Cohesive Wildland Fire Management Strategy

Policy Options

National Goals	National Challenges	Management Options
Restore and Maintain Landscapes	Vegetation and Fuels	Prescribed Fire: Expand or maintain in areas of current use Prescribed Fire: Expand into areas of limited current use Prescribed Fire: Utilize on a limited basis Manage wildfires for resource objectives: In forested systems Manage wildfires for resource objectives: In non-forested systems Manage wildfires for resource objectives: In areas where increased awareness of community risk is necessary. Non-fire Treatments: Supported by forest products industry Non-fire Fuels Treatments: In non-forest areas Non-fire Fuels Treatment: In areas with limited economic markets Fuels Treatments as a precursor to prescribed fire or managed wildfire.
Fire-Adapted Communities	Homes, Communities, & Values at Risk	Focus on home defensive actions Focus on combination of home and community actions Adjust building and construction codes, municipal areas Adjust building and construction codes, non-municipal areas
Respond to Wildfires	Human-Caused Ignitions	Reduce accidental human-caused ignitions Reduce human-caused incendiary ignitions (e.g., arson)
	Effective and Efficient Wildfire Response	Prepare for large, long-duration wildfires Protect structures and treat landscape fuels Protect structures and target prevention of ignitions

***As related to addressing national challenges and in support of the three Cohesive Strategy goals. The three national goals are both related and interdependent upon each other, making management options supportive of achieving progress in all three goal areas but to varying degrees.**

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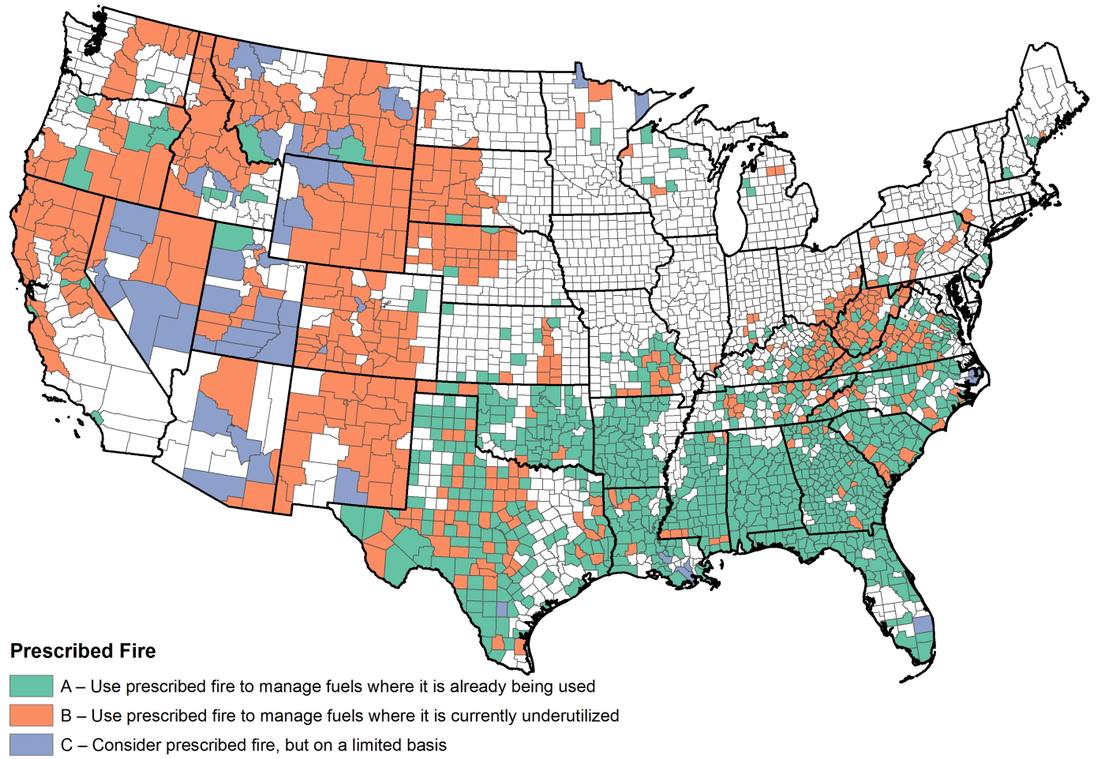
Option: Prescribed Fire



Prescribed Fire

Broad areas of the country have the potential for prescribed fire use based on their natural fire regime, vegetation, and level of human development. National maps of potential for prescribed fire use were developed in both forested and non-forested systems based on vegetation, FRG, and land cover. These maps provide a baseline from which further opportunities for use were explored. Emphasis is on broad-scale application of prescribed fire, focusing on counties where a significant portion of each county has the potential for prescribed fire use. Specific local concerns such as smoke management, cost, or environmental issues that might limit or constrain prescribed fire use were not considered.

A. Use prescribed fire to manage fuels where it is already being used. One management opportunity for prescribed fire use is to maintain or expand its application in areas where it currently is used. Fire management specialists in these areas have the necessary training and experience to implement a prescribed fire program and the history of uses suggests community acceptance and tolerance. The analysis of probable areas of prescribed fire use based on remotely sensed data and other reports indicate that many counties throughout the Southeast and scattered counties in the Northeast and West are substantively using prescribed fire. This option would build on that experience and expand its use where economically feasible and socially acceptable.

Data explanation

There is known prescribed fire activity in these counties and potential for forested or non-forested prescribed fire [Rx fire> 0 and Forest Rx fire potential or Non Forest Rx fire potential >20%].

B. Use prescribed fire to manage fuels where it is currently underutilized. A second opportunity is to expand into areas with prescribed fire potential, yet evidence of current, widespread application is lacking. These include many areas in the West as well as counties in the central Appalachians. Implementing prescribed fire regimes in these regions likely will require additional training and resources, as well as outreach and coordination with the communities that are most likely to be affected. Environmental constraints, especially in rangeland systems with invasive species (e.g., cheat grass) or critical wildlife habitat, will have to be considered and addressed appropriately, as will the economic costs of introducing prescribed fire in more challenging areas.

Data explanation

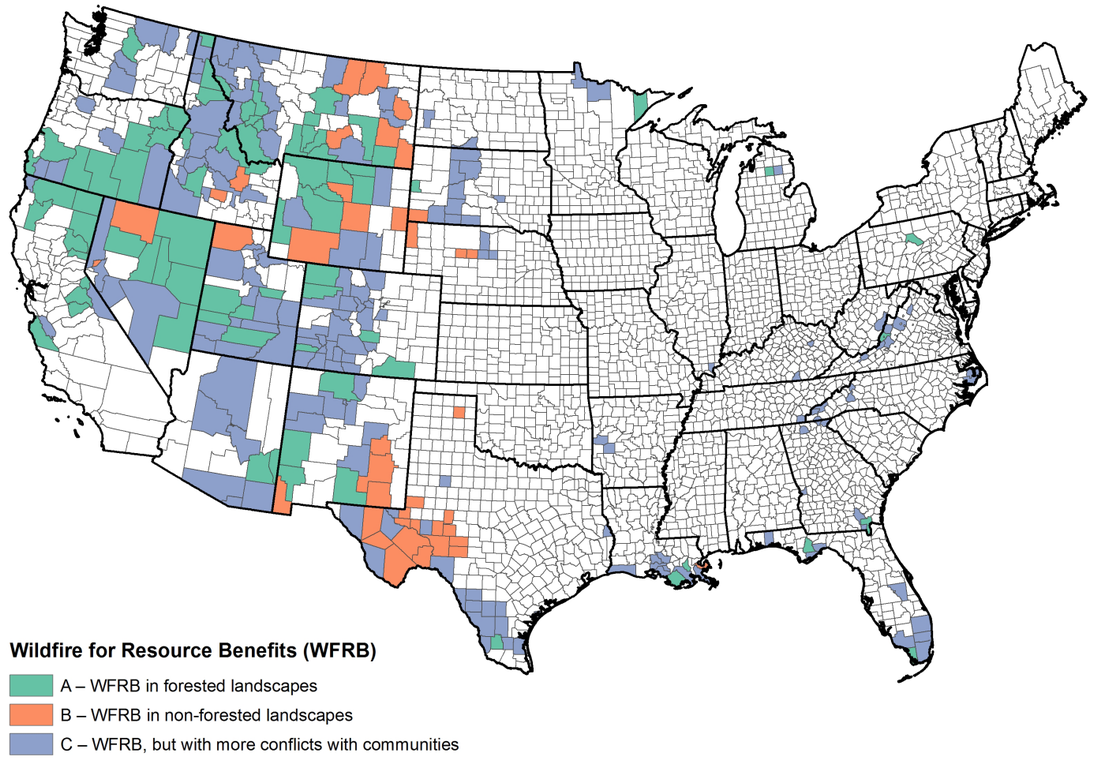
There is no history of fire in these counties, but has high potential for fire in the future [Sum of Fire and Non-Fire Rx potential >60% and Prescribed Fire < 1].

C. Consider prescribed fire, but on a limited basis. The third opportunity includes counties that have areas with potential for prescribed fire, but perhaps not to the extent as in Options a or b. As an example, these include counties where a smaller proportion of the total county area is suitable for prescribed fire, but it generally occurs in remote areas in large contiguous blocks. These include western counties with areas of low road density and where more than 25 percent of the total county area is suitable for prescribed fire. Remoteness presents the advantage of possibly fewer conflicts with human communities, but the disadvantage of potentially higher application costs and difficulty of control.

Data explanation

There are moderate amount of roads in these counties with moderate potential for fire in the future [Not 1A or 1B and Roaded <40% and the Sum of Fire and Non-Fire Rx potential >25%].

Option: Managing Wildfire for Resource Benefits



Managing Wildfire for Resource Benefits (WFRB)

Managing wildfire for resource objectives and ecological purposes refers to a strategic choice to use unplanned ignitions to achieve resource management objectives. Federal fire policies traditionally restricted use to Federal wilderness areas, national parks, or other remote areas under specific conditions or circumstances. These restrictions were intended to reduce risk and avoid potentially negative impacts or consequences to lands of other ownerships. Guidance issued in 2009 regarding implementation of Federal fire policy ensures consistency among agencies and has led to expanded application of this method to manage wildland fuels. In contrast, most state and local jurisdictions are statutorily constrained to and full wildfire suppression. Like prescribed fire, allowing wildfires to burn for the purposes of ecosystem restoration or hazard reduction has inherent risk. These risks must be balanced with the potential benefits on an individual incident basis, which requires both pre-incident planning at the landscape scale and sophisticated incident management.

A. WFRB in forested landscapes. Opportunities for managing wildfire for resource objectives were identified by first looking at those areas where prescribed fire was deemed suitable. Counties where managing wildfire for multiple benefits in forested landscapes seems plausible.

Data explanation

There is prescribed fire potential and isolated, natural forested landscapes or a larger percentage of protected areas in these counties [Option 1A, 1B, 1C and (Roaded <40% or Wilderness area >12.5%) or PADUS >50% and Class ≠ D,E, F and Cluster = 2]

B. WFRB in non-forested landscapes. Counties were identified separately from those counties dominated by non-forest vegetation where this tactic might also be applied. Both Options a and b are associated with rural areas with few roads, low numbers of ignitions (mostly natural), moderate flame intensities, and large contiguous blocks of natural vegetation. The forested areas have a high percentage of Federal ownership (primarily USFS, BLM, or NPS) and a mix of FRGs I, II, and IV. Non-forested areas include counties with low Federal ownership and FRGs II and IV.

Data explanation

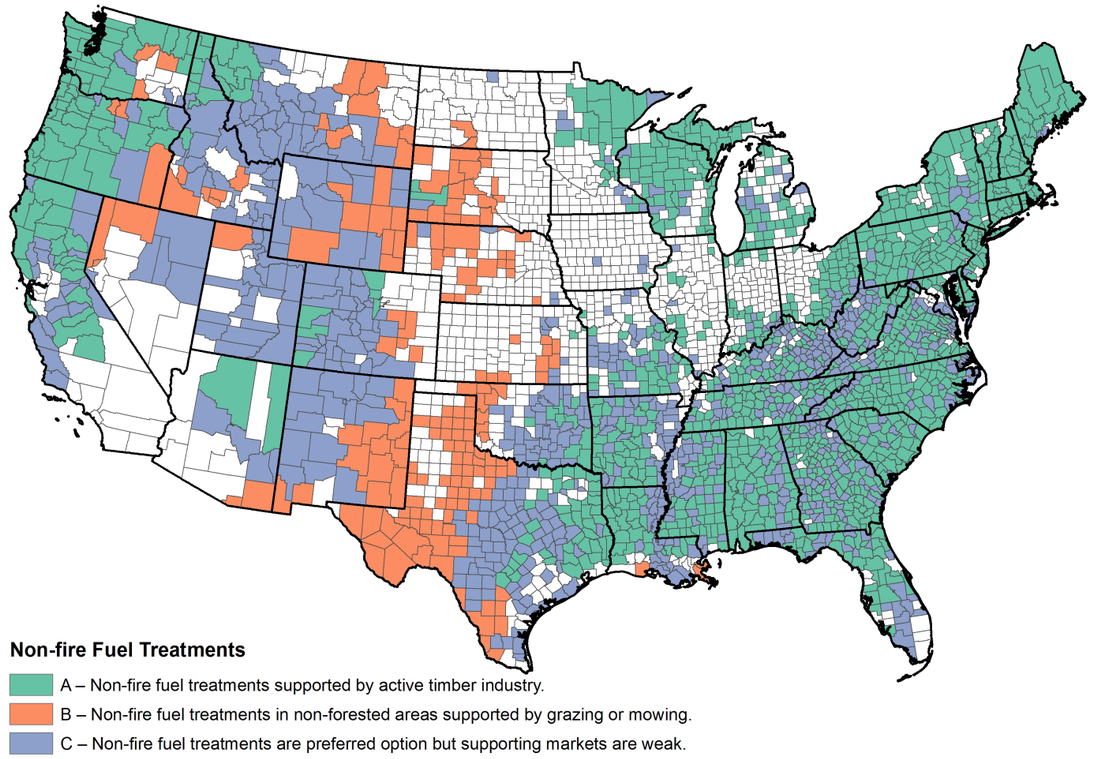
There is prescribed fire potential and isolated, natural and agricultural landscapes in these counties or there is a large percentage of protected lands and these areas are not located in the East [Option 1A, 1B, 1C and (Roaded <40% or Wilderness area> 12.5%) or PADIS >50% and Landscape Class= D,E or F and Cluster =2]

C. WFRB, but with more conflicts with communities. A third set of counties were highlighted where the landscape characteristics suggest potential ecological benefits from managing wildfire for resource objectives, but the community attributes suggest a higher potential for conflicts. Community concerns would necessarily lead to greater restrictions and control on incident management objectives.

Data explanation

There is prescribed fire potential and isolated, natural landscapes in these counties, or there is a large percentage of protected lands and these areas are not rural Western locations (Option 1A, 1B, or 1C and Roaded < 40% or Wilderness area >12.5%) or PADUS >50% and Cluster ≠ 2.

Option: Non-fire Fuel Treatments



Non-fire Fuel Treatmetns

A variety of methods that do not directly involve fire often are used to change vegetation composition and structure and alter fuels to reduce hazard. These include mechanical thinning and clearing debris in forests or mowing in rangelands, among others. Non-mechanical methods can involve livestock grazing to reduce fine fuels in rangeland systems, or using herbicides to eradicate or suppress unwanted vegetation. These methods can be used wherever they are economically viable, especially where using fire as a management tool is undesirable or carries high risks. One advantage of such methods is that they often can be applied with a greater level of control over the location, timing, and desired outcome of the treatment. Mechanical treatments are particularly suited for fuels management following natural disturbances such as severe storms, intense droughts, or insect outbreaks that radically change forest structure. These aptly named "event fuels" can quickly create hazardous conditions in areas that otherwise seemed relatively benign.

A. Non-fire fuel treatments supported by active timber industry. Opportunities for using active timber markets to offset costs of mechanical fuels treatments in forests were identified by using data about timber jobs, mill production, and forested area available for mechanical treatment (Option 3.a, Figure 3.5). These counties occur throughout the Northeast and Southeast, within the Pacific Northwest, and scattered in the interior West.

Data explanation

These counties are forested or agricultural with some timber jobs and potential for mechanical treatment [Class ≠ E or F and Cluster = 5 and Timber jobs > 100 and Mechanical treatment >15].

B. Non-fire fuel treatments in non-forested areas supported by grazing or mowing. A second opportunity includes non-forested counties where combinations of mechanical (mowing), chemical herbicide use, or biological control (grazing) appear feasible (Option 3.b, Figure 3.5). These include the range and grasslands systems where frequent—even annual—control of vegetation might be advantageous or where it is desirable to alter vegetation composition and structure and limit fire extent. Economic costs and benefits will vary locally and depend on treatment type. For example, grazing rights or leases might be managed in ways that promote fuels management at reduced costs.

Data explanation

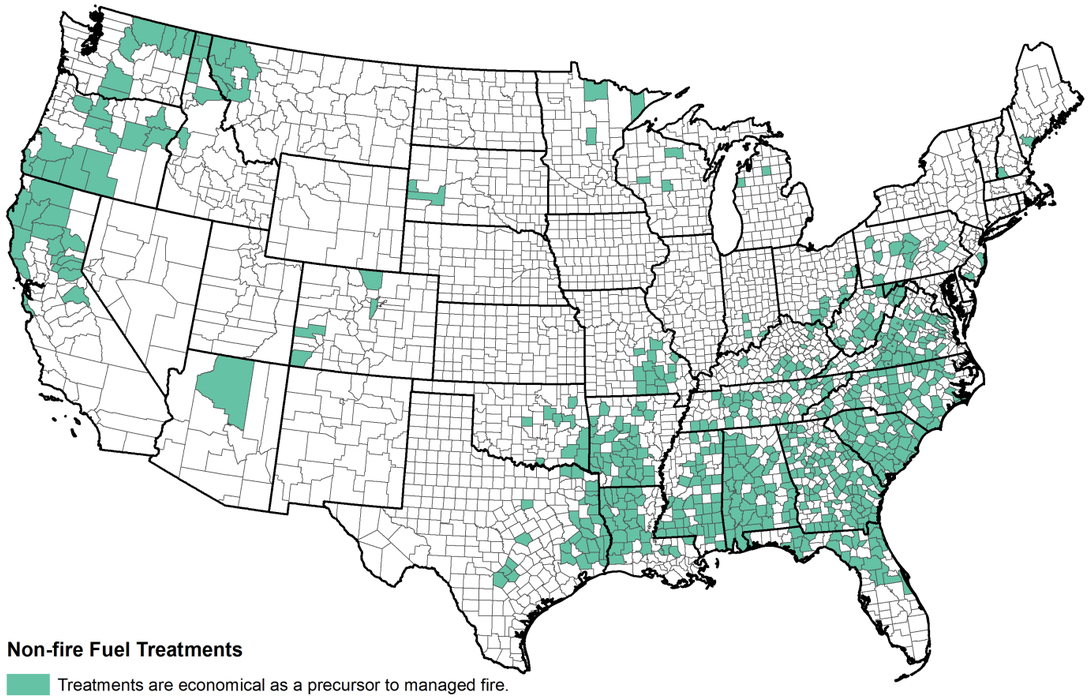
Non-forested rangelands that aren't agricultural [Class= E or F and Cluster ≠ 5].

C. Non-fire fuel treatments are preferred option but supporting markets are weak. A third opportunity includes counties where mechanical treatment in forests offers considerable benefit, but where evidence of economic value or markets to support such activities is weak (Option 3.c, Figure 3.5). These include major areas of the intermountain West, central Texas and Oklahoma, and scattered counties throughout the Southeast, Northeast, and Pacific Coast.

Data explanation

Forested counties that aren't agricultural with no timber jobs or mechanical treatment potential [Class = G, H, I, J or K and Cluster ≠ 5].

Option: Fuel treatments as a precursor to prescribed fire or managed wildfire



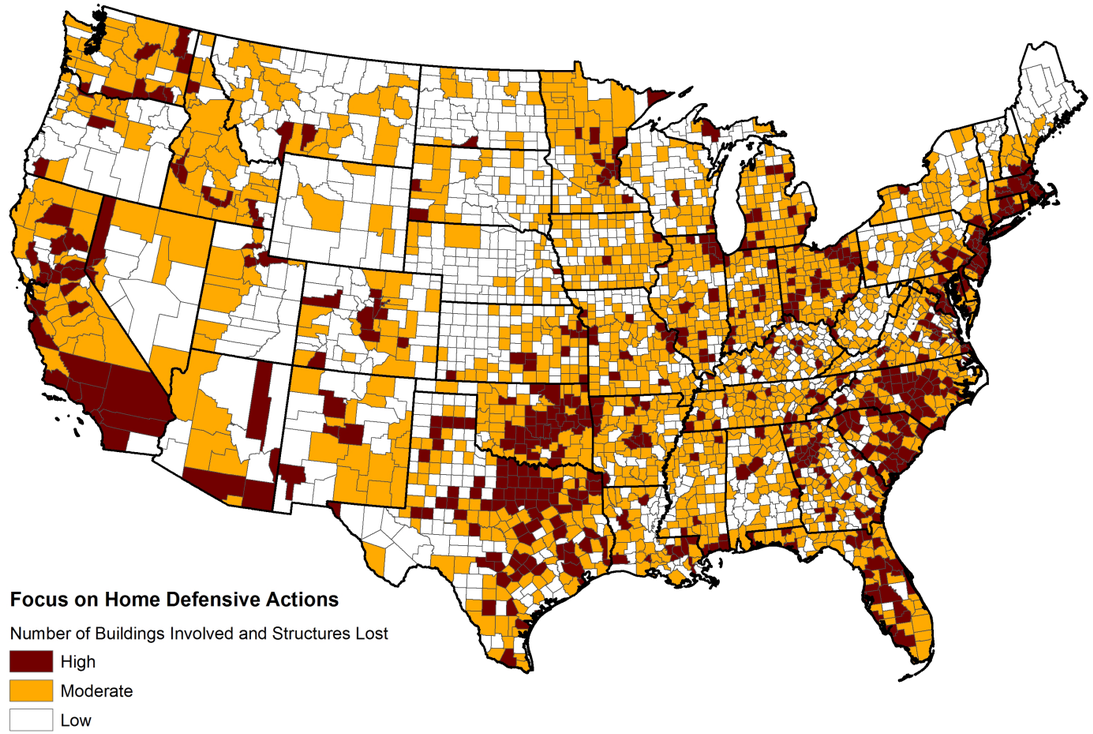
Fuel treatments as a precursor to prescribed fire or managed wildfire

A variant on the theme of non-fire fuel treatments highlights areas where economically sustainable mechanical treatment could be used as a precursor to and in combination with safer and more expanded use of wildland fire. The intent is to use mechanical treatments strategically to reduce the risks from wildland fire use across a broader landscape. For example, mechanical treatments in pine plantations that are located between communities and wildland areas might facilitate prescribed fire use or allow greater response flexibility in the wildlands. Essentially, this involves an intersection of Options 1 and 3.a. The net result is Option 4, which includes many southeastern counties, the Pacific Northwest, and scattered interior counties.

Data explanation

There is current prescribed fire activity or potential for prescribed fire in these forested or agricultural counties. There are timber jobs and mechanical treatment potential [Option 1A, 1B, 1C and Option 3A].

Option: Focus on home defensive actions



Focus on home defensive actions

The density of structures lost or buildings involved in wildfires highlights opportunities across the US where homes are affected by wildfire and would substantively benefit from greater individual home protection efforts.

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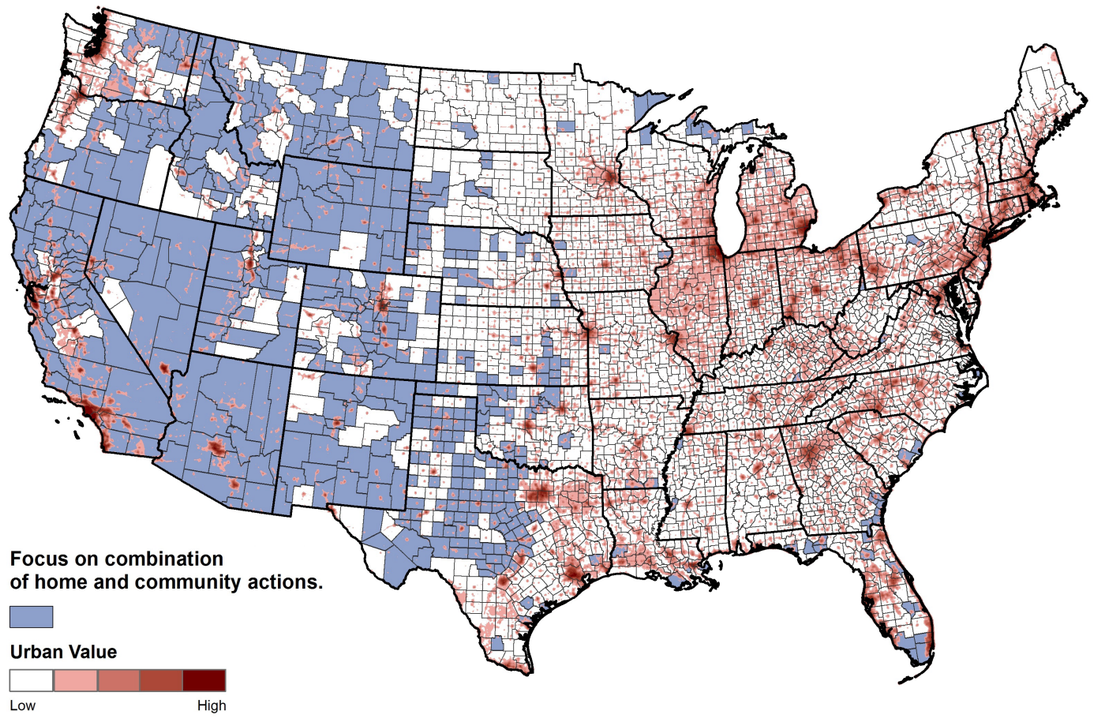
Option: Focus on a combination of home and community actions



Focus on a combination of home and community actions

Community clusters 2, 3, 4, and 6 include counties where community planning and coordinated action in combination with individual actions by property owners should be highly encouraged (Option 6.b, Figure 3.9).

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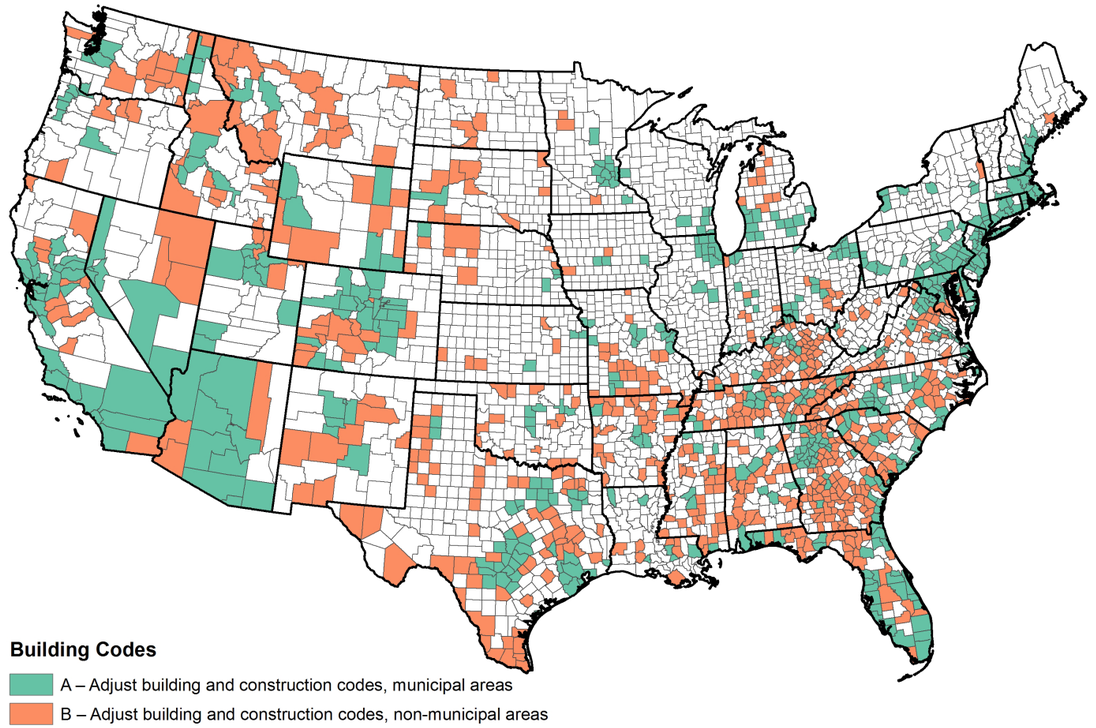
Option: Building codes



Building codes

One approach to making homes and other buildings more resistant to ignition is to focus on building materials and construction standards. Such standards engage individual property owners and enhance the effectiveness of community-wide actions. Building standards and adjustments in infrastructure are more easily applied to new construction and development than to existing development, and communities can be designed or managed in ways that enhance response effectiveness or mitigate risk. Changes in building codes are more likely to be effective when targeted at areas of new construction in high-hazards areas, and consequently counties with increasing WUI area or increasing WUI home density growth—the latter being more closely aligned with increasing home construction overall— suggest opportunities where such efforts are most likely to have a significant effect. Because municipal and non-municipal areas tend to exhibit varying levels of ability to implement building standards, these are mapped separately (Options A and B).

A. Adjust building and construction codes, municipal areas.

Data explanation

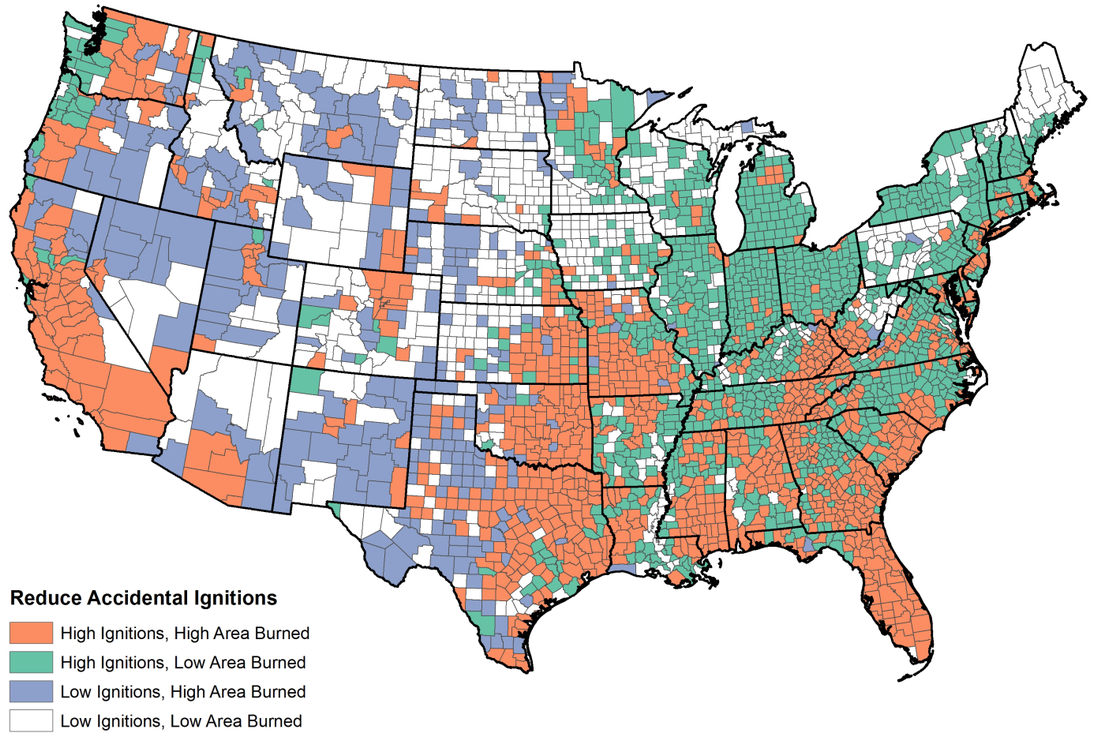
These are advantaged suburban or urban and suburban counties, or eastern areas that experience prescribed fire, or private forested urban or suburban areas [Cluster = 4 or Combination = 7A, 8A, 7H, or 7I].

B. Adjust building and construction codes, non-municipal areas.

Data explanation

These counties have high Wildland Urban Interface areas or experience housing growth, and are not agricultural nor experience low amounts of fire, and they are not suburban or urban areas [WUI growth >35 or Percent growth in housing density in WUI >15 and Cluster ≠1, 5 and not in Option 7A].

Option: Reduce accidental human-caused ignitions

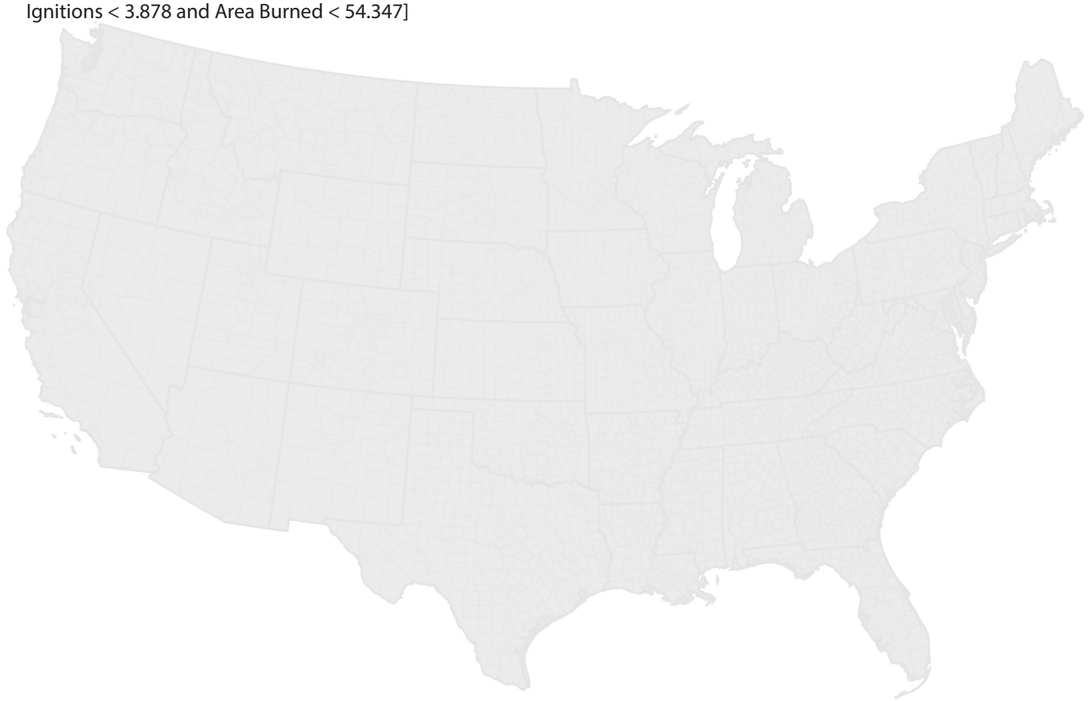


Reduce accidental human-caused ignitions

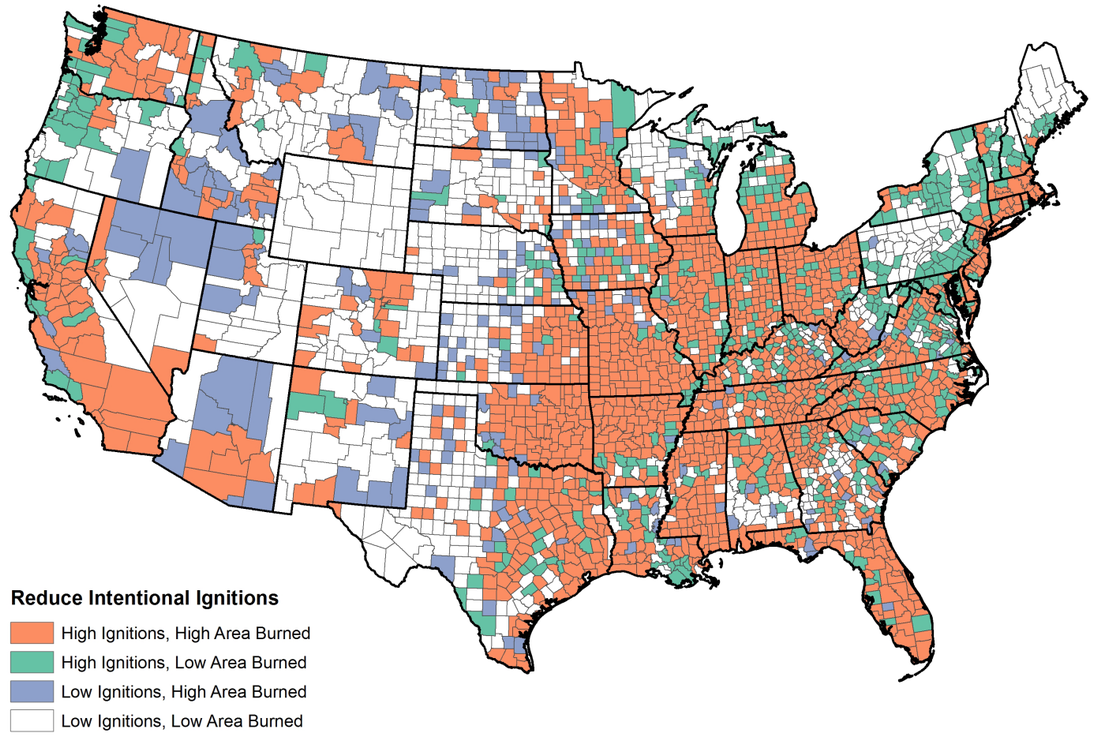
Counties were divided into two classes based on ignitions: those with either higher or lower than normal numbers of human-caused incidents (the median is used to define "normal"). Similarly, counties were split based on the area burned by human-caused ignitions relative to the national median. Combinations of these two divisions were used to create a four-color map of the nation. Counties falling into the high-high combination are found predominantly in the southeastern and south-central states and in the far West. The Northeast has a high percentage of the high-ignition-density, low-area-burned counties, while the interior West displays the bulk of the low-ignition-density, high-area-burned counties.

Data explanation

- High Ignitions, High Area Burned [Accidental and Unknown Ignitions > 3.878 and Area Burned >54.347]
- High Ignitions, Low Area Burned [Accidental and Unknown Ignitions > 3.878 and Area Burned <54.347]
- Low Ignitions, High Area Burned [Accidental and Unknown Ignitions < 3.878 and Area Burned >54.347]
- Low Ignitions, Low Area Burned [Accidental and Unknown Ignitions < 3.878 and Area Burned < 54.347]



Option: Reduce human-caused incendiary ignitions



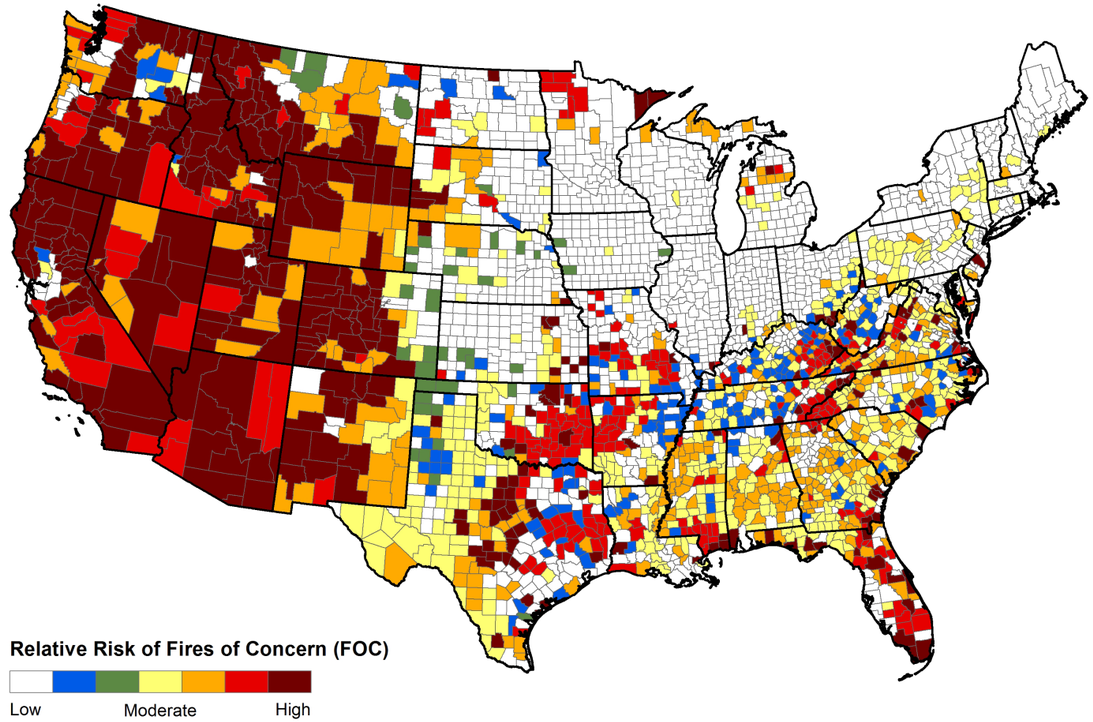
Reduce human-caused incendiary ignitions

The second option under this theme similarly focuses on areas experiencing higher than normal incendiary ignitions or the area burned by such fires (Option 5.b, Figure 3.14). There is more congruence between ignition density and area burned with incendiary fires than with accidental fires. Thus, large portions of the East and more populated counties of the West exhibit a combination of both high incendiary ignitions and high area burned.

Data explanation

- High Ignitions, High Area Burned [Incendiary Ignitions > .272 and Area Burned >51.995]
- High Ignitions, Low Area Burned [Incendiary Ignitions > .272 and Area Burned <51.995]
- Low Ignitions, High Area Burned [Incendiary Ignitions < .272 and Area Burned >51.995]
- Low Ignitions, Low Area Burned [Incendiary Ignitions < .272 and Area Burned < 51.995]

Option: Prepare for large, long-duration wildfires



Prepare for large, long-duration wildfires

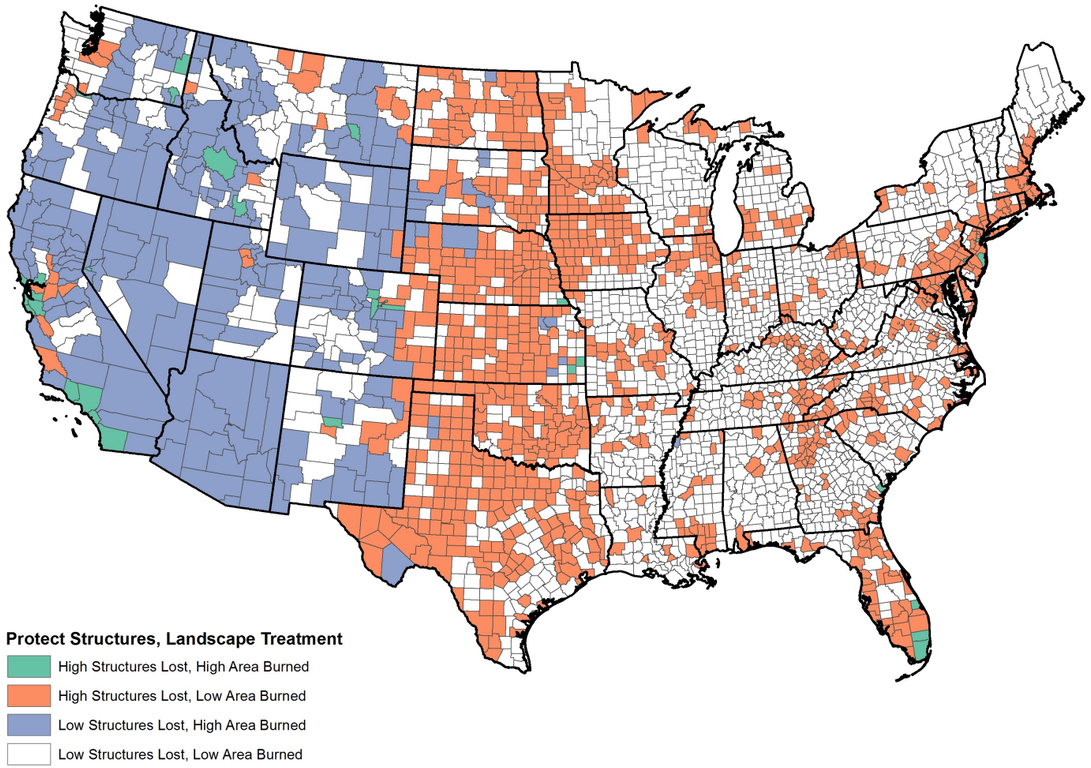
Because large wildfires cause significant challenges, it is important to know where large, long-duration wildfires are likely to occur and plan accordingly. Normative terms like "large" and "long-duration" are context-dependent. For example, a large fire in the intermountain West may imply thousands of acres, whereas a fire exceeding a few hundred acres in New England would be unusually large. Identifying a national standard that reflects these nuances is difficult. For analysis purposes, we defined an index of fires of concern (FOC) as being greater than 1 square mile in extent and at least two weeks in duration (from report to containment). The two standards work in tandem. Larger western fires tend to be constrained by duration; fires lasting more than two weeks are generally much larger than 1 square mile. In the eastern United States, the size constraint ensures that long-duration fires are of consequential size. The 10-year record of events (2002-2011) shows higher frequencies of FOC in dryer western counties, coastal areas of the Southeast, the southern Appalachians, and the upper Midwest (Figure 3.15).

Realistically, 10 years is too brief an interval to provide a precise estimate of the chance of a relatively rare event. A more inclusive estimate of where these larger, longer duration fires might occur in the future is obtained by extrapolating the 10-year sample to all combinations of resiliency classes and community clusters. The resulting map indicates that much of the West, Southeast, and mid-Atlantic regions display areas of relatively higher probability for fires of concern, as well as scattered counties of the upper Midwest.

Data explanation

- Extrapolation requires treating the entire area within a combination class as a single sample unit rather than analyzing individual counties. Highly urban areas (Landscape Class A) are excluded from extrapolation due to high intraclass variation.

Option: Protect structures and treat landscape fuels



Protect structures and treat landscape fuels

A second opportunity related to larger fires focuses on the relationship between area burned (as reported in Federal and state records) and structures lost (as reported in the nationwide ICS-209 incident reporting system). An index of the rate at which structures are lost relative to the area burned was created and compared to the area burned itself. A four-color map reflecting the intersection of those two indices reveals an interesting pattern (Option 9, Figure 3.17). The combination of high rates of structure loss with low area burned is dominant in the Central Plains and Eastern regions. Prioritizing response resources towards structure protection in these areas seems prudent. Conversely, the Intermountain West exhibits most of the area with high rates of area burned, but relatively lower rates of structures lost per unit area burned. The opportunity to employ greater flexibility in the tactics used in suppressing and containing fires in this region might be explored. Greater flexibility could lead to enhanced ecological benefits, reduced overall suppression costs, and perhaps less direct risk to firefighters.

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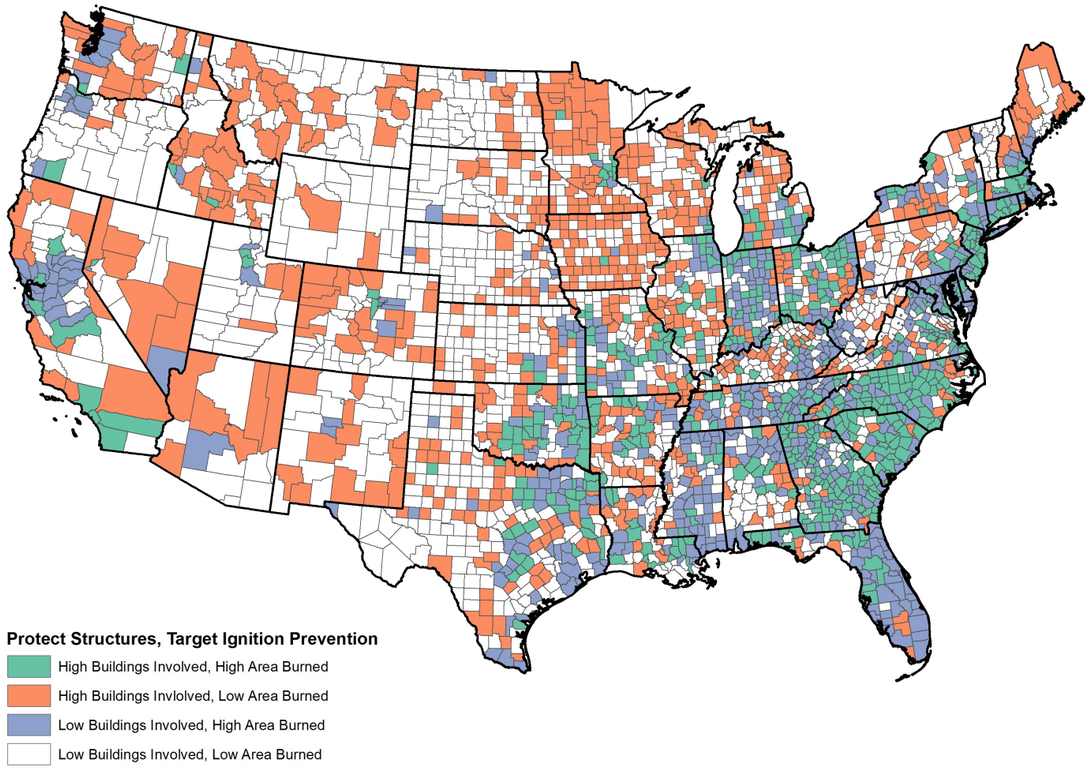
Option: Protect structures and target prevention of ignitions



Protect structures and target prevention of ignitions

The final response opportunity is most relevant to initial response, which often is the responsibility of a local fire department or agency. Data from NFIRS were examined and indices computed of the numbers of buildings involved per incident and the relative frequency of reported accidental human-caused ignitions. The intersection of higher-than-normal values for these variables indicates that the number of buildings involved per reported incidents is one of the few variables lacking a strong geographical pattern. In contrast, the relative frequency of accidental ignitions tends to be higher in the East and more populous areas of the West. The intersection of these two variables has an interesting pattern that illustrates the widespread extent of the challenges in managing wildfire risk and offers a guide to matching structure protection with prevention efforts (Option 10, Figure 3.18).

Reducing human-caused ignitions should result in a commensurate reduction in the workload of local response organizations and considerably less risk to structures throughout much of the East and populous Western counties. Throughout much of the remainder of the country, there is an expectation that buildings frequently will be involved in local incidents, even if the overall number of responses is relatively low.