Research Brief for Resource Managers

Fitting Solutions to the Problems of California Wildfires

Forest management is certainly needed in California, to protect life and property, as well as to restore ecosystem structure and function. But even when it is successful, forest management only addresses a fraction of the wildfire problem because forests only cover a small percentage of the state. To demonstrate where resources might be better allocated across the state, these authors examined the distribution of area burned and structures lost across five different California vegetation types and how the distribution of fire has changed in these landscapes through time.

Using fire perimeter and fire destroyed structure data (CAL FIRE), ignition data (Fire Program Analysis Fire-Occurrence Database), and vegetation type data, the authors assessed wildfires in five broad California vegetation types between 1950 to 2019 (Figs.1 & 2).

The authors found that conifer forests represented just 19% of California (Fig.1a: green pie wedge), while the other flammable vegetation types together make up 38% of the state. They also found that human ignitions were overrepresented in grassland and shrubland habitats (Fig.1b), while the majority of destroyed structures since 2000 have been in non-coniferous vegetation types (Fig.1c,d). Further, the largest area burned has been in woodlands and grasslands (Fig.1e). Over time (Fig.2: pale

Management Implications

- Certainly, more forest management is needed. However, evidence shows that damage to humans and human structures is predominantly OUTSIDE of conifer forest ecosystems, in shrublands, hardwood forests, and grasslands Together these have the most area burned, and do not always benefit from fuel treatments.

- Because no amount of natural vegetation management will completely resolve fire risk to human structures, focus should be on increasing the resilience of human built communities that are inside or adjacent to natural areas (**i.e., the WUI, or wildland urban interface**).

green and bright yellow lines, respectively), fire has remained disproportionately represented in shrubland and herbaceous vegetation.

Overall, Schwartz and Syphard (2021) illustrate that coniferous forest fires are not the dominant type of fire in California, and they recommend refocusing budgets and resources on fire prevention and land use planning in built environments across all habitats, rather than the emphasis on conifer forest management.
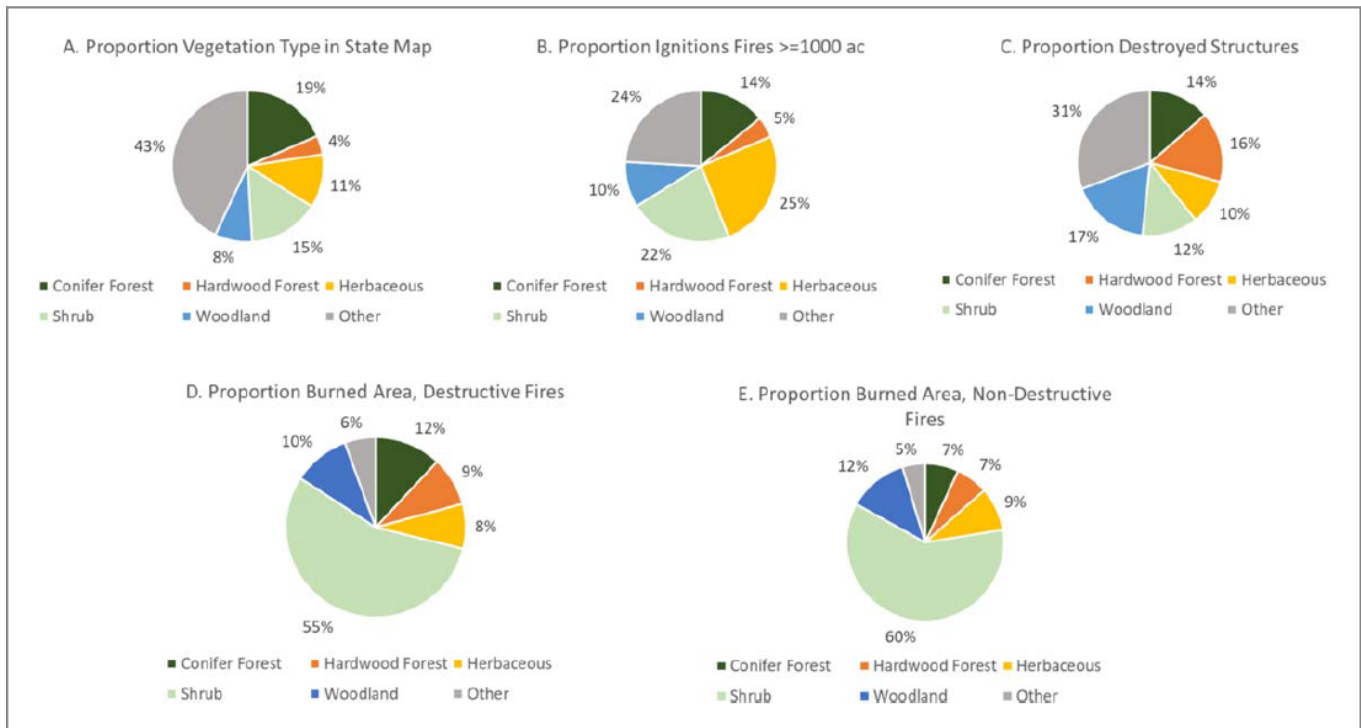
Figure 1. Pie charts of proportional representation of (a) amount of vegetation type; (b) ignitions of large fires; (c) location of structures destroyed; (d) area burned in fires that destroyed buildings; and (e) area burned in fires that did not burn structures plotted by five major vegetation types (conifer forests, hardwood forest, woodlands, herbaceous dominated communities and shrubland communities) addressed in this paper. Deserts, agricultural crop lands and urban areas are lumped into 'other'.
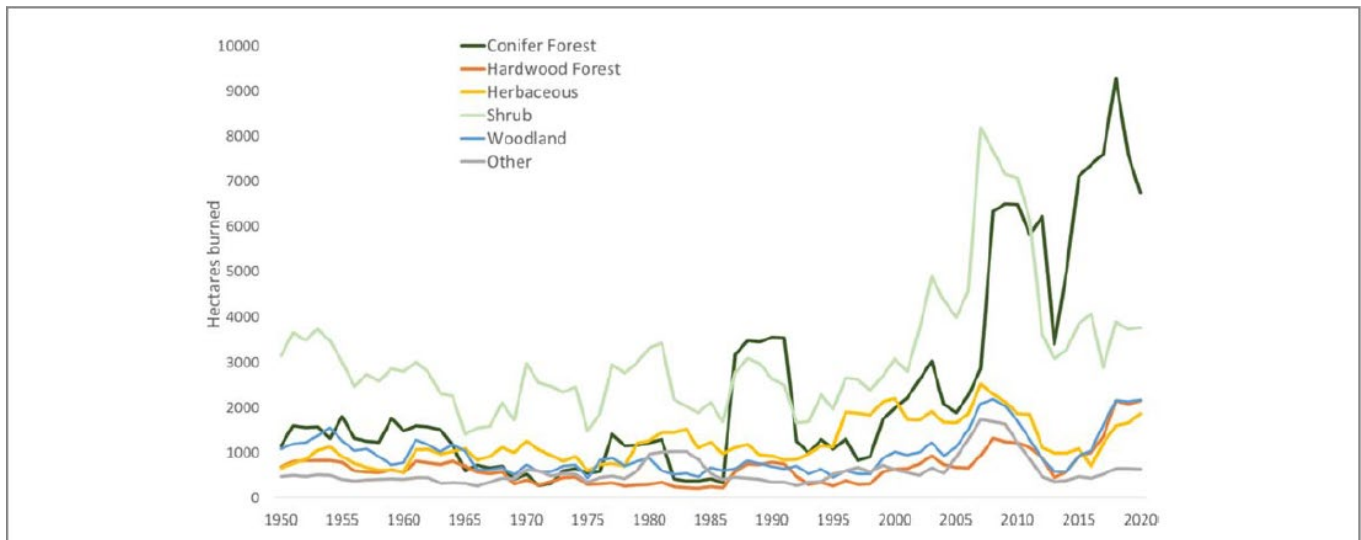
Figure 2. Area burned through time by the major vegetation types addressed in this paper. Area burned is smoothed on a five year window. The 'other' category includes primarily agricultural lands and desert.