

# 2018 NATIONAL

## PRESCRIBED FIRE USE SURVEY REPORT



Technical Report 03-18

Prepared by the Coalition of Prescribed Fire Councils, Inc.

**This report is a collaborative effort of the National Association of State Foresters and the Coalition of Prescribed Fire Councils.**



NATIONAL ASSOCIATION OF  
**State Foresters**

The mission of the National Association of State Foresters is to represent state and territorial forester interests by influencing forest policy and leading efforts to promote healthy and sustainable trees and forests.



COALITION OF  
**PRESCRIBED  
FIRE COUNCILS, INC.**

The mission of the Coalition of Prescribed Fire Councils is to promote the appropriate use of prescribed fire for enhancing public safety, managing resources, and sustaining environment quality.

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**Acknowledgements:**

Special appreciation is given to all 50 state forestry agencies for providing the prescribed fire use intelligence; without their participation this report would not be possible. Thanks to Stephen J. Pyne for providing the foreword. Thanks to the Jones Center at Ichauway for its continued support and particularly to my colleagues Jean Brock for GIS support, Lisa Giencke for data analysis, graphics, and editorial support, and Jessica McCorvey for technical support and report layout.

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## Executive Summary

The National Association of State Foresters (NASF) and the Coalition of Prescribed Fire Councils (CPFC) worked collaboratively to produce the 2018 National Prescribed Fire Use Survey Report. Since 2012, this report has been compiled every three years, and is unique among fire surveys. Numerous surveys have been conducted that investigated the challenges that fire managers and land owners face relative to prescribed fire use in the United States. Although informative, these surveys do not specifically address the challenges state agencies navigate in managing fire programs. States operate independently to develop policy and regulations that work for their own interests; as a result, prescribed fire programs differ greatly by state and region. This system of state autonomy is the foundation upon which fire programs are built, therefore it is especially important to have a deeper understanding of each state's perspective.

This year's survey results showed 11.3 million acres were treated with prescribed fire in 2017. The majority of acres (80%) were burned to meet forestry objectives with the balance related to agriculture. Although the Southeast led the nation in total acres (7.6 million), the West's 3.3 million acres represented an increase over 2014 and 2011 estimates. Despite this increase in burn acres in the West, the Southeast and the Northeast, as well as the nation as a whole, have experienced a decline in total prescribed fire acres. The national total is down 12% from 12.8 million acres in 2011; only 14 states (28%) increased their prescribed fire activity from 2011 to 2017. Consistent with previous surveys four states burned 1+ million acres, but for the first time zero acres were reported by some states. At the same time, the number of prescribed fire councils has grown to 35 councils in 31 states, a 40% increase since 2011. Weather, capacity, and air quality/smoke management remain the top three impediments for prescribed fire implementation. Weather outranked all other categories with 8 out of every 10 states identifying it among their top three impediments. Although the wildland-urban interface (WUI) is often cited as a reason for not getting fire on the ground, surprisingly only one state chose WUI as the number one limitation on the use of prescribed fire, and WUI was the impediment category with the fewest states listing it among the top three impediments. Significantly, this survey documents for the first time the degree of liability as defined in each state's prescribed fire statute(s). Five states (10%) have no prescribed fire law, and only seven states (14%) have the highest degree of liability protection in the form of gross negligence laws.

Clearly programmatic similarities and differences exist at national, regional, and state scales when considering prescribed fire management. The path from authorizing an individual prescribed burn to the act of placing an active flame on the ground is riddled with challenges at every step. Only by fully understanding our collective role and responsibility can prescribed fire be safeguarded in the future. It is the intent of the NASF and CPFC that the National Prescribed Fire Use Surveys serve as a means to foster collaborative support and partnerships that increase the appropriate use of prescribed fire as a natural resource management tool to enhance forest health and public health and safety.

## Foreword - Passing the Torch

Probably hominins were burning landscapes even before they became sapient. Cooking food allowed our ancestors to shrink their guts and expand their heads. Cooking landscapes was likely part of the same project. We've been burning ever since. When allied with European colonization, the process mutated into more virulent forms, and when settlement bonded with industrialization, it sometimes became both promiscuous and abusive. Charles Sargent's map of forest fires for the 1880 census shows an agricultural nation that was rapidly industrializing and had fire everywhere, some good, some bad. The worst conflagrations broke out where fire met axe and gorged on mountains of logging slash. America was to the late 19th century what Brazil was for the late 20th.

Out of this wreckage came state-sponsored conservation, which seized on fire as the most visible and politically potent emblem of what was wrong. Formal programs for fire protection, which tended to mean fire exclusion, followed. All this aligned with precepts of European forestry. Unfortunately forestry emerged from an anomalous part of the world, temperate Europe, that did not have a natural basis for fire. It saw wildfire mostly as an expression of social disorder, or as Bernhard Fernow once put it, of "bad behavior and loose morals." For the proponents of conservation the control of fire became a foundational principle. In 1905 the creation of the U.S. Forest Service gave the doctrine an institutional presence. In 1910 the Big Blowup galvanized doctrine into ideology. A protest movement that argued for 'light burning' or the 'Indian way' of forest management was dismissed as nonsense and condemned as anathema.

Fire exclusion didn't work - couldn't work on landscapes that had known fire, both natural and anthropogenic, since the waning of the Pleistocene. The mere effort to ban fire added to the damage. Over the question of fire two sides polarized: one argued for state-sanctioned suppression, the other, for laissez-faire folk burning. In 1942 Raymond Conarro proposed a compromise in the form of the 'prescribed fire.' Prescribed burning promised access to fire, but a fire informed with some scientific rigor and institutional discipline. The concept rooted, first in the southeast, then by the 1970s throughout the federal land agencies. In principle 'fire by prescription' would replace suppression-only as an informing doctrine. Tame fire would substitute for wild fire. Good fire would forestall bad fire. Even more radically, the proposition grew that landowners had a right to burn.

It's always harder to retrofit than to build right the first time. Suppression remained, in most of the country, the default setting, and there were plenty of places that needed it. Even states like Florida that pioneered prescribed fire as a foundational premise maintained vigorous fire control capabilities. Yet throughout much of the southeast landowners, both private and public, swapped fire exclusion for fire by prescription. The practice spread among prairie restoration enthusiasts, found NGO support with The Nature Conservancy, the Tall Timbers Research Station, the Joseph W. Jones Ecological Research Center, and prescribed fire councils, which have scaled up to embrace most of the country. Not all the places that need good fire have it, and almost no one burns as much as they would like. But where prescribed fire has flourished, the issues have gone well beyond the simple argument that fire is necessary into finer-grained discussions over the seasonality, timing, frequency, and size of the burning.

But prescribed burning never succeeded with equal aplomb in the West. It certainly exists, and in places, it is vital, but it has not thrived as an informing practice. Why? The reasons are many, but consider two differences as illustration. In the southeast or in tallgrass prairie, a few years without fire remakes the landscape as woody species infest the scene and fuels stack like green cordwood; the effect of excluding fire is soon visible. In the semi-arid



West decades may pass before similar effects appear. In the eastern U.S. threatened and endangered birds from the Bachman's sparrow to the iconic red-cockaded woodpecker all leverage the Endangered Species Act to promote more burning. In the West birds with equivalent standing, from spotted owls to sage grouse, push toward fire exclusion.

Politics, wilderness, liability, costs (social as well as fiscal) - all have encumbered western prescribed fire to the point that it has become, in places, a boutique practice. The effort to craft a prescribed natural fire repeatedly stumbled, changing its name as often as flu viruses mutate. The Florida model works only in patches. Yet fire will come, and fire needs to do its ecological work.

The evolving solution is the yet-unnamed managed wildfire. Fire officers adjust their response to an ignition, from whatever cause, to whatever the land needs. Often this can take a box-and-burn strategy in which they draw wide perimeters around the point of ignition and burn out. The final size may be an order of magnitude greater than if they had applied traditional suppression. Typically, reports will speak to a 'confine and contain' strategy, or allude to 'resource benefit' fires, or simply elide over the reasoning beyond references to firefighter safety and cost efficiency in favor of getting more fire on the land. Some patches within the final perimeter may not burn at all, and some burn more severely than managers might wish, but much of the burning will fall within a range of what a prescribed fire would. Because the practice does not come with its own bureaucratic category there is no sense of how much of this burning goes on.

Done properly, the managed wildfire is a hybrid - part suppression, part prescribed burn. Suppression concentrates on sites of major assets at risk such as communities or municipal watersheds. The burning out can be imagined as a prescribed fire conducted under urgent, but not emergency, conditions. Too often suppression burnouts do more damage than the wildfire. Here the burning is broad and has days in which to be completed, and can be conducted with some of the thoughtfulness and preparation that characterize a traditional prescribed fire. Such fires involve active management, not monitoring, and they have the added benefit that they help contain smoke that might otherwise linger for weeks.

I believe such fires are the future of prescribed burning in the West. There is no reason why the practice shouldn't expand to suitable sites elsewhere.

After the Great Fires of 1910, we had 50 years of all-suppression, all the time. We took out good fires as well as bad. Then, beginning with the fire revolution that bubbled up in the 1960s and 1970s, we sought to restore good fire. The revolution quickly won the intellectual fight; the institutional skirmishing, often a slog, continues. Now that project, too, has run its 50 years, and it seems we are entering a new phase change in which fire practices will be mixed, a pyric mash-up, that lets managers better adapt the right kind of fire to the land.

What might the future hold? As America continues to recolonize its rural lands with urban sprawl, suppression, where it is needed, will strengthen. Prescribed fire as a set-piece practice will spread where suitable fireescapes and fire cultures promote it. Likely, commercial uses of fire for plantations and pasture, along with fire for simple fuel reduction, will decline, while burning to enhance ecological integrity will rise. Many landscapes, however, will experience a curious fire fusion in which actively managed wildfire accounts for much of the good fire that agencies seek. As yet we have no metric by which to parse out the prescribed from the suppressed in such events. When we do it is likely that prescribed fire under its western avatar will reach proportions comparable to what has occurred in the southeast.

Over the past century we have had to accept that what works in Southern California doesn't work in south Florida. Equally, we have to accept that what works in the Florida panhandle may not work in northern California or the Northern Rockies. There are many ways to get good fire on the land, and many institutional arrangements to promote them. We need them all.

The future promises to be messy, but it has always been messy. Fire doesn't make for clarity. The world seen through flames flickers and smudges. But it's a better world than one without.

Steve Pyne

## Introduction

Back in 2012 the Coalition of Prescribed Fire Councils (CPFC) and the National Association of State Foresters (NASF) partnered to produce the first-ever report that investigated national prescribed fire activity. At the time these two organizations felt they were best positioned to approach state forestry agencies for prescribed fire intelligence. The effort garnered 100% support from states; NASF and CPFC partnered again in 2015 to produce a second report. These reports are necessary and critical to understand how much prescribed fire is being implemented and to better track where it is occurring. This information, along with trends in activity, can be useful tools to help guide the efforts of decision makers, researchers, prescribed fire councils, and academia, as well as policy by wildland fire and environmental quality agencies. The 2018 report is a continued effort by the CPFC and NASF to acquire and maintain the most relevant and current prescribed fire activity data of its kind.

This 2018 survey follows the same precedent of previous reports by conducting a national evaluation that focuses on the scale of prescribed fire use, state-level supporting programs and requirements, and identifying factors that limit the use of prescribed fire. The survey report is based on 2017 prescribed fire activity and, where applicable, utilizes the 2012 and 2015 reports to illustrate and describe trends. This report uses the best information available from state forestry agencies, and includes completed surveys from all 50 U.S. states. The data presented are intended to inform the fire community by identifying challenges at a national scale, as well as defining key regional and state differences and similarities.



## Methods

In early 2018, all 50 U.S. state forestry agencies received the National Prescribed Fire Use Survey and an invitation to participate. The survey questions centered around prescribed fire activity, state-level programs and requirements, and factors limiting prescribed fire implementation. For the purpose of this survey, forestry and agricultural acreages were reported separately and include all 2017 federal, state, and private prescribed burning activity. Rangeland burning was reported and calculated as a forestry activity. NASF geographic regions were used to conduct all regional comparisons and are consistent with the National Cohesive Strategy’s geographic boundaries.

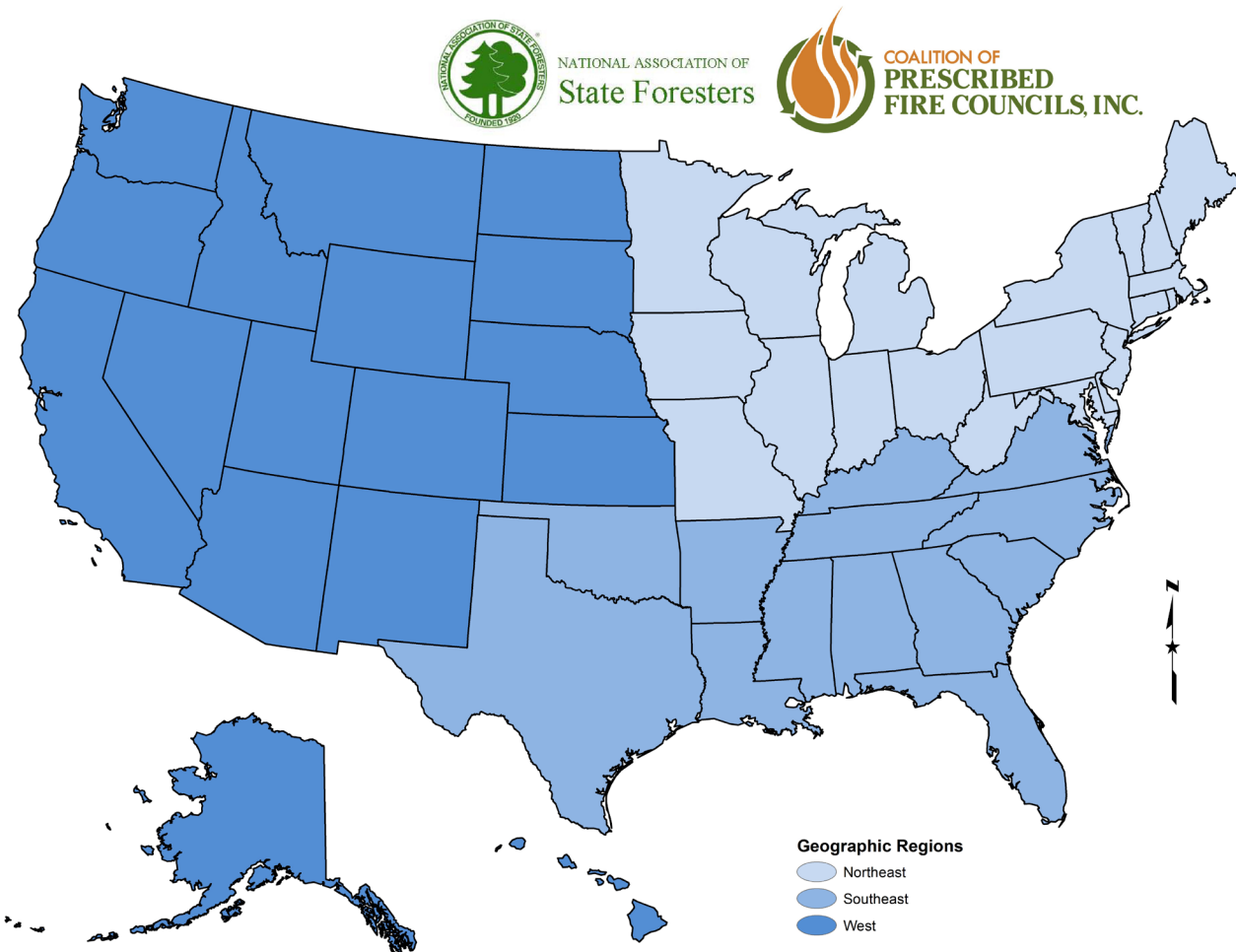


Figure 1. Geographic Regions

Survey questions were presented as yes/no/sometimes or fill-in-the-blank formats in an effort to avoid any ‘record keeping’ differences that exist between state fire programs and to collect consistent data. Additionally, the impediment categories developed in the 2012 National Prescribed Fire Use Survey Report were also used in an effort to provide consistency among previous survey years and reflect trends, if applicable. Each state agency was asked to identify and rank their top three impediments from the established list (see Table 1).

## Methods (continued)

Table 1. The nine impediment categories are as follows:

Capacity Concerns	Limited personnel, training, private contractor availability, partnerships, equipment
Weather Concerns	Narrow burn windows, drought, available burn days
Air Quality/Smoke Management Concerns	Visibility, nuisance, emission impacts
Resource Concerns	Limited funding, high implementation costs
Public Perception Concerns	Lack of public understanding/acceptance
Liability/Insurance Concerns	Landowner liability, insurance availability and/or cost
Permitting/Legal Concerns	State law, burn bans, local restrictions, NEPA process, ESA
WUI/Population Growth Concerns	Urbanization, influx of new residents
Low Priority	Agency or landowner priority, too difficult

## Results

### Prescribed Fire Activity

#### 2017 National Prescribed Burning Activity by Resource Objective

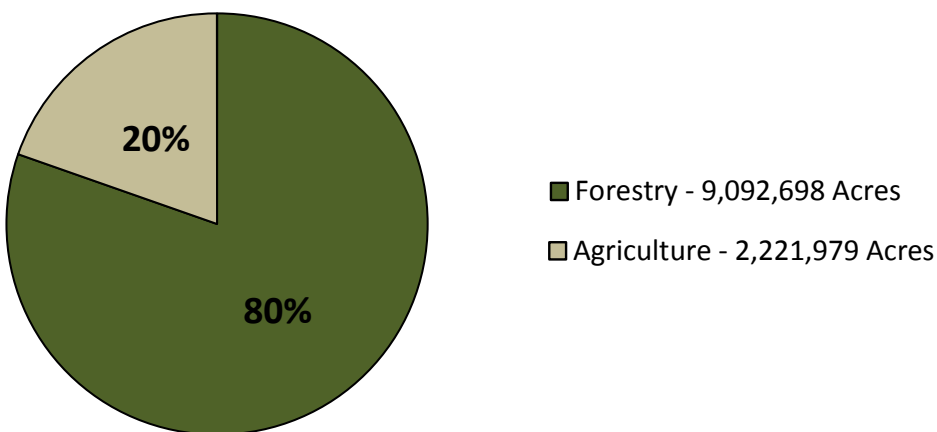


Figure 2. Percentages and acres of national prescribed fire activity by resource objective.

Results (continued)

**2017 Northeast Region Prescribed Burning Activity by Resource Objective**

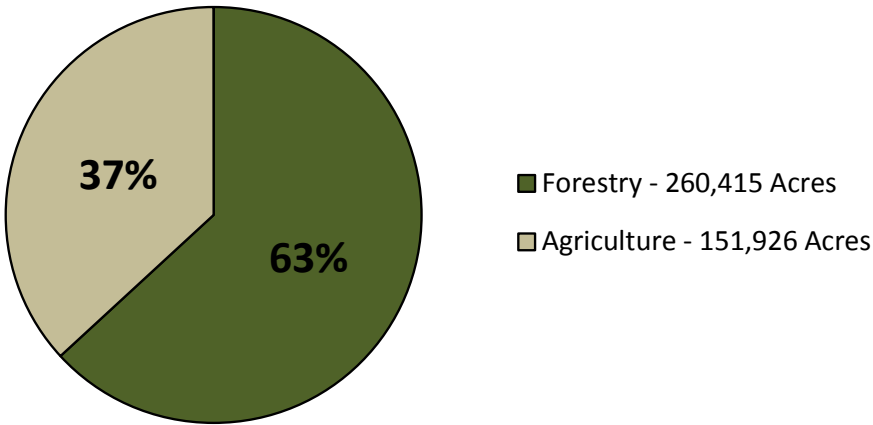


Figure 3. Percentages and acres of northeastern prescribed fire activity by resource objective.

**2017 Southeast Region Prescribed Burning Activity by Resource Objective**

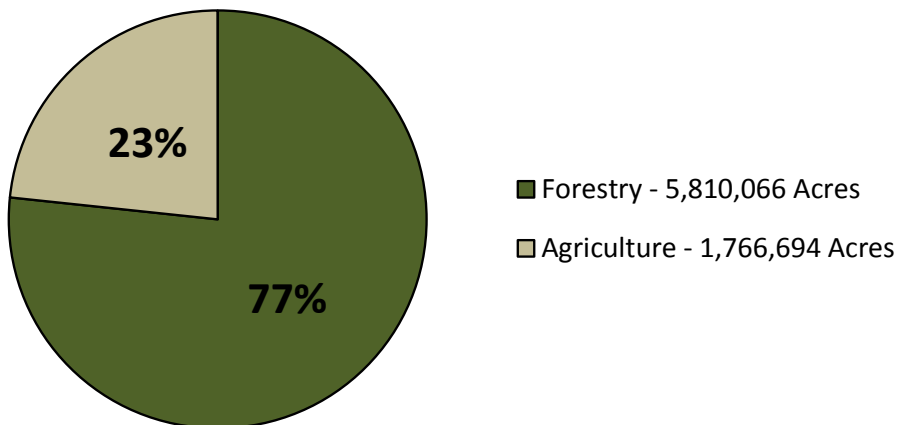


Figure 4. Percentages and acres of southeastern prescribed fire activity by resource objective.

Results (continued)

**2017 West Region Prescribed Burning Activity by Resource Objective**

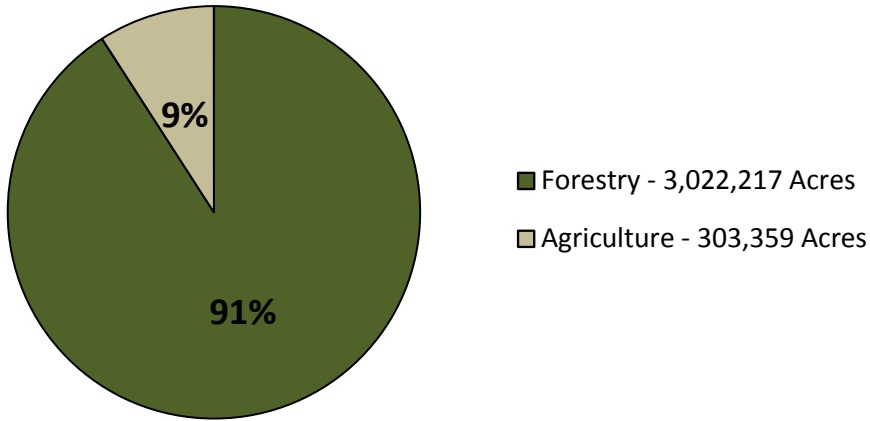


Figure 5. Percentages and acres of western prescribed fire activity by resource objective.

**2017 Forestry & Agricultural Prescribed Fire Activity by Region**

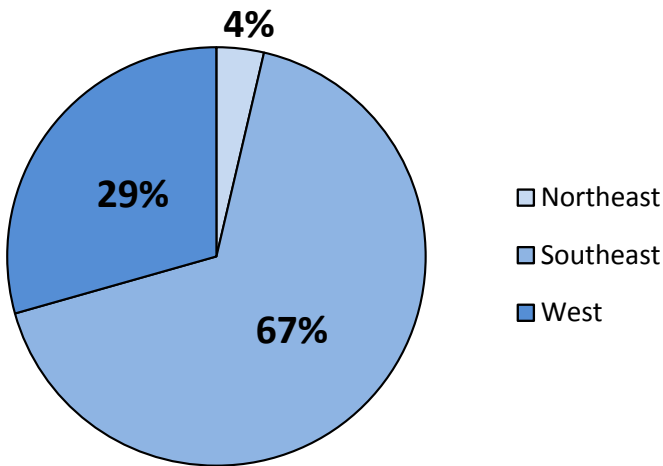


Figure 6. Percentages of all national prescribed fire acres by region.



Results (continued)

**2017 Forestry Prescribed Fire Activity by Region**

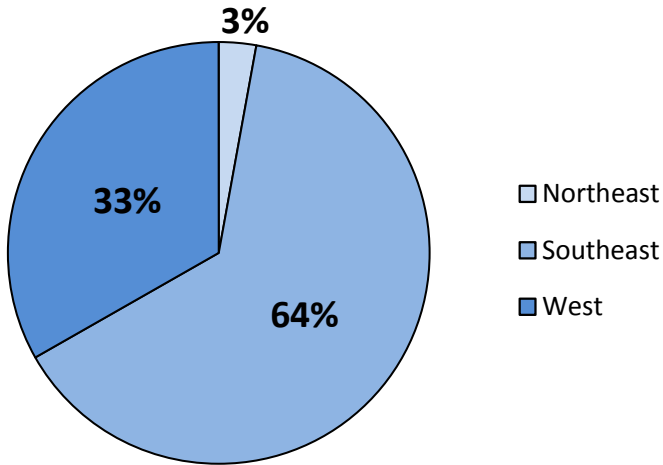


Figure 7. Percentages of all forestry prescribed fire acres by region.

**2017 Agricultural Prescribed Fire Activity by Region**

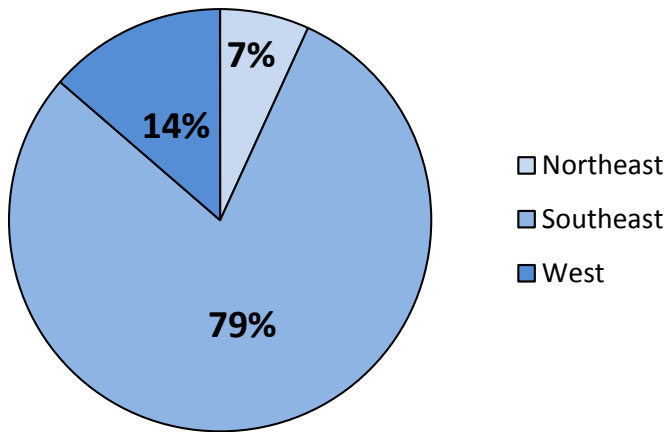
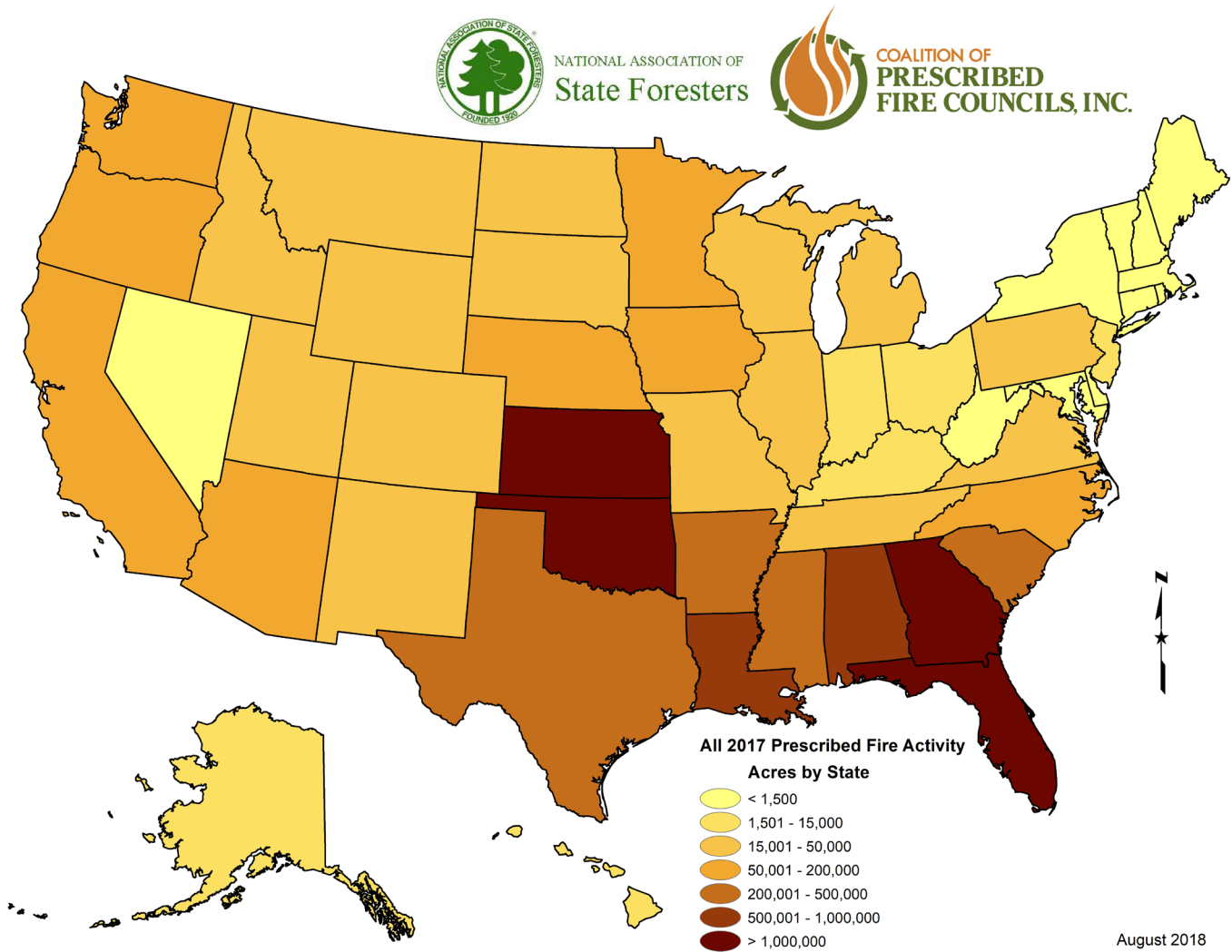


Figure 8. Percentages of all agricultural prescribed fire acres by region.

Results (continued)



August 2018

Figure 9. Acres of all prescribed fire use by state. Coarse acreage classes were created using a histogram that determined the most significant breaking points in acres reported.

Results (continued)

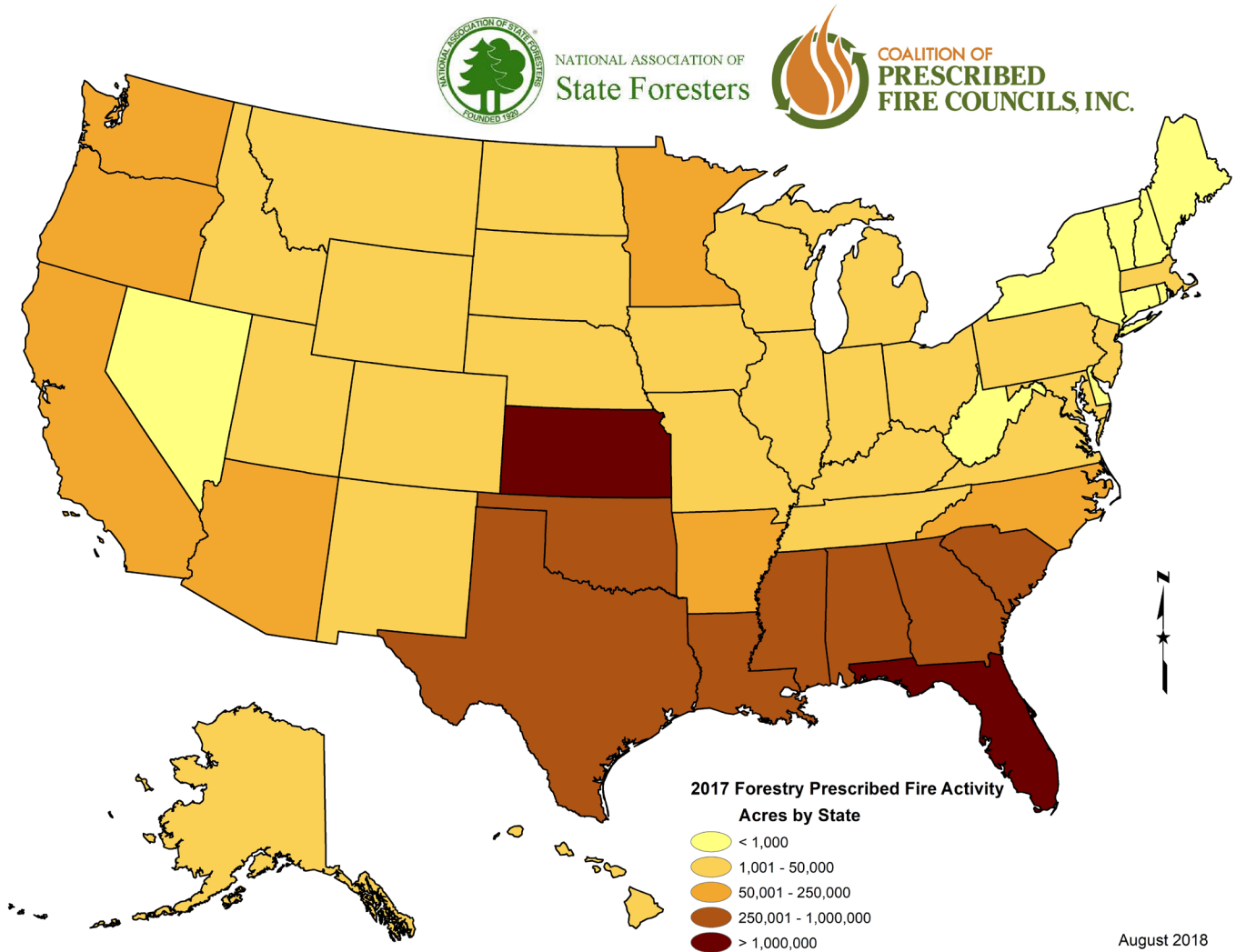


Figure 10. Acreage of prescribed fire use for forestry objectives by state. Coarse acreage classes were created using a histogram that determined the most significant breaking points in acres reported.

Results (continued)

State-level Programs

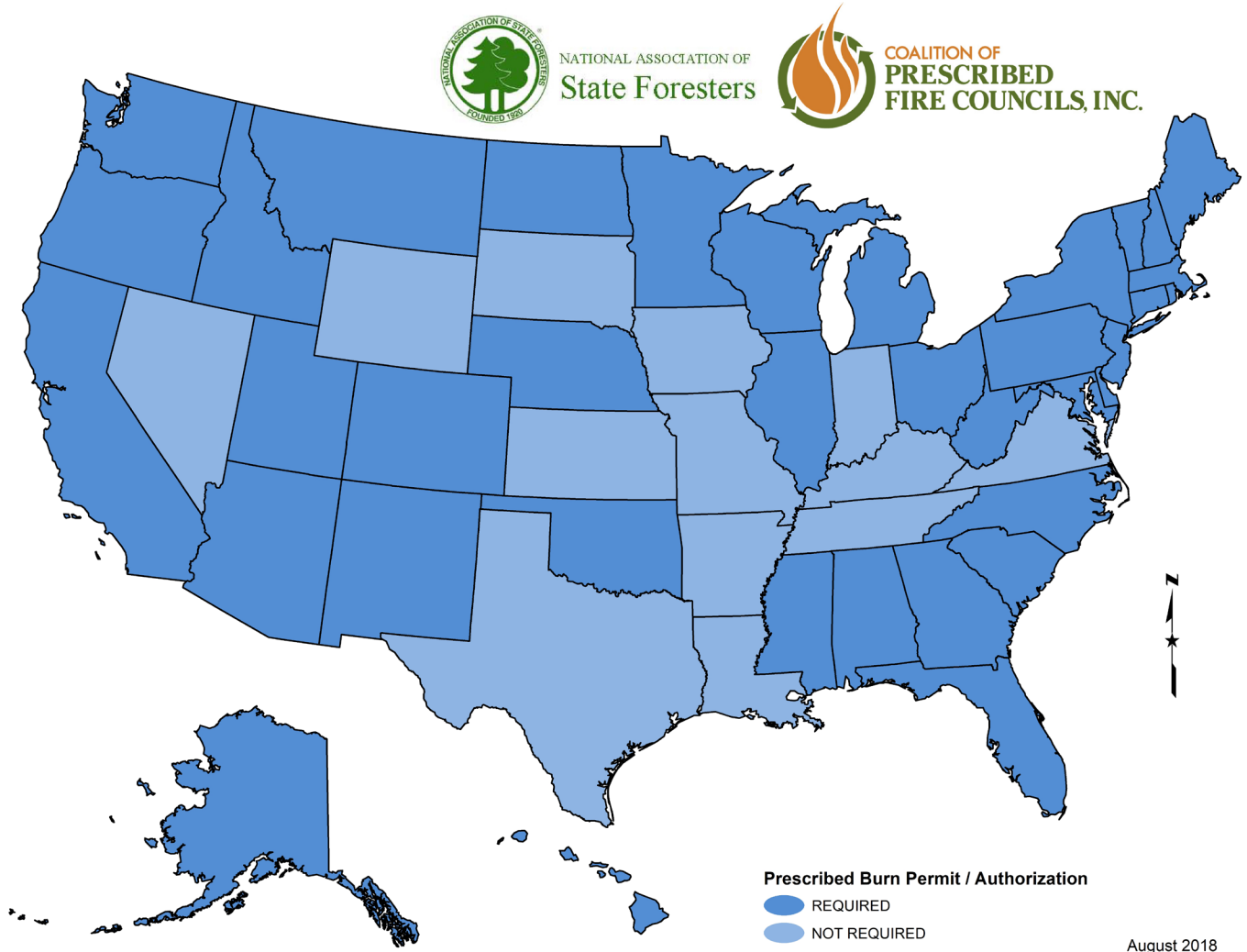


Figure 11. Thirty-seven states (74%) utilize some form of prescribed fire burn permit or authorization system.

Results (continued)

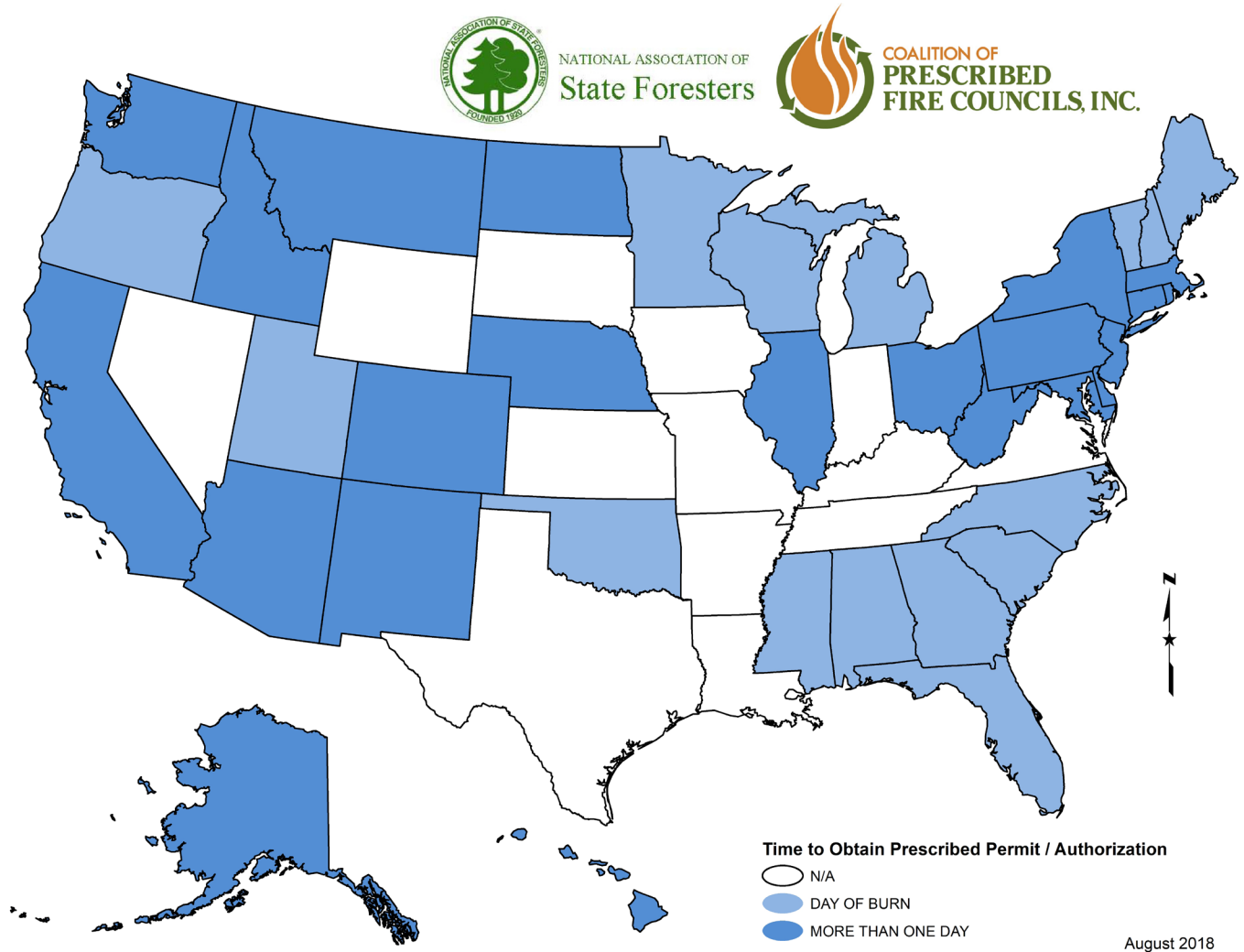


Figure 12. Prescribed fire authorizations can be obtained the day of the burn in 15 states (30%), but require a longer time period in 22 states (44%).

Results (continued)

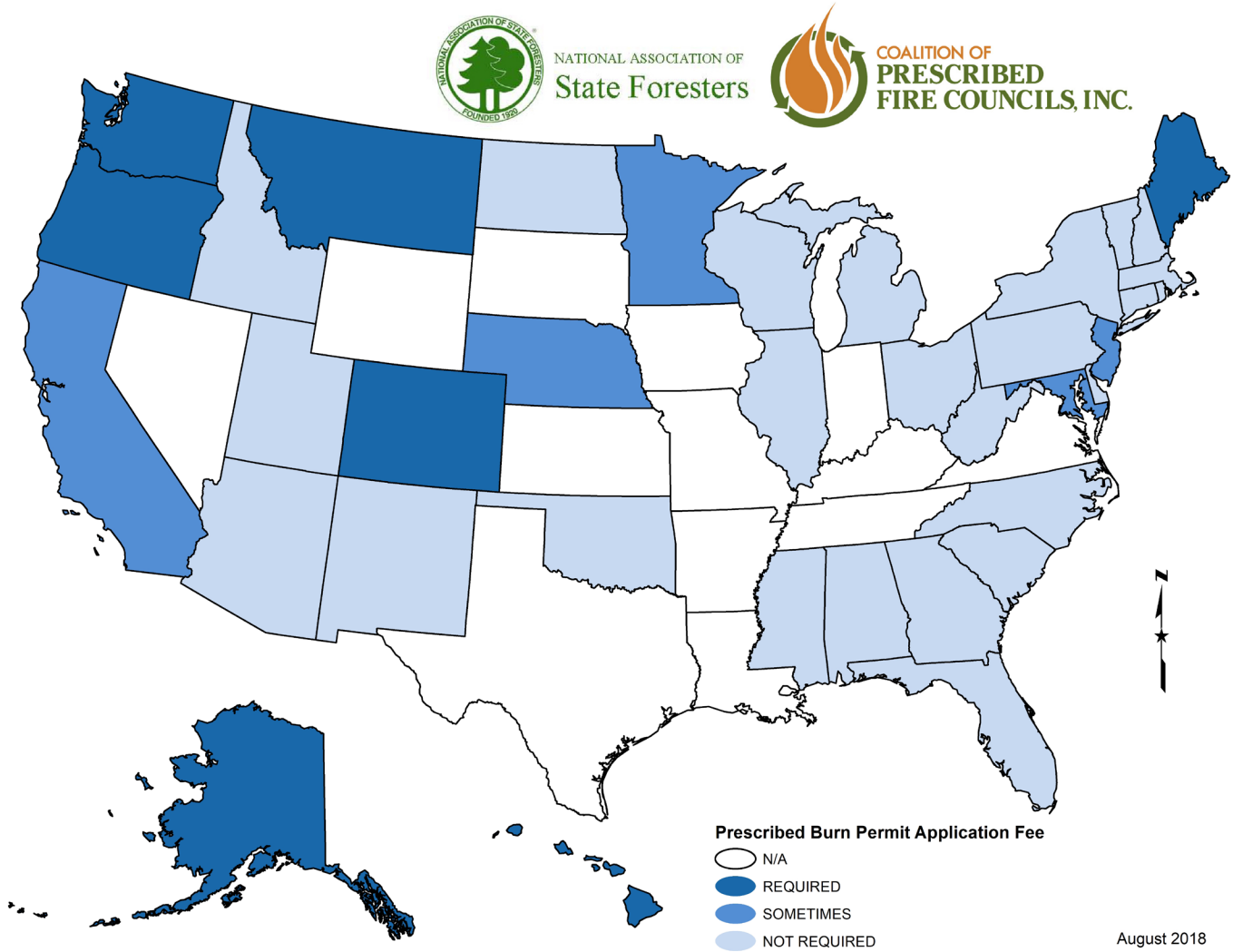


Figure 13. Twelve states (24%) can have costs associated with the permitting process.

Results (continued)

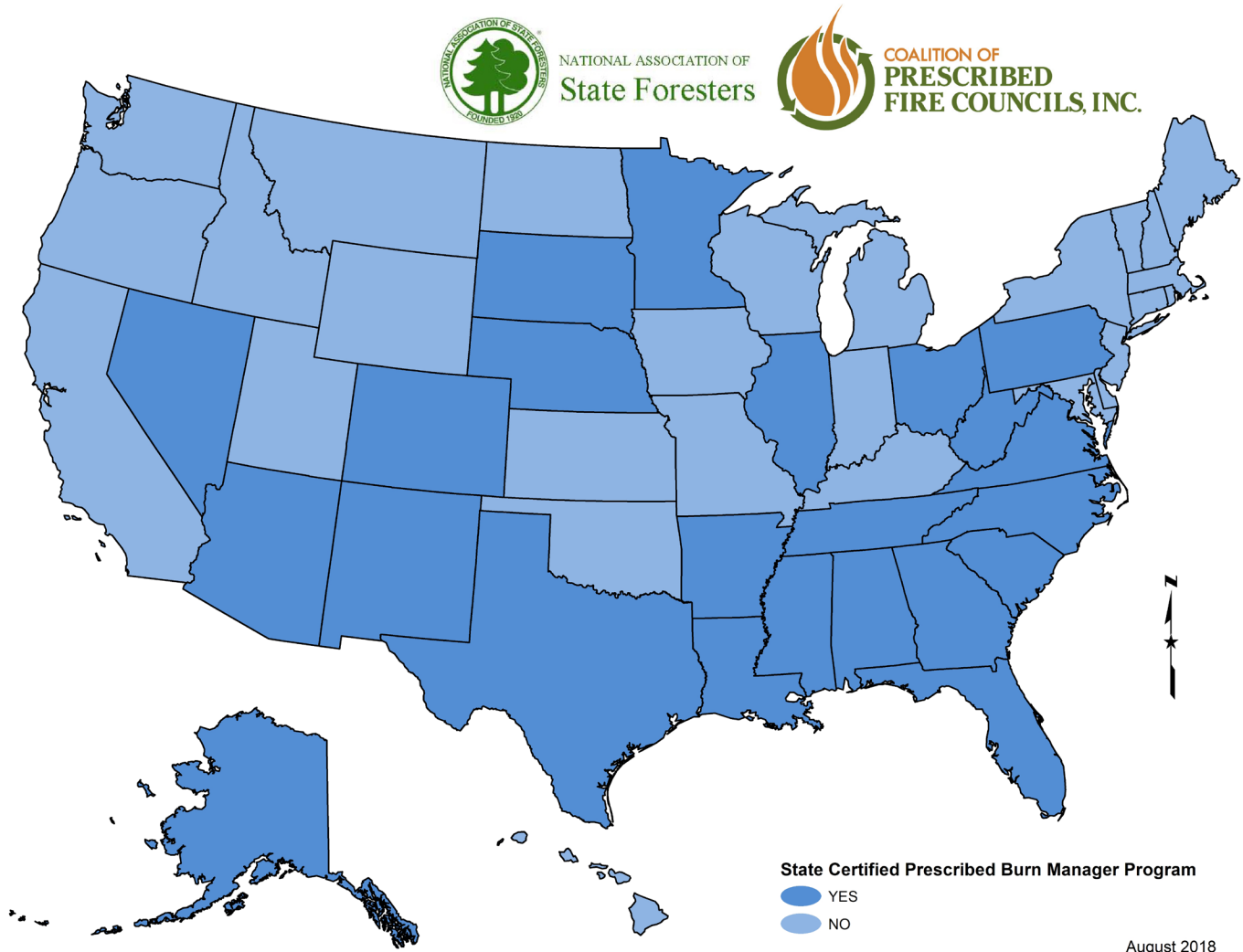


Figure 14. Twenty-three states (46%) reported offering prescribed burn manager certification courses.



Results (continued)

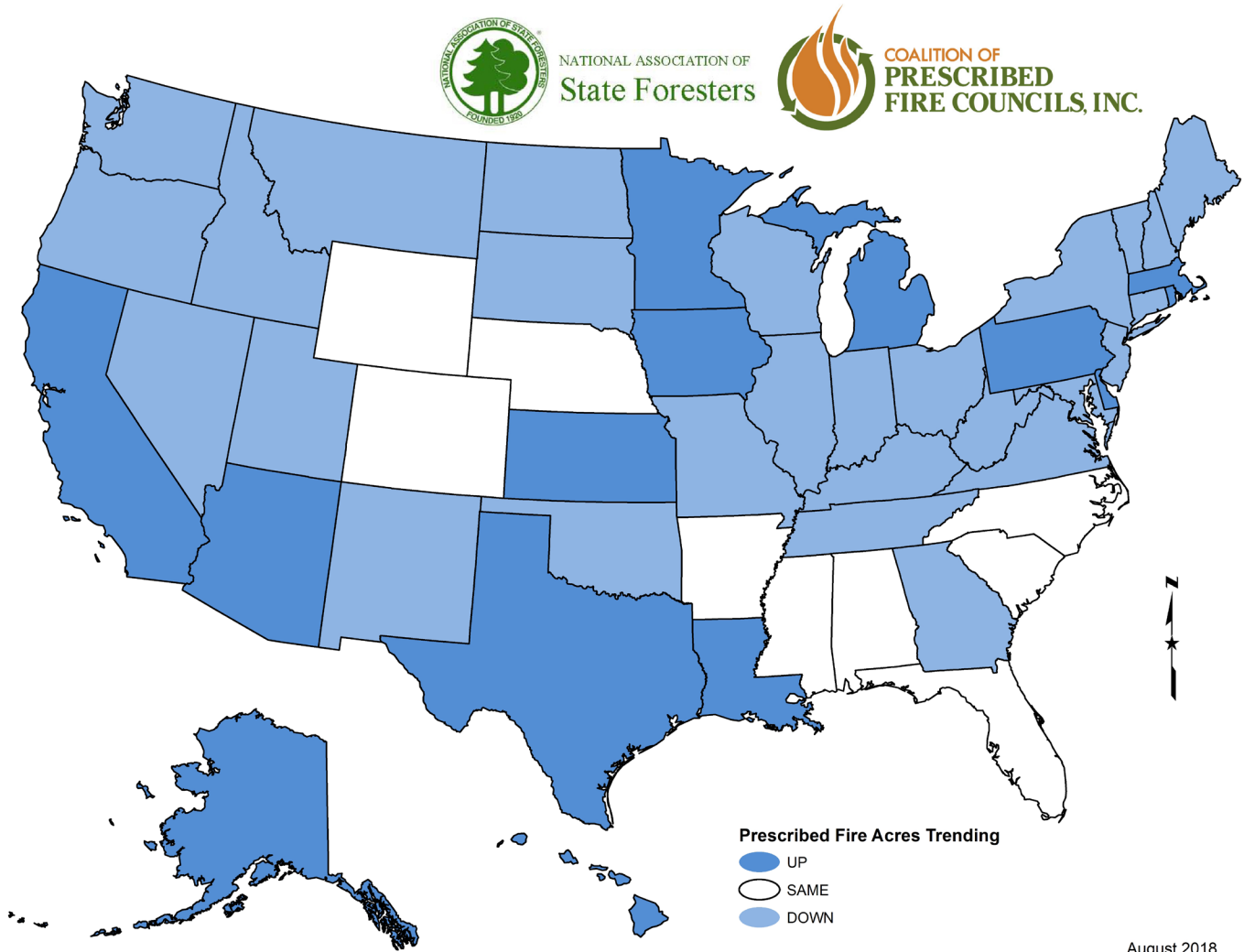


Figure 15. 2017 prescribed fire acre trend compared to the calculated average from 2011, 2014, and 2017 survey years. “Up” represents a >10% increase in acres reported, “Same” represents 2017 acres that fall within ±10% of the three survey average, and “Down” represents >10% reduction of acres reported.

Results (continued)

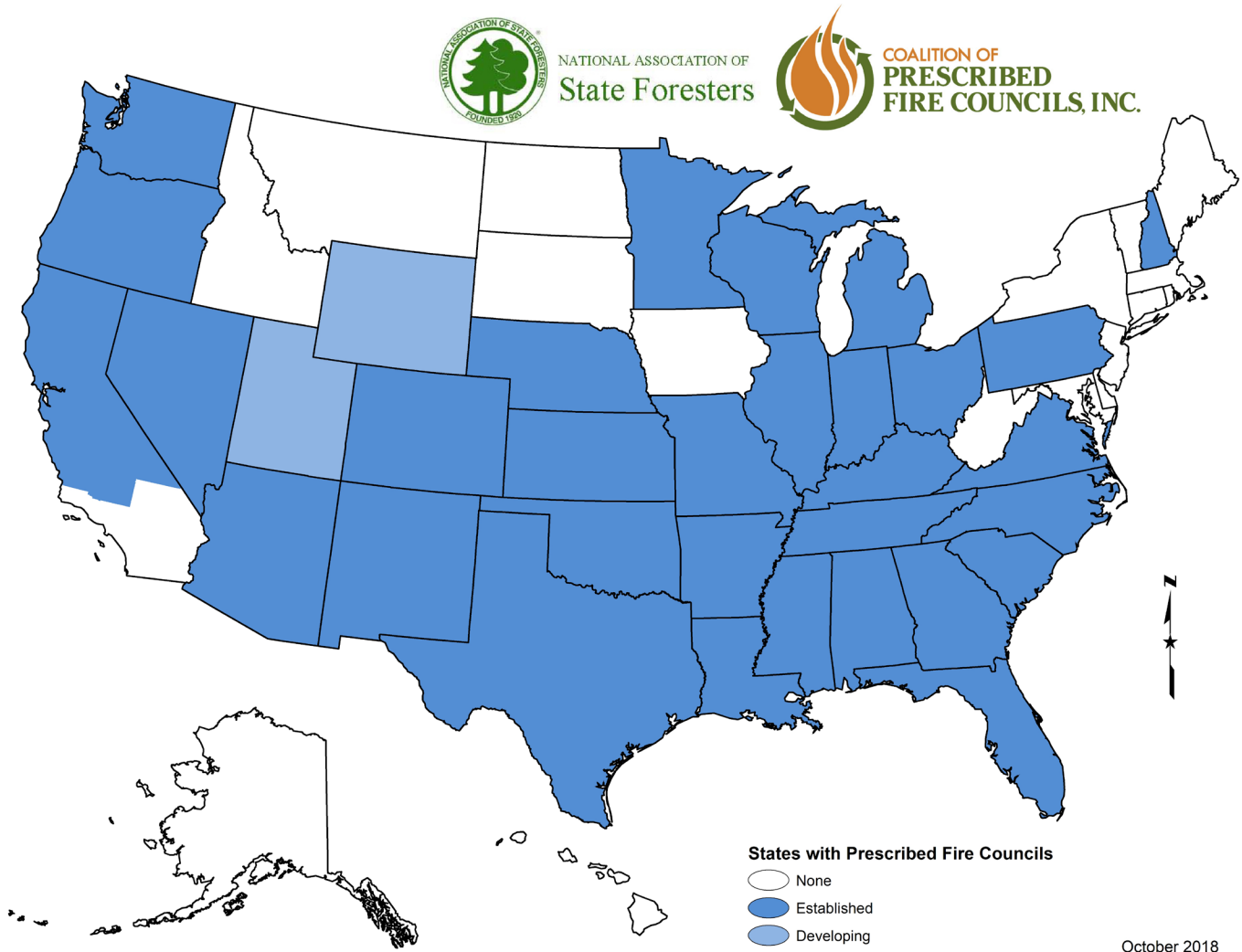
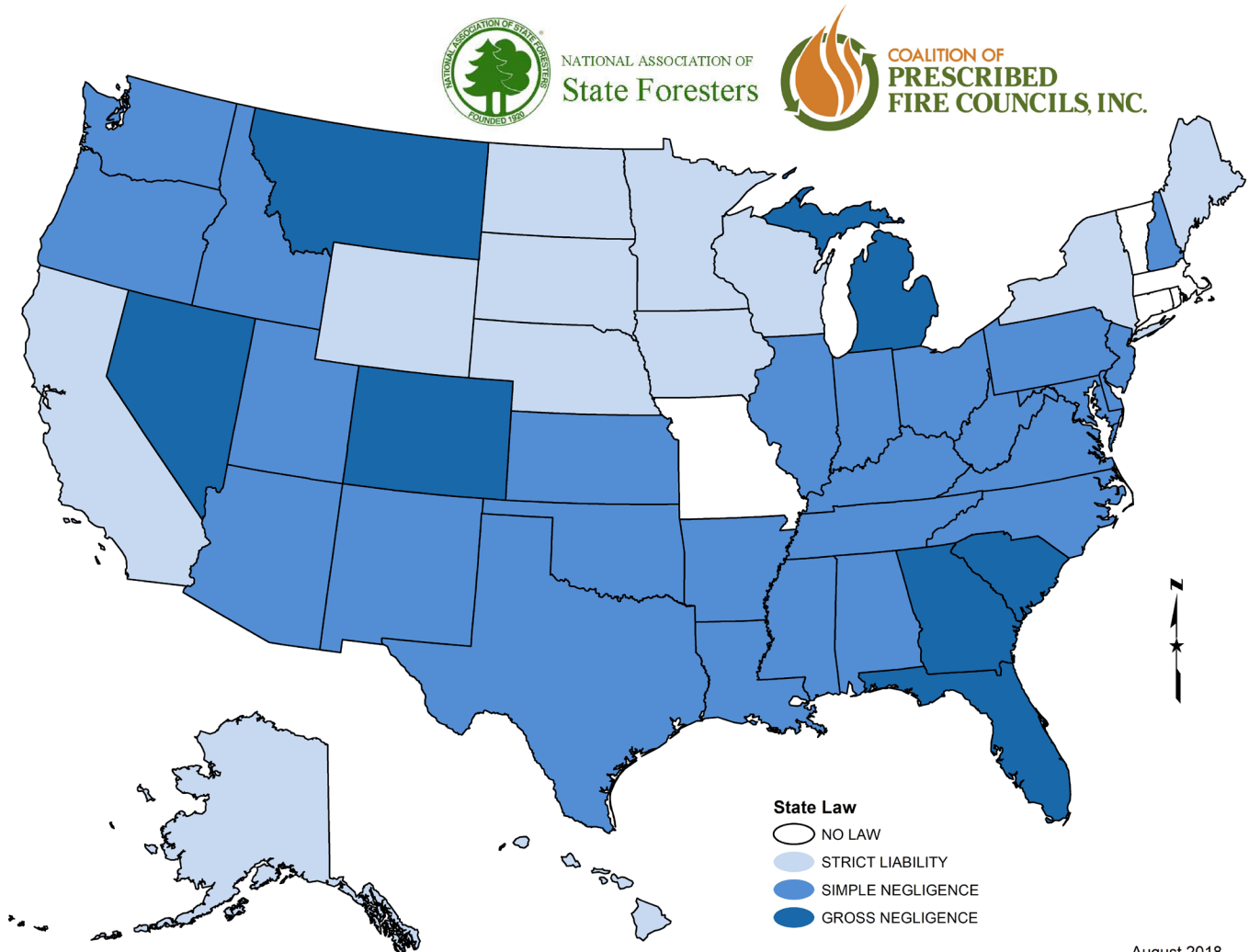


Figure 16. Thirty-five prescribed fire councils exist in 31 states (62%), and two are under development.

Results (continued)



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Figure 17. Map illustrates the degree of liability as defined in each state’s prescribed fire statute(s). Five (10%) have no prescribed fire law, 12 (24%) have strict liability, 26 (52%) have simple negligence, and 7 (14%) have gross negligence liability.

Results (continued)

Prescribed Fire Impediments

Top Impediment Limiting Prescribed Fire Use Nationwide Ranking

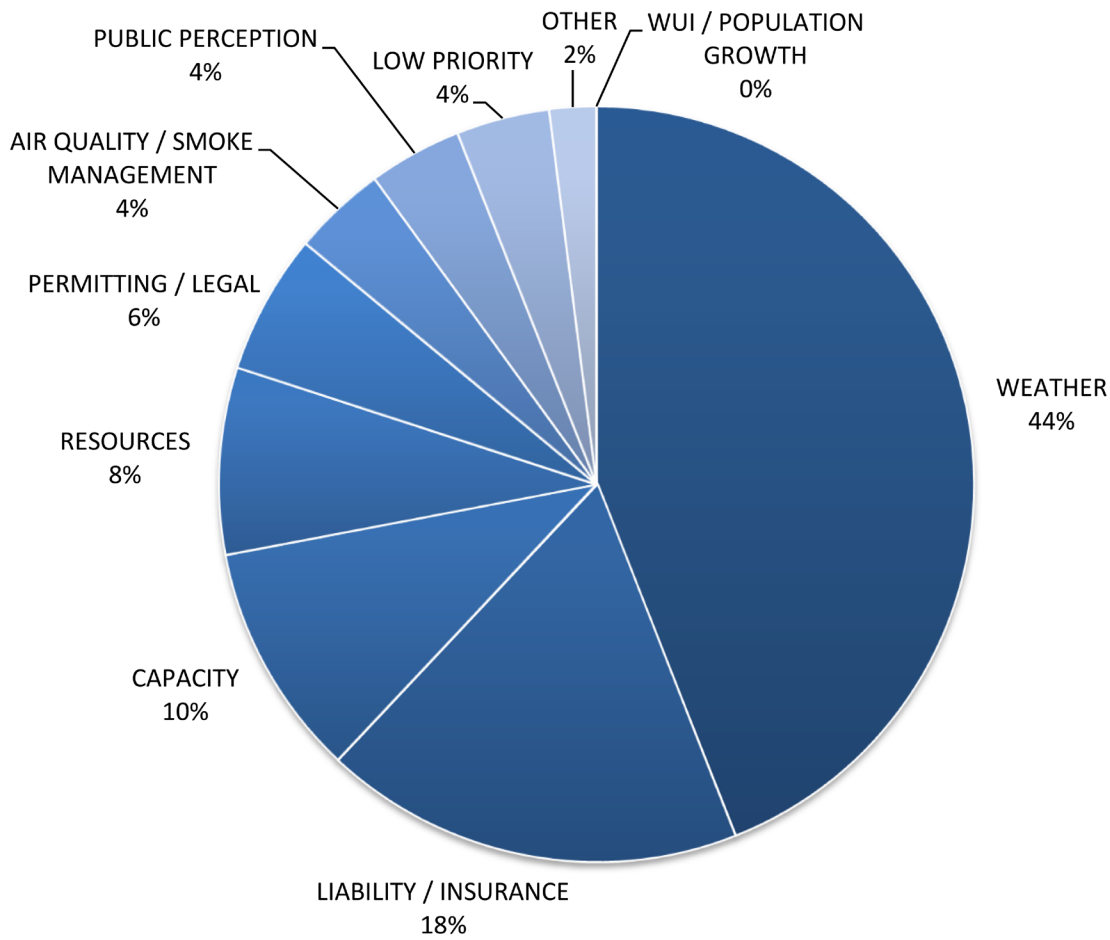


Figure 18. National summary of impediments reported by states as the single most limiting factor in the use of prescribed fire. Weather, liability/insurance, and capacity were the three impediments most selected as the number one choice and accounted for 74% of all responses.

Results (continued)



Figure 19. These graphs illustrate the national and regional percentages of states that reported an impediment as one of their “top three” selections limiting prescribed fire.

## Discussion

The first focal area of this survey was to determine prescribed fire occurrence by resource objective on both national and regional scales. The survey revealed that an estimated 11,314,677 acres were treated with prescribed fire across the U.S. in 2017. Of that estimate 9,092,698 acres were forestry related and 2,221,979 acres were agricultural related. In the U.S. forestry use of prescribed fire (80%) dwarfed agriculture’s use (20%). Regionally the West reported the highest percentage of prescribed fire use for forestry objectives (91%), with the Southeast reporting 77% and the Northeast at 63%. When compared to other survey years, 2017 reflects a national downward trend in the total acres treated since 2011\*. This trend is also present for the Southeast and Northeast regions; the West, in contrast, experienced an increase in prescribed fire activity from 2011 to 2017.

*\*The 2012 National Prescribed Fire Use Report total prescribed fire acres treated in 2011 has been changed to 12.8 million (8,315,156 forestry acres, 4,460,306 agricultural acres) from 20.2 million as originally published. This change was made due to better fire intelligence.*

### National Prescribed Burning Trend

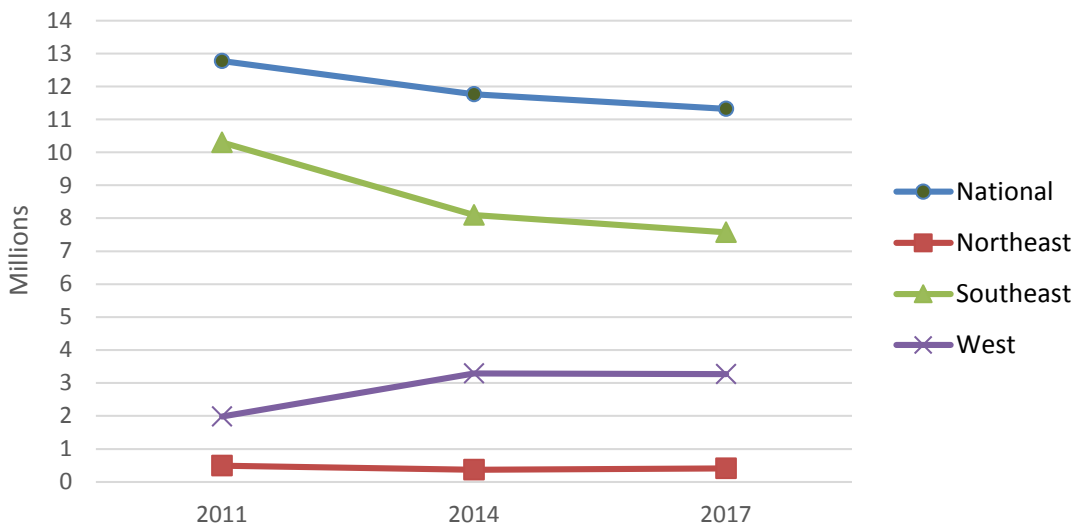


Figure 20. Comparison of national and regional prescribed burned acres across survey years.

The second focal area of this report was to identify state-level programs that support prescribed fire implementation. Nationally, the majority of states (74%) utilize some formal process for permitting or authorizing prescribed fire activity. Forty-four percent of states require more than one day to obtain approval, and 24% of state programs have associated fees. State operated and instructed prescribed burn manager certification programs are another important tool used by many states to manage prescribed fire. In 2017, 46% of states offered such programs, compared to 34% in 2011, and some are directly linked to either the permitting system and/or state laws governing liability protection.

**Discussion** (continued)

For the first time, states were asked to specify the degree of liability associated with prescribed fire as defined in their respective state statute(s). Prescribed fire laws fall into one of three categories which provide an increasing level of protection to the prescribed fire practitioner; 1) strict liability is a standard of liability under which a person is legally responsible for harm even if there was no negligence found, 2) simple negligence is a standard of liability under which a person is legally responsible for harm if reasonable care was not taken, 3) gross negligence is a standard of liability under which a person is legally responsible for harm only if less care than even a careless person would use—reckless disregard for safety—was proven. Unexpectedly, determining which level of liability protection is afforded by state statutes was not always a straight-forward process, with many states wrestling to understand their exact status. Several common reasons were identified that caused the uncertainty:

- 1) law predates the term prescribed fire (circa 1940s) thus not specifically mentioned
- 2) multiple state agencies share legal jurisdiction concerning wildland fire and can have differing interpretations
- 3) law does not adequately differentiate arson and prescribed fires, or multiple laws concerning wildland fire and arson fires are conflicting
- 4) no case law, i.e. law has not been tested

Therefore there are likely errors in the reporting, but the survey results show that 26 states (52%) fall within the simple negligence standard, while 5 states (10%) have no law, 12 states (24%) have strict liability, and 7 states (14%) have gross negligence standards.

Discrepancies between tracking forestry and agricultural prescribed fire activity were detected, as in previous surveys. Thirty-one states (62%) have a formal process to track the number of acres burned for forestry purposes, while only 12 states (24%) track agricultural burns. Agricultural uses of fire tend to be non-regulated and treated differently than forestry uses of fire.

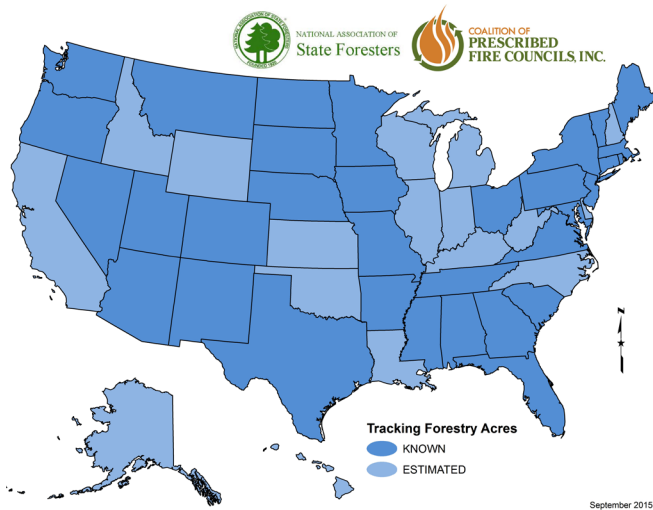


Figure 21. Thirty-one states have a formal process to track forestry prescribed fire activity.

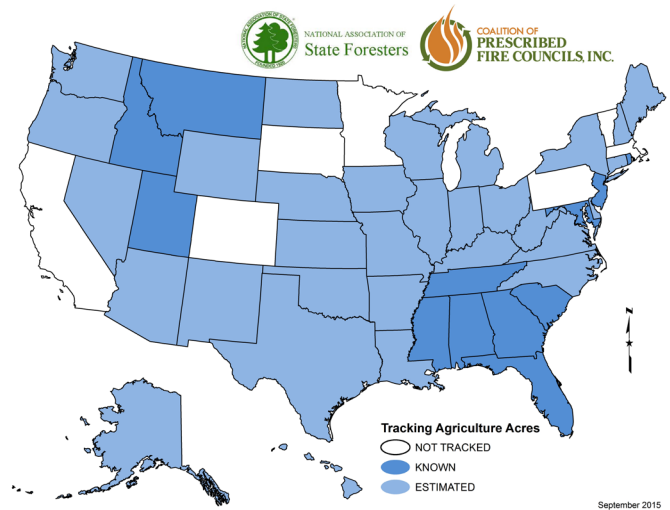


Figure 22. Only 12 states have a formal process to track agricultural prescribed fire activity.



**Discussion** (continued)

The last focal area of this survey was to determine the impediments states viewed as the most limiting for prescribed fire implementation. The nine impediment categories that were used in previous surveys were used again to determine the “number one” and “top three” impediments at national and regional scales. Weather, capacity, and air quality/smoke management were identified as the nation’s top three impediments. Weather solidified its rank, by consecutive increases across survey years, as the top national challenge.

**Top Impediment Limiting Prescribed Fire Use National Ranking**

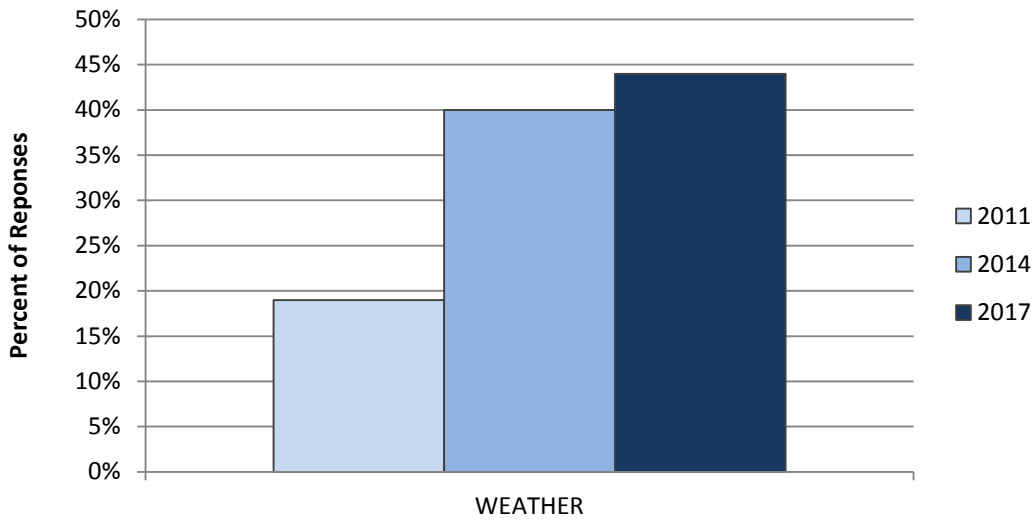


Figure 23. Comparison of weather as a top national impediment across survey years. Weather was the number two impediment in 2011, but became the top impediment in 2014 and increased in importance from 2014 to 2017.

Discussion (continued)

**Top 3 Impediments Limiting Prescribed Fire Use National Ranking**

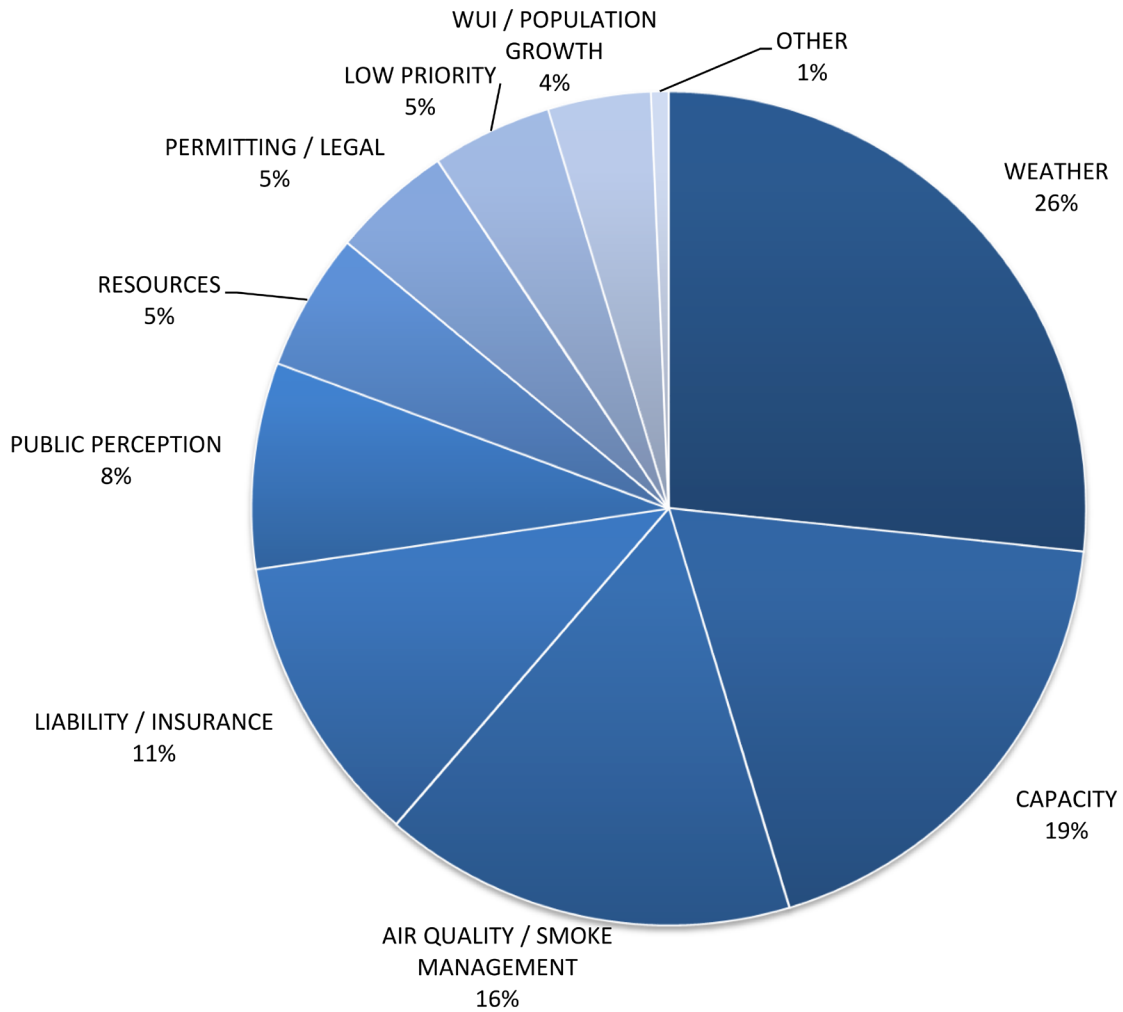


Figure 24. National summary of the top three impediments reported by states. Weather, capacity, and air quality/smoke management were the three highest ranked among all categories.

Discussion (continued)

**Top 3 Impediments Limiting Prescribed Fire Use Northeast Ranking**

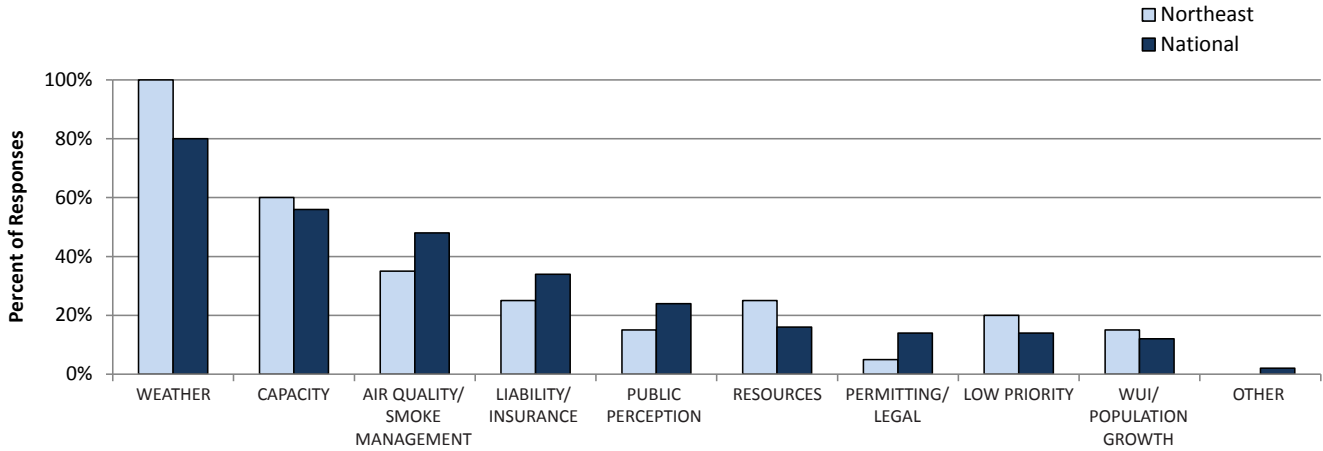


Figure 25. The Northeast ranked weather, capacity, and air quality/smoke management as the top three challenges. Every state in the Northeast (100%) identified weather as a top impediment.

**Top 3 Impediments Limiting Prescribed Fire Use Southeast Ranking**

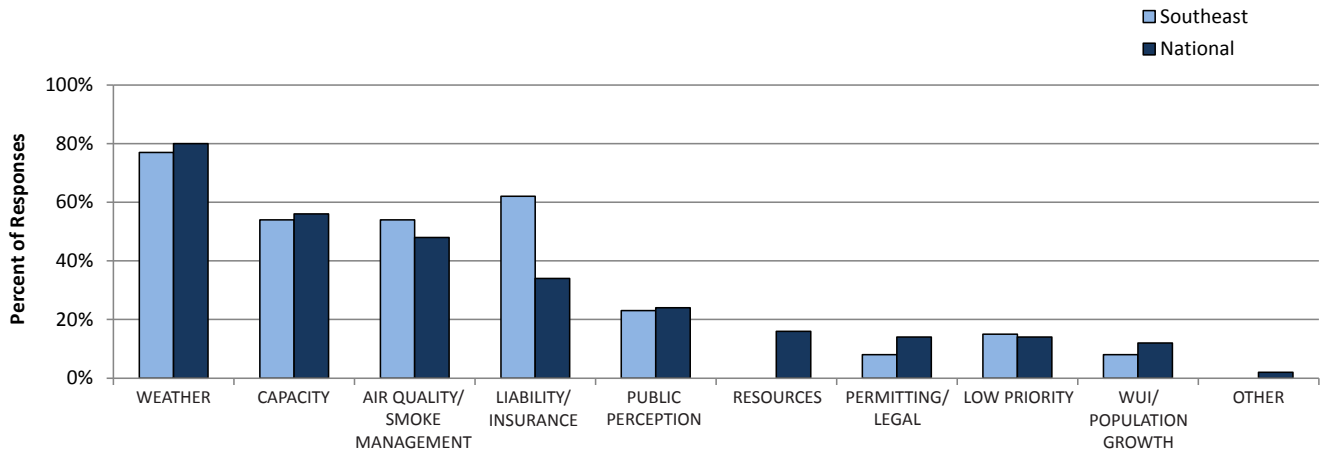


Figure 26. The Southeast ranked weather, liability/insurance, and capacity (air quality/smoke management and capacity tied as number three) as the top three challenges, with liability/insurance ranking much higher than the national average. No southeastern state chose resources as a top impediment limiting the use of prescribed fire.

Discussion (continued)

**Top 3 Impediments Limiting Prescribed Fire Use West Ranking**

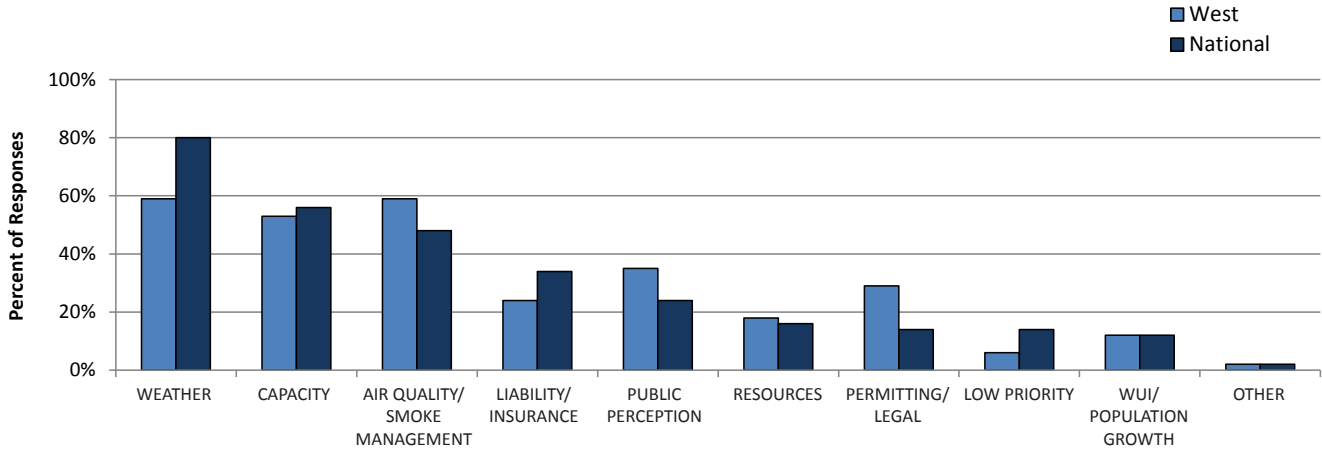


Figure 27. The West ranked weather, air quality/smoke management, and capacity as the top three challenges. Air quality/smoke management, public perception, and permitting/legal all ranked higher as compared to the national average.

This third triennial prescribed fire use survey report is significant for several reasons. Now with three completed surveys, fire use trends are emerging and patterns of limitations on the use of prescribed fire are solidifying. Prescribed fire intelligence has improved as a result of these fire use surveys, with a concomitant increase in the reliability of available prescribed fire tracking data. With this information, we continue to gain a better understanding of state, regional, and national trends in prescribed fire usage, state-level programs supporting prescribed fire, and impediments to greater use of prescribed fire. With a downward trend in national prescribed fire usage since 2011, it is imperative that we examine regional and national challenges to prescribed fire usage and begin to develop strategies to overcome these obstacles. Continued monitoring of national prescribed fire usage over time will also be critical in determining whether we are successful at getting fire on the ground, despite the numerous impediments to its use.