



Three years later. The same range after sheep had been excluded for three years. Brush, grass and ground-cover returned. Only cattle allowed to graze. - OUT WEST, 1906

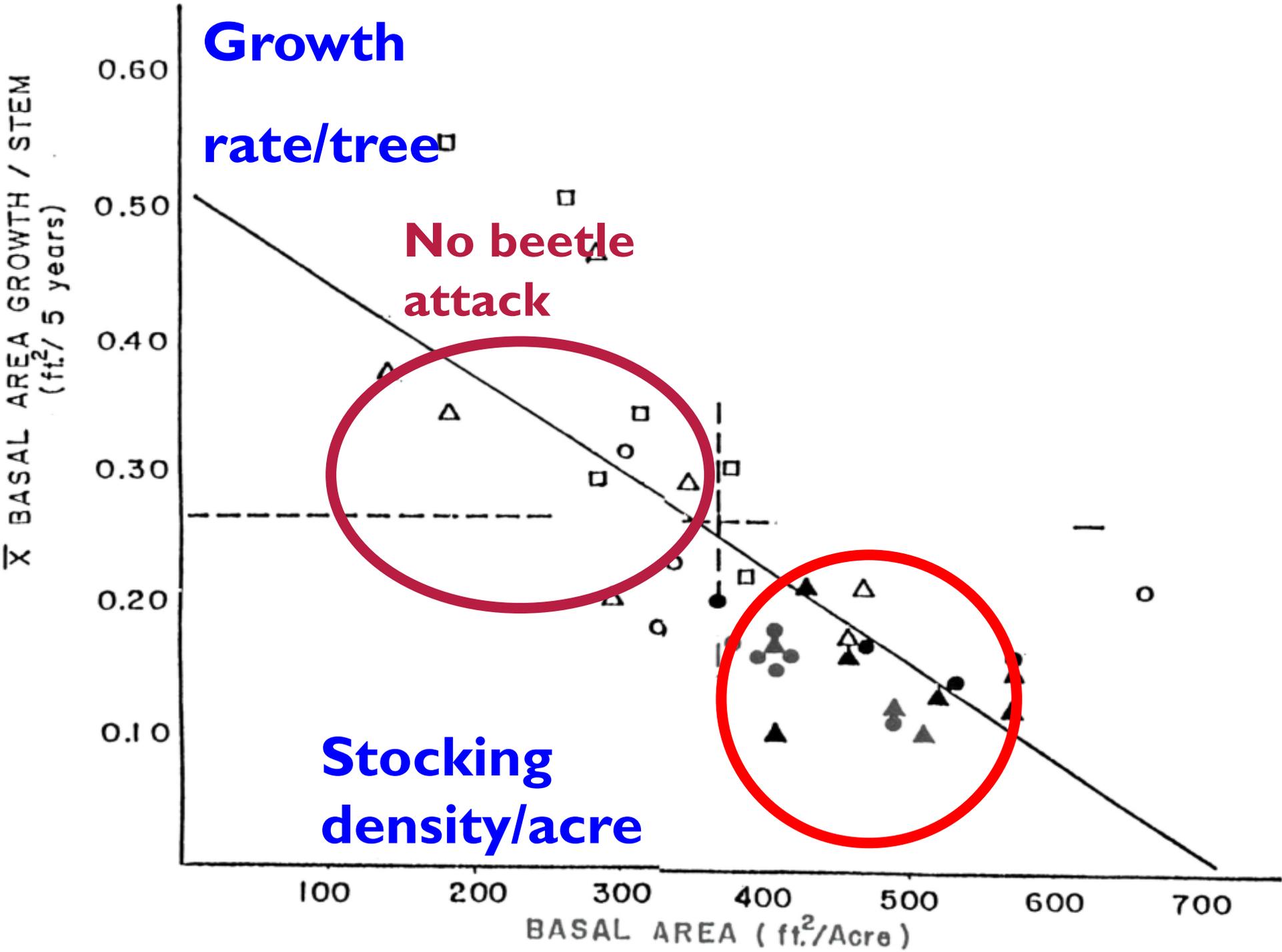
**San Bernardino National Forest, c. 1906. Open forest, brush understory.**

from Robinson, The San Bernarinos. 1989. Big Santa Anita Historical Society.









# FORESTS EVOLVED WITH DISTURBANCE

---

- Fire
- Insects
- Disease
- Fires Account for One-Fifth of Global CO<sub>2</sub> and Other GHG Emissions- Levine & Cofer, 2000, Schimel 1995



# NATURAL FIRE REGIME

---

- Elements:
  - Fire Intensity
    - $f$  of fuel arrangement
    - $f$  of weather
    - $f$  of topography
  - Fire Size
  - Fire Frequency



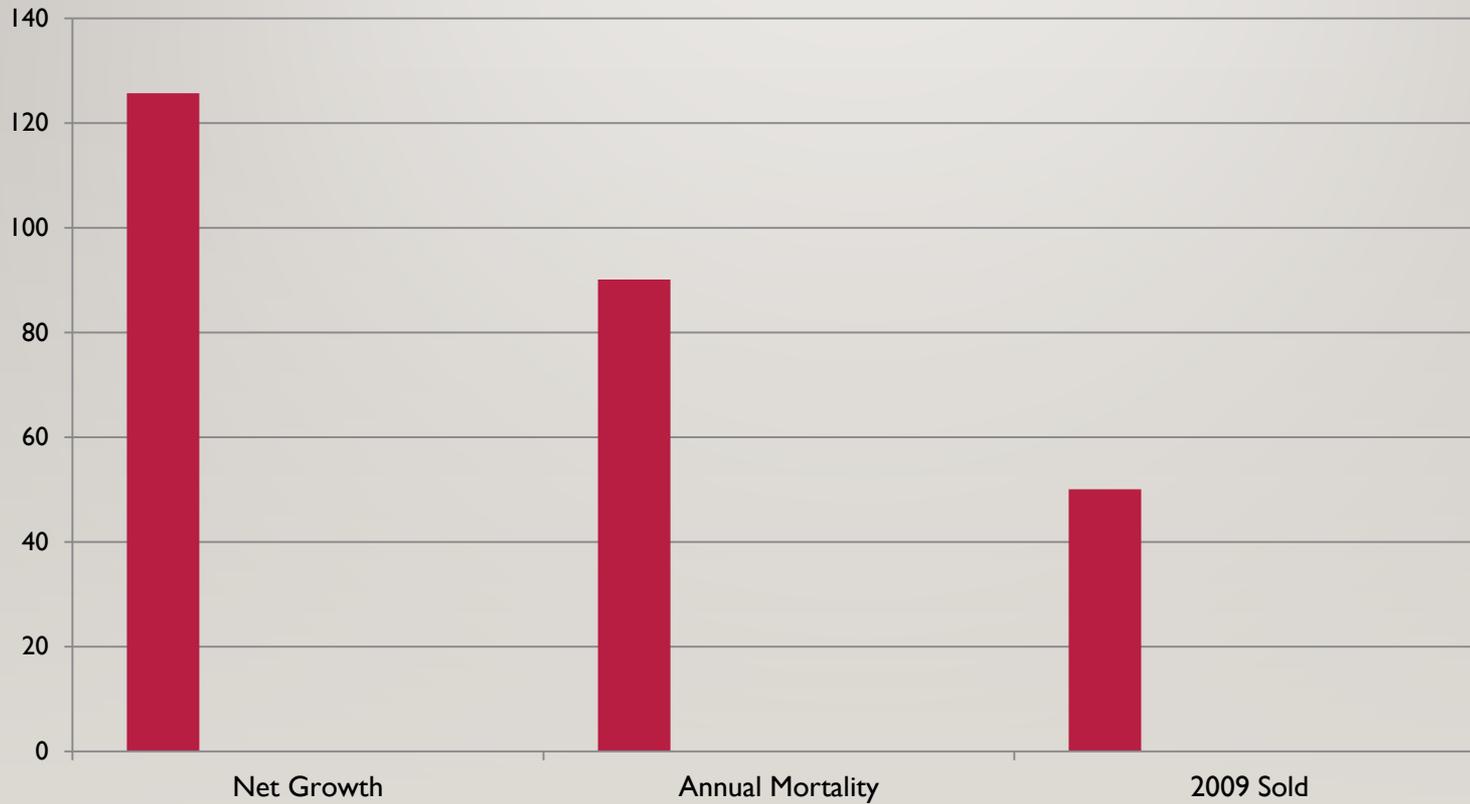
# ROLE OF FIRE IN THE ECOSYSTEM

---

- Regeneration
- Competition Reduction
- Nutrition
- Thinning
- Sanitation
- Succession
- Wildlife

## Annual Net Growth and Mortality; Klamath Natl. Forest

MMBF



# CONE FIRE - SEPT. 2002

## BLACKS MOUNTAIN EXPERIMENTAL FOREST

**Unthinned**



**Thinned  
+  
Prescribe Burn**

**Unthinned**

**Thinned  
Early 1980s**

**1 1:40 PM**