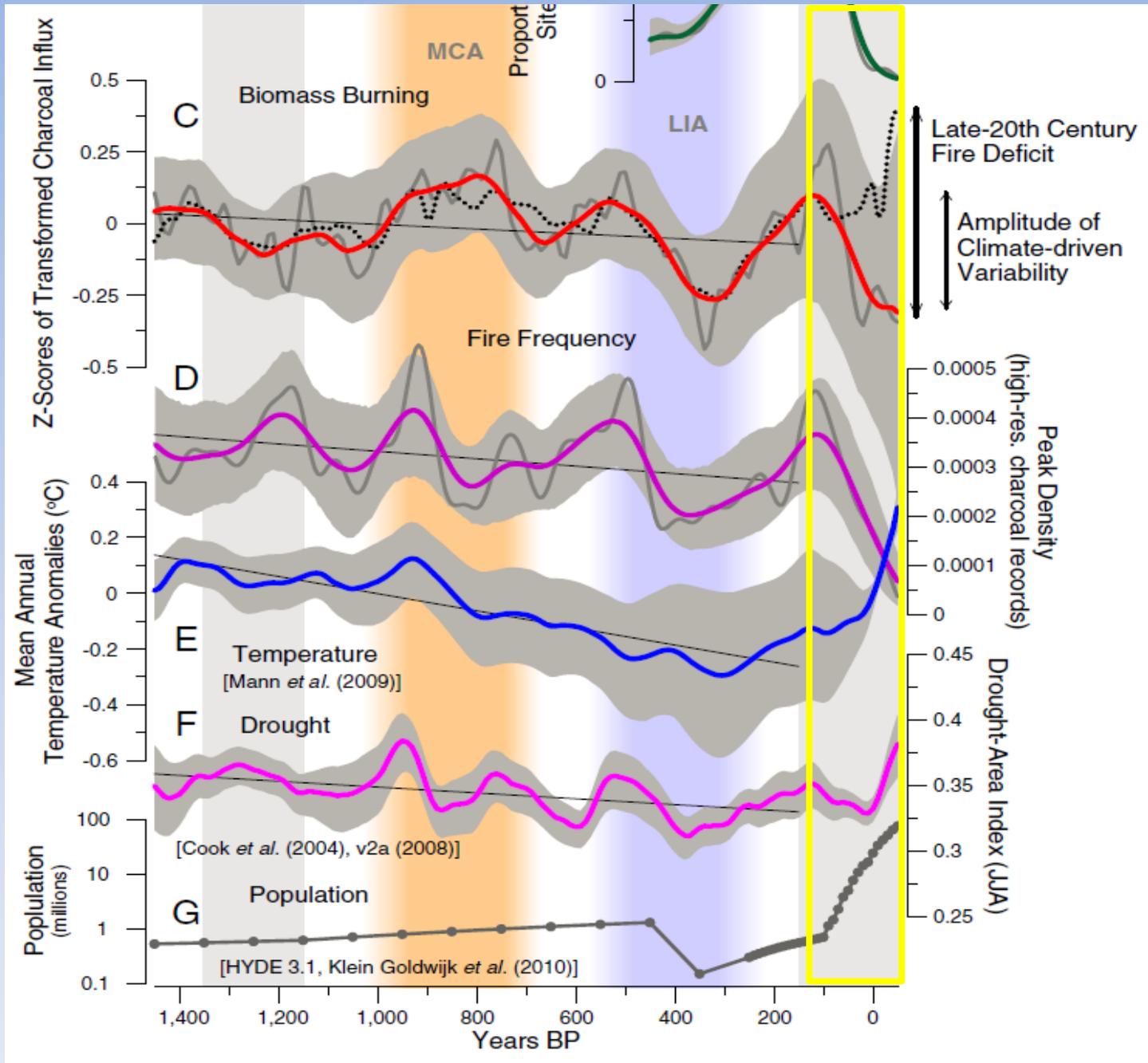




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Fire deficit in Sierra Nevada forests: how the lack of fire contributed to the current calamity

Reconstructed historical climate and fire





~1915

2005



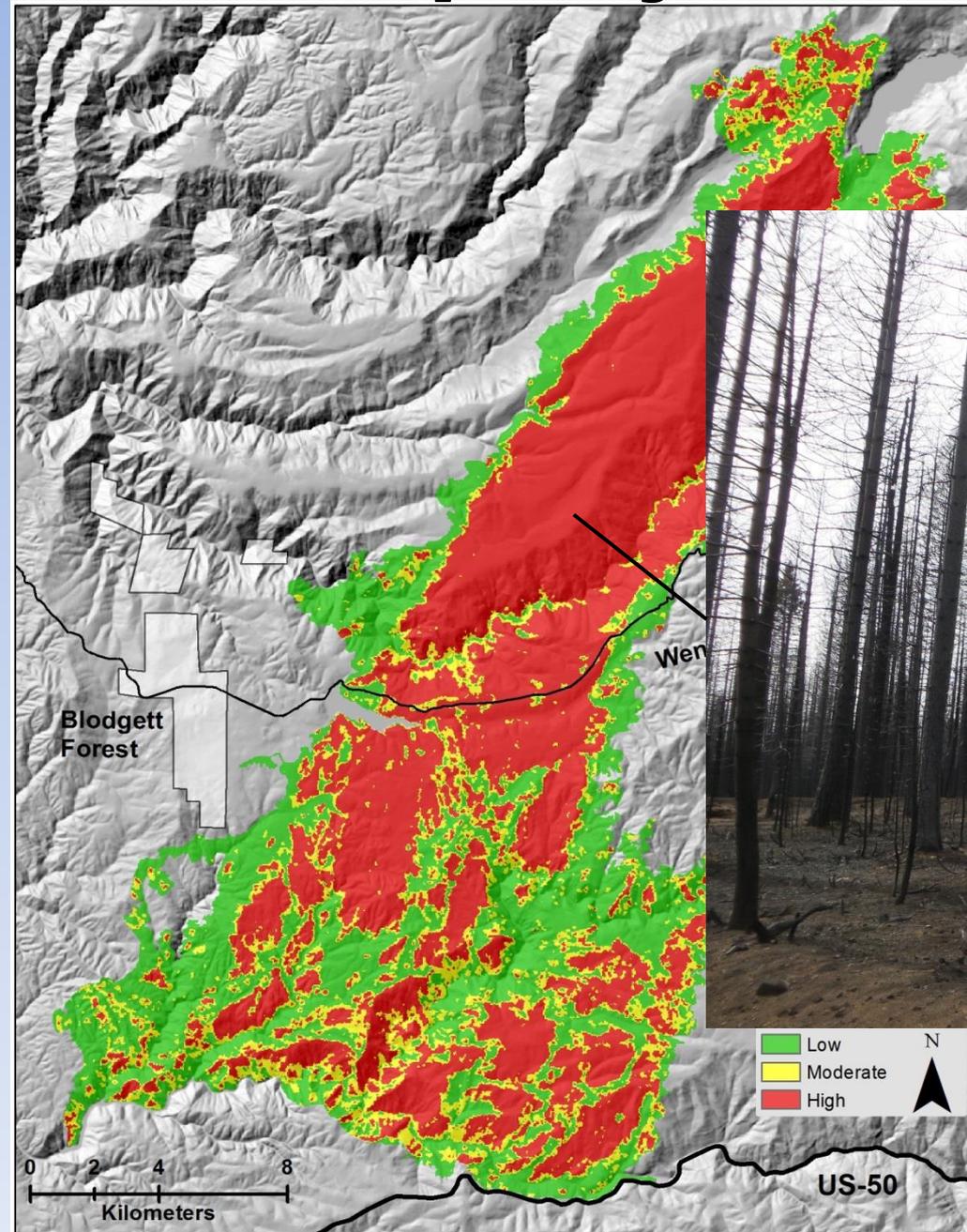
**Guard Station, Plumas
National Forest (near UC
Forestry Camp)**

Historical vs. current forest conditions: re-measurement of early forest surveys

Year	Basal area (ft ² ac ⁻¹)	Tree density (ac ⁻¹ ; >6 in.)	Pine proportion	Shrub cover (%)
1911	87	22	0.56	28
2013	173	101	0.45	14



Contemporary forests: highly vulnerable to severe fire effects, e.g., King Fire (2014)



Ten years after high severity fire: Plumas NF

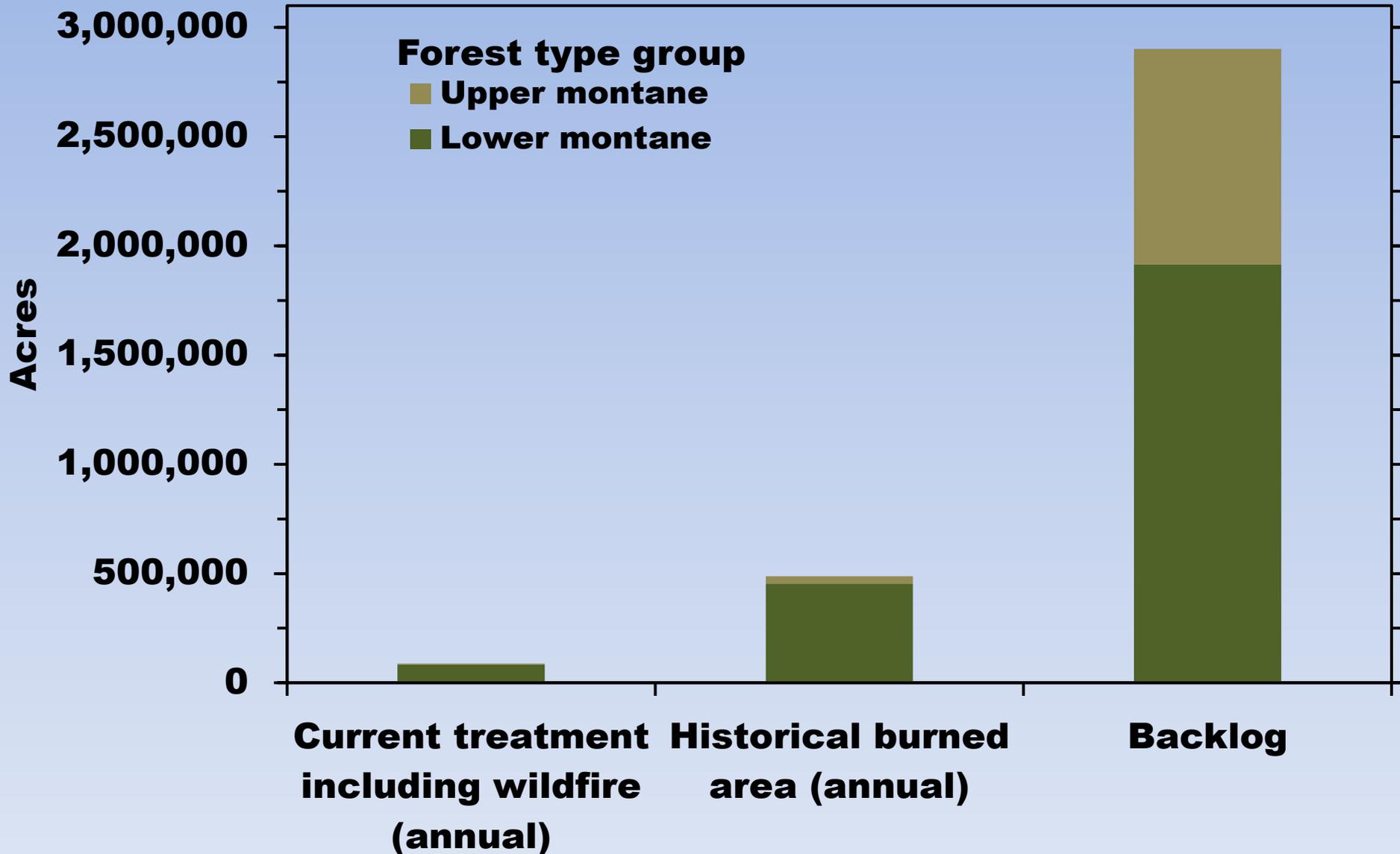


Contemporary forests: less resilient drought

- **Higher tree density = more drought stress**
- **Mortality disproportionately affecting large trees**

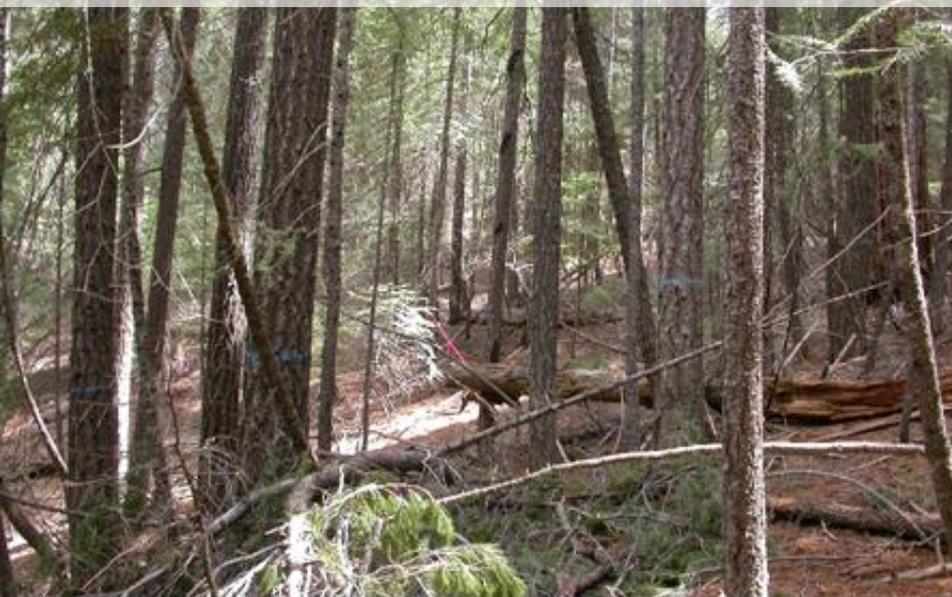


Contemporary vs. historical “treatment”



A

Restoration treatments: Thinning



Restoration treatments: Prescribed fire



Blodgett Forest: thinning + Rx fire



C 570
P113 S
8-19-03
MECH&FIRE
POST TREAT

Yosemite National Park: multiple Rx fires



Forest management implications:

- **Current forests are substantially altered from historical conditions**
 - **Greater tree density (small trees)**
 - **More fuels**
 - **Lower variability**
- **Contemporary high severity fire EXCEEDS historical levels, and likely increasing**
- **Large-scale restoration strategies are needed**
 - **Balance *treatment* impacts vs. *fire* impacts to wildlife**
 - **Introduce more variability**
 - **More beneficial fire**

