Thinning and Harvesting

Tending and Re-growing

Benjamin Snyder
Illinois Department of Natural Resources
District Forester

Consider

- What are we managing?
- Why?
- What is Tending?
- What is Re-growing?

What are we managing?

Central Hardwoods Joint Venture

Central Hardwood Forest

Forest and physiographic regions of the Eastern United States – Braun 1950

What are we managing?

- Site = productivity
  - Dry or Xeric – oak/hickory
  - More moist or Mesic – oak/hickory is sub-climax
  - Floodplains – bottomland

What are we managing?

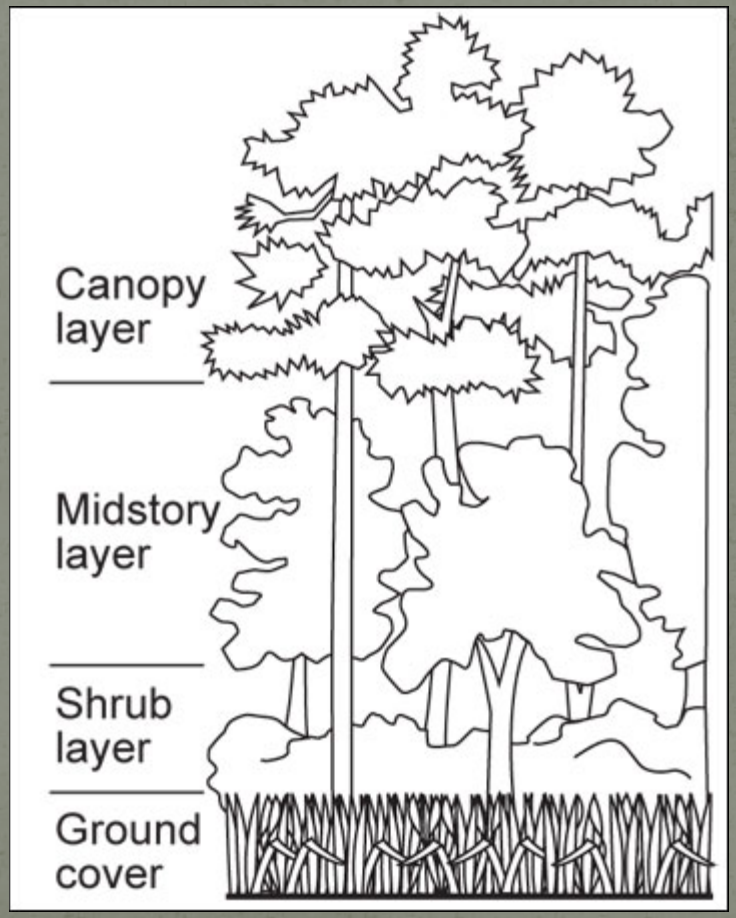
- Trees
- A Healthy Forest
- Growth rate
- Regeneration – the next generation
- Grasses, forbs, wildflowers, shrubs, etc.

What are we managing?

- Common tree species
  - Timber: Oak, hickory, tulip poplar, sugar maple, red maple, ash, cherry, walnut…
  - Other associated trees: sassafras, silver maple, willow, beech, ironwood, redbud, dogwood, sycamore, sweetgum, etc.

Layers of a Healthy Forest

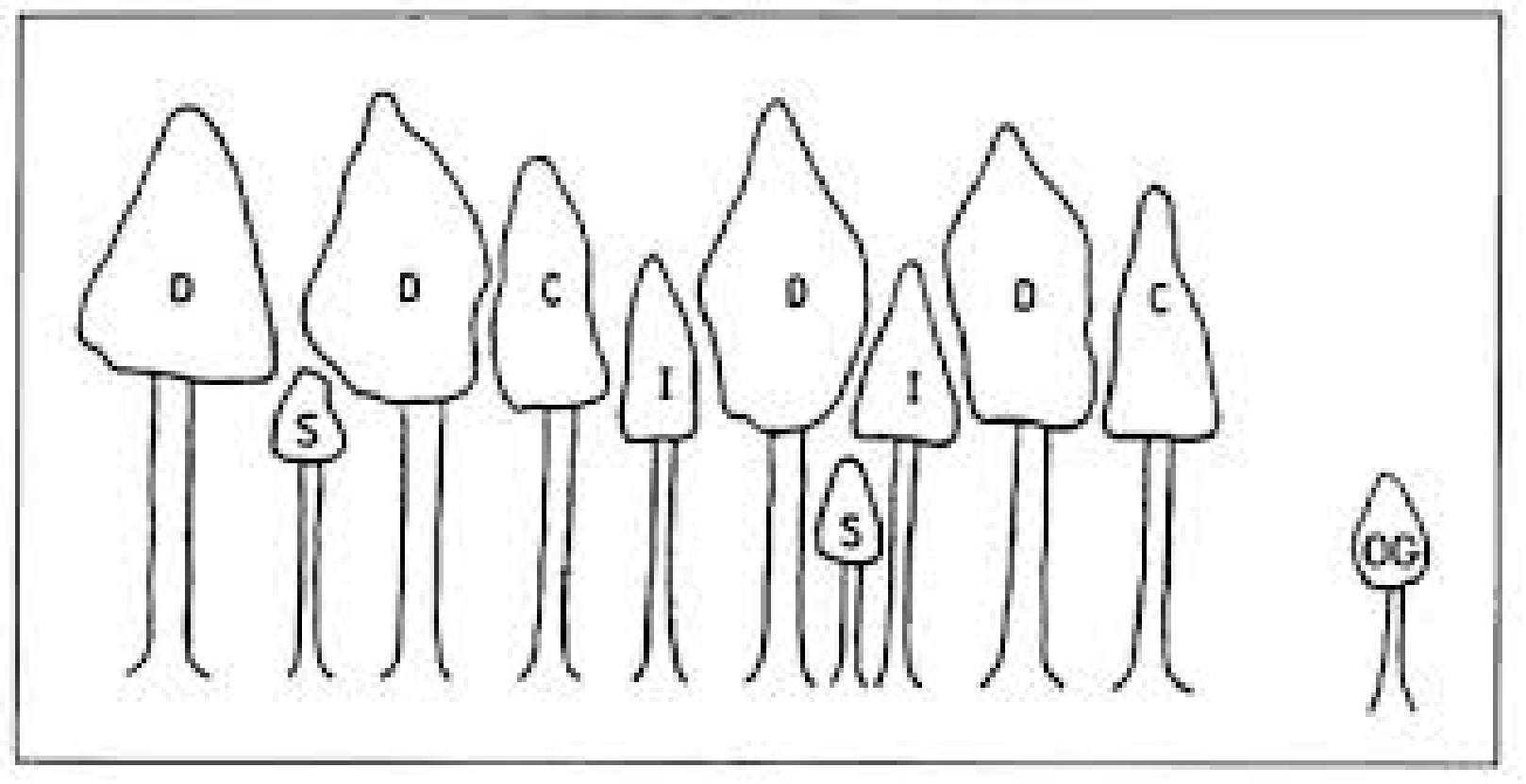
- Canopy
- Midstory
- Understory
- Ground Layer
- Soil



Crown Classes

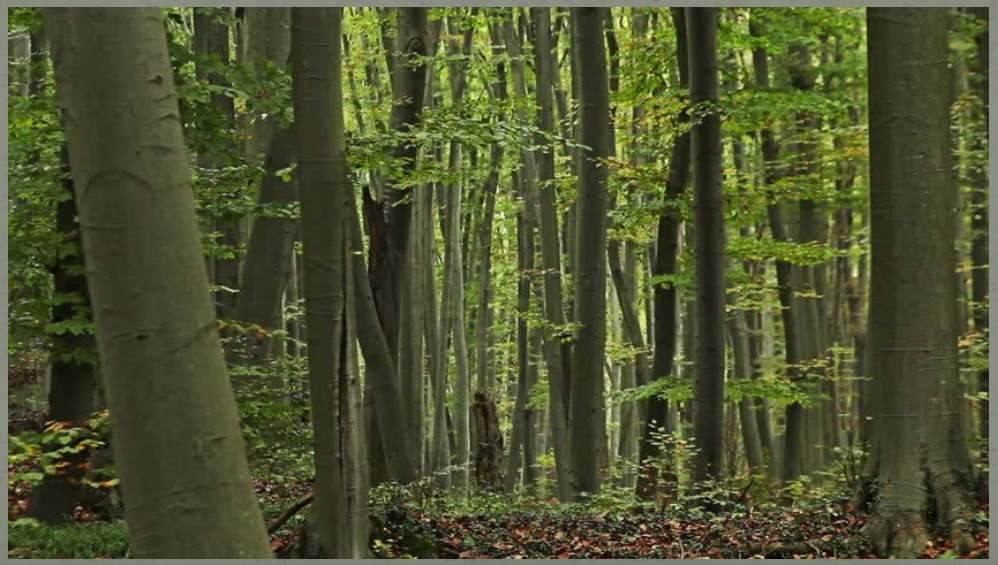
- Dominant: crown above the general level of the canopy
- Co-Dominant: trees with crowns that form the general level of the canopy
- Intermediate: shorter trees with crowns extending into the canopy. Usually have small/crowded crowns.
- Suppressed: trees with crowns entirely below the canopy level

Crown Classes

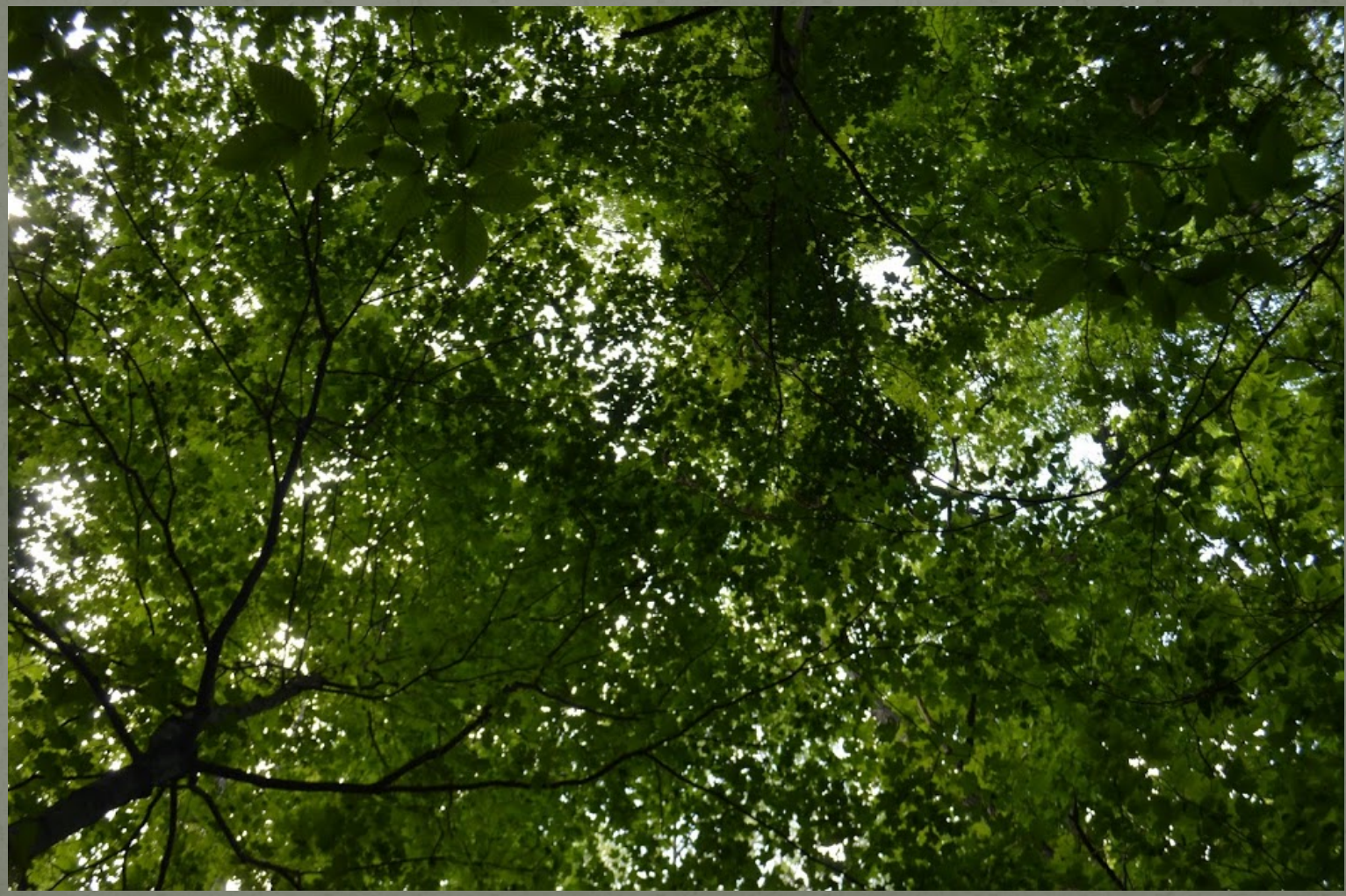


Shade Tolerance

- Tolerant: can survive and prosper under a forest canopy
- Intolerant: a tree that can thrive only in the main canopy or in the open



Canopy Cover



65% Canopy Cover

Silviculture

- The science and art of tending and regrowing a forest

- What is silviculture used for
  - Improve wildlife habitat
  - Manage watersheds
  - Mimic natural disturbance
  - Manage visual qualities of the forest
  - Maintain ecological conditions
  - Allow natural regeneration
  - Sustainable management of forest products
  - Agroforestry

Uneven or Even Age

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

Two-aged: a stand with trees of two distinct age classes separated in age by more than plus or minus 20% of the rotation age.

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.

What is **Not** Tending or Re-growing

- High Grading
- Diameter Limit Cutting
- Clearing
- Harvesting the most valuable species
- Leaving the least valuable species
- Altering forest composition toward poor trees for timber, wildlife, and biodiversity

Tending = Thinning

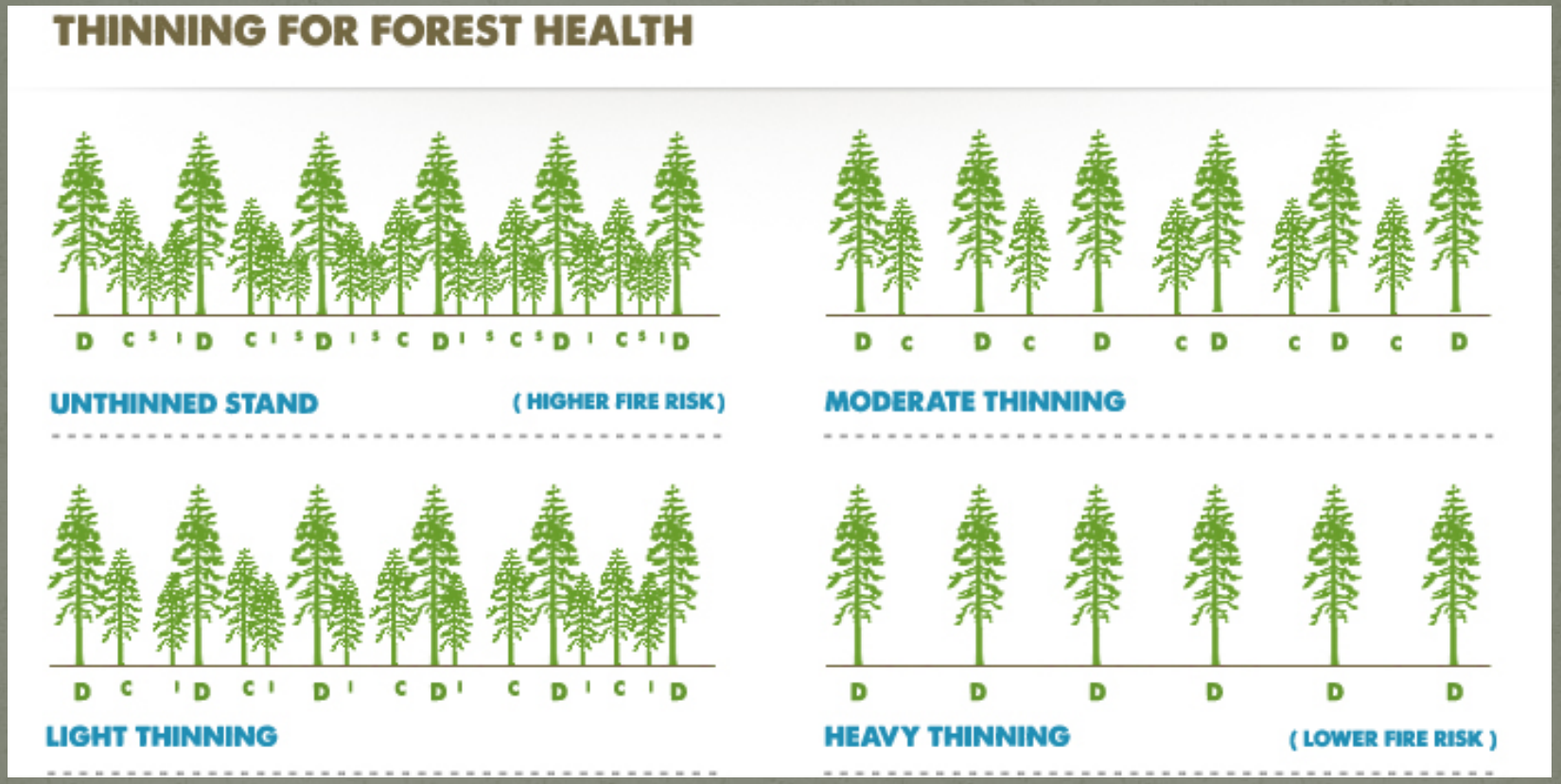
Tending – Thinning

- Cutting in immature forests with a closed canopy
- Canopy closure is not permanently broken
- Objective: shorten length of time to grow large trees by preventing density-dependent mortality

Why Tend Your Forest?

- Increases growth: 20% or more
- Enhances wildlife habitat
- More mast production
- Prevents stagnation
- Prevents disease
- Improves species composition
- Improves tree quality
- Maintains proper stocking
- Removes poor quality or poor form trees
- Counteracts past management - restoration

Thinning


THINNING FOR FOREST HEALTH
UNTHINNED STAND
(HIGHER FIRE RISK)
MODERATE THINNING
LIGHT THINNING
HEAVY THINNING
(LOWER FIRE RISK)

Types of Thinning

- Pre-commercial
- Commercial

Forest Stand Improvement

- Older stands
- Best opportunity to increase diameter growth
- Often best applied in stands with uniform size and quality
- Basal Area to be removed is determined by a forest inventory and optimal stocking
- Removes overstocked and poor quality trees to provide growing space

Thinning Methods

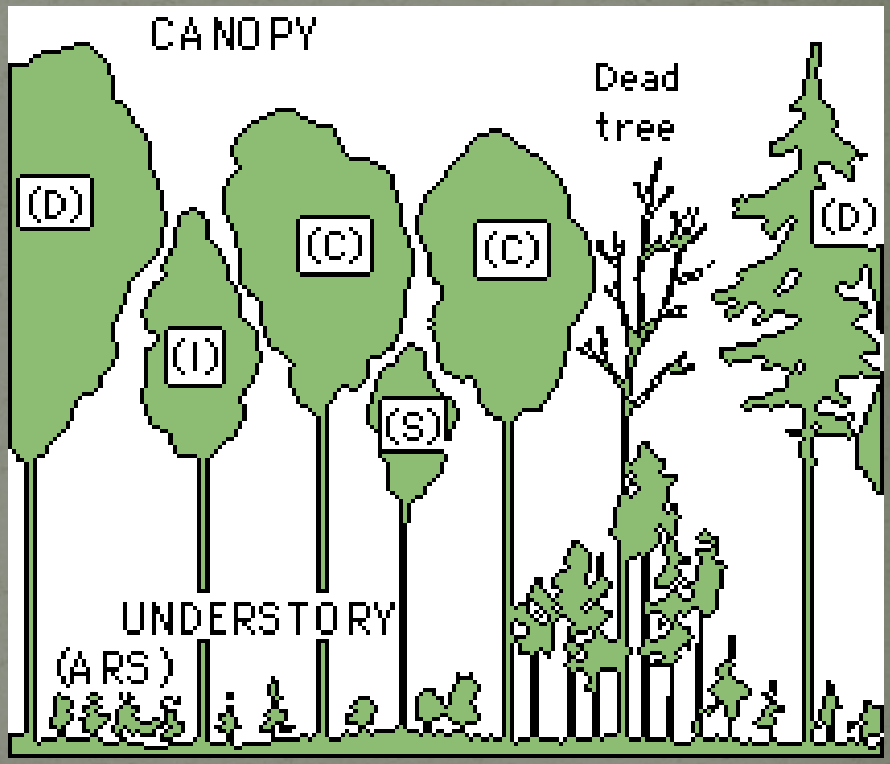
- Mechanical
- Low Thinning
- Crown Thinning
- Selection
- Free or Crop Tree Release

Tending should

- Increase light levels
- Makes the stand appear more uniform
- Leave some cavity trees
- Leave trees on the ground

Choosing Trees to Retain

- Dominant or Co-dimant
- Deep crown
- Unforked top
- Free of trunk injury or disease
- Appropriate species



Re-growing = Harvest

Harvesting does not always = Re-growing

Why Regrow a Forest?

- To release advance regeneration
- Regenerate shade intolerant trees
- Prevent loss of trees, shrubs, and plants from the site
- Resilience
- Diversity
- Revenue
- Sustainable Management

Considerations for re-growing a forest

- Control invasive species first
- Control shrub layer and midstory through Forest Stand Improvement (FSI)
- Fire can help control small competition
- Adequate seed crop is needed
- Shade intolerant species require adequate sunlight
- Other factors: deer browse, seed source, soils, etc.
- Aesthetics

Advance Regeneration

- A key to oak regeneration
- Oak seedlings that are 4-5’ tall
- Required before the overstory is removed
- Oak species need adequate sunlight to reach this stage

Even-age Natural Regeneration

- Clearcut: any opening large enough to regrow shade intolerant trees
  - Strip Cut
  - Patch Cut
- Seed Tree: 5-30 trees per acre left
- Shelterwood: 30-50 trees per acre left

Clearcut

Strip Cut

Patch Cut

Seed Tree

Shelterwood

A shelterwood harvest in an oak stand has stimulated regeneration.

Un-evenage Natural Regeneration

- Single Tree Selection: regenerates shade-tolerant species
- Group Selection: .5 to 2 acre openings

Single Tree Selection

Single-tree and group selection harvest methods cause the least change in the visual appearance of a woodland, but they regenerate only shade tolerant species

Photo © Mel Baughman

Group Selection

How to Harvest

- Hire a consulting forester to:
  - Use silviculture to re-grow your forest
  - Mark all trees that will be cut
  - Determine the volume being sold
  - Solicit for competitive bids
  - Plan operations – skid trails
  - Setup a contract
  - Oversee the harvest


JOHN DEERE
440C