

Mortality and wildfire trends in giant sequoia



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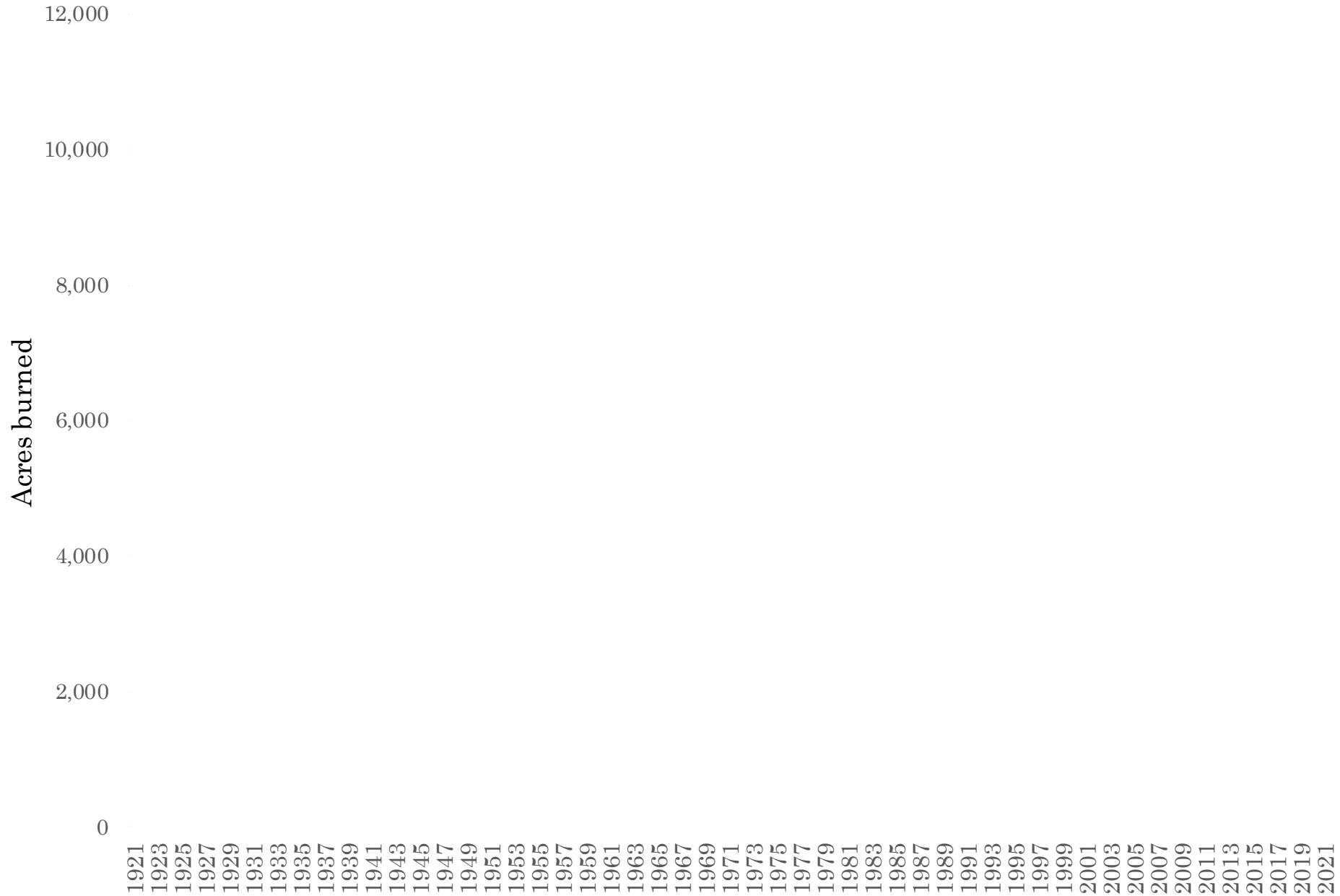
³ Save the Redwoods League

⁴ USDA Forest Service, Rocky Mountain Research Station

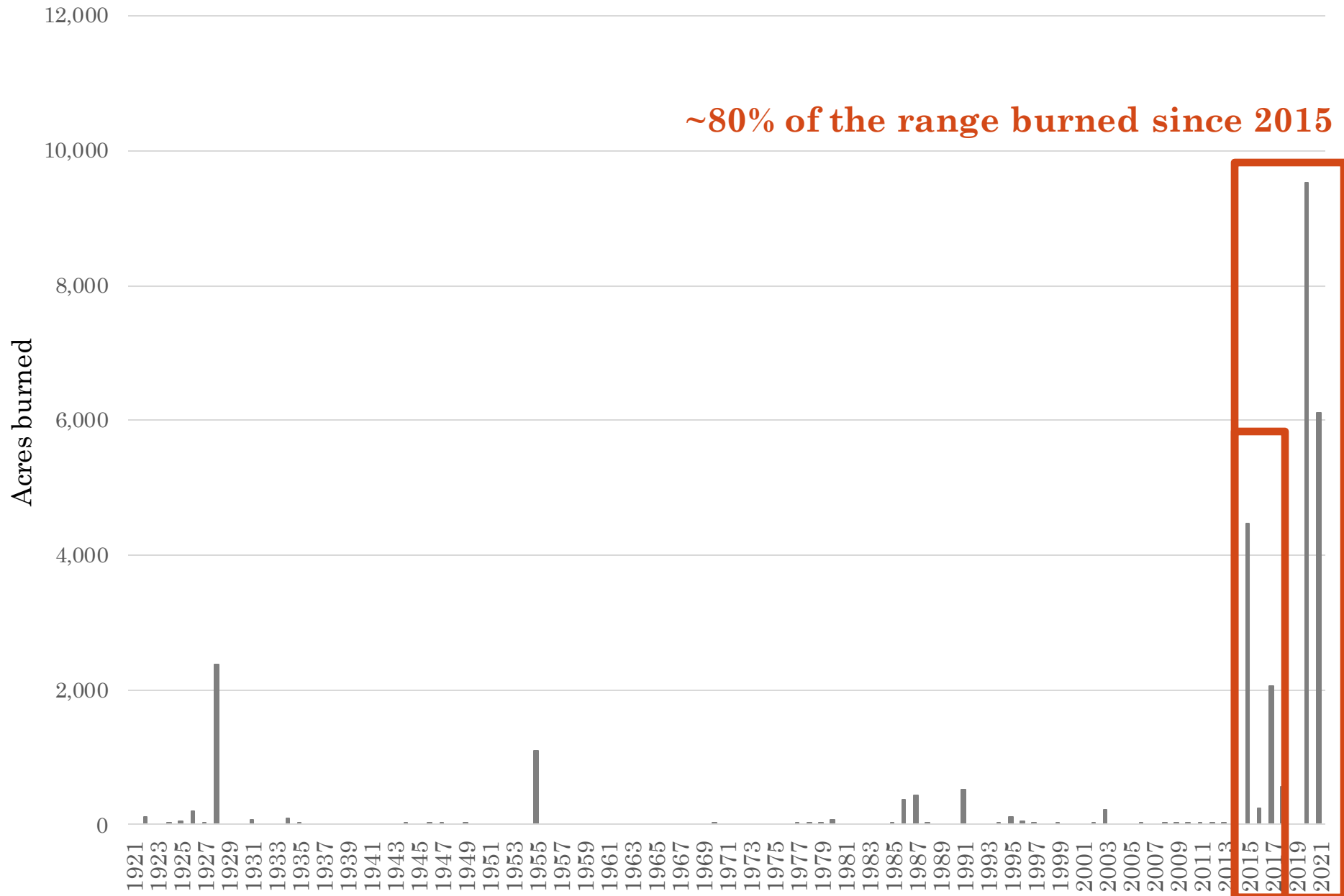
⁵ USGS (retired)

⁶ Sequoia and Kings Canyon National Parks

Giant sequoia acres burned 1921-2021



Giant sequoia acres burned 1921-2021



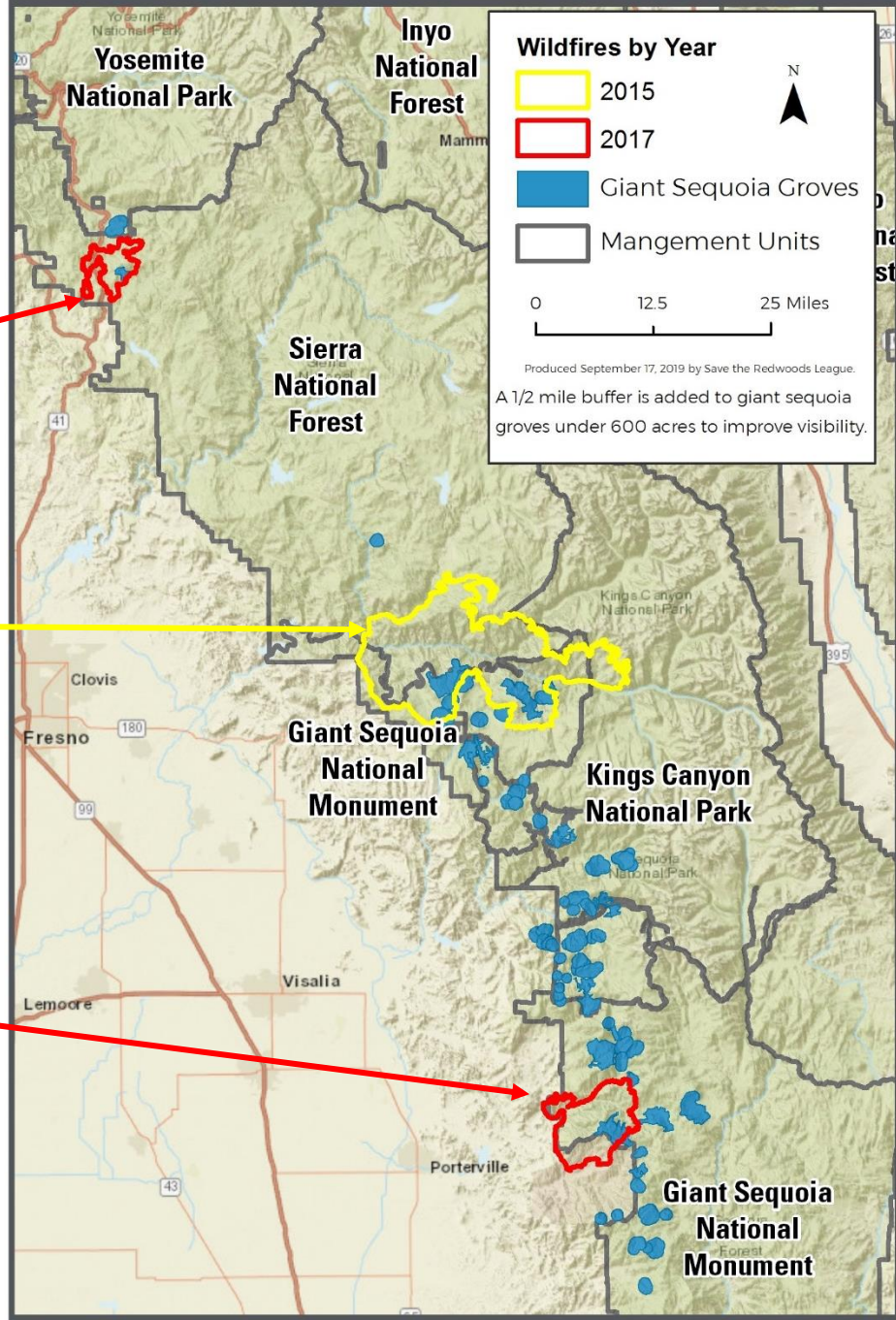
GIANT SEQUOIA RANGE

Study sites

Nelder Grove
2017 Railroad Fire

Evans, Kennedy and Lockwood Groves
2015 Rough Fire

Black Mountain Grove
2017 Pier Fire



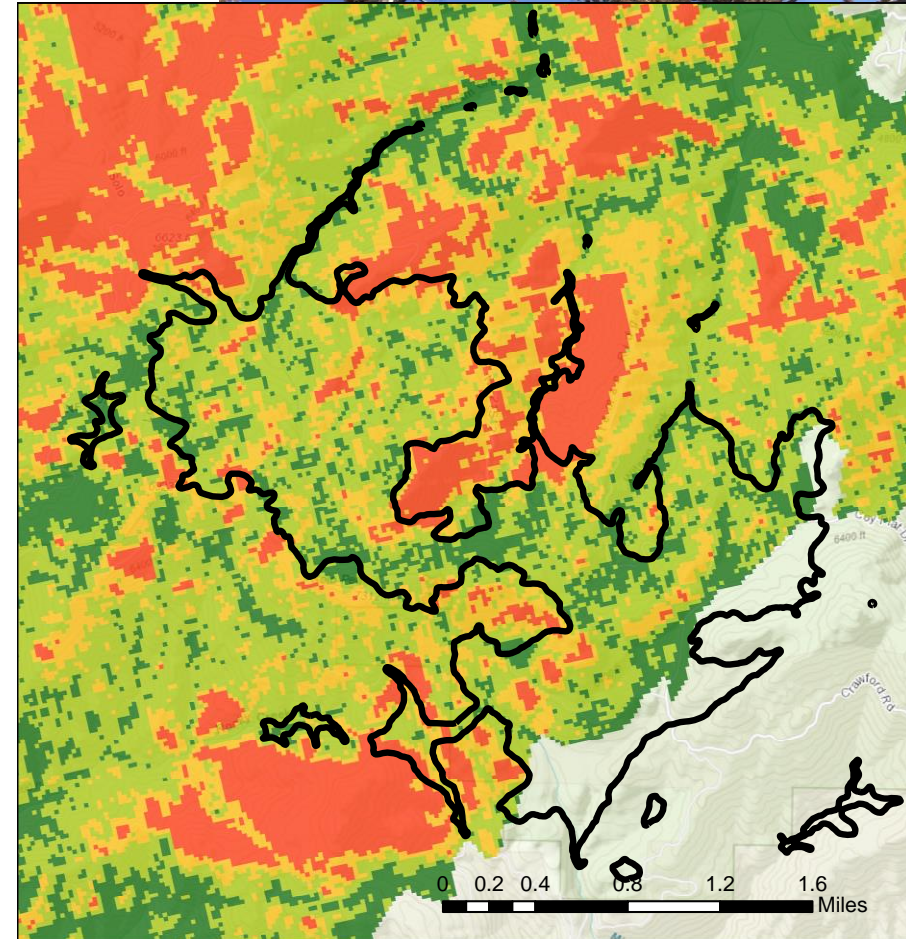
Research results

- Mortality rates for large sequoias (>4 feet DBH)
- Tree characteristics and topography associated with mortality across all three fire areas
- Predictors for delayed mortality at Black Mountain Grove



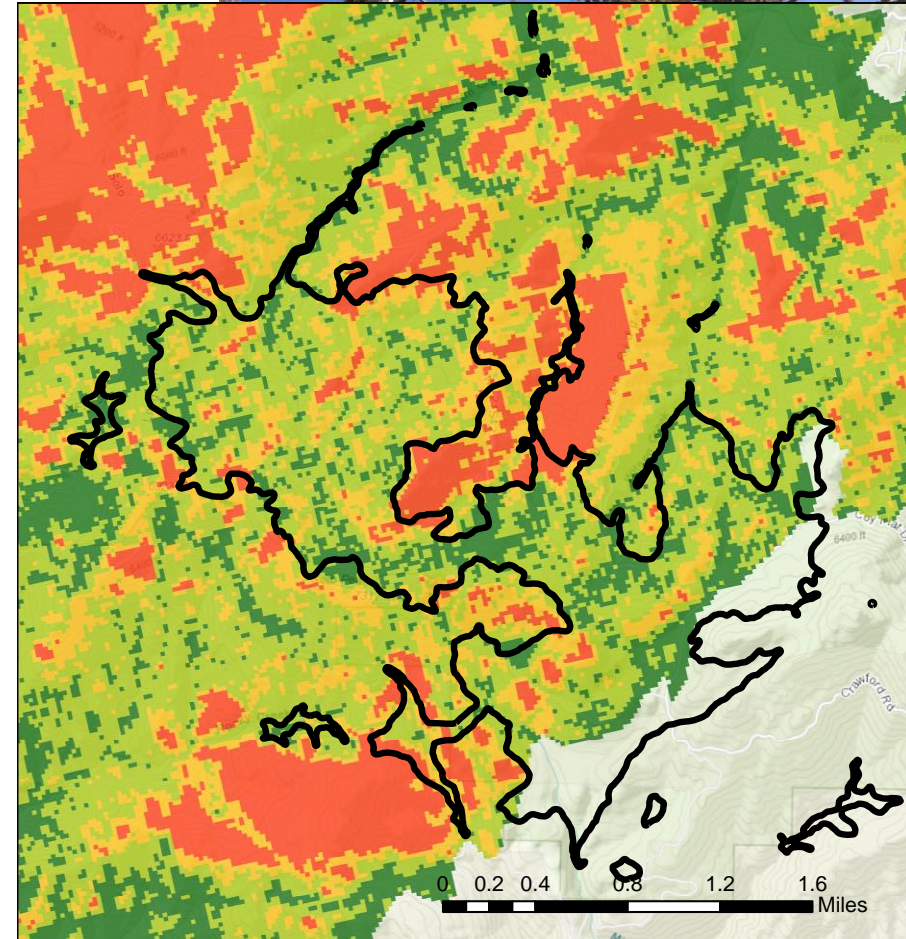
Mortality rates

- Surveyed 459 large sequoias
 - Mean DBH: 9.8 ft (range: 4-20)
 - Mean Height: 203 ft (range: 72-262)
 - 30 trees >90% torch (full crown consumption)
- 41% (186) dead by 2020
- Mortality rate by fire severity class:
 - High: 84% (75-100%)
 - Moderate: 28% (14-45%)



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Mortality estimates 2020-2021



National Park Service

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Preliminary Estimates of Sequoia Mortality in the 2020 Castle Fire

Sequoia & Kings Canyon National Parks

10-14%

Version: 25 June 2021 (DRAFT in press)

Authors: Nathan Stephenson¹, Christy Brigham²

¹U.S. Geological Survey, Western Ecological Research Center

²National Park Service, Sequoia and Kings Canyon National Parks



National Park Service

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2021 Fire Season Impacts to Giant Sequoias

Sequoia & Kings Canyon National Parks

Executive Summary

Dr. Kristen Shive*, Dr. Christy Brigham**, Tony Caprio**, and Paul Hardwick**

*The Nature Conservancy

**National Park Service, Sequoia and Kings Canyon National Parks

3-5%

The 2021 fire season included two large wildfires (both started by the same lightning storm in early September) that burned into a large number of giant sequoia groves. This species has a limited distribution, covering just ~28,000 acres in ~70 groves on the western

Variables linked with mortality at all 3 fires

- Having a catface
- Less robust crown pre-fire (smaller crown ratio)
- Lower elevation



Delayed mortality at Black Mountain Grove

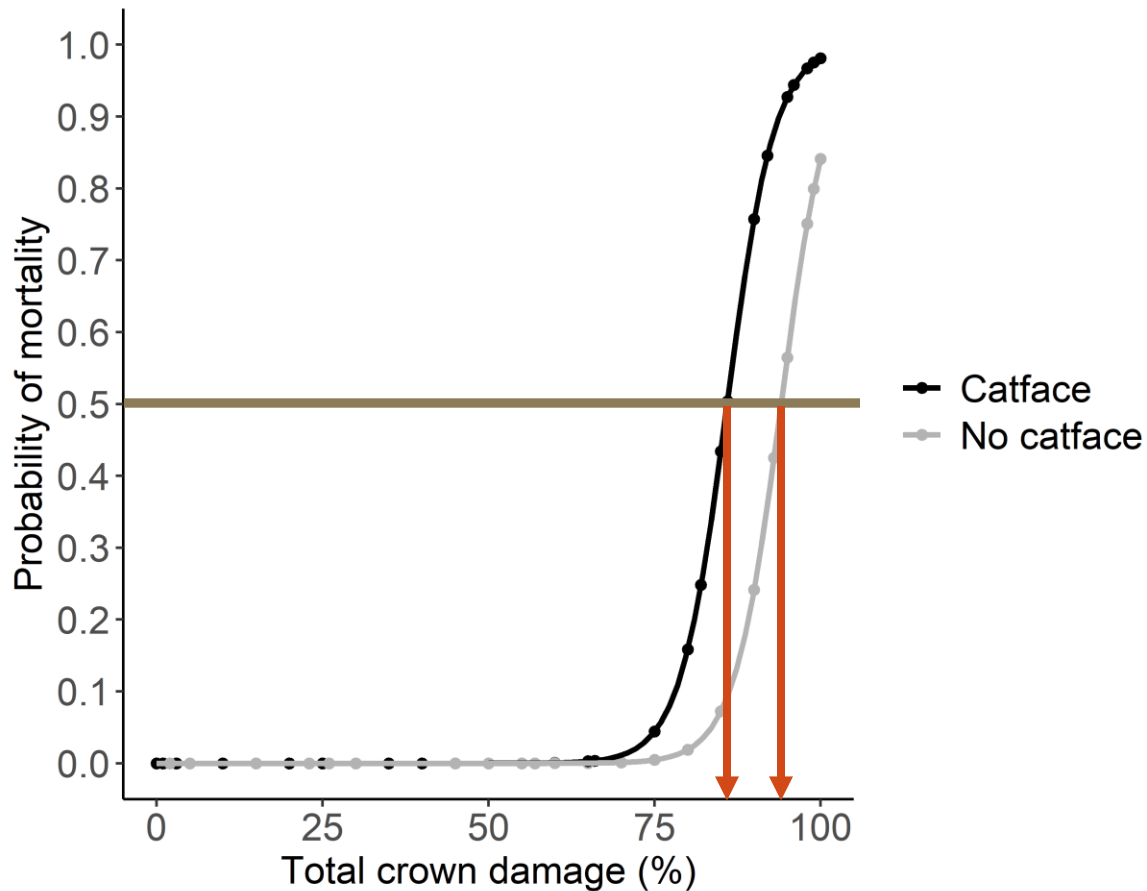
- Having a catface
- % crown damage



Delayed mortality at Black Mountain Grove



Mortality thresholds



With catface:
~85% crown damage

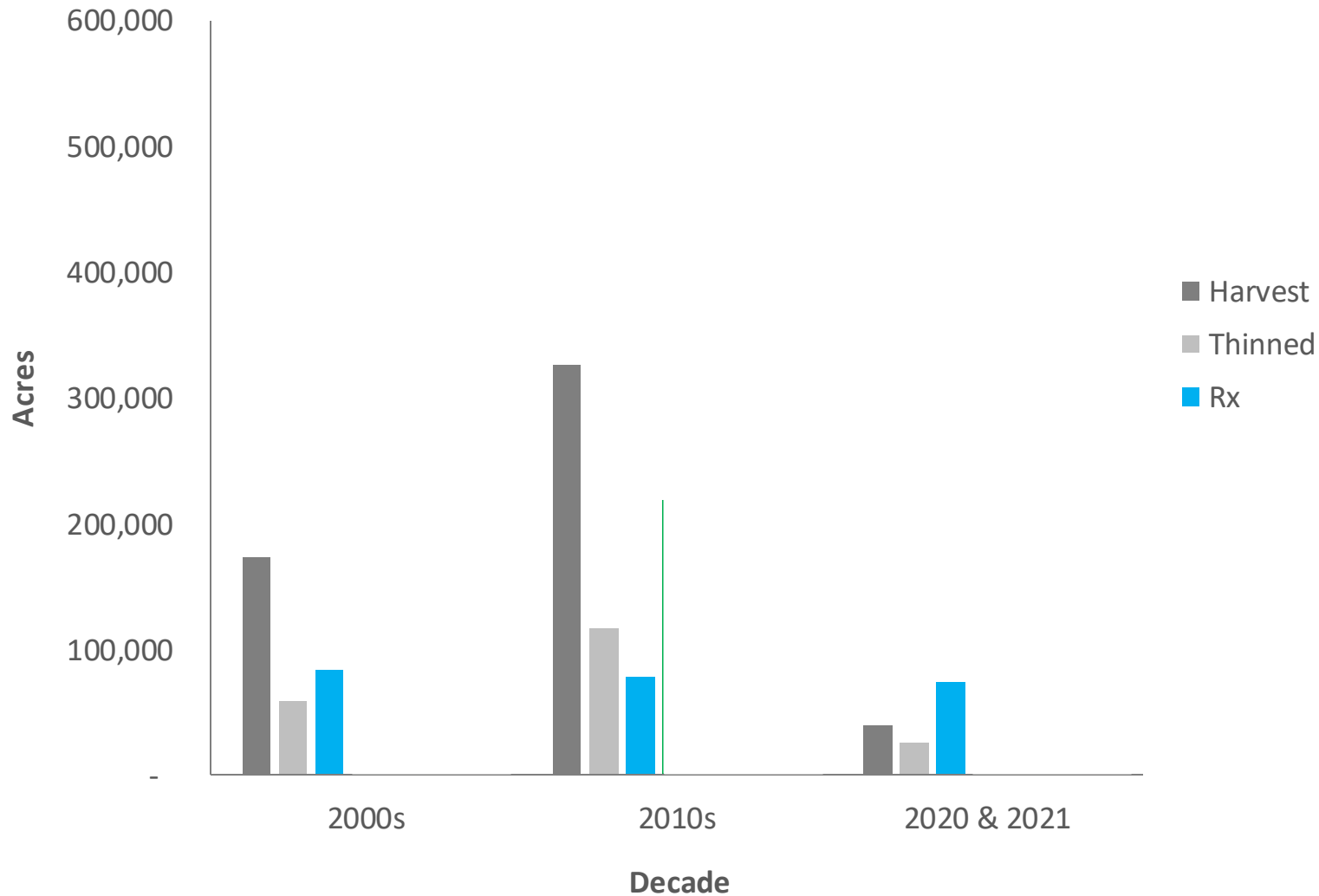
No catface:
~95% crown damage



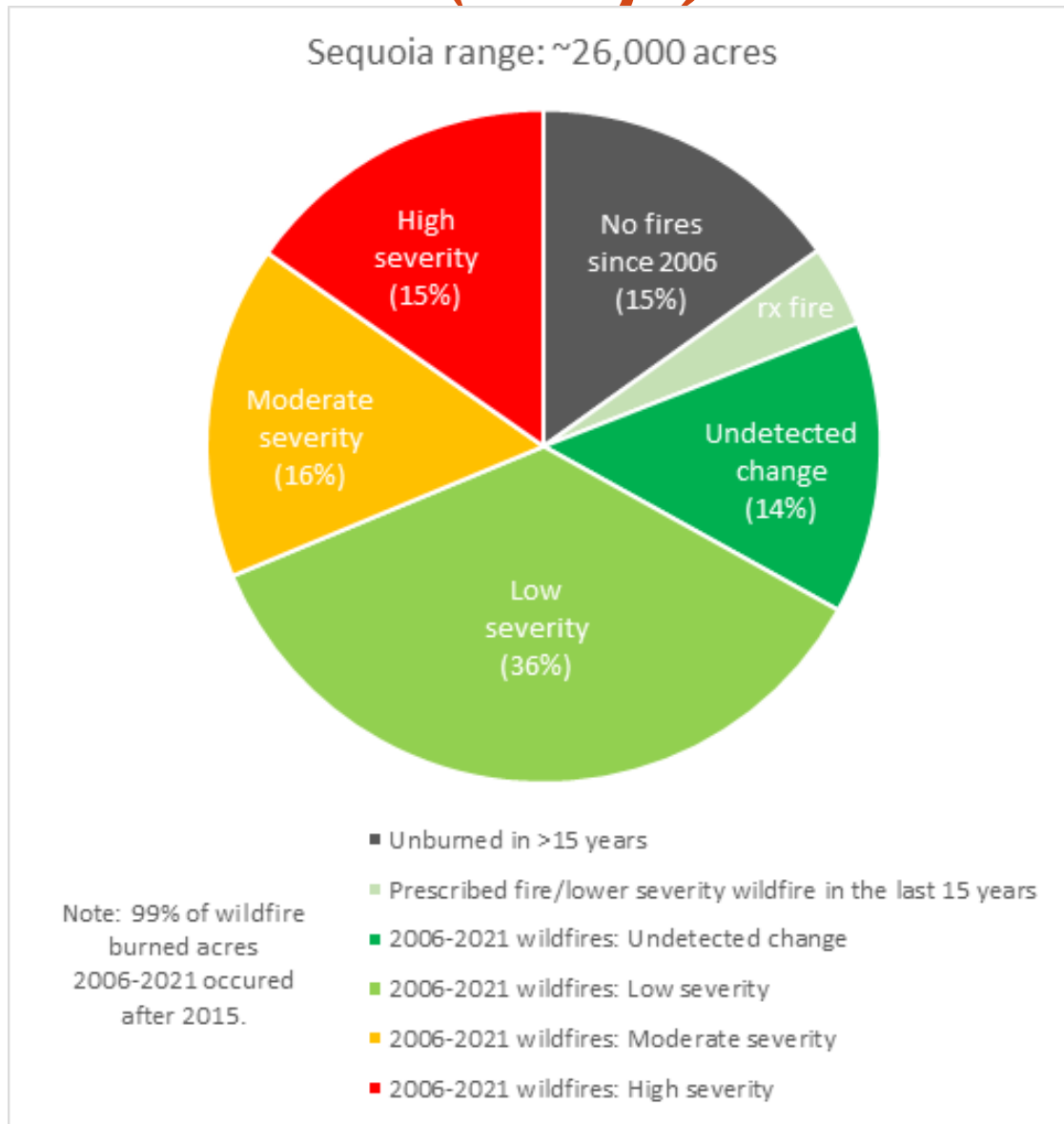
Wildfire trends

Sierra Nevada - Mixed conifer & Yellow pine

Treatments & wildfires by severity (public and private)

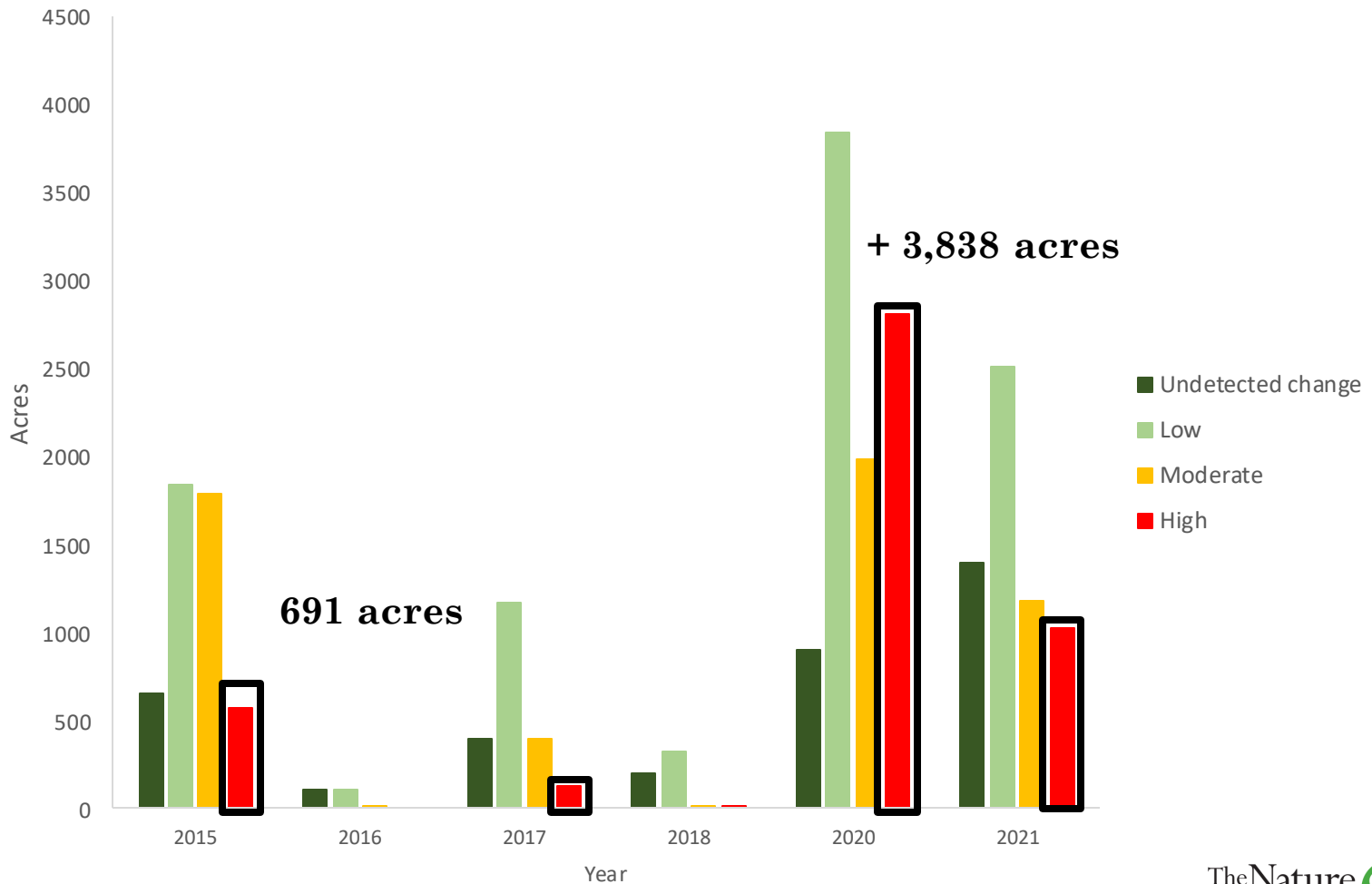


Wildfire and treatment trends (draft)

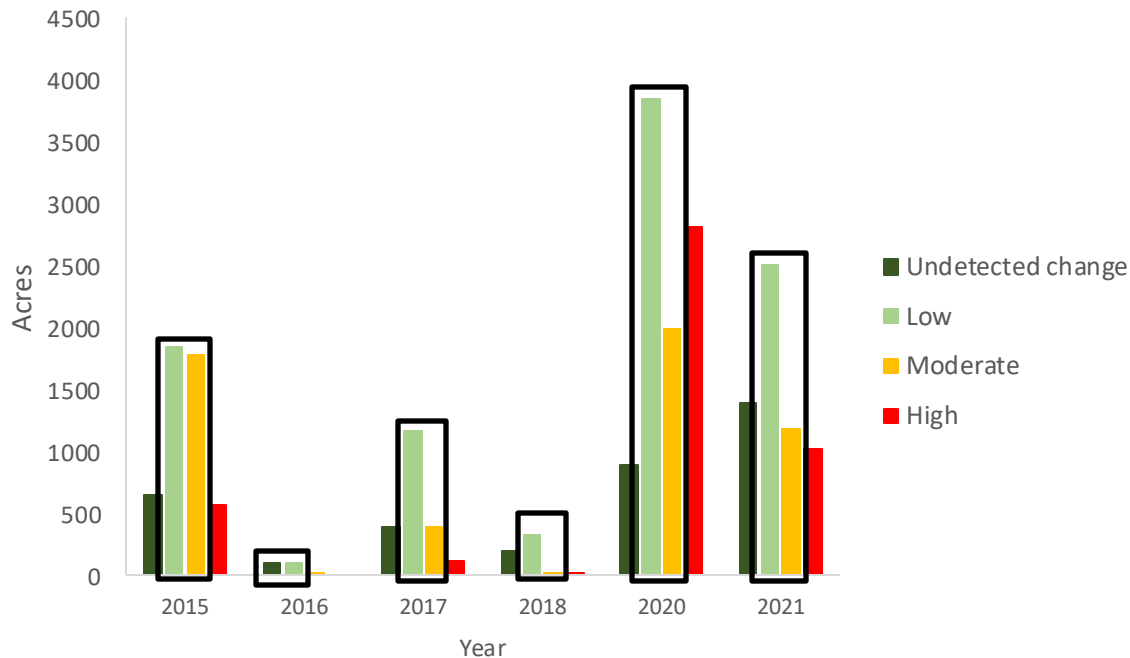


Wildfire trends

Giant sequoia area burned by severity class



Where do we go from here?



Potentially beneficial acres

Low: 9,795

Moderate: 5,367

Total: 15,162



2021 KNP Complex

Acknowledgements



Save The Redwoods
LEAGUE

F **R** **ST**



2021 KNP Complex