2012 NATIONAL PRESCRIBED FIRE USE SURVEY REPORT

Technical Report 01-12

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:

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For a copy of this report visit www.prescribedfire.net

Executive Summary

Science demonstrates that low-intensity surface fires were historically a critical ecological process in as much as 60% of North American landscapes. When applied appropriately in fire-dependent ecosystems, prescribed fire maintains forest health and function, provides habitat for wildlife populations, enhances soil and water conservation, and promotes public health and safety. Prescribed fire is also often required silviculturally to develop, maintain, and protect commercial timber stands. However, its necessary use is often misunderstood, if not unknown, by the public. Societal attitudes and perceptions create inherent challenges for 21st century land managers using fire, whether they are working to restore or maintain ecosystem function or to protect resource investments. As a result, today many natural landscapes have departures from historic fire-return intervals that make them more susceptible to damage from wildfire. To gain a better understanding of how fire is currently being used and to identify challenges for its continued use, the National Association of State Foresters (NASF) and the Coalition of Prescribed Fire Councils, Inc. (CPFC) partnered to develop and conduct a national prescribed fire use survey.

Based on responses from all 50 state forestry agency surveys, this report outlines 2011 national and regional prescribed fire activity, state prescribed fire programs, and identifies impediments limiting prescribed fire use. The results of the survey show that all federal, state, and private prescribed fire use in the U.S during 2011 totaled an estimated 20.2 million acres. Agricultural interests accounted for 61% of the activity and 39% were forestry related. A major regional difference was that most forestry burning occurred in the Southeast while most agricultural burning occurred in the West. Also, the results clearly identified capacity as the nation's top impediment for prescribed fire in all regions. The lack of trained prescribed fire managers, training opportunities, private contractors, and partnerships are national and regional concerns.

The purpose of this survey is to disseminate findings into current projects, facilitate direction and vision on future programs, and serve as a baseline for activities pertaining to the use of prescribed fire as a resource management tool. It is the ambition of both the NASF and the CPFC that this survey aid fire managers, prescribed fire councils, agencies, and policymakers to better understand prescribed fire use, address common national interests, and identify regional differences.

Foreword

It's a paradox that the time of America's most promiscuous burning was the moment the country produced its most comprehensive survey of fire. The 1880 census had an appendix on "Forests," written by Charles Sargent, which matched survey text with a map of fire. Two years earlier John Wesley Powell had released his landmark *Arid Lands* study, which included a map of Utah that identified four categories of land, one of which was burned area. Two years after the census Franklin Hough published his three-volume survey of American forestry, lavishly illustrated with vignettes of burning.

Courtesy The Forest Historical Society, published in Pyne, Stephen J. "America's Fires"

Figure 1. 1880 Survey Map. Darkest color represents >10% of "woodlands burned within settled areas."

Together they depict a country full of flame, a country not unlike Brazil in recent decades. The widest range of burning was embedded within an agricultural matrix; the most spectacular, along an expanding frontier rapidly being felled or filled with livestock; the most reckless and abusive, where industrial combustion ran through a fast-morphing countryside. Some landscapes were not recorded, although they burned routinely, because they were not forested. Others were not sufficiently populated for observers to tabulate their fires. But the gist was clear. The geography of America's fires was a geography of its land use.

What makes the 1880 survey particularly informative is that it predates any national consolidation of land ownership or fire institutions. The public domain still existed to be disposed of; only one national park existed (Yellowstone), and no national forests, wildlife refuges, monuments, grazing districts, or State reserves like Adirondacks Park. Not until 1890 did the Census Bureau announce that a distinct line of settlement was no longer identifiable, which led Frederick Jackson Turner in 1893 to declare the "end" of the American frontier. Between those two announcements the president was authorized to set aside land as forest reserves, the start of state-sponsored conservation.

Foreward *(continued)*

It went without saying that there was no controlling authority over fire beyond custom and local practice. There was scant formal regulation over burning, and no organized control for large fires. Most burning was local, agricultural, and routine; but breakdowns could be spectacular. In 1871 Chicago, Peshtigo, and a putative million acres of the North Woods burned on the same day; decades of similar disasters followed. One can interpret Sargent's, Powell's, and Hough's surveys as attempts to bring some rational order to what seemed to progressive observers as an orgy of burning, what V.L. Parrington famously labeled "the Great Barbecue." If fire was essential to how most Americans made their world habitable, it was also implicated in most environmental catastrophes.

As America's lands became fixed, and as it turned to coal and oil for its firepower, its tolerance for free-burning fire plummeted. What it could not substitute for, it suppressed. In 1911 the Weeks Act created the infrastructure for a system of fire protection by encouraging the States to establish forestry bureaus and by providing federal grants to assist. Disasters tend to move power upward, and so control over fire shifted from landowners to the state, and then up levels of government. America became an urban society, which meant fewer Americans used fire in their daily lives. Authorities treated open burning as though it were atomic energy, too dangerous for ordinary citizens to use.

A century later the scene looks different. A revolution in thinking about fire begun in the 1960s has sought to promote fire, make fire institutions serve land use, and validate a civil society for fire. It has culminated in a rechartering of rights and responsibilities under a "national cohesive strategy," released on the centennial of the Weeks Act.

The actual pyrogeography of the country is poorly known, however. The USGS has published a cartography of large (wild) fires for 1980–2005. Landfire has promoted maps of fire regime classes, but this describes a hypothetical geography and assumptions about presettlement conditions. What does not exist is a map that summarizes the full gamut of contemporary fire because there is no record of prescribed burning. Not being a disaster, there was no general mechanism to control it; and until it was threatened with formal extinction, there was no organized movement to retain and document it. But without such data the country must try to balance its combustion budget with only half its fire ledger before it.

Now, there is hope for a quantitative basis by which to understand how America's pyrogeography has changed over the past 130 years. In many respects America's history has inverted its geography. What hasn't changed is an enduring presence for fire and the need to make tough bets about what it means and how to use it. At least now we can play with a full deck.

Steve Pyne

Introduction

Anthropogenic use of fire has influenced and shaped North American landscapes since human occupation some 12,000 years ago. For millennia humans lived harmoniously with fire, and used it efficiently to craft surroundings that were more habitable, productive, and safe. In the United States, these ancient linkages between man and fire began to erode as our country became industrialized. After five generations, today this linkage is nearly severed. Although the lands' need for fire continues, the ecological imperative for fire is no longer understood and goes largely ignored by the public. Restoring this human and fire link in the 21st century is essential to maintain forest health, and more importantly, to provide public health and safety.

Annual wildfire activity has been tracked for decades. These data are necessary for securing resources, instituting fire-fighter training standards, monitoring trends, providing public safety measures, and guiding national policy needed to manage wildfire across the U.S. Much less is known about prescribed fire activities, but the needs are similar. How much and where prescribed fire occurs year-to-year, and to what degree it meets resource needs is poorly understood. All prescribed fire operations are carried out at a local scale and generally go unnoticed unless they become a nuisance. Prescribed fire permitting or authorization, if required, for all public and private land managers is conducted at the state level. State fire laws, rules, and regulations are as individual as the states that administer them, and also vary widely by region. Program size, ability to track fire activity, in-state training opportunities, and permitting processes are equally unique.

A state-level approach allows for programs that work locally, but can cause a lack of cohesion when addressing consent on regional or national issues. A national evaluation that specifically focuses on the scale at which prescribed fire occurs, what programs support prescribed fire, and identifies factors that limit prescribed fire use is nonexistent. These are all relevant questions necessary to make informed policy and programmatic decisions. To aid in gaining a better understanding of prescribed fire use, the National Association of State Foresters (NASF) and the Coalition of Prescribed Fire Councils (CPFC) collaborated in early 2012 to conduct a national prescribed fire use survey of all state agencies responsible for prescribed fire activities.

This report is based on the best 2011 information available from state forestry agencies. Even though record keeping procedures vary among states, 100% participation was achieved, making the survey the most comprehensive and complete of its kind. The data presented is intended to identify challenges at a national scale, as well as help determine regional and state differences and similarities. The following report presents the findings of the survey.

Methods

In early 2012, state forestry agencies received the National Prescribed Fire Use Survey questionnaire and an invitation to participate. The survey questions focused on prescribed fire activity, state-level programs, and identifying factors limiting prescribed fire implementation. For the purpose of this survey, forestry and agricultural acreages were reported separately and include all 2011 federal, state, and private prescribed burning activity within the boundary of the state reporting. Rangeland burning was reported and calculated as forestry activity. NASF geographic regions were used to make all regional comparisons and are consistent with those used in the developing National Cohesive Strategy.

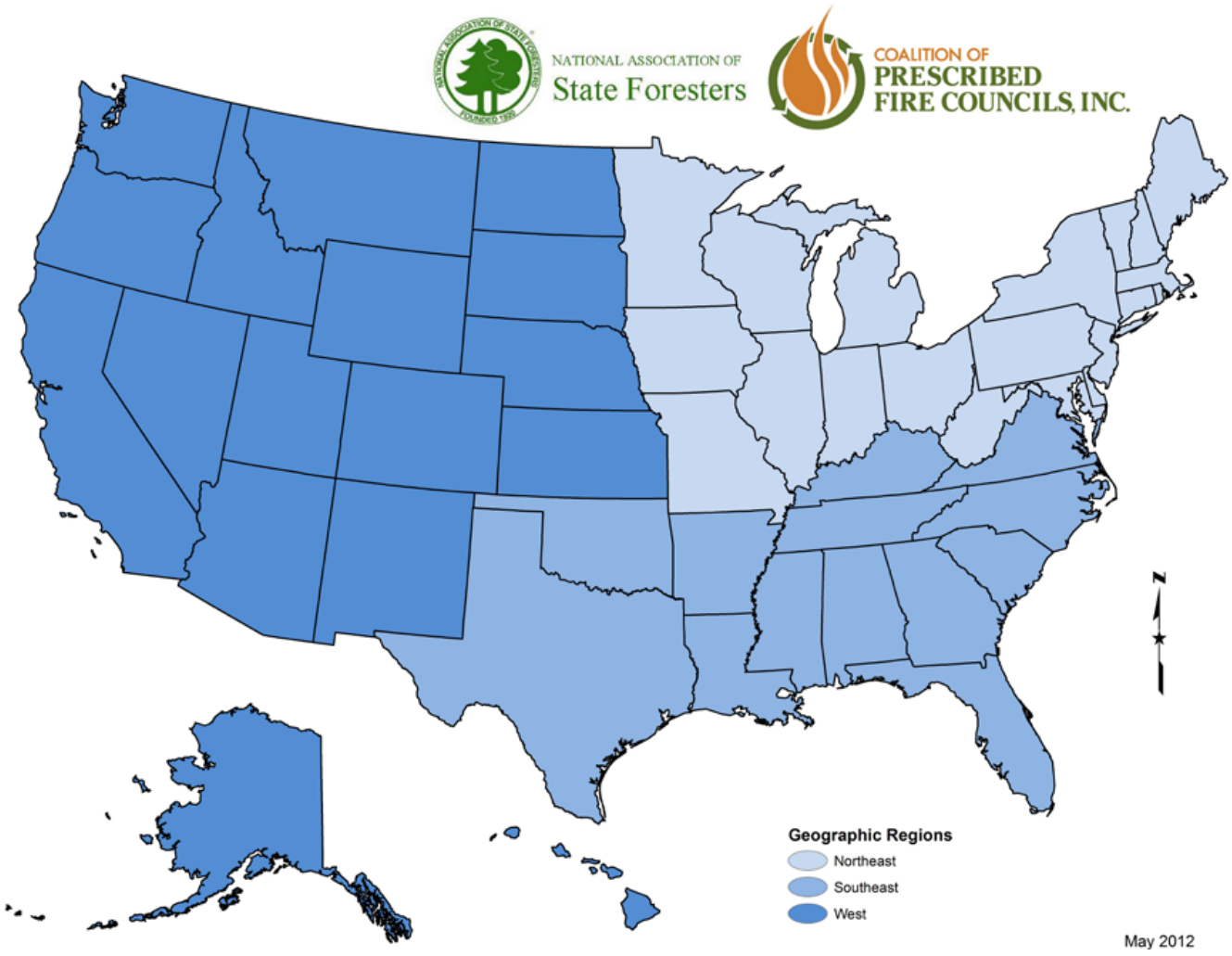

Figure 2. U.S. geographic regions.

Since differences do exist between state fire programs, questions were posed and presented as a yes/no or fill in the blank format in an effort to collect consistent data. The exception was identifying impediments. It was important to collect impediment responses without suggestion or guidance in an attempt to gain a "fresh" look at current challenges to prescribed fire implementation. State agencies were asked to list the three top impediments that limit prescribed burning in their state. From the collected responses, nine broad impediment categories were created that accepted all responses without interpretation.

Methods *(continued)*

Table 1. The nine impediment categories are as follows:

Capacity Concerns	Limited personnel, training, private contractors, 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
WUI/Population Growth Concerns	Urbanization, influx of new residents
Low Priority	Agency or landowner priority, too difficult

Results

Prescribed Fire Activity

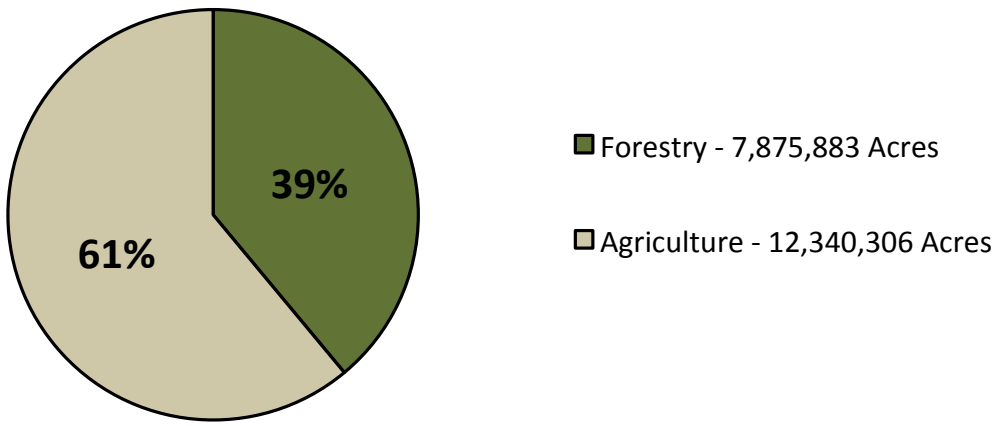

Figure 3. Percentages and acres of national forestry and agriculture prescribed fire activity. Over half of all national prescribed fire use (61%) is for agricultural purposes.

Results *(continued)*

2011 Northeast Region Prescribed Burning Activity by Resource Objective

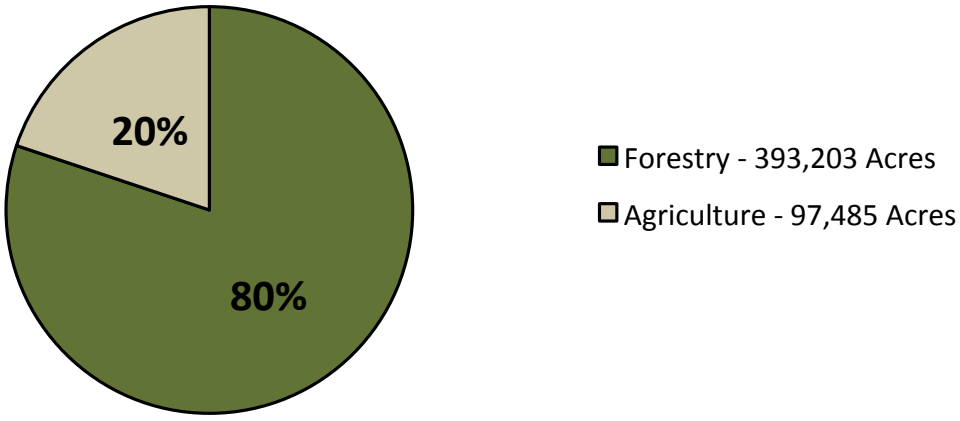

Figure 4. Percentages and acres of northeastern forestry and agriculture prescribed fire activity. Eighty percent of prescribed fire use in the Northeast is for silvicultural purposes.

2011 Southeast Region Prescribed Burning Activity by Resource Objective

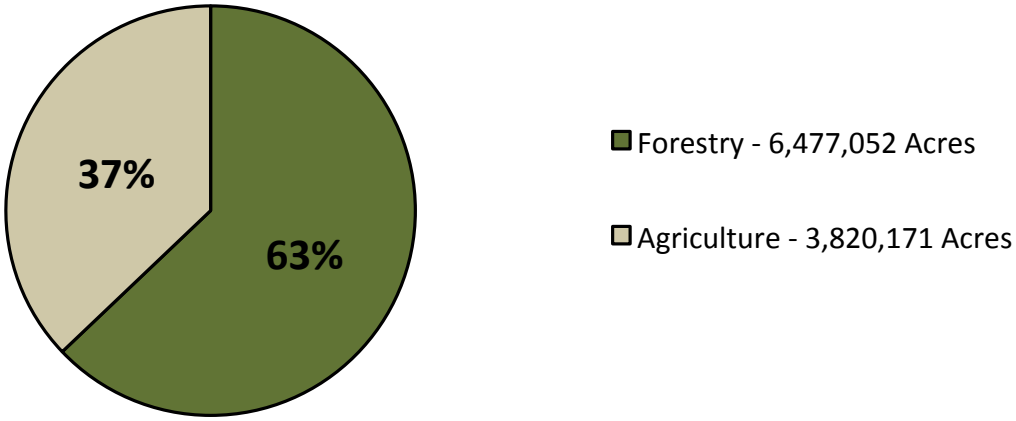

Figure 5. Percentages and acres of southeastern forestry and agriculture prescribed fire activity. Sixty-three percent of prescribed fire use in the Southeast is for silvicultural purposes.

Results *(continued)*

2011 West Region Prescribed Burning Activity by Resource Objective

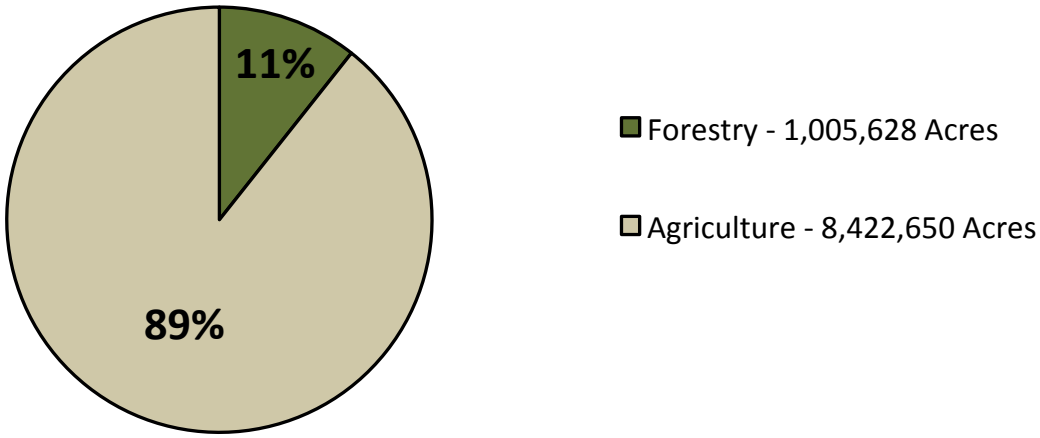

Figure 6. Percentages and acres of western forestry and agriculture prescribed fire activity. Eighty-nine percent of prescribed fire use in the West is for agricultural purposes.

2011 Foresty & Agricultural Prescribed Fire Activity by Region

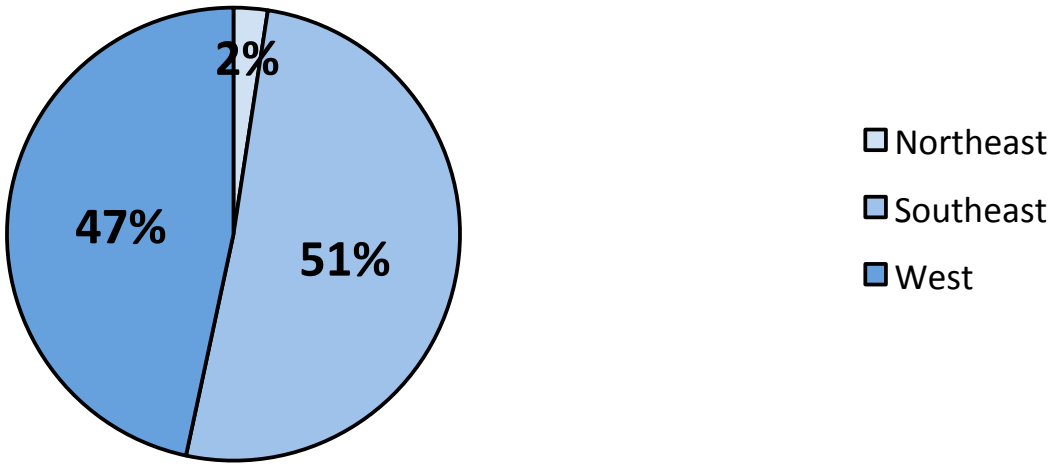

Figure 7. Percentages of all national prescribed fire acres by region. The Southeast and West account for 98% of the national prescribed fire activity.

Results *(continued)*

2011 Forestry Prescribed Fire Activity by Region

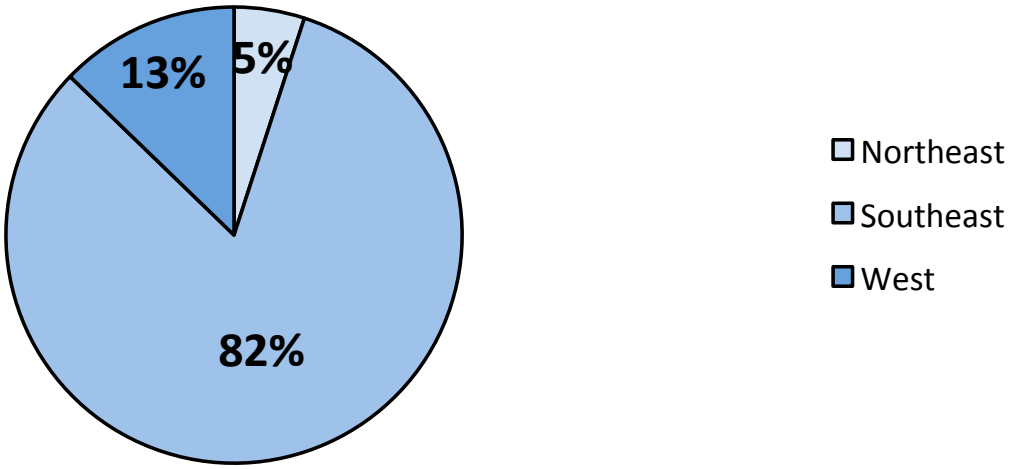

Figure 8. Percentages of all forestry prescribed fire acres by region. Eighty-two percent of the national silvicultural fire use occurs in the Southeast.

2011 Agricultural Prescribed Fire Activity by Region

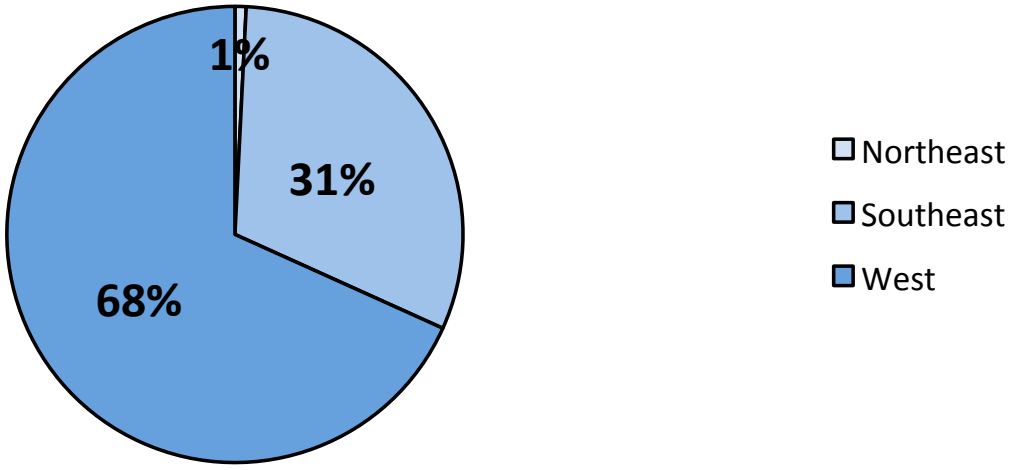

Figure 9. Percentages of all agricultural prescribed fire acres by region. Sixty-eight percent of the national agricultural fire use occurs in the West.

Results *(continued)*

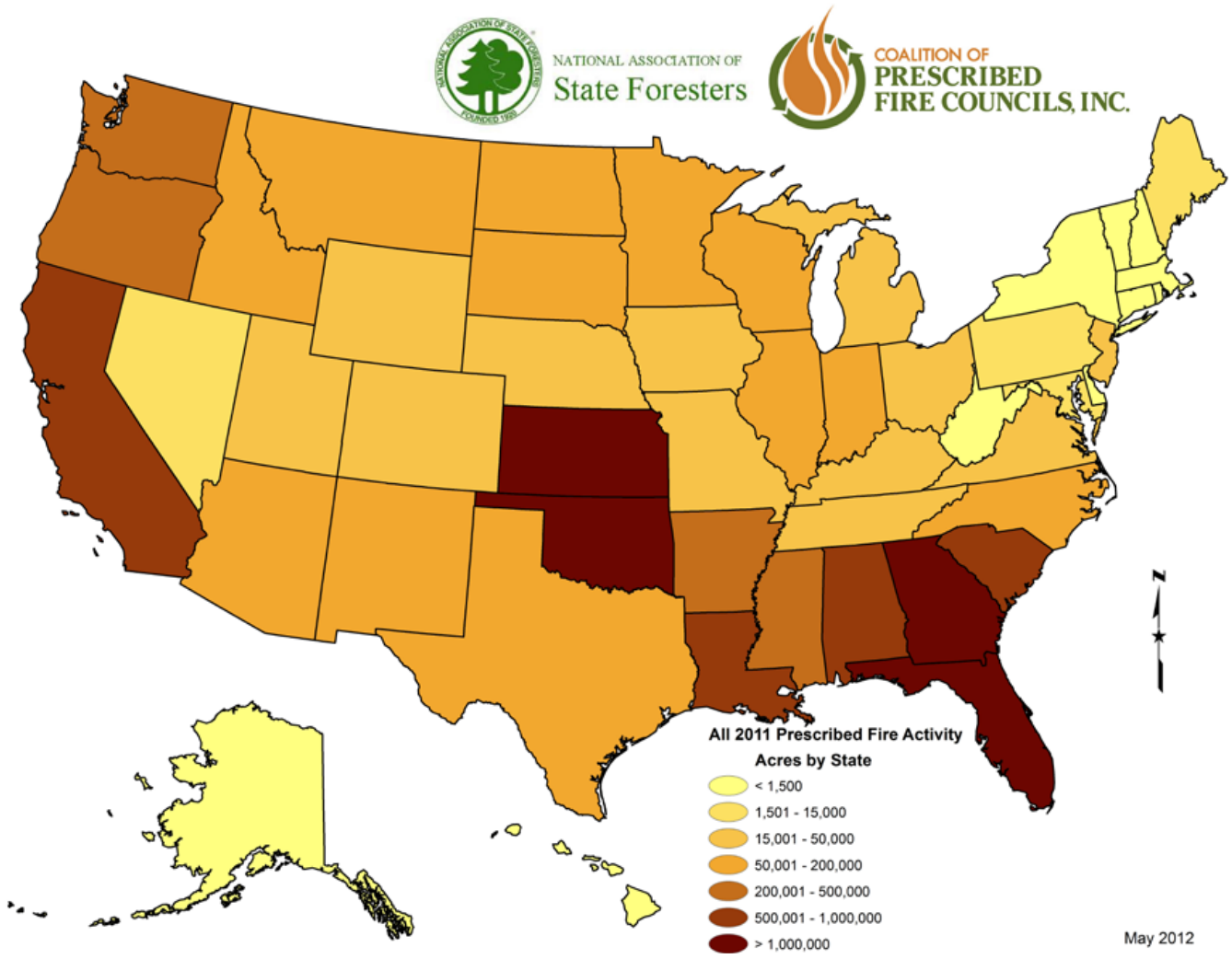

Figure 10. Acres of all prescribed fire use by state. The coarse acreage classes were created using a histogram which determined the most significant breaking points in acres reported.

Results *(continued)*

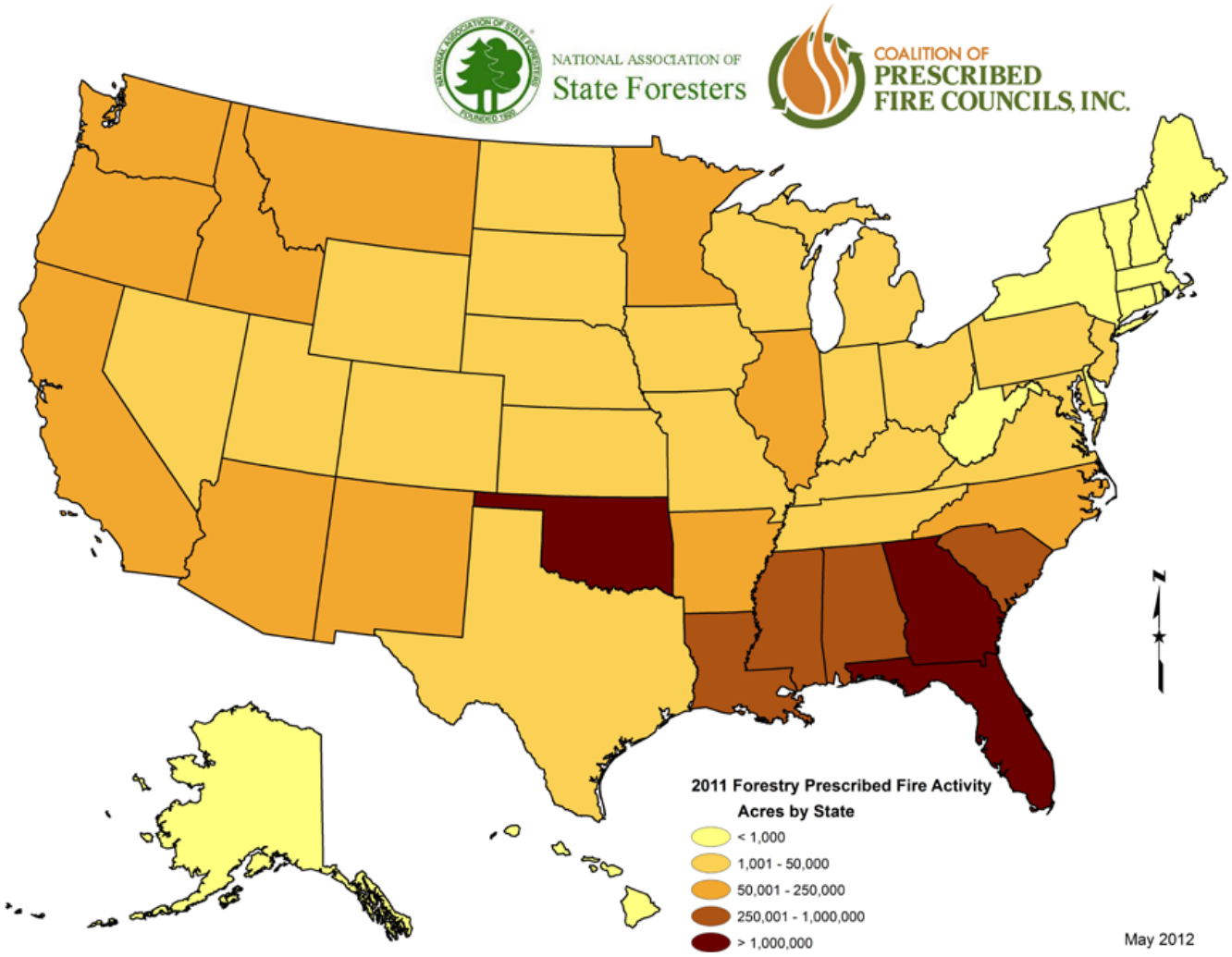

Figure 11. Acreage of prescribed fire use for forestry objectives by state. The coarse acreage classes were created using a histogram which determined the most significant breaking points in acres reported.

Results *(continued)*

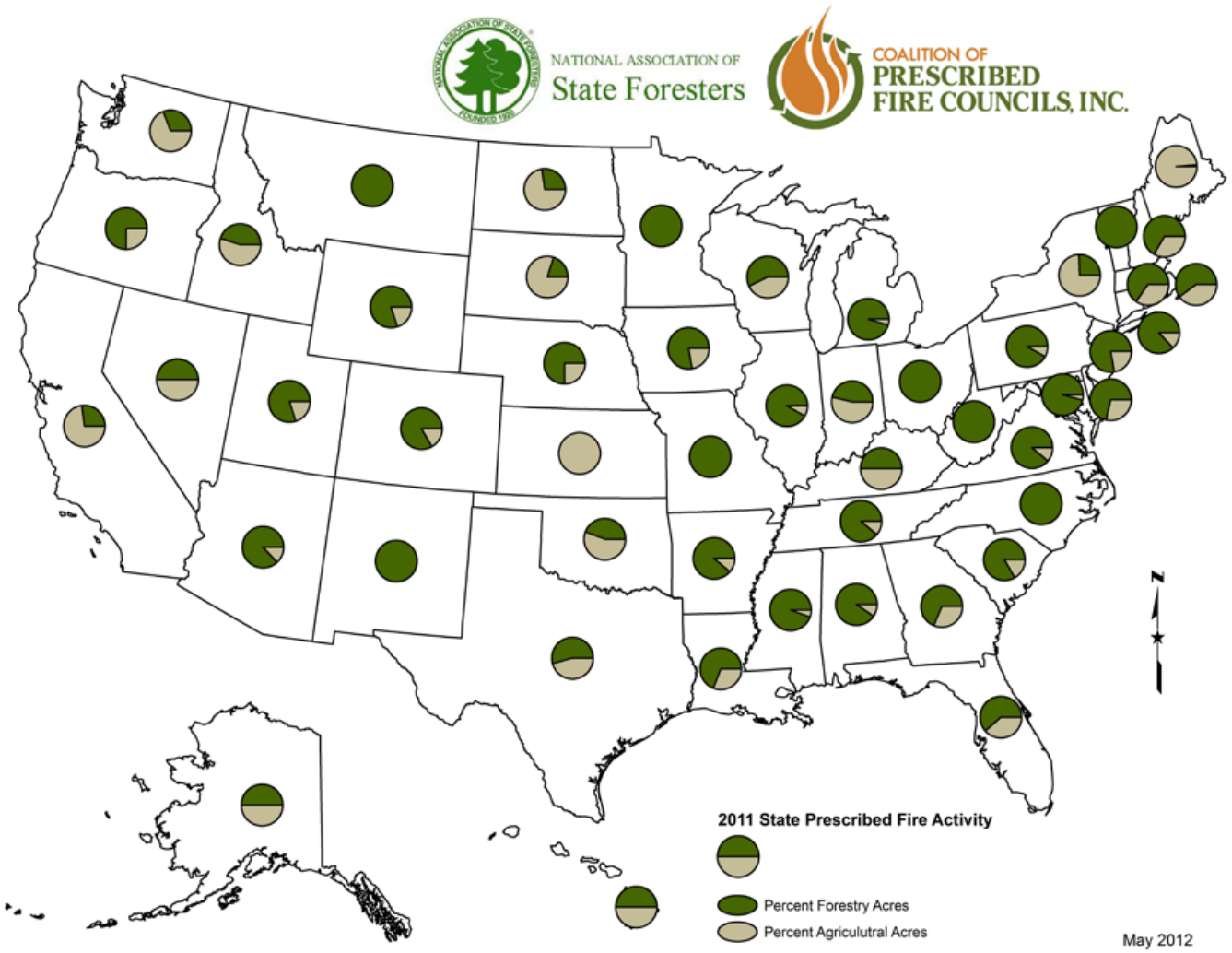

Figure 12. Percentage of forestry and agricultural prescribed fire activity by state.

Results *(continued)*

State-level Programs

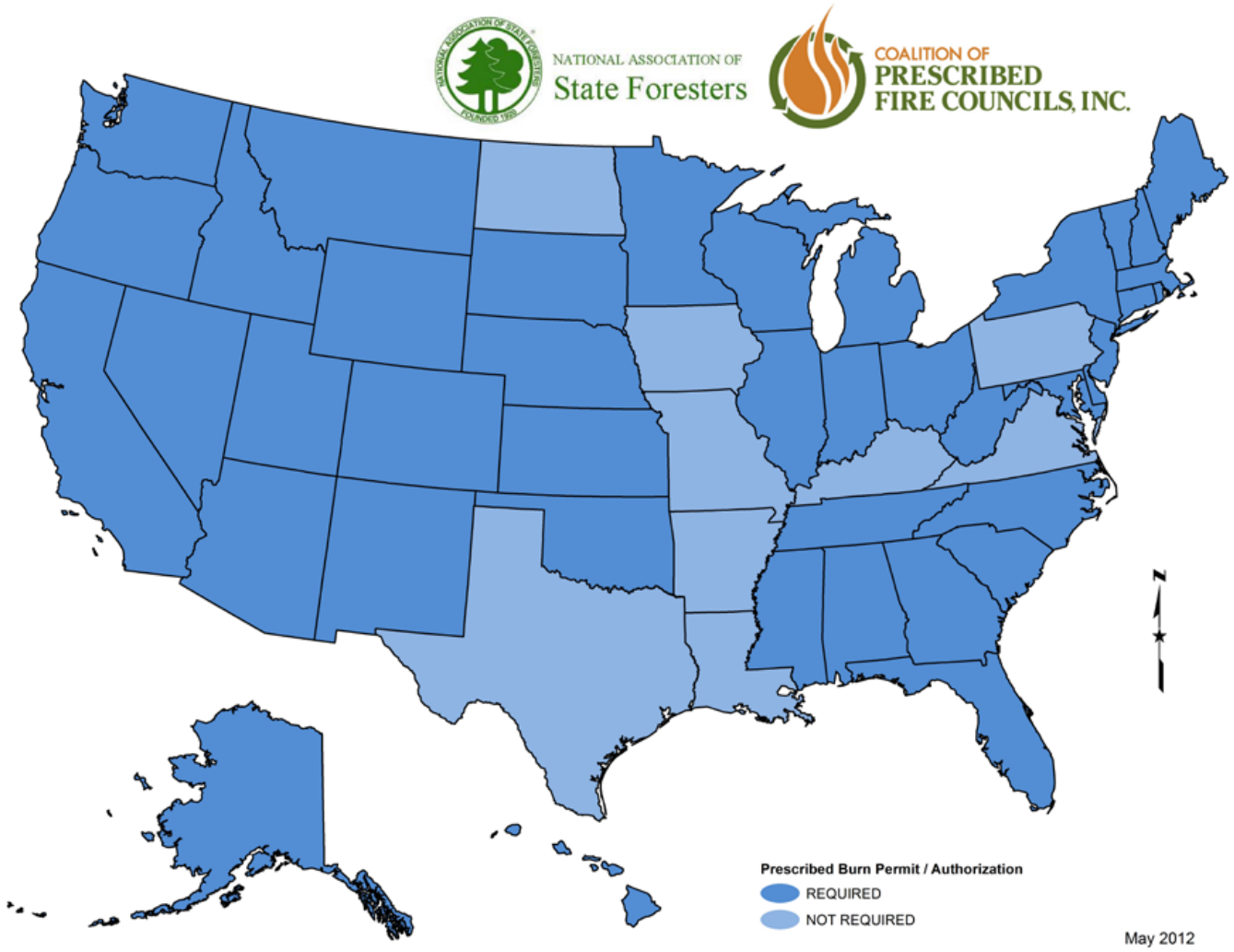

Figure 13. Forty-one states (82%) utilize some form of prescribed burn permit or authorization system.

Results *(continued)*

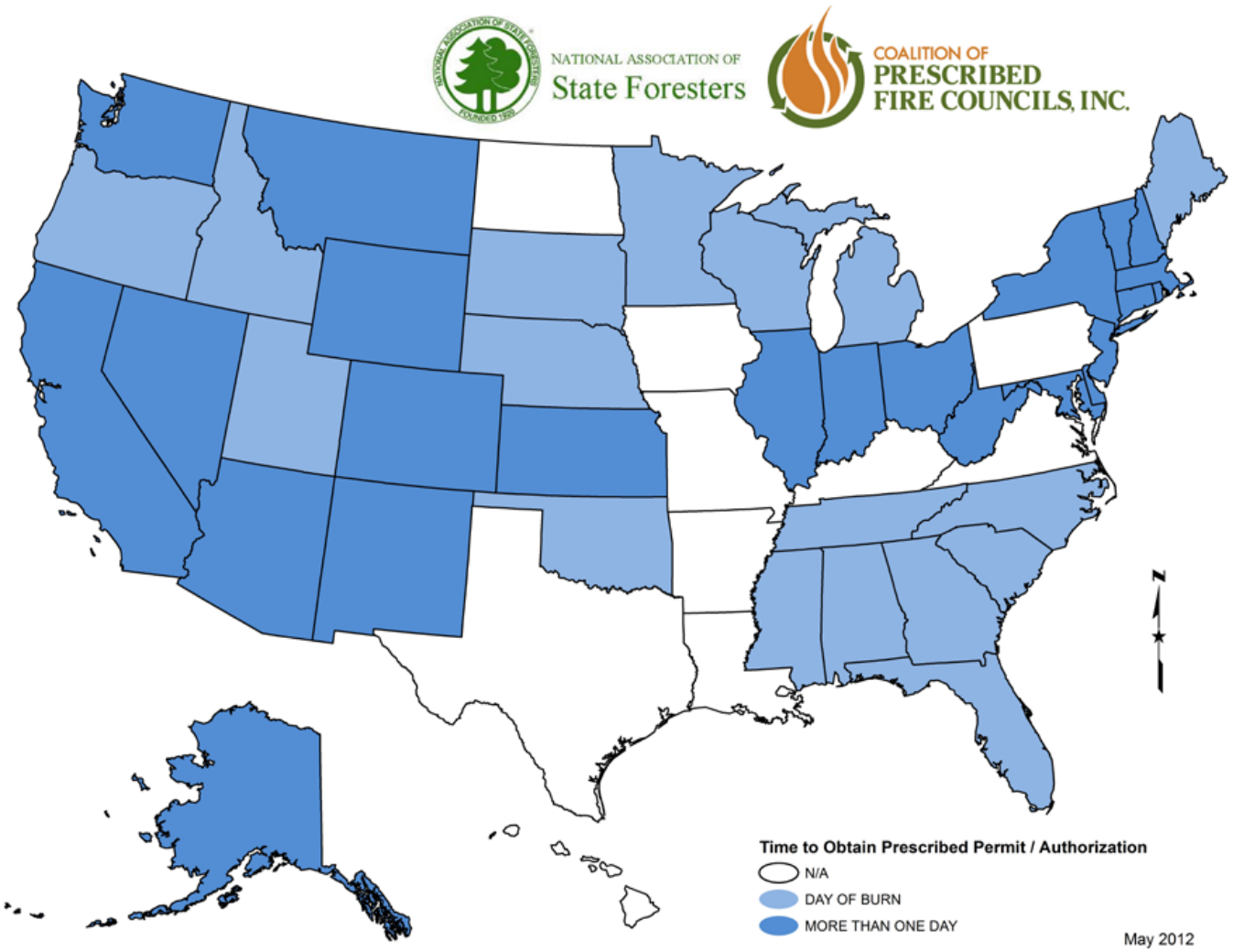

Figure 14. Nine states do not require a permit or authorization for prescribed fire use, but of the states that do, 59% require the permit be obtained prior to the day of the burn.

Results *(continued)*

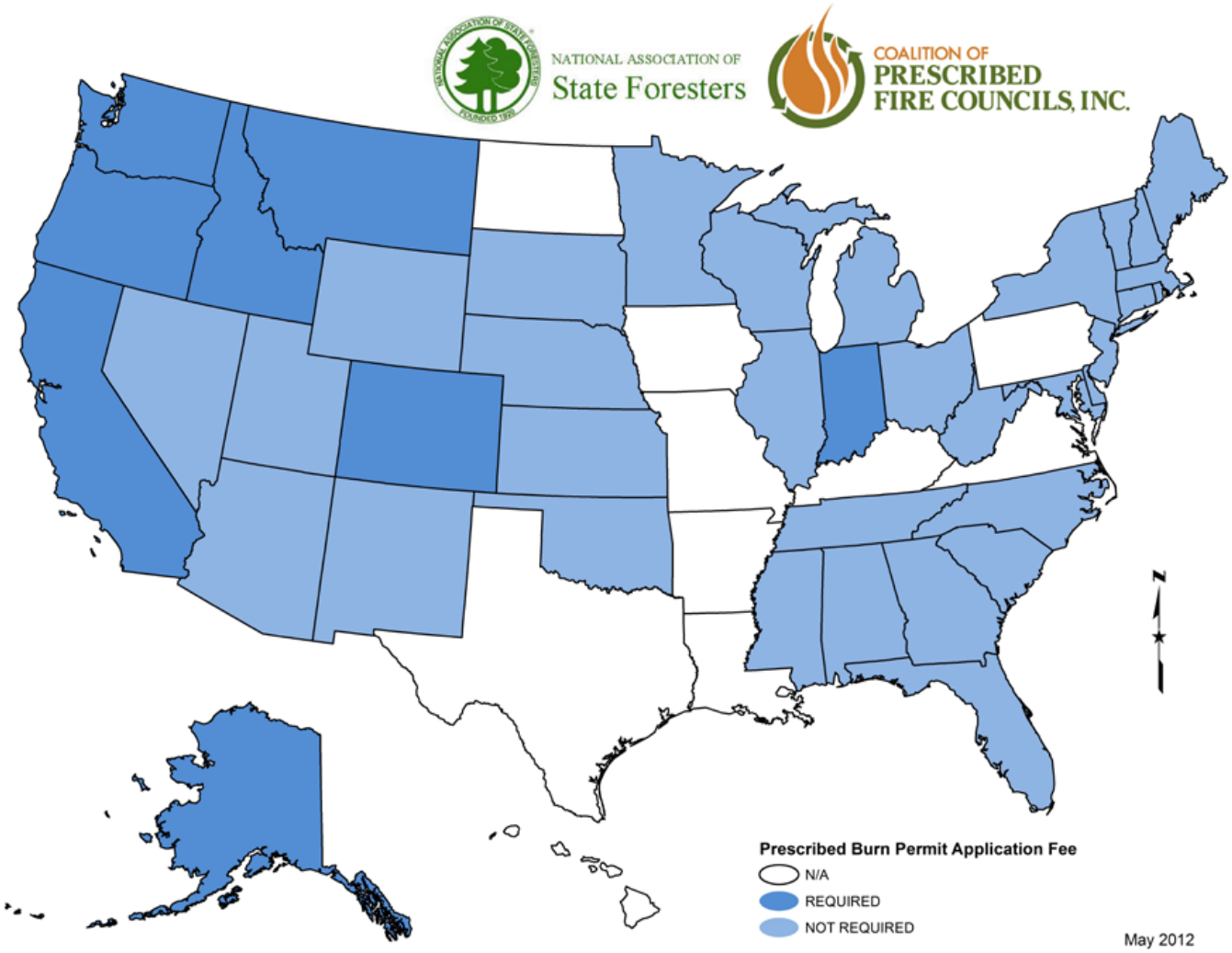

Figure 15. Eighty-four percent of states have no associated costs for prescribed burn approval. Seven of the eight that do have fees are located in the West.

Results *(continued)*

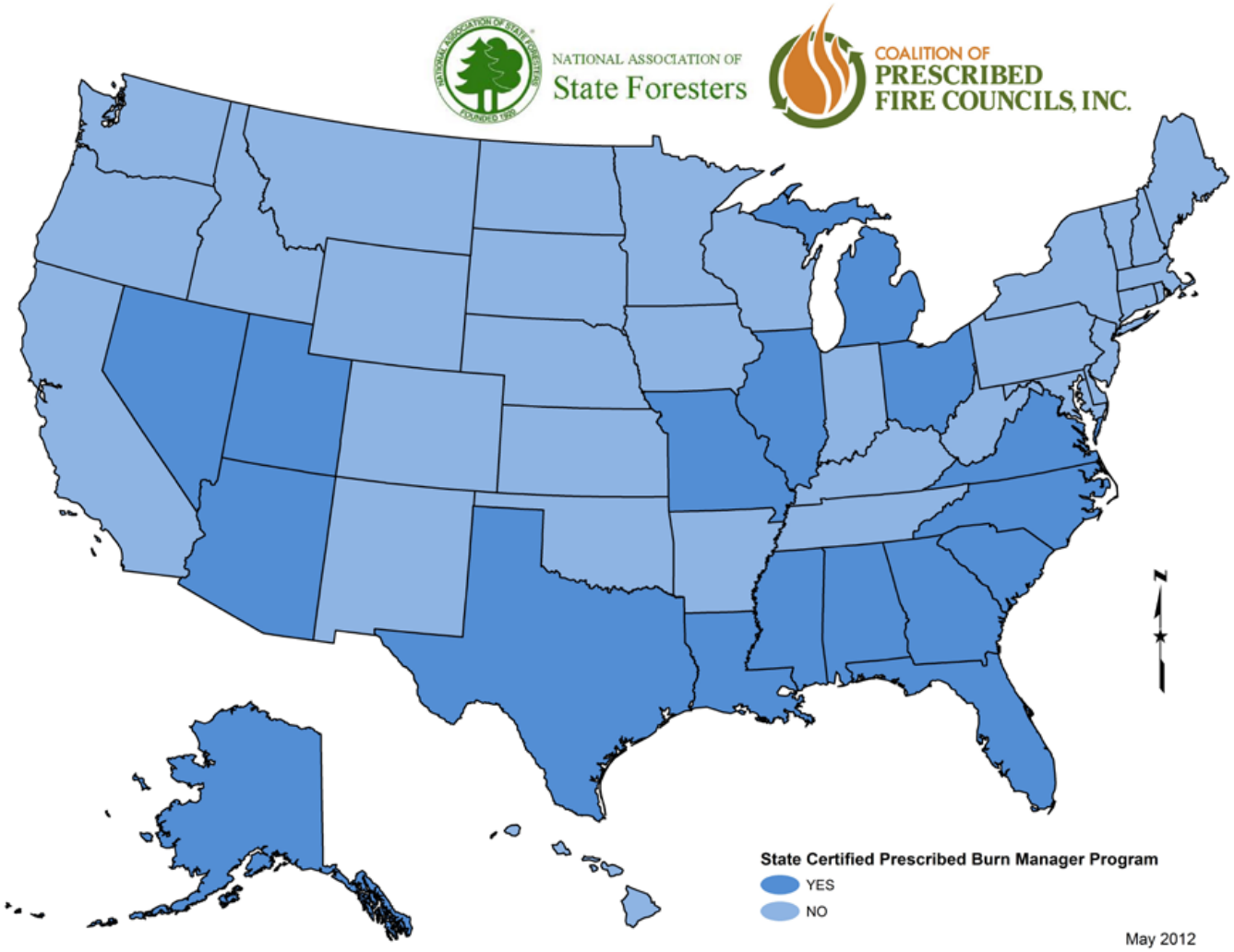

Figure 16. Seventeen states offer prescribed burn manager certification courses; some are linked directly to state fire laws that provide liability protection.

Results *(continued)*

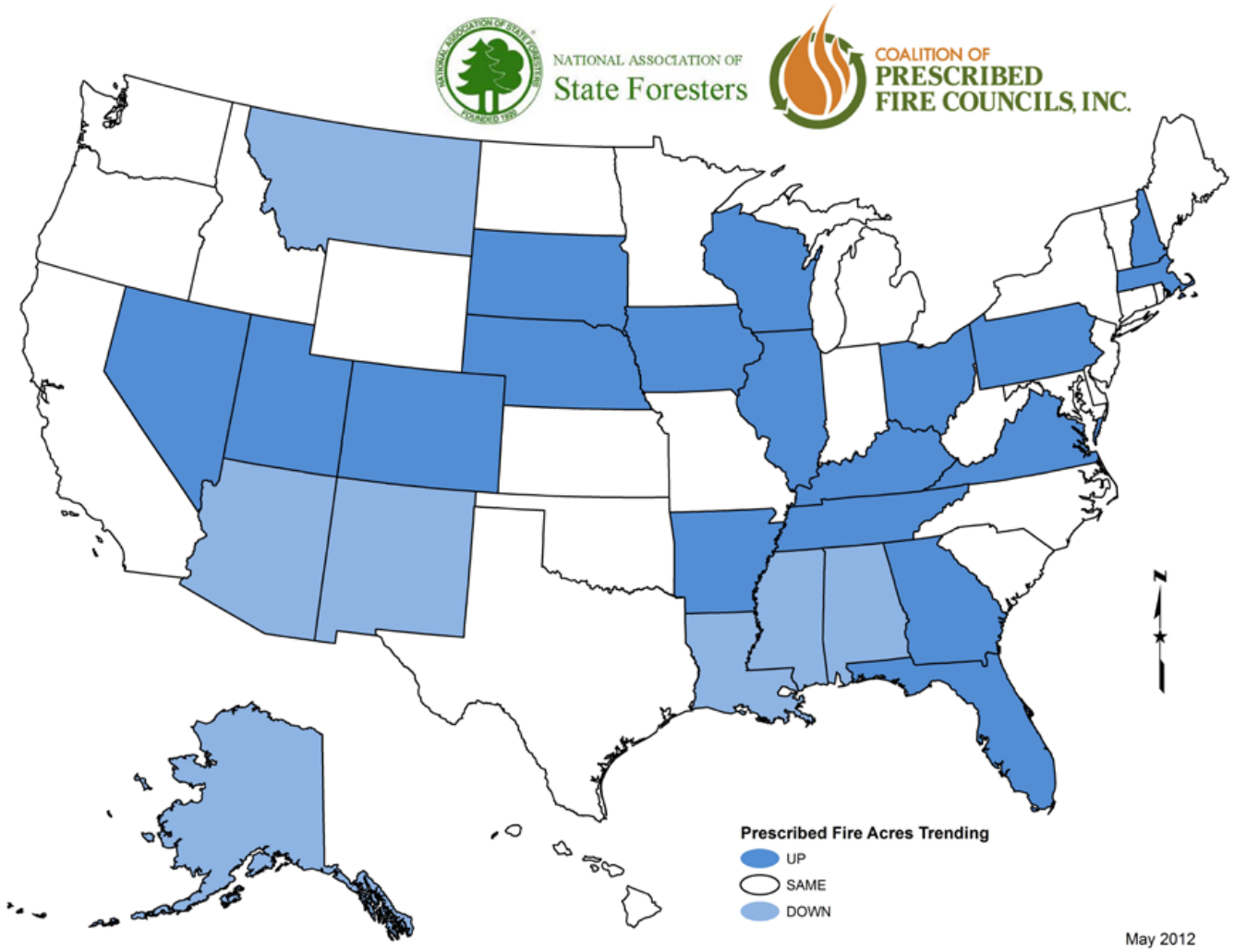

Figure 17. Eighty-six percent of states indicated prescribed fire acres either stable or trending up.

Results *(continued)*

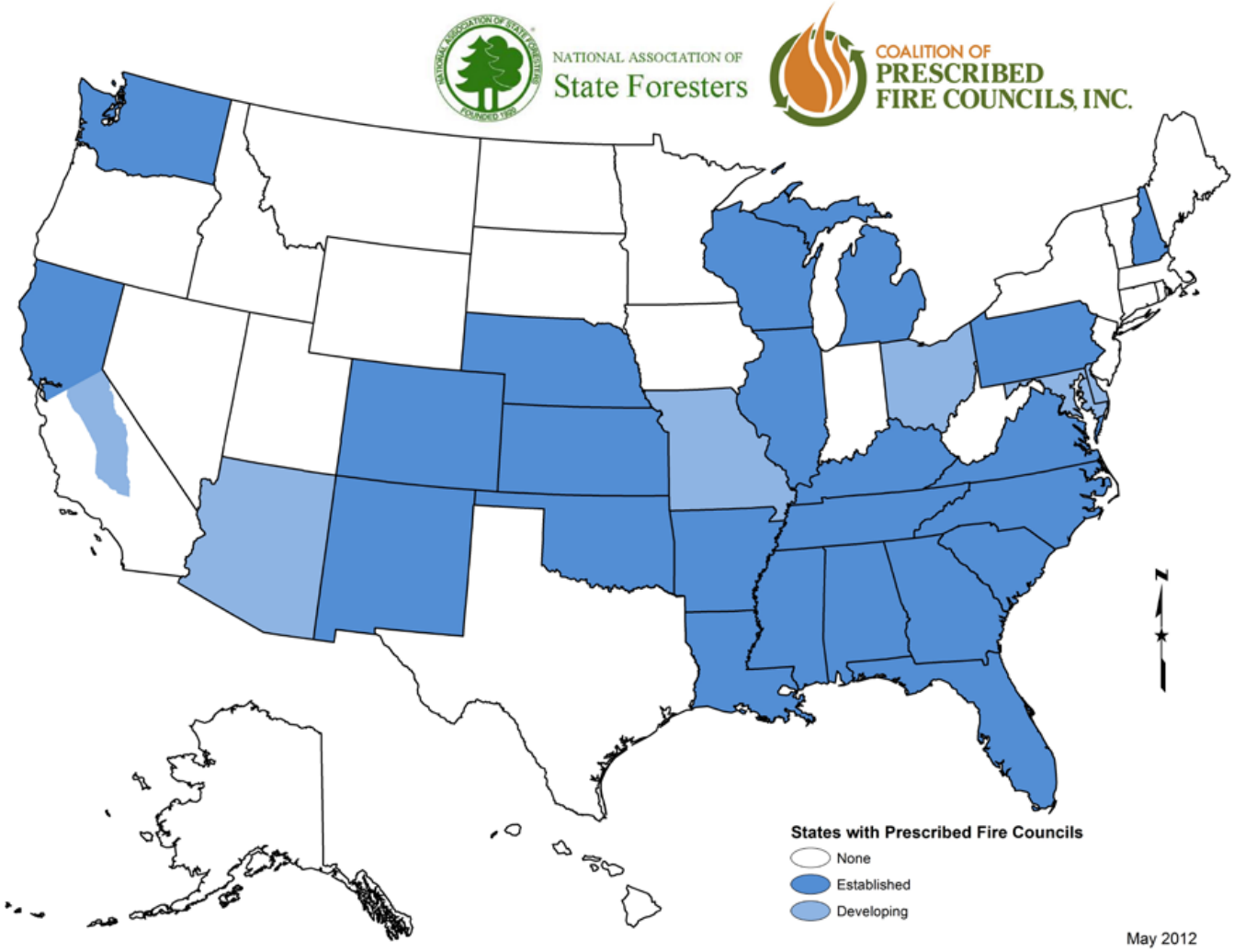

Figure 18. Twenty-five prescribed fire councils exist in twenty-three states. State Prescribed Fire Councils partner federal, tribal, state, and private interests around the appropriate use of prescribed fire.

Results *(continued)*

Prescribed Fire Impediments

Impediments Limiting Prescribed Fire Use Nationwide Ranking

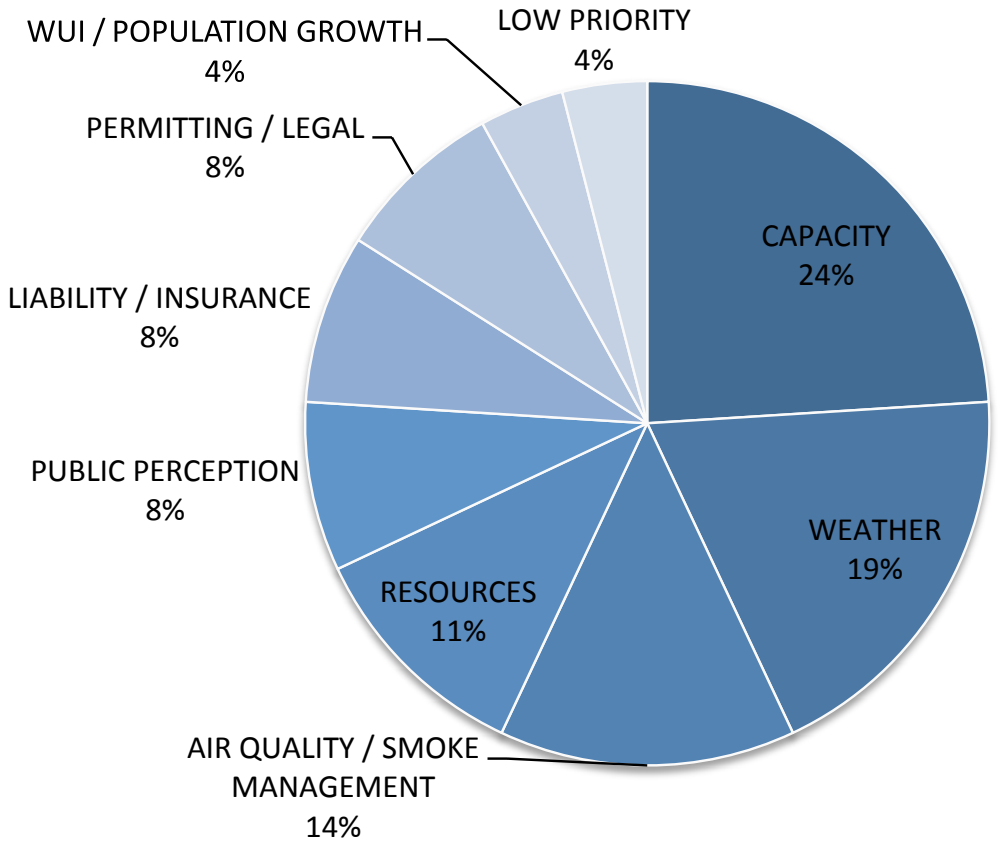

Figure 19. Capacity, weather, air quality/smoke management, and resources each accounted for greater than 10% of the responses from individual state forestry agencies, and are the four most significant national challenges for prescribed fire implementation.

Results *(continued)*

Impediments Limiting Prescribed Fire Use Northeast Ranking

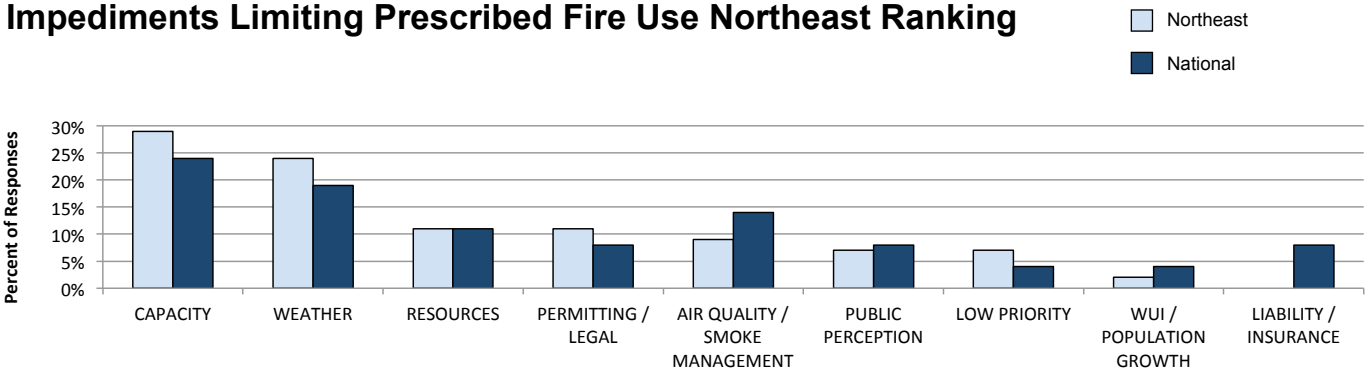

Figure 20. Capacity, weather, resources, and permitting/legal concerns are the top four prescribed fire implementation challenges in the Northeast. Capacity, weather, permitting/legal, and low priority are more challenging in the Northeast when compared to national responses.

Impediments Limiting Prescribed Fire Use Southeast Ranking

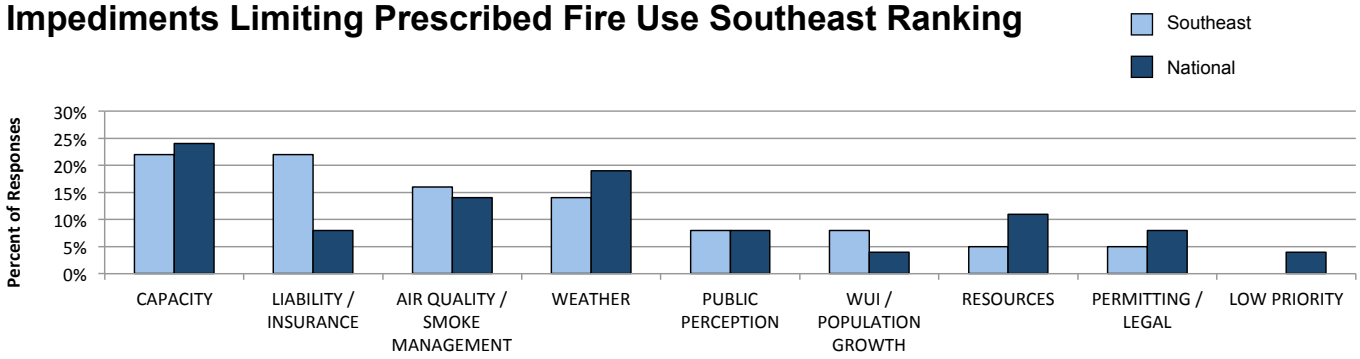

Figure 21. Capacity, liability/insurance, air quality/smoke management, and weather concerns are the top four prescribed fire implementation challenges in the Southeast. Liability/insurance and WUI/population growth are much greater concerns in the Southeast when compared to national responses.

Results *(continued)*

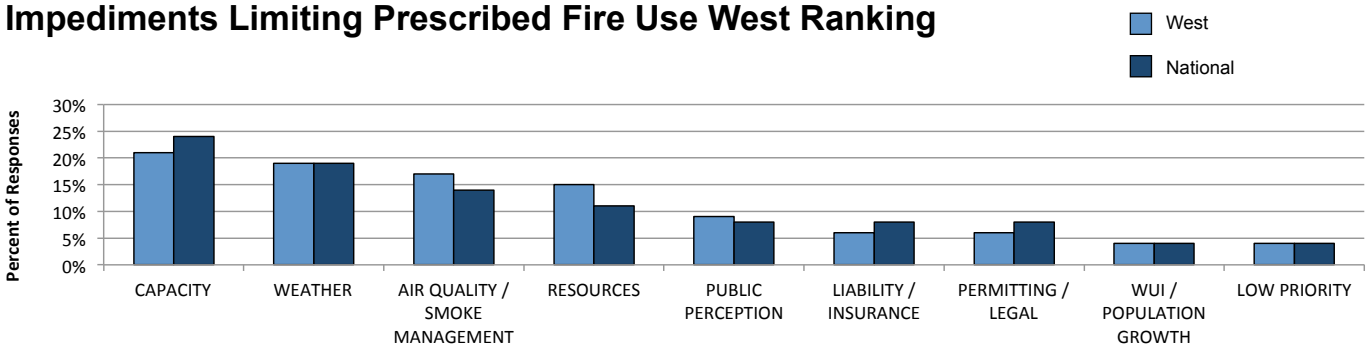

Figure 22. The West's top four impediments matched those of national importance, and of all regions, the West most closely tracked national responses.

Discussion

The primary objective of this initiative was to determine the scale at which prescribed fire is being used today and for what purposes. The survey revealed that an estimated 20,216,189 acres were treated with prescribed fire across the country in 2011. Of that figure, approximately 7.9 million acres were forestry related and 12.3 million were agricultural related. Nationally 98% of all prescribed fire activity occurred in the Southeast and West, 51% and 47% respectively, and eight states burned more than 500,000 acres. A significant regional difference is that the Northeast's and Southeast's primary use of prescribed fire was for forestry management, and the West's primary use was for agricultural management.

A secondary objective was to determine what state-level programs are in place for prescribed fire management. Nationally the majority of states (82%) use some form of permitting or authorization process. The process can be completed the day of the burn, typically by phone or internet, in 40% of those states that require a permit. One regional difference is permits can be obtained the day of the burn in every southeastern state, while states in the Northeast and West typically require permits to be obtained at least one day in advance of the burn. Another regional difference is that of the few states (eight) that have an associated cost or fee to obtain a permit, all but one are located in the West.

State certified burn manager programs were another point of interest in the survey. According to the results, 17 offer such programs. The Southeast reported nine states with certification available to prescribed fire practitioners, and the remaining states were equally divided between the Northeast and West, with four in each region.

The last objective was to determine major impediments that limit prescribed fire use. Based on the responses collected, nine broad categories were determined. Capacity, weather, air quality/smoke management, and resources were the national issues of highest importance, and accounted for 68% of the responses. Capacity was the number one issue nationally, as well as within each region: the lack of trained prescribed fire managers, training opportunities, private contractors, and partnerships appears to be the major bottleneck for prescribed fire implementation. The regional differences between the other eight impediments were between the Northeast and the Southeast only. In the Northeast capacity, weather, permitting/legal, and low priority were all more important when compared to the national results, while air quality/smoke management and liability/insurance were both less important. Liability/insurance tied capacity as the number one impediment in the Southeast, and when compared to the national response had the highest degree of difference among all regional comparisons. The results also suggest resources and low priority are less important in the Southeast. The West's responses closely mirrored the national responses.

Discussion *(continued)*

Although there is little doubt that acres burned annually have been reduced since the 1880 survey, current prescribed fire use is stable or increasing in 43 states. This is encouraging. Prescribed fire remains a local endeavor; each tract with its own unique challenges and best managed at the state level. However, certain challenges extend beyond state boundaries and are greater than any single state, agency, organization, or landowner can address alone.

The 1880 survey map was the first comprehensive survey of the use of fire in the United States and illustrated that it was "a country full of flame," to quote Steve Pyne. It is not referenced to suggest we return to some scale of fire use of 130 years ago, but rather is an attempt to better understand fire's evolution in recent history. The U.S. has undergone distinct and irreversible changes including landscape fragmentation, a public removed from an understanding of fire's fundamental role in managing land, and more frequent catastrophic fires. Nonetheless, the fact remains that fire was important then just as it is today, and prescribed fire remains a necessary land management tool.

Perhaps the greatest change over the last century is the land manager's need to plan and execute prescribed fire in a socially acceptable manner. When and where a burn would take place 130 years ago was solely the decision of the landowner. Today's prescribed fire manager must consider a complex web of policy, legal statutes, and liability, as well as public safety, health, and acceptance. The degree of implementation difficulty is often defined by burn location and complexity, making coordination key to success. The most successful prescribed fire programs, no matter the location or level of difficulty, are the result of collaboration. The most successful collaboratives work as seamless partnerships, void of any dominating group or individual interest, focusing on the goals at hand. They do not recognize barriers to meet objectives; they find ways to succeed. Most importantly, through careful planning and implementation, the modern day prescribed fire manager is willing to accept the associated risks of prescribed fire use because of its necessity for the resource being managed. The challenges are many, but if prescribed fire is to remain a viable resource management tool into the future, it will require the combined problem-solving efforts of the entire fire community.