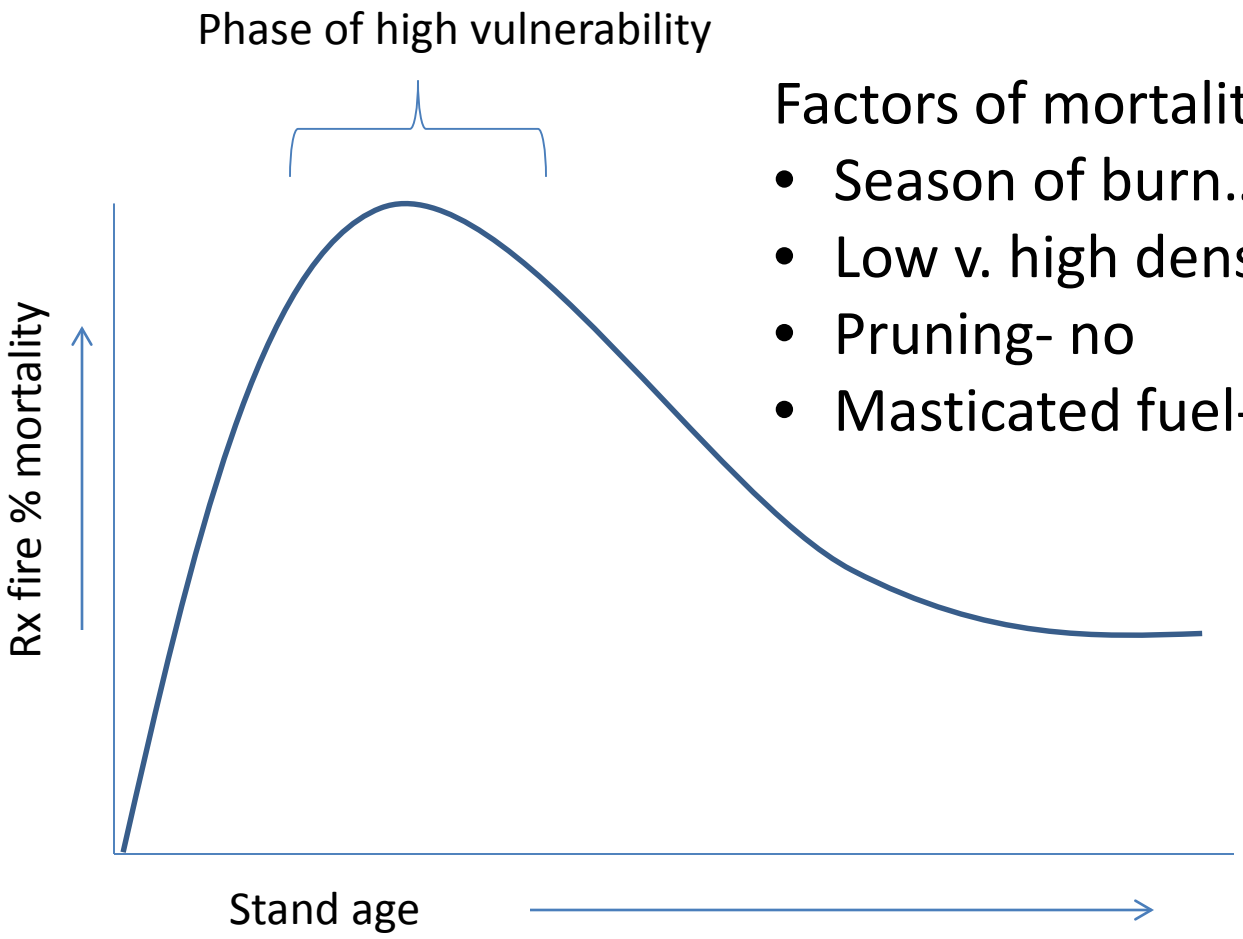
Prescribed fire in young stands

Implications

Rx fire is feasible in stands as young as 13 years

(~5-6” dbh of codominant trees)



Factors of mortality

- Season of burn… yes
- Low v. high density stands… maybe
- Pruning- no
- Masticated fuel- no

Berkeley Forests

Blodgett Forest:

- ~4,500 ft elevation
- Productive
- Mixed conifer

Pyro-idealism v. Pyro-realism

“Fire in the Sierra Nevada is as important as rain”

- Harold Biswell, 1960’s

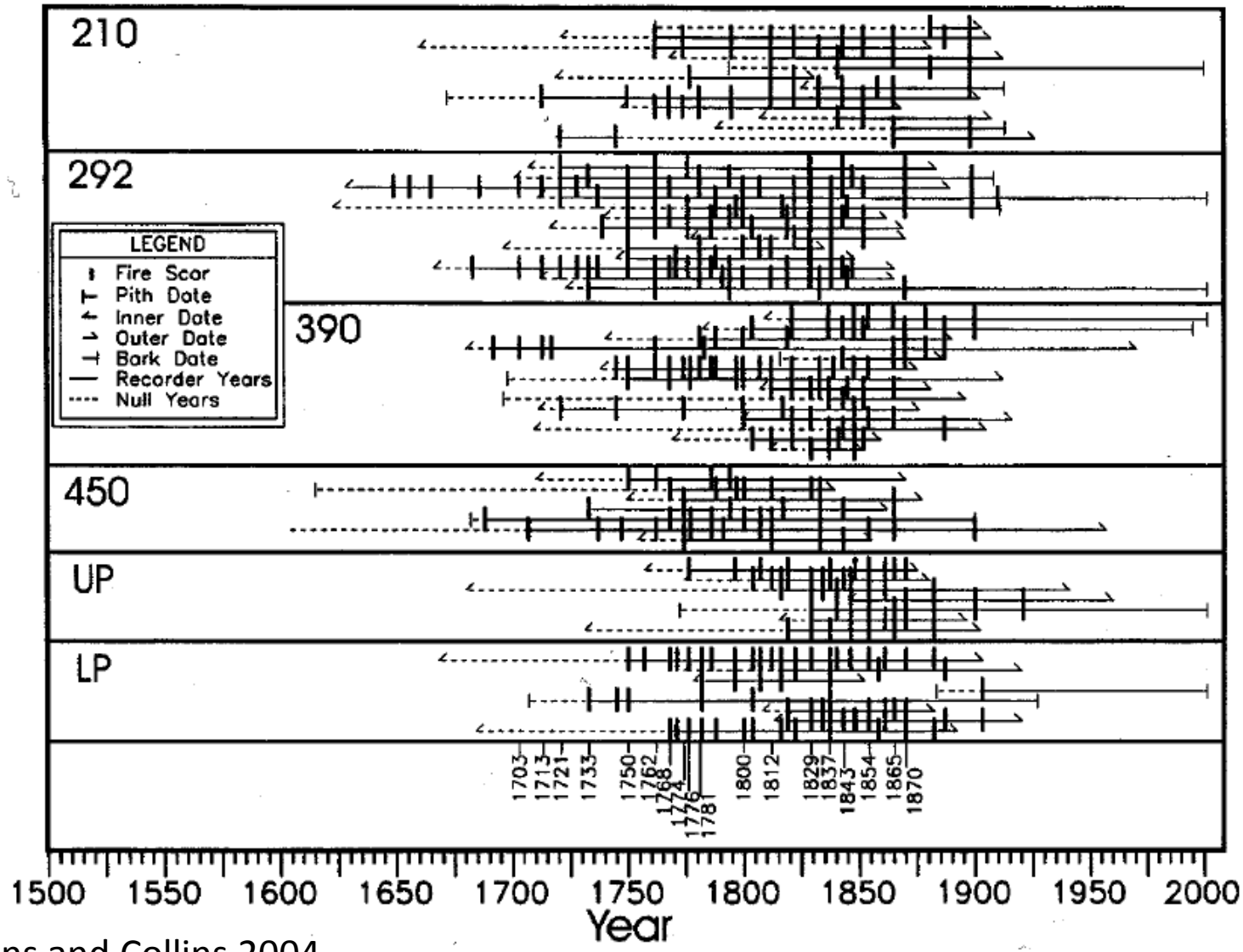
“working with fire is rarely used because of liability, casualty risks and little tolerance for management errors.”

- North et al. 2015 *Science*

Fire in young stands jibes with pre-suppression fire regime

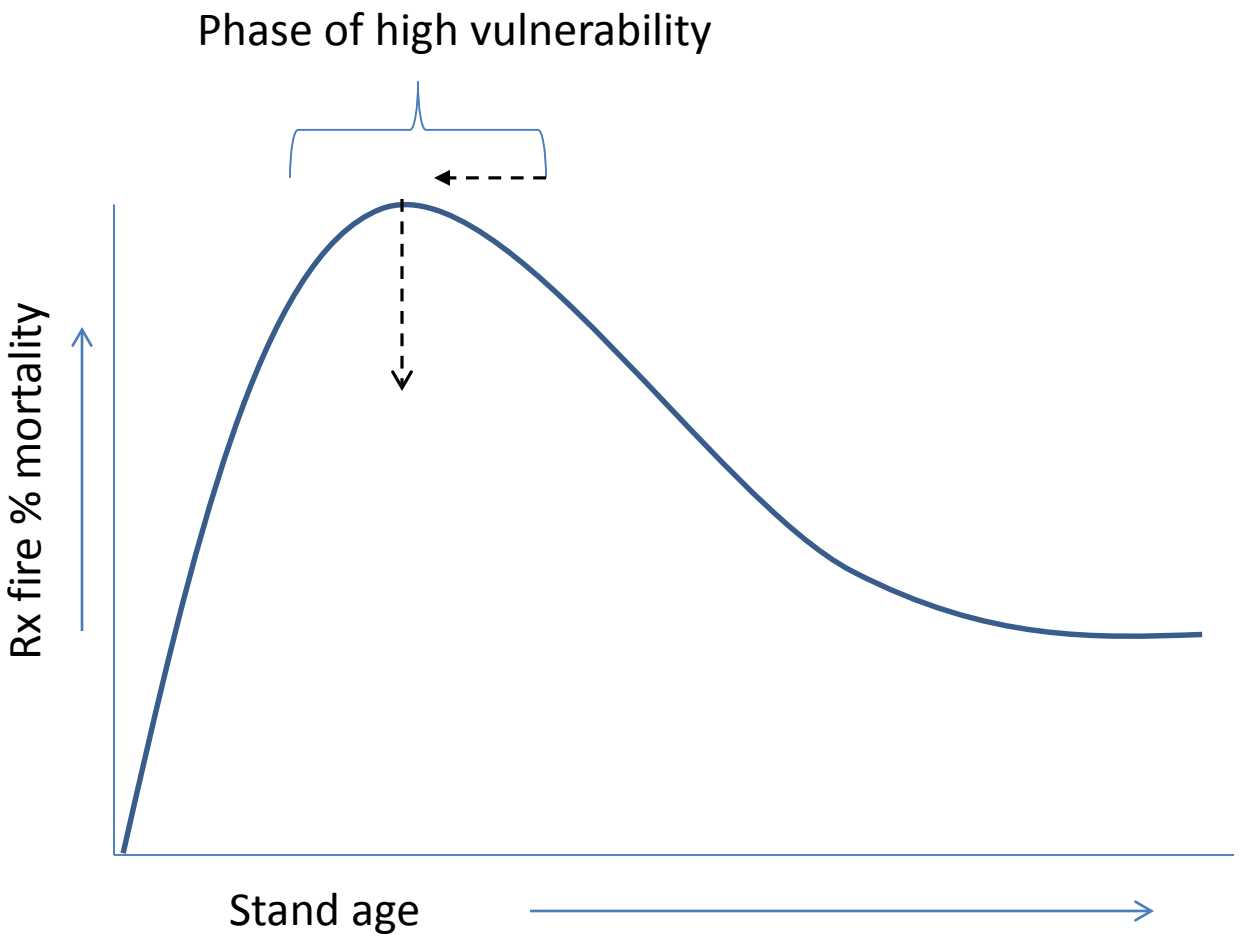
Median point fire interval:

13 years



Stephens and Collins 2004

How young can you go?



TAYSR

(Treatment Alternatives for Young Stand Resilience)

Premise 1. Young stands are abundant, now and in the future

TAYSR

Premise 2. Density management in young stands can be desirable for numerous objectives

TAYSR

Premise 3. If feasible, fire may be an important (and cheap) tool in young stands

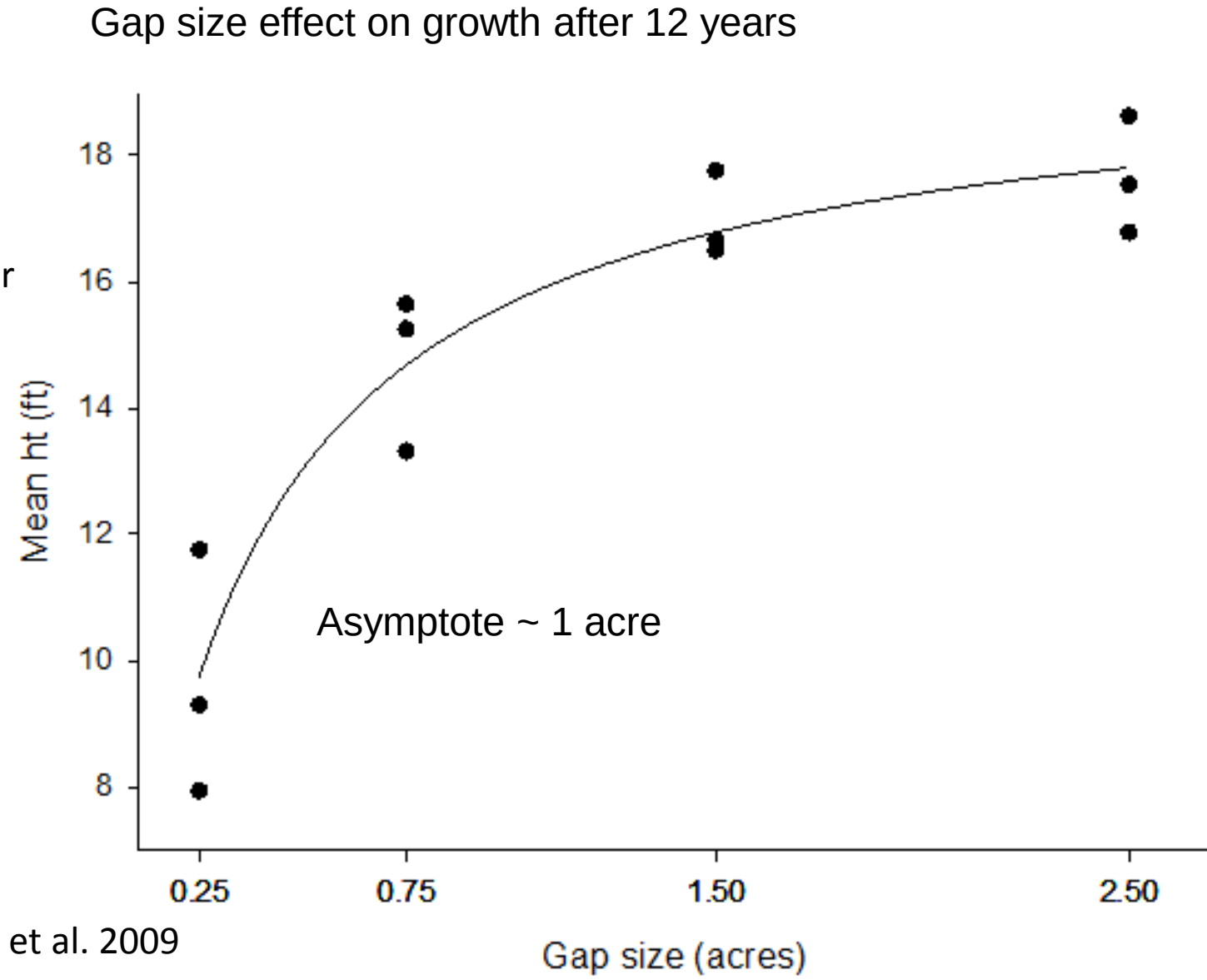
Experiment design

- Stands regenerated with group selections- 13 years old
- Stand histories represent standard mgmt:
  - Site preparation
  - Planting diverse species
  - Early competition control

- Target structure: high density stands being considered for thinning treatments

Group selections… young *stands*?

- Ecologically, yes:
  1 acre ~ 10 acres
- Use for high experimental power
- N = 17 stands



York et al. 2009

Stand treatment alternatives

- Burn only in fall (high density)
- Thin, then burn in fall
- Thin, then burn in spring
- Thin, then nothing
- Thin, then apply herbicide

Experimental unit ~ 1 acre stand
Replicated 3 to 4 times
Thin is via mastication
Rx burn conditions similar to mature stands

Post-fire, low density

Surface fire; fairly continuous across stand

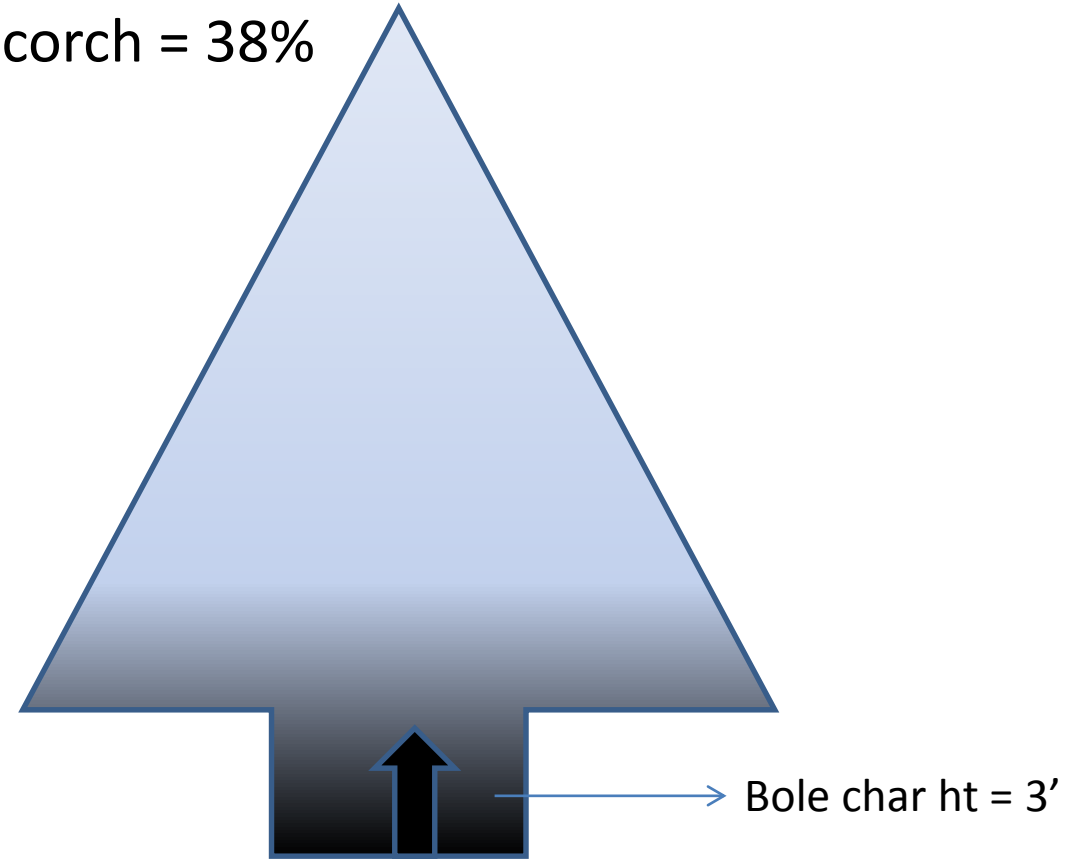
Fire behavior- high density (600 tpa)

Clumpy (high density + high fuel) =
torching of clumps

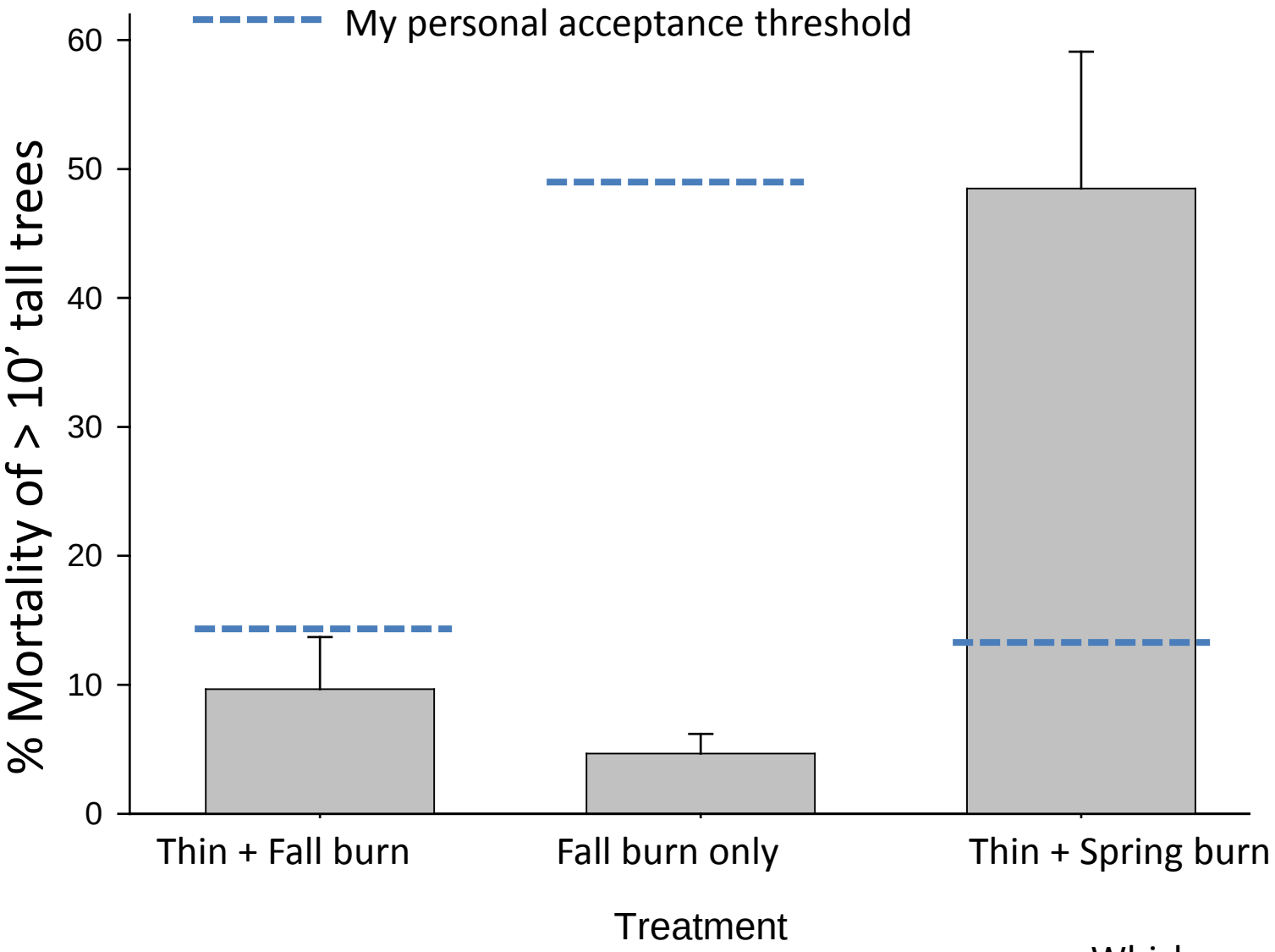
Tree-level damage

Mean % crown volume scorch = 38%

Heating = mode of leaf mortality



Stand level survival – Post burn



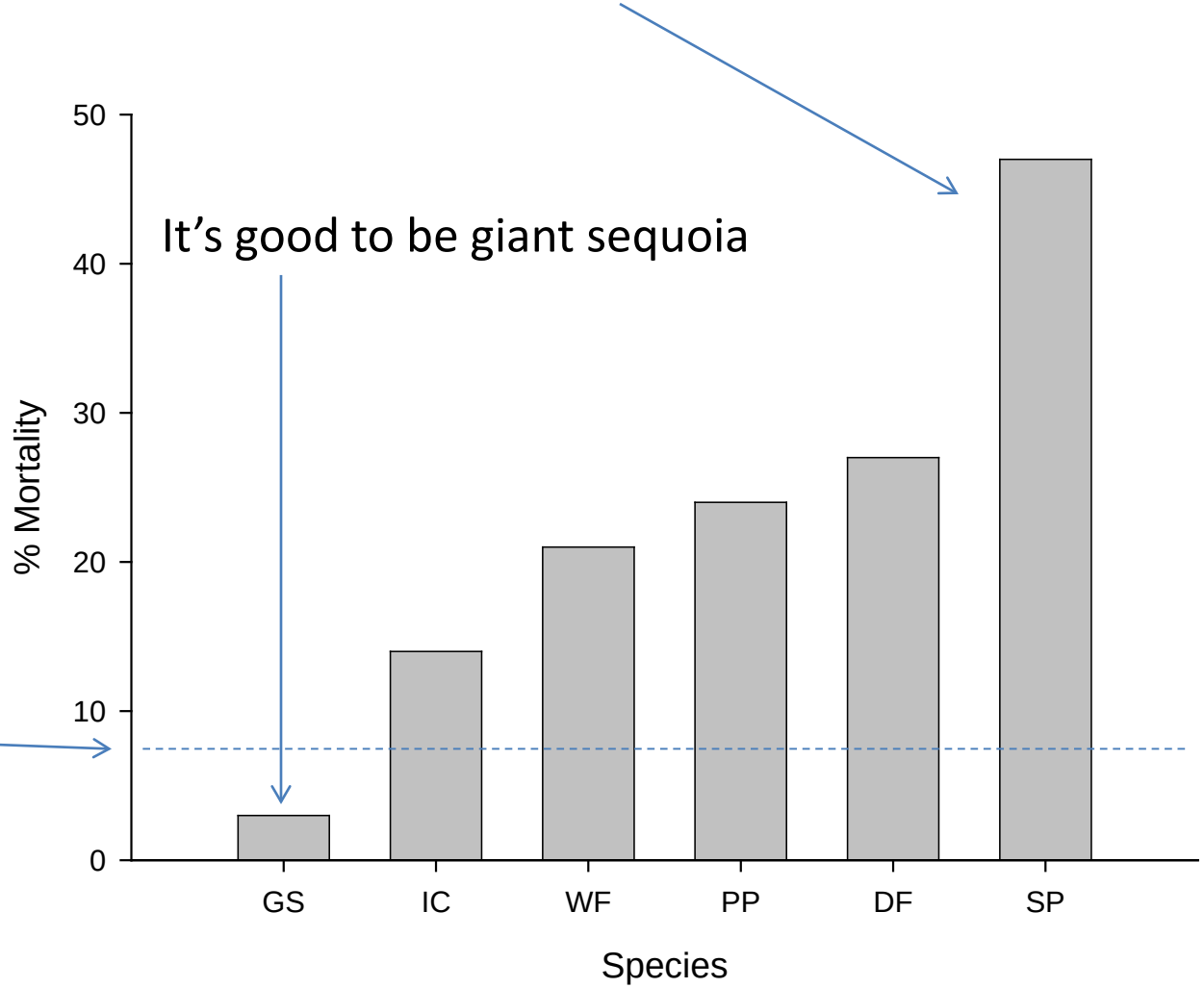
Whiskers = Std. dev

Silent Spring

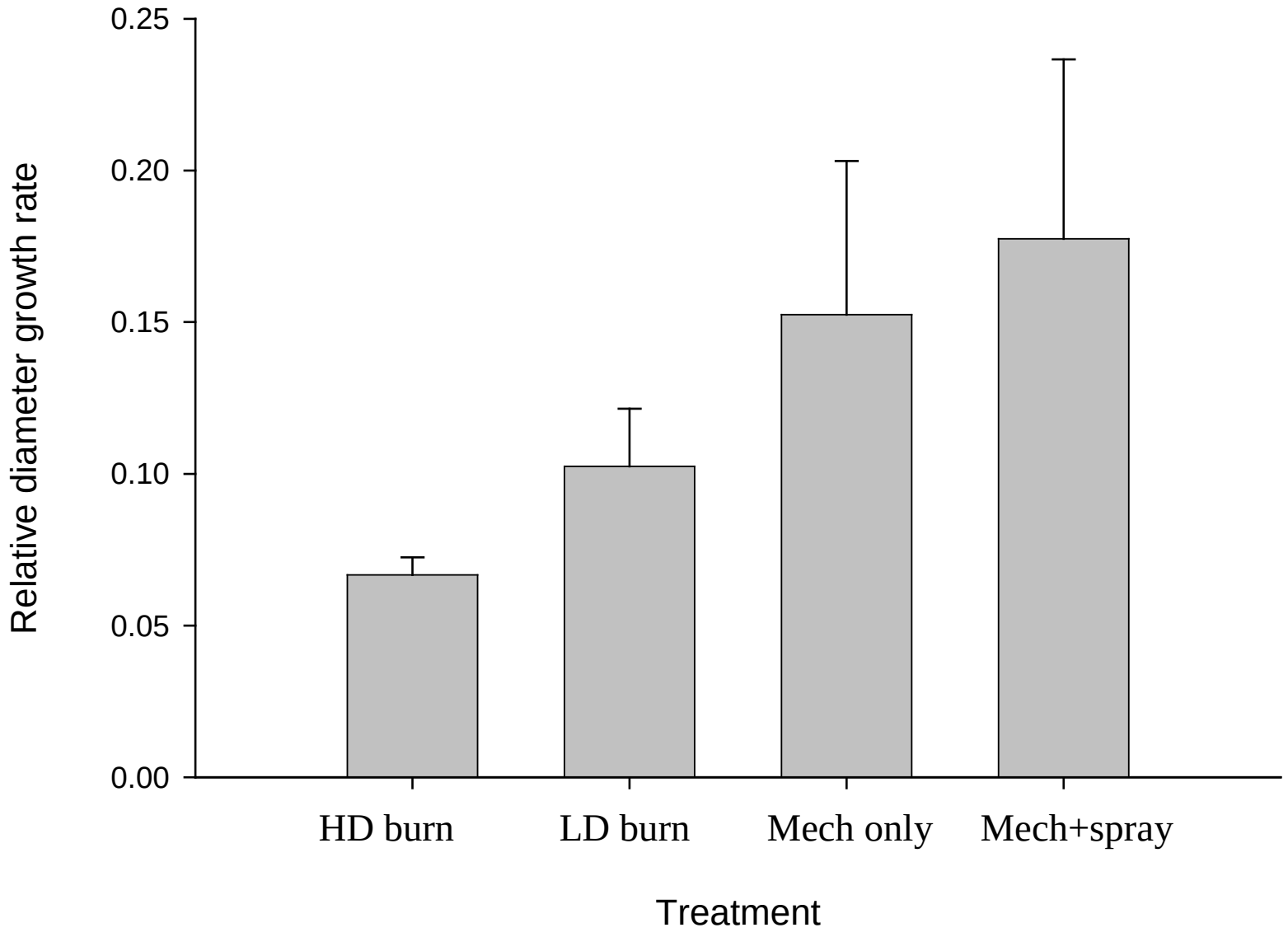
Delayed mortality:
1-2 yrs after

- Phenological?
- Interaction with beetles

Species: Sucks to be sugar pine in the spring



Average Tree Growth



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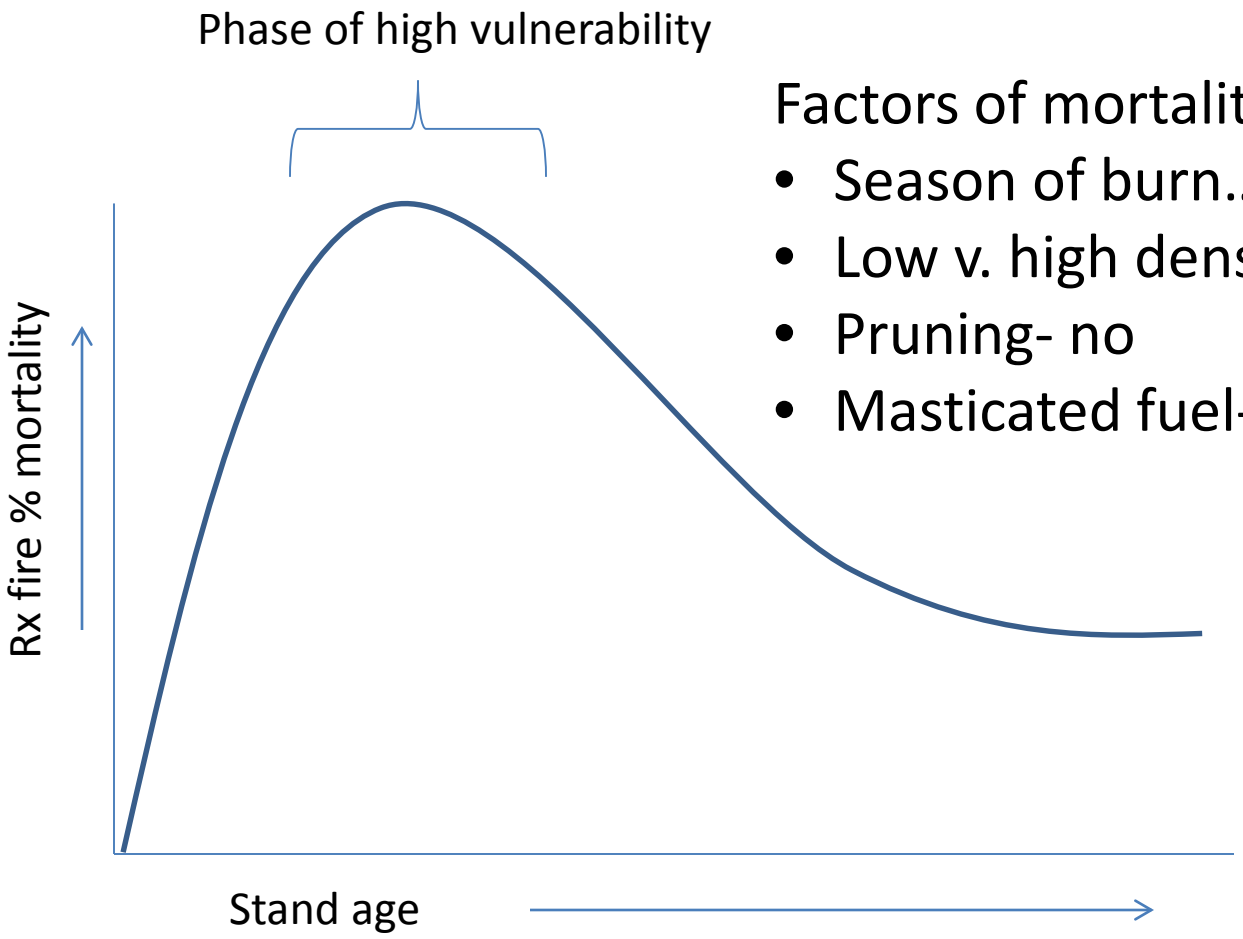

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