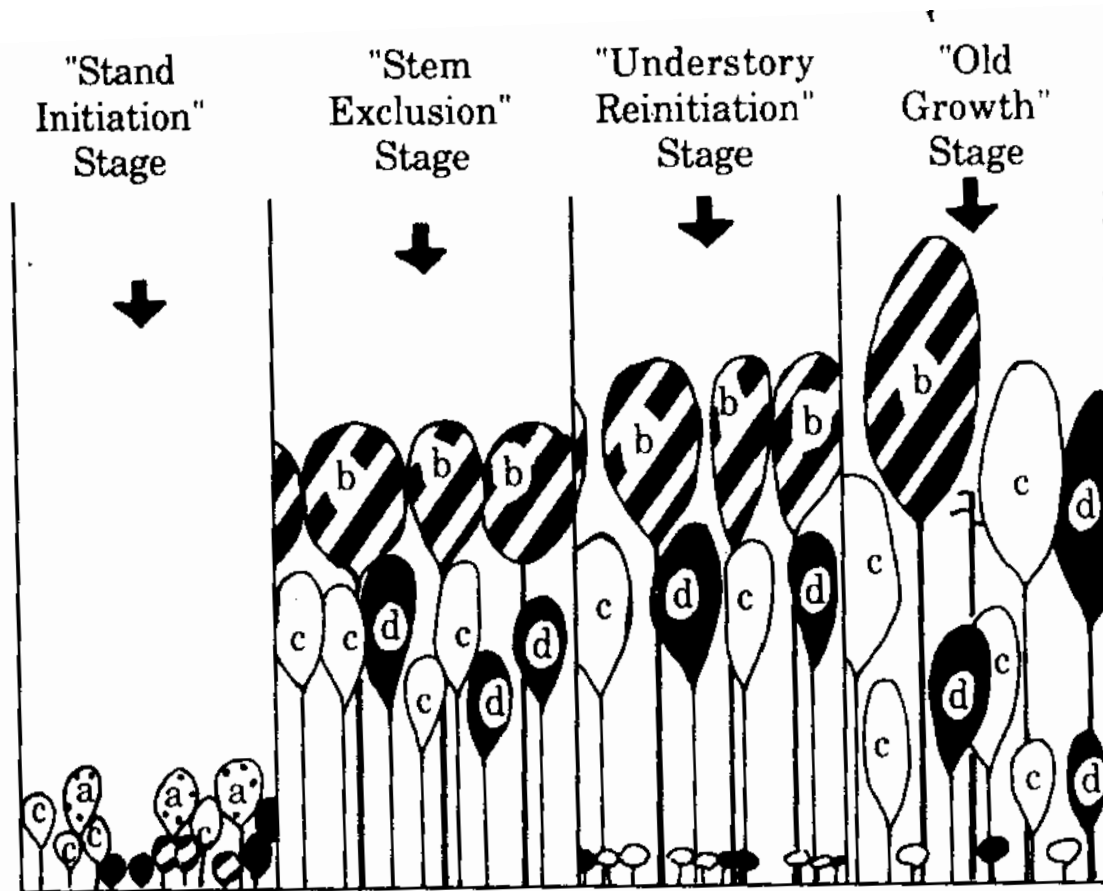


Mortality in the context of long-term stand dynamics

Rob York

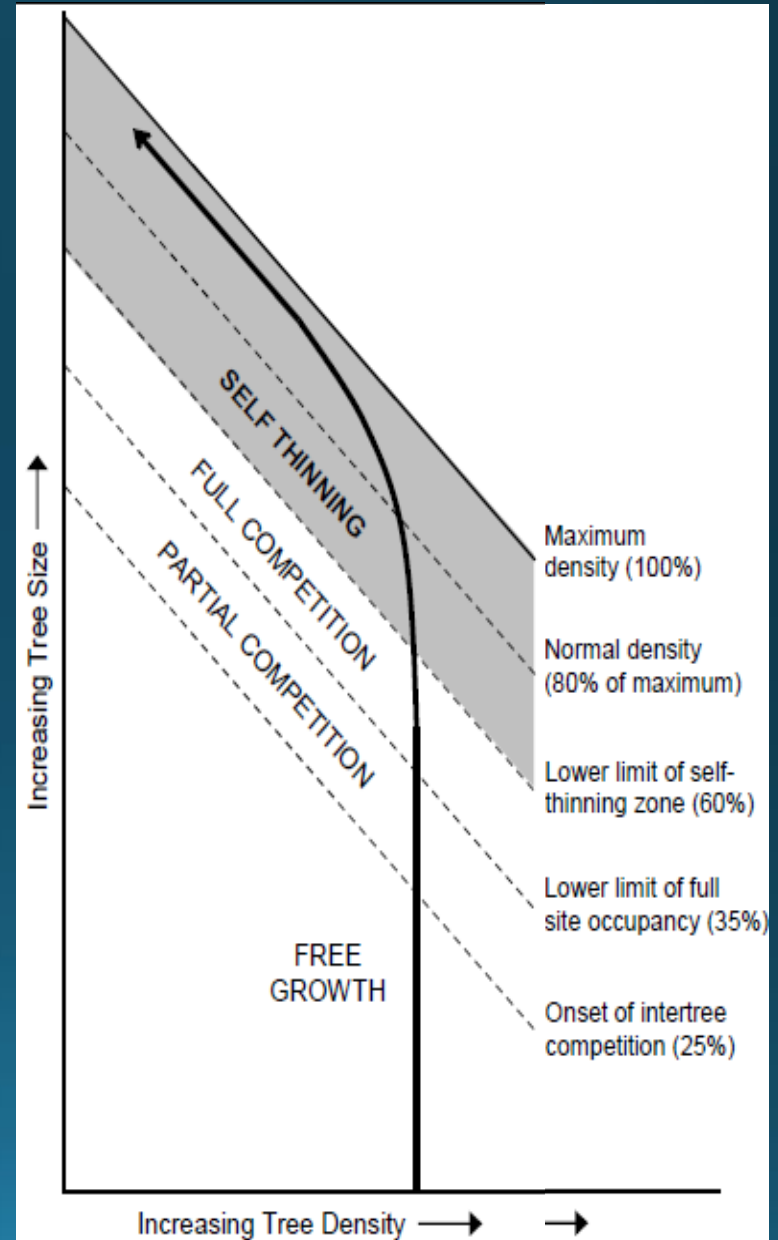
What is stand dynamics?



Oliver and Larson 1996 *Stand Dynamics*

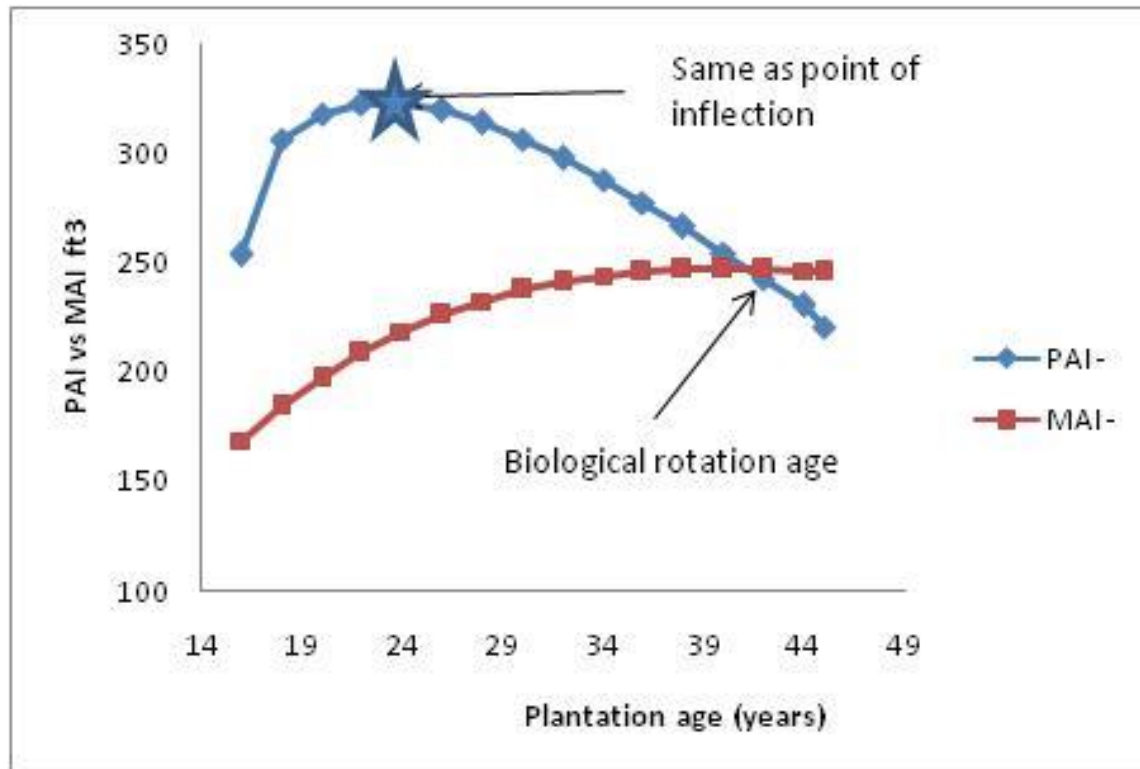
Why its important to Foresters: Stand Density is a metric for Competition

- Competition begets mortality
- Mortality begets structural change (stand dynamics)

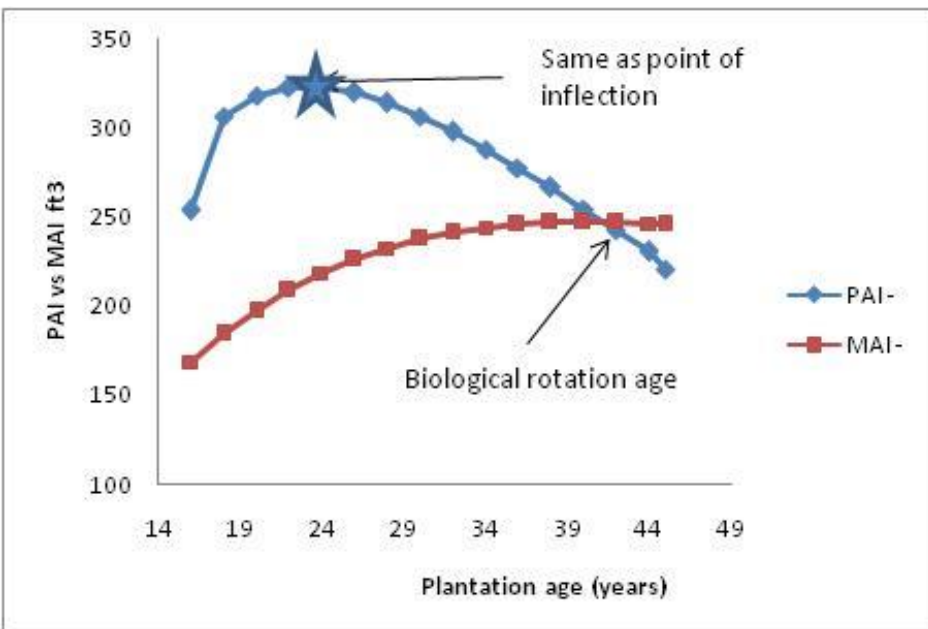


Culmination of Increment

- A key stage in stand development
 - For managers and silviculture nerds
 - When does it occur in mixed conifer forests?

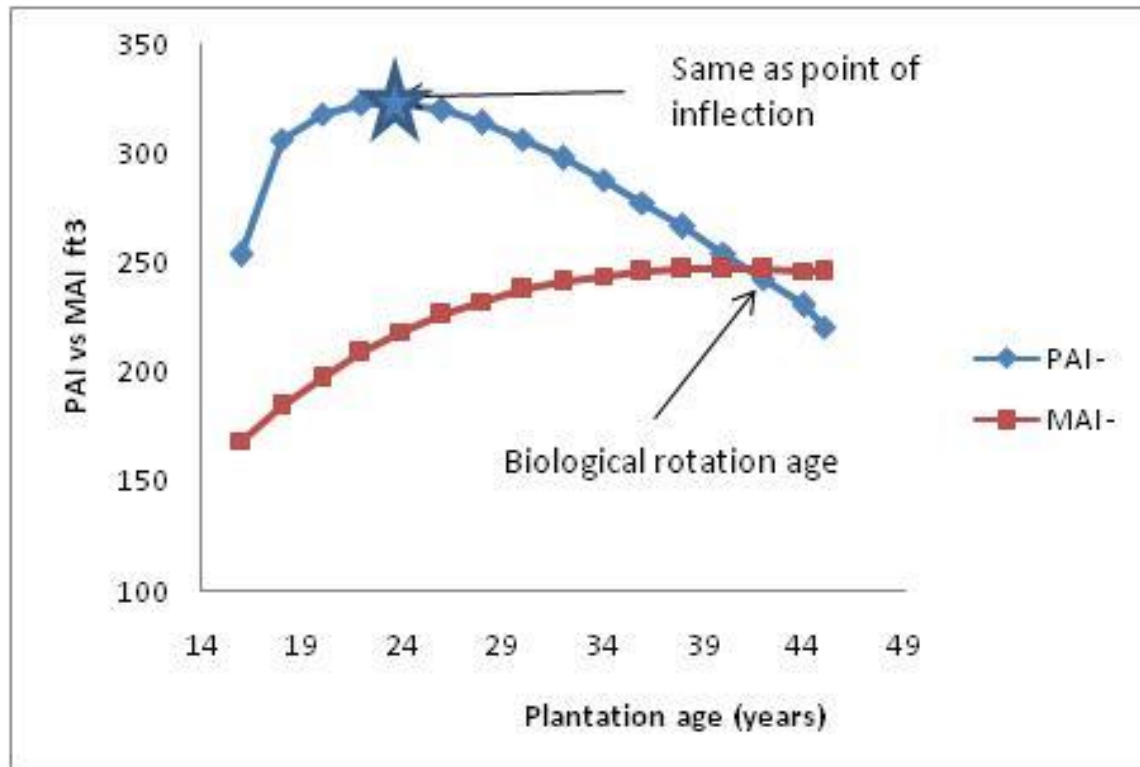


MAI v. PAI

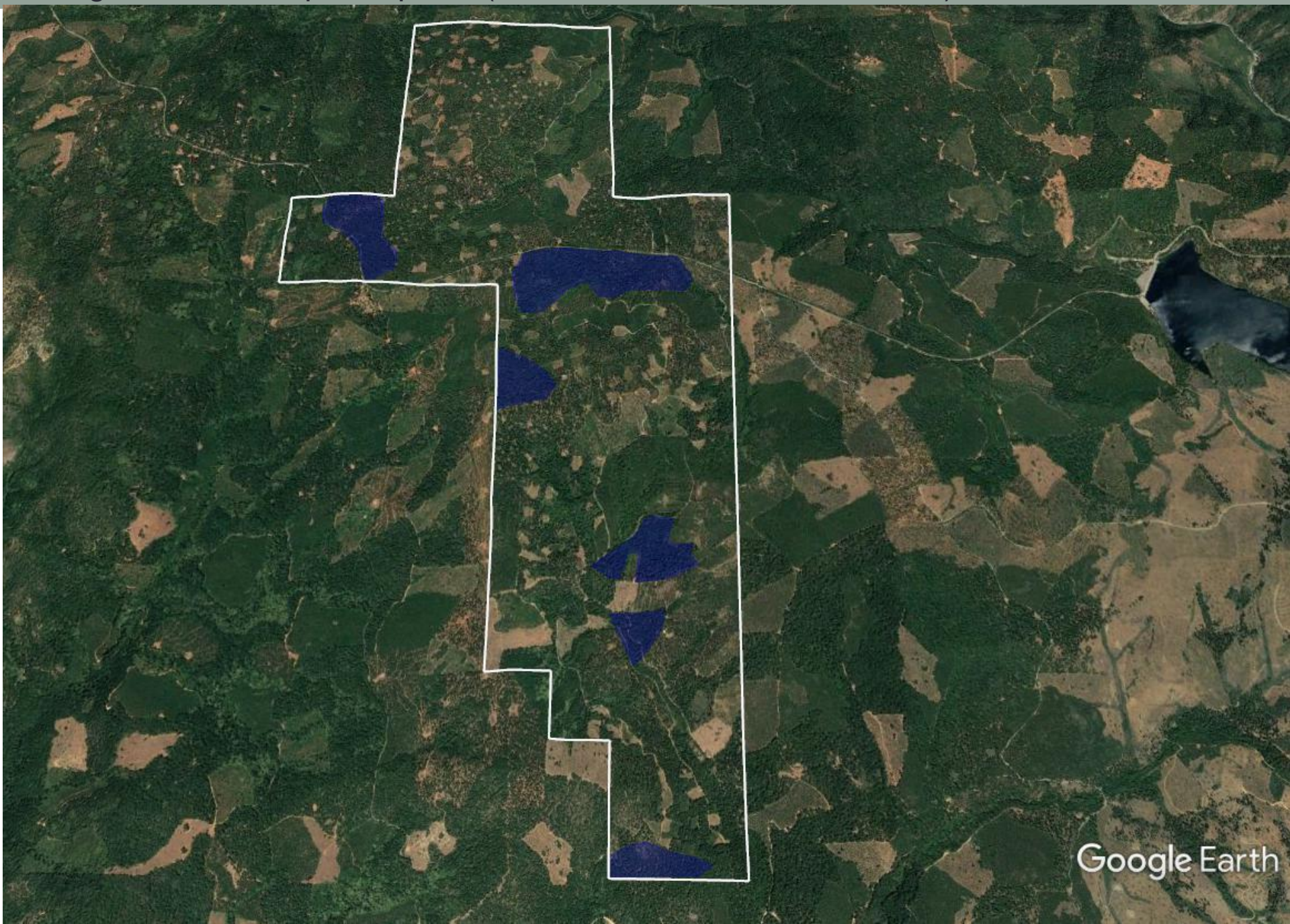


Culmination of Increment

- Estimated through chronosequences and growth projections
- Not with *observation through present time*
- Until we have tracked stands, it is hypothetical
- E.g. Harmon and Pabst 2015



Blodgett Forest- a special place (reserves last measured in 2014)

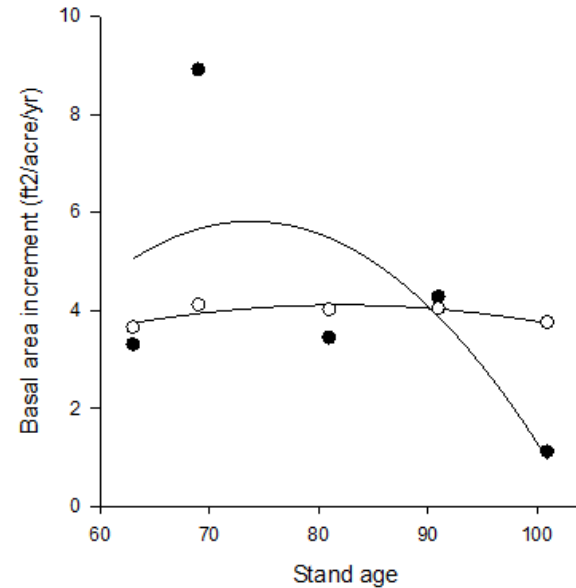


Stand #1

Basal area (i.e. total wood production) has already culminated

- MAI meets PAI at 90 years

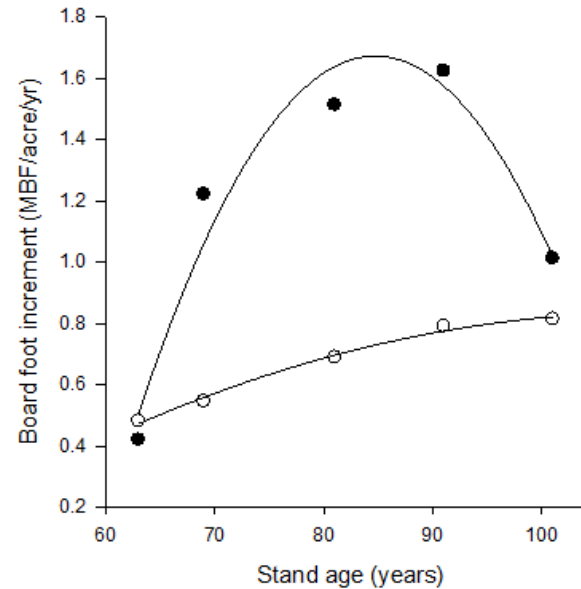
C220 Basal area increment: culmination = 90 years



Merchantable timber volume will culminate soon

- MAI meets PAI at 103 years

C220 Board foot increment culmination = 103 years



Stand #2

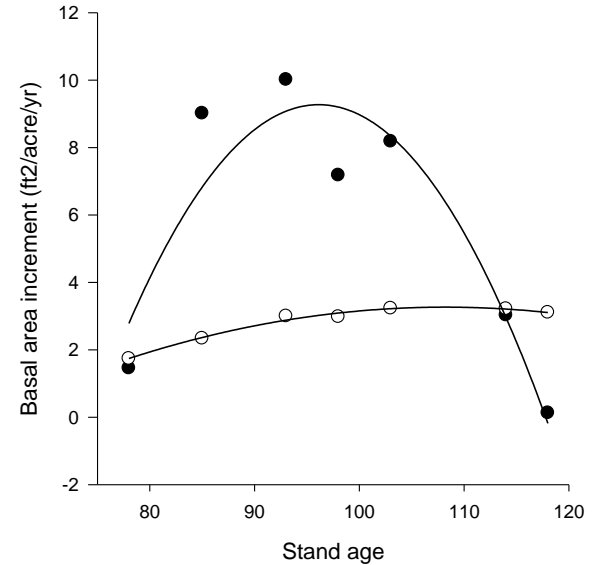
Basal area has already culminated

- MAI meets PAI at 113 years

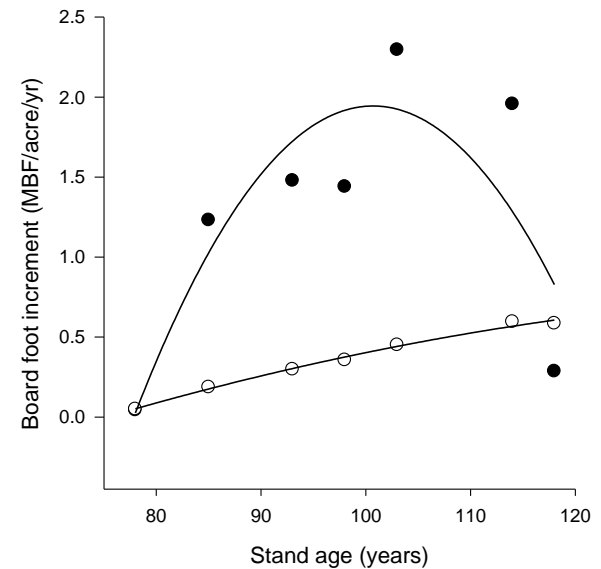
Merchantable timber volume will culminate soon

- MAI meets PAI at 120 years

C630 Basal area increment culmination = 113 years



Board foot culmination = 120 years



Stand #3

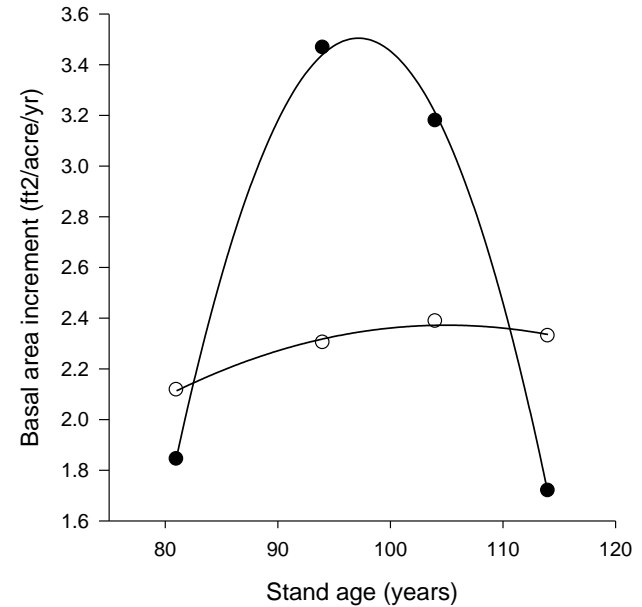
Basal area has already culminated

- MAI meets PAI at 110 years

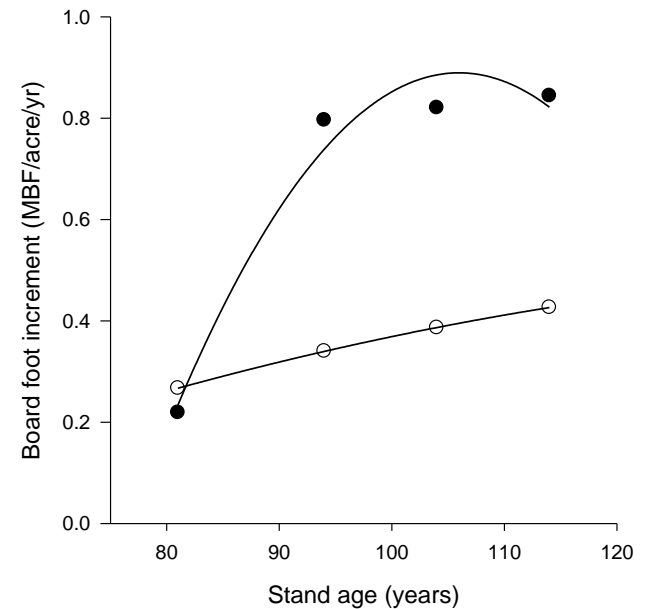
Merchantable timber volume will culminate later

- May have already

C600 basal area culmination = 110 years



Board foot culmination = "later"



Stand #4

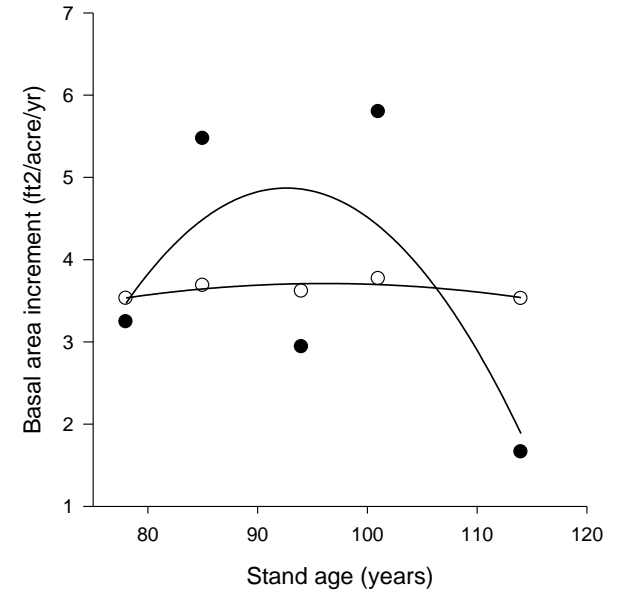
Basal area has already culminated

- MAI meets PAI at 106 years

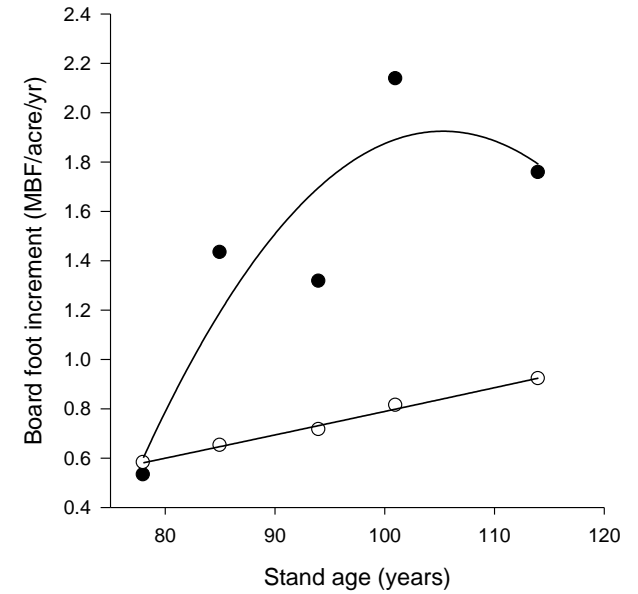
Merchantable timber volume will culminate later

- May have already

C520 basal area culmination = 106 years



Board foot culmination = "later"



Trends in Reserves



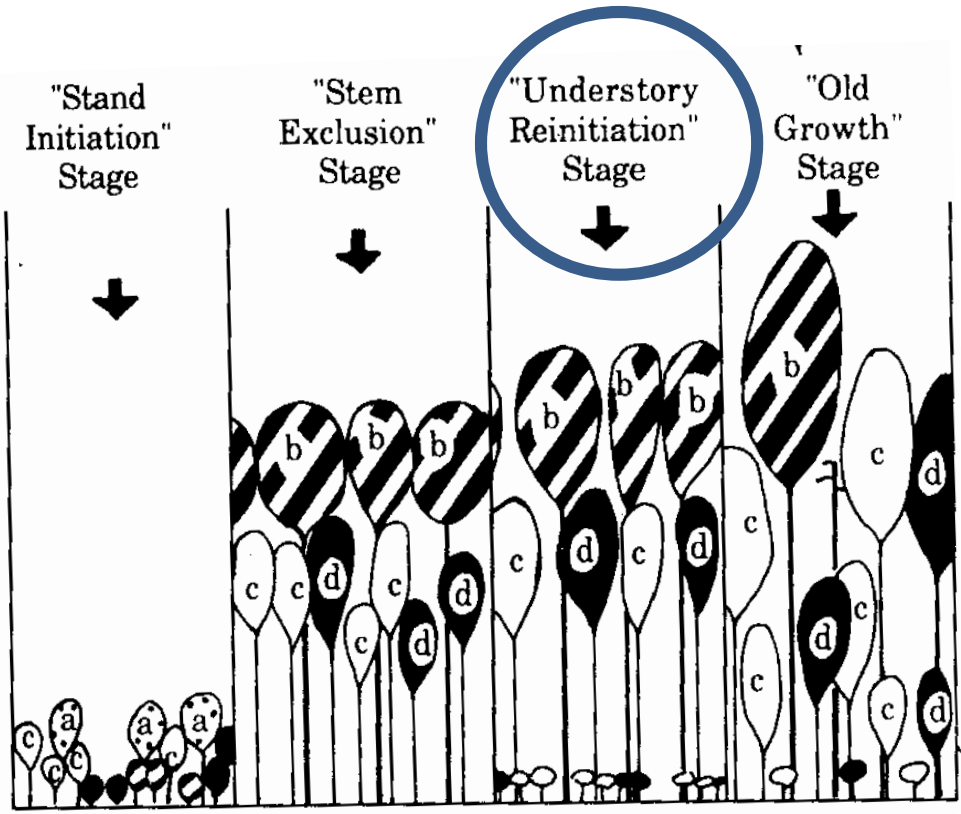
Mean Culmination of BA = 107 yrs (90-113)
Mean Culmination of MBF *at least* 111 years

What did Dunning and Reineke say?

Stem volume MAI = 70 yrs, regardless of site
MBF culmination = 95 yrs for high site
= up to 150 for low site

... *Longer* than the conventional wisdom

In what phase are "second growth" stands?



Silviculture nerds should be freaking out right now...

Relevance for the rest of us:

- Tree mortality is an inevitable outcome of competition
- Fuel input = BIG TREES dying = big fuel pieces
- Ladder fuel layer is emerging
- Firification almost complete (dead fir being replaced by fir regeneration)
- Culmination of MAI may take longer than we thought