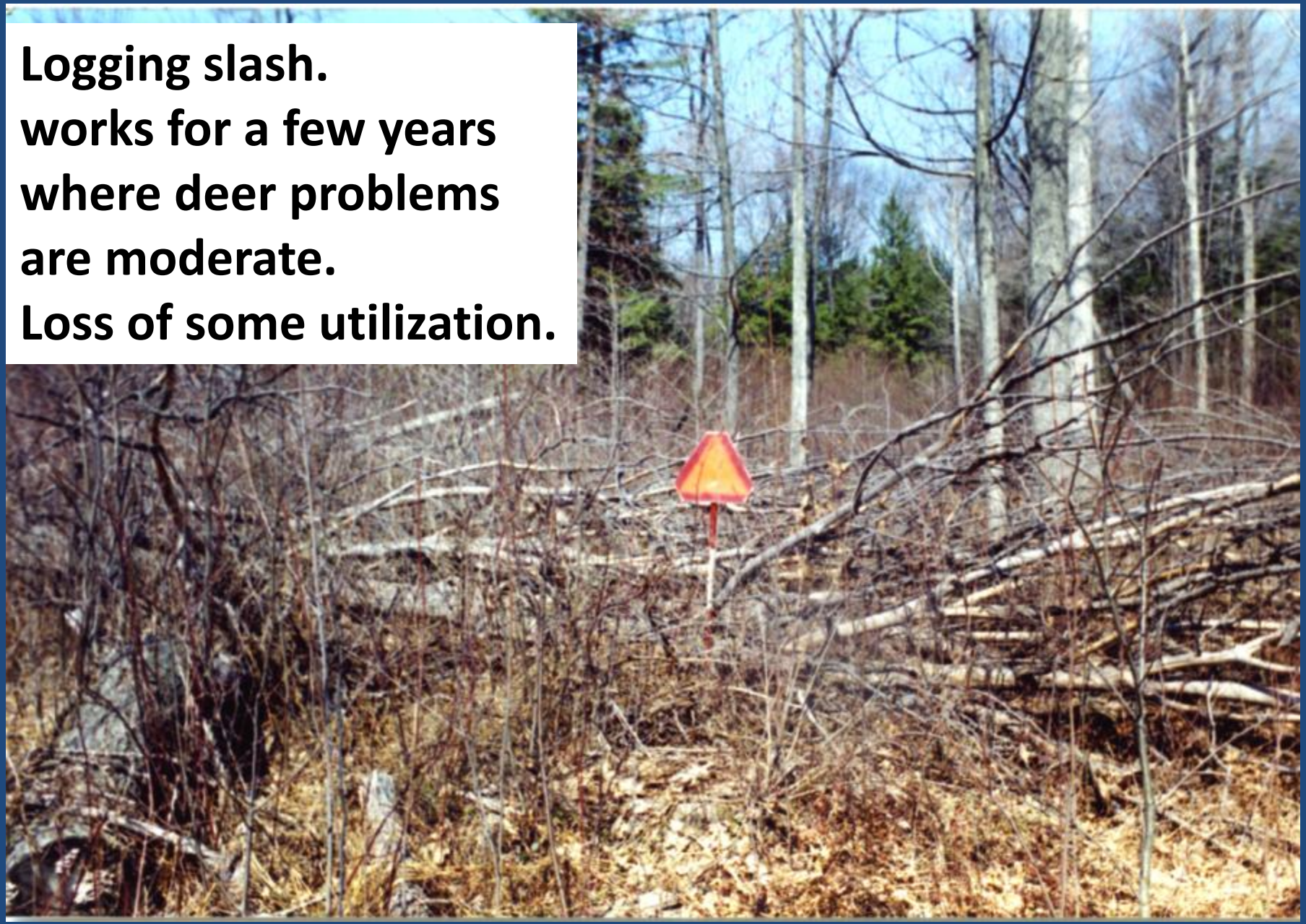
Use sulfameturon methyl (Oust) ***without*** a surfactant

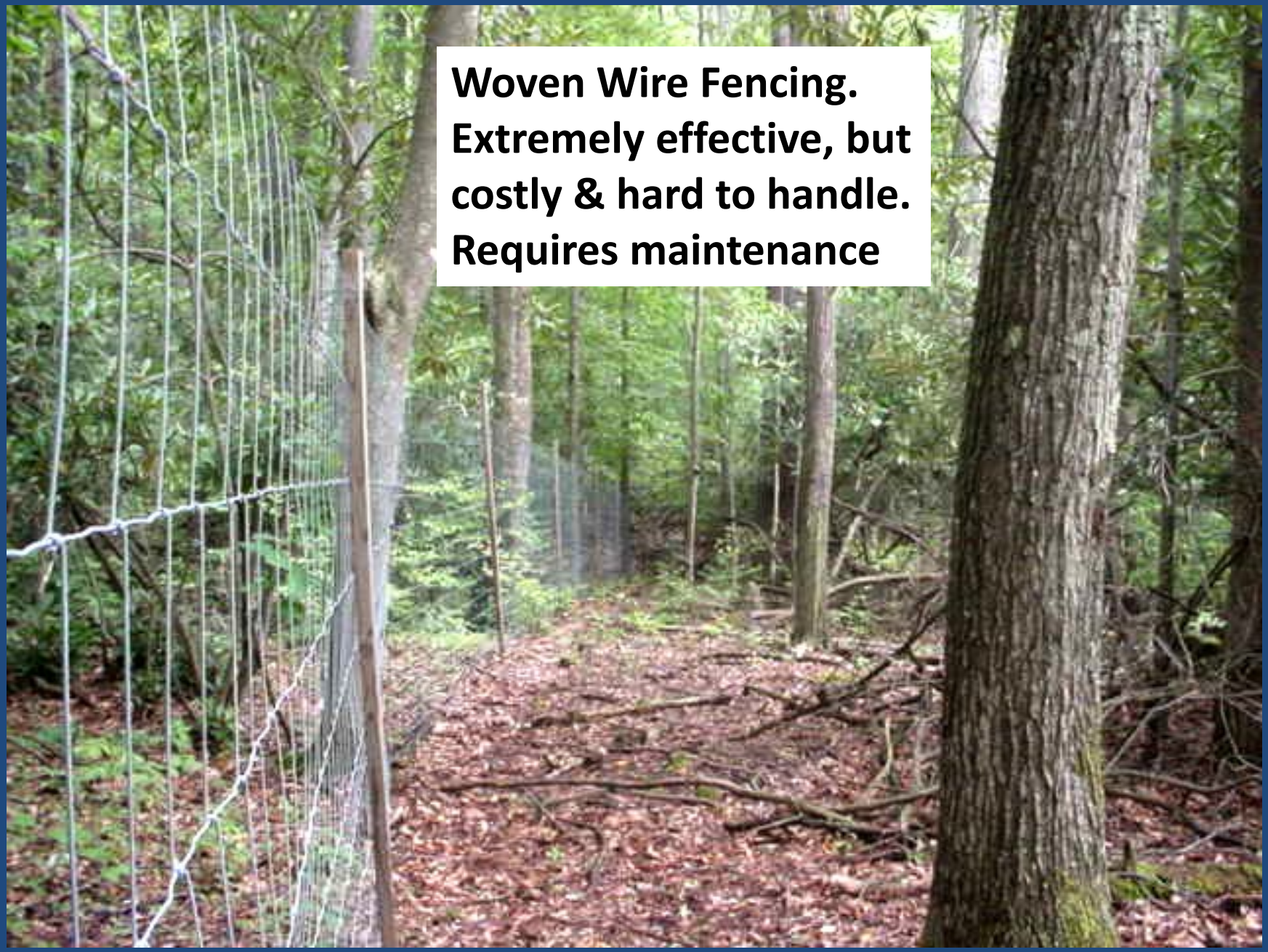
Practice Clip & Spray

Shield seedlings with a bucket or stovepipe

There are Several Options for Controlling Deer

Increase hunting pressure and success, especially on does.


Logging slash.
works for a few years
where deer problems
are moderate.
Loss of some utilization.


Woven Wire Fencing.
Extremely effective, but
costly & hard to handle.
Requires maintenance


Plastic Fencing.
Easier to handle, but expensive.
Requires maintenance

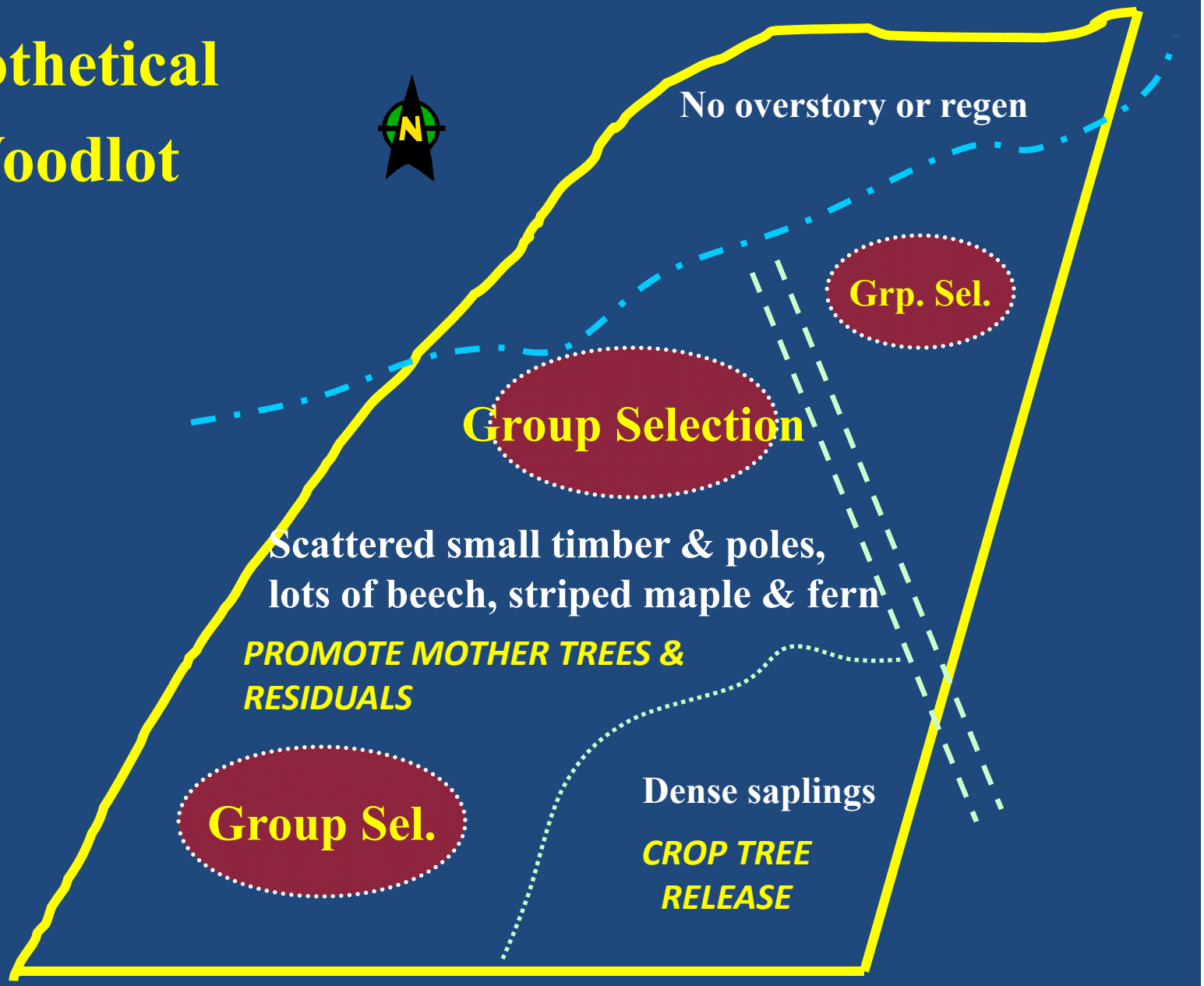
Individual Tree Fencing

- Welded wire fencing.
  - 5’ x 100’ roll
  - Makes 16 cages
  - Close with hog rings
  - Anchor with sod staples
  - Cost about $6.25/cage
- Extremely durable
- Reusable

Group Selection with Sprouts

Group Selection with Sprouts

Our Hypothetical 20 acre Woodlot



Artificial Regeneration

- **Problem:** Insufficient regeneration to meet management objectives. Seed source lacking.

- **Warning:** This approach is costly, time consuming, and fraught with problems. However, it may be the only choice to restore a badly abused area.

Do I Plant Acorns or Seedlings?

There are advantages and disadvantages to both.

Planting Acorns

- Advantages
  - They're free
  - Easy to obtain
  - Easy to plant
  - Adapted to local conditions

Planting Acorns

- **Disadvantages**
  - Potentially high loss rate
  - Must plant many acorns to get a few successful germinants
  - Seedlings grow slowly at first, lengthening the time they're susceptible to deer browsing

Planting Seedlings

- Advantages
  - Requires few seedlings, relative to acorns
  - Bypass many of the problems associated with acorn survival and germination
  - Develop competitive-sized seedlings quickly
  - Less constrained by local acorn availability

Planting Seedlings

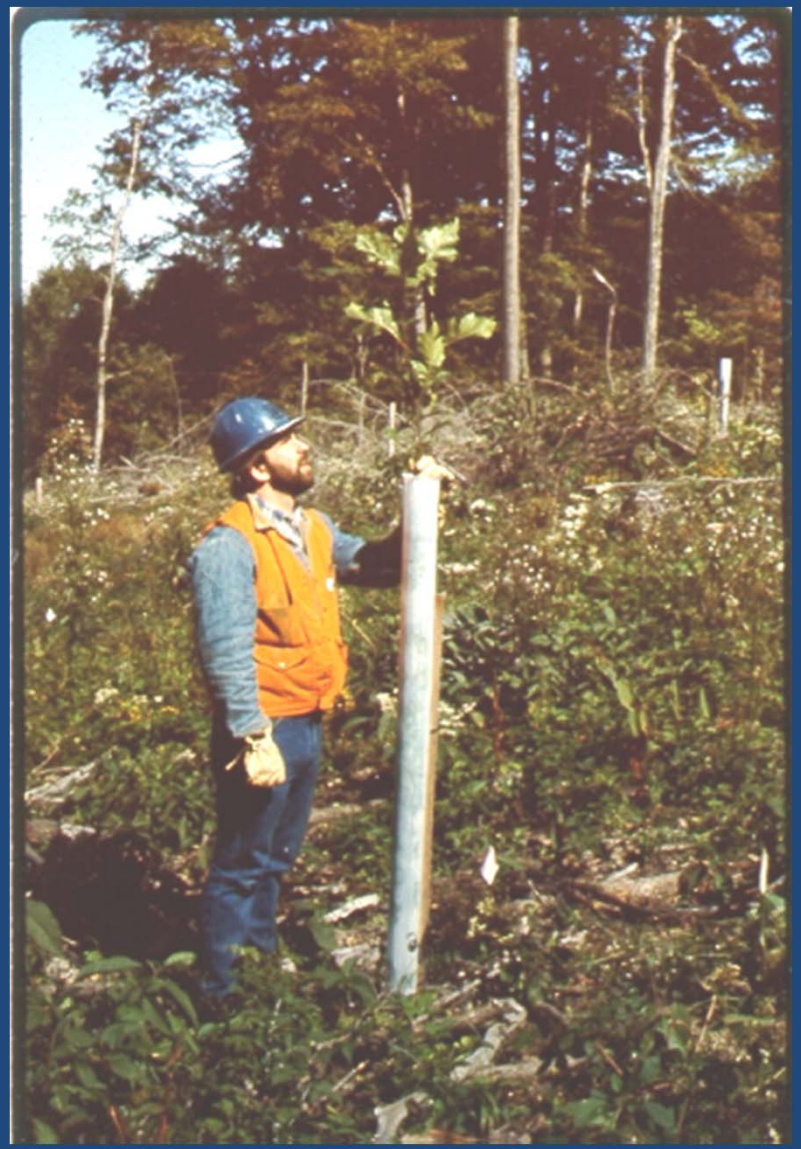
- Disadvantages
  - Can be expensive
  - Can be difficult to plant correctly due to large root system
  - Seedling may not be well suited for local conditions
  - Possible slow growth due to transplanting shock
  - Can be especially attractive to deer
  - Usually require follow-up maintenance

Planting Acorns

- Mimic the habits of blue jays and squirrels.
  - Plant only sound acorns (float test)
  - Plant acorns individually, not in groups
  - Plant in autumn (CO & WO must be planted soon after collection)
  - Plant in open areas or areas of thin leaf litter
  - Plant acorns 1” deep in the forest floor

Planting Seedlings

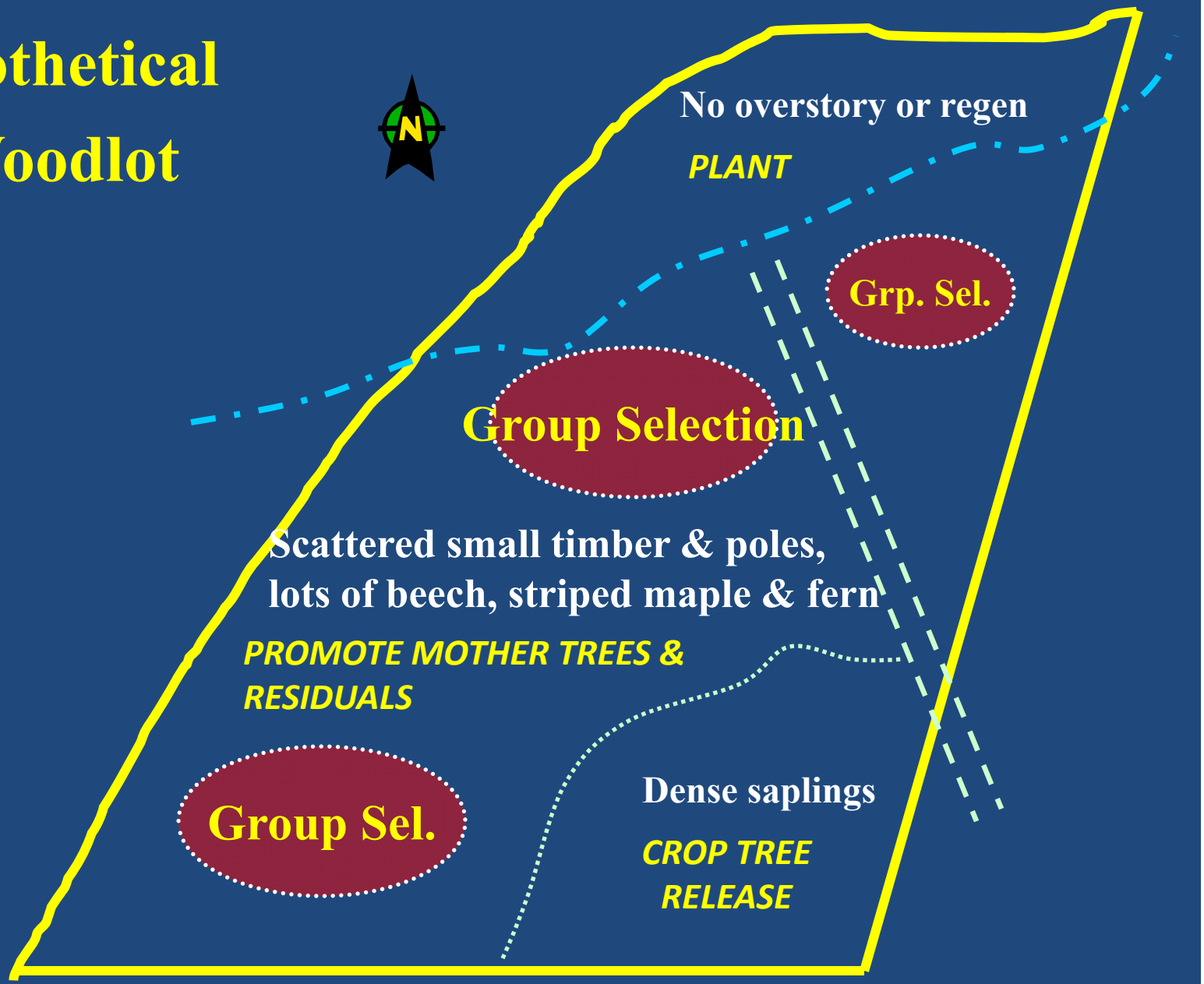
- Use high-quality nursery stock adapted to your area.
- Avoid planting close to stumps likely to vigorously sprout (e.g., basswood or red maple).
- Do not plant inside tall/thick logging debris.
- Do not plant under residual trees.



Planting Seedlings

- Maintain shelters
  - Stakes, ties, bear damage, vandalism, remove nets, cut shelters later.
  - Good access helps.
  - Dormant season best for work.
- Secondary treatments are essential
- Release sheltered trees from overtopping vegetation.
- Avoid high quality sites

Our Hypothetical 20 acre Woodlot



Summary

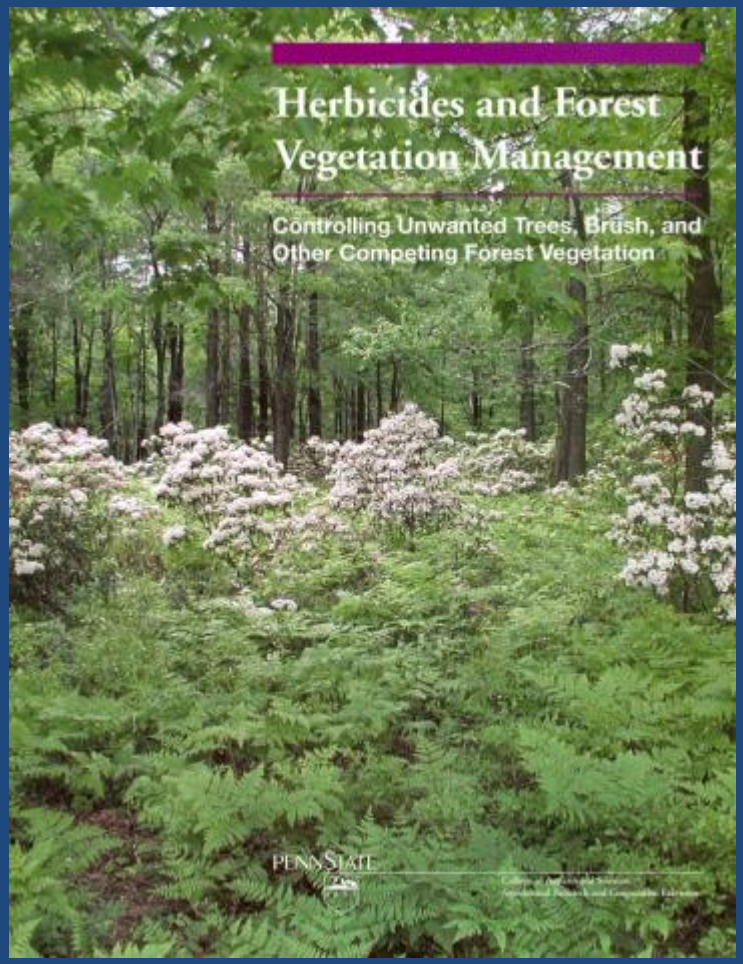
Oaks have important cultural significance and provide a wide range of ecological benefits and economic value to private woodlots.

A basic understanding of their important characteristics is necessary to manage them correctly.

Improving the health and vigor of *existing* oak trees is the most important thing a landowner can do to improve his woodlot. Preparing for future regeneration opportunities is a close second.

Helpful Resources

- **Guidebooks**
- **Herbicides & Forest Vegetation Mgmt, 2005, Penn State Extension**
- **Prescribing Regeneration Treatments for Mixed Oak Forests, 2008, USDA Forest Service General Technical Report NRS-33**
- **Technical Guide for Crop Tree Release, 2007, Univ. of TN Pub FM-11**



Helpful Resources

- **General Books**
- Woodland Ecology for the Small Owner, 1980, by Leon Minckler
- Working with your Woodland, 1993, by Mollie Beattie and others
- Common Sense Forestry, 2002, by Hans Morsbach
- Wildlife and Woodlot Management, 2004, by Monte Burch

Helpful Resources

- **Forestry Professionals**
- Cornell & Penn State Forestry Extension Offices
- State/County Service Foresters
- Northern Research Station Labs
- Consulting Foresters
- Tree Farm Program
- Woodland Owners Associations

QUESTIONS?