



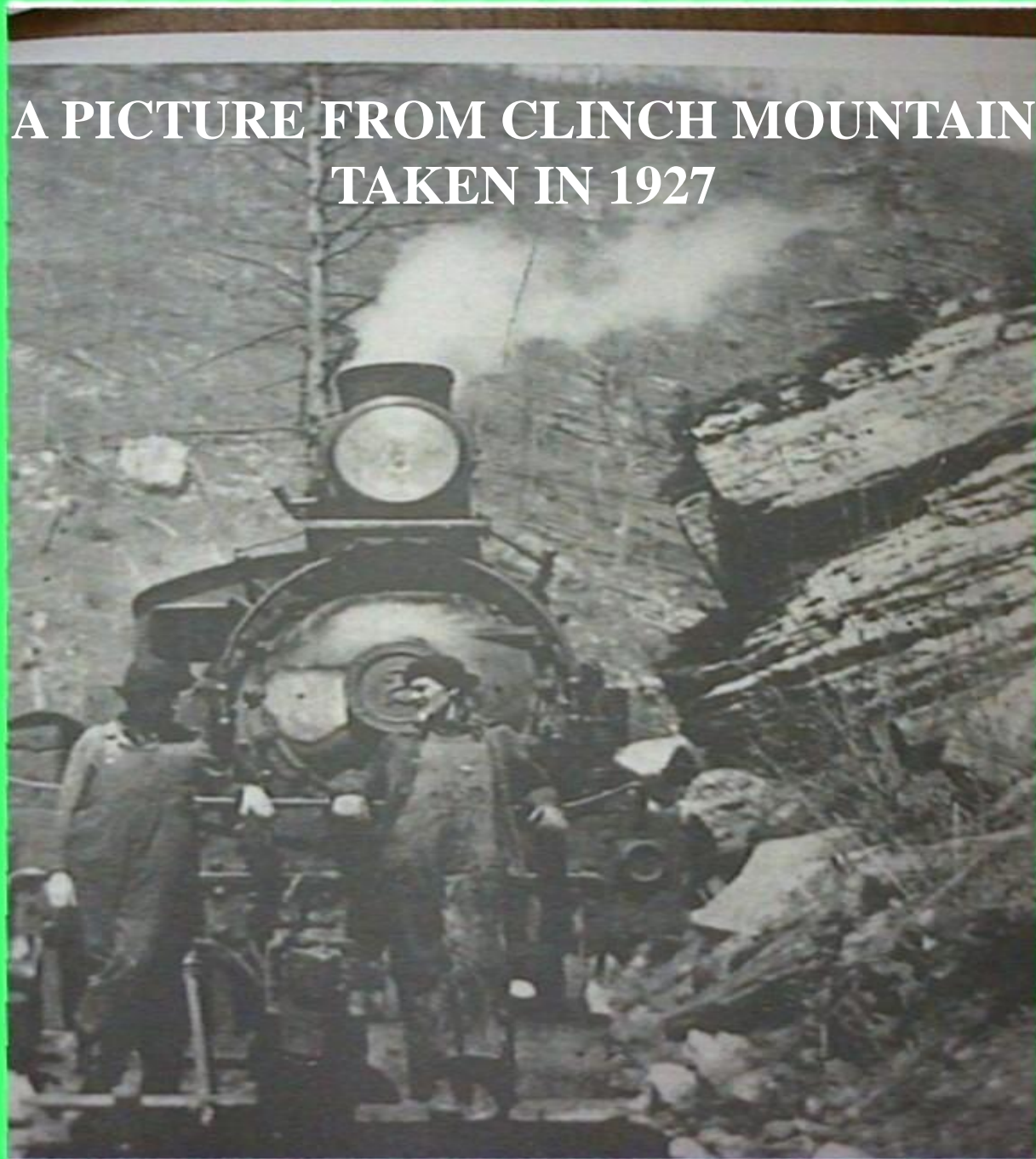
Sustainable Forestry and Harvesting in Southwest Virginia

**Bill Worrell
Extension Agent
Forestry & Natural Resources**

How can America have the wood and paper products it needs today while protecting the environment and ensuring that future generations have the same abundant resources?



A PICTURE FROM CLINCH MOUNTAIN
TAKEN IN 1927



**THE SAME POINT ON CLINCH
MOUNTAIN AS IT LOOKED IN 2000**



**DOWNHILL FROM THE
SAME SPOT**



Ecology



Succession

- Succession is the gradual process of one plant community replacing another one over time
- Stand initiation
- Stem exclusion
- Understory re-initiation
- Complex



Shade-tolerance

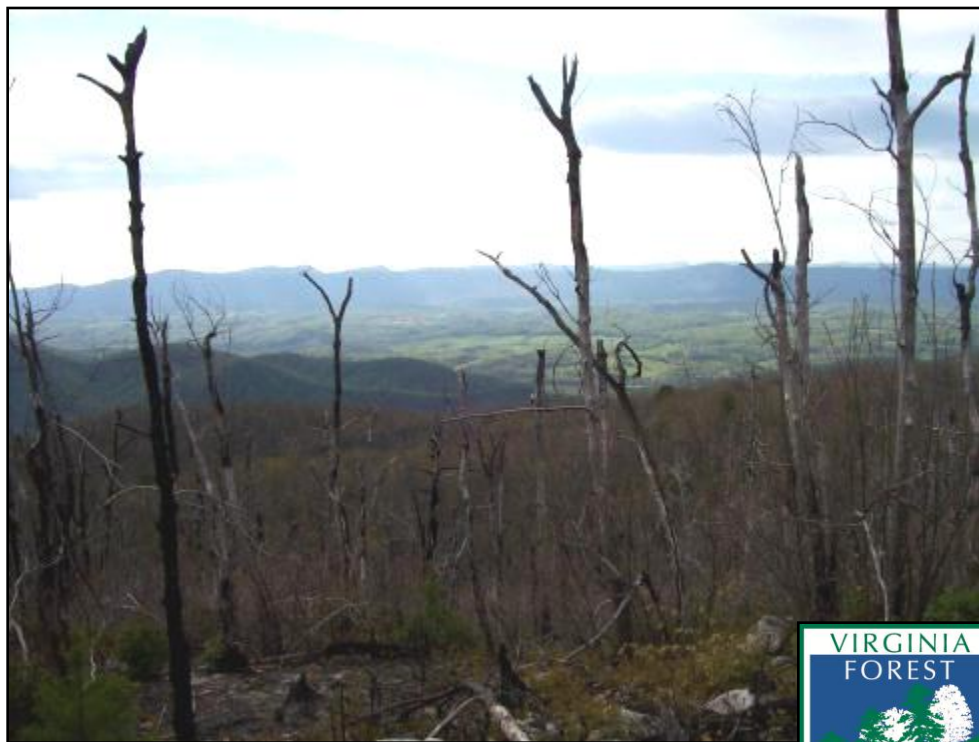
Tolerance is the ability of a species to survive and grow under limited light conditions

- Tolerant
 - Eastern hemlock, dogwood, maples, beech
- Intolerant
 - Most pines, black locust, black cherry, yellow poplar, black walnut
- Intermediate
 - White pine, most oaks, white ash, hickories



Disturbance

- Large-scale
 - Set back succession to regeneration stage
 - Occur infrequently
 - Changes are drastic & immediate
 - Stand-replacing
 - Hurricanes
 - Ice storms
 - Wildfires
 - Clear cuts
 - Insects/diseases



Disturbance

- Small-scale
 - Individual or small group mortality
 - Age, insects, disease, injury
 - Gap creation
 - Increase in sunlight (temporary?)
 - Increase in soil moisture (temporary?)
 - Temperature
 - Wind/snow patterns
 - Intolerant pioneer species fill in

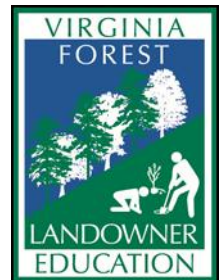
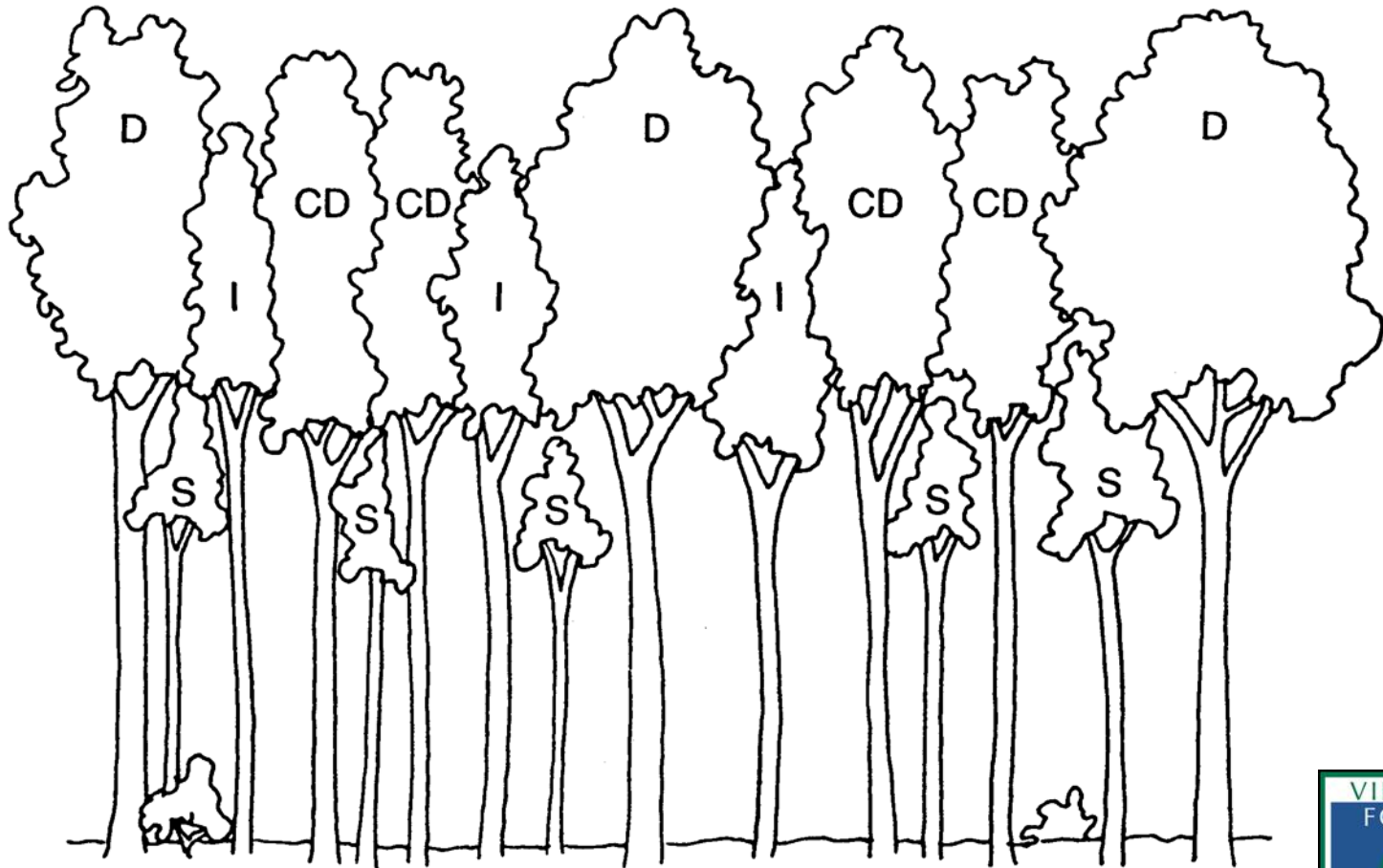


Forest Structure

- Understory
- Midstory
- Overstory
 - Crown class



Forest Structure



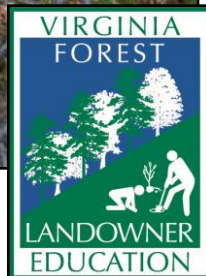
Forest Structure/Composition

- Even-aged
- Uneven-aged
- Two-aged
- Pure
- Mixed-species



Ecology

Forest structure and composition are complex and ever-changing



Management

- Silviculture
 - Art & science of managing a stand of trees to meet specific management objective
 - Includes harvesting, regeneration, and all intermediate treatments (thinning, TSI, etc.)
 - Valid silvicultural systems plan for the future health and productivity of the stand



Management

- Valid silvicultural systems include:
 - Shelterwood (and irregular shelterwood)
 - Seedtree
 - Clearcut
 - Selection (group & single tree)
 - A select(ive) cut is **NOT** a valid silvicultural system - it is high-grading!
- Visual Guide to Timber Harvesting
 - www.forestandrange.org



Shelterwood & Seedtree

- Even-aged
- Prep cut, establishment cut, removal cut
- Preserves seed source until adequate regeneration est.
- These trees continue to grow
- Shelterwood also provides shelter for seedlings
- Tolerant/moderately tolerant species



Silvicultural Clearcut

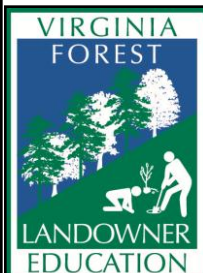


- Even-aged
- Remove all overstory trees (including non-commercial stems)
- Advanced regeneration (natural) or plant seedlings or seed (artificial)
- Shade intolerant species (loblolly pine)



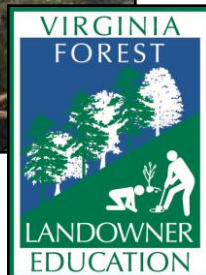
Selection

- Single tree and group selection
- Remove the WORST and leave the BEST
- Natural or artificial regeneration in openings
- Shade tolerant/intermediately tolerant/intolerant
- Uneven-aged



Intermediate Operations

- Intensive versus extensive
- Competition control
- Fertilization
- Timber stand improvement/thinning
- Crop tree release
- Prescribed fire
- Do nothing



Harvesting Systems



Animal Logging

- Less than 20% slope
- Small piece size
- Size, weight, & number of animals dictate payload capacity
- Short skidding distances



Skidder logging

































Cable Logging



















