What Do Oaks Need To Grow?

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What Do Oaks Need To Grow?

Outline

A. Context of Oak in Wisconsin

B. Application of Commercial Intermediate Stand Management or "thinning"

C. Generally Accepted Oak Regeneration (GAP) Systems

D. Management Alternatives

What is Sustainable Forestry?

Sustainable forestry is the practice of managing dynamic forest ecosystems to provide ecological, economic, social, and cultural benefits for present and future generations.

Ch.28.04(1)e, Wis. Statutes

What is Sustainable Forestry?

Sustainable forestry practices must be based on:

- Compatible landowner objectives
- The capabilities of each site
- Scientifically sound silviculture

<u>Each of these factors is equally important</u>

A. The Context of Oak in Wisconsin

Oak Forest of Wisconsin

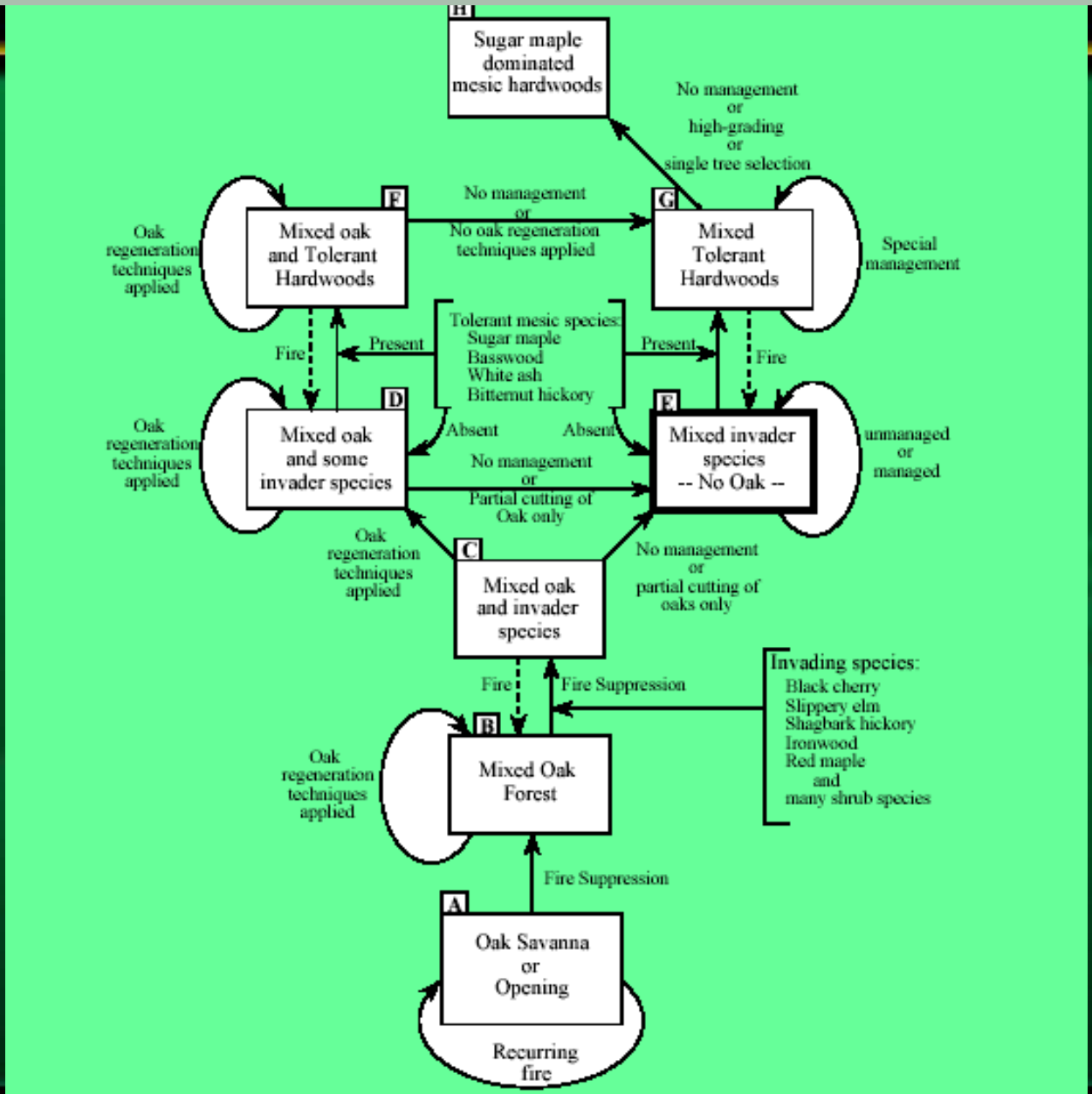
Oak forests encompass 3.4 million acres in Wisconsin (about 20% of total forest cover)

- Oak is the 3rd most abundant cover type (acres)

Successional Trends (S. WI landscapes)

- Changes in disturbance regimes during the 1900's have facilitated conversion to shade-tolerant tree species
  - Fire suppression
  - "Selective logging"
    - *Limited management*
  - Heavy deer browsing
  - Invasive shrubs

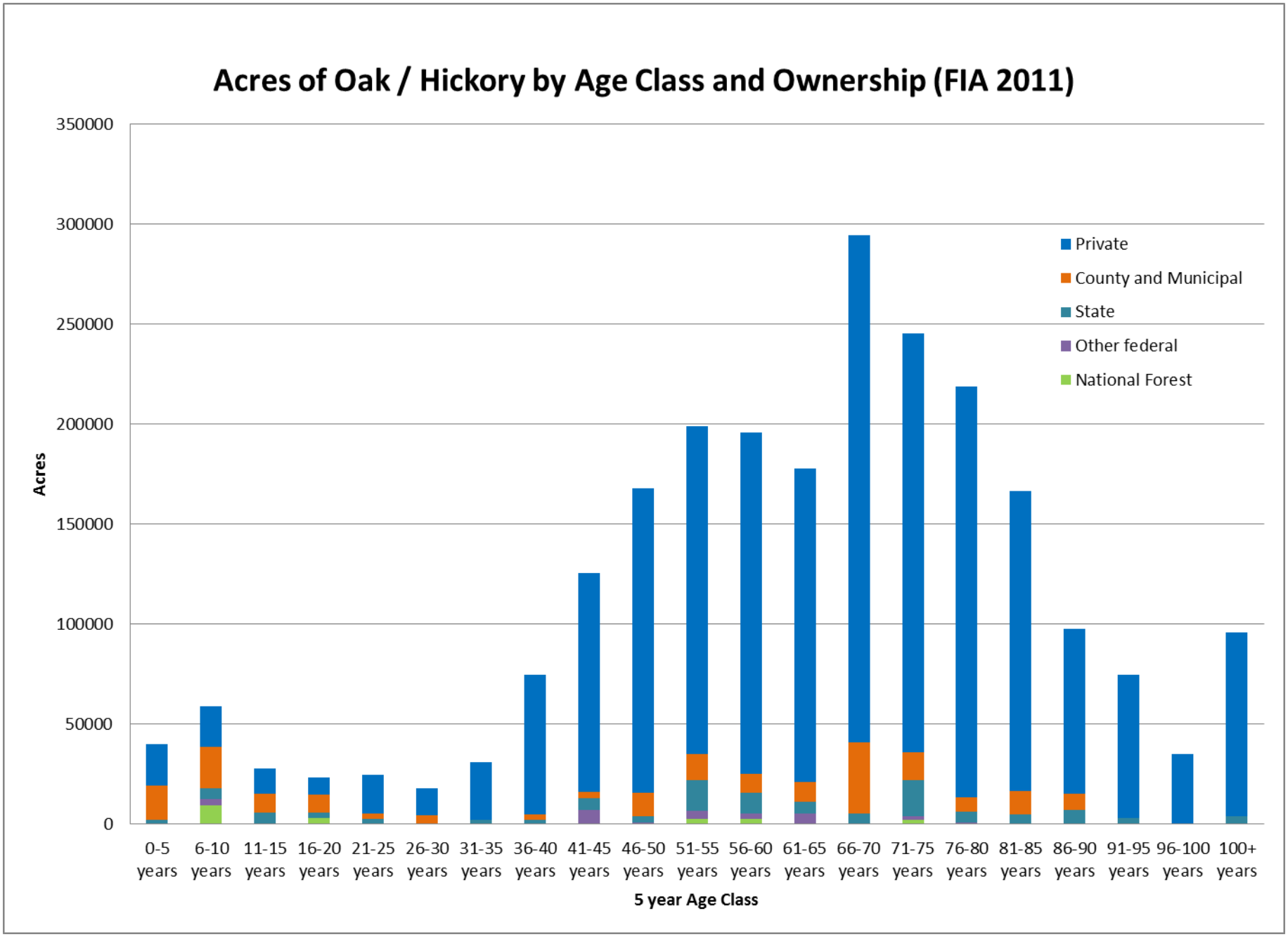
Forest Community Dynamics (with and without management) on Mesic and Dry-mesic Sites in Southern Wisconsin



Oak Forest of Wisconsin

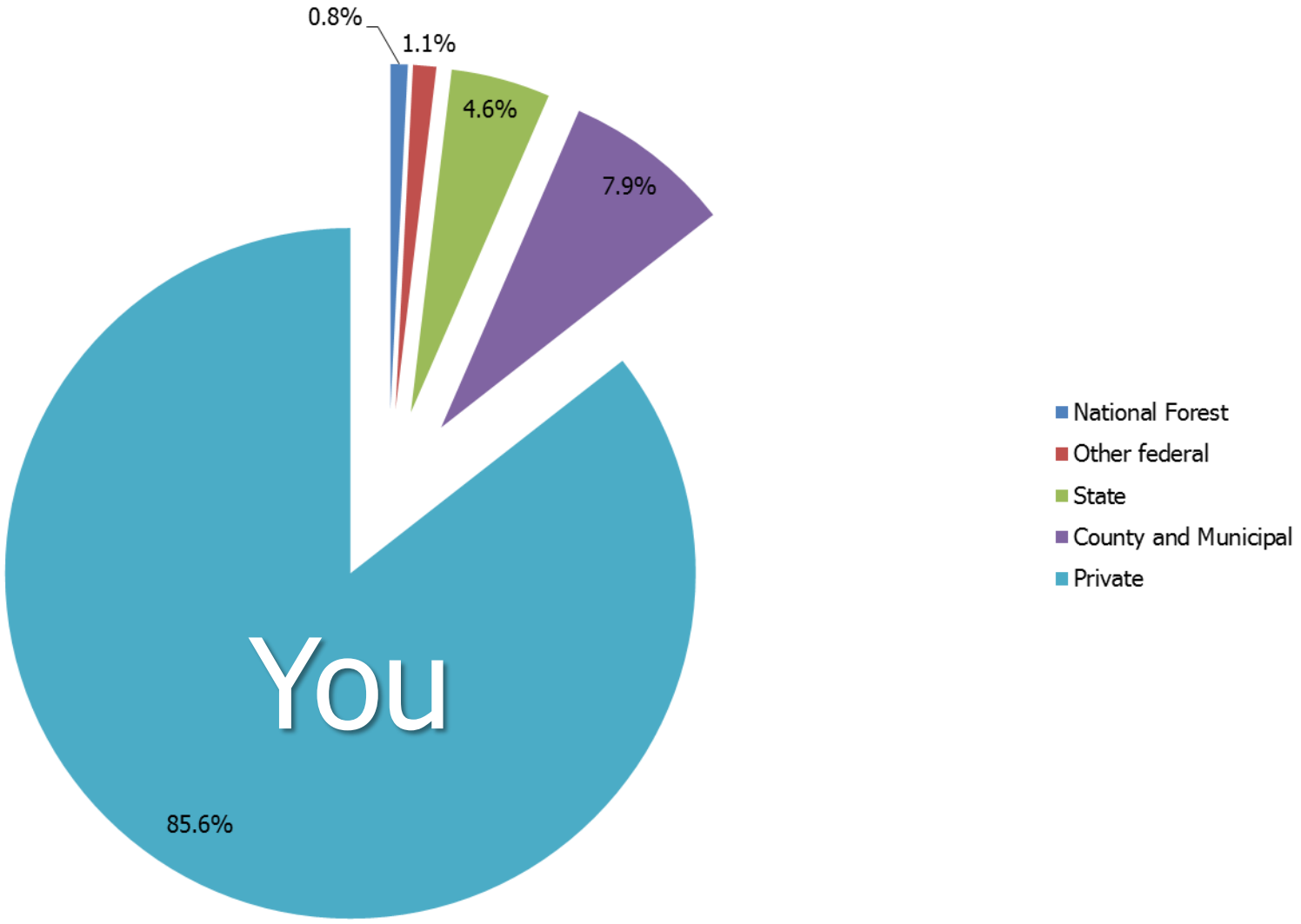
- ✓ Cutting older growing stock
  - Only 4% older than 100 years
- ✓ Not regenerating oak as a cover type
  - Select red and white oak removals > growth
  - Driftless region: oak removals nearly twice growth
- ✓ 66% of resource in 40 to 80 year range
  - Need for regeneration is at hand…

∴ Apparent shift of Oak resource from good site (mesic) to poor sites (dry).


Acres of Oak / Hickory by Age Class and Ownership (FIA 2011)
350000
300000
250000
200000
150000
100000
50000
0
Acres
Private
County and Municipal
State
Other federal
National Forest
0-5 years
6-10 years
11-15 years
16-20 years
21-25 years
26-30 years
31-35 years
36-40 years
41-45 years
46-50 years
51-55 years
56-60 years
61-65 years
66-70 years
71-75 years
76-80 years
81-85 years
86-90 years
91-95 years
96-100 years
100+ years
5 year Age Class

Who is in a position to influence the future of oak?

Wisconsin Oak / Hickory Acreage (FIA 2011)



Oak Forest of Wisconsin

- Our challenge as the oak resource matures is to successfully regenerate stands
  - Foresters and Landowners need to:
    1. Understand the ecology of oak
    2. Employ strategies for regeneration across site types
    3. Explore improving operational techniques for regeneration (i.e. tinker)

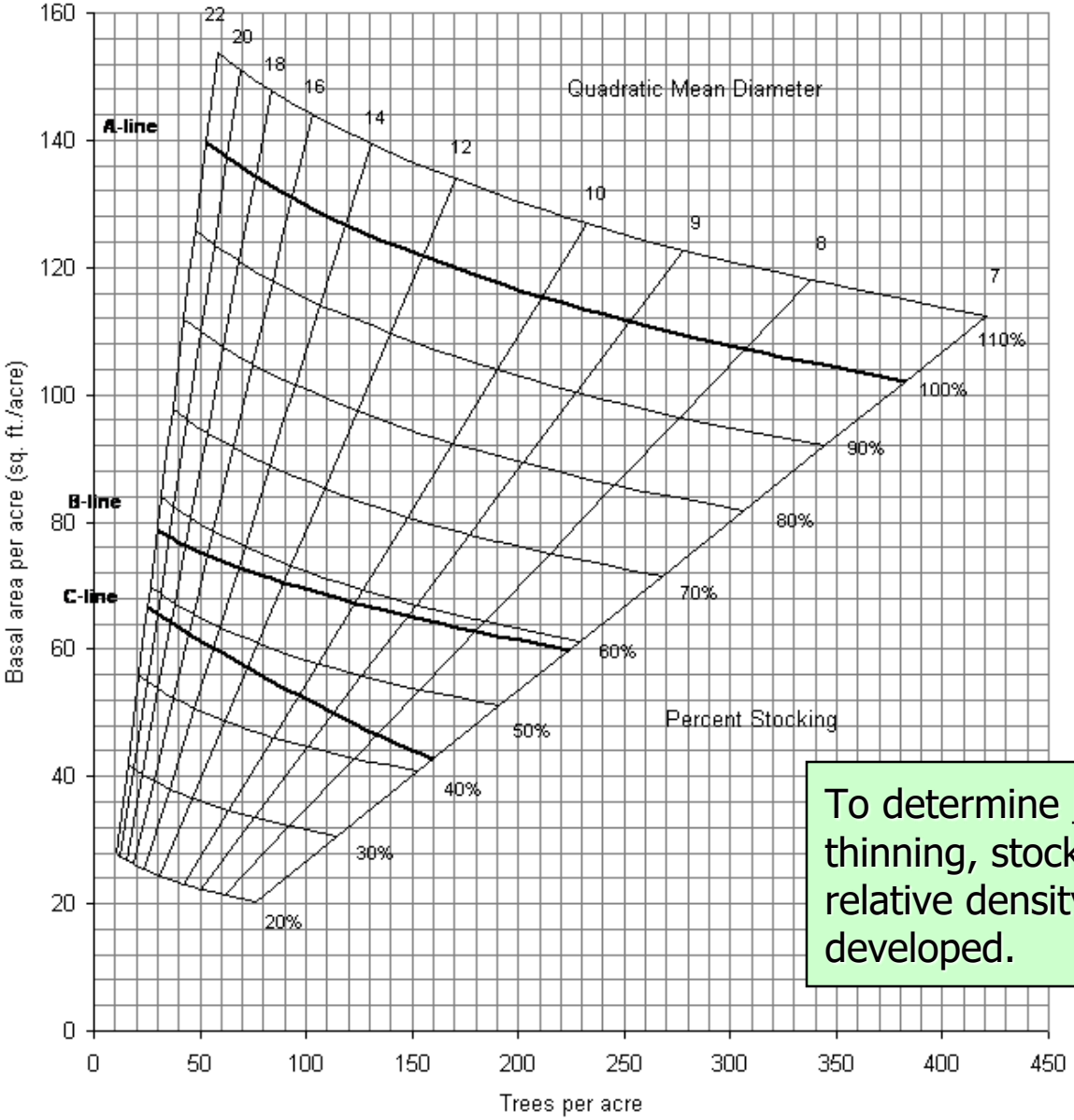
B. Application of Intermediate Stand Management

The primary objectives of intermediate thinnings in oak stands are:

- To capture losses that would occur as a result of competition and suppression
- To improve overall stand quality by concentrating growth on the most desirable trees
- To improve stand vigor, growth, and health
- To improve species composition
- To generate income during the stand rotation

Notes

- If you do not have sufficient desirable growing stock or crop trees, do not thin but regenerate.



To determine <u>how much</u> to remove in a thinning, stocking charts based on the relative density of oak stands have been developed.

Thinning Notes

- ✓ Don't thin in the last 20% of a stand's rotation
  - ✓ Remove no more than 1/3 stand relative density in any thinning
  - ✓ This may remove the periodic growth of the stand and defeat the purpose of thinning.
  - ✓ This may complicate regeneration harvests due to the presence of a brushy understory dominated by species other than oak.
- ✓ 1st thinnings applied late should be conservative
  - ✓ Prescriptions for 1st thinnings in degraded stands will tend to be imprecise and combine commercial thinning with TSI

Thinning Notes

- ✓ To avoid the pitfalls of high grading and diameter limit harvesting, at least 75% of the trees cut should be smaller than the average stand diameter, "thinning from below"

  ∴ If this is not possible, a regeneration harvest is likely a better choice.

C. Natural Regeneration Methods For Oak Regeneration

Southern Habitat Type Groups
Generally Accepted Regeneration Methods

Table 41.7 Northern Habitat Type Groups

Habitat Type Groups	Coppice	Overstory Removal	Shelterwood
Very Dry to Dry	GAP	GAP	X
Dry to Dry–Mesic	GAP	GAP	GAP
Dry-Mesic	X	GAP	GAP
Mesic		GAP	GAP
Mesic to Wet–Mesic		GAP	GAP

GAP – Generally Accepted Practice
X – Method may have potential for application
(See discussion under specific regeneration method)

Southern Habitat Type Groups
Generally Accepted Regeneration Methods

Table 41.8 Southern Habitat Type Groups

Habitat Type Groups	Coppice	Overstory Removal	Shelterwood
Dry	GAP	GAP	X
Dry-Mesic	XX	GAP	GAP
Dry-Mesic to Mesic, and Mesic including phases	XX	GAP	GAP
Mesic to Wet–Mesic		GAP	GAP

GAP – Generally Accepted Practice
X – Method may have potential for application. (See discussion under specific regeneration method)
XX - On steep slopes in the Driftless area with small diameter trees where shelterwood is not practical.

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Oak Regeneration Notes

The regeneration of oak forests is an ecological process, not an event.

- The oak regeneration process may straddle the end of a rotation and the beginning of the new stand (10+ years).

You can apply different silvicultural treatments as long as you stay true to oak ecology.

D. Management Alternatives for Oak Regeneration

Mgmt Alternatives For Oak Regeneration

Shelterwood with Prescribed Fire

Recent studies have documented effective ways of applying prescribed fire along with silvicultural methods

∴ To correctly use fire to promote regeneration of mixed oak forests, stand dynamics and the oak regeneration process must be considered simultaneously

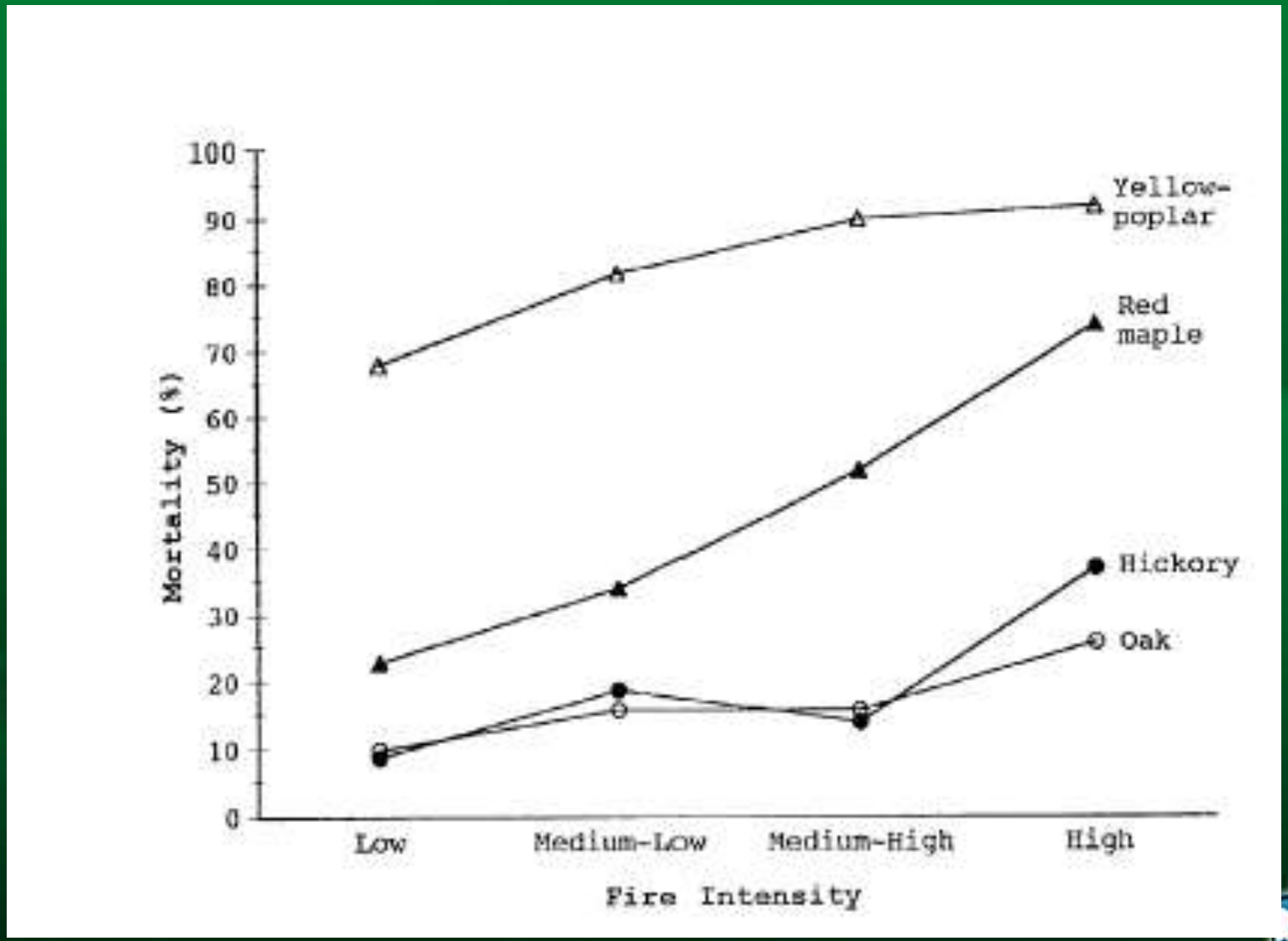
The Shelterwood - Burn Method

The Shelterwood - Burn Method: 1st Stage Shelterwood harvest

The Shelterwood - Burn Method: Advanced Regeneration Development

The Shelterwood - Burn Method: Relatively Hot Growing Season Prescribed Fire

Fire and Advance Regeneration



The Shelterwood - Burn Method: Oak Dominates Advanced Regeneration Pool

Notes to the Shelterwood - Burn Technique

- Mechanical site scarification or waiting for a bumper acorn crop are probably better management strategies for establishing new oak seedlings than prescribed burning.
- Oak reproduction will not be uniform over the entire burned area

Notes to the Shelterwood - Burn Technique

- One burn will likley not be enough if oak dominance is desired in the new stand
- It is believed that oak dominance of the advanced regeneration will continually increase with repetitive spring burning at about 2-4 year intervals.
- Fot this system to work, competing vegetation cannot be allowed to outgrow the ability to be killed by fire.


Questions?