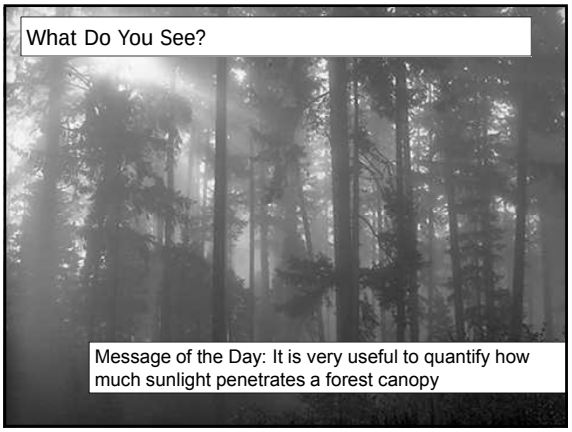
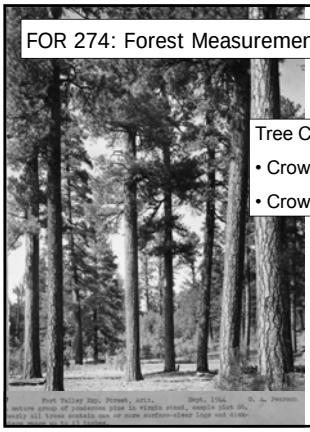
What Do You See?



Message of the Day: It is very useful to quantify how much sunlight penetrates a forest canopy

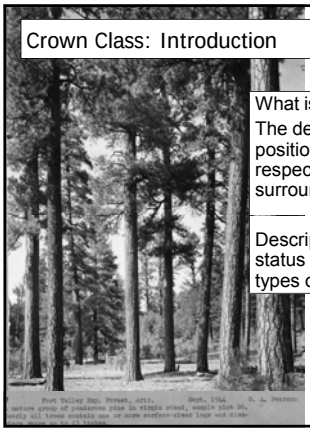
FOR 274: Forest Measurements and Inventory



Tree Crowns

- Crown Class
- Crown Size

Crown Class: Introduction

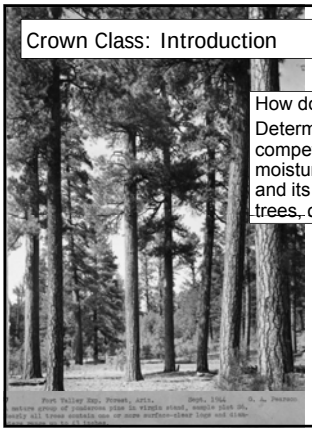


What is Crown Class:

The description of the relative position of the tree crown with respect to competing vegetation surrounding the tree

Descriptors of the competitive status of trees in all structural types of stands

Crown Class: Introduction



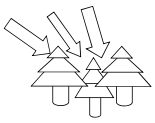
How do we Measure Crown Class:

Determined in the context of competition for sunlight or moisture between the subject tree and its immediate environment, trees, or shrubs

Crown Class: Introduction

How do we Measure Crown Class:

Base your classification on how much light the tree's crown is receiving, not its position in the canopy

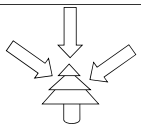


Crown Class: The Classes

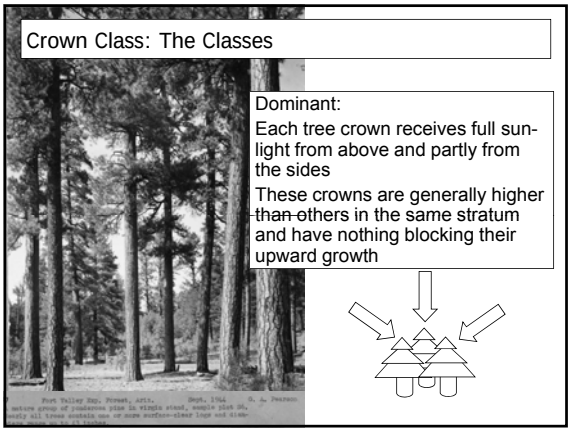
Open-grown or Isolated:

Each tree crown receives full sunlight from both above and from all sides

In even-aged stands, these trees are characterized by crowns that are well above the main canopy height



Crown Class: The Classes

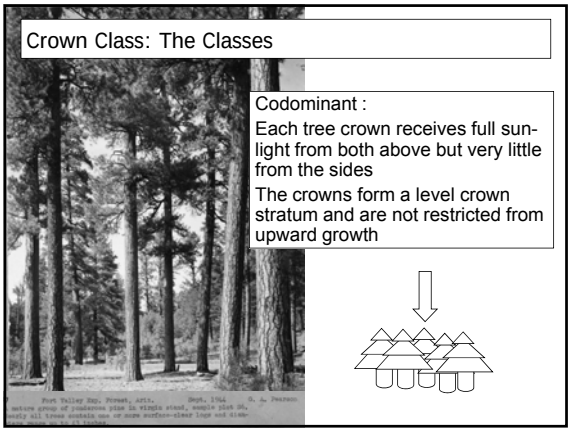


Dominant:

Each tree crown receives full sunlight from above and partly from the sides

These crowns are generally higher than others in the same stratum and have nothing blocking their upward growth

Crown Class: The Classes

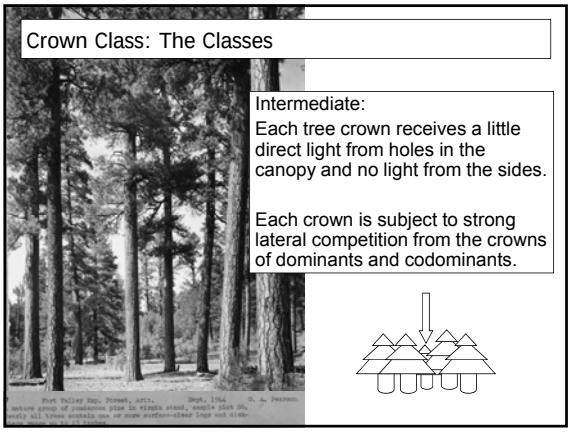


Codominant :

Each tree crown receives full sunlight from both above but very little from the sides

The crowns form a level crown stratum and are not restricted from upward growth

Crown Class: The Classes

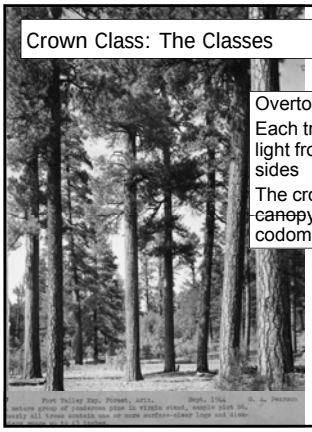


Intermediate:

Each tree crown receives a little direct light from holes in the canopy and no light from the sides.

Each crown is subject to strong lateral competition from the crowns of dominants and codominants.

Crown Class: The Classes

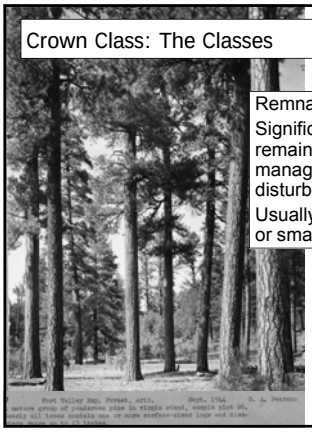


Overtopped:

Each tree crown receives no sunlight from either above or from all sides

The crowns are entirely below the canopy stratum of dominant and codominant trees

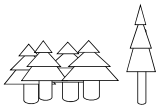
Crown Class: The Classes



Remnant:

Significantly older trees that remain from a previous management activity or a disturbance event

Usually isolated individual crowns or small clumps

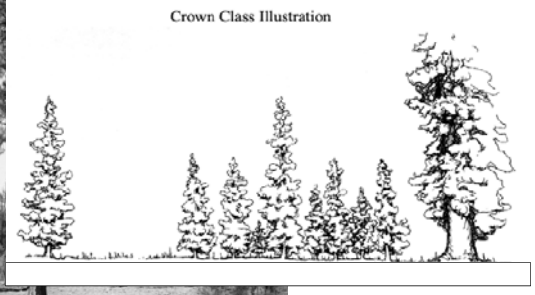


Crown Class: The Classes

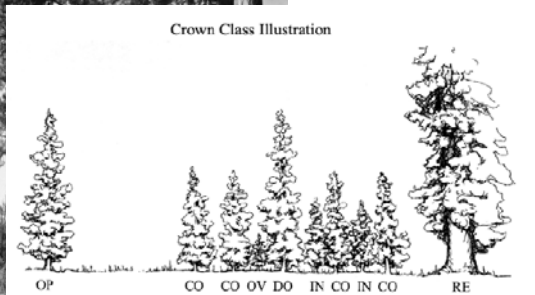
Others:

Leader Above Brush	The terminal leader of the tree is above the surrounding brush while the middle or lower crown may be within the brush canopy.
Leader Within Brush	The terminal leader and upper crown of the tree is within the brush canopy.
Leader Overtopped by Brush	The crown of the tree is completely overtopped by the surrounding brush. Brush cover crown classes only apply to isolated or dominant trees with brush competition; therefore, brush cover crown class codes are used as modifiers for open-grown or dominant trees. Competition from adjacent trees is more important than competition from shrubs if they both occur. Generally, brush cover crown codes are used in stands where overstory tree competition is absent.

Crown Class: What would you record?



Crown Class: What would you record?

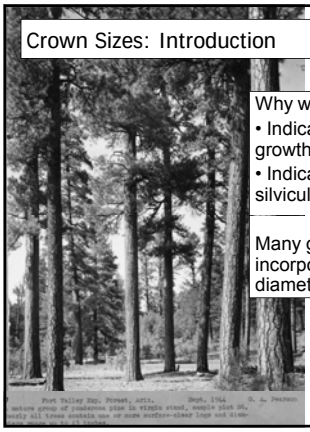


FOR 274: Forest Measurements and Inventory

Tree Crowns

- Crown Class
- Crown Size

Crown Sizes: Introduction

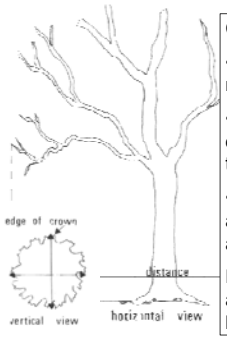


Why we measure crown sizes:

- Indicator of productivity and growth
- Indicator of response to a specific silvicultural treatment

Many growth and yield models incorporate crown size information: diameters and heights

Crown Diameter: Definition

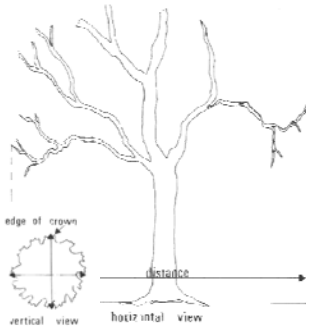


Commonly used definitions:

- Average of maximum and minimum diameter
- Average of maximum and diameter measured at right angles to the maximum
- Average of a random orientation and a second measure at right angles to the first measure

For highly irregular crowns an average of multiple measures may be used

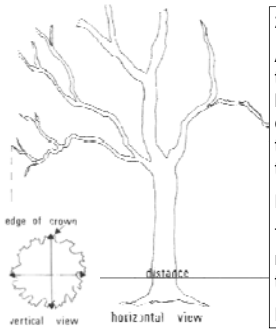
Crown Diameter: Measurement



1 person:

- Connect loggers tape to center of tree stem
- Walk out to longest observed branch
- Keep tape horizontal
- Measure distance to branch tip
- Repeat in opposite direction

Crown Diameter: Measurement



2 people:

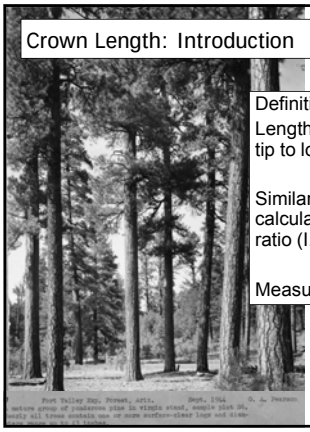
Along the widest part of the tree crown - hold tape horizontally and extend until each person is vertically under the tip of the longest branch on their side

Record this as maximum width

Turn tape by 90° and repeat measurement along the thinnest part of the tree crown

Record this as minimum width

Crown Length: Introduction

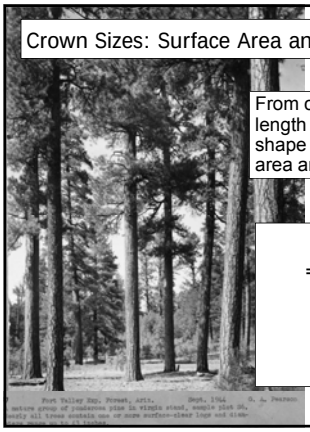


Definition:
Length of green crown from leader tip to lowest live foliage

Similar to measure used to calculate % live crown or crown ratio (I.e. last lecture)

Measurement: Clinometer

Crown Sizes: Surface Area and Volume



From crown diameter and crown length we can assume the tree shape is a cone to model surface area and volume:

Surface area (ft^2, m^2)

$= \pi d_b/2 * \sqrt{(L^2 + (d_b/2)^2)}$

Volume (ft^3, m^3)

$= \pi d_b L/12$

Practical: Measuring Crowns