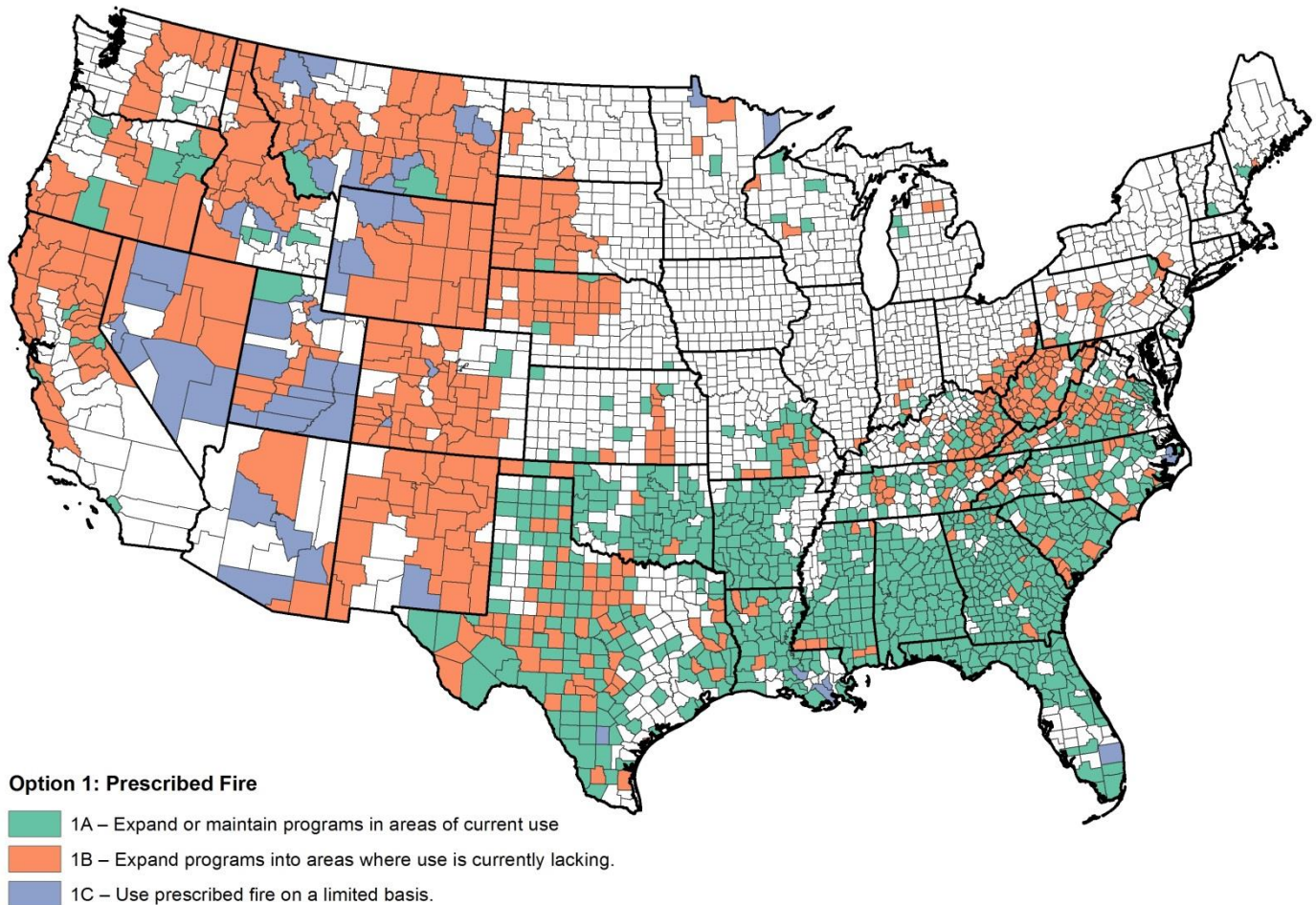


Policy Options

| Theme | Option | Description |
|------------------------------------------------|--------|---------------------------------------------------------------|
| Prescribed Fire | 1A | Expand or maintain programs in areas of current use |
| | 1B | Expand programs into areas where use is currently lacking |
| | 1C | Use prescribed fire on a limited basis |
| Managing Wildfire for Multiple Benefits | 2A | Apply tactic in forested systems |
| | 2B | Apply tactic in non-forested systems |
| | 2C | Apply tactic, but with awareness of community risk |
| Fuel Treatment other than Rx Fire | 3A | Treatment opportunities supported by forest products industry |
| | 3B | Non-forest areas with opportunity for treatment |
| | 3C | Treatment opportunities limited by economic markets |
| | 4 | Treatments are economical as a precursor to prescribed fire |
| Managing Ignitions | 5A | Reduce accidental human-caused ignitions |
| | 5B | Reduce human-caused incendiary ignitions |
| Home and Community Actions | 6A | Focus on home defensive actions |
| | 6B | Focus on combination of home and community actions |
| | 7A | Adjust building and construction codes, municipal areas |
| | 7B | Adjust building and construction codes, non-municipal areas |
| Response | 8 | Prepare for large, long-duration wildfires |
| | 9 | Protect structures and treat landscape fuels |
| | 10 | Protect structures and target prevention of ignitions |

Option 1: Prescribed Fire



Option 1: Prescribed Fire

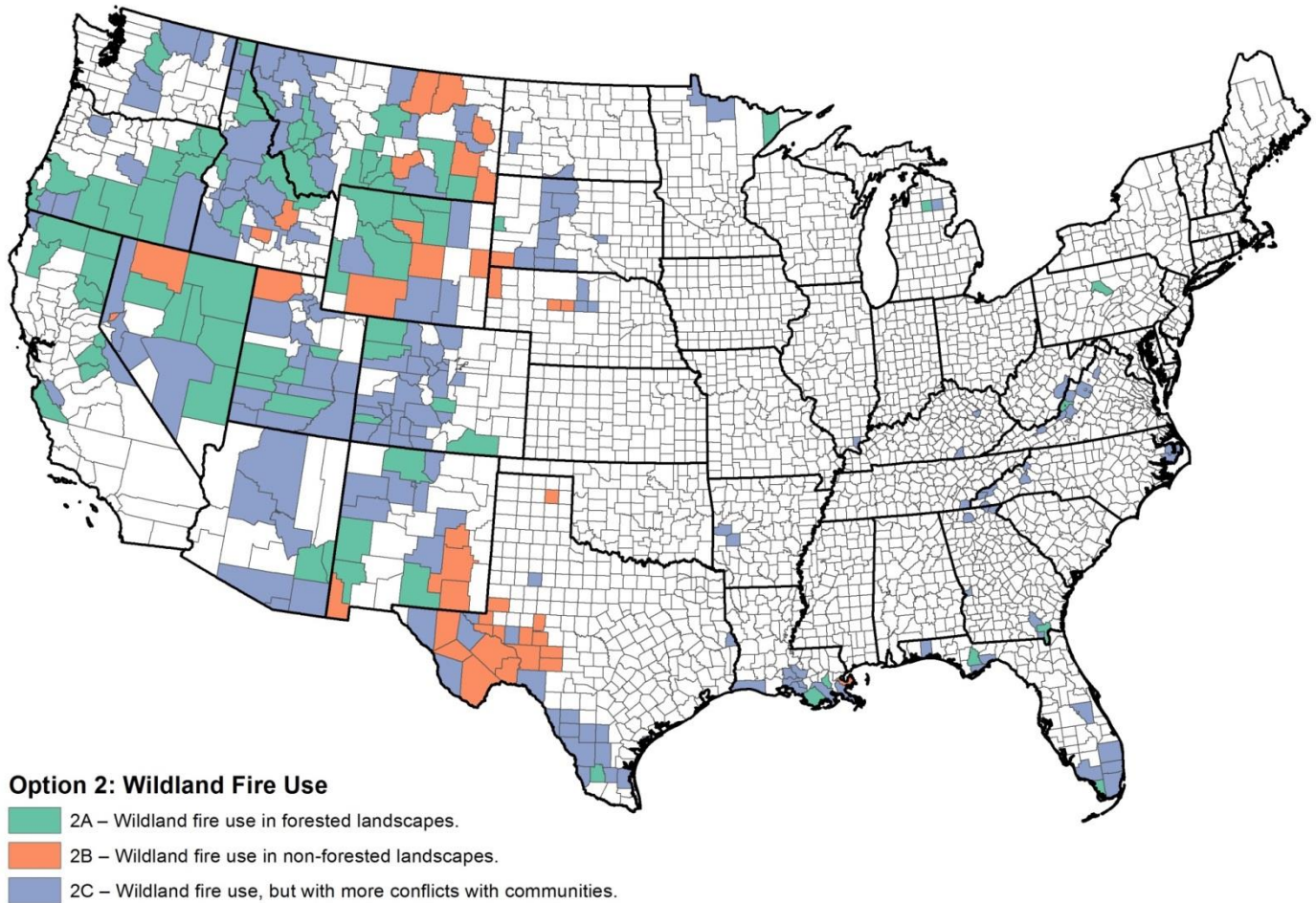
The emphasis is on broad-scale application of prescribed fire, focusing on counties where a significant portion of each county could benefit. Prescribed fire can be applied nearly everywhere for very specific reasons; such local concerns are not captured here.

Option 1A) Expand or maintain programs in areas of current use. The first priority is to maintain or expand prescribed fire in areas where it is currently being broadly applied. These areas logically have the necessary training and experience to implement a prescribed fire program and also suggest community acceptance and tolerance. Our analysis of probable areas of prescribed fire use used remotely sensed data and other reports to suggest that many counties throughout the Southeast and scattered counties in the Northeast and West are currently and substantively using prescribed fire.

Option 1B) Expand programs into areas where use is currently lacking. The priority would be to focus on areas where prescribed fire has been identified as suitable, yet the evidence for current, widespread application is less compelling. 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.

Option 1C) Use prescribed fire on a limited basis. The area for prioritization includes those counties that have areas suitable for prescribed fire, but perhaps not to the extent as in 1A or 1B. As an example, these include counties where the proportion of the total area suitable for prescribed fire is small, but it occurs in remote areas in relatively large contiguous blocks. These include Western counties with areas of low road density where more than 25% of the total county area is suitable for prescribed fire.

Option 2: Managing Wildfire for Multiple Benefits



Option 2: Managing Wildfire for Multiple Benefits

Managing wildfire for multiple benefits refers to either a strategic or tactical choice to utilize unplanned ignitions in order to achieve management objectives similar to those associated with prescribed fire. Policies vary, but this tactic has traditionally been restricted for use in federal wilderness areas, national parks, or other remote areas and only under specific conditions or circumstances. Federal wildland fire policies allow its use more generally, whereas many state and local jurisdictions are explicitly prohibited from implementing any strategy other than full suppression on wildfires. 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.

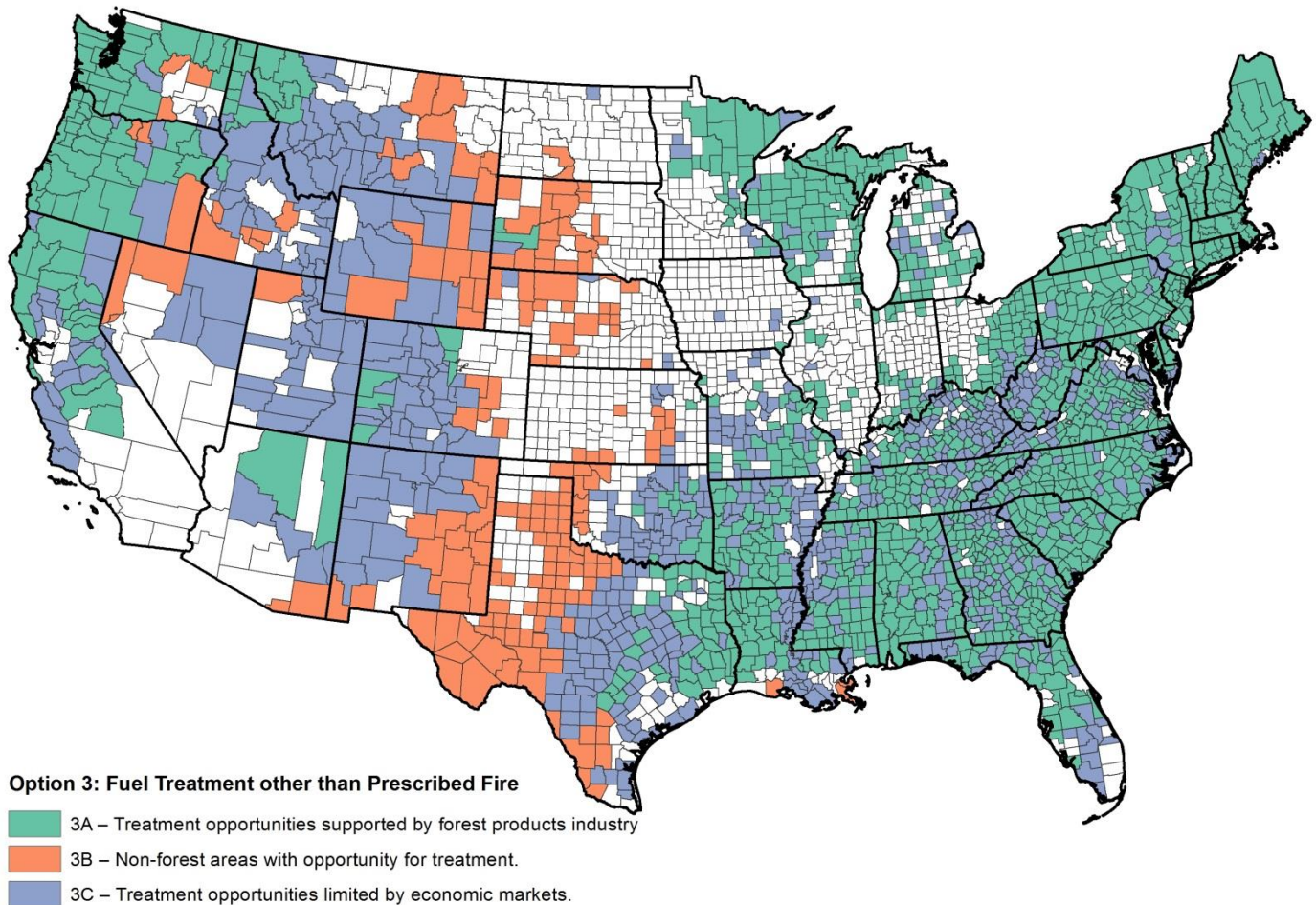
Option 2 (continued)

Option 2A) Apply tactic in forested systems. Areas were identified that might be suitable for managing wildfire for multiple benefits by looking first at those areas where prescribed fire was deemed suitable. This option highlighted counties where managing wildfire for multiple benefits in forested landscapes seems plausible.

Option 2B) Apply tactic in non-forested systems. These counties are dominated by non-forest vegetation where this tactic might also be applied.

Option 2C) Apply tactic, but with awareness of community risk. The third set of counties is where the landscape characteristics might benefit from managing wildfire for multiple benefits, but the community attributes would suggest potential conflict.

Option 3: Fuel Treatment other than Prescribed Fire



Option 3: Fuel Treatment other than Prescribed Fire

Option 3A) Treatment opportunities supported by forest products industry. These are where an active timber market might offset some of the cost of mechanical treatments in forests by using data about timber jobs, mill production, and forested area available for mechanical treatment. These counties occur throughout the northeast and southeast, within the Pacific Northwest, and scattered in the interior West. Note that we are not asserting that commercial timber harvest is equivalent to fuels management. There are regions where intensive forest management for commercial products can lead to reduced fuel loadings, greater access, enhanced control over both wildfire and prescribed fire, and generally reduced wildfire threat.

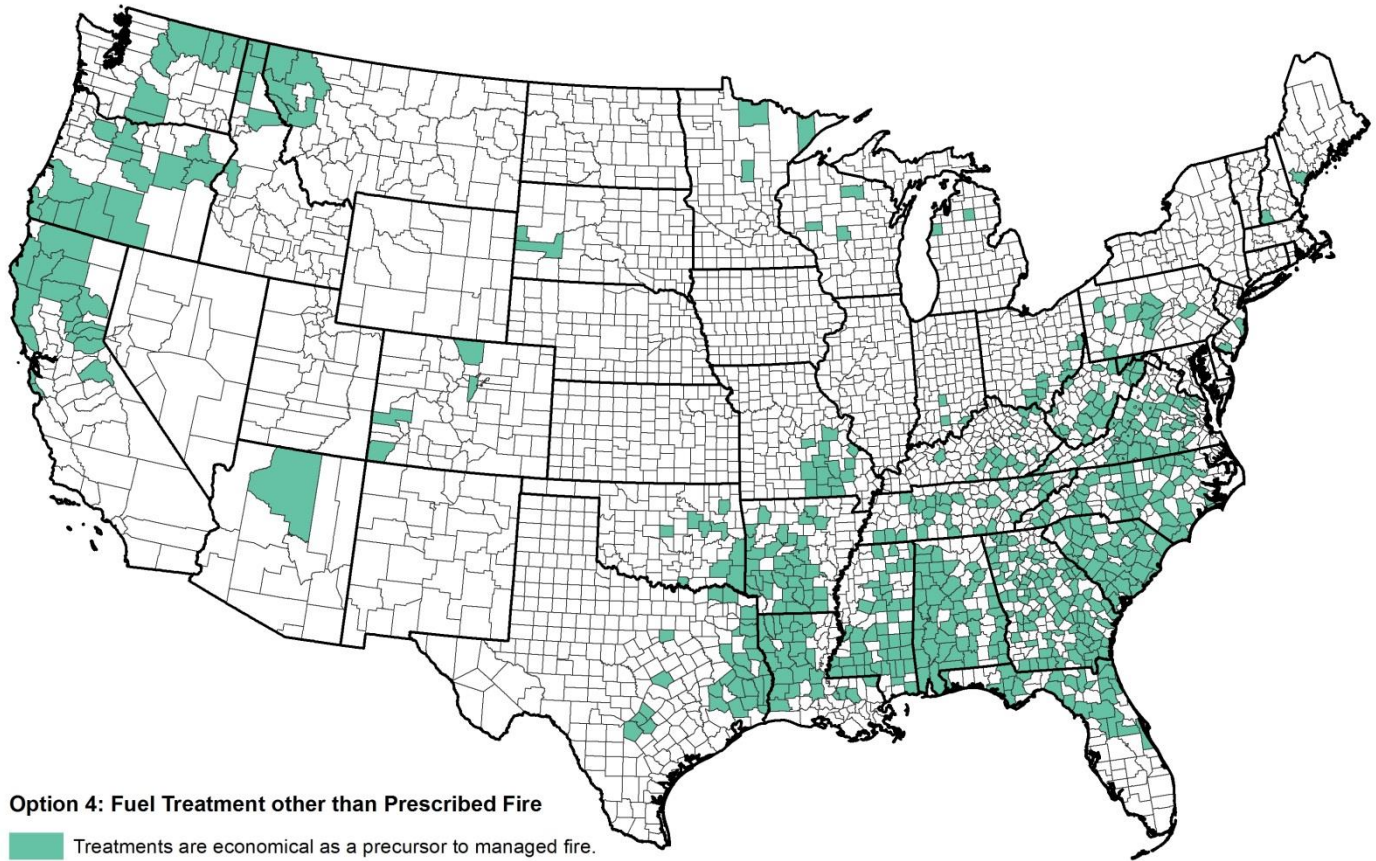
Option 3 (continued)

There are also areas where selective harvest can leave behind excessive timber slash or debris, promote uncontrolled growth of the understory, encourage spread of invasive species, and generally exacerbate fuel conditions. Much depends on the strength of local markets and landowner incentives to leave conditions better following harvest than before.

Option 3B) Non-forest areas with opportunity for treatment. These are non-forest areas where combinations of mechanical (mowing) or biological control (grazing) appear feasible. These include the range and grasslands systems where frequent—even annual—control of vegetation might be advantageous. Economic costs and benefits will vary locally and depend on treatment type.

Option 3C) Treatment opportunities limited by economic markets. The third set of counties included in this option include those where mechanical treatment in forests offers considerable benefit, but where evidence of economic markets to support such activities is weak. These include major areas of the interior West, central Texas and Oklahoma, and scattered counties throughout the Southeast and Northeast.

Option 4: Fuel Treatment other than Prescribed Fire

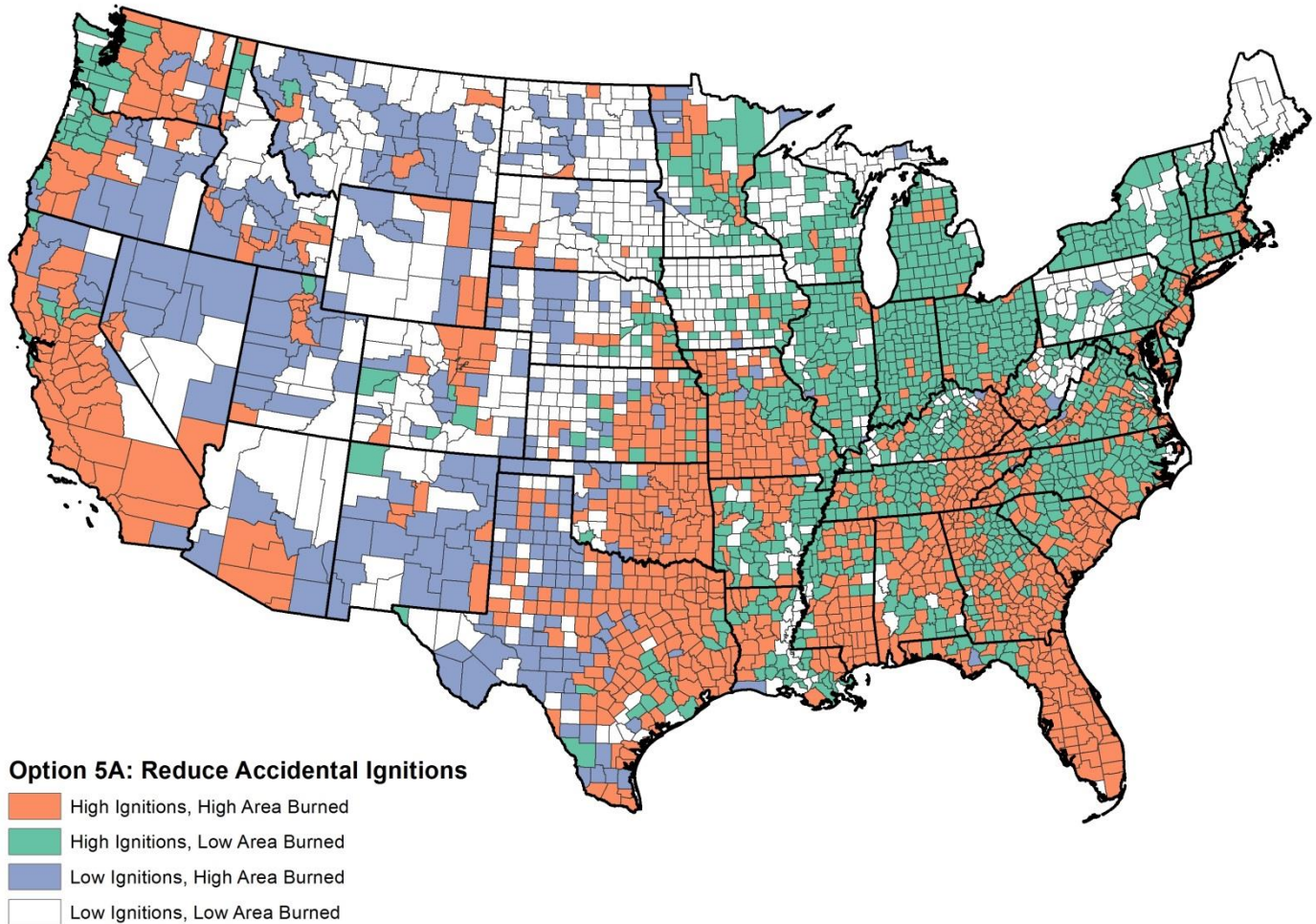


Option 4: Fuel Treatment other than Prescribed Fire

Option 4) Treatments are economical as a precursor to prescribed fire.

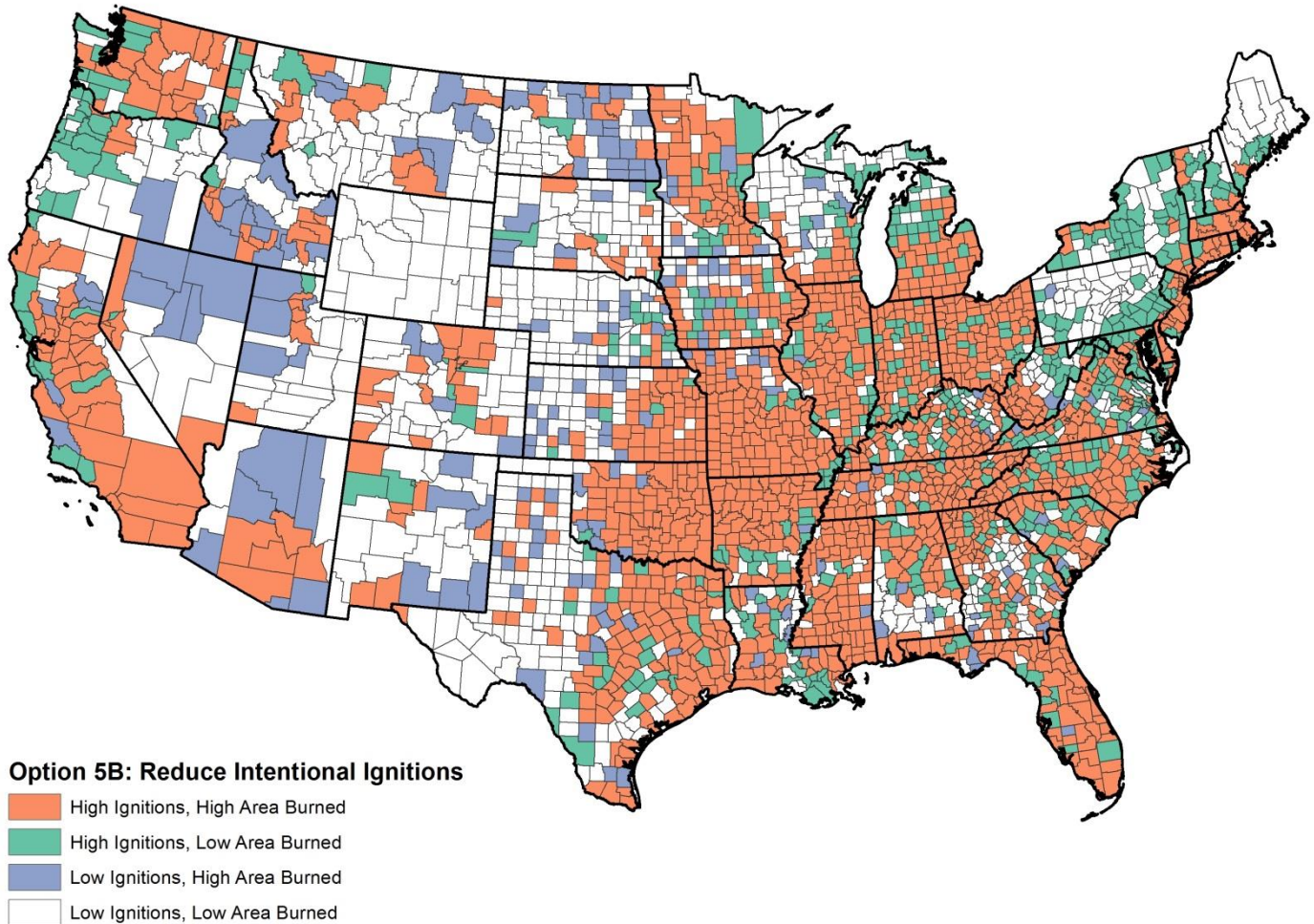
A variant on the theme of non-fire fuel treatments is an option in which mechanical treatment is viewed as a precursor to safer and more expanded use of prescribed fire. Essentially, this involves an intersection of Options 1 and 3A. The net result is Option 4, which includes many southeastern counties, the Pacific Northwest, and scattered interior counties.

Option 5A: Managing Ignitions



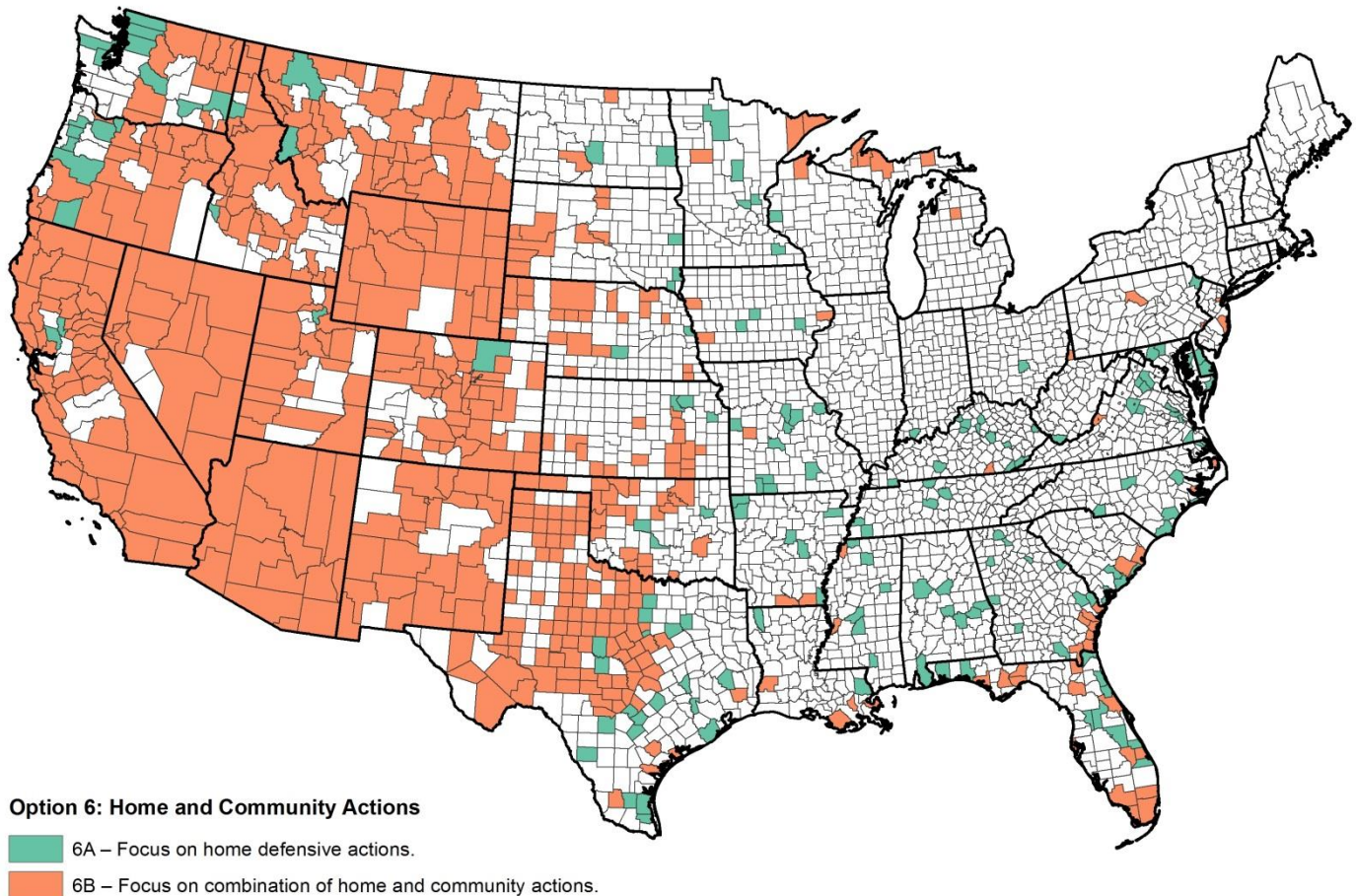
Option 5A) Reduce accidental human-caused ignitions. The first option under this theme highlights counties where the intent or focus would be to substantively reduce the number of accidental ignitions. The two classes of higher-than-normal ignition density and higher-than-normal area burned are used to create a four-color map with low-low, high-low, low-high, and high-high combinations. 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.

Option 5B: Managing Ignitions



Option 5B) Reduce human-caused incendiary ignitions. The second option under this theme focuses on areas experiencing higher than normal incendiary ignitions or the area burned by such fires. 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.

Option 6: Home and Community Actions

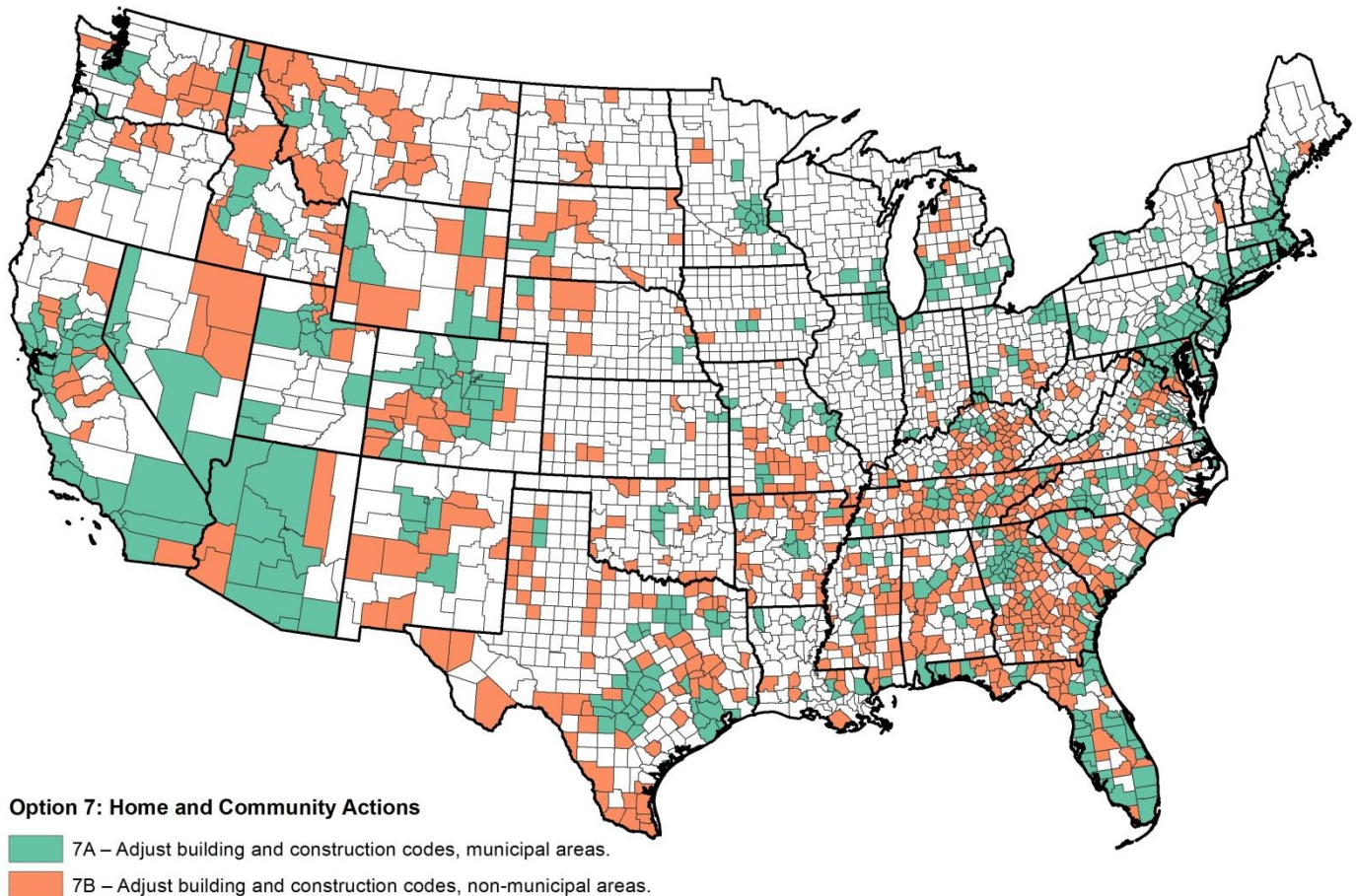


Option 6: Home and Community Actions

Option 6A) Focus on home defensive actions. Counties were identified with high levels of exposure in the WUI along with relatively high levels of wildfire extent as a representative sample of counties where focusing on individual structures is likely to be effective regardless of community-level activities.

Option 6B) Focus on combination of home and community actions. Additional counties where the combination of structure protection and community planning and coordinated action seems essential are identified separately.

Option 7: Home and Community Actions



Option 7: Home and Community Actions

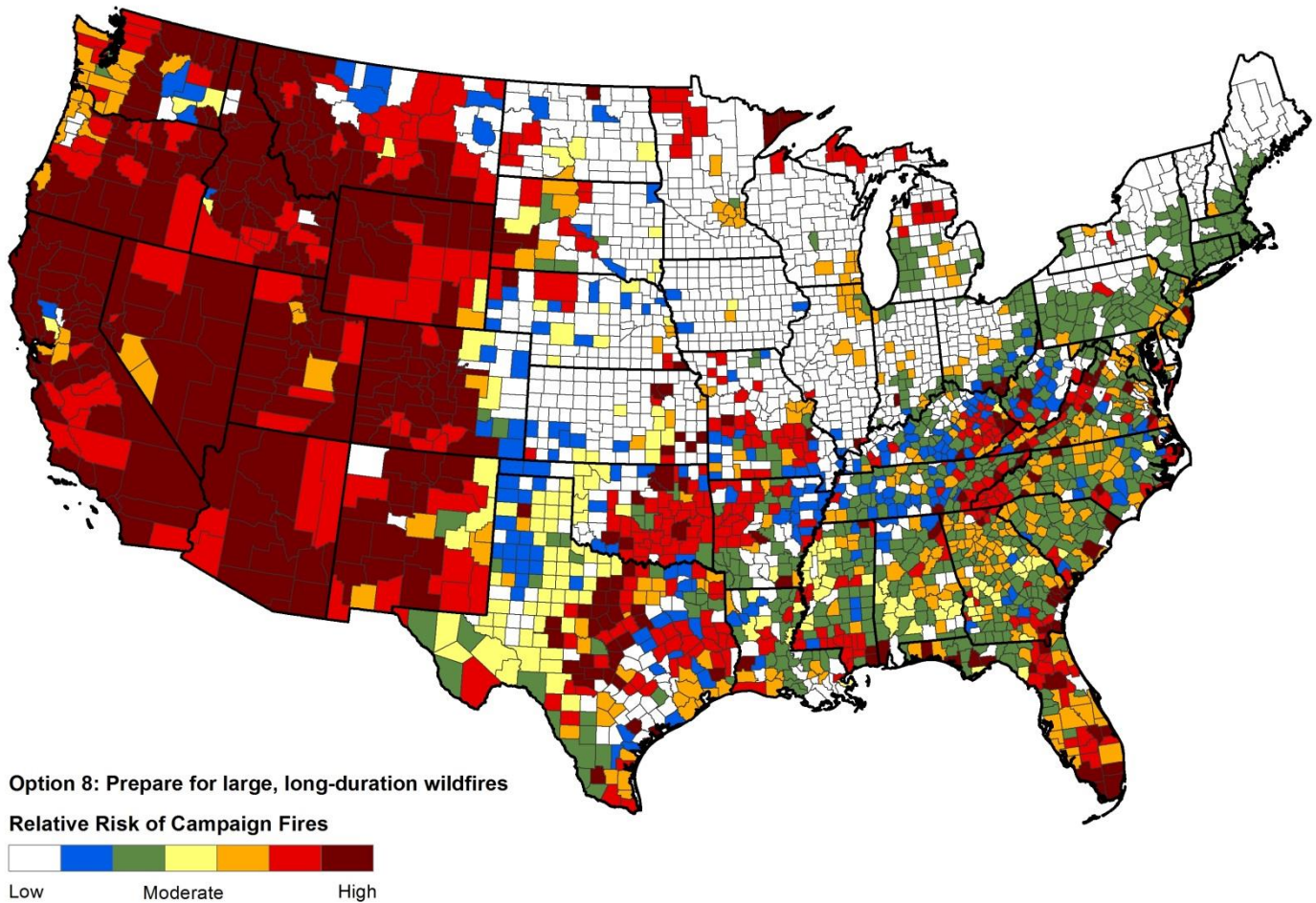
Option 7A) Adjust building and construction codes, municipal areas. Option 7B) Adjust building and construction codes, non-municipal areas.

One approach to making homes and other buildings more resistant to ignition is to focus on building materials and construction techniques. Similarly, 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. Building standards are more easily applied to new construction and development than to existing structures. Such standards engage individual property owners and enhance the effectiveness of additional community-wide actions. Counties with increasing WUI area or increasing WUI home density growth—the latter being more closely aligned with increasing home construction overall—are places

Option 7 (continued)

where such standards 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, we have mapped them separately.

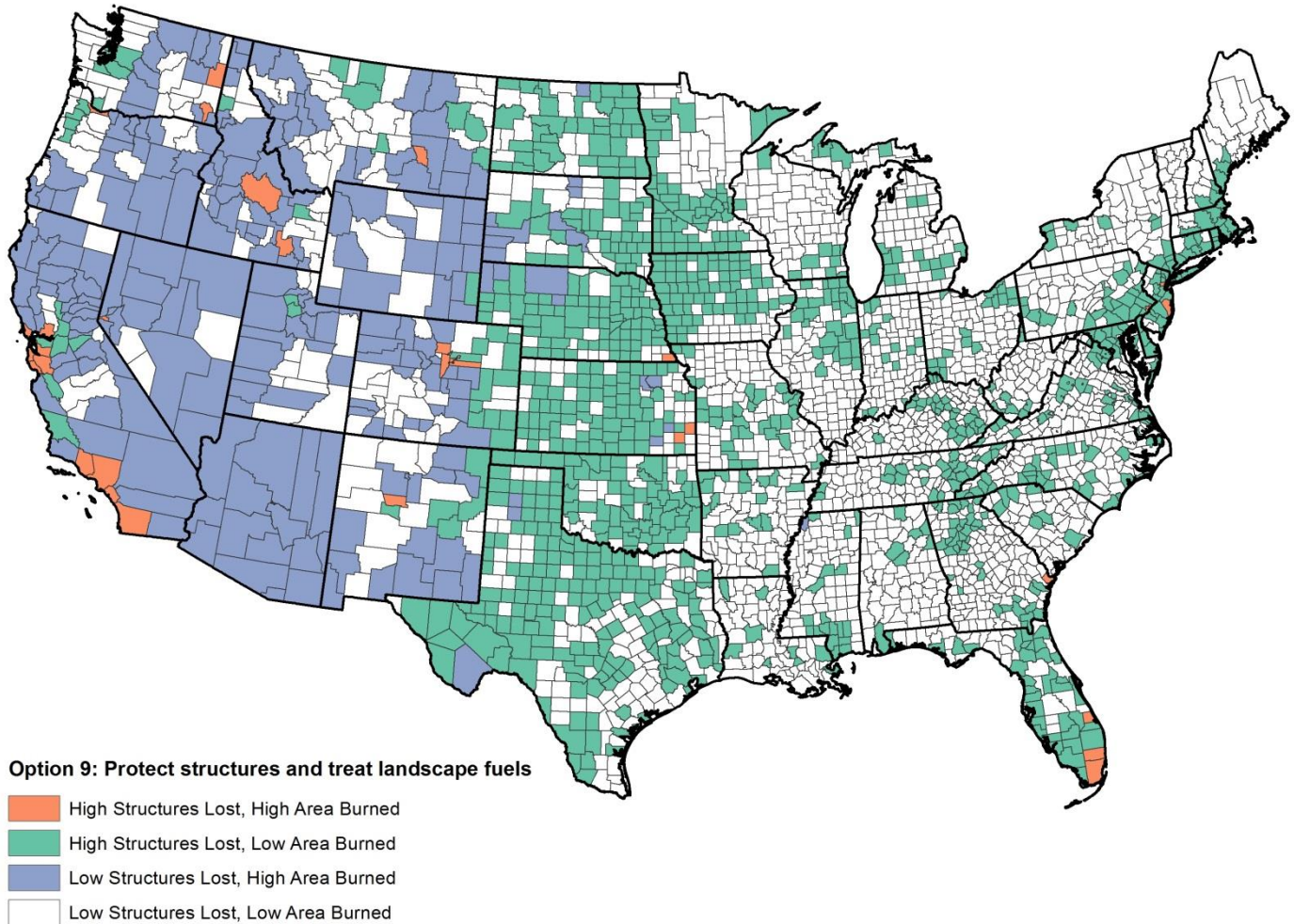
Option 8: Response



Option 8: Response

Option 8) Prepare for large, long-duration wildfires. Because large wildfires are so important, the likelihood of observing a large, long-duration wildfire were mapped. These “campaign fires” are defined as being greater than 1 square mile in extent and at least two weeks in duration (from report to containment). Our ten-year record of events provides a sample of where such fires occur. Extrapolating that sample to all combinations of resiliency classes and clusters generates a national map that reflects the relative likelihood of experiencing a campaign fire within each county; Option 8 would prioritize preparedness based on this likelihood. The resulting map indicates that much of the West, Southeast, and mid-Atlantic regions display areas of higher probability, as well as scattered counties of the upper Midwest.

Option 9: Response



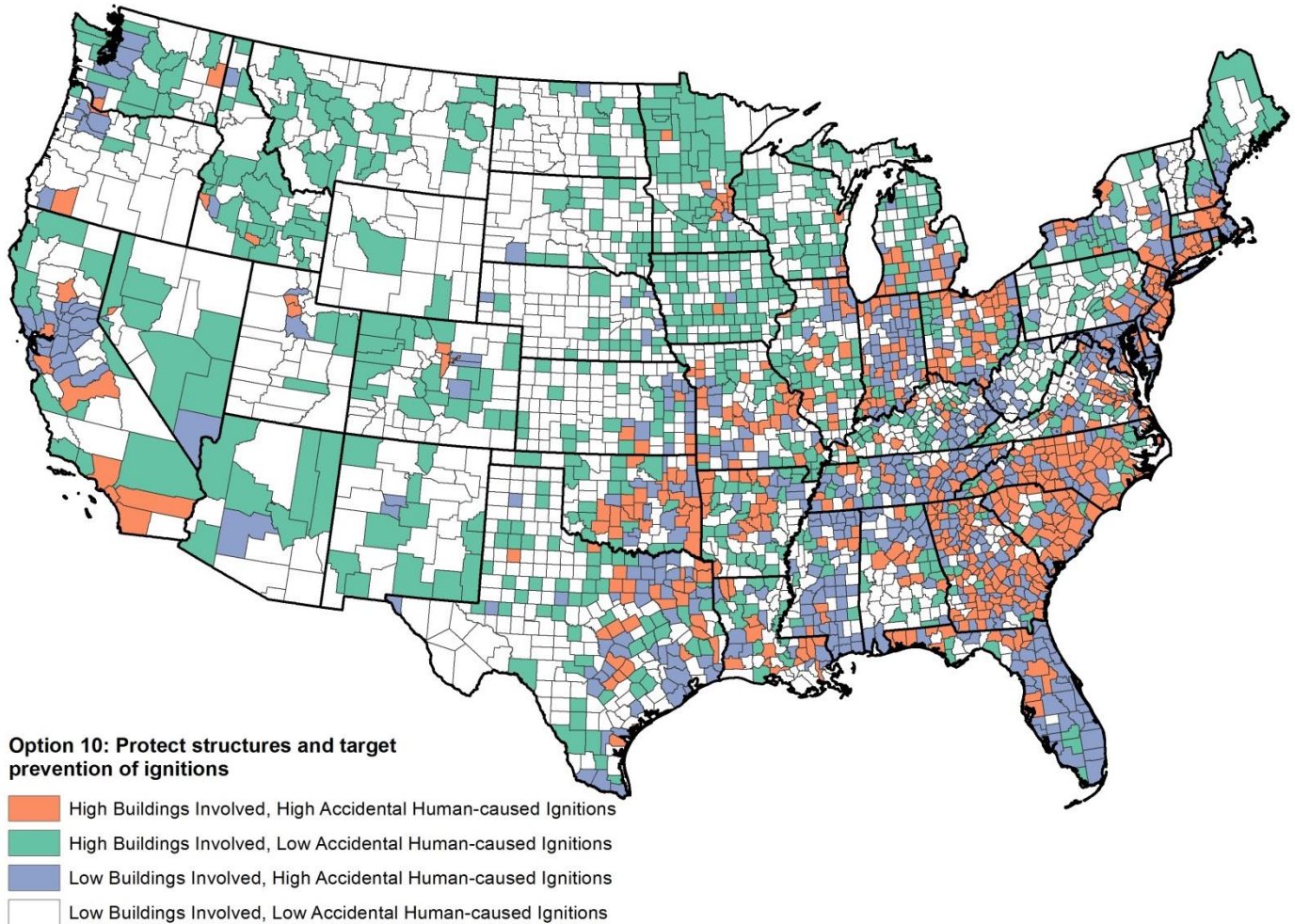
Option 9: Response

Option 9) Protect structures and treat landscape fuels. A second option 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). We created an index of the rate at which structures are lost relative to the area burned and compared the rate of loss to the area burned itself. A four color map reflecting the intersection of those two indices revealed an interesting pattern. The combination of high rates of structure loss with low area burned is dominant in the Central Plains and Eastern regions. Conversely, the interior West exhibits most of the area with high rates of area burned, but relatively lower rates of structures lost per unit area burned. Counties exhibiting a combination of both high area burned and

Option 9 (continued)

high structure loss rates are few in number, but highlight some of the most problematic counties in the country from a response perspective. Option 9 would prioritize structure protection in combination with efforts to reduce fire size based on these patterns.

Option 10: Response



Option 10: Response

Option 10) Protect structures and target prevention of ignitions. The final response option is most relevant to initial response, which often is the responsibility of a local fire department or agency. We examined data from the National Fire Information Reporting System (NFIRS) and computed indices 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 indicate 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 this

Option 10 (continued)

issue and offers a guide to prioritization of structure protection with prevention efforts. 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 will be involved in many local incidents, even if the number of responses is relatively low.