

The Impacts of Long-Term Management Strategies on Forest Health

Lessons from
the Sierra
Nevada

Olivia Hemond

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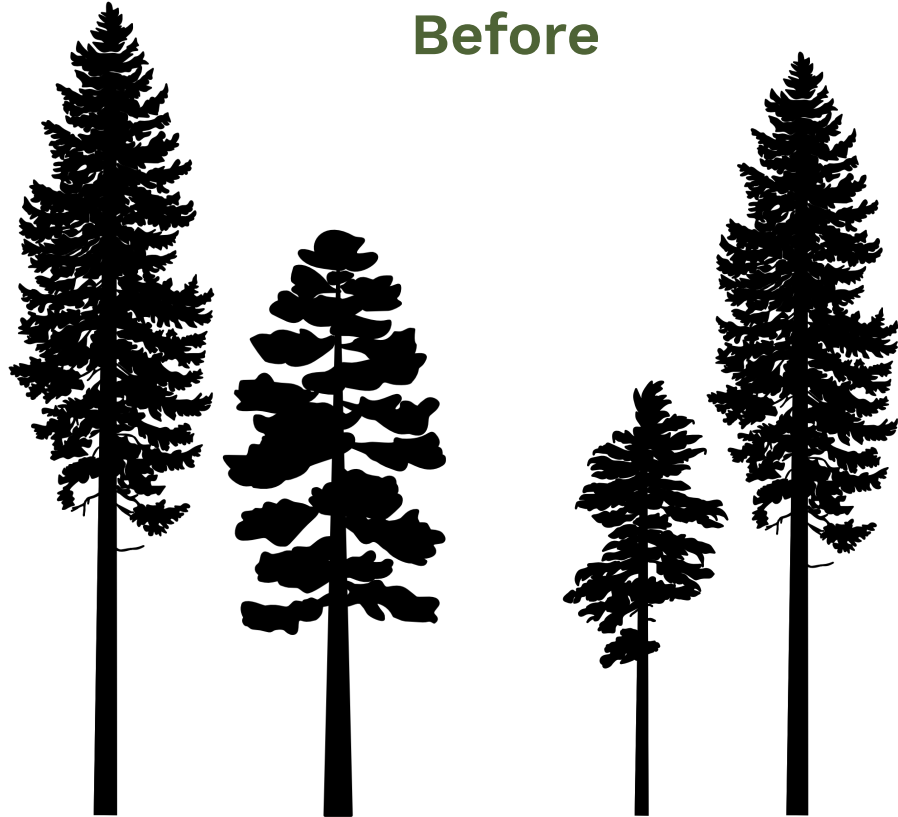
*Data from:
Stephens et al. 2023*



Sierra Nevada Conservancy

Wildfire suppression practices have created
overgrown, overcrowded forests

Before



After



This ineffective management has increased forest **vulnerability** in the Sierra Nevada



To reduce vulnerabilities, we can choose between **different types** of active forest management

Prescribed Fire



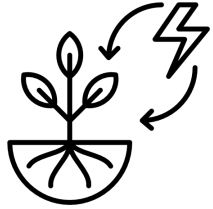
The Nature Conservancy

Mechanical Thinning



CalMatters

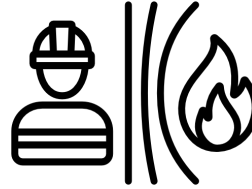
But how do these strategies **compare**?
Can they meet **multiple** management goals?



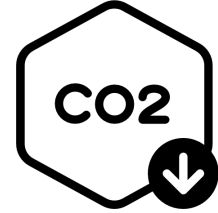
Forest
resilience



Cost
effectiveness



Wildfire risk
reduction



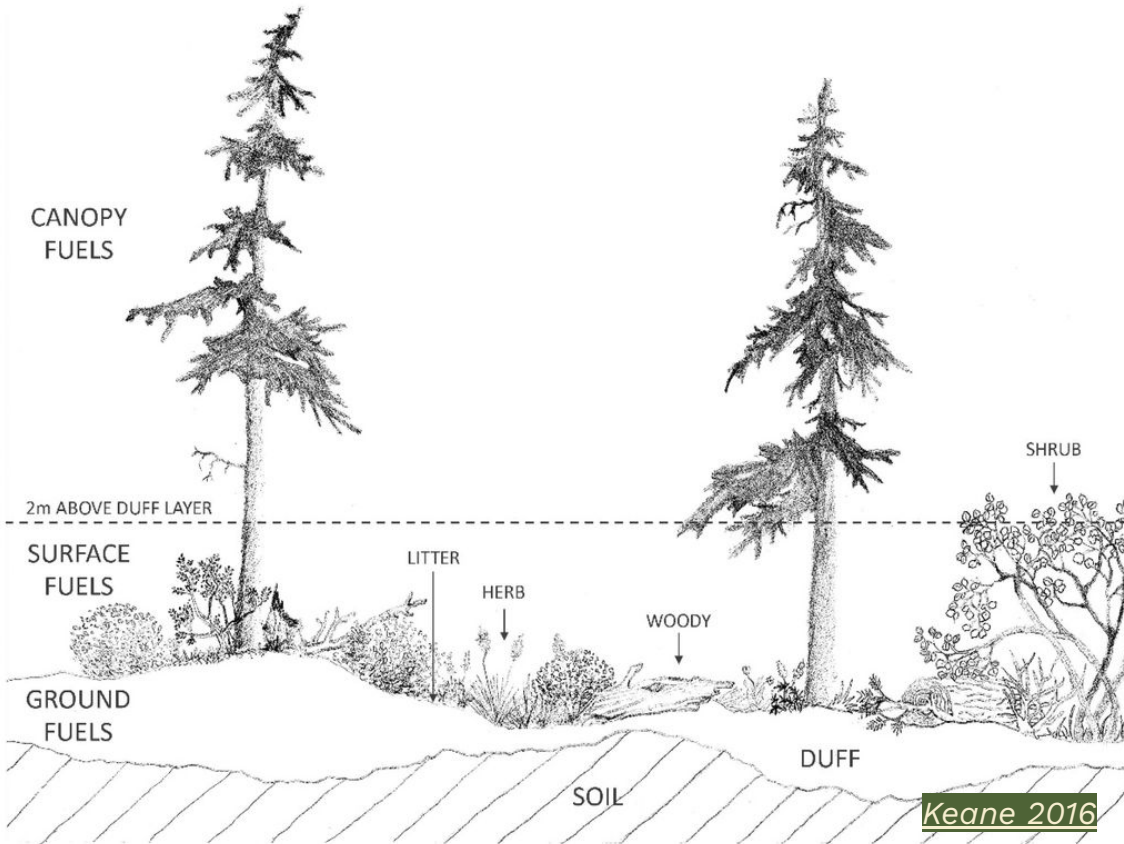
Carbon
sequestration

Multiple Management
Goals

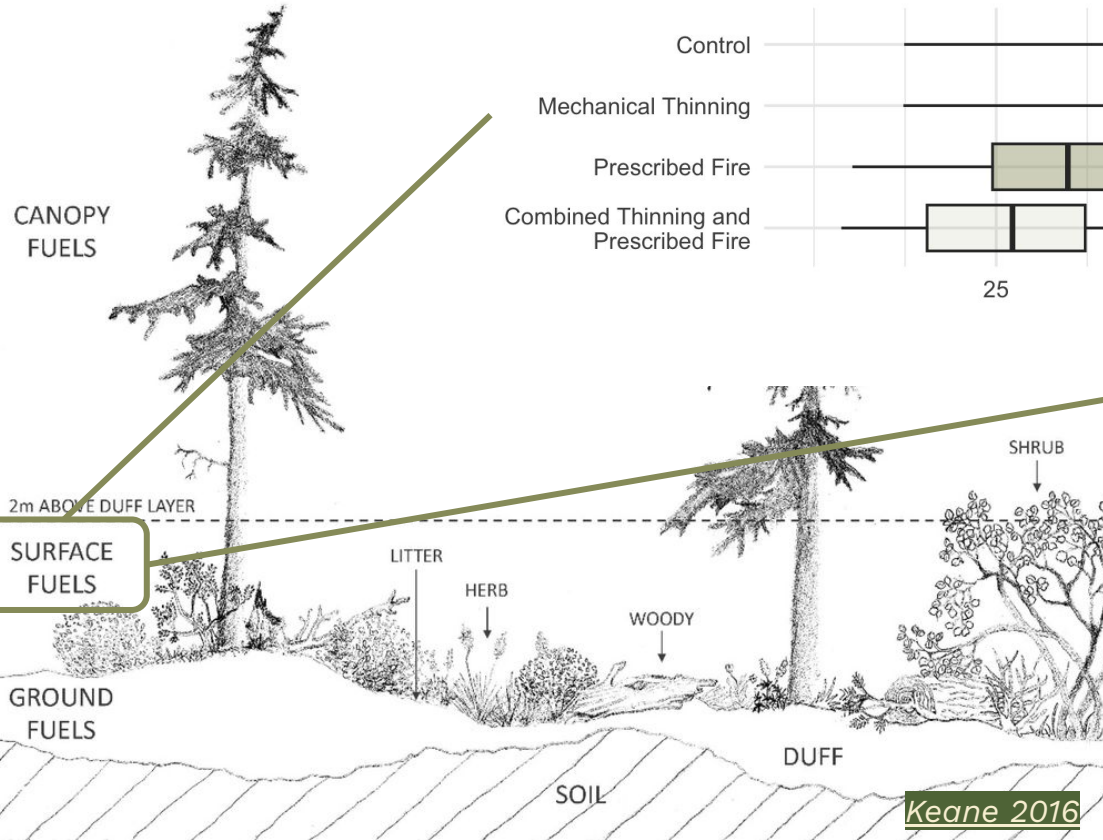
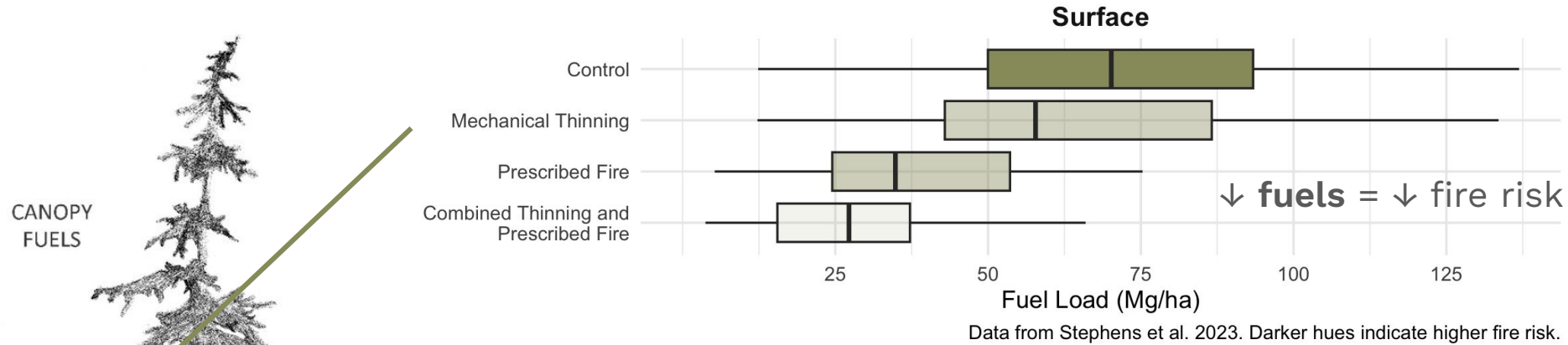
Researchers tested the different management strategies over 18 years



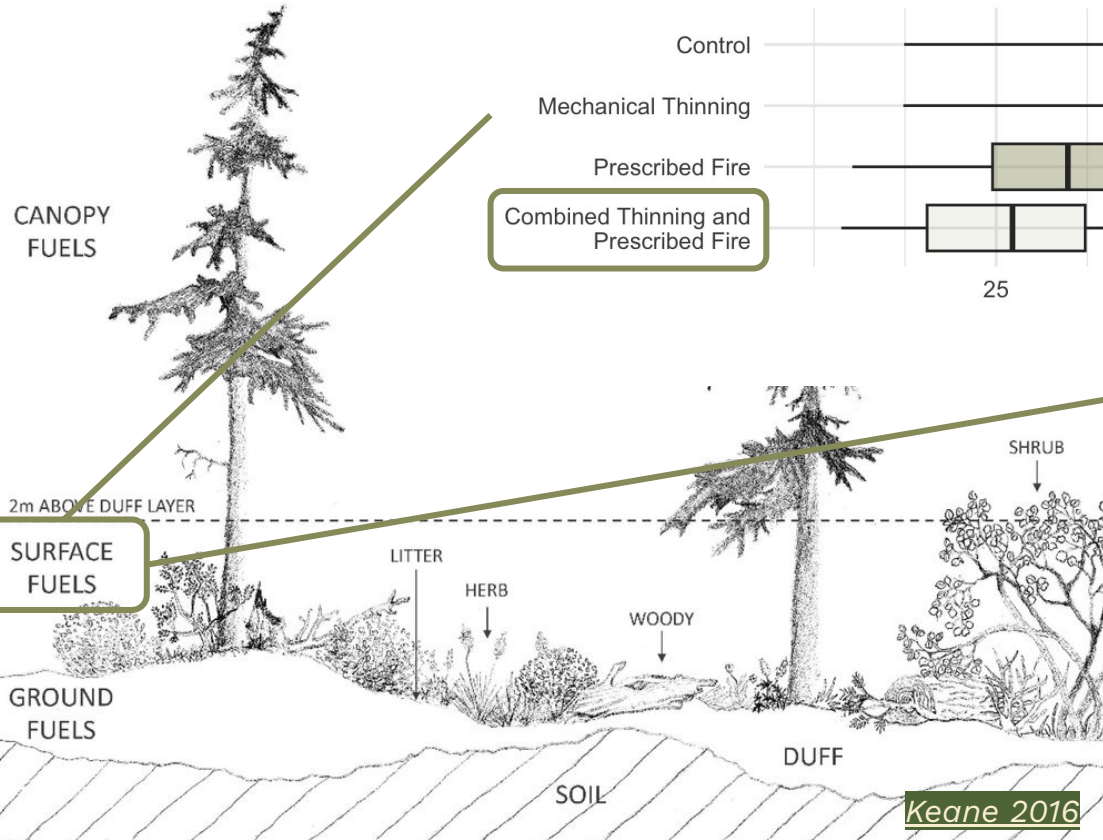
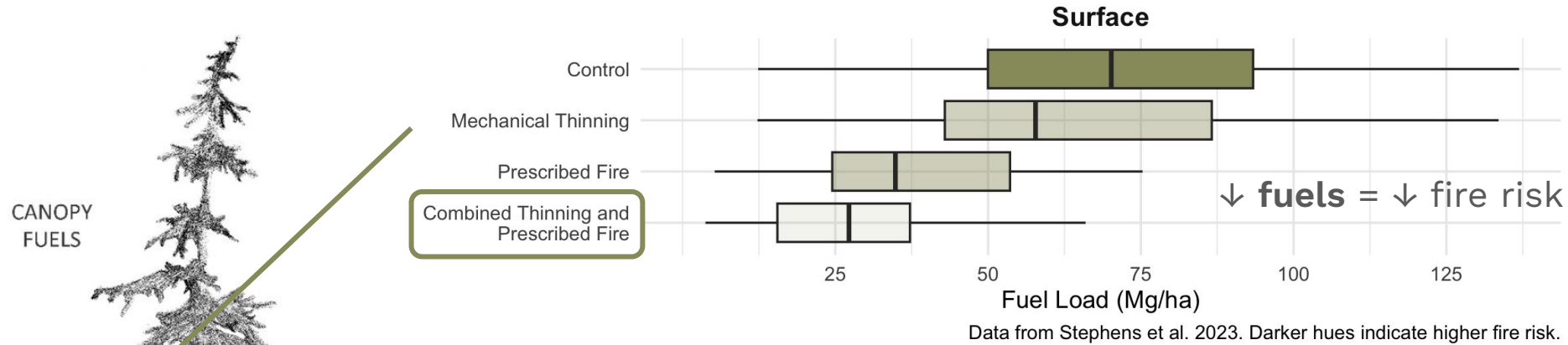
Combining treatments is best for reducing fire risk



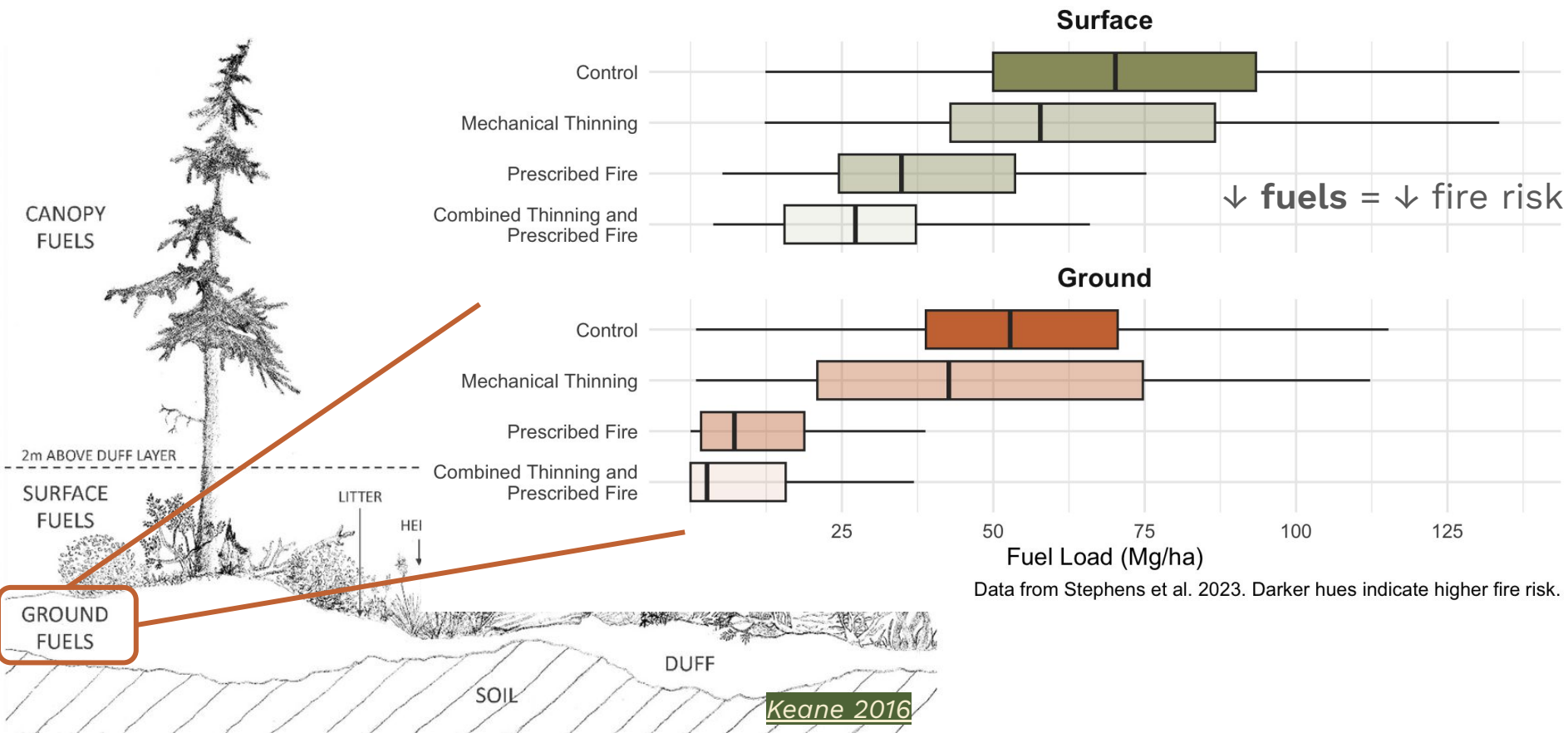
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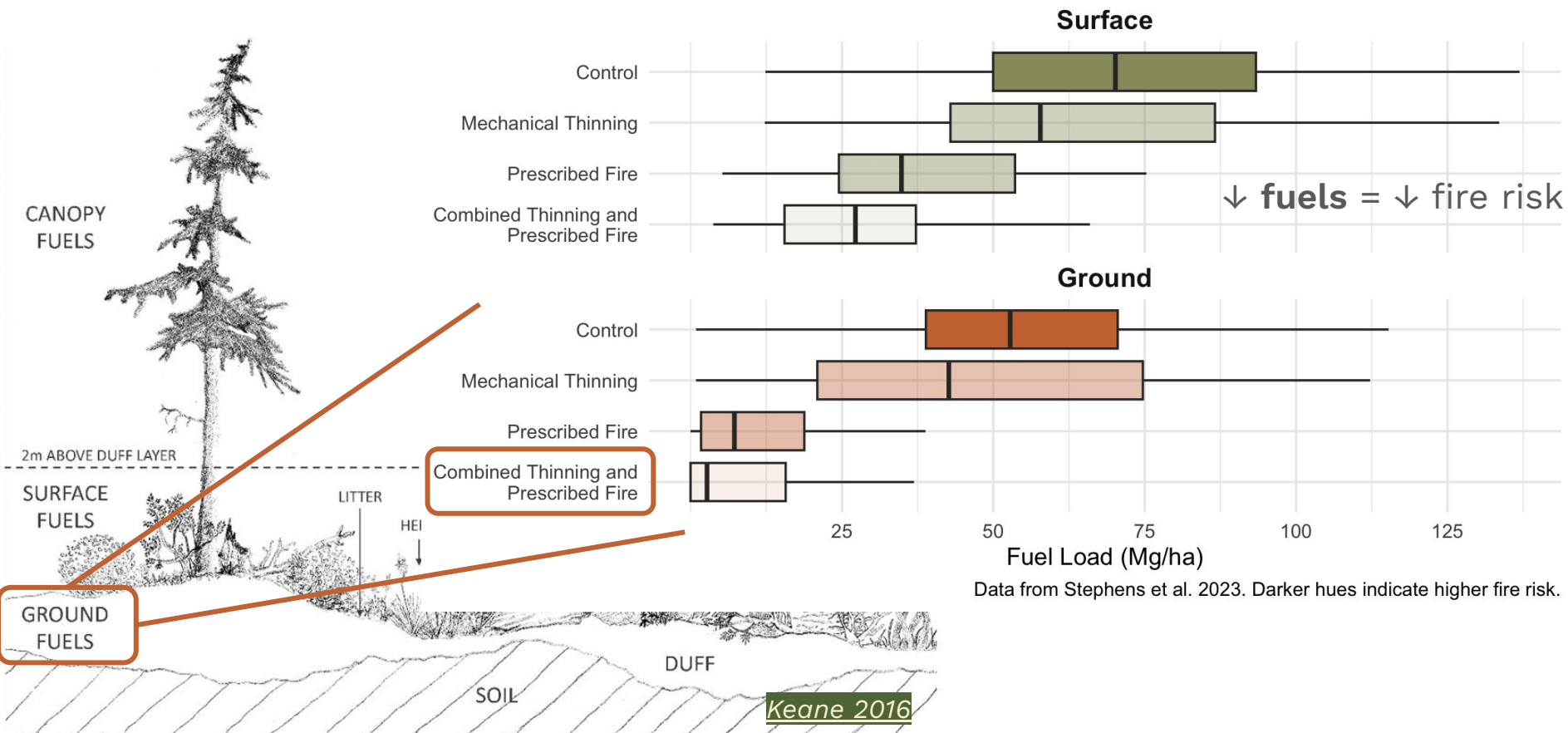
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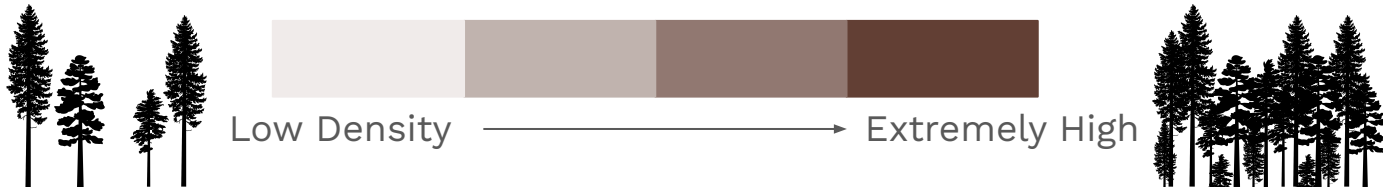
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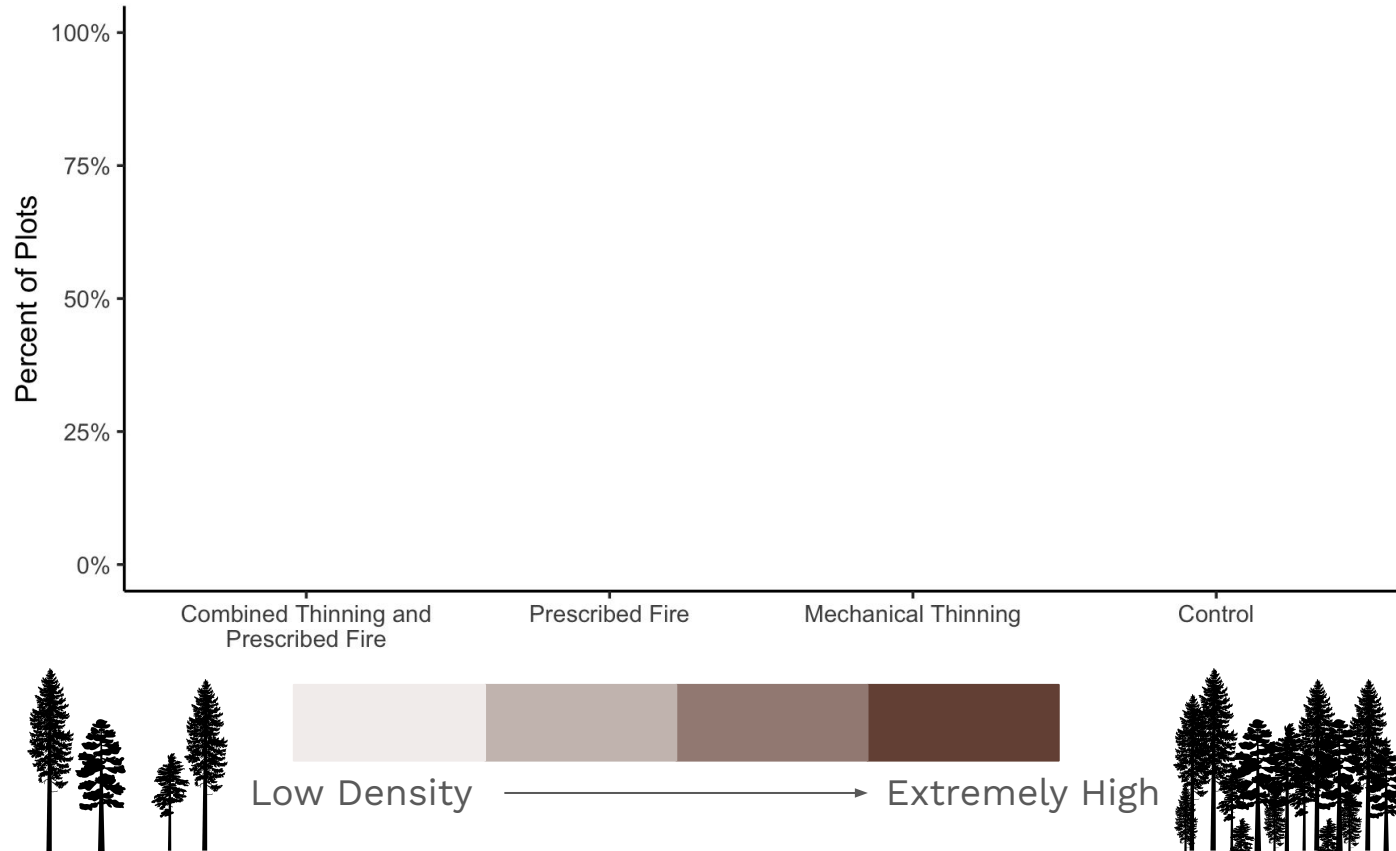
Combining treatments is best for reducing fire risk



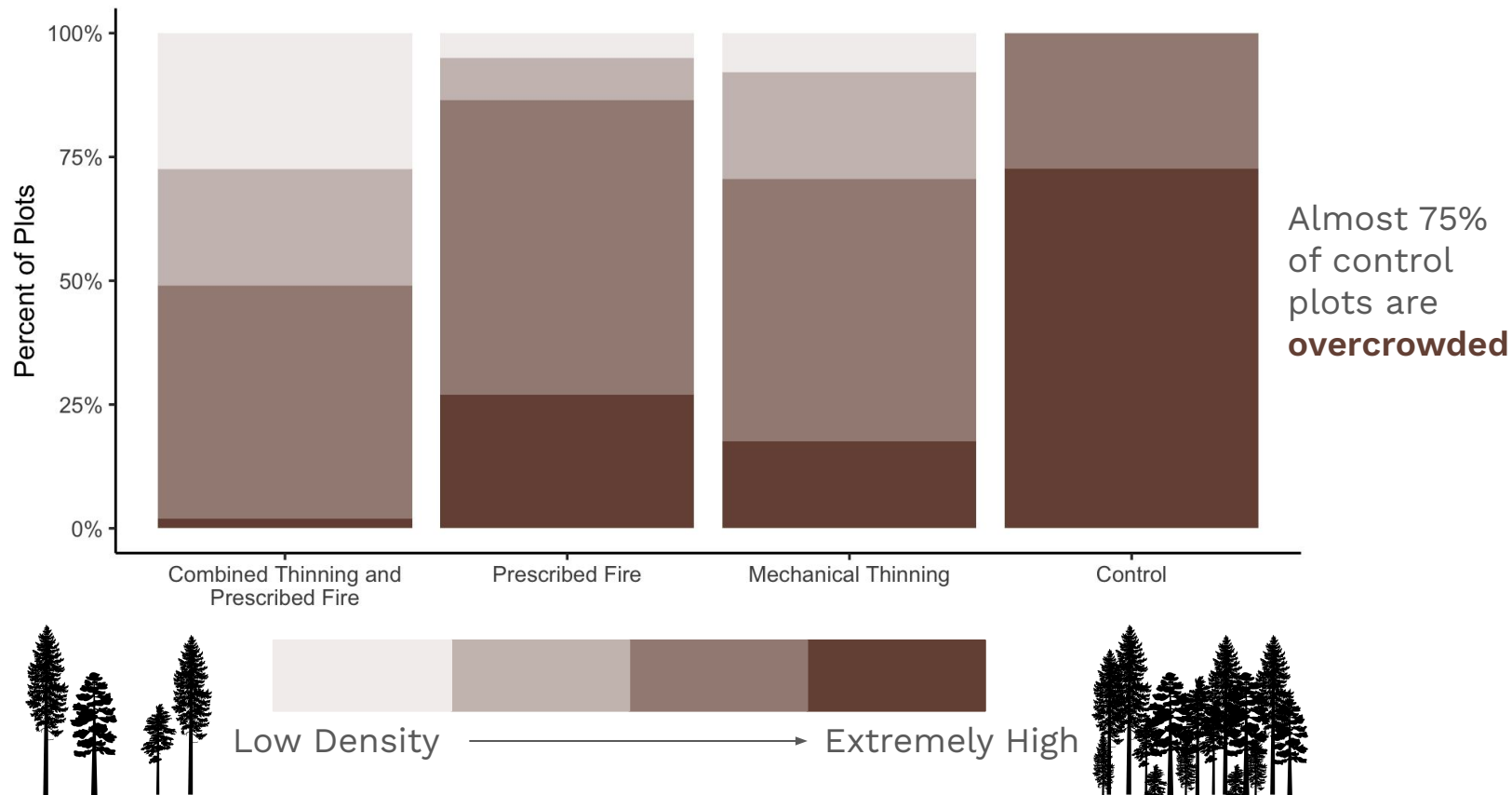
All treatment options **reduced** forest densities,
improving their resiliency



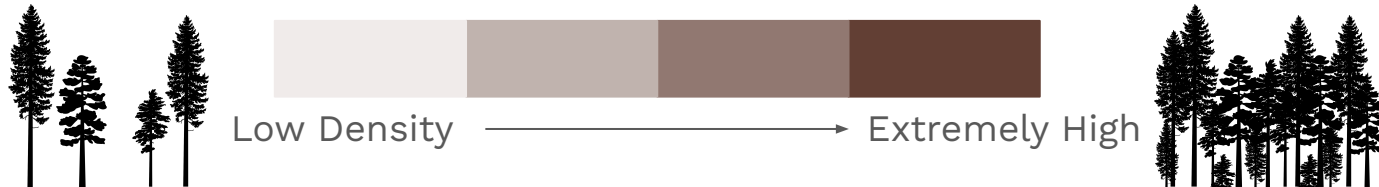
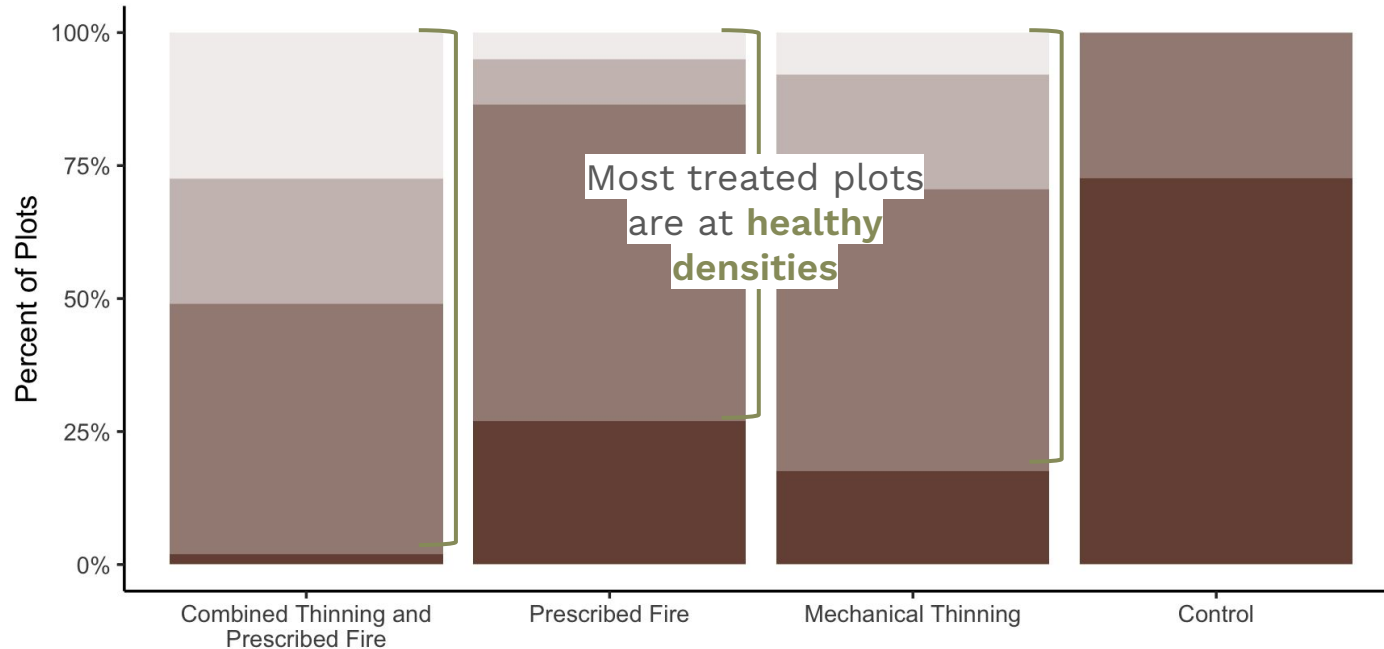
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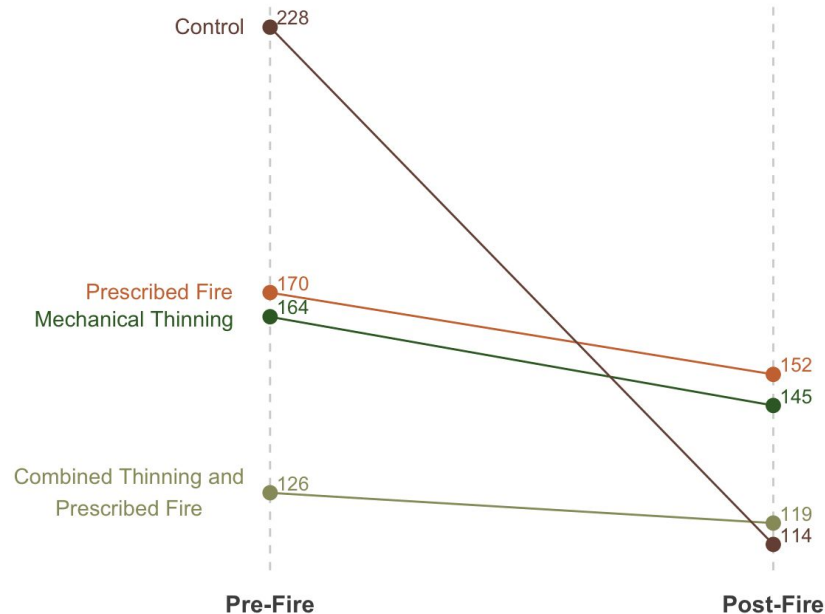
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Prescribed fire and mechanical thinning both preserve high amounts of forest carbon

Carbon Stocks in Mg/ha Before and After a Simulated Fire

Control plots risk losing the greatest amount of carbon from wildfires



Data from Stephens et al. 2023.

Mechanical thinning is **most cost effective**



+\$13

↑
Net profit!



-\$163



+\$337

↑
Net profit!



\$0

Costs per ha/yr

The best management strategy depends on forest managers' **goals** and **budget**



Expensive but
effectively reduces
fire risk



Profitable but
higher fire risk

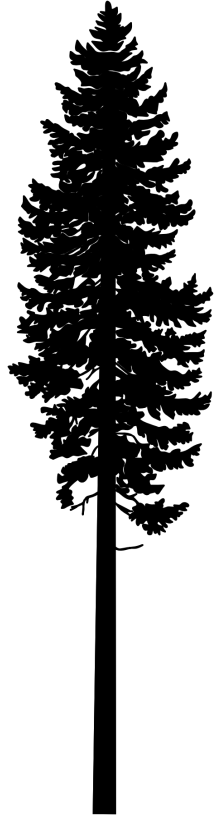


Overall most
effective but *barely*
profitable



Cheap but *overall*
least effective

Increased **funding** and **action** are essential to protect the forests of the Sierra Nevada





Thank You for Listening!

All data visualizations are my own. Photo credits are given.

All raw data was obtained from: Stephens et al. 2023

National Forest Foundation