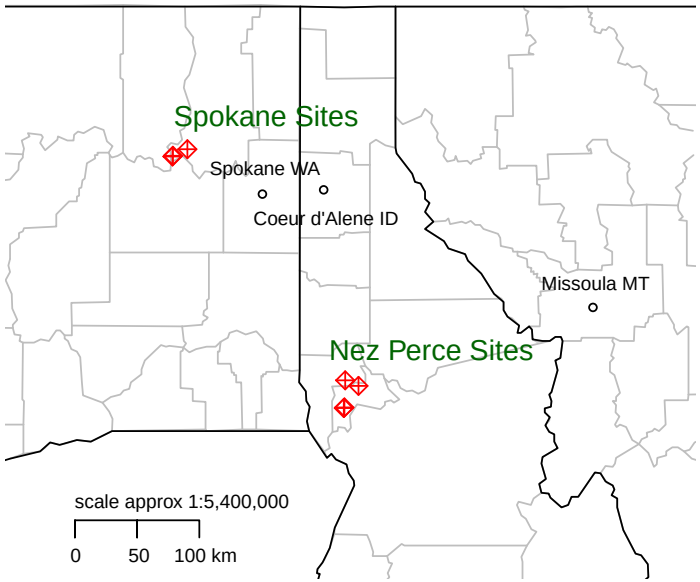
Ponderosa Pine Growth Response to Precommercial Thinning (PCT)

James Furlaud & David Affleck

University of Montana

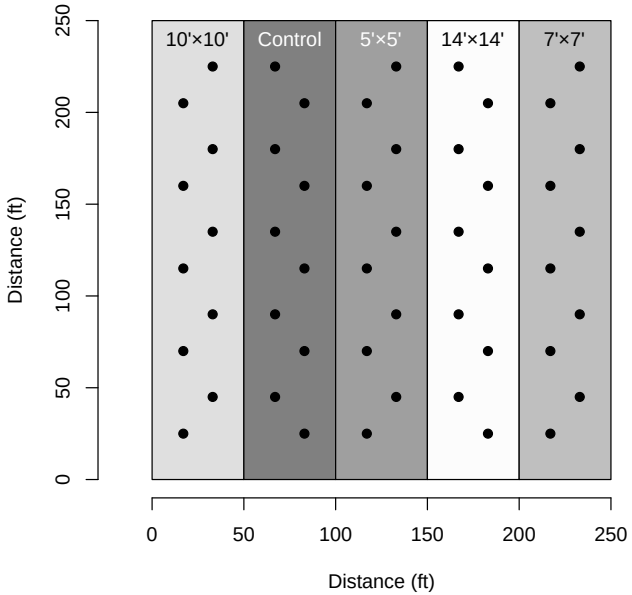
March 26, 2013

Nez Perce and Spokane Precommercial Thinning Trials



- Initiated in 1997/98 in response to lack of regional PCT information
- 4 sites on Nez Perce tribal lands; 3 sites on Spokane tribal lands
- Measured pre-thin and 4 times post-thin
  - Most recent data collection (2011) yet to be analyzed

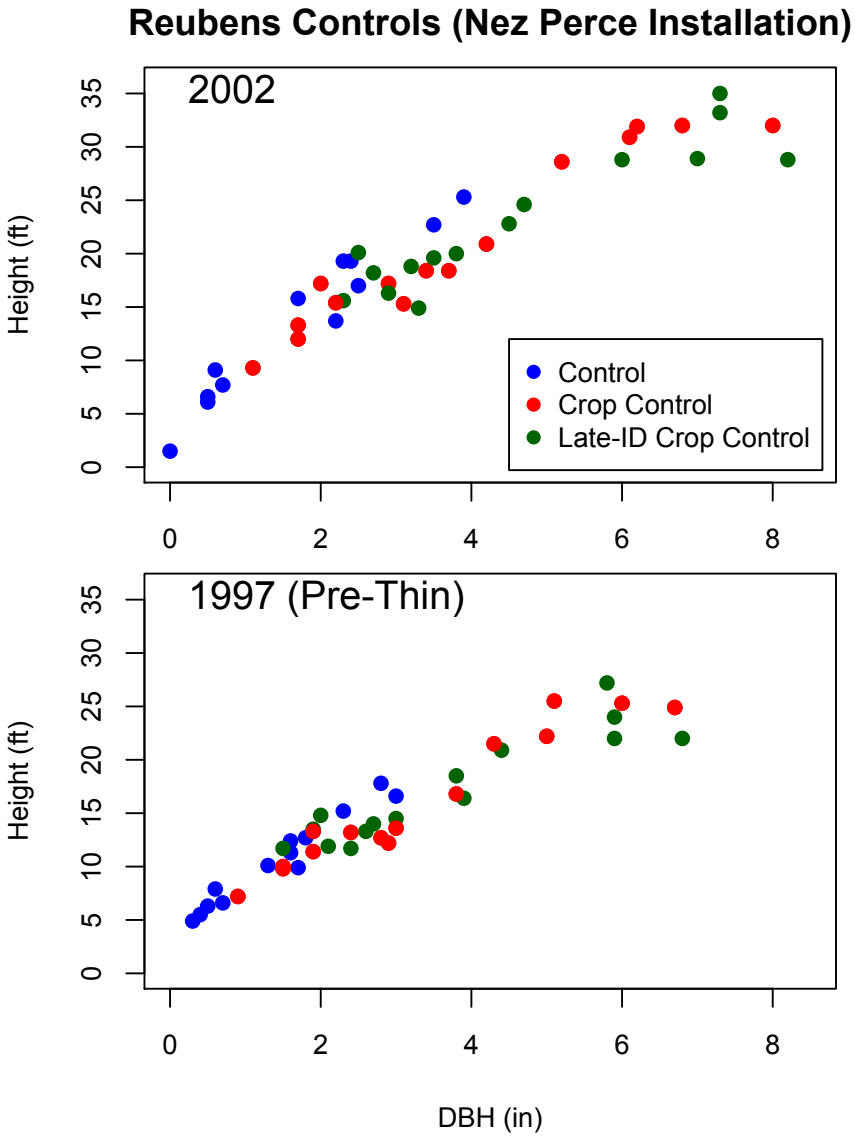
Experimental Design



- At each point:
  - 3 tagged "leave" trees
    - DBH, height, and crown growth
  - Stand characteristics (density)
    - Variable radius plots (trees $>$ 2.3 in. DBH)
    - Fixed area plots (trees $\leq$ 2.3 in. DBH)

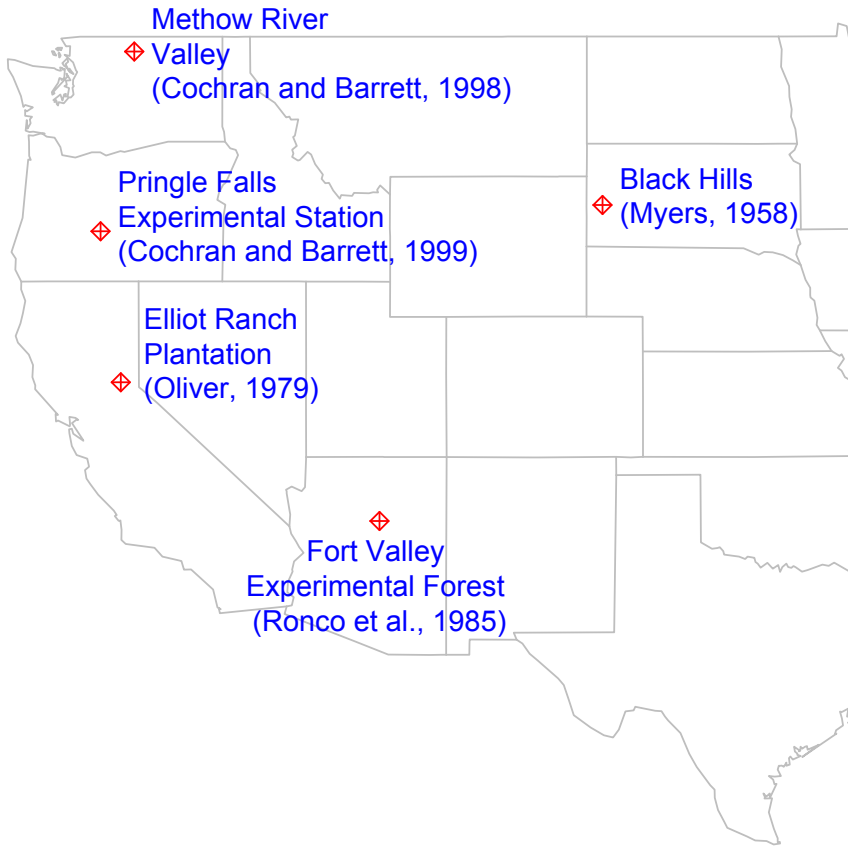
Nez Perce Controls

- Tree selection in Nez Perce control did not account for size difference
- Three categories of control trees
  - Control - "non-leave" controls
  - Crop Control - "leave tree" controls from original measurements
  - Late-ID Crop Control - trees newly tagged in 2002

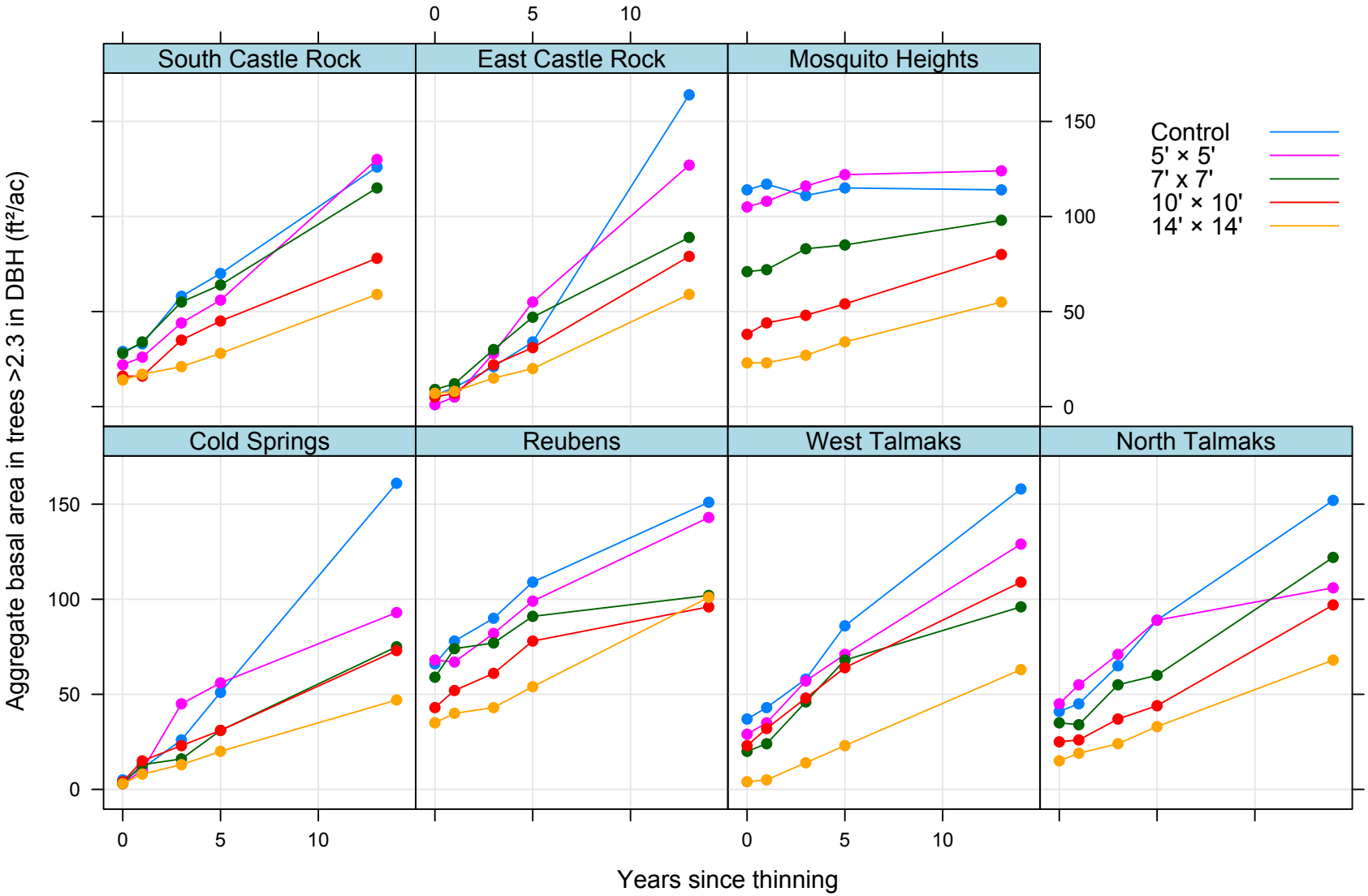


Previous Pre-Commercial Thinning Studies

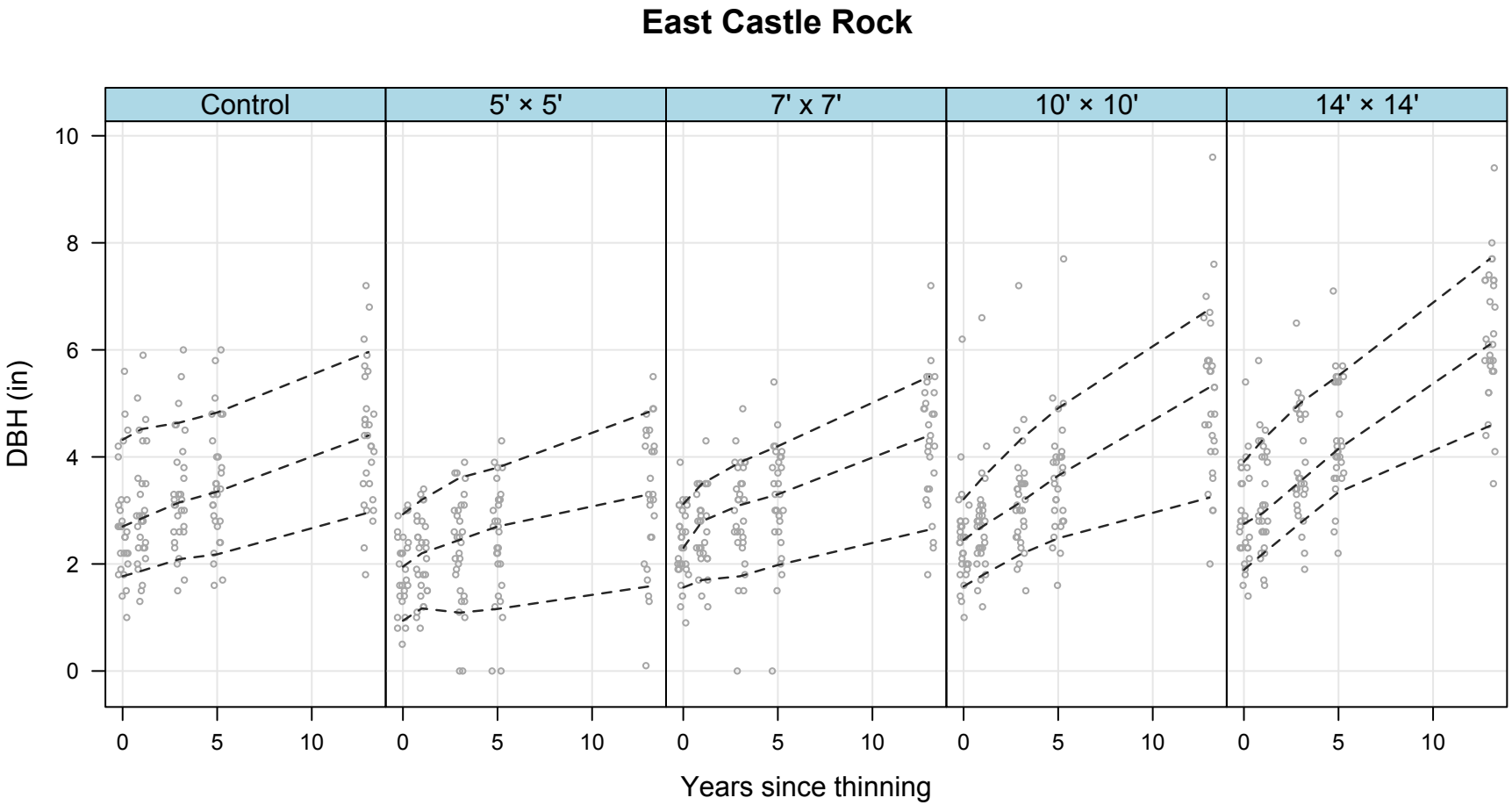
- Methow Valley, WA
  - Stand less dense, older when thinned (47 years)
- Black Hills, SD
  - Stands varied in density and age when thinned
- Pringle Falls Experimental Station, OR
  - Suppressed old growth understory released and thinned in 1958
- Fort Valley Experimental Forest, AZ & Elliot Ranch Plantation, CA
  - Target basal area (GSL) maintained through multiple thinnings



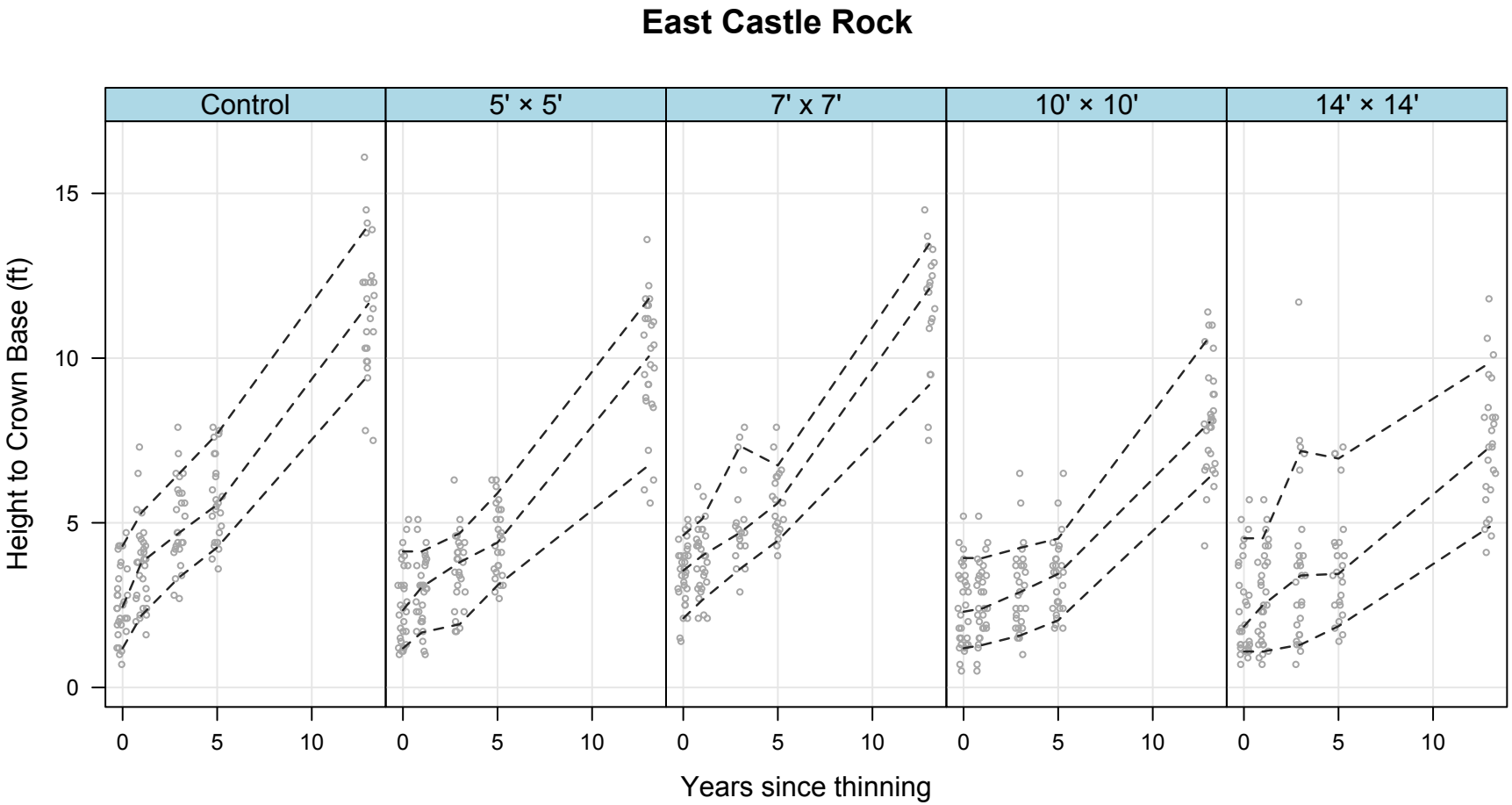
Stocking Levels



Changes in Diameter Distribution



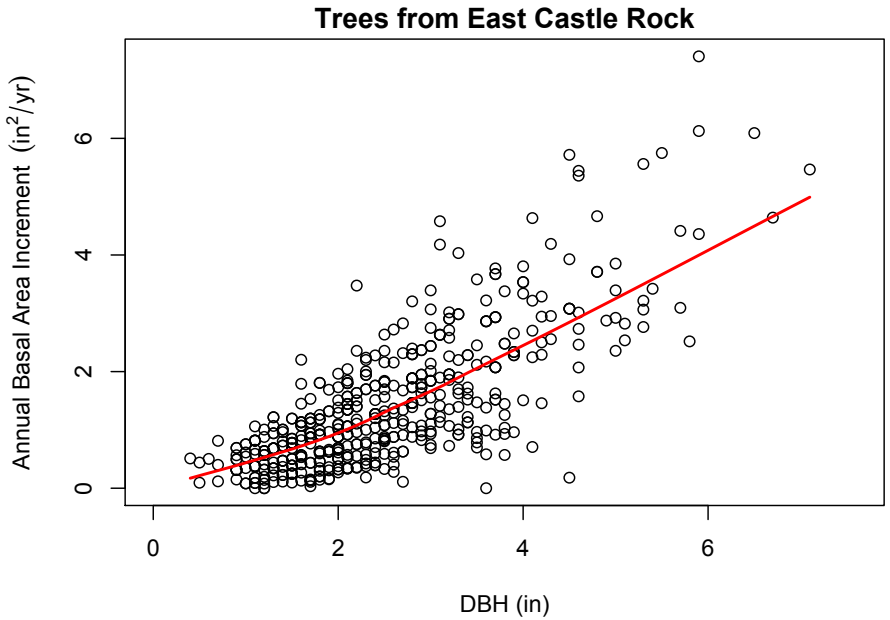
Height to Crown Base

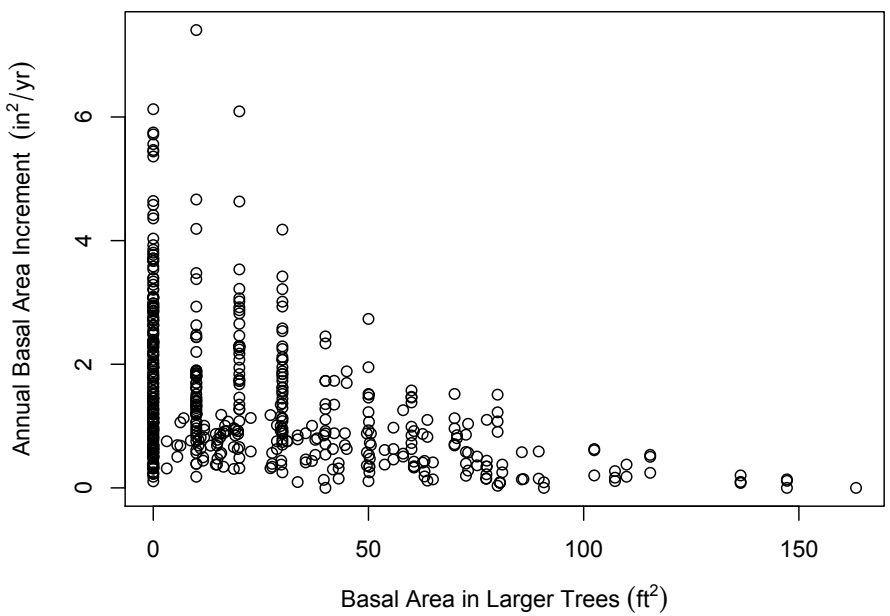


How Does Thinning Really Affect Growth?

- Discrete treatment spacing levels are approximate
- To isolate effect of density on growth:
  - Use continuous density metric
  - Incorporate information other factors that drive growth
    - e.g. Tree size and competitive status
- Think about modeling growth using multiple predictors

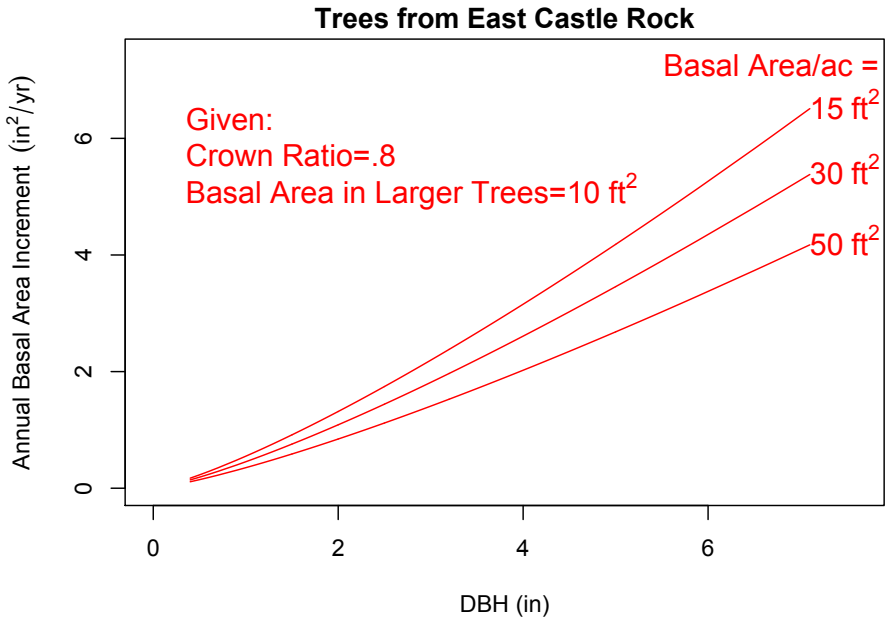
Modeling Basal Area Increment

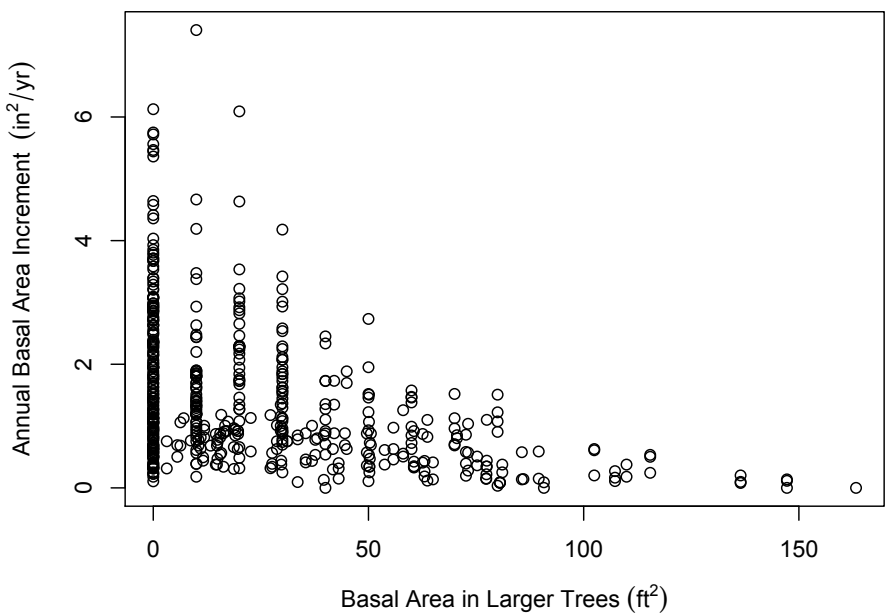




- Factors that drive growth:
  - Initial size
  - Relative size and competitive status
  - Quantitative density
  - Crown health
  - Site Quality

Modeling Basal Area Increment





- Factors that drive growth:
  - Initial size
  - Relative size and competitive status
  - Quantitative density
  - Crown health
  - Site Quality
- Using this information we can model basal area growth
  - Decide on optimal conditions based on local information

Acknowledgements

- Inland Northwest Growth and Yield Cooperative
- Nez Perce Tribe
- Spokane Tribe of Indians
- Dennis E. Ferguson, USDA Forest Service
- John C. Byrne, USDA Forest Service
- William R. Wykoff, USDA Forest Service
- Brian Kummet, Nez Perce Tribe
- Ted Hensold, Bureau of Indian Affairs

Questions?