

Silviculture

Art & science of establishing & tending trees & forests

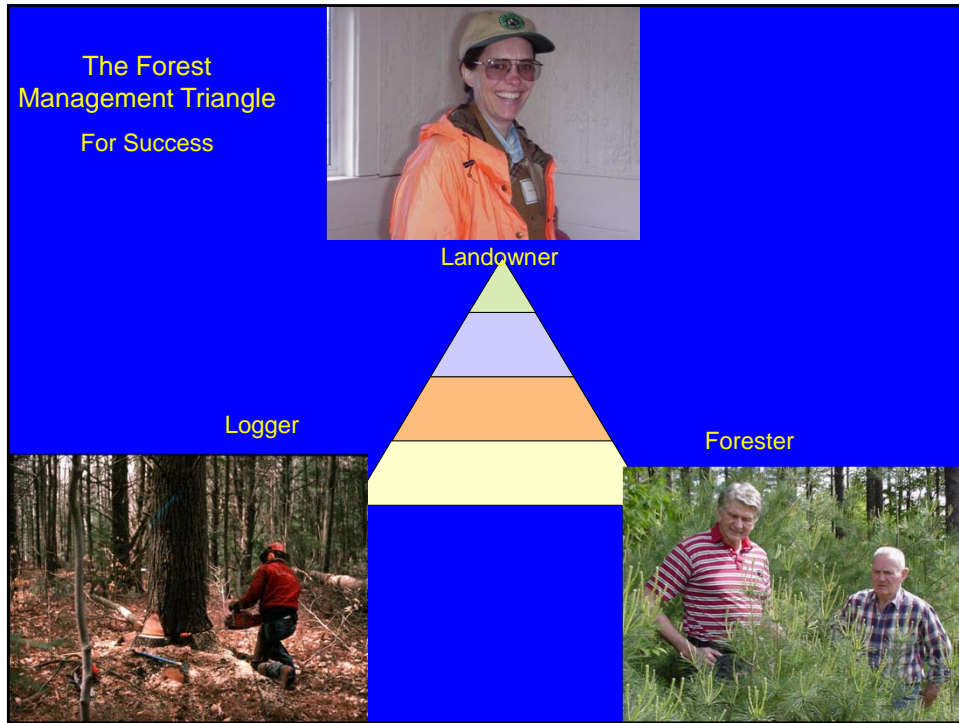


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Presented to NH Coverts, September 2011



Silviculture Actions Have Two Broad Outcomes

- Grow the trees that are already present
 - tending
- Start new trees
 - regenerate
- In practice, often accomplish both outcomes at once
- Most common actions- cut trees or leave trees

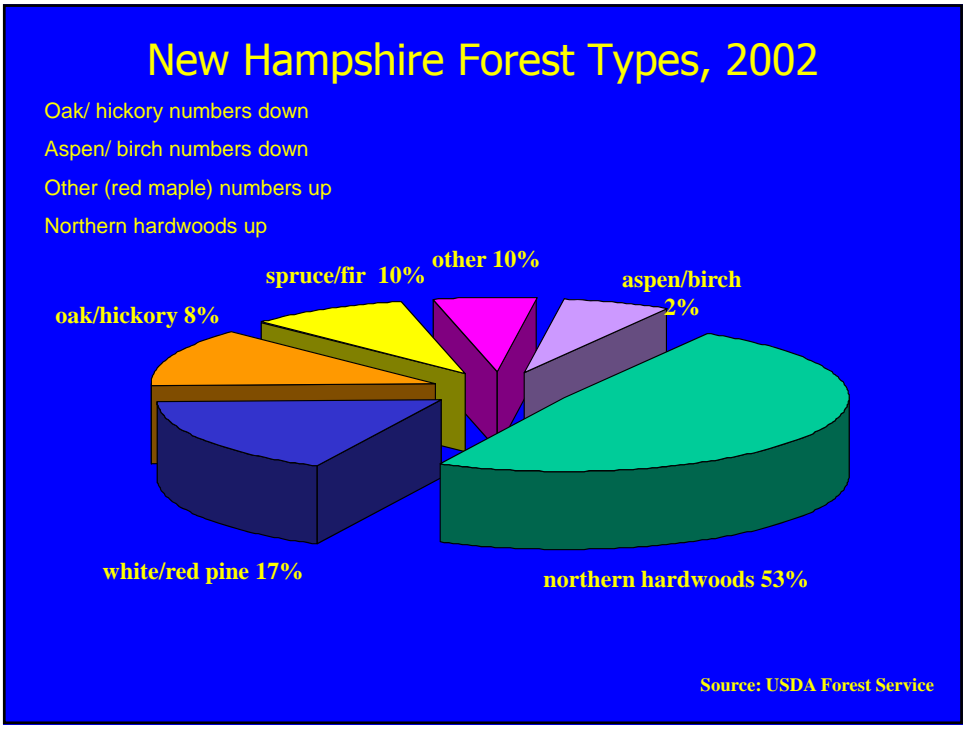


Hallmarks of Good Forest Stewardship/ Management

- Considers multiple resources
- Based on landowner objectives
- Uses best available practices
- Practices based on a plan
- Looks long term
- Uses professionals
- Uses best available science- SILVICULTURE

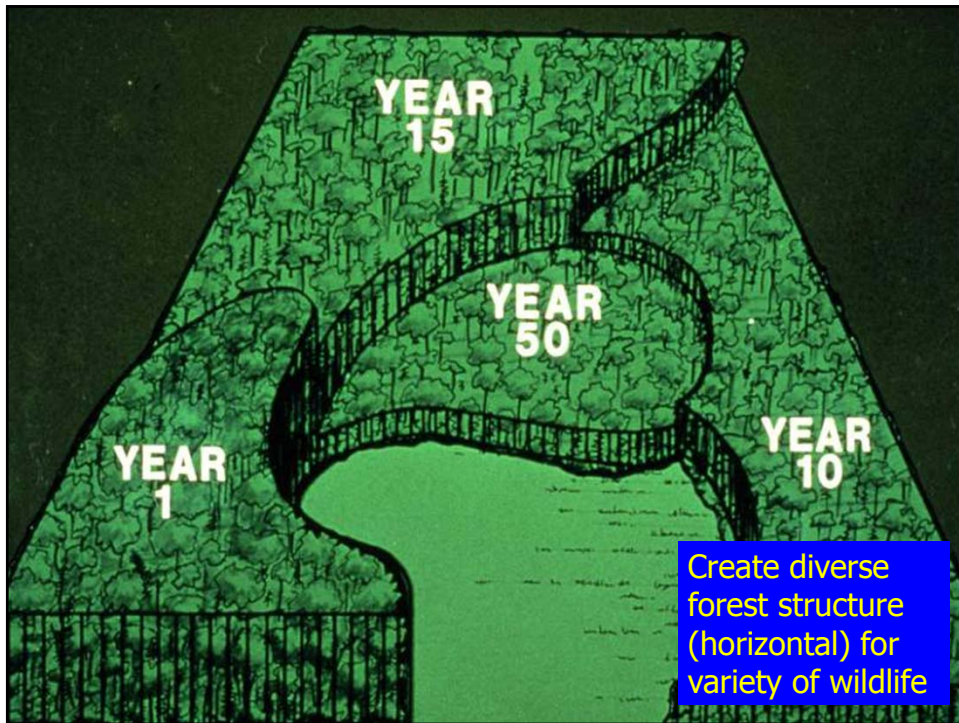
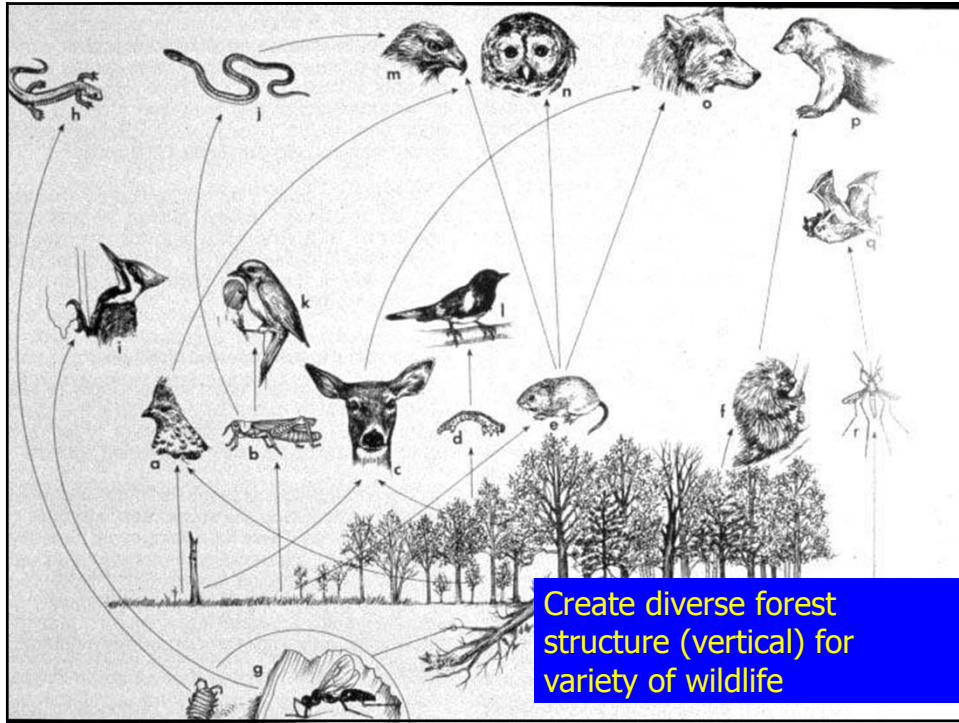
GOOD FORESTRY
in the Granite State:
Recommended Voluntary
Forest Management
Practices for
New Hampshire

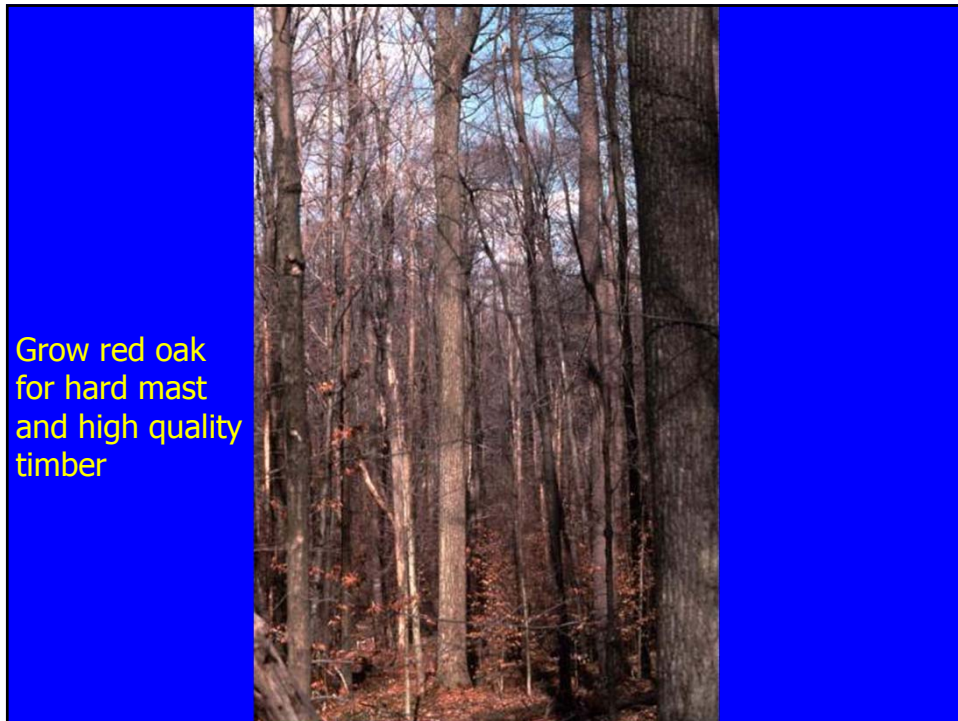
Presented by The Good Forestry in the Granite State Steering Committee

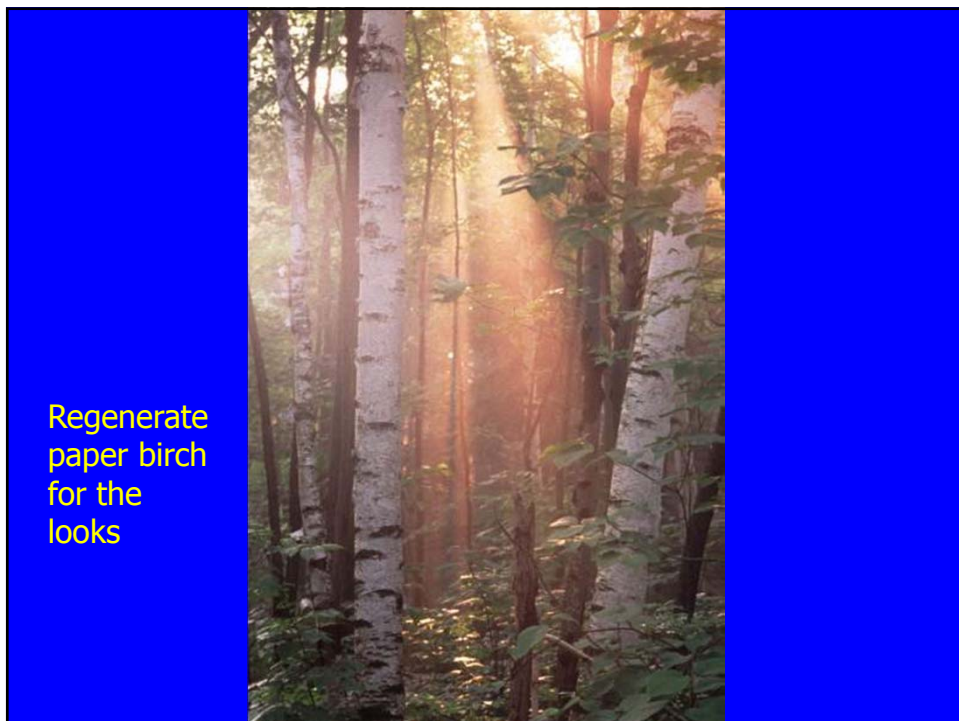


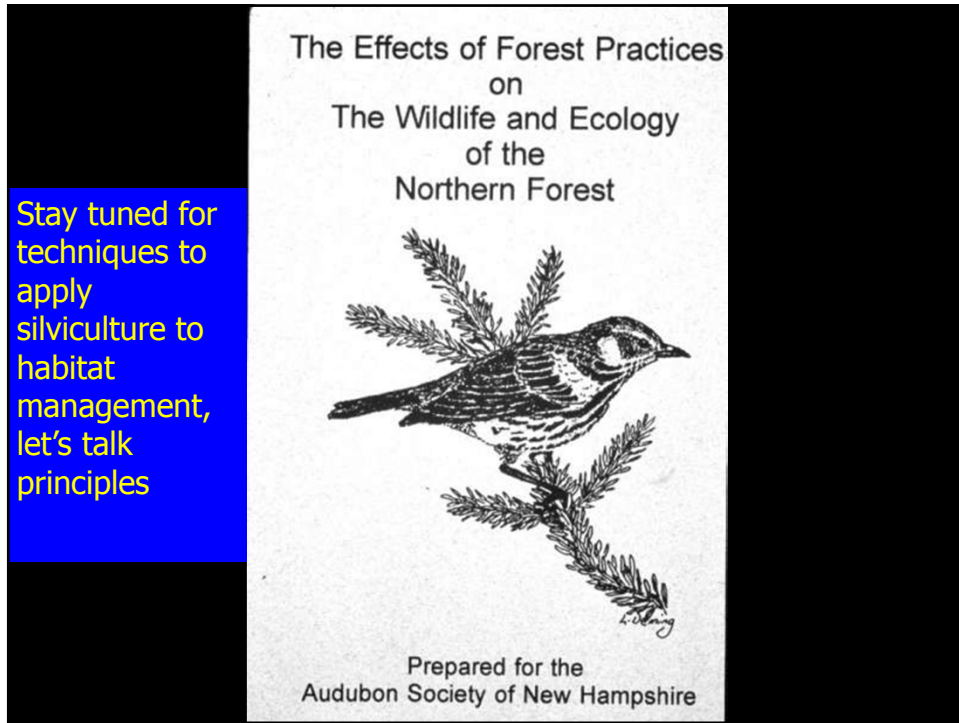




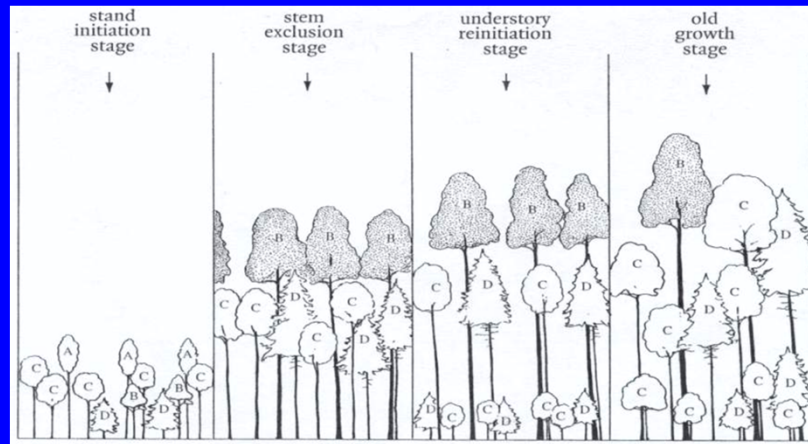






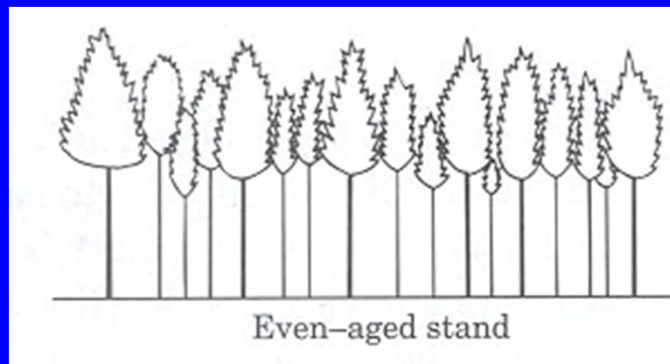


Stands will proceed through each stage in absence of disturbance



By harvesting, we can alter stand composition and structure to encourage desired habitat conditions

Many of Our Forests Are Even-Aged



- Trees about same height
- Diameters are different, yet trees are same age
- Large diameter trees aren't necessarily older
 - Diameter not a good predictor of age
- Uneven-aged stands go through same stages of stand development made up of a lot of little even-aged

Intermediate Activities (Tending)

- Thinning (weeding and thinning, crop tree release)
- Improvement Cutting
- Release
- Pruning



Goal of Intermediate Practices

- Tending the crop
- Limited effect structural diversity
- Young to "middle age" stands
- Improve the existing stand quality
- Provide money, products such as firewood
- Remove insect/diseased trees
- Regeneration not goal- openings too small to encourage germination and sustain seedling/sapling growth

Intermediate Cuttings- Release

(liberation, cleaning, weeding, tsi or timberstand improvement)

- Improve composition of young stands
- By removing poor quality trees growing over/competing with them
- Probably no product maybe firewood
- 0-20 years
- 0- 4 inches DBH (seedling/sapling)



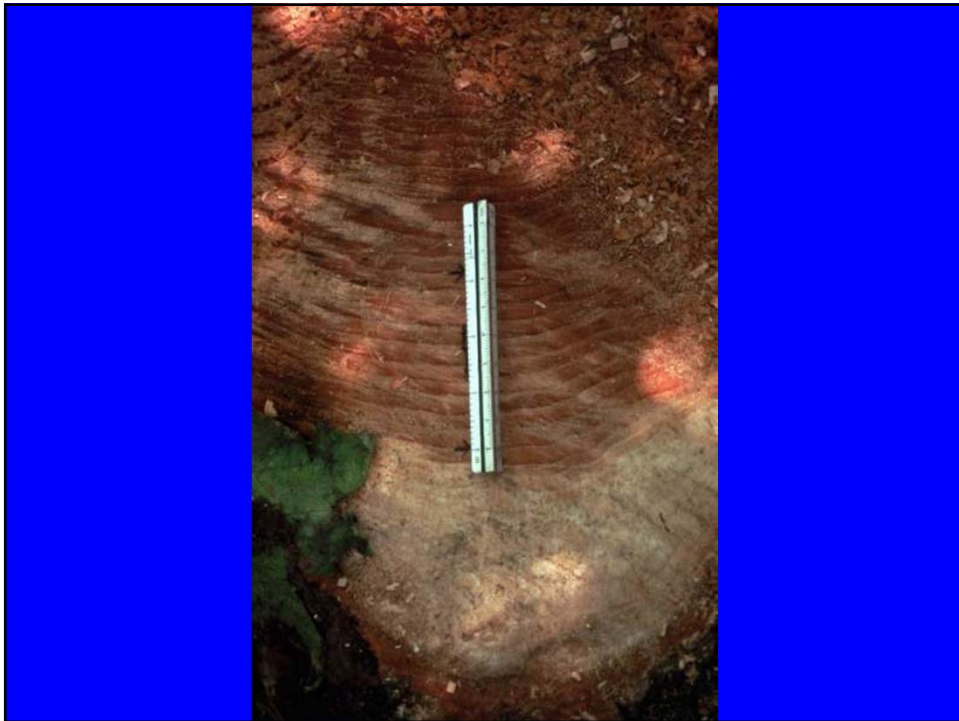


Intermediate Cuttings- Thinning

(weeding and thinning, tsi or timberstand improvement)

- Increase growth of specific trees (crop trees)
- Remove trees deemed less desirable
- 20-50+ years
- 4-10 inches DBH (pole size)
- 10- 16 inches DBH (small sawlog)
- Product firewood



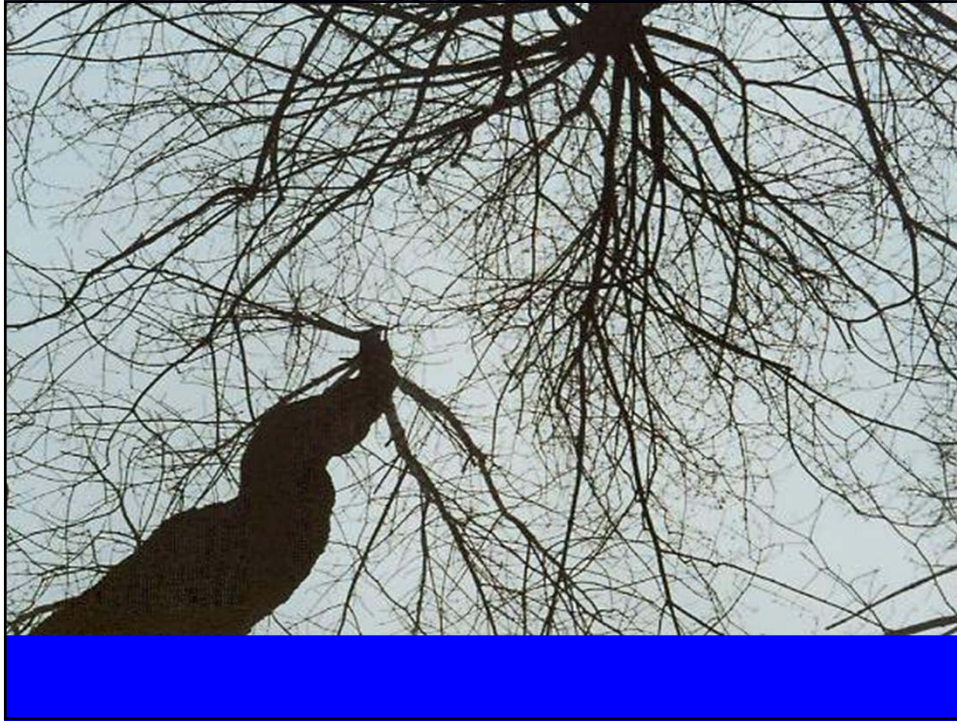


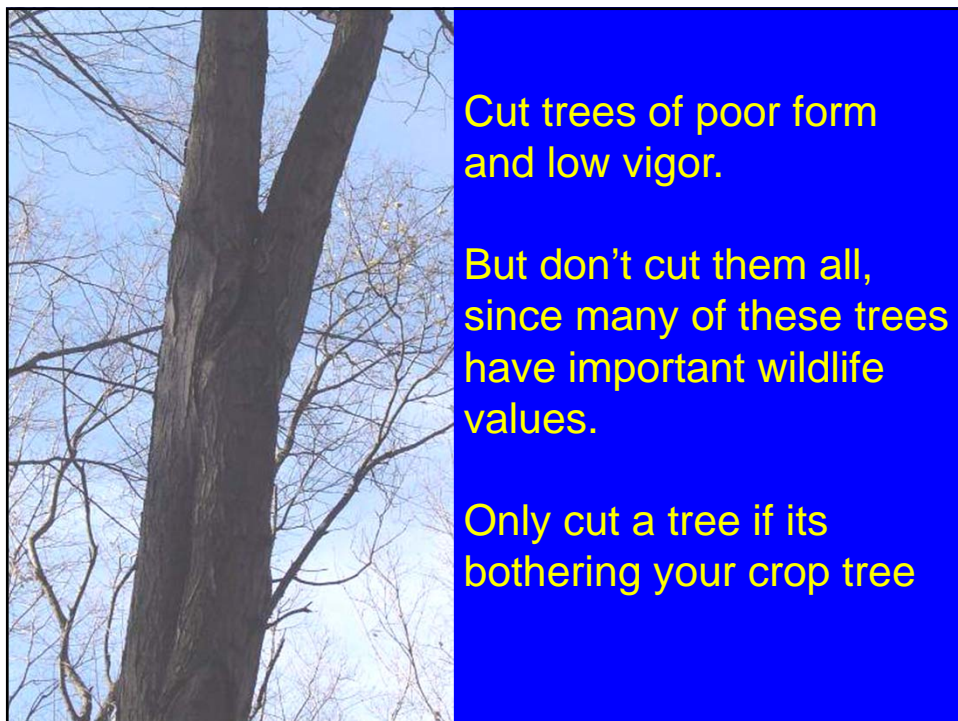
Mark Your Trees to Cut and Leave

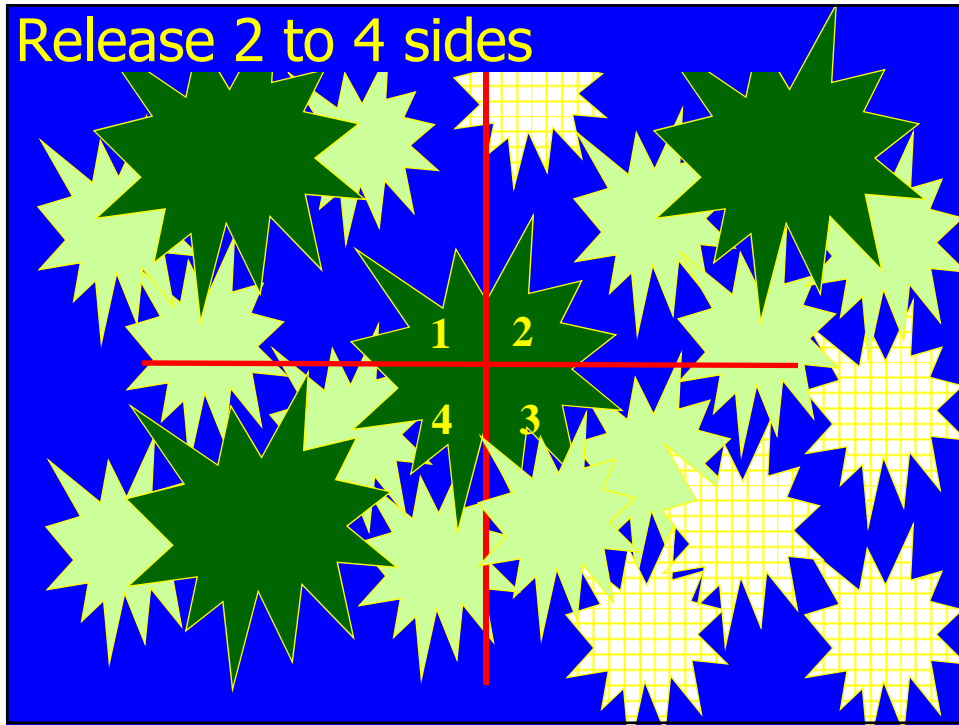


What I do for when I choose trees to cut

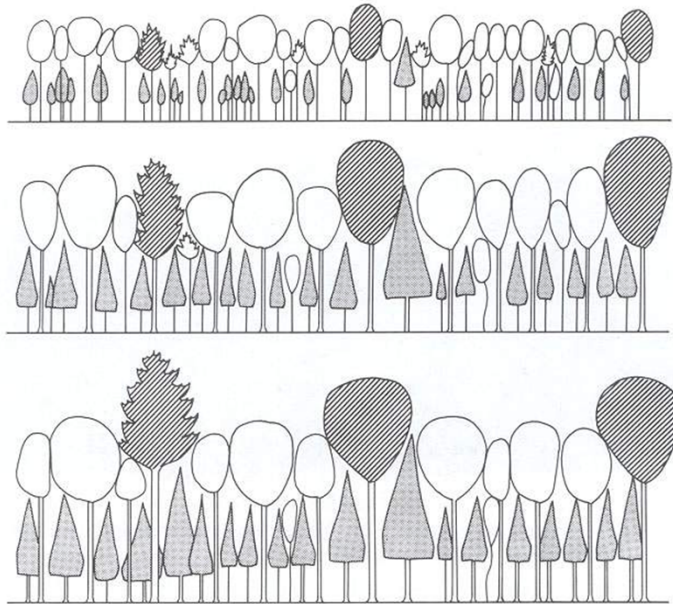
- Look for the trees I want to grow
 - Species – Most valuable for timber- keep options open to cut for timber in the future
 - Healthy – look up at the top, trees with the largest tops relative to their neighbors
 - Relatively straight, with at least one log before trunk forks (maintains option to cut timber in the future)
- Remove trees touching their top





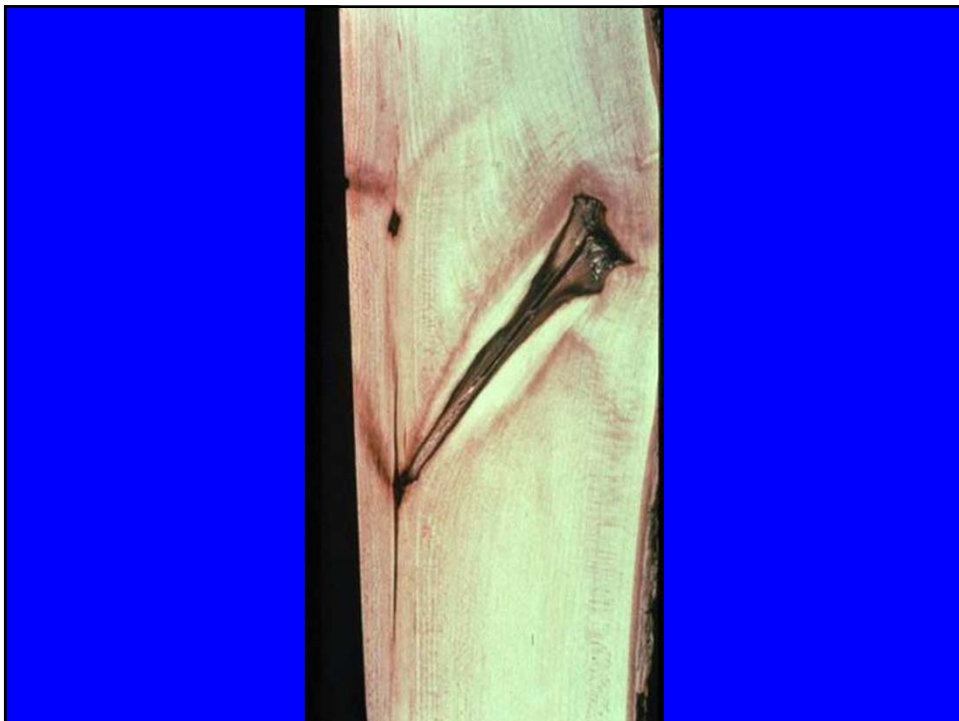
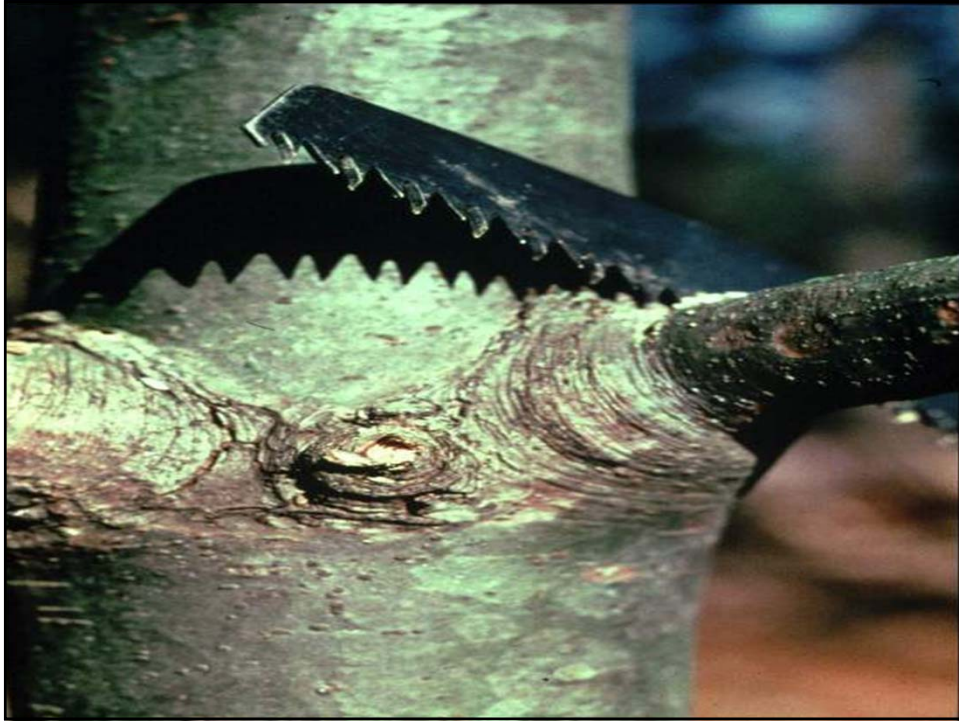


Leave Healthy Trees



Intermediate Cuttings- Improvement Cuttings

- Similar to thinning only trees larger
- 10-20 inches DBH, 50+ years
- Firewood and low grade sawlogs
- May promote regeneration
- Some even consider this an uneven-aged technique



Regeneration (seedling or sprouts)



All about manipulating light

Timing of the harvest is important:

- In terms of the life of the stand- and-
- In terms of time of year

Which silvicultural technique use depends on:

- species present
- species want
- site capability



Advanced regeneration

- presence of seedlings/saplings
- red oak, white pine, red spruce, hemlock, balsam fir, sugar maple

Sprouts

Most hardwood species
stump sprout

especially important for
regenerating red maple and
red oak



Aspen and Beech
root sucker/clone

Softwoods do neither and must be
regenerated from seed

Planting after you cut trees?

We don't need to
Most of our
forests
regenerate
rapidly on their
own after cutting



Scarification

Disturb the soil- not very deep- mix leaf litter with mineral soil

To create a seedbed for regeneration

Usually during logging

Absent snow, drier time of year

In the absence of advanced regen

In a good seed year

White pine, red oak, yellow birch, hemlock



Remember tree tolerance: Opening size important in determining which species will regenerate.

Opening size determines amount of light in the opening



Small Openings



If want to grow tolerant trees, use system casts less light on the ground

- hemlock
- balsam fir
- beech
- sugar maple

Shade tolerant species

Larger openings

If want to grow intolerant trees, use system casts more light on the ground



- birch
- aspen
- white pine
- red oak

Shade intolerant (and mid-tolerant) species

Softwoods		Hardwoods	
Extremely Tolerant			
balsam fir		American beech	
eastern hemlock		sugar maple	
Tolerant			
red spruce	white spruce		red maple
	northern white cedar		
Intermediate			
eastern white pine		white ash	red oak
		yellow birch	
Intolerant			
red pine			paper birch
Extremely Intolerant			
			aspen

Site & Soil Suggest Species to Grow

• white ash, sugar maple	➔	• moderate well drain & enriched fine texture
• beech	➔	• sandy tills
• red oak	➔	• sandy tills & outwash
• white pine	➔	• outwash & sandy tills
• red spruce, hemlock, balsam fir	➔	• shallow pan, poorly drained, outwash, shallow to bedrock

Silvicultural Systems

Regeneration Techniques

Uneven age

- Single tree selection
- Group selection



Less light

- On ground
- Tolerant trees

Even Age

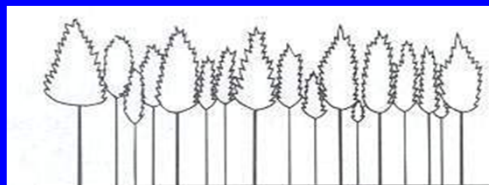
- Shelterwood
- Seed tree
- Clearcut



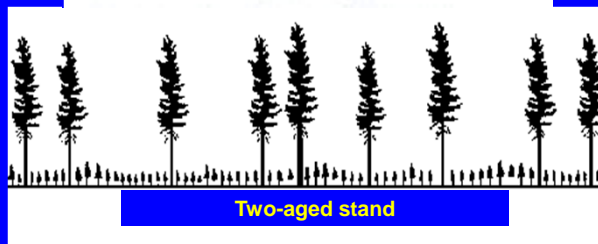
More light

- On ground
- Intolerant trees

Two age- from a partial cutting scheme such as shelterwood or group selection. May be temporary.



Even-aged stand



Two-aged stand



Uneven-aged stand

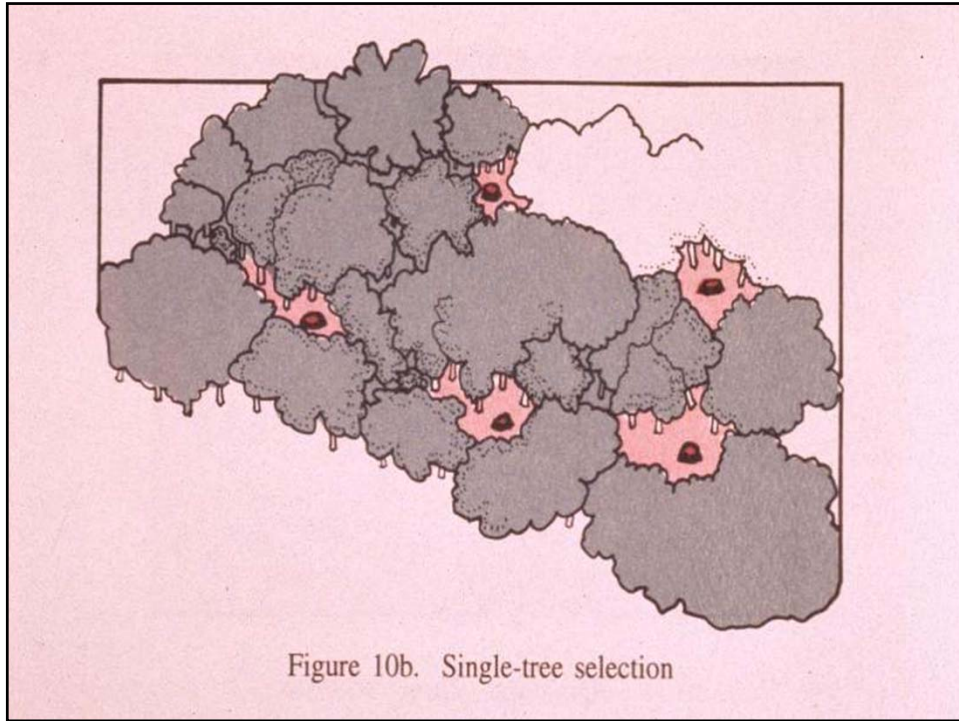
Silvicultural Systems

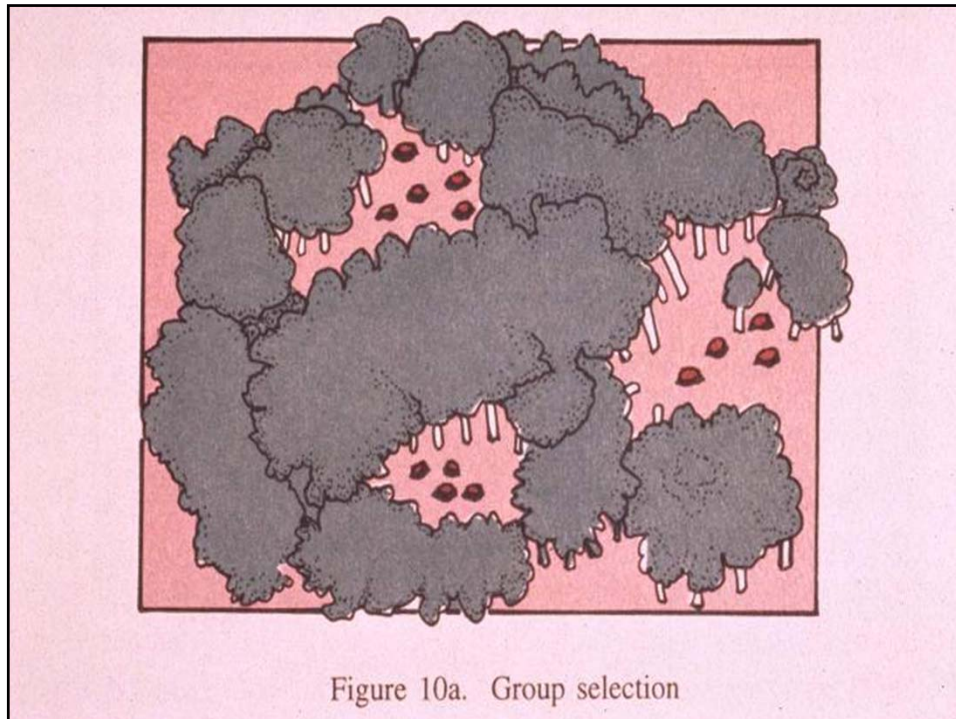
Uneven-Aged Management

- Single Tree Selection
- Group Selection

Single Tree Selection

- At least 3 distinct age classes free to grow
- Achieved by a series of harvests
- Mature and low quality trees cut in all sizes
- Regenerate tolerant species
- Maintains a mature canopy
- Maintains a close canopy and vertical structure- a wall of green
- Beech, sugar maple, red spruce, balsam fir, hemlock
- Diameter limit cutting is a NO NO





Group Selection

- 1/4 to 1/2 acre groups cut
 - Up to 2 acres
- Can think of approaching patch clearcuts
- For regenerating intermediate tolerant species (red oak, white pine)

Group Size Openings



Opening Size
(diameter of circle)

1/20 acre	52 foot
1/10 acre	75 foot
1/5 acre	105 foot
1/4 acre	117 foot
1/2 acre	166 foot
2/3 acre	200 foot
1 acre	234 foot





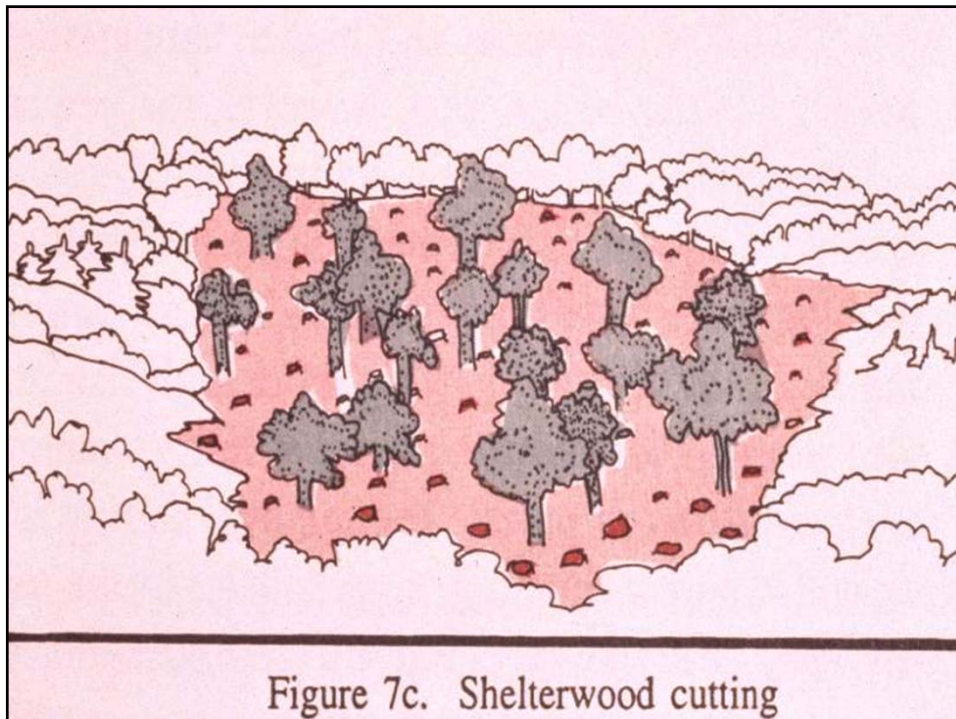
Silvicultural Systems

Even-Age Management

- Clearcut
- Shelterwood
- Seed Tree

Shelterwood

- Series of harvests to regenerate
- Harvest removes smaller trees, leaving trees to provide correct light conditions and seed source
- Cutting can look light to heavy
- Heavier shade regenerates tolerants (red spruce or hemlock)
- Lower amounts of shade regenerates intermediate tolerants (red oak and white pine)
- Cut overstory when understory regenerated- may be in multiple stages





First cut-
- no advanced
regeneration
-leave overwood for
shade and seed

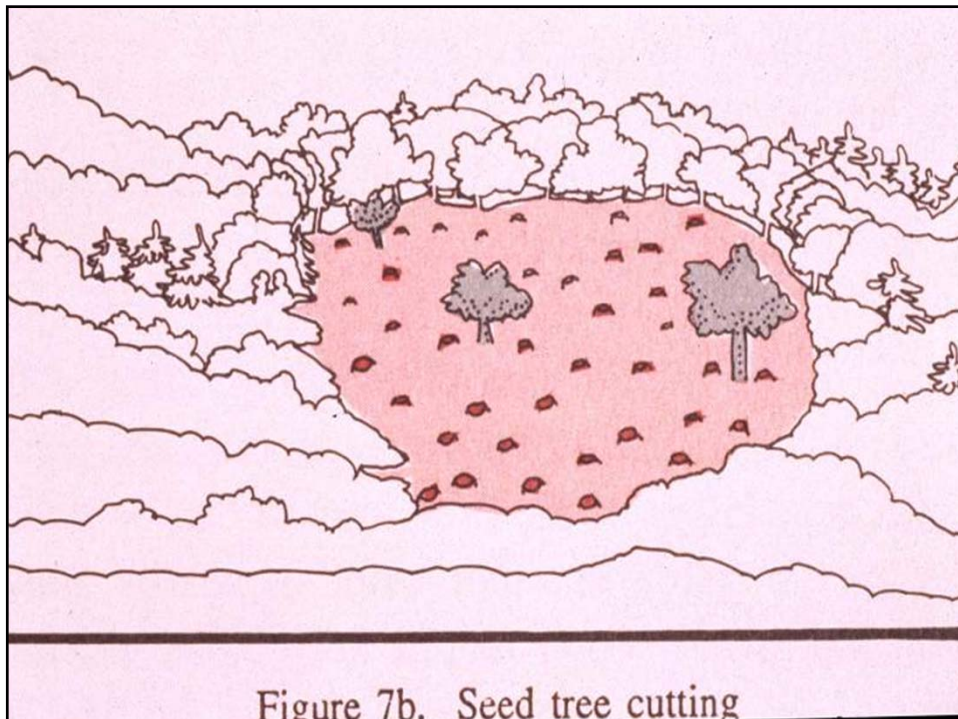


Sometimes looks like
selection- difference is timing
of final cut of big trees



Seed Tree

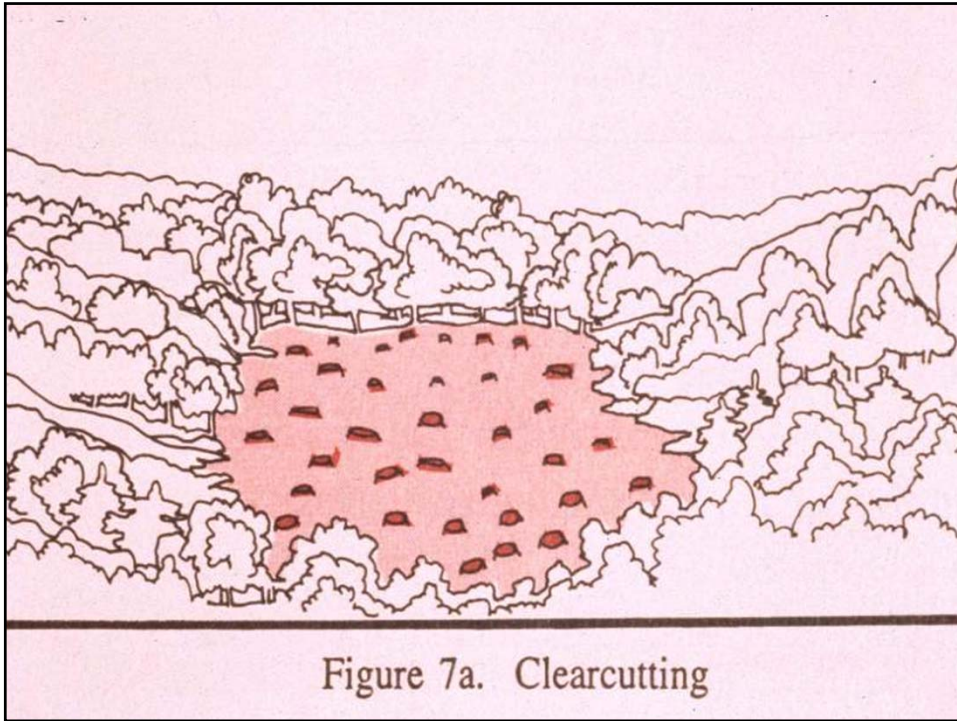
- Leave 5-10 desirable trees per acre
- For seed, visual relief
- Good source for future snags and super canopy trees
- May leave these for entire rotation





Clearcut

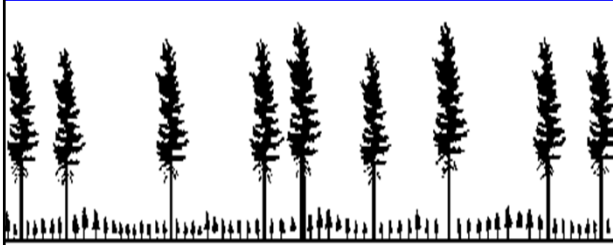
- Cut everything 2" and greater
- Size depends on objectives and ownership
- Variations- patches and strips
- Regenerates
 - intolerant (paper birch, cherry, aspen/poplar)
 - intermediate (yellow birch and red oak)
 - tolerants with advanced regeneration





Two-aged stands

Seed tree cuts, deferred shelterwoods, shelterwood with reserves, clearcuts with reserves can be considered two-aged stands as long as some of the original overstory trees remain in the stand



Two-aged stand

Can enhance vertical and horizontal diversity by varying the spatial pattern of the cutting and by leaving some permanent reserve trees

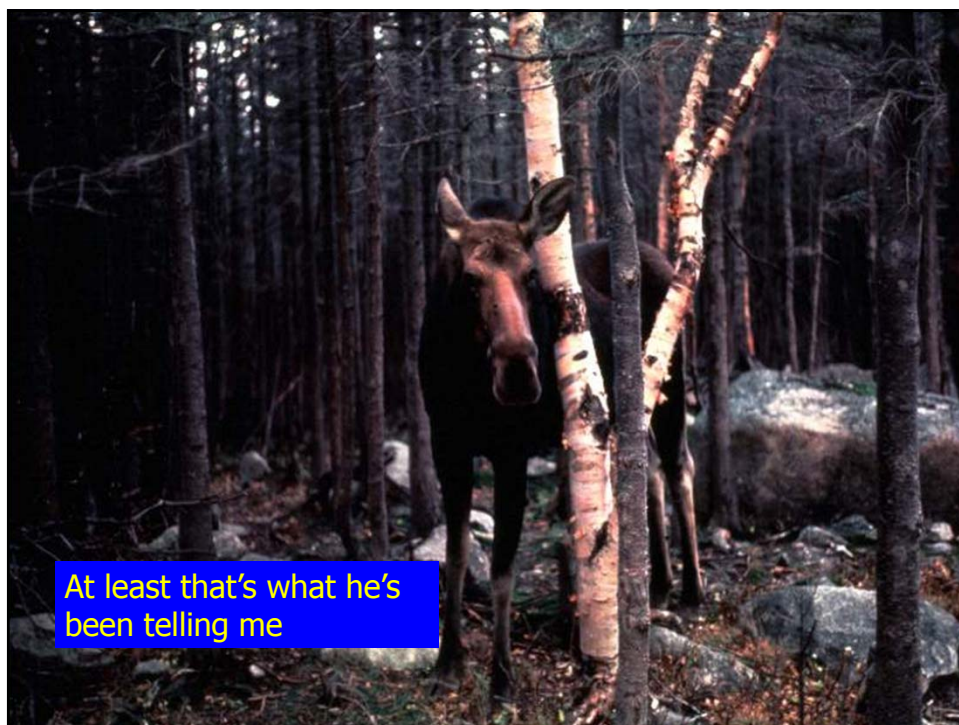
Common practice on private land to retain some of the overstory trees indefinitely for aesthetics, wildlife trees, future woody debris



Stay tuned for applying these and other techniques to habitat management



Matt's gonna tell you
everything you need to
know



At least that's what he's
been telling me