Session 2: The Range and Scope of Social-Ecological Consequences of Wildfire in the West

Miranda Mockrin, USDA Forest Service

The Social-Ecological Consequences of Future Wildfire in the West on June 13-14, 2024

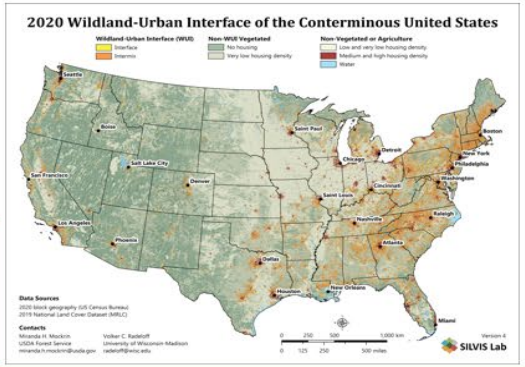
Session Objective/Goal

Session Objective: Describe the consequences of wildfires on communities of different types (e.g., rural, overburdened, marginalized), at different geographic scales

Goal:

- **Share research and consider consequences of wildfire :**
  - Aging population (60+) and role of WUI growth
  - Wildfire losses and recovery challenges by setting (more urban vs more rural)
- **Conclude with research needs**

Issue 1: Aging population and wildfire vulnerability



Post WWII Suburbs

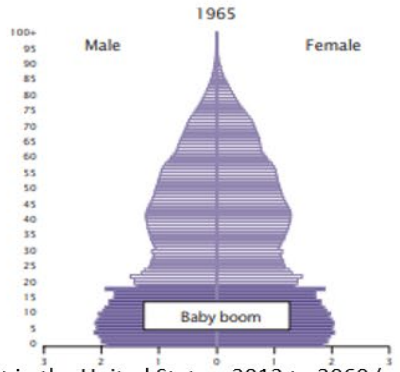
Exurban/sprawl era begins …

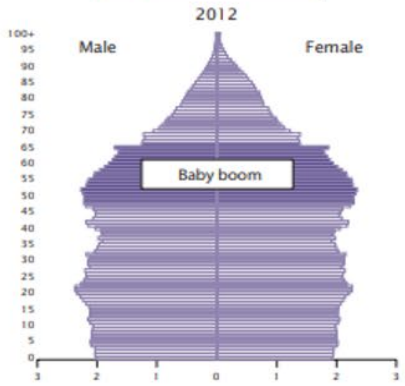
1940 1960 1980 2000 2020 2040

Baby Boomers born (1946-1964)

19% of US pop. > 60 yrs old

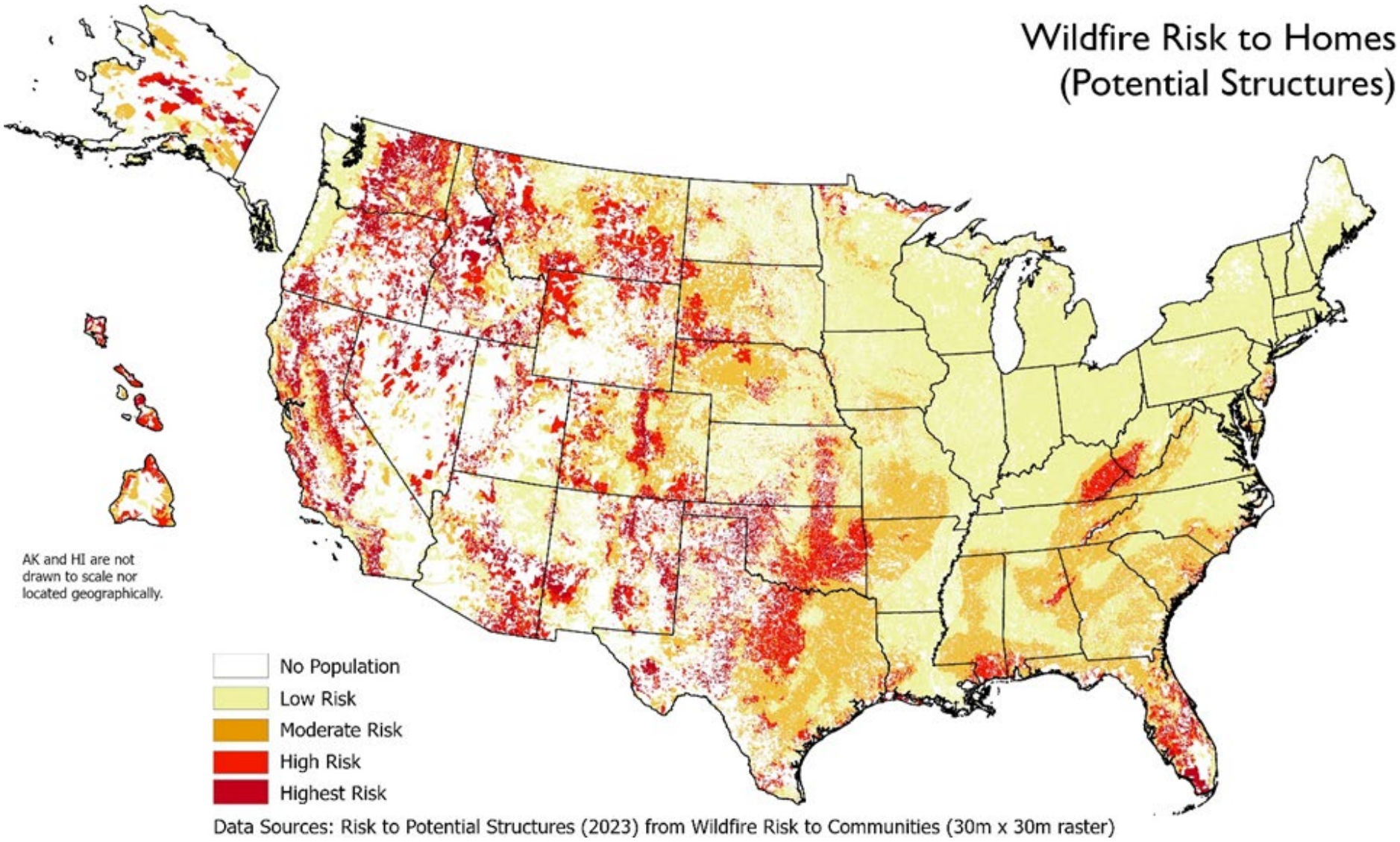
26% > 60 yrs old





ıe Baby Boom Cohort in the United States: 2012 to 2060 (census.gov)

Aging and wildfire exposure



Radeloff et al. 2023.

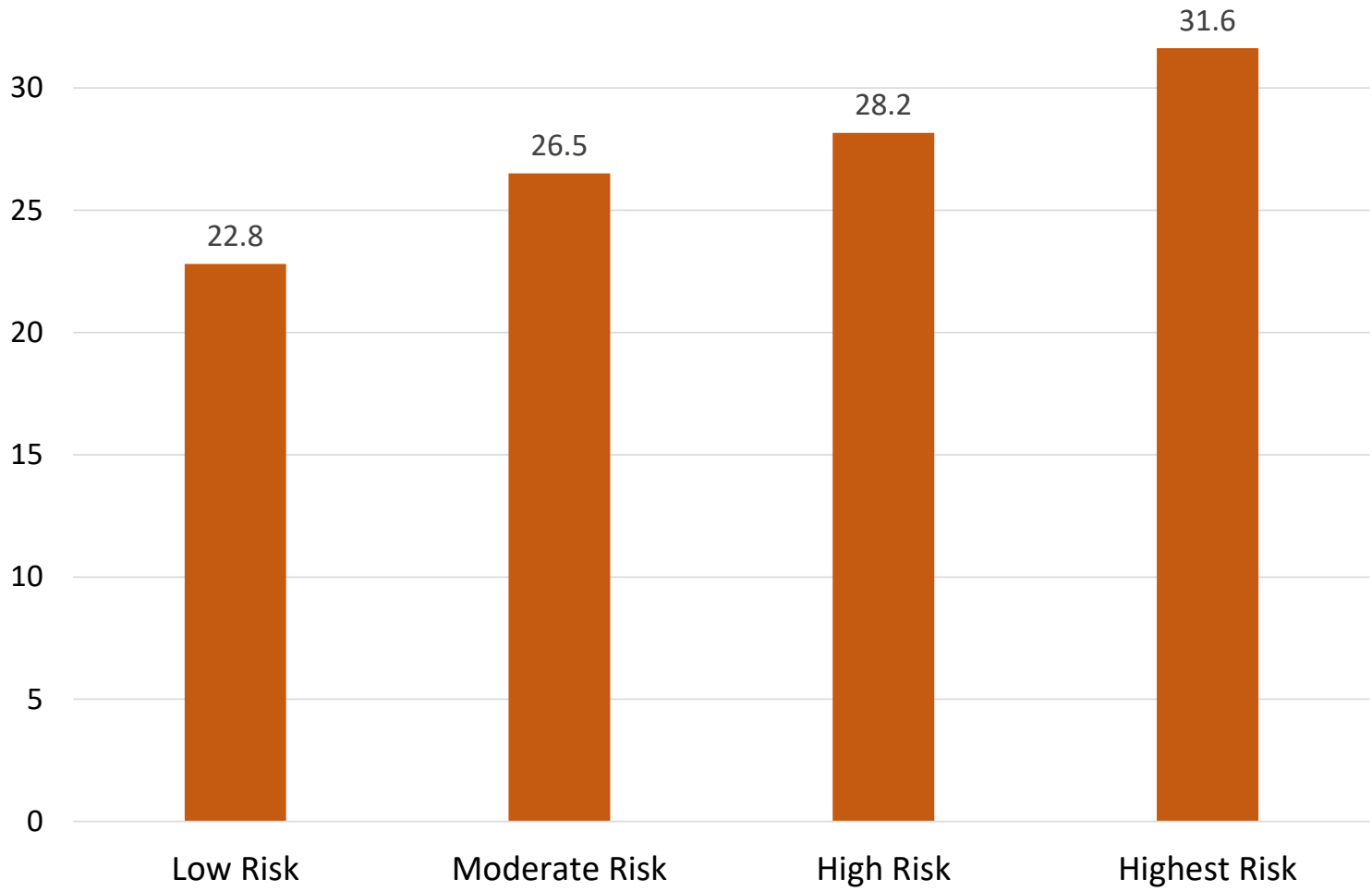
Dillon et al.,
Forthcoming 2024

Evers et al., 2023

From Winkler and Mockrin, in review.

Percent of residents over age 60 increases with wildfire risk

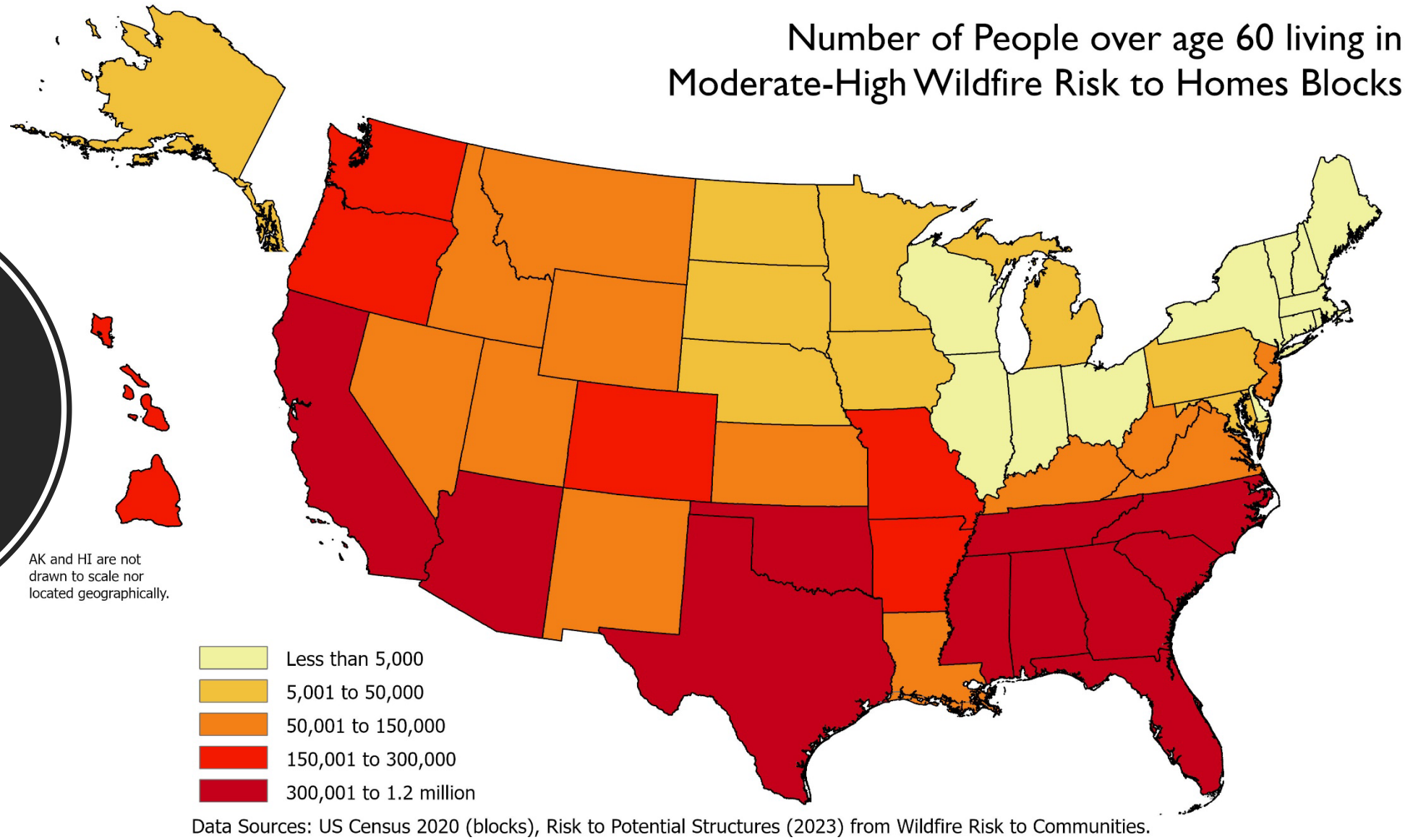
People are older in higher risk areas



Note: Percent of all residents who were over age 60 at Census 2020 by wildfire risk. These values represent population-weighted averages, calculated by summing the number of residents over age 60 across all blocks within each risk category and dividing by the summed total population within each category. Confidence intervals for each category are low (0.02, 0.06, 0.11, and 0.25, respectively from Low to Highest Risk), and so not represented in the chart.
Source: USDA, Economic Research Service using data from US Census 2020, Wildfire Risk to Potential Structures (2024)

From Winkler and Mockrin, in review.

> 1 million each in California, Florida, & Texas



The average age of those who died in the 2023 Lahaina Fires was 65.

Source – Maui Police Department. January 2024. Preliminary After Action Review, page 53.

The average age of those who died in the 2018 Camp Fire was 72.

The average age of those who died in the fires that burned across Sonoma and Napa a year before: 73.

Source – CalMatters 2020. https://calmatters.org/projects/older-californians-increased-risk-wildfires/

<u>By 2030, 26% of US population will be 60 or older</u>

Issue 2: Wildfire losses and recovery

- Housing loss and recovery as a key outcome of wildfire and consideration for future loss
- Rebuilding is a long, difficult process but **challenges intensify in rural and exurban areas**

Building and rebuilding after fire, nationally (2015), in Colorado (2016, 2015), and in California (2021), long-term CA & SC (2022). Land use planning (2020) and community adaptation (2018) after wildfire.

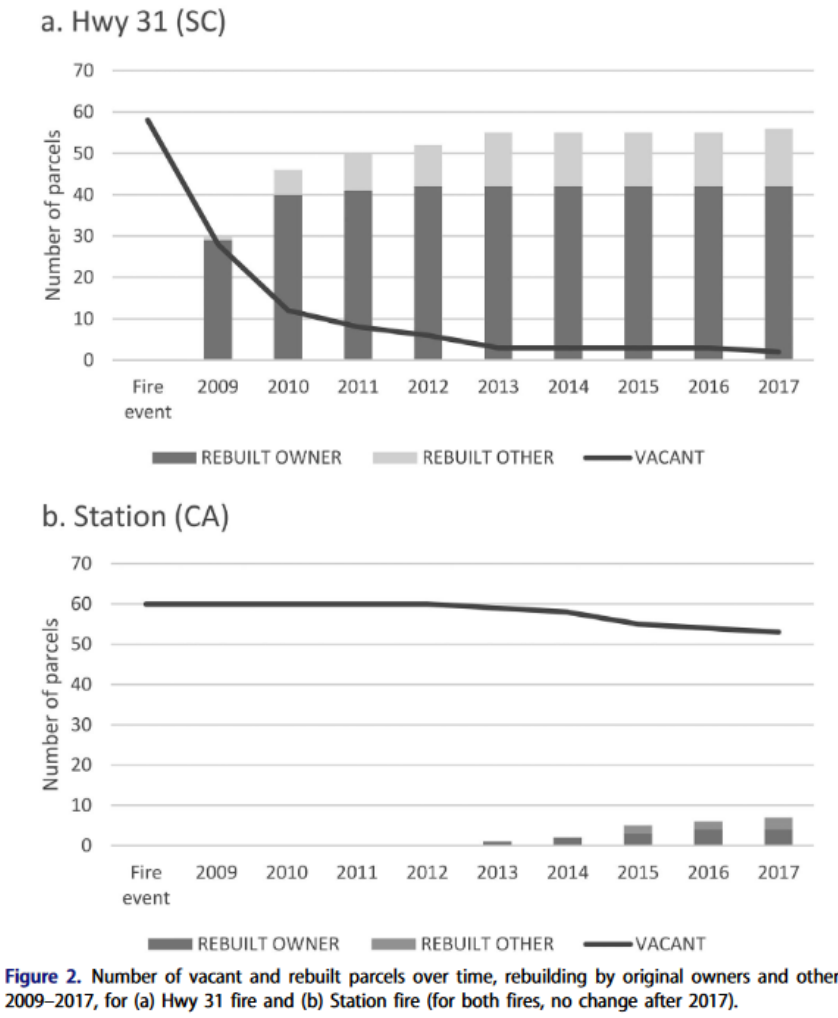
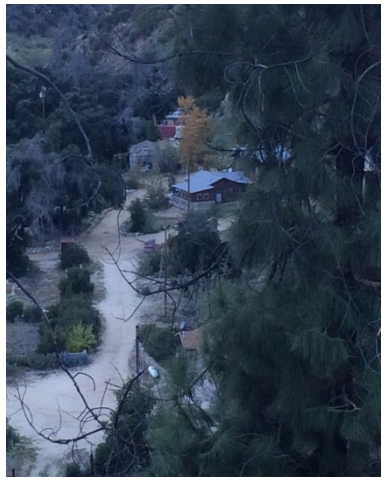


Figure 2. Number of vacant and rebuilt parcels over time, rebuilding by original owners and others, 2009–2017, for (a) Hwy 31 fire and (b) Station fire (for both fires, no change after 2017).

Wildfire recovery by setting



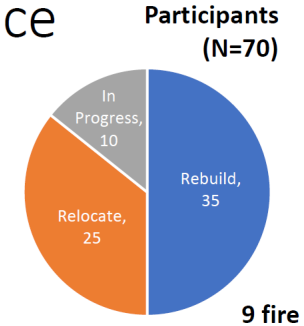
vs.

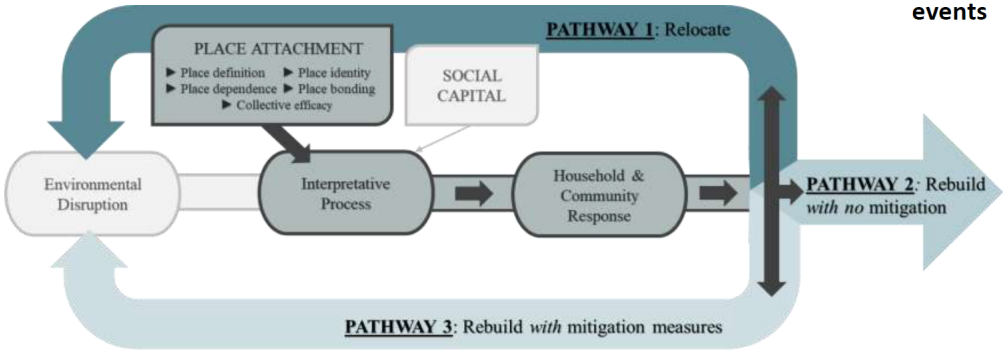
	Time to rebuild	Cost & complexity of rebuilding	Insurance payouts	Vegetation restoration	Other hazards	Infrastructure concerns	Gov't/civic resources
Rural/exurban settings, in comparison to urban/suburb.	↑ 4-8 years vs. 2+	↑	↓	↑	↑	↑	↓

Ongoing work: Photovoice to Understand Vulnerability, Housing, and Place Attachment in Northern California

RQ: What is the role of place attachment after wildfire?

- Phenomenology & decision pathways:
  - To rebuild the same
  - To rebuild differently (safer?)
  - To relocate?





Model of people-place interactions when faced with disruption. Adapted from Mihaylov & Perkins, 2014.

Researchers

Ronald Schumann, University of North Texas

Alex Greer, University at Albany

Sherri Binder, BrokoppBinder Research & Consulting

Miranda Mockrin, USDA Forest Service

Rebuilding progress in affluent WUI areas, Sept 2022

Session Objective/Goal

Session Objective: Describe the consequences of wildfires on communities of different types (e.g., rural, overburdened, marginalized), at different geographic scales

Goal:

- **Share research on two issues** -
  - WUI expansion and aging population
  - Wildfire losses and recovery challenges exacerbated in more remote settings
- **Conclude with research needs**

Research Needs

How can we track wildfire effects without data on loss?

Only California collects spatial data on buildings lost

We can characterize vulnerability with secondary data -

How does that relate to lived experience?

What happens over time, with chronic/ repeated wildfire?

As with all hazards, long-term recovery is understudied

Thank you

Next steps on aging work – ERS report and data online at FS

Wildland-urban interface data online –

- Understanding the Wildland Urban Interface (1990-2020) (arcgis.com)
- Forest Service Research Data Archive (usda.gov)

Recovery studies thus far –

- Wildfire as a 'hot moment' for recovery? (2020)
- Building and rebuilding after fire, nationally (2015), in Colorado (2016, 2015), and in California (2021)
- Land use planning (2020) and community adaptation (2018) after wildfire

Post WWII Suburbs

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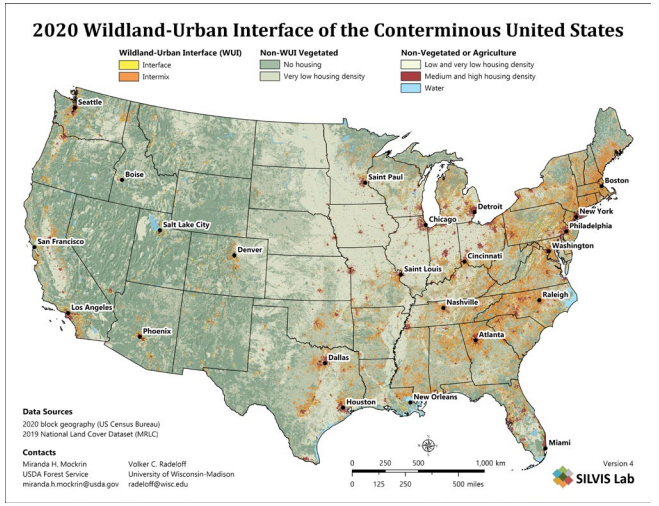

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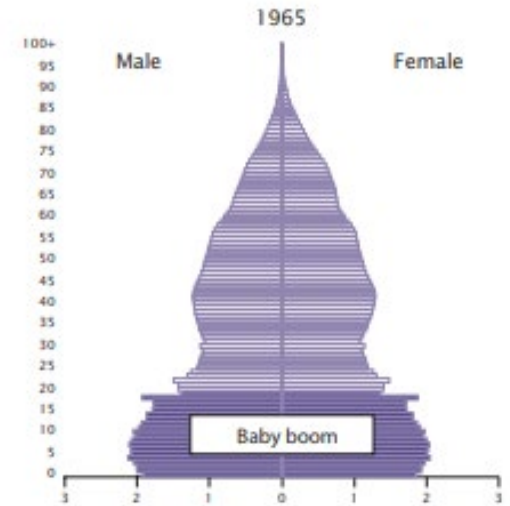
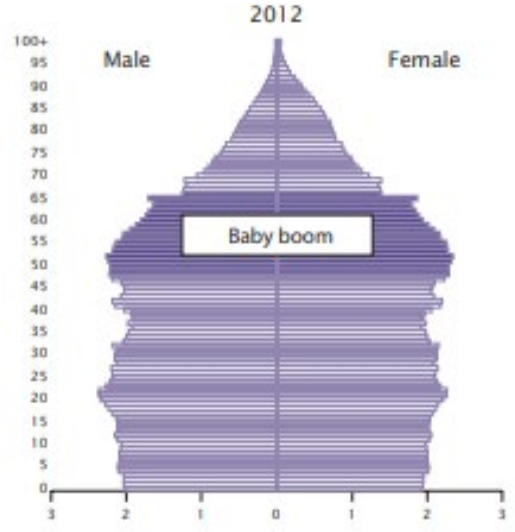
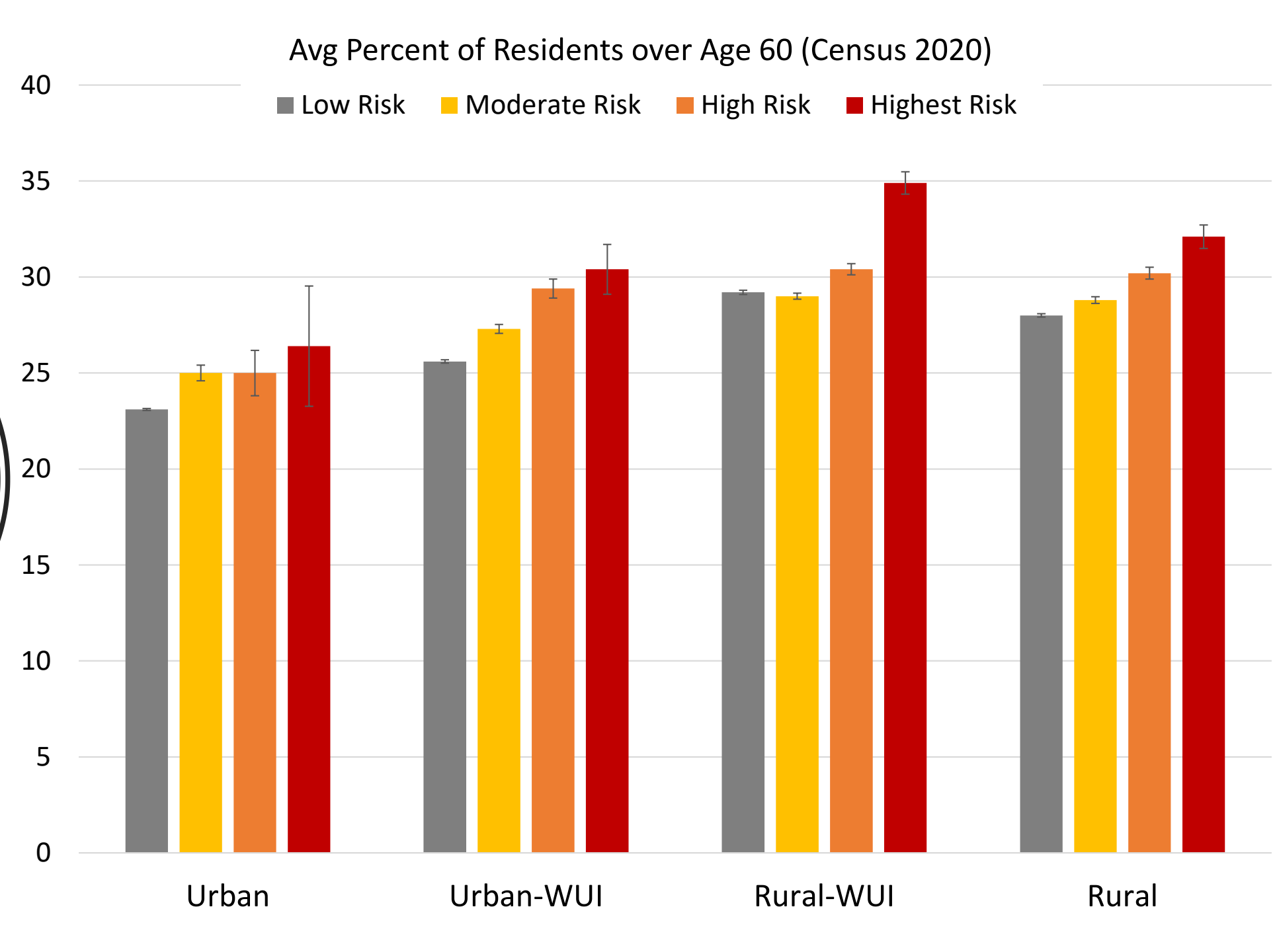
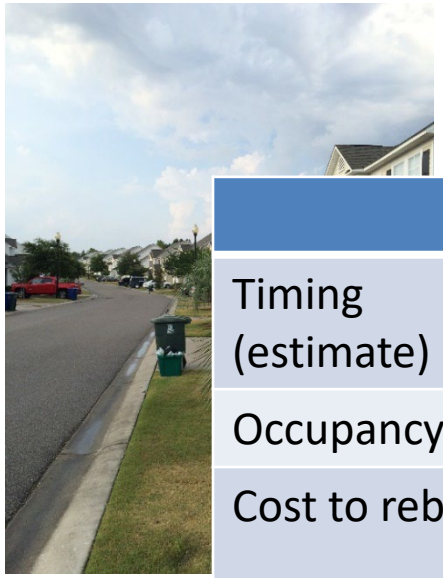




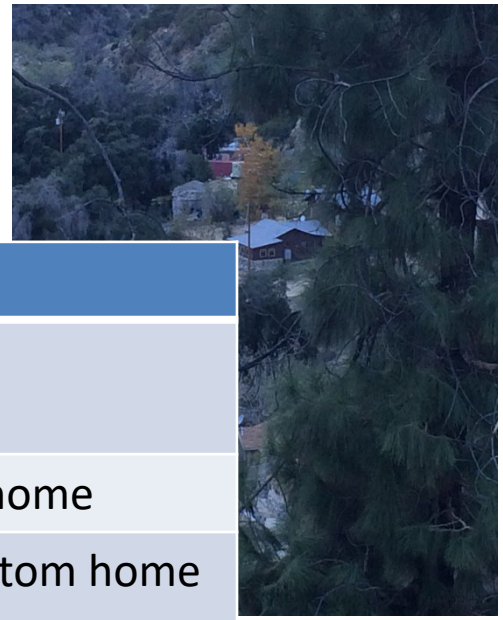
The Baby Boom Cohort in the United States: 2012 to 2060 (census.gov)

35% of residents in highest risk areas of the Rural WUI are over age 60





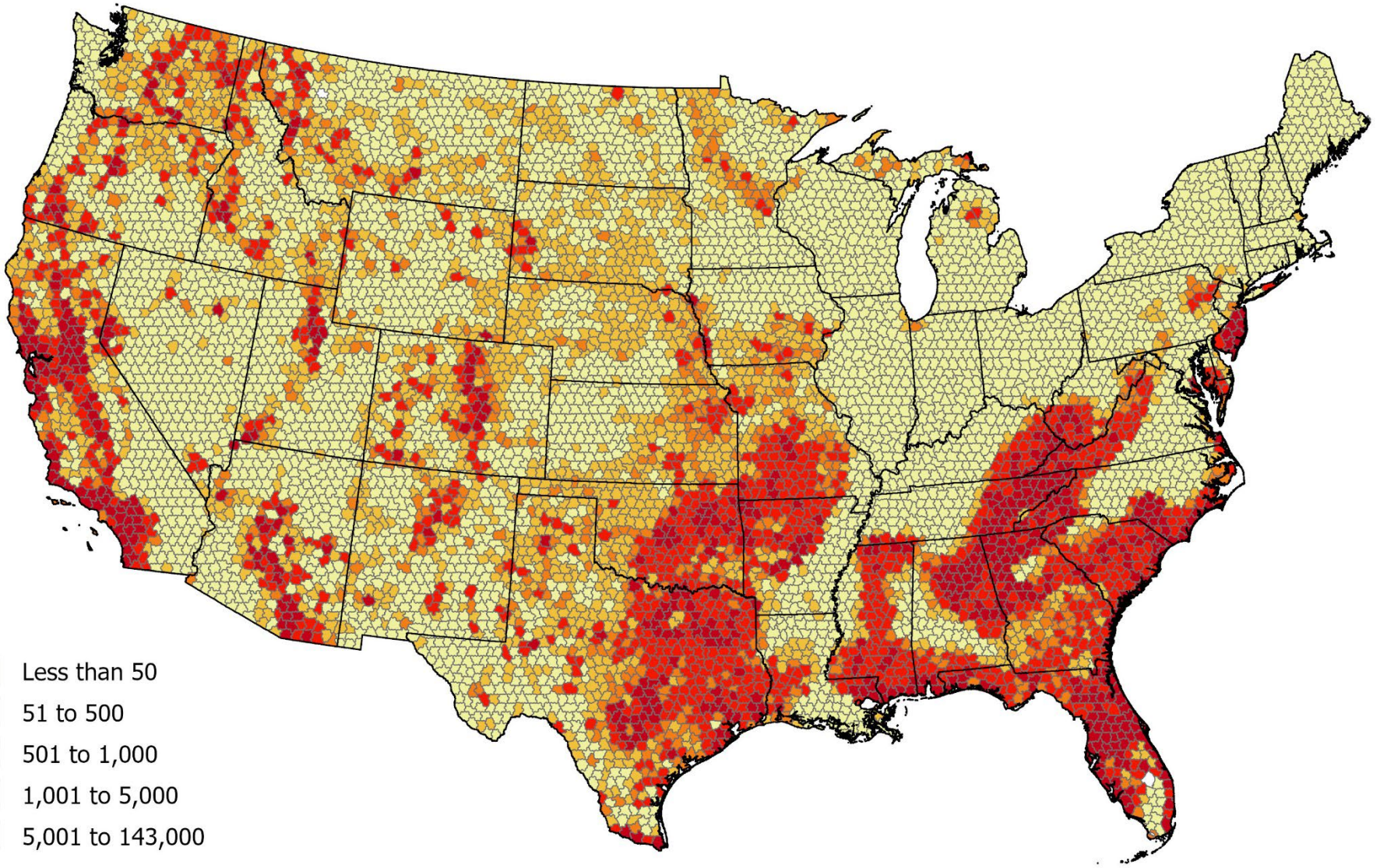
Wildfire recovery by setting



	Urban/suburban	Exurban/rural
Timing (estimate)	2 years or more	4-8 years
Occupancy	More likely primary home	Can be 2nd home, vacation home
Cost to rebuild	Typically lower because of proximity, standard home plans	Higher because remote, custom home
Homeowners insurance	Usually better coverage – primary home, lower costs	Typically more limited – higher costs, may not have been insured, challenging to maintain coverage
Vegetation restoration		More challenging
Addt'l hazards		More concerns - debris flow, mudslides
Infrastructure	Roads and infrastructure maintained by local gov't	Owners responsible for private roads, septic, potential upgrades
Rebuild flex/use	Rebuilding may be required/HOA issues	Can be used for recreation/camping

Firesheds

Number of People over age 60 living in Moderate-High Wildfire Risk to Homes Blocks



Data Sources: US Census 2020 (blocks), Risk to Potential Structures (2023) from Wildfire Risk to Communities, Fireshed Registry (USFS 2023)

From Winkler and Mockrin, in review.