Photo:Evan Larson

Fire and Tree Mortality Measurements

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Outline

- How does fire induce mortality to trees?
- Measuring features
- Data collection review

How does fill induce mortality?

- Crown
- Cambium- “Girddling”
- Roots
- Cavitation
  - Capillary embolism

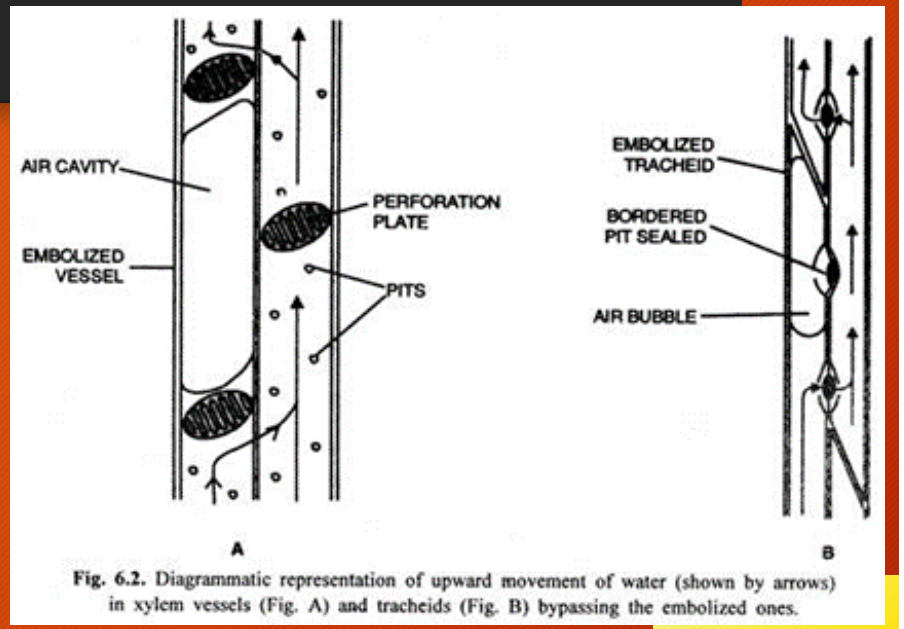
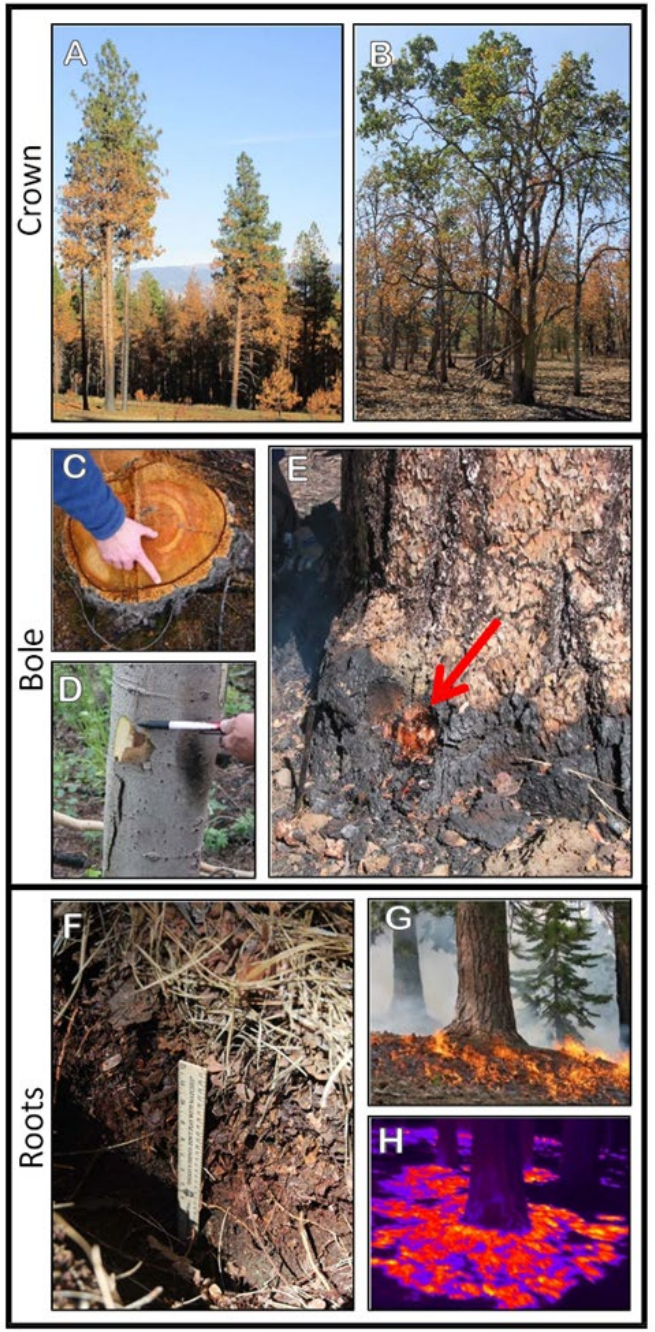
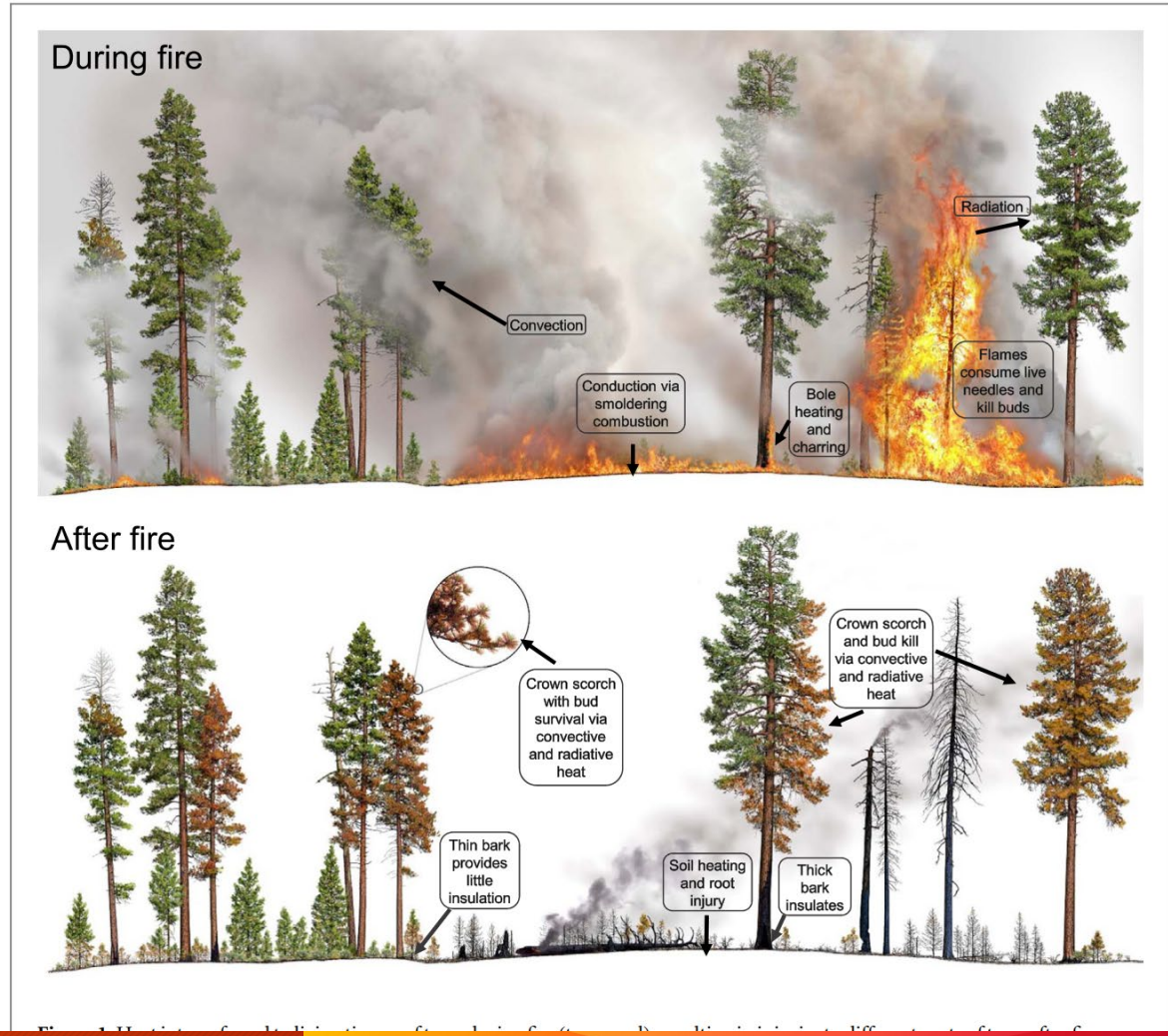


Fig. 6.2. Diagrammatic representation of upward movement of water (shown by arrows) in xylem vessels (Fig. A) and tracheids (Fig. B) bypassing the embolized ones.



Monitoring

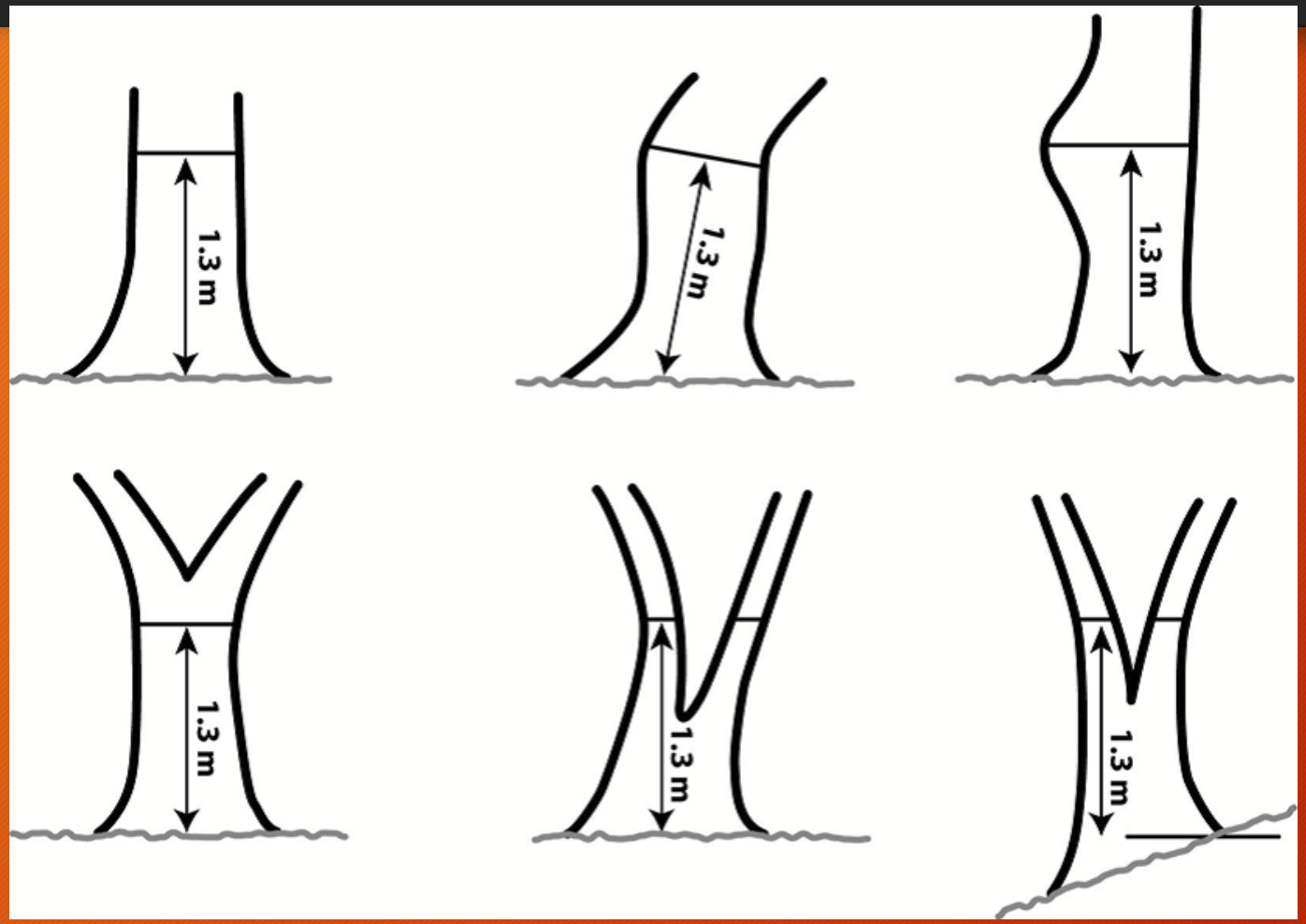
- Measuring features
- What are your overstory objectives?
- What to measure when?
- Plot techniques
- Fire Behavior



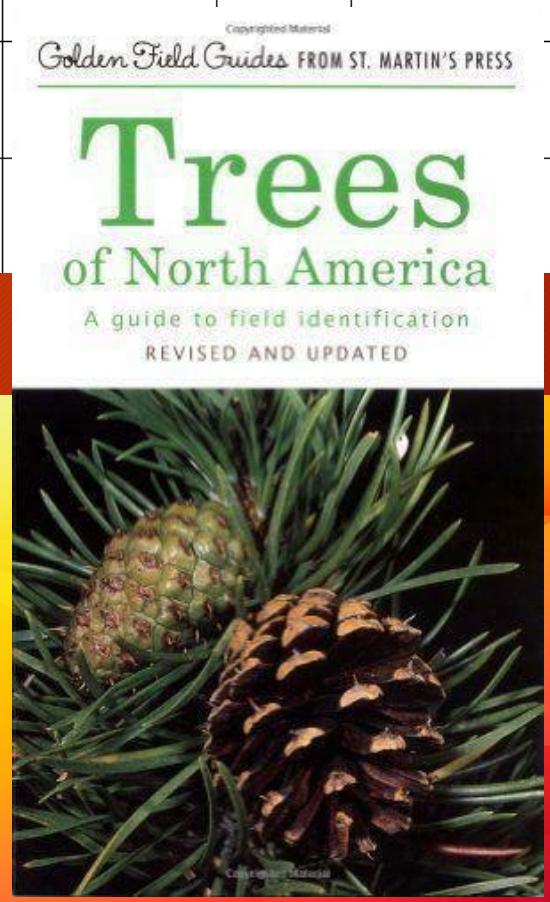
Data Collection

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1		PROJECT NAME_____									DATE_____					Recorder _____		
2		TREATMENT:		**PREBURN**		**POSTBURN**		**BURN + 1**		**BURN +____YRS**								
3	**Plot**	**Date**	**Tree #**	**Tree Spp**	**DBH**	**Tree Height**	**CBH**	**Crown Ratio %**	**Crown Class**	**Crwn Scorch (% Live)**	**Max Bole Char**	**Min. Bole Char**	**Live / Dead**	**Insect Activity**	**Decay**	**Cavity**	**Remarks**	
4	5	10/8/14	1	Red Oak	6	25	6	75	CD	N/A	0	0	L	N	N	N	Little impact from fire	
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		

Data Collection



Plot	Date	Tree #	Tree Spp	DBH
5	10/8/14	1	Red Oak	6



Data Collection

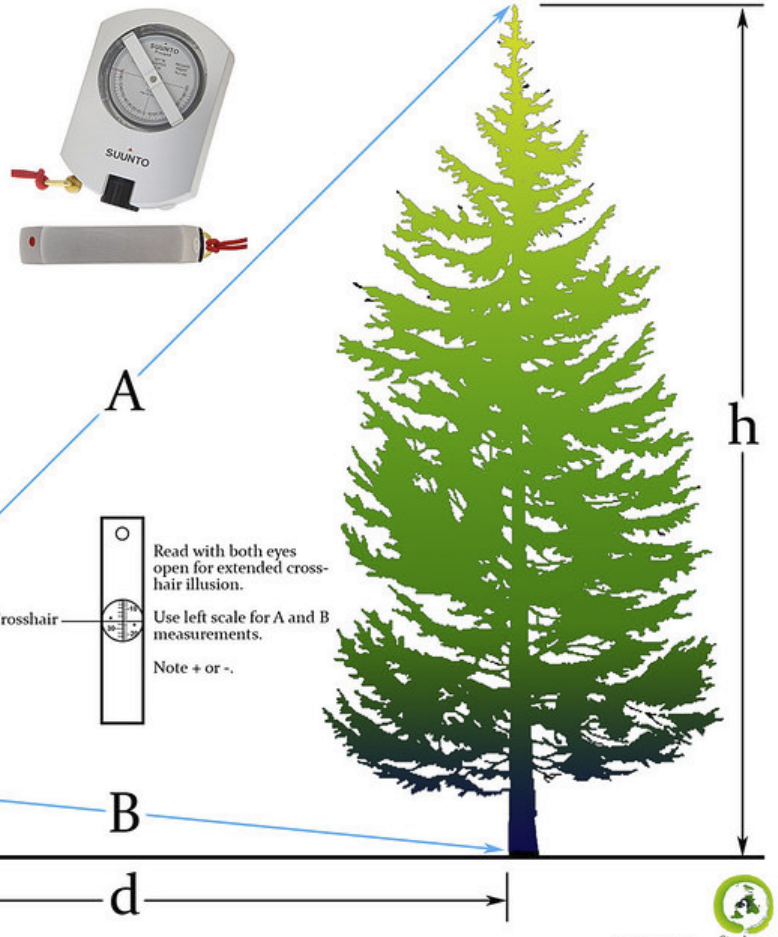
Tree Height	CBH	Crown Ratio %	Crown Class
25	6	75	CD

Measuring Height with a Clinometer

$h = (A - B) \times (d \times .01)$

h = height
A = top measurement
B = bottom measurement
d = distance

Example:
1. Measure a distance (d) of 20 meters from the base
2. Read the top measurement (left scale %) and note the + or -. +100
3. Read the bottom measurement (left scale %) and note the + or -. -5
4. Enter the numbers in the formula and calculate
   h = (100 - (-5)) x (20 x .01)
   h = 105 x .2
   h = 21 meters



Data Collection

Tree Height	CBH	Crown Ratio %	Crown Class
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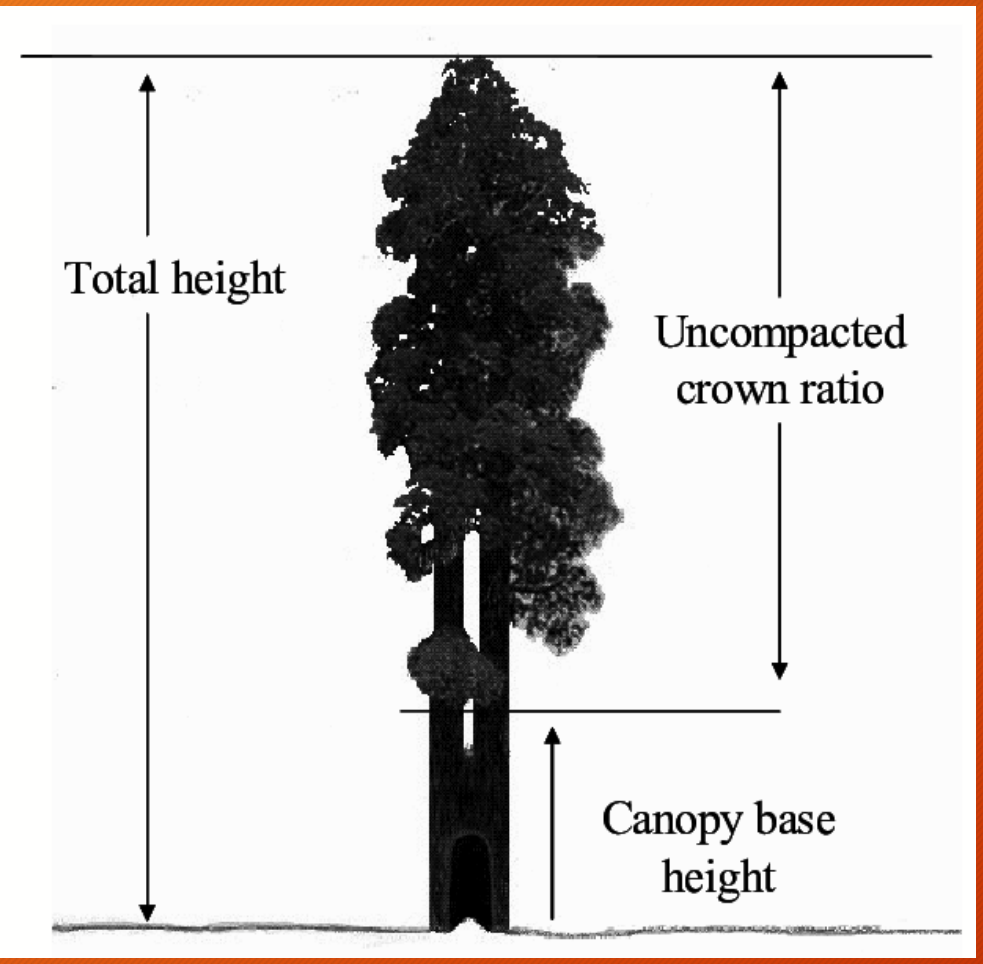

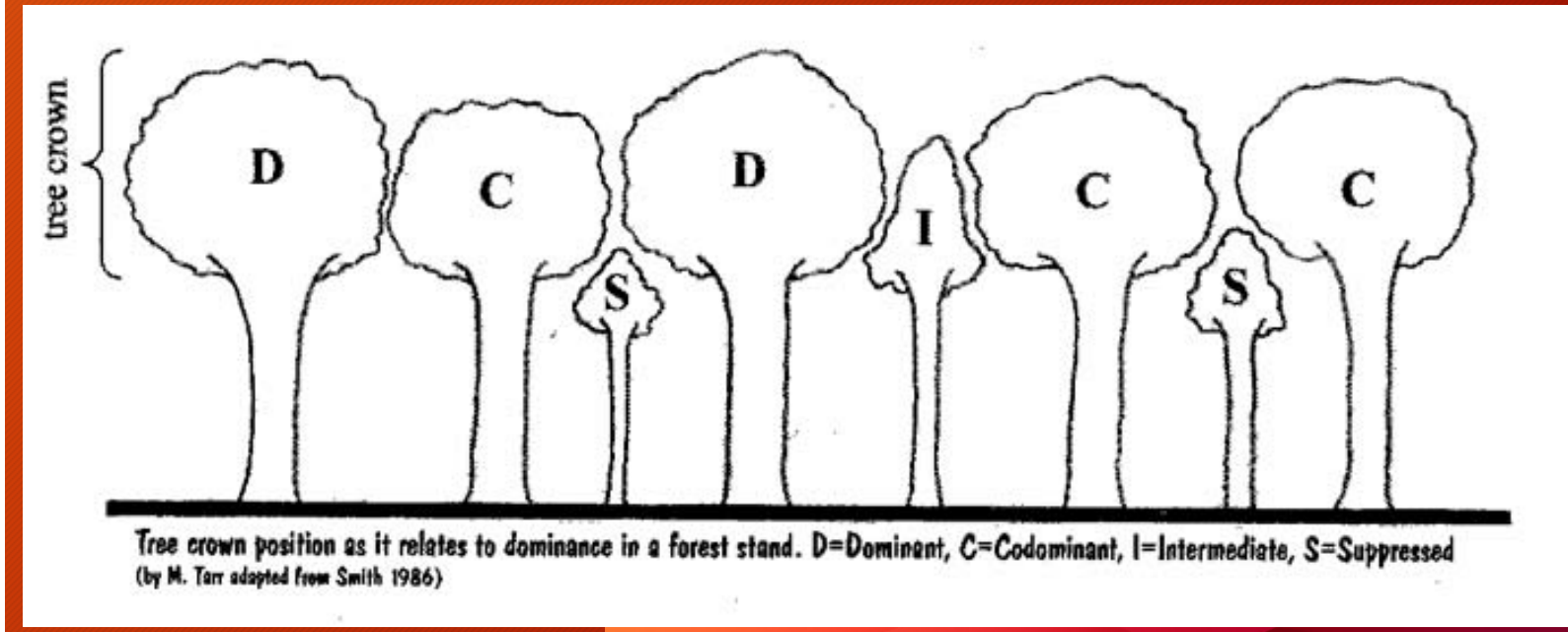

Tree crown position as it relates to dominance in a forest stand. D=Dominant, C=Codominant, I=Intermediate, S=Suppressed
(by M. Tarr adapted from Smith 1986)

Data Collection

Crwn Scorch (% Live)	Max Bole Char	Min. Bole Char
N/A	0	0

Data Collection

Insect Activity	Decay	Cavity	Remarks
N	N	N	Little impact from fire

QUESTIONS?

Sharon M Hood et al 2018 Environ. Res. Lett.13 113004

J.J. Midgley et al. / South African Journal of Botany 77 (2011) 381–386