

Time & Date: November 14, 2012
1300 – 1500 Eastern Time

Phone #: xxx-xxx-xxxx **Passcode:** xxxxxx#

Desired outcomes:

1. Review progress on Phase III of the Cohesive Strategy
2. Set expectations for the Phase III report
3. Review WFEC progress on the Governance Tasking
4. Get concurrence on next steps

<i>Time</i>	<i>#</i>		<i>Topic</i>	<i>Presenter</i>
1300 – 1310			Welcome	Butch Blazer Kim Thorsen
1310 – 1345	1	<input checked="" type="checkbox"/> Information <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Decision	Cohesive Strategy <u>Background:</u> Review of where we are and what it took to get here. <u>Desired Outcome:</u> 1. Understanding of the current status of the Phase III deliverables and what is left to be accomplished 2. Agreement on remaining tasks and timeline <u>Reference material:</u> 1. Briefing Paper	Roy Johnson Tom Harbour
1345 – 1400	2	<input checked="" type="checkbox"/> Information <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Decision	Governance Tasking <u>Background:</u> WFEC was tasked with reviewing wildland fire governance and making recommendations for improvement. Bill will review the guiding principles and process being used as well as the accomplishments to date. <u>Desired Outcome:</u> 1. Understanding of the current status of the governance tasking <u>Reference Material:</u> 1. Briefing Paper	Bill Kaage

<i>Time</i>	<i>#</i>		<i>Topic</i>	<i>Presenter</i>
1400 – 1415	3	<input checked="" type="checkbox"/> Information <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Decision	Expectations for next Face to Face WFLC Meeting <u>Background:</u> Tom and Roy will present the topics, discussions and decisions that will be brought forward to WFLC at their next face to face meeting. <u>Desired Outcome:</u> 1. Agree with estimated schedule and expectations for the next WFLC face to face meeting <u>Reference Material:</u> 1. TBD	Tom Harbour Roy Johnson
1415 – 1500	4	<input type="checkbox"/> Information <input checked="" type="checkbox"/> Discussion <input type="checkbox"/> Decision	Open Discussion	WFLC Members
1500			ADJOURN	

DRAFT



Cohesive Wildland Fire Management Strategy
National Goals; Collective Solutions

Response to Wildfire
Fire Adapted Communities
Resilient Landscapes
Supported by Science

The National Cohesive Wildland Fire Strategy: Northeast Regional Risk Analysis Report



**A Phase III Report by the
Northeast Regional Strategy Committee**

November 1, 2012



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Executive Summary

This Northeast Regional Risk Analysis has identified a set of feasible alternative approaches and options for addressing the Cohesive Strategy Goals in the Northeast U.S. For each of the investment options, the key risks, barriers, and opportunities are identified, and will be addressed in the Regional Action Plan to be developed.

The options for addressing each goal are:

Goal 1: Restore & Maintain Landscapes	Goal 2: Fire Adapted Communities	Goal 3: Response to Wildfire
Option 1A - Increase the use of prescribed fire where multiple benefits can be achieved.	Option 2A - Focus on promoting and supporting local adaptation activities to be taken by communities.	Option 3A - Improve the organizational efficiency and effectiveness of the wildland fire community.
Option 1B – Increase the extent of fire dependent ecosystems and expand the use of fire as a disturbance process.	Option 2B - Focus on directing hazardous fuel treatments to the wildland-urban interfaces	Option 3B - Increase the initial response capacity (initial attack).
Option 1C - Focus on mitigating “event” fuels to reduce potential fire hazard.	Option 2C - Focus on promoting and supporting prevention programs and activities.	Option 3C - Further develop shared response capacity (extended attack; long duration fire potential).

These options represent alternative strategies that wildland fire management organizations, federal, state, and local governments, non-governmental organizations and local communities can adopt in any number and combination to best meet their objectives and address the risks they may face from potential wildfire impacts. This report, however, does not contain a quantitative cost trade-off analysis of the options as there was not time, capacity, or access to the needed information to be able to conduct such an analysis.

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. During Phase II, the National Science and Analysis Team (NSAT) examined various aspects of wildland fire and developed conceptual models specific to each component. The purpose of these models was to display the interactions and relationships among factors, such as the relationship between fuel treatments and the extent and intensity of wildfire. The NSAT also identified various data sets that might be used in Phase III to build analytical models consistent with the concepts articulated in Phase II. Building on these efforts, Phase III has involved an extensive effort to collect data necessary to quantify relationships and provide a rigorous examination of risk.

For each national goal, narratives of regional investment options for the Northeast are presented and accompanied by graphics, tables, and maps that highlight spatial differences and topical issues in the Northeast Region. These narratives also highlight the opportunities and potential barriers to achieving substantial reduction in regional wildland fire risks. Alternatives and options identify opportunities to focus the Cohesive Strategy on important regional values including: fire fighter and public safety, cultural



values, ecological values, marketable products, and property owner values. The analysis looks at wildland fire related challenges, and identifies opportunities within the region, at the county level where information exists. The alternatives and options are not mutually exclusive. *There is no one preferred alternative to be applied across the Northeast region.* Instead the alternatives present investment options that need to be balanced to achieve each of the national Cohesive Strategy goals and implement effective wildland fire management consistent with the applicable land management objectives.

The wildland fire management community and those potentially affected by wildfire have expressed their order of preference for investing in these options by Cohesive Strategy goal in the Northeast given the landscape conditions and available resources that currently exist. The actual mix of investments is dependent on many factors such as, but not limited to: local land management objectives, specific community needs, agency mission, potential risks, existing barriers, available skills, qualified personnel, budgets, equipment, and other resources. The approximate ranges of desired investment levels expressed by the Northeast Regional Strategy Committee for each Cohesive Strategy goal on an annual basis are:

Goal 1: Resilient Landscapes	30-35%
Goal 2: Fire Adapted Communities	20-25%
Goal 3: Wildfire Response	40-50%

There are some distinct differences in goal investment preferences with the Federal and Tribal agencies indicating a more balanced distribution among the three goals, approximately a third for each goal. Federal agencies indicate the highest percentage of investment in fuel treatment activities. The State agencies prefer substantially less investment in goal 1 and would invest more in goal 3 as they have greater (and often mandated) protection responsibilities. This is true especially for local fire departments and agencies as they are primarily responsible for protection of life and property. Due to the relatively large amounts of wildland-urban interface in the Northeast and the associated complexities and risks to life and property, a rapid, effective response to wildfire is often the most cost effective and lowest impact approach to dealing with current wildland fire management issues on the Northeast.

There is also a difference in preferred options for investing in the three Cohesive Strategy goals by geographic sub-region within the Northeast U.S. The investments are much more balanced among sub-regions than among agencies and organizations within each sub-region. There is a noticeable difference between New England and New York and the Mid-Atlantic and Mid-West in goal 1 investments (fuel treatments activities). This may be due to less available and fragmented acreage to treat, seasonal variability of the “burning window”, and especially to a significantly higher population density limiting the feasibility of treatments due to proximity to urban areas and related health concerns to smoke from burning.

This identification of alternative approaches and options, along with an analysis of risk, barriers, critical success factors and opportunities is intended for use by agencies, organizations and communities at the federal, state, and local levels for their individual and collaborative wildland fire and other land management planning efforts. This risk analysis will also serve as a foundation for the Northeast Regional Action Plan report to be developed later this year.

At the national level, Phase III will continue with development of a national risk analysis and a national



action plan. The National Science and Analysis Team (NSAT) will develop a comparative risk model using the data sets, and will develop a national trade-off analysis. When the comparative risk and trade-off analyses are complete, a National Phase III Risk Analysis Report will be written to bring together the issues and alternatives discussed in the three regional reports. A National Action Plan will be developed based on the national risk and trade-off analyses.



The National Cohesive Wildland Fire Strategy: Northeast Regional Risk Analysis Report

Introduction and Background

The National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is a bold new national approach to the increasingly complex reality of wildland fire management. The Cohesive Strategy was developed in response to growing concern over mounting annual costs of fighting wildfires and devastating wildland fire losses to communities and values at risk. The Cohesive Strategy acknowledges the reality that fire is a natural process, necessary for the survival of many ecosystems, and focuses on attempting to reduce the conflict between wildfire and people. By simultaneously looking at the role of fire in the landscape, the ability of humans to plan for and adapt to living with fire, and the need to be prepared to respond to fire when it occurs, the Cohesive Strategy takes a holistic approach to wildland fire. The Cohesive Strategy brings together representatives of all stakeholders with an interest in wildland fire – federal and state land management agencies, local governments, landowners, environmental groups, tribal groups, fire professionals, and non-governmental agencies, and other entities to discuss goals and work collaboratively to develop shared objectives. The Cohesive Strategy effort engages natural and social scientists to employ a scientific model to inform the conversation with the best available science, designed to help determine the best path forward in addressing the complex issues relating to wildland fire. Working through regional strategy committees (RSC) representing the three distinct regions of the country – the Northeast, the Southeast, and the West, these groups are devising a shared strategy or method that will guide decision-making to best use our ecological, social, and economic resources in preparing for, responding to, and recovering after inevitable wildland fires.

The Cohesive Strategy differs from all the fire plans that came before it by taking an “all lands” view of wildland fire management. Fire knows no boundaries -- not ownership boundaries, not state boundaries. Policymakers must take a landscape level approach and work across boundaries to implement effective wildland fire management techniques. And all stakeholders must be included– those who own the land, those who use the land, and those who love the land. The Cohesive Strategy is unprecedented in its focus on initiating dialogue and collaborating on a national scale.

This report will summarize the work done in the Northeast Region during Phase III of the Cohesive Strategy. Actions from Phases I and II will be briefly described in this report. More information on Phases I and II can be found on the website, www.forestsandrangelands.gov, including the Phase I and Phase II reports and foundational national documents.

Three Phases of the Cohesive Strategy

The Cohesive Strategy has been developed in three phases. In Phase I, stakeholders met to develop the national goals, propose performance measures, and agree upon the guiding principles of the Cohesive Strategy. Phase I also created a framework under which the three regions would create individual assessments and strategies tailored to their unique, regional needs. During Phase II, diverse groups of stakeholders representing each of the three regions met independently to identify regional challenges and opportunities as well as key priorities. Each region also took a closer look at how the processes of



wildland fire, or the absence of wildland fire, affected their values-at-risk. In Phase II, the Northeast Region broadly defined its objectives and activities necessary to achieve those objectives. Phase III serves as the conclusion of the planning phase of the Cohesive Strategy, during which the scientific analysis and an in-depth risk assessment are added to the goals and objectives to aid in identifying alternative approaches and investment options to guide implementation through a set of regional and national action plans.

Core Values and Vision for the Future

The Cohesive Strategy is built on several principles and values, including engaging stakeholders, managers, and scientists; using the best available science, knowledge, and experience; and emphasizing partnerships and collaboration. The Cohesive Strategy sets out a vision for the future of wildland fire management: **The vision for the next century is to: “Safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, live with wildland fire.”**

Guiding Principles

The following guiding principles were crafted through discussions with federal, state, tribal, and local governmental and non-governmental organizational representatives in Phase I. Stakeholder input received during Phase I forums was used in developing the guiding principles, which are an overarching set of principles that apply to all stakeholders in the wildland fire management community. The guiding principles apply to the three goals of the strategy: resilient landscapes, fire-adapted communities, and wildfire response. These guiding principles and core values were developed at the national level and were also adopted by the three regions as the regional guiding principles:

- Reducing risk to firefighters and the public is the first priority in every fire management activity.
- Sound risk management is the foundation for all management activities.
- Actively manage the land to make it more resilient to disturbance, in accordance with management objectives.
- Improve and sustain both community and individual responsibilities to prepare for, respond to and recover from wildfire through capacity-building activities.
- Rigorous wildfire prevention programs are supported across all jurisdictions.
- Wildland fire, as an essential ecological process and natural change agent, may be incorporated into the planning process and wildfire response.
- Fire management decisions are based on the best available science, knowledge, and experience, and used to evaluate risk versus gain.
- Federal, local, state, and tribal governments support one another with wildfire response. They engage in collaborative planning and the decision-making processes that take into account all lands and recognize the interdependence and statutory responsibilities among jurisdictions.



- Where land and resource management objectives differ, prudent and safe actions must be taken through collaborative fire planning and suppression response to keep unwanted wildfires from spreading to adjacent jurisdictions.
- Safe, aggressive initial attack is often the best suppression strategy to keep unwanted wildfires small and cost down.
- Wildland fire management programs and activities are economically viable and commensurate with values to be protected, land and resource management objectives, and social and environmental quality consideration.

The Three National Goals

Three factors were identified as the primary focus areas for the Cohesive Strategy. They are: restoring and maintaining resilient landscapes, creating fire adapted communities, and responding to wildfires. Flowing from the guiding principles and core values, and primary focus areas, three national goals were adopted in Phase I. The three national goals are:

- **Restore and Maintain Landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- **Fire-Adapted Communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.
- **Wildfire Response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

In Phase II of the Cohesive Strategy, each of the regions adopted these goals and used them to define objectives, performance measures, and preliminary alternative implementation approaches.

The Cohesive Strategy represents a new way of looking at wildland fire management. It is different from previous efforts in that it includes all the stakeholders as partners and is not focused on landscape management by single government agencies. Instead, the Cohesive Strategy is organized around how the partners with an interest in wildland fire management will approach decision-making collectively. This new approach may not change the kinds of actions that are taken on the ground to deal with fire -- the programs which exist to reduce excess fuels, to prepare and protect communities, or to suppress fires. It is a strategy, a way of looking at a national challenge and considering landscape scale solutions that include all stakeholders. The publication of the Phase III report is not the end of the Cohesive Strategy process. It is only the end of the planning phase of the strategy development. Implementation of the strategy by the diverse partners that have been involved in its development will continue through the decisions that are made, informed by a scientific method, to effectively prepare for, utilize, and respond to wildland fire.

This Northeast Regional Risk Analysis report includes a description of the issues being addressed by the Cohesive Strategy, a characterization of wildland fire risks, and three alternative approaches and investment options available to address the risks. The report brings together all the variables to enable decision-makers to consider ways to not just respond to fire with suppression actions, but to also lower the potential for extreme wildfire behavior by reducing amounts of hazardous fuels before wildfire



events, and to prepare communities to tolerate inevitable wildfire events without loss of life or critical infrastructure.

America's wildland fire challenges are complex and difficult to solve independently. To improve our collective understanding, we will gain more knowledge and context as to the extent and geographic locations of risks and opportunities that could influence wildland fire management decisions through the risk assessment and analysis process. Risk assessment and analysis provides scalable information for reducing risk at the local, regional, and national levels. The intent of the risk analysis is not to make a final decision as to which alternative management options will be selected. Rather, the intent is to derive information useful for further deliberations among stakeholders, partners, agencies, and policy makers at the national, regional and local levels as decision processes move forward within and beyond Phase III of the Cohesive Strategy.

For each national goal, narratives of regional investment options are presented and accompanied by graphics, tables, and maps that highlight spatial differences and topical issues in the Northeast Region. These narratives also highlight the opportunities and potential barriers to achieving substantial reduction in regional wildland fire risks. Alternatives and options represent opportunities to focus the Cohesive Strategy on important regional values including: fire fighter and public safety, cultural values, ecological values, marketable products, and property. The analysis looks at wildland fire related challenges, and identifies opportunities within the region, at the county level. The alternatives and options are not mutually exclusive. *There is no one preferred alternative to be applied across the Northeast Region.* Instead the alternatives present investment options that need to be balanced to achieve strategic goals and implement effective wildland fire management consistent with the applicable land management objectives.

The report is intended to enable the Cohesive Strategy partners to understand how their choices might align with reductions in risk, given a common understanding of regional and national wildland fire risks across the landscape, supported by scientific analysis. The report will describe the kinds of decisions that can be made, the potential benefits/consequences and outcomes associated with alternatives, and the associated uncertainty.

The Cohesive Strategy Phase III risk analysis and report establishes a new approach to implementing a national wildland fire management policy by recognizing the significant differences in wildland fire challenges and opportunities across the various regions of the country, and by using real life examples to tell stories that illustrate the changes that could be implemented by the federal, state, local, and non-governmental wildland fire management stakeholders and partners of the Cohesive Strategy, either jointly or individually. Success in achieving the three broad goals of the Cohesive Strategy is a long-term proposition – no single decision by policymakers or management actions by land managers will solve our Nation's complex the wildland fire issues. The strength and success of this Phase III report will lie in its ability to motivate collaborative actions to reduce wildland fire risk by the diverse agencies, organizations, and partners involved in the wildland fire issue.

Alternatives and options neither identify specific implementation actions (i.e., who will do what, where, how, and when), nor specific process actions. However, it is expected that the analysis will inform specific actions the region may wish to pursue, such as increasing investments that improve the capability of local fire departments to assist with wildland fire suppression, or fostering collaborative action by communities that reduces their exposure to wildland fire risk. These types of specific actions

will be identified as part of the Northeast Regional Action Plan developed by the Northeast Regional Strategy Committee's (RSC) in parallel with the other two regions.

Future Steps in Phase III

As work continues in Phase III, the following reports will be produced to further assist national and regional decision-makers that deal with wildland fire to address the goals and objectives of the Cohesive Strategy:

1. The National Risk Analysis Report will be developed following the regional analyses and drafting of the Regional Analysis Reports.

The three risk analyses developed will inform a national effort to assess and define national findings. The resulting National Risk Analysis Report will provide an executive summary of the regional risk analyses; document the risk analysis process including an explanation of risk characterization; summarize the regional analyses; describe the national-level findings and commitments based on regional risk analyses; and identify the next steps for the Cohesive Strategy effort.

2. Complete Regional Action Plans and a National Action Plan

The intent of the Northeast Regional Action Plan is to capture actions the RSC has agreed to pursue during the next five years to make progress towards achieving the three national goals of the Cohesive Strategy. Specific actions are likely to focus on process improvements related to the immediate success opportunities identified; the barriers and solutions within the region's decision-space; pursuing the alternatives in whole or in part; providing information as a result of the regional or national risk analysis; presenting feedback received through the communication and outreach effort, and input from stakeholders throughout Phase III.

The Northeast Regional Action Plan will also include the identification of performance measures. The action plan will lay out a plan of work, identifying which stakeholders will be responsible for carrying out specific elements of the plan and precisely what they will do, and when it will be completed. The intent is to create a mechanism for recording commitments the RSC has made and to ensure accountability in completing the actions. The actions outlined in the Regional Action Plan document will be the initial efforts for implementation of the Cohesive Strategy at the regional and local levels, in an effort to make a positive difference on-the-ground.

These reports will assist the Cohesive Strategy partners in the Northeast Region in understanding how their choices might better align with reductions in risk given a common understanding of regional and national wildland fire risks. It is through this Phase III risk analysis report that progress might be possible in creating environments that will be conducive to addressing regional wildland fire risks and issues.

Communications and Stakeholder Input

Collaboration among stakeholders forms the foundation of the National Cohesive Wildland Fire Management Strategy. The Northeast Regional Strategy Committee has worked toward inclusiveness and transparency to further understanding and involvement among shared interests. Stakeholder input received during forums and comment periods has refined and clarified the regional objectives, options,



values, barriers and actions to address wildland fire management issues in the 20 states that form the Northeast region. In fact, the NE region's guiding principles for implementation were developed from stakeholder feedback. Stakeholder collaboration will continue to shape the direction of the strategy in the Northeast. A complete description of outreach efforts and stakeholder involvement can be found in appendices 4 and 5.

Science Contributions to the Cohesive Strategy

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. During Phase II, the National Science and Analysis Team (NSAT) examined various aspects of wildland fire and developed conceptual models specific to each component. The purpose of these models was to display the interactions and relationships among factors, such as the relationship between fuel treatments and the extent and intensity of wildfire. The NSAT also identified various data sets that might be used in Phase III to build analytical models consistent with the concepts articulated in Phase II. Building on these efforts, Phase III has involved an extensive effort to collect data necessary to quantify relationships and provide a rigorous examination of risk.

The scientific models will continue to be refined and a trade-off analysis process will be developed at the national level. These will be contained in the National Risk Analysis Report to be finished in 2013, and a National Action Plan will describe actions for implementation of the Cohesive Strategy at the national level, and will be completed before the end of 2013. These developments may have some impact on the regional analysis and the action plan in the future; updating will be a continuous process as new information is received by the NE RSC.



Risk Analysis and Descriptions

In this section, the wildland fire management situation in the Northeast will be described followed by an in depth analysis of the risks, barriers, and critical success factors that will be addressed in this Phase III Risk Analysis Report and the subsequent Regional Action Plan.

Overview of Wildland Fire across the Landscape in the Northeast U.S.

The Northeast Region encompasses 20 Midwestern and Northeastern states and the District of Columbia (Map a). The 20 states comprise the most densely populated region of the nation, home to more than 41 percent of Americans. Complex land ownership and management, natural and weather, climate event created fuels, high wildfire occurrence, and extensive wildland urban interface (WUI) distinguish the Northeast Region from the West, yet the Northeast has similarities to the Southeast.



Map a. Northeast Region

Landscape Characteristics - The Northeast Region is comprised of diverse ecosystems; from prairie to pine, hardwoods to boreal forests, from coastal wetlands to mountains, displaying the full range of fire regimes across the Region. Some of the most critically endangered ecosystems exist in the Northeast Region, including grasslands, savannas and pine barrens, all of which have declined by 98 percent since the onset of European settlement. All are fire – dependent and lack of fire in the system is part of the cause for their decline (Noss, La Roe III, & Scott, 1995). Both human and natural fire ignitions have

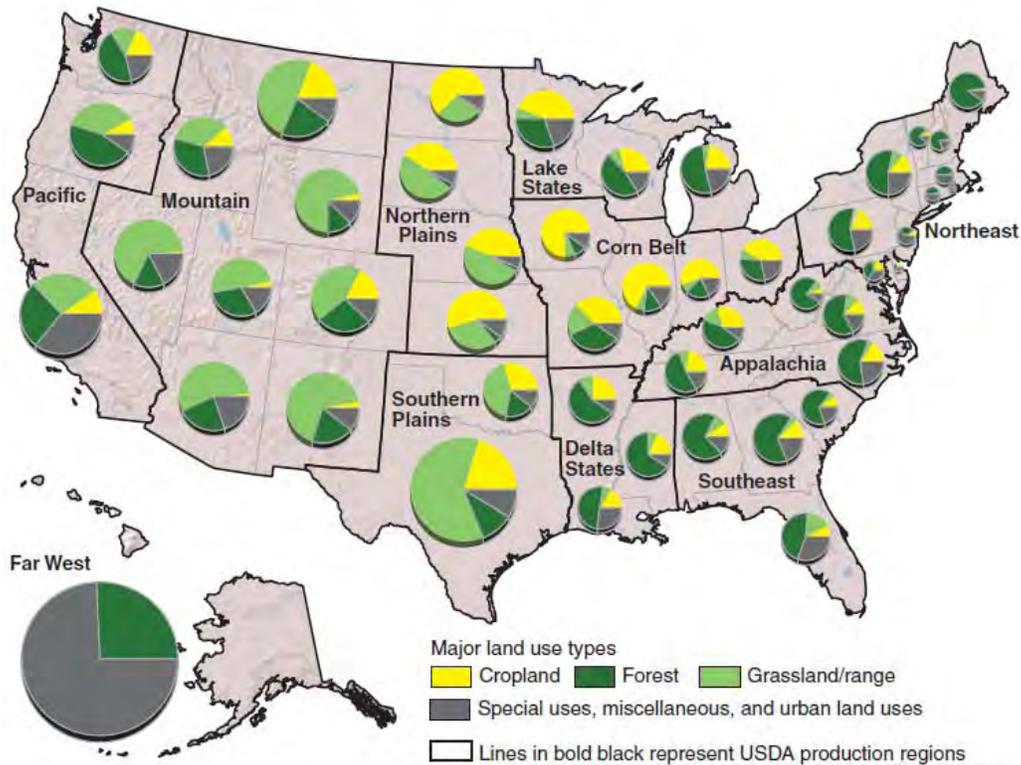


played important roles in shaping the ecosystems of the Northeast. Soil and climate are determining factors to the distribution of fire adapted ecosystems across the region.

Land Ownership Patterns - Lands are owned and held in stewardship by a diversity of individuals, tribes, industry, organizations, and local, state and federal agencies (Map c). The vast majority of land is in private ownership. Land uses and ownership patterns are complex, with many small holdings creating a diverse range of owner objectives. Public lands are often isolated among other land uses, including private and industrial forests and agricultural lands. Many public lands are managed for multiple uses. Balancing the needs of society with the protection and management of natural resources creates challenges for the fire community.

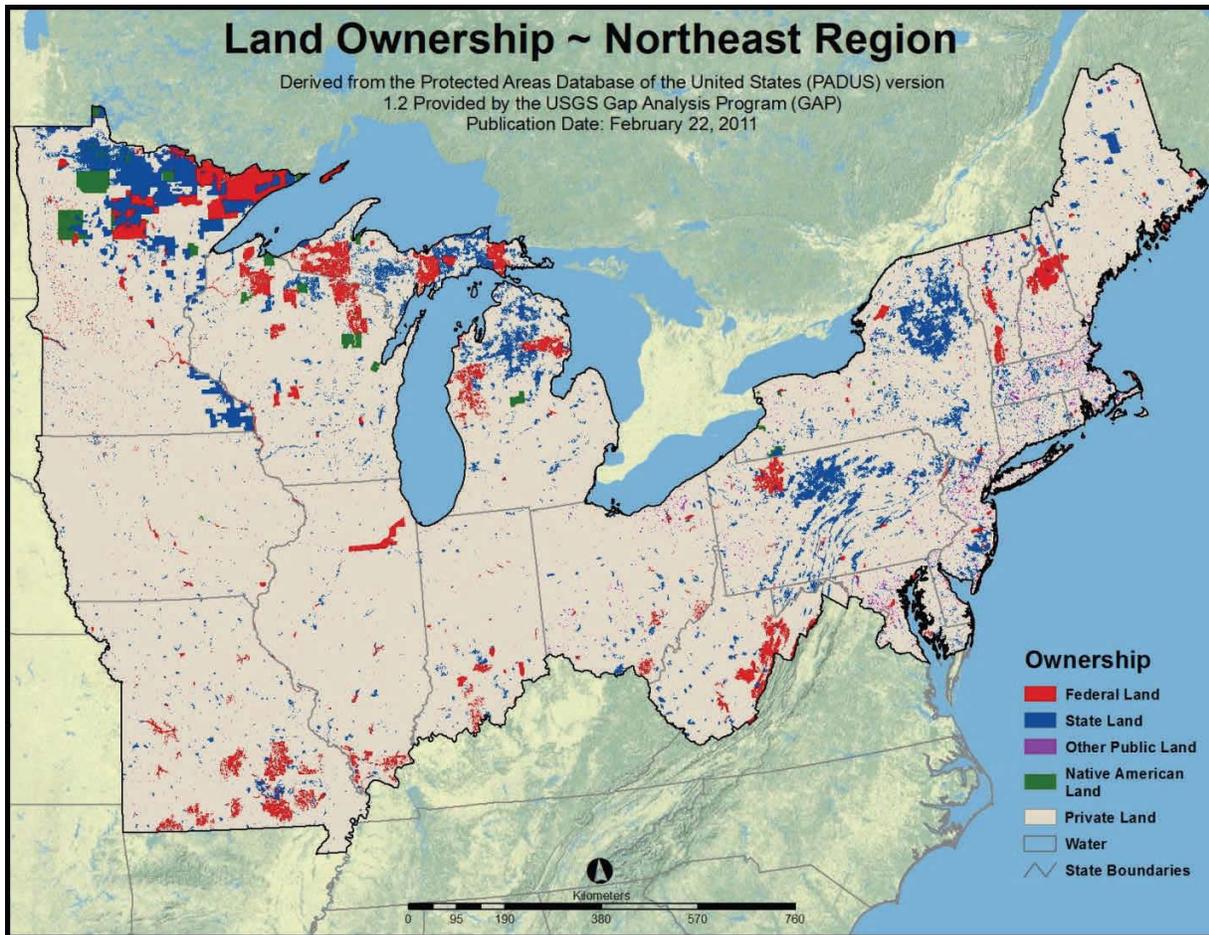
Land-use patterns have greatly affected ecosystems spatial distribution, connectedness and function. Ownership patterns, parcel size and varying management objectives makes ecosystem management in fire dependent landscapes challenging, and for some ecosystems nearly impossible. Census projections show a steady increase in population and urban expansion in the Northeast. Increased human populations and development will impact ecosystem health, sustainability and management and increase the need for wildfire response services. Expanding wildland urban interface in fire prone areas also increases costs for treatments and limits managers' ability to use beneficial fire on the land as a management tool. Smoke from prescribed burning or from wildfire can have negative impacts on public health and safety, which can restrict using fire to restore ecosystem health.

"Land shifts in and out of uses for a variety of reasons. Changing commodity and timber prices, agricultural and natural resource policies and, more recently, bioenergy policies prompt private landowners to shift land to uses that maximize returns to land. Land near urban areas is also subject to residential, commercial, and industrial development pressure; however, once converted to an urban use, land rarely transitions back to less intensive agricultural or forestry uses. Total cropland area, forest-use land, and grassland pasture and range declined nearly 11, 8, and 3 percent, respectively, over 1959-2007, whereas land in special uses and in urban uses increased (map b). Trends vary by region, however. For example, while cropland used for crops (the dominant component of total cropland) increased in the Corn Belt over the last five decades, both the Northeast and Southeast have experienced a long-term decline in cropland due to urban pressures and a comparative disadvantage in many crops." (Nickerson et al, 2011)



Map b. Land Use by State 2007 (USDA EIB98_2)

More than 40 percent (170 million acres) of the 413 million acres of land in the Northeast Region is forest. Most of the forest land is privately owned (76 percent) versus 24 percent which is publicly owned (Map c). However, according to the Forest Inventory and Analysis (FIA) reports approximately 350 acres of forest land is being lost each day (Smith, Miles, Perry, & Pugh, 2009). This loss is expected to accelerate over the next 30 years to nearly 900 acres per day (Stein, et al., 2005). This will lead to a higher value placed on remaining forests to provide habitat, recreation, forest products, and ecosystem services.



Map c. Land Ownership in the Northeast U.S.

Climate Change Influences in the Northeast – There is substantial evidence that climate is changing, and there are uncertainties related to the potential impacts on the ecosystems of the northeastern United States. There is trend evidence toward warming and wetter climate in the Northeast, yet warmer temperatures and less rainfall during the summer can lead to drought conditions that create higher wildfire risk. Many of these potential impacts, which include increases in invasive species, changes in forest vegetation, altered weather patterns and water cycles are likely to contribute to more frequent and prolonged drought periods. These drought periods in turn create the potential for increases in both the frequency and severity of wildland fires in the northeastern United States. The U.S. Department of Agriculture, Forest Service, Northern Research Station has recently produced a report titled: *Changing climate, changing forests: The impacts of climate change on forests of the northeastern United States and eastern Canada.* The following excerpts from this report describe some of the effects to be expected from the changes occurring to the climate in the northeastern U.S.



Excerpts from Northeast Climate Change Study

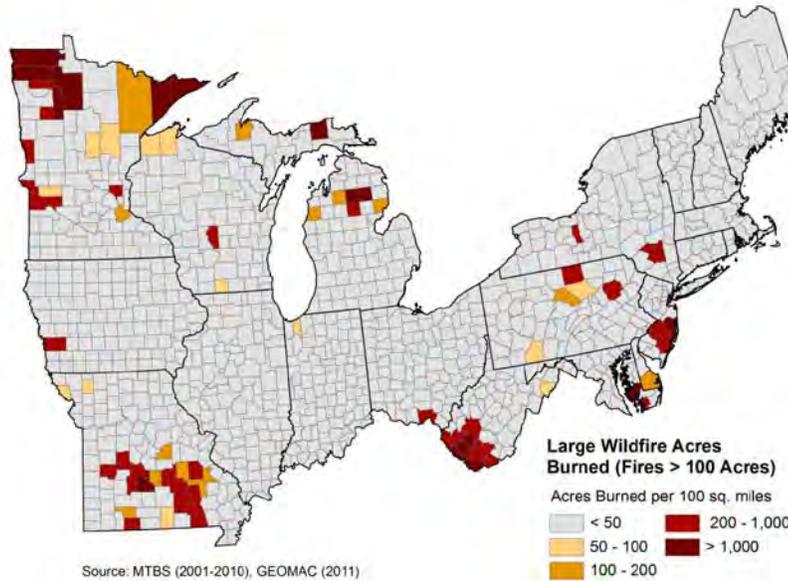
“Decades of study on climatic change and its direct and indirect effects on forest ecosystems provide important insights for forest science, management, and policy. A synthesis of recent research from the northeastern United States and eastern Canada shows that the climate of the region has become warmer and wetter over the past 100 years and that there are more extreme precipitation events. Greater change is projected in the future.”

“Evidence from multiple datasets show unequivocally that climate change is underway in the Northeast, and the rate of change is faster than expected with larger changes observed since 1970. Several long-term datasets suggest that the climate of the region has become warmer and wetter over the past 100 years, and that there are more extreme precipitation events (Hayhoe et al. 2007). Results from regional climate models predict that the Northeast will become even warmer and wetter in the future, but also more prone to drought.”

“Climate exerts strong influence over ecological functions, such as water use and plant productivity, that have critical impacts on forests. Warmer winters and a longer growing season will increase evaporation and water use by forests. Greater water use will likely reduce summertime soil moisture and increase the occurrence and length of droughts. Drought will decrease forest productivity and increase the susceptibility of trees to insects and disease, with ripple effects on fall foliage, wood supply, and other economic resources. In addition to these direct forest effects, the projected changes in temperature, snowfall, and rainfall will likely prompt a cascade of changes in the water cycle, resulting in altered conditions in the region’s rivers and streams.”

“Model projections suggest that forest productivity for individual hardwood species is likely to be enhanced in the future by warmer temperatures and increased concentrations of carbon dioxide (CO₂) in the atmosphere. However, it is not clear whether these modeled gains will be realized across the landscape and/or whether they can be sustained. Other stresses, particularly altered winter freeze-thaw cycles, increased drought and fire potential, air pollution, and heightened vulnerability to pests and disease, can reduce productivity.” (Rustad et al. 2012)

Wildland Fire Occurrence - Wildfires occur throughout the year but are concentrated during the spring and fall, and over the summer months on dry soils (see monthly ignitions graphic in Option 3B). Due to variation in climate and growing season characteristics, fire season migrates across the region generally moving from south and west to north and east in the spring. A fall fire season generally appears after leaf fall. Episodes of ignitions during dry periods can saturate the landscape and overwhelm the capacity of local fire organizations. The occurrence of large wildfires in the Northeast can be described in risk management terms as low occurrence but high risk. These larger fires tend to occur in areas that contain more contiguous and undeveloped forested tracts of land. (Map d)



Map d. This map shows counties with recorded wildfires that have burned areas greater than 100 acres. (MTBS-GeoMAC, data from NFIRS, NASF and Federal Record System, 2012)

Many wildland fires can be fast moving but are often contained within a single burning period (one day). Although not all fires are reported, available data from federal agencies, states, and local fire departments suggest well over 100,000 outdoor fires annually. Most wildfires are human caused (Figure a). Accidental fires (Map e) and arson are the primary causes of fires in the Region.

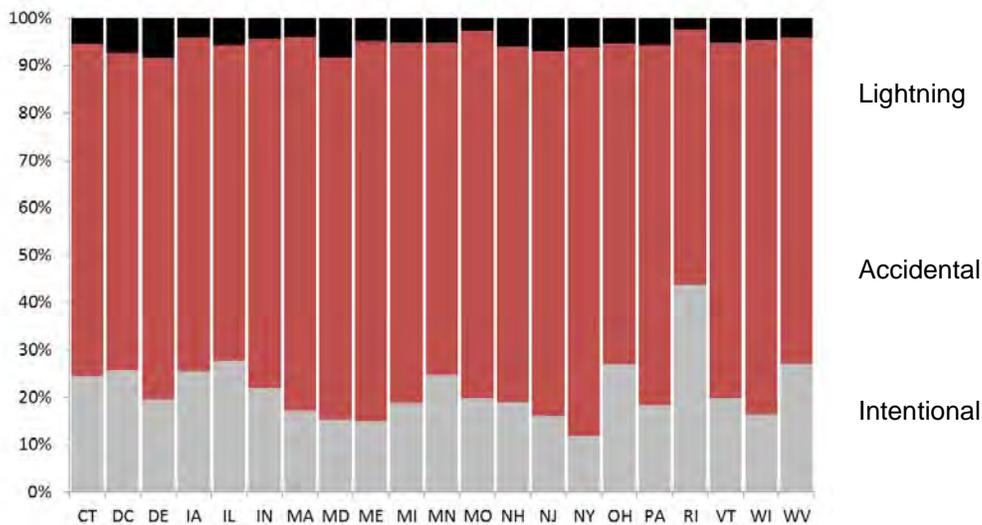
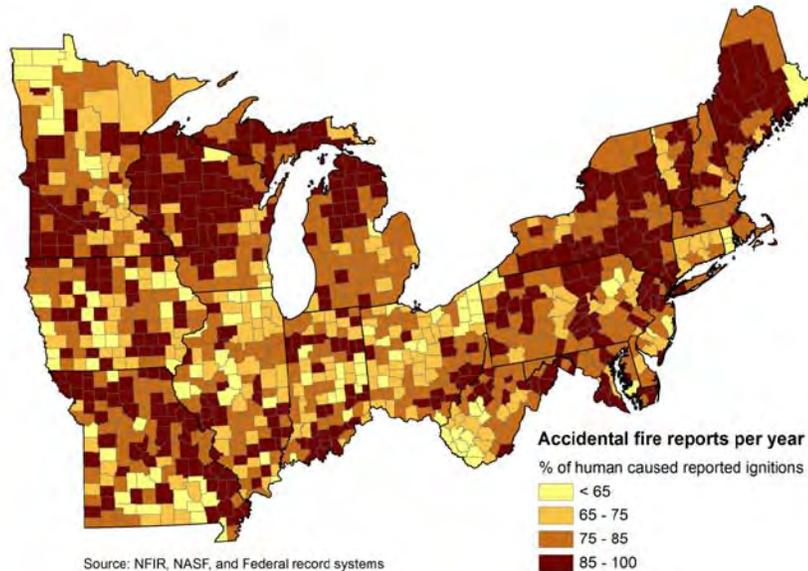


Figure a: Percent of reported lightning, accidental and intentional fires of known cause for states in the Northeast Region based on federal, state, and local data



Map e. Percent of reported incidents of known human caused fires attributed to accidental ignition for the Northeast based on state, federal and local data (NFIRS, NASF, and Federal Record System).

Large destructive wildfires occur infrequently when compared to other areas of the country, however, homes and infrastructure are lost or damaged on small fires as well as large wildfires in forest, non-forest, and urban areas. The risk of wildfire increases as a result of natural events. Wind, ice, disease and insects can create large areas of downed timber and increased fuels (vegetation), leading to exacerbated wildfire conditions. All ecosystems can experience short and long-term wildfire hazards if these conditions remain in place. Removal of residual effects from natural events is more urgent with the current and expected population growth in forested areas.

Seasonal and extended drought conditions often create wildfire hazards in the Northeast. Seasonal drought is anticipated on shallow and more coarsely textured soils, and is highly predictable. Prolonged droughts also occur and can affect a localized area or multiple states. In 2012 drought conditions created prolonged wildfire risk in many areas across the region, and caused wildfire concerns in the some states that are unaccustomed to summer fire season . Drought ensued over approximately seven years across northern Wisconsin and upper Michigan, which resulted in shallow lakes drying up, which affected water sources for suppression response (figure b). It can take many inches of rainfall to recharge ground water and soil moisture, which then improves fuel moistures, but can take more than one growing season to significantly affect live fuel moistures.

EACC Fuels and Fire Behavior Advisory September 2011
Concerns to Firefighters and the Public:

- Multiple jurisdictions transitioning beyond initial attack
- Mop-up and lingering heat will require greater time, resources, and caution.
- Expect greater intensity and quicker transition to larger fires.
- Expect greater resistance to control at all levels; reliance on traditional barriers and techniques are ineffective
- Expect the complexity and scope of fires to accelerate more quickly



■ D0 - Abnormally Dry ■ D1 Drought – Moderate ■ D2 Drought – Severe
■ D3 Drought – Extreme ■ D4 Drought - Exceptional

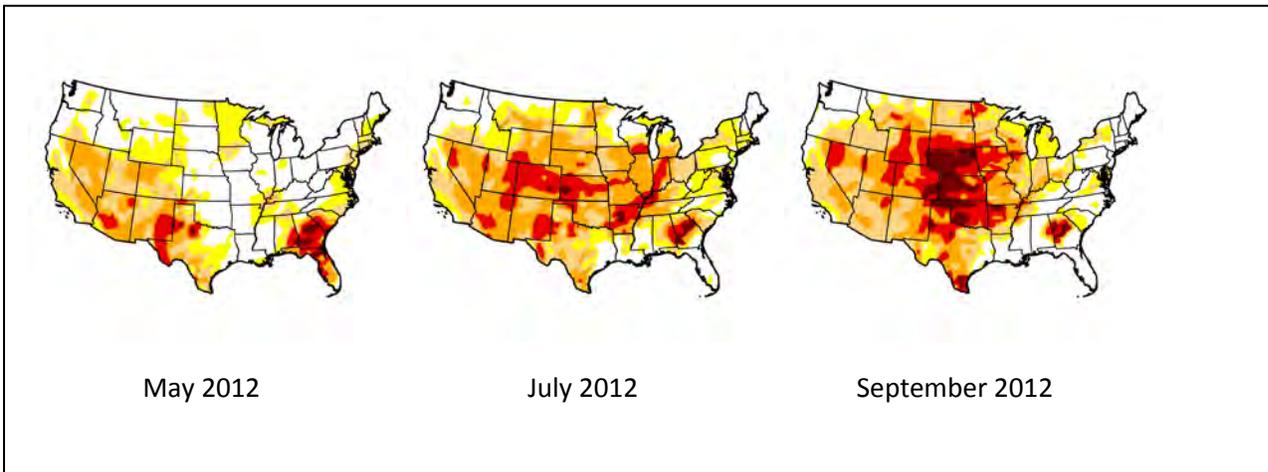


Figure b. **Drought Severity** - Drought Progression in summer of 2012 – dark red represents extreme drought conditions (Source - The U.S. Drought Monitor is produced in partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration)

Wildland fire response and management responsibilities - In the Northeast Region, wildland fire management responsibilities are characterized by a patchwork of jurisdictions and ownership, and often more than one agency may be involved in the management of wildland fire incident. Firefighter and public safety is of utmost concern at every level. Wildland fire management in the Northeast Region is the result of collaboration, partnerships, and cooperation among states, Fire Compacts, federal fire management agencies (e.g. The Forest Service (FS), Bureau of Indian Affairs (BIA), National Park Service (NPS), United States Fish and Wildlife Service (USFWS), tribal governments, and many local fire departments). State forestry agencies are typically the lead agency in wildfire suppression and have been mandated to suppress all wildfires. Many entities from the local fire chiefs, law enforcement officials, and land managers to fire managers have roles and responsibilities that affect coordination for fire and fuels management and the use of fire to manage resources and protect values at risk. The coordination and integration of wildfire management across jurisdictions varies by state. Every agency has a different set of policies guiding their response to wildland fire. States are mandated to suppress all wildfires, while federal agencies have some flexibility to manage natural ignitions to benefit resources. Land ownership juxtaposition creates challenges when responding to an incident.

NFFPC
NORTHEASTERN FOREST FIRE PROTECTION COMMISSION

BIG RIVERS
Forest Fire Management Compact
Illinois • Indiana • Missouri • Ohio

GREAT LAKES FOREST FIRE COMPACT
MINNESOTA • WISCONSIN • MICHIGAN • MANITOBA • ONTARIO
PREVENTION • TRAINING • OPERATIONS
about us fire links members contact us

Northeastern Forest Fire Protection Compacts: In 1949, Congress passed an Act establishing the first regional compact to prevent and control forest fires in the Northeast.



Description of Wildland Fire Risks, Barriers, and Critical Success Factors for the Northeast U.S.

During Phase II of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy), each of the three Regional Strategy Committees (RSCs) – Northeast, Southeast, and West – identified risks, barriers and critical success factors that would impact their ability to be successful in implementing the Cohesive Strategy. The terms as used in this process are defined as:

Risk – A situation involving exposure to danger; the possibility that something unpleasant or unwelcome will happen.

Barriers – Policy or administrative impediments that must be removed in order for the Cohesive Strategy to be successful.

Critical Success Factors – Policies, programs, agreements, partnerships, resources, and other factors that must be present for the Cohesive Strategy to be successful.

These three areas will be addressed in part by the alternatives and options outlined in this report for the Northeast Region. Further, specific actions and activities designed to mitigate these risks and barriers or put identified critical success factors in place will be identified in the subsequent Regional Action Plan. In addition, many of these items are national in scope and will be addressed either at the national wildland fire leadership level or by a joint, coordinated regional approach. The following is a detailed description of the identified risks, critical success factors, and the key policy and administrative barriers as they relate to addressing each goal in the Cohesive Strategy in the Northeast Region.

Cohesive Strategy Goal 1 – Restore and Maintain Resilient Landscapes

This goal recognizes the current lack of ecosystem health and variability related to achieving the national goal of restoring and maintaining resilient landscapes in the Northeast. The RSC members and stakeholders who developed the Northeast Regional Assessment believe that the most resilient landscapes in the Northeast will be achieved by thoughtful planning and management. Restoring landscapes is a regional interest, and fire resiliency is one piece of this interest. Listed below are the key risks, critical success factors, and barriers to implementing Goal 1 in the Northeast Region:

Lack of Prescribed Burning and Smoke Concerns

Prescribed burning is accomplished on a very small percent of the region. The majority of burning is achieved by state and federal agencies, but locally private organizations and landowners also burn significant areas, and the amount of burning is trending slowly upward. Uncertainties exist related to how much should or could be burned given capacity of agencies and organizations, air quality issues, budgets, and many other local concerns.



Figure a. prescribed burn across federal and state boundaries (NH Division of Forests and Lands Apr 13, 2012)

There is a need to increase private land management assistance to complement and implement broader fuel reduction-management objectives across fire prone landscapes. There are currently few incentives for private landowners to conduct fuels management on their lands. There is also a need to integrate federal and state level fuels and prevention programs and provide fuels management incentives to mitigate undesired fire effects and property loss in the densely populated Northeast region.

Smoke is an important concern that could affect the use of fire on private lands as well as public lands. *More expertise with smoke modeling, particularly in the highly dissected landscapes, is needed to avoid putting smoke into communities. Improving the ability to identify and work with those households with health concerns needs to be addressed.*

Loss of Fire-dependent Ecosystems

Due to a limited or lack of active management in fire-dependent ecosystems that are resilient to fire, many of these ecosystems are being reduced, fragmented, or lost (e.g., jack pine systems, oak woodlands, prairie and grasslands, barrens, and savannas). Fire-dependent plants are being replaced by shade-tolerant, fire sensitive vegetation which is less flammable. Although less flammable vegetation change can be used to protect values at risk such as wildland urban interface (WUI), the impacts to fire dependent ecosystems are severe in terms of ecological function, plant and animal habitat, and ecosystem services.



Figure b. A jack pine seedling sprouts Wednesday, Sept. 5, 2012, in the fertile soil nearly one year after the Pagami Creek fire burned through an area near Isabella Lake. (Derek Montgomery for MPR)

Inadequate Biomass Utilization

The forest products industry is integral to cost effective restoration, hazard mitigation, and fuels reduction. The infrastructure for utilization of pulp, saw timber, and biomass, and skills and equipment are all necessary for cost effective treatments.

Declines in the forest products industry due to the recession of 2007-2009, a continued weak housing sector, and international competition for forest product commodities has caused industry infrastructure to decline or be nearly lost in some locations such as parts of Illinois, and Indiana. In other areas with abundant supplies of wood, the recent decline in the forest products industry has led to many closures of forest product companies. When infrastructure and skills are lost, costs for services go up. There is a reluctance to invest in high value equipment and facilities when market uncertainties exist. It is unclear how the demand for wood products, including biomass, will impact wildland fire management in the Northeast. Currently where biomass markets are available, hazardous fuels that are otherwise non-merchantable can be treated and disposed of at a lower cost.

Impacts from Event-created Fuels

The presence of abnormal amounts of (severe storm activity, pests, and other drought-related effects) event fuels continues to exacerbate the risk of wildland fire in the Northeast.

Climate change may accelerate the frequency or increase the severity of disturbances, such as drought, catastrophic winds, ice storms, rainstorms, wildfires, and floods and evidence continues to mount that disturbance events are increasing in frequency and intensity. Uncertainties exist with relation to short and long term impacts on wildfire management when considering changes like more frequent disturbances (i.e. wind and wildfire) and increased amount or severity of pests and diseases which can increase fuel loading (Swanston, et al., 2011).



Presence of Threatened, Endangered, and Sensitive Species Habitat

In many cases the lack of fire has created a worse situation for threatened, endangered, and sensitive animal and plant species and unique natural areas. The natural vegetation is structurally different than in the past, thereby altering the natural community and making it more vulnerable to subsequent wildland fires with undesired effects.

Impacts from Invasive Plants

The presence of invasive plant species such as Japanese Stiltgrass, Common reed grass (Phragmites), and mile-a-minute plants are causing changes in fuel loading and fire risk in the region. These species increase rates of spread, increase fire intensity, and add to the complexity and risk of suppressing wildfires and conducting prescribed burns.

Skills and Resource Capacity Concerns

Loss of experienced and skilled personnel and lack of experienced workforce and resource capacity to return fire to fire-dependent landscapes exists and is due in part to a lack of public awareness. As a result, along with unreliable and inadequate levels of funding for staffing, efforts to gain needed training and experience efforts are hampered when opportunities exist. These skill and capacity needs also extend to expertise required for carrying out rehabilitation activities to address water quality and erosion issues following a wildfire event.

Limited Scientific Information

While there is an abundance of fire related science which is pertinent to most areas within the Northeast Region, there is limited science related to the role of wildland fire in New England. There is also a need to improve fuel treatment effectiveness, smoke management strategies, and wildland fire planning using the best available science.

Coordination and Collaboration Barriers

Government agencies at all levels, partners, and stakeholders must be able to effectively and efficiently share resources such as aircraft, heavy equipment, and prescribed burning crews. There is a critical need to remove policy barriers and process complexities which affect the ability to effectively and efficiently share resources, not only for wildfire management and response, but for fuels and prescribed fire work.

Cohesive Strategy Goal 2 – Fire-adapted Communities

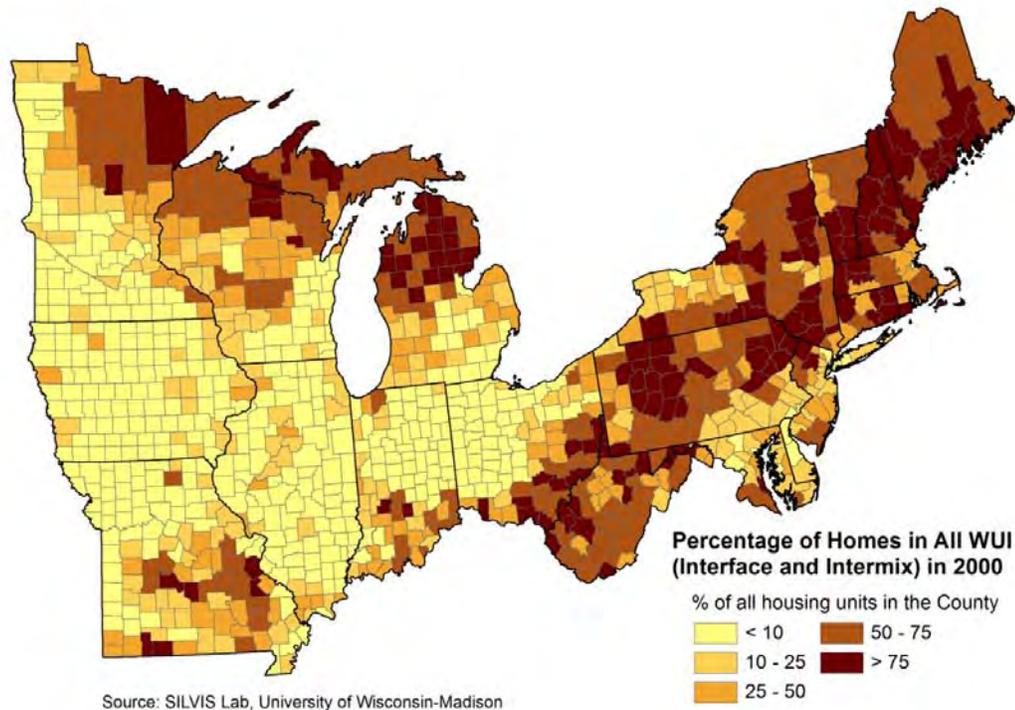
A suite of risks, barriers and critical success factors including expanding human populations, increased human-caused wildfire ignitions, and fuel accumulation (from wind, ice, insect, and disease events, as well as vegetation growth in the absence of fire) continue to create complex challenges for communities across the Northeast. Community adaptability is at the center of coordinated cross-jurisdictional wildland fire management that addresses quality of life as a part of the larger environmental landscape. A fire adapted community acknowledges the risks associated with its surroundings and, together with fire authorities including local fire departments, mitigates risks to safety and a sustainable quality of life. Listed below are the key risks, critical success factors, and barriers to implementing Goal 2 in the Northeast Region:

Urbanization and Landscape Fragmentation

The highest proportion of land in the wildland urban interface (WUI) is in the east, reaching a maximum of 72 percent of land area (map f) in Connecticut, and the highest number of housing units in WUI in



New Hampshire (Radeloff, Hammer, Stewart, Fried, Holcomb, & McKeefry, 2005). Census projections for the Northeast point to a steady increase in overall population. The vast majority of this growth will expand urban areas, often at the expense of wildlands. By 2050, total population across the 20 states is expected to exceed 137 million (USDA Forest Service, Northeastern Area State and Private Forestry, Cooperative Fire Management), with a 133 percent increase in urban area (Nowak, Walton, Dwyer, Kaya, & Myeong, 2005) (Nowak & Walton, 2005).



Map f. *Wildland Urban Interface - shown by percent of county of interface and intermix (all WUI). The wildland-urban interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline.*

Fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Parcelization differs from fragmentation in that the ownership of a tract of land is broken into increasingly smaller tracts. (Figure c)



Figure c. Illustration of fragmentation and parcelization differences

Expanding urbanization increases the risks to ecosystem health from wildland fire and invasive species. Accelerated forest conversion and fragmentation threatens ecological function (USDA Forest Service, Northeastern Area, 2007). An increase in the amount of wildland urban interface (WUI) will increase the complexity of fire management across the Northeast and Midwest. The expanding WUI may lead to tighter restrictions on smoke production from prescribed burning for health reasons.

Lack of Local Planning and Coordination

There are conflicts and barriers to fire adaptation by a lack of coordination among local land use planning, building ordinances, and building codes. This lack of planning among local jurisdictions and building codes hinders the comprehensive efforts needed to address risks to communities ranging from hazardous fuels or activities such as unregulated debris burning that can pose threats to life and property during periods of high fire danger.

Other related areas where inadequate planning contributes to wildfire risks are failing to insure there is sufficient access for emergency response equipment, especially in rural areas; and not providing defensible space (space around structures that has been cleared of flammable vegetation to reduce the risk of wildfire), and the necessary infrastructure for adequate water supplies for firefighting.

There are several programs available to communities to assist them in developing plans to address these types of risks posed by wildfires, such as Firewise Communities USA and Community Wildfire Protection Plans (CWPP). While some communities have utilized these programs, far more, especially those in fire prone areas most at risk have not. The primary reason for this lack of program utilization is a lack of understanding of the fire risk to property and how these programs would be helpful. Communities generally don't take action because they don't see the risk.

Lack of Awareness and Complacency

Most fires in the Northeast U.S. are started by humans and immediately place homes and property at risk. National Fire Information Reporting System (NFIRS) data compiled with state and federal fire data is now available for this analysis. The lack of awareness regarding this information creates a perception that there are limited fire issues in the Region.

Increasing wildfire risk (seasonal or more expansive) needs to be continually disseminated to a broad audience including the fire community and public. Homeowners and recreation users are spread



throughout the wildlands and wildland-urban interface (WUI) and may be unaware of the wildfire risks resulting from weather events such as wind storms and drought, invasive plants, and flammable building materials and landscaping. The biggest impact in recent years has been a rise in evacuation frequencies which can present significant costs to communities and agencies (McCaffrey, Personal Communication).



Figure d. Potential WUI hazard (Source: Heidi Wagner, Firewise Advisor, National Fire Protection Association)

There is a need to acquire data on the effectiveness and lessons learned from the various prevention programs being utilized by all wildland fire community partners.

More Effective Use of Resources

Cost-effectiveness in preventing and managing wildland fire is as important now as ever. With reduced budgets and resources, organizations need to strive for cost-effectiveness while at the same time ensuring firefighter and public safety are not compromised. Many firefighters not only act to suppress structural and wildland fires, they carry out prescribed burning activities, and respond to other emergencies.

A lack of agreements and memoranda of understanding (MOUs) creates jurisdictional barriers to efficient and effective treatment and maintenance of fuel-treated areas (for example, neighborhood agreements)

Cohesive Strategy Goal 3 – Wildfire Response

Throughout the Northeast, local fire departments, both career and volunteer, are key partners and are often the first and sole responders on wildfires. Support from Federal and state agencies is vital. Wildfires may be small in size, but numerous, and occur in bursts throughout the fire seasons creating a high risk potential to life and property when wildfire do occur. These factors, combined with the density of people and parcels of land under diverse ownership, create a complex wildfire response environment. A balanced wildfire response requires integrated pre-fire planning with effective, efficient, and coordinated emergency response. Listed below are the key risks, critical success factors, and barriers to implementing Goal 3 in the Northeast Region:



Firefighter and Public Safety Risks

Risk of injury or fatality on wildfires in the Northeast aligns with the four major common denominators of fire behavior on fatal and near fatal fires: relatively small fires; light fuels such as grass, leaves, and light brush; unexpected wind shifts; and fire running uphill. Reports show (Mangan, 2007) that the leading causes of wildland firefighter deaths are by heart attacks, particularly volunteer firefighters (Figure e). The number of volunteer firefighters dying from heart attacks probably can be explained by a couple of factors: many more volunteer firefighters are involved in wildland fires on the local level than are agency firefighters, and many volunteer departments have no physical fitness testing or health screening requirements. Burnovers account for twenty percent of fatalities and injuries according to reports.

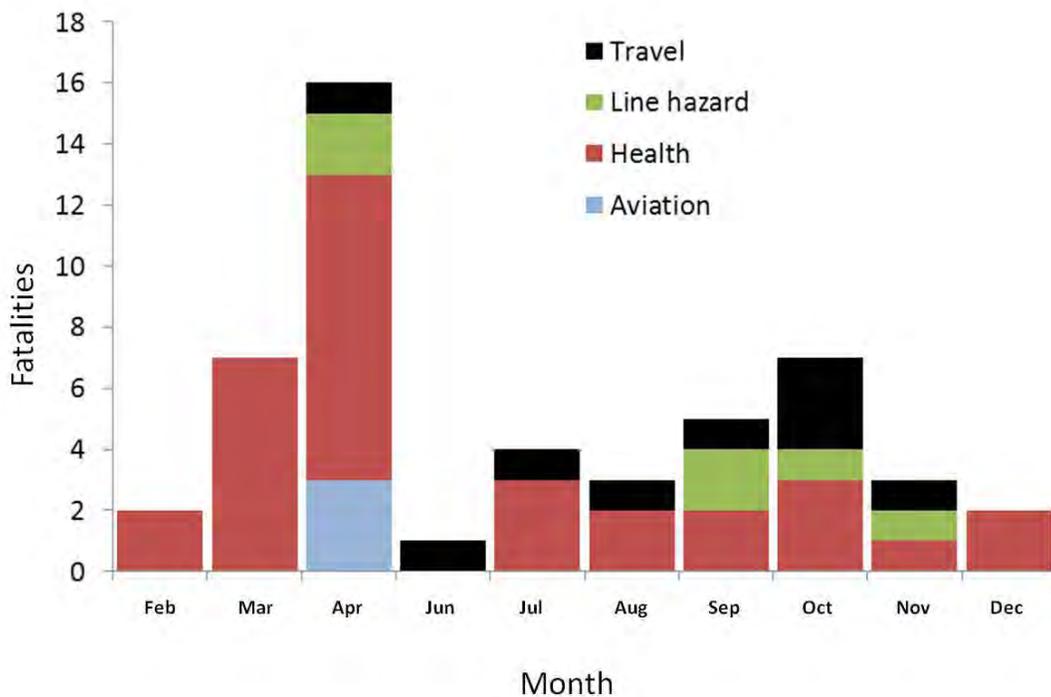


Figure e: Northeast monthly wildland firefighter fatalities by the activity or cause that led to death (1990-2012)

There is an ever present concern for public safety related to wildfires, including evacuations, protecting home and property, and post fire trauma or distress (Mangan, 2007). This concern includes the need to improve and maintain infrastructure (airports, roads and bridges, etc.) that affect wildfire response. Other related areas where inadequate planning contributes to wildfire risks are failing to ensure there is sufficient access for emergency response equipment, especially in rural areas.



*Figure f. Wildfire in the Wildland Urban Interface or WUI
(Oceana Dunes Fire, 2005 Michigan DNR)*

There is also an increased risk of injury or fatality to fire fighters and the public while responding to fire emergencies. This includes insuring that qualification, training, health and physical standards are met for all emergency responders.

Another key concern is with communications on wildland fire incidents as there continue to be serious safety issues related to cost, complexity, and lack of interoperability of fast changing radio systems.

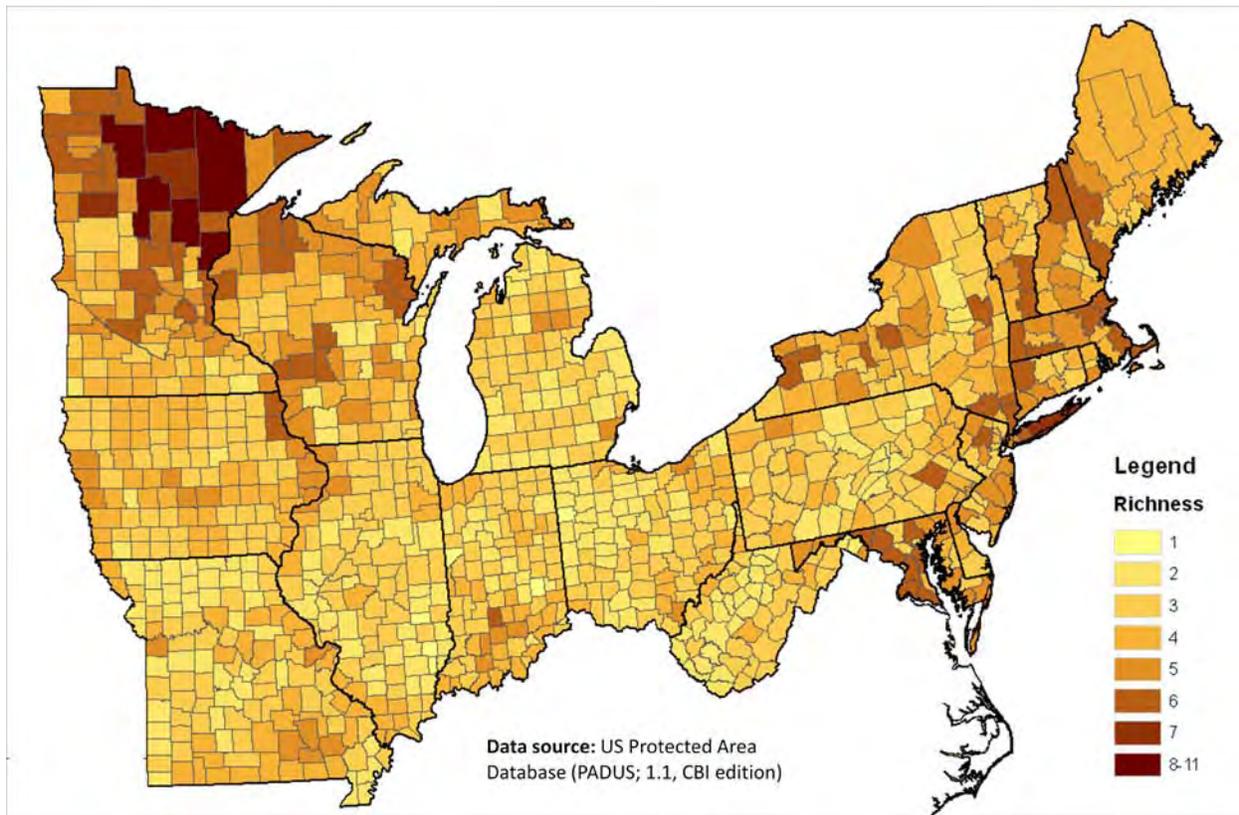
Shared Investment in the Firefighting Workforce

Continued and increased investment in the firefighting workforce is necessary in order to maintain capacity to respond to wildfire as well as mitigate fire hazards. A lack of investment in the firefighting workforce will lead to: fewer firefighters on the ground which will potentially lead to: reduced safety, reduced capability at accomplishing local projects, reduced initial attack and extended attack success, and diminished incident management capabilities that includes Northeast contributions to the national suppression efforts.

Overall, the wildland fire fighting work force is aging, and recruitment, especially of volunteer fire fighters is becoming more difficult. In the long term there may be a generation gap in the fire fighting work force available for future leadership in the fire community.

Differing Jurisdictional Responsibilities

The Northeast Region is a patchwork of jurisdictions and ownership, and often more than one agency may be involved in the management of wildland fire (Map g). Every agency has a different set of policies guiding their response to wildland fire. Many states are mandated to suppress all wildfires, while federal agencies have some flexibility to manage natural ignitions to benefit resources. Land ownership juxtaposition creates challenges such as obtaining access, and in some cases, who automatically responds, when responding to an incident.



Map g . Illustrates county jurisdictional response richness for the Northeast as measured by the number of different federal agencies, and state and local presence. The more entities with presence in a county, the higher richness becomes, regardless of area held. This map treats all local jurisdictions as one entity.

Suppression options, cost share, and policy differences are a few examples of what is considered on each initial attack. The primary response agency for most wildland fire incidents in the Northeast is the local fire department. In addition, many solutions have been developed within the Region, which support efficient and effective fire management programs, like state-level Type 3 Incident Management Teams (IMT) and a regional interagency Type 2 IMT. Each area of the region defines their respective protocols based on past successes.

The fire community in the region lacks an inclusive approach to the development of a “lessons learned” program where both successes and failures are shared for the benefit of all fire managers in the Region.

Inability to Maintain or Increase Local Capacity

There are many and various scales of wildland fire management within and across the States, all with a dependence on local fire departments and other local resources. More than 13,500 local fire departments provide wildland fire protection support on public and private lands in the region (USDA Forest Service, Fire and Aviation Management). Local fire departments, both professional and volunteer, are key partners and are often the first and sole responders on wildland fires. Maintaining or increasing the capacity of local fire departments to respond to wildfires is vital to augment state, federal, and tribal response needs, which also need to be maintained. There is evidence that infusions of money and



equipment into poorly funded VFDs is effective in improving response capacity through a number of existing programs such as Volunteer Fire Assistance (VFA), Fire Fighter Property (FFP), and Federal Excess Personal Property (FEPP).

Most of the fire community is also vital to all hazard response in the Northeast. Wildfire preparedness at the local fire department level is often overshadowed because of the responsibility for all hazard and medical emergency response.

Inadequate Training and Qualifications Coordination

Inefficiencies in the national qualification standards and procedures must be addressed to increase response capabilities. Responding to wildland fire events is a complex, interagency task. Many resources that would otherwise be available for mobilization are unavailable because of cumbersome qualification standards and procedures. As a result, resources are not available for mobilization

A shorter time period for meeting qualifications is needed to have more resources available for mobilization. Better coordination is also needed among local, state, tribal and federal agencies who are investing in training. A set of clear definitions for position requirements for training and experience would improve the ability of individuals to meet the qualifications standards.

Incompatibility of Policies and Standards

Policy barriers and process complexities can adversely impact the ability to effectively and efficiently share resources, not only for wildfire, but for fuels and prescribed fire work. For example, qualification standards pose barriers to sharing resources when the USDA Forest Service follows one set of rules, while all other state and federal agencies follow the Wildland Fire Qualification System Guide, PMS 310-1, and local resources a third set of rules.

Different budgeting and fiscal policies limit the ability of agencies to share resources. Changes in the federal agencies fiscal policies have eliminated the ability of federal agencies to facilitate the movement of resources on non-federal fires. This will result in larger more expensive fires and greater losses.

How can our management actions mitigate the impacts of wildland fire?

The following descriptions for each Cohesive Strategy goal are intended as guidance by the Northeast Regional Strategy Committee for the development of feasible management actions that will address the risks, barriers and critical success factors listed in the previous section.

Cohesive Strategy Goal 1 - Resilient Landscapes

Wildfire and fuel hazard mitigation objectives can often be achieved through integrated planning at many scales. For example in pine types, more open canopied forest can be managed near homes. Ecosystem restoration and hazard mitigation can be very compatible objectives in fire adapted ecosystems in the region.

Education and Awareness - Continued engagement with the public on wildland fire management issues is important. Lack of action on the part of the public or landowner is not necessarily only due to lack of knowledge and understanding of fire risk; trust in those conveying the information and the availability of



personal resources to mitigate are also important. Educational programming should provide consistent messages, be realistic and related to local values and needs, and encourage personal responsibility.

Information is disseminated at conferences, such as the Fire in Eastern Oak Forests Conferences, and professional and agency meetings and is widely available on the internet (for example, <http://www.firescience.gov>) and in traditional published form. The challenge for fire managers as well as land managers is the synthesis and practical application of the abundant science to their local conditions to plan and implement fire management objectives to be effective on small parcels and landscapes, and across ownerships. Fire Science Consortiums, Fire Learning Networks (FLNs), and prescribed fire councils are increasing in the Region. These efforts have been successful at disseminating science and information, sharing successes and identifying common issues, and creating opportunities for joint implementation and hands-on learning at a more local level.

Cohesive Strategy Goal 2 - Fire-Adapted Communities

Shared responsibility between the public and local, state, and federal governments for wildland fire management and protection is a key to success. Land and home owner wildfire awareness programs, where used, have been highly successful, but programs like Firewise Communities USA are not widespread in fire prone areas today. Regularly occurring wildfires do not necessarily motivate landowners into action to reduce risks, such as fuels treatments to reduce vegetation density and surface fuels, use of non flammable building materials and fire resistant landscaping. Often professional advice and assistance with planning and funding are the missing pieces to action.

Wildland fire management in the Northeast Region is the result of collaboration, partnerships, and cooperation among states, Fire Compacts, federal fire management agencies (e.g. The Forest Service (FS), Bureau of Indian Affairs (BIA), National Park Service (NPS), United States Fish and Wildlife Service (USFWS), tribal governments, and thousands of local fire departments. The coordination and integration of wildfire management across jurisdictions varies by state. State forestry agencies are typically the lead agency in wildfire suppression and have been mandated to suppress all wildfires. Many entities from the local fire chiefs, law enforcement officials, and land managers to fire managers have roles and responsibilities that affect coordination for fire and fuels management and the use of fire to manage resources and protect values at risk.

Cohesive Strategy Goal 3 - Response to Wildfire

Public and firefighter safety was overall the dominant value shared by stakeholders. Most fires in the region are relatively small. Wildfire response is swift and aggressive with a reliance on ground-based equipment. Thousands of miles of roads provide vehicle access for emergency response: aircraft are used in those areas where access is limited. The many and various scales of wildland fire response and management occur within and across the States, all with a dependence on local fire departments and other local resources. More than 13,500 local fire departments provide wildland fire protection support on public and private lands in the region (USDA Forest Service, Fire and Aviation Management). Local fire departments, both professional and volunteer, are key partners and are often the first and sole responders on wildland fires. Maintaining or increasing the capacity of local fire departments to respond to wildfires is vital to augment state, federal, and tribal response needs. Most of the fire community is also vital to all hazard response in the Northeast.



Alignment of wildland fire management priorities poses challenges within states as well as across broader agency and organizational jurisdictions. One example of a successful partnership is the Minnesota Incident Command System (MNICS). This is an organization of state and federal agencies committed to providing coordination, education and implementation of the Incident Command System to support wildfire and all hazard incidents in Minnesota and nationwide.

With longer intervals between large wildfire events, investments in preparedness, at least across some parts of the region, is challenged and questioned, because wildland fire management is expensive. Wildland fire preparedness at the local fire department level can be overshadowed because of the responsibility for other emergency response. A 2004 survey of all Ohio fire departments showed wildland fire response to be the third greatest impact on the fire department behind structure fire and emergency medical services responses. For partially paid or fully paid fire departments wildland fire response was the fourth greatest impact with emergency management services (EMS) being number one. Additionally, due to the seasonal nature of wildland fires in the Northeast, it is challenging for fire departments to place consistent emphasis on this issue.

State forest fire programs vary in size across the area. In some areas they are the primary response agency and in others provide a support role to the local fire departments. In all cases, during times of significant activity, they are critical to support wildfire response and are reinforced through forest fire compacts between the states. The Northeast Region shares an international border with Canada, and several provinces are wildland fire management partners through agreements and fire compacts. The compact provide resource capacity that individual states could not afford to maintain.

Established under the Weeks Law and other specific legislation enacted by Congress, state forest fire compacts reduce wildfire suppression costs for local, state and federal jurisdictions by allowing states to share personnel and equipment and by minimizing the fire fighting burden on any single state during periods of high fire occurrence. There are four state forest fire compacts within the Northeast Region:

Northeast Forest Fire Protection Compact – States of New York, Connecticut, Massachusetts, Vermont, New Hampshire, Maine and Rhode Island; New England National Forests; the Canadian Provinces of Quebec, New Brunswick, Newfoundland Labrador and Nova Scotia; the National Park Service; and the US Fish and Wildlife Service.

Middle Atlantic Forest Fire Compact – States of Delaware, New Jersey, Maryland, Ohio, West Virginia, Virginia and Pennsylvania.

Big Rivers Forest Fire Management Compact – States of Missouri, Indiana, Iowa, and Illinois

Great Lakes Forest Fire Compact – States of Michigan, Wisconsin, and Minnesota; and the Canadian Provinces of Manitoba and Ontario



What was learned from the modeling results?

The types of data collected can be broadly categorized into five general types: biophysical, socioeconomic, land-use and ownership, wildfire frequency and extent, and incident response. Biophysical variables include physical measures such as precipitation, temperature, and terrain. They also include characteristics of vegetation that contribute to wildfire behavior. Socioeconomic variables describe the demographic and economic characteristics of populations and communities within each county, and also describe the distribution of homes within the wildland-urban interface. Land-use and ownership describes the mixture of public and private lands and also helps quantify the extent to which lands might be suitable for active management, e.g., by highlighting areas that historically supported forest product management. Variables describing wildfire frequency and extent have been gathered from various reporting systems that have been put in place by federal, state, and local fire departments. They also include data from independent monitoring systems that track wildfire using satellites and other remote devices. Finally, they include a series of modeled products from governmental and private entities. Similarly, incident response information has been gathered from many of the same reporting systems. These variables track who responded to wildfire, how long they took to arrive on site, and how long was required before the fire was contained. Information on injuries and casualties can also be found in these same reporting systems.

Before data were used in analysis, three additional steps were accomplished. The first step was one of quality control. Obvious errors in the data were corrected where it was apparent that the corrections would enhance the fidelity of the original data. In some cases limited numbers of observations were omitted from further consideration due to obvious mistakes that could not be corrected or missing information. The second step involved compiling, reformatting, or summarizing data to fit within a common sampling frame—the county. For some data sets, for example many of the social economic variables, data were originally provided at the county level and no reformatting was necessary. Other, higher-resolution data were processed using GIS techniques to provide a county-level summary. Many data were also normalized to provide comparative area-based or incident-based metrics such as acres burned per hundred square miles or firefighter injuries per 1000 incidents.

The third step in data preparation involved filtering and consolidation. In this step, a preliminary correlation analysis was used to identify common patterns among the data that allowed a subset of the data to be used to characterize conditions efficiently. That is, a smaller set of variables were identified that were highly correlated with other variables and could be used alone without significant loss of information. Statistical techniques including factor analysis and clustering were used to reduce the number of variables further by creating super variables that were either linear combinations of other variables (from factor analysis) or categorical groupings of counties based on their similarities (using cluster analysis). The combination of filtering and consolidation techniques allowed the total number of variables considered to be reduced by nearly two-thirds. Even so, there were over 100 variables available for potential analysis.



Alternative Approaches for Addressing the Cohesive Strategy Goals in the Northeast Region

Background

In the Phase II report titled: *A National Cohesive Wildland Fire Management Strategy: Northeast Regional Assessment*, the Northeast Regional Strategy Committee identified a set of broad and strategic objectives that will contribute toward success in each of the three national goals identified in the Cohesive Strategy.

In Phase III, the Northeast Regional Strategy Committee, along with stakeholders across the Northeast fire community, provided their views on the priorities among the options they developed for addressing each of the three national goals. The results of this input were analyzed and used to formulate the set of preferred investment options listed in this report. These represent the most important options the Northeast U.S. wildland fire community believes will guide a cohesive approach to achieving the three national goals.

The overall average preferences for the investment of resources in the three Cohesive Strategy goals on an annual basis are as follows: 32 percent for goal 1, 24 percent for goal 2, and 44 percent for goal 3. The responses were evaluated by organization and geographic sub-region respectively. Responses also indicated investment preferences for options within each goal. These preferred options were developed by the RSC for this risk analysis report from the full suite of objectives developed in Phase II. The full analyses of these responses are located in appendix 8.

The responses from the Northeast fire community illustrate the goal investment option preferences by agency or organization with wildland fire management responsibilities. These preferences are consistent with the varying missions among these levels and types of agencies and organizations, all with some measure of wildland fire management responsibilities. The preferences among the Federal and Tribal agencies show a fairly even balance among the 3 goals, approximately a third for each goal. Federal agencies indicate the highest percentage of investment in fuel treatment activities. The State agencies indicated substantially less investment in goal 1 and prefer to focus more resources toward goal 3 as they have greater and often mandated protection responsibilities. This is true especially for the local fire response agencies as they are primarily responsible for protection of life and property. These preferences are also consistent with the higher population and urban densities of the Northeast region, especially in New England.

Option preferences for investment in goal 2 range from about 15-30 percent, with the highest percentages for the Federal and Tribal entities and the lowest percentages by the local agencies. This is due primarily to funding availability, as these types of activities usually represent a lower funding priority compared to meeting mandated protection responsibilities, not necessarily to management preference or effectiveness of investments.

The responses also illustrate the variation of goal investment option preferences by geographic sub-region within the Northeast U.S. The investment preferences are much more balanced among sub-regions than among agencies and organizations within each sub-region. There is a noticeable difference between New England, New York, and the Mid-Atlantic and Mid-West in goal 1 investments (fuel



treatments activities). This may be due to less available acreage to treat, a shorter burning “window” due to seasonal variability, and especially to a significantly higher population density in the region that often limits the feasibility of treatments due to landscape fragmentation, proximity to urban areas, and related health concerns to smoke from burning.

Description of the Northeast Regional Investment Options for Addressing the Cohesive Strategy Goals

Listed below in this section are three feasible investment options for each of the three Cohesive Strategy goals that were developed from the full suite of objectives outlined on the Phase II Northeast Regional Assessment Report. These investment options are based on the responses of the Northeast Regional Strategy Committee and the broader fire community across the Northeast U.S. (See Appendix 8 for the detailed analysis). These options are presented under each Cohesive Strategy goal in order from those with the greatest number of preferences expressed in the responses to the least, but there is significant variation among individual entities throughout the region. All of these options are considered *feasible approaches* to addressing the three Cohesive Strategy goals, as are other possible combinations of these investment options, depending on the particular agency mission, geographic location, past management practices, the risks or issues to be addressed, ecosystem type, proximity to population areas, presence of threatened and endangered species, invasive species, and other factors. It is expected that these options will be evaluated by fire management specialists and decision-makers based on these many factors, and based on past and current successes and the data, when and where available, from a scientific perspective.

Each investment option description includes a discussion of the background and current situation related to the option, a description of the key risks, barriers, and critical success factors the option is designed to address, some opportunities that have been identified to address these risks, barriers, and critical success factors, the relationship this option may have to other options described in this report, and if applicable, any external factors that may influence the ability to implement this option.



COHESIVE STRATEGY GOAL 1: *Restore and Maintain Landscapes – Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives.*

Option 1A - Increase the use of prescribed fire where multiple benefits can be achieved including, but not limited to, wildlife habitat, silviculture, threatened and endangered species habitat, ecosystem restoration, and where fire can be effective in control or eradication of non-native invasive plants.

Background - Native Americans and early settlers used fire to clear land or maintain open grasslands and forests of the Northeast (NASF Prescribed Fire Survey 2012). In the past when and where a burn would take place was solely the decision of the owner or manager. Much of the Northeast forests and open areas were created and maintained through repeated burning, either through natural causes like lightning or by humans.

Large devastating fires like the Peshtigo Fire in Wisconsin in 1871 which occurred during heavy land clearing and logging eras changed the way the Northeast viewed unregulated open burning. Most states opted to regulate when open burning could occur, such as Ohio, which bans outdoor burning during March, April, May, October, and November from 6 am to 6 pm daily, when escaped prescribed fires can cause the most problems. The State Forester can waive this law and does so for certified prescribed fire managers. In Maryland's urban counties there is no open burning from June 1 to September 1 due to air quality issues.

Current situation - Compared to the other regions of the country, prescribed burning is used the least in the Northeast Region, about 2% of the national burning activity done in 2011 according to a national survey. According to the survey (NASF Prescribed Fire Survey 2012), all states in the Northeast have some level of prescribed burning. Most prescribed fires are accomplished for forestry purposes. The majority of burning is achieved by state and federal agencies although locally private landowner burning is significant. Uncertainties exist related to how much should or could be burned given capacity of agencies and organizations, air quality issues, budgets, and many local concerns (NE Phase II Regional Assessment report).

Prescribed burning can be an effective tool to meet management objectives whether on public or private lands, forest or in agricultural areas, and in urban and rural areas. Eight states in the Northeast Region have prescribed fire councils whose overarching goal is to create one voice to assist fire practitioners, policymakers, regulators, and citizens with issues surrounding prescribed fire use. In addition to the federal agency burner training and certification program, four of the 20 states have an active burn manager certification program. These programs generally are developed to promote the public health, safety, and general welfare of those involved in contact with prescribed burning, prevents economic damage, death, or injury due to the misuse of open or prescribed burning, and ensures the use of proper prescribed burning procedures.



Figure a. Prescribed Burning In Vermont (Dead Creek WMA, Addison, Vermont, April 13, 2012 Brooke Taber, NWS)

Landowners in the Northeast region have diverse interests and objectives for their land including wildlife habitat, recreation and tourism, tax interests, aesthetics, and ecosystem health and sustainability. Stakeholder input has indicated that prescribed burning is used to meet a wide range of objectives, and that under many scenarios burning actually accomplishes more than the primary objective. Prescribed fire and fuels reduction are often compatible practices if it helps achieve the primary objectives for the land (NE Phase II Regional Assessment report).

Many of the federal land management units, such as national forest, wildlife refuge, or national park, have plans that specify burning to meet their goals and objectives. Land and Resource Management Plans for the 15 national forests occurring in the Northeast Region expect increasing levels of burning to meet public and resource objectives. National Wildlife Refuges in the region burn just over half (55%) the acres needed to meet objectives where funding drives capability and capacity to burn (table a). To maintain or restore some ecosystems and habitats larger areas are necessary to meet the needs for some plants, animals, and insects. In areas where managing naturally caused wildfires is allowed, such as northern Minnesota (Voyager NP, Superior NF), the combination of the two methods has the potential to achieve multiple objectives on a larger portion of the landscape.

Table a. National Wildlife Refuge Burning in the Northeast (US F&WS)

Burnable Acres	1,538,540
Acres to burn per year to meet objectives	145,200
Average Acres Burned, per year	80,000
Deficit Burning	65,200

Due to the absence of wildland fire today combined with fragmentation due to land use variability, many species of plants and animals which depend on fire to maintain habitats are at risk. In addition to federally listed species, states have identified plant and animals that are threatened, endangered, or



sensitive. Many need habitats that are effectively and efficiently created and maintained using fire (table b).

Table b. Threatened or Endangered List for Northeast States

Animals	EA_COUNTIES
American burying beetle	5
Dakota skipper	15
Delmarva Peninsula fox squirrel	9
Eastern massasauga	119
Gray bat	64
Indiana bat	412
Karner blue butterfly	33
Kirtland Warbler	33
Ozark big-eared bat	2
Poweshiek skipperling	5
Sprague's Pipit	3
Virginia big eared bat	5
Plants	
Eastern prairie fringed orchid	116
Houghton goldenrod	9
Leafy prairie clover	9
Mead's milkweed	29
Prairie bush-clover	49
Running buffalo clover	41
Short's bladderpod	1
Small whorled pogonia	4
Grand Total counties	963

Most states are actively managing smoke from prescribed burning using smoke management programs or policies to guide prescribed fire use. The programs identify conditions which are acceptable for smoke transport and dispersion.

Barriers/Risks/Critical Success Factors - Of the nine impediments (table c) to prescribed burning identified nationally - capacity, weather, resources, and permitting and legal concerns are the top four prescribed fire implementation challenges in the Northeast, although every concern occurs someplace within the region.

Table c. Prescribed burning impediment categories (NASF Prescribed Fire Survey 2012)

Impediment Category	Description
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

Other challenges to expanding burning in the Northeast are:

- Conflicts with forest products utilization and economic losses. Scorched bark and damage to wood can affect how a tree can be used.
- Wildfire season is also prescribed burning season in many areas. Additional personnel and equipment are often needed to do both safely, which adds cost that strain already stretched budgets.

Opportunities - *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.* (NASF Prescribed Fire Survey 2012)

Opportunities to expand or increase prescribed burning will ultimately be the decisions of agencies and states as well as the collaborative decisions of local conservation partners. Collaboration leads to resolving many of the funding, capacity, and resource issues that limit the ability of many single organizations to maintain and to increase burning. Some opportunities and ways to expand the use of prescribed fire are:



- Expand burning in those areas farther away from heavily populated areas, with a variety of conservation partners. Areas like northern Minnesota, Maine, and the more isolated areas of New York and Missouri may offer opportunities to increase the levels of burning without many of the conflicts related to risk or public health and safety. There is also an economy of scale, with burning larger pieces of ground. The Mark Twain National Forest has been able to increase their burn unit size by using aerial ignition techniques, roads as control lines and developing agreements with land owners to allow burning through private lands. Other agencies and organizations have successfully increased burning by sharing burn qualified personnel and equipment.
- Potential expansion could be found in areas where private lands adjacent to public lands are managed for multiple purposes. Identify areas where burning is going on successfully and seek collaboration with adjacent or intermingled public and private partners.
- There are many private conservation partners throughout the Northeast Region. Identification of areas where there is compatible land management objectives will also be important to collaborative burning efforts especially where private land owners can take advantage of partnering with agencies and organizations that have a skilled burning workforce and are burning on adjacent lands.
- There are opportunities for increased levels of outreach and education that can be tailored to local conditions and public areas. Websites like Visit My Forest (<http://www.visitmyforest.org/>) promote and demonstrate how prescribed fire is used to meet public desired condition in recreation and hunting and fishing areas.
- Increase the number of prescribed fire councils to assist public and private burners, and share the voice of burners statewide. Councils have been successful in supporting and actively resolving issues in states like getting burner certification programs started, liability legislation for certified burners, and training. To date, the New Hampshire Prescribed Fire Council, which consists of 13 partners, has been successful in establishing State-wide prescribed fire qualification and training standards as well as a standardized template for prescribed burn plans.
- Expand The Nature Conservancy (TNC) sponsored fire learning networks (FLN). Currently there are 2 FLNs that cover a small amount of the Northeast Region, and one in development (MI). Part of the mission and objectives of the FLN is peer learning and learning exchanges to overcome barriers to sustainable and integrated ecological, economic and social solutions.
- Prioritize burning among local organizations and agencies could resolve the capacity issue, by collaborating on the highest priority areas when the burning windows are available.
- Pursue suppression agreements with agencies and organizations to free up personnel for prescribed burning. This could partially address conflicts with using the same personnel for suppression and burning.
- Establish a Joint Fire Science program to cover all areas of the Northeast.



Option 1B - Emphasize and actively manage to maintain, restore, and expand when possible, to increase the extent of fire dependent ecosystems and expand the use of fire as a disturbance process. Employ mechanical or other non-fire treatments to reduce risk before re-introducing fire to the ecosystem.

Background – Wildland fire has played a key role in shaping the ecosystems of the Northeast. Both lightning caused and human ignited fires once burned across landscapes creating a mosaic of conditions and habitats. Land uses, values, and fire suppression have changed the distribution, function, and sustainability of fire dependent systems. Some ecosystems that depend on fire, such as prairies were converted for mostly agricultural purposes, while other fire maintained ecosystems converted to more closed canopied forests.

Land-use patterns have greatly affected ecosystems spatial distribution, connectedness and function. Ownership patterns, parcel size and varying management objectives makes ecosystem management in fire dependent landscapes challenging, and for some ecosystems nearly impossible. Expanding development such as housing and commercial developments also increases costs for treatments and limits managers' ability to use beneficial fire on the land as a management tool. Smoke from prescribed burning or from wildfire can have negative impacts on public health and safety, which can restrict using fire to restore ecosystem health (NE Phase II Regional Assessment report).

Current Situation

"The first rule of intelligent tinkering is to save all the parts."
Aldo Leopold, A Sand County Almanac

Remnants of the once larger areas of fire dependent ecosystems occur in uplands and wetlands, across all the states in the Northeast Region. For example, pitch pine communities and their associates tend to occur on well to excessively drained sandy soils on the Atlantic seacoast, and are found from central New Jersey, northward into southern Maine. Often referred to as "barrens" they can be found on outwash plains within interior areas as extensive pine-oak communities. This type is also represented by exposed ridges or southern facing slopes found within more hilly terrain such as the White Mountains in New Hampshire, Green Mountains in Vermont, and Adirondack Mountains in New York. Boreal spruce and pine, jack pine, and northern pine and mixed pine/oak communities are also examples of fire dependent communities across the northern tier states in Minnesota, Wisconsin, and Michigan, and east to New York into Maine. The oak and oak- hickory communities are the most extensive fire dependent systems remaining in the Northeast. Based on the fire regime graphs, fire is lacking for the majority of these types and when overlaid with wildland-urban interface (WUI) area distribution that tends to have the highest values potentially at risk.

Fire Regimes in the Northeast US - A diverse array of fire-adapted plant communities once covered the eastern United States. European settlement greatly altered fire regimes, often increasing fire occurrence (e.g., in northern hardwoods) or substantially decreasing it (e.g., in tallgrass prairies). Notwithstanding these changes, fire suppression policies, beginning around the 1920s, greatly reduced fire throughout the East, with profound ecological consequences.

The absence of fire was noted by many ecologists and fire experts across the Northeast as being the missing disturbance factor which also influences composition and structure so the ecosystem has departed from a historic point of reference (Figure a).

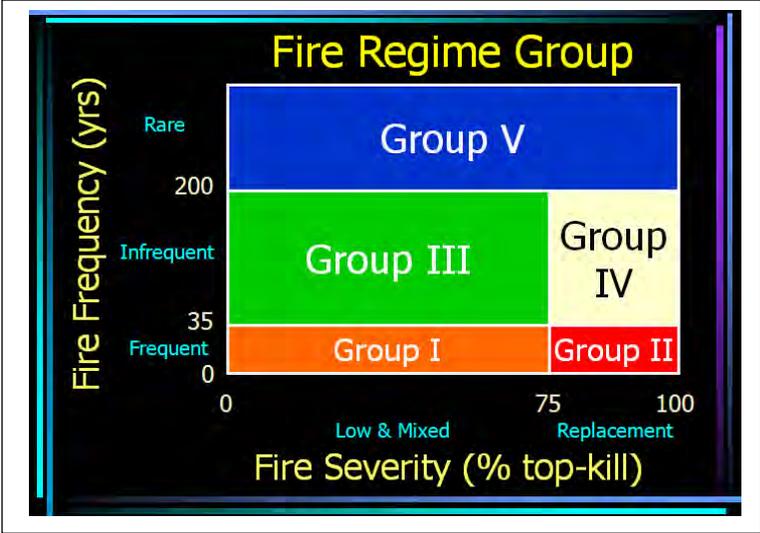


Figure a. Fire Regime Condition Classification Chart

Areas evaluated as fire regime group III have greater departure from natural conditions than fire regime group II, with fire regime group I being defined as within the range of natural variability in terms of ecosystem health (Figure b). Without fire, forest and woodlands develop closed canopies and as a result of shading, shade-tolerant, fire-sensitive plants replace fire-tolerant plants. (See appendix 7 for more details on fire regime classification)

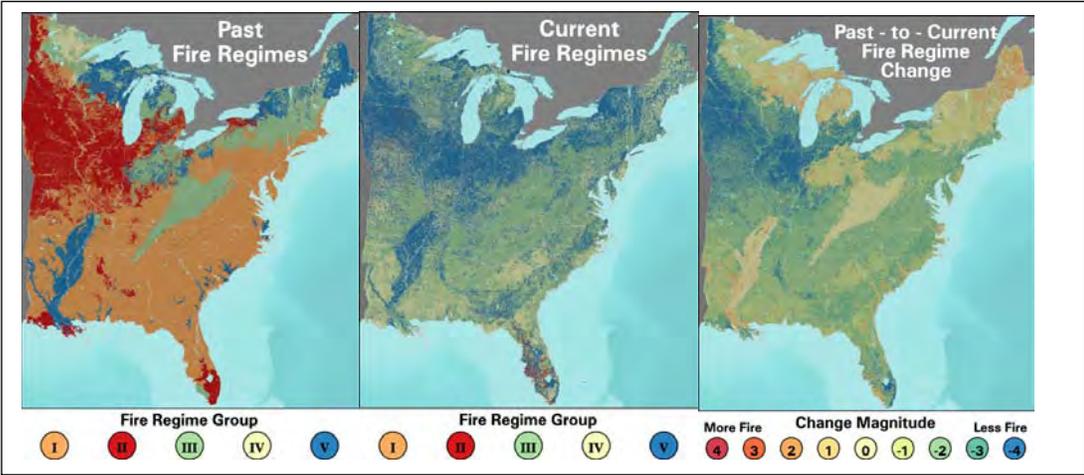


Figure b. Fire Regime Progression Changes in the Eastern US

These longer fire return intervals continue to favor shade-tolerant species at the expense of shade-intolerant, fire-adapted species. Stand-level species richness is declining, and will decline further, as numerous fire-adapted plants are replaced by a limited set of shade-tolerant, fire-sensitive species, as

well as invasive plants. As this process continues, the effort and cost required to restore fire-adapted ecosystems escalate rapidly. (Nowacki et al. 2008)

The majority of land in the Northeast is in private ownership, and large areas of public land are generally isolated from each other. In forested areas, large blocks of private, forested lands, once under management by forest products and paper companies, have been or are currently being subdivided and sold, further adding to the numbers of owners and fragmentation.

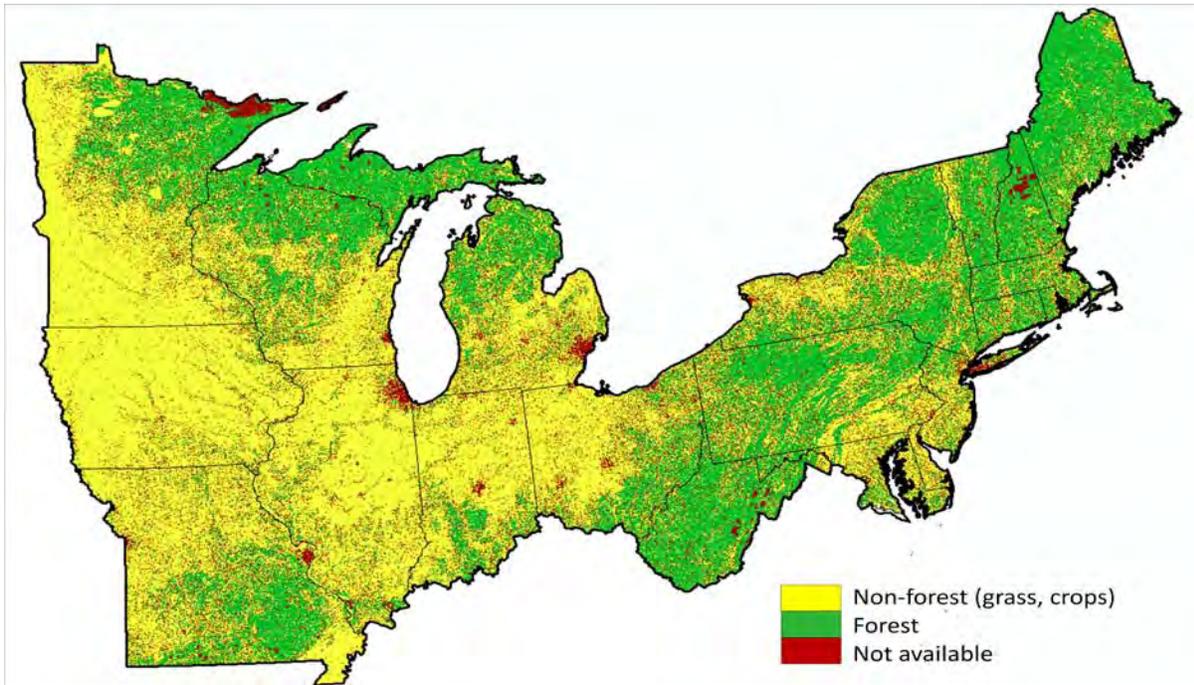
Although all areas are important and have values, the size of area presents varying benefits and challenges. Small land parcels can be more vulnerable to many influences such as invasion from non-native species, or more disturbances such as wildfires, and may take costly conservation measures to maintain. Often, these same parcels function as natural areas for the public- as examples of a potential management approach for others to consider in restoring other lands or seed collection areas. Large tracts of land may be sustaining more of the diversity and function than small parcels, but also need maintenance to ensure sustainability, and using larger scale fire presents challenges in remote and populated areas of the Northeast.

To achieve composition and structure objectives mechanical and possibly chemical treatments need to be employed, along with prescribed fire. In cases where fire intensity creates an unacceptable risk of escape or fire severity may be too high to achieve objectives removing some of the fuels like trees, shrubs, dead and down material may be necessary to be successful (Map a). Pre-treating areas before prescribed fire is applied may be necessary to have successful results in the long term.

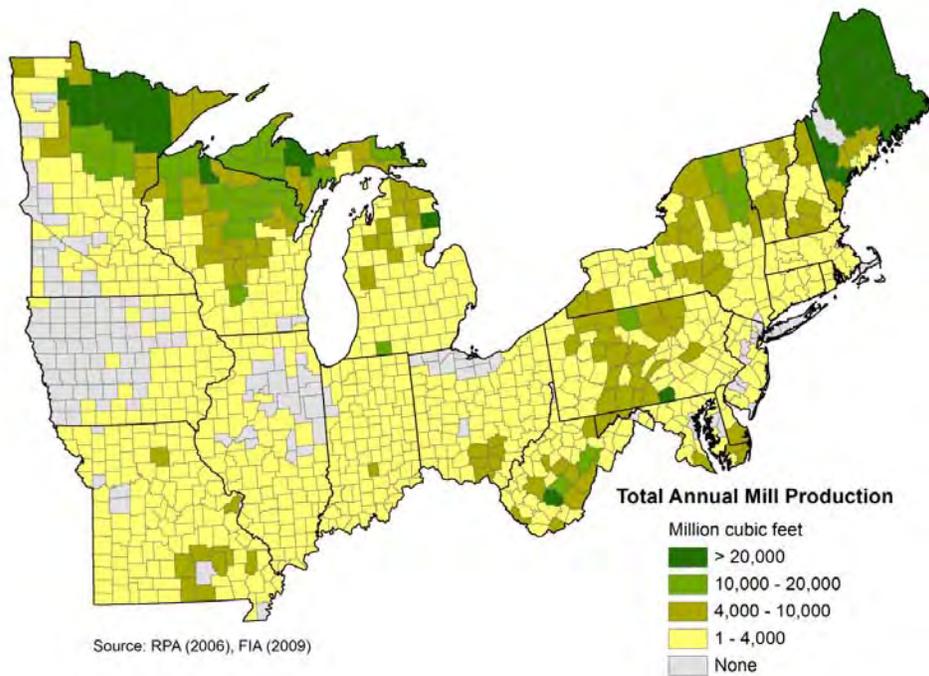
The Buckhorn Wildlife Area in central Wisconsin is managed to promote an oak-pine barrens native community on 934 acres of land by utilizing commercial timber harvests, firewood salvage, piling, and burning.. Due to the lower development and public use and the large fire-break provided by a lake, the wildlife area provides opportunity to use prescribed fire as a primary management tool.

Using mechanical means to achieve the desired objectives have been used in developed and undeveloped areas whether forested or non-forested, and many types of equipment are employed depending on land use, the terrain and management objectives. Mechanical treatments commonly refer to hand or mechanized methods of treating vegetation. They can include mowing, brush cutting, girdling, chopping, thinning, pruning, anything that achieves the desired structure of the vegetation and fuel reduction objectives. Management objectives have been met by combining treatment types and in some areas grazing and herbicide are used in combination with mechanical options and prescribed burning.

Market conditions, as affected by product availability of raw materials and profitability have caused losses of the wood product industry whose skilled workforce and machinery are needed to achieve many of the composition and structure objectives as efficient and cost effective. Achieving these cohesive strategy goals is more likely in areas with forest products industries or woody biomass markets, although there are successful partnerships for prairie, savanna and barren restoration efforts in non-forested areas. As map b below indicates, there is a presence and some potential mill capacity for utilizing products in much of the Northeast, although as mentioned earlier, it is slowly declining. Increasing mechanical treatments to reduce the risk of wildfire in the wildland-urban interface, especially where wood utilization capacity exists is still a viable, cost-effective solution to addressing these to mutually compatible benefits in the Northeast.



Map a: Forest areas generally available for mechanical fuels treatment in the Northeast based on fuels and road accessibility. Areas not available include urban areas, water bodies, etc. Non-federal Wilderness Areas and Inventoried Roadless Areas are also excluded.



Map b. Mean annual mill production based on Forest Inventory and Analysis surveys



Wildfire is aggressively suppressed in those areas that experience high fire intensity and areas where fires burn more readily, such as ecosystems adapted to recurrent fire. This can have an unintentional negative affect allowing fuels to build-up which in turn increases the risk of higher intensity fires.

Currently only two percent of the national need for prescribed fire has been applied to the landscape in the Northeast. This rate needs to be increased substantially in order to conserve or restore many fire dependent ecosystems. Federal agencies, such as the U.S. Fish and Wildlife Service, recognize that they are burning only 55% of the burnable acres in their jurisdictions. The authority to manage naturally caused wildfire only exists with a few federal land management units, such as Voyageurs National Park and the Superior National Forest. The combination of prescribed fire and naturally caused wildfire on a greater percentage of the landscape allows more fire disturbance in those ecosystems that need it. Using naturally ignited fire and prescribed fire to mimic stand replacement fire in ecosystems like jack pine are nearly impossible because of the risk associated with failure (i.e. high value resources at risk). Collaborative planning is necessary to maintain the jack pine and pitch pine ecosystems in populated places like New Jersey, Michigan, Wisconsin, Long Island and Cape Cod. In areas like the one million-acre Boundary Waters Canoe Area, wilderness is managed under principles of ecosystem management and multiple uses. Many recent wildfires have been managed as such and have returned a boreal forest mosaic on a large landscape.

Fragmentation and development have reduced habitats for fire-dependent species, pushing them toward listing if not already listed as threatened or endangered. Functioning ecosystems, with a variety of successional conditions, provide a range of habitats for specialists and generalist. Habitat

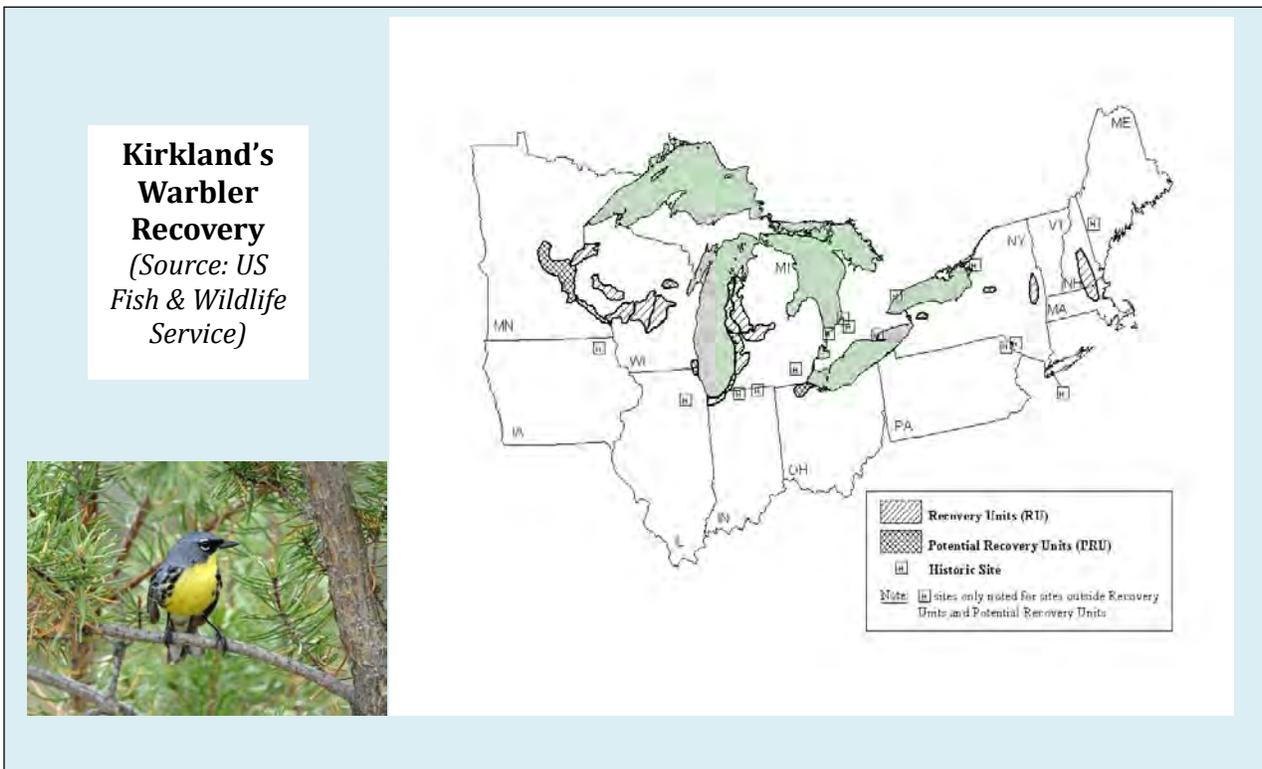


Figure c. Kirkland's Warbler nests on the ground in young dense thickets of jack pine



requirements, such as size of area, vary between species but often occupy and thrive in similar ecosystems. For some species like the Kirkland's Warbler larger patch sizes are needed in jack pine, one of the most volatile fuel types in the northeast.

There are state and national initiatives and programs where integration of shared objectives is required as funding criteria. Many public and private landowners have management goals and objectives to restore natural landscapes and ecosystems. Although a comprehensive compilation is not available at this time, many public land management agencies and organization are aware of conservation partner's restoration goals, and their management plans at a local level. The Missouri Pine-Oak Woodlands Restoration Project is a collaborative effort to restore a globally significant Shortleaf pine-oak woodland ecosystem on a approximately 443,635 acres.

(<http://www.fs.fed.us/restoration/CFLRP/index.shtml/index.shtml>). Collaboration at this large landscape scale included partners from the State Department of Conservation and Department of Natural Resources, Ozark National Scenic Riverway, State of Missouri, The Nature Conservancy, Mark Twain National Forest, Leo A. Drey Foundation and the Pioneer Forest, and numerous private and local governments.

Another example of successful restoration and use of fire on maintaining the vitality of native grass and forb plantings is the Conservation Reserve Program (CRP) which has had a positive effect in Minnesota. (http://www.fsa.usda.gov/FSA/printapp?fileName=ss_mn_artid_628.html&newsType=crpsuccessstories)

Opportunities - *Ecosystem (ecological) restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.*

Setting restoration priorities using prescribed burning can be difficult, as all fire-based communities are important. Burning regimes should be established according to the relations between fire and vegetation, with prairies burned most frequently (annually or biennially) and with progressively longer fire return times for savannas, woodlands, and forests (Anderson 1991, 1998). Site conditions (mesic versus xeric) should be considered along this fire-community gradient (prairie to forest), as they dictate the rapidity of vegetation change without fire. Priority should be placed on prescribing fire on mesic sites, as once these sites undergo mesophication, it is difficult to reestablish burning regimes. From a landscape perspective, restoration opportunities are probably greatest on oak and pine woodlands and forests, since lands formerly harboring tallgrass prairie-savanna systems have been largely converted to agriculture, with little land-use change in sight (Iverson and Risser, 1987). By focusing on large, contiguous ownerships, especially on federal and state lands where restoration is a priority, larger landscapes could be burned, thereby maximizing benefit-to-cost ratios (spreading relatively fixed costs over a larger area) and allowing variation in fire behavior to form a more "natural" mosaic of burn severities, vegetation patches, and niches for a greater array of species. (Nowacki et al. 2008)

A restored ecosystem should be able to sustain itself over time with minimal intervention, although in some cases active management might be required, such as maintenance burns in fire-adapted ecosystems. (US Forest Service, Restoration Framework 2006)

Focus efforts to identify and collaborate on public and conservation areas such as state natural areas, research natural areas, special interest areas, wilderness areas, or other largely intact fire dependent ecosystems are managed for. These focal areas serve as opportunities for expansion where possible. This would partially address a concern stated in the NE Phase II Regional Assessment report, "invest in joint



management planning and implementation that achieves strategic objectives and reduces the effects of fragmentation of fire dependent landscapes.”

In many cases fire dependent ecosystem successional paths can be used as fuel breaks or areas of reduced crown fire potential. In some cases allowing or accelerating succession to that can support only wildfire of low intensity is desired to reduce the risks especially where WUI is threatened. This addresses issues and risks with structures being involved in most fires in the northeast. In Canada, managed natural wildfires and prescribed fire has been used successfully for natural regeneration of boreal jack pine forests.

Recommendation of the Forest Service Ecological Restoration Framework, 2006: *“to improve the agency’s ability to restore ecosystemseffectively applying national, forest, and project planning to engage Forest Service resources, partners, and stakeholders in identifying and implementing restoration needs and priorities;”*

Relationship to other Options - None of the wildfire management issues in the Northeast exist in isolation. This investment option directly relates to many of the risks, issues and opportunities for Goal 1, Option 1A using more prescribed burning throughout the region; all options relative to Fire Adapted Communities such as focusing hazardous fuels treatments in the WUI; and most issues relative to wildfire response.



Option 1C - Focus on mitigating “event” fuels through mechanical treatments and utilizing markets for biomass products to clean up and reduce the potential fire hazard from blowdowns, ice storms, and other forest damaging events.

Background - Fuel hazards arise from natural events. Wind, ice, disease and insects can create large areas of very high fuel loading in forested areas. All ecosystems can experience short and long term altered fire behavior characteristics if event fuels are left untreated. Removal of event fuels is more crucial when the proximity to homes and other infrastructure could lead to significant economic loss if a wildfire occurs. Event fuels may also represent an economic opportunity to supply forest product needs ranging from biomass to higher valued products.

Current Situation - A preliminary spatial assessment of forest disturbances from both biotic and abiotic events reveals that all states in the region are impacted but Minnesota, Wisconsin, Michigan, Pennsylvania, and New York have had the greatest area impacted in the last three years (Figure a).

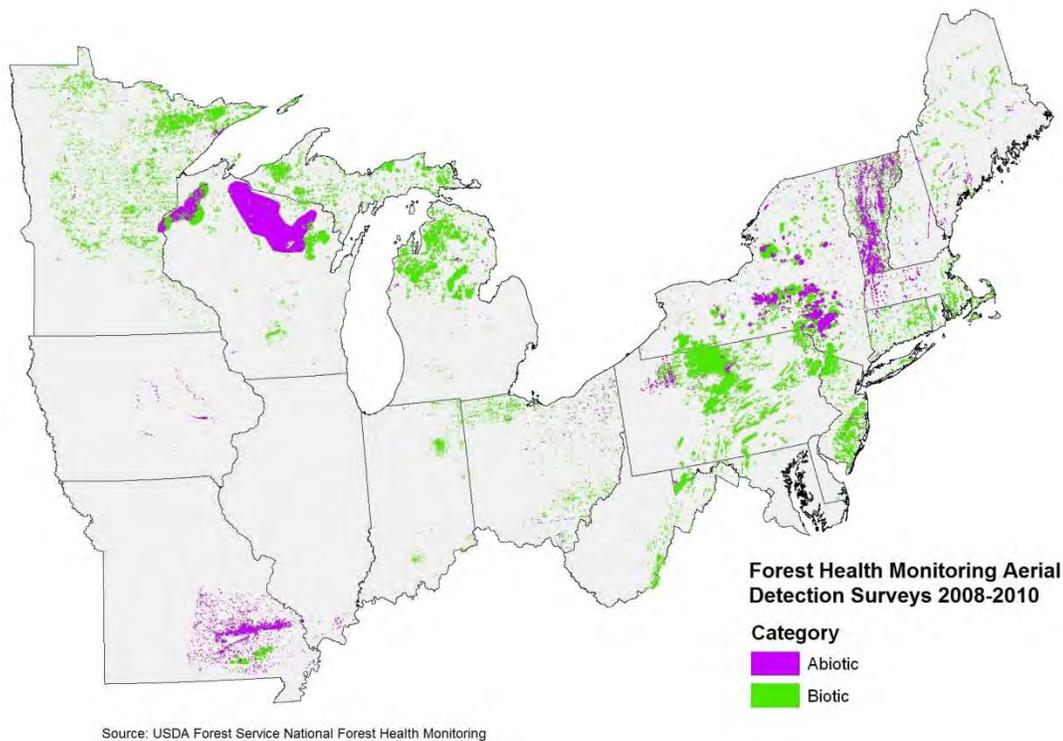


Figure a. Biotic and abiotic forest disturbances across the Northeast Cohesive Strategy Region for the years 2008, 2009, and 2010. Note that inconsistencies exist due to variation in mapping efforts.

During the three year period from 2008-2010, there were over 104,000 disturbances identified (Table a), totaling over 16,000,000 acres (Table b). These disturbances are largely driven by biotic factors with

defoliators, boring insects, and decline complexes accounting for the greatest share of the damage, with 7.4, 1.7, and 0.8 million acres, respectively.

Table a. Number, source, and size range of forest disturbances in the Northeastern and Mid-western United States during 2008, 2009, and 2010.

Size (acres)	Abiotic	Biotic	Unknown	Total
< 1.0	1,114	16,266	763	18,143
1.1 to 10	15,699	19,282	763	35,744
10.1 to 100	5,892	25,448	2,532	33,872
100.1 to 1,000	1,969	12,113	934	15,016
> 1,000ac	305	1,322	133	1,760
Total	24,979	74,431	5,125	104,535

Risks/Barriers/Critical Success Factors - While many of these disturbances are either too small or otherwise not applicable to creating event fuels, others do create substantial coarse woody debris and extensive mortality that may exacerbate wildland fire management problems. Abiotic events such as storm damage represents about one-fourth of the total number of disturbances and affected nearly 5,000,000 acres during the recent three year analysis period. While the vast majority of abiotic events are less than 100 acres, it is also noteworthy that most of the area disturbed is derived from events that exceed this threshold (Table b). Such events may create both wildland fire management problems and represent economic opportunities for salvage logging and cleanup of debris.

Table b. Area, source, and size range of forest disturbances in the Northeastern and Mid-western United States during 2008, 2009, and 2010.

Size (acres)	Abiotic	Biotic	Unknown	Grand Total
< 1	453	9,789	488	10,730
1.1 to 10	56,698	74,374	4,029	135,100
10.1 to 100	196,034	995,428	98,928	1,290,390
100.1 to 1,000	555,387	3,428,923	249,502	4,233,812
> 1,000	3,942,602	6,395,408	486,415	10,824,425
Grand Total	4,751,174	10,903,922	839,362	16,494,458

In the northern tier of the region, especially in the Lake States, high winds in excess of 100 mph have resulted in large blowdowns in the recent past. For example in July 2011, straight-line winds of nearly 100 mph affected parts of northern Minnesota and northern Wisconsin leaving firefighters worried about the potential for extreme fire behavior stemming from the heavy fuel loads (Figure b). In July 1999 an extreme wind event effected parts of the Minnesota and Canada along the border and resulted in forest damage to over 600 square miles in the Boundary Waters Canoe Area. It was estimated that over 10 million trees were blown down. According to the National Weather Service, areas of Northeast Minnesota and northwest Wisconsin are especially prone to large forest blowdowns, which can significantly increase the risk and impacts from large catastrophic wildfires in those areas.

[www.crh.noaa.gov/dlh/?n=1jul2011_wind_damage].



Figure b. Resulting event fuels following extreme damaging winds that affected parts of northern Minnesota and Wisconsin in July 2011. (Photo courtesy of Wisconsin DNR and the National Weather Service)

Extreme winds that cause excessive fuel loads may also be seen as potential opportunities to supply raw material to the wood products industry. The forest products industry is integral to cost effective restoration, hazard mitigation, and fuels reduction. The infrastructure for utilization of pulp, saw timber, and biomass as well as skills and equipment are all necessary for cost effective treatments. A review of mill production in the region does exhibit a general coincidence of mill capacity with recent forest disturbances in Minnesota, Wisconsin, Michigan, Pennsylvania and New York (Figure c). Thus, the capacity to utilize event fuels exists where a preliminary analysis suggests they are most likely to be needed. However, recent economic trends in the forest products industry has resulted in a decline in wood consumption by pulp mills and other sectors of the market (Figure d).

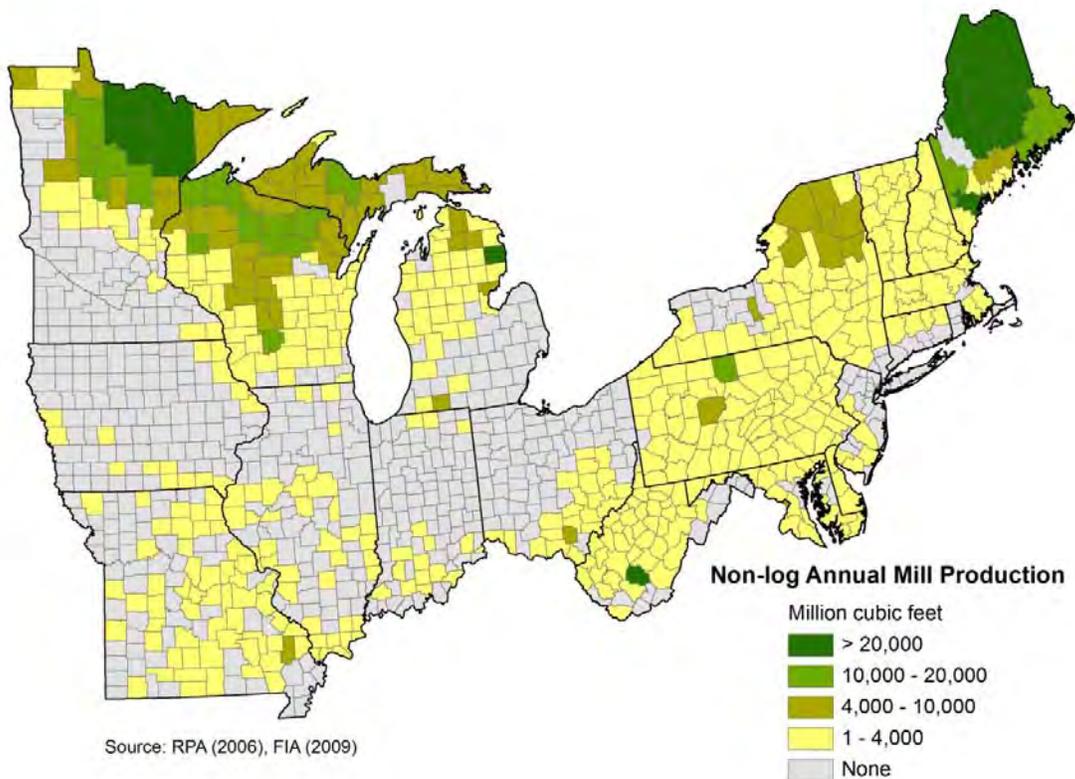


Figure c. Non-log mill production in the Northeast.

Declines in the forest products industry are due to the recession of 2007-2009 and a continued weak housing sector, international competition for forest product commodities once sourced primarily in North America, and a lower overall demand for print media due to increased use of electronic alternatives (Woodall et al. 2011). Raw material prices have declined and supply issues are largely secondary to end product demand. When prices for raw materials are historically low as they are currently, utilization of event fuels may be less feasible due to more complex operational requirements and less than optimal product characteristics. Thus, while the capacity to use event fuels exists, the economic incentives are currently lacking.

Opportunities - New markets for wood products such as biomass for energy production or wood fiber for nanotechnology have yet to offset traditional consumptive uses. In the absence of a less than robust demand for raw materials other incentives are needed for landowners to clean up event fuels. These incentives do exist and stem from programs sponsored by the federal and state agencies. Some examples include the Forest Stewardship Program, Conservation Reserve Program, and the Forest Land Enhancement Program. A more complete assessment of these programs is needed.

While differences exist among these and other programs, they all provide some degree of assistance or financial aid to landowners to manage their land using the best available scientific and professional guidance. Abatement of hazardous fuel would be a qualifying activity in some instances. Use of the

Forest Stewardship Program and similar incentives should be considered for the strategic cleanup of hazardous fuels when and where they occur and landowners are willing to participate. In the Northeast and Mid-western United States, forest disturbances from both biotic and abiotic events can lead to problematic event fuels that have the potential for extreme fire behavior and severity. In most cases, heavy fuel loads are contrary to achieving landscapes that are resilient to fire. The forest products industry retains a capacity to utilize these fuels, although the demand for the subsequent products has significantly diminished in the past decade. Alternatively, existing federal and state programs may be helpful in providing incentives for private landowners to cleanup following major blow downs or insect outbreaks. Coordination among the states within the region would facilitate the best use of limited funds for this purpose.

In extreme cases, event fuels also threaten fire adapted communities and other infrastructure, and greatly complicate fire response. Although heavy fuel loads from large blowdowns and other natural occurrences can easily be identified, divided ownership patterns within large events will make designing a strategic response more complex.

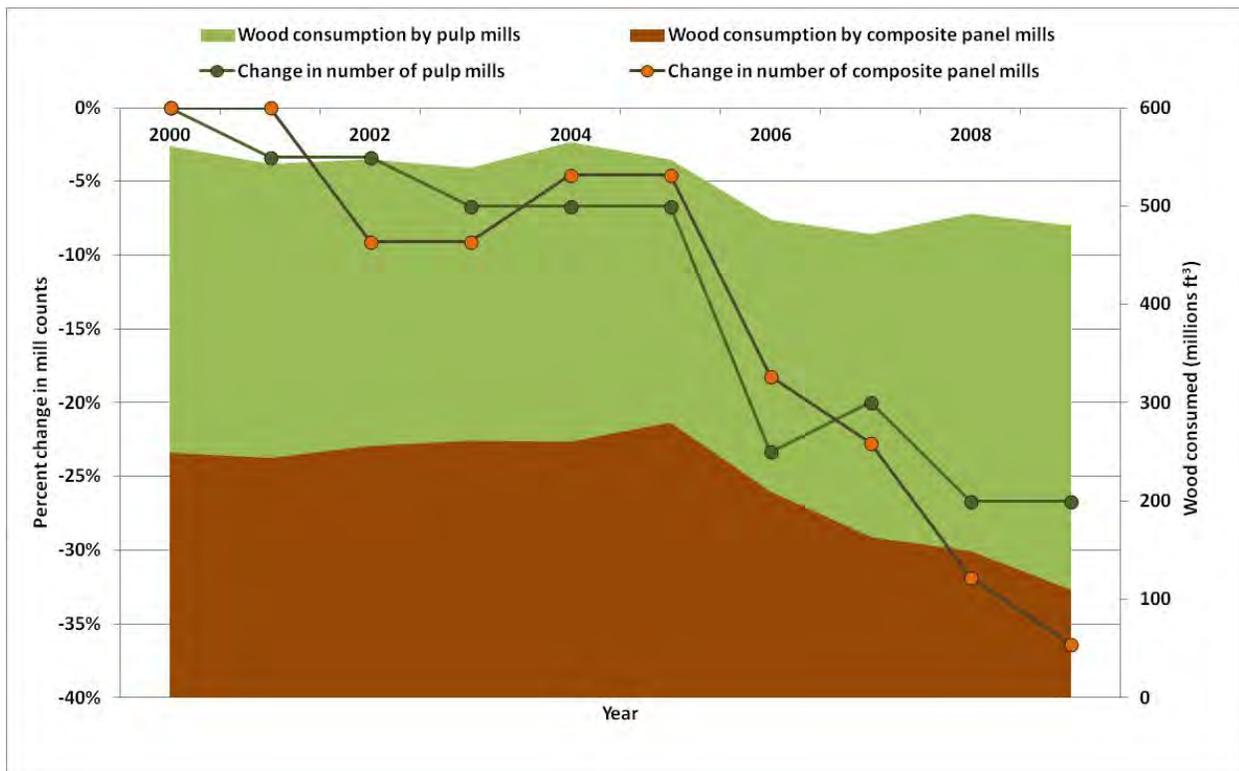


Figure d. Change (percent) in number of pulp and composite wood panel mills since 2000 and wood consumed by pulp and composite panel mills, 2000-2009, North Central states (IL, IN, IA, KS, MI, MN, MO, NE, ND, SD, WI) (Woodall et al. 2011).

Relationship to Other Options – When events create hazardous fuels near communities, there are both added risks from catastrophic wildfires, and opportunities for biomass utilization. Some planning and preparedness approaches for a community to be able to respond to these kinds of events are addressed in Goal 2, Options 2A and 2B.



COHESIVE STRATEGY GOAL 2: Fire Adapted Communities – Human populations and infrastructure can survive a wildland fire. Communities can assess the level of wildfire risk to their communities and share responsibility for mitigating both the threat and the consequences.

Option 2A - Focus on promoting and supporting local adaptation activities to be taken by communities such as increasing capacity of volunteer fire departments (VFD), passing ordinances, developing Community Wildfire Protection Plans (CWPP), joining Firewise, or other similar programs.

Background - This goal and investment option focuses on creating fire adapted communities that protect homes and infrastructure by promoting fire resistance within those communities. Becoming a fire adapted community reduces the chance of structure and infrastructure losses through wildfires. Loss of structures can create economic and emotional stress on a community. Creating fire adapted communities is an investment of relatively few dollars that can be effective in preventing large losses due to structure fires; increase public awareness of wildfires; reduce fire ignitions; make wildfires easier to extinguish; and reduce resource losses.

Current Situation - The Northeast Region is diverse with large urban areas, agriculture and forests. The rural areas also tend to have higher population densities when compared to the West. The Northeast Wildland Urban Interface (WUI) is concentrated in the rural forested regions (refer to map a. in Option 2B). Making these areas more fire resilient through programs like Firewise, Community Wildfire Protection Plans (CWPP), and local ordinances can help reduce structure losses in the WUI areas. Table a. shows the number of these programs States currently have in place in their communities. These programs can have spin off effects by making residents more aware of wildfire and its potential impacts. This awareness may help reduce the occurrence of human caused fires.



Northeast State	# of CWPPs	# of Firewise Communities
Connecticut	0	0
Delaware	1	0
Illinois	1	0
Indiana	2	0
Iowa	5	0
Maine	47	4
Maryland	29	4
Massachusetts	9	2
Michigan	9	1
Minnesota	4	2
Missouri	1	11
New Hampshire	21	1
New Jersey	12	6
New York	2	1
Ohio	13	2
Pennsylvania	30	7
Rhode Island	0	0
Vermont	2	0
West Virginia	18	2
Wisconsin	17	15
Total	223	58

Table a. CWPP totals as of April 27, 2012; Firewise totals as of Sept. 27, 2012

Risks/Barriers/Critical Success Factors - Local governments can further adopt Firewise principles or CWPP recommendations by establishing zoning and building ordinances containing fire adaptation principles. Often rural counties do not adopt building codes and lack the capability to enforce such ordinances in any case. This is especially true in regions lacking socioeconomic resources. Homeowners may not have the economic resources to follow buildings codes and make their properties fire resistive. County and town governments are reluctant to adopt codes and ordinances that may place a burden on constituents.

Developers creating “natural developments” often have covenants for the community which precludes fuels treatments within the developments. Green building programs such as Leadership in Energy and Environmental Design (LEED) often promote the use of natural materials on a building’s exterior along with natural vegetation adjacent to the building. The green guides do not consider wildfire risk in their recommendations.

Local fire departments are looked to as the community experts with fire both structure and wildfire. Fire department personnel, especially volunteer fire departments (VFD), have demonstrated service to their community. Fire department personnel can provide the leadership for Firewise and CWPP programs, and with recommending and enforcing ordinances. Wildfires that start structure fires increase the firefighting equipment and personnel needs exponentially. Creating fire adapted communities would reduce the number of wildland structure fire combinations – thus reducing the burden on VFDs.



Across the country VFDs are finding increasing difficulty recruiting and retaining personnel. Part of the cause is the increased training requirements for structure firefighting and Emergency Management Services (EMS). Creating a fire adapted community may be a low priority for VFDs.

Opportunities - The creation of a fire adapted community starts at the local level. Implementing fire adapted communities requires the engagement of public and private organizations. Local governments include county boards, townships, and city governments. Public and private organizations could include volunteer fire departments, home owner associations and other public service organizations.

Programs like the National Fire Protection Association's (NFPA) Firewise communities, CWPPs, and local ordinances can help implementation of the fire adapted communities concept. Firewise Communities started in 2002 and includes 700 communities in 40 states. Firewise communities are concentrated in the West where the large catastrophic fires are concentrated thus elevating the programs visibility. A few States in the East with strong state Firewise programs also have a significant number of Firewise communities. Florida, Virginia and Arkansas are examples of states with strong Firewise programs. Apparently the large wildfires in the Northeast have not helped develop interest in Firewise beyond the communities directly impacted by the large fires, likely due to their relatively low frequency and therefore low public awareness.

The CWPP planning process is the collaboration between communities and agencies interested in reducing wildfire risk. The planning processes involve a collaboration of local governments, local fire departments, and state wildfire authorities. The plans have three elements: collaboration with adjacent federal agencies, identification of fuel treatment needs, and recommendations for measures to reduce risks to structures. Federal collaborators are an important component in CWPPs; however Federal wildland agencies have a limited presence in the Northeast, thus limiting collaboration opportunities and funding for fuel treatments.

New York City Example: *A significant example of collaboration with a community is underway between Gateway National Recreation Area (National Park Service), the Borough of Staten Island, and several New York City Municipal Agencies. Contrary to conventional perception, the City has a very high wildland fire occurrence. A CWPP has been drafted and will soon be in place. The stated goals of the draft CWPP are to:*

- *Eliminate damage and destruction to property and natural resources from wildfires.*
- *Improve wildfire prevention techniques as a means of reducing human-caused wildfires.*
- *Improve the Fire Department of New York's (FDNY) ability to contain and extinguish wildfires.*
- *Manage the fuel load of natural vegetation occurring on open spaces in the community to reduce the destructive potential of any wildfire.*
- *Increase and maintain the community's understanding of wildfire in their community.*

Relationship to other options – There is a strong relationship to the other options in Goal 2. For most States and communities there will be a need to employ one or more of the Goal 2 options to assist a community in becoming a fire-adapted community due to the relatively low threat and long intervals between large fires that could threaten most communities in the Northeast. There is also strong relationship to Goal 3, Option 3A as many community leaders who might assist communities by increasing their awareness and identifying programs and resources come from the local fire fighter agencies, particularly volunteers who obtain wildland fire training.

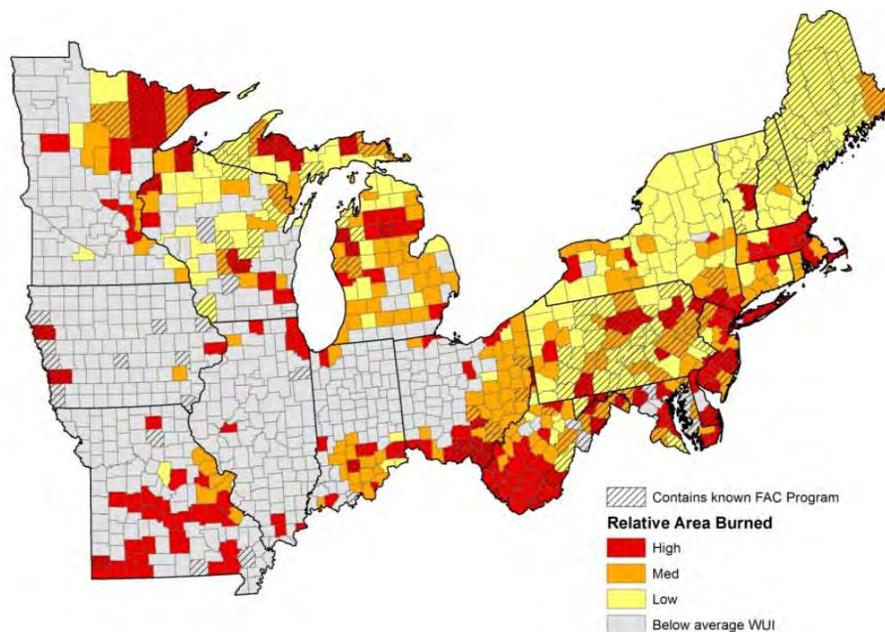


Option 2B - Focus on directing hazardous fuel treatments to the wildland-urban interfaces (WUI). Treatments of WUI lands should provide a broader area of effective protection and reduced risk.

Background - Although the northeastern United States typically is not considered to be regularly at risk from catastrophic wildland – urban interface fires, threatened areas do exist (Pyne, 1982). During development of Phase II of the Cohesive Strategy, the Northeast Regional Strategy Committee identified regional specific issues leading to wildland fire management concerns.

Current Situation - Currently, as described in the Phase II National Report, the lack of fire on the landscape has created two primary issues in the Northeast. These issues in the Northeast can be described in risk management terms as: 1 – a low public perception of wildfire risk due to a low occurrence of large fires, but having a high risk to life, property and infrastructure if or when they escape initial attack, and 2 – the Northeast has an extensive area of wildland-urban interface conditions. A spatial analysis of land cover and census block data performed by Radeloff *et al* (2005), found the eastern USA contains the greatest extent of WUI in the 48 contiguous states.

Risks/Barriers/Critical Success Factors #1 - Perception of Risk- A survey of seasonal and year-round residents and landowners within a 2-mile radius of the Myles Standish State Forest in Plymouth and Carver, Massachusetts revealed insights toward fire management strategies, and public participation in planning efforts to reduce fire hazard. Research results indicate previous experience with wildland fire was a major factor influencing respondents’ perception of fire risk. (Blanchard and Ryan, 2007).



Map a. The correspondence of fire-adapted community programs and fire risk for the Northeast. Fire hazard is based on the combined wildfire and outdoor fire occurrence records in federal, state and local (NFIRS) datasets. Counties in gray have below average WUI, based on census and land cover characteristics. Hashed counties have at least one known program.



Opportunities #1 - Increase education of residents about wildland fire risk - Local land managers could conduct education programs familiarizing bordering communities the positive benefits of hazardous fuels reduction treatments, including ecosystem health. Knowledge about specific fuel treatments positively influence support for fuels reduction treatments. Survey results from the Blanchard and Ryan study indicated strong support for education programs for residents and property owners as part of fire hazard reduction plans. Assistance to communities and counties could be provided by WUI coordinators or specialists who are trained, understand the needs, can assist and coordinate in design and implementation of fuels reduction, and are linked with sources of available funding such as grants.

Risks/Barriers/Critical Success Factors #2 - Multi-Jurisdictional, Fragmented Landscape - The majority of land in the Northeast is private. Because wildfire crosses multiple ownership boundaries, scale is particularly important in terms of project development. Large-scale plans that include substantial areas of land at the county and multiple-township level tend to use a WUI concept as compared subdivision or township level plans that might cover a few hundred acres (Figure a). Community Wildfire Protection Planning as an incentive is not as useful in the eastern USA, where public land is less dominant and the perceived fire risk is lower than in the West. (International Journal of Wildland Fire 2009)



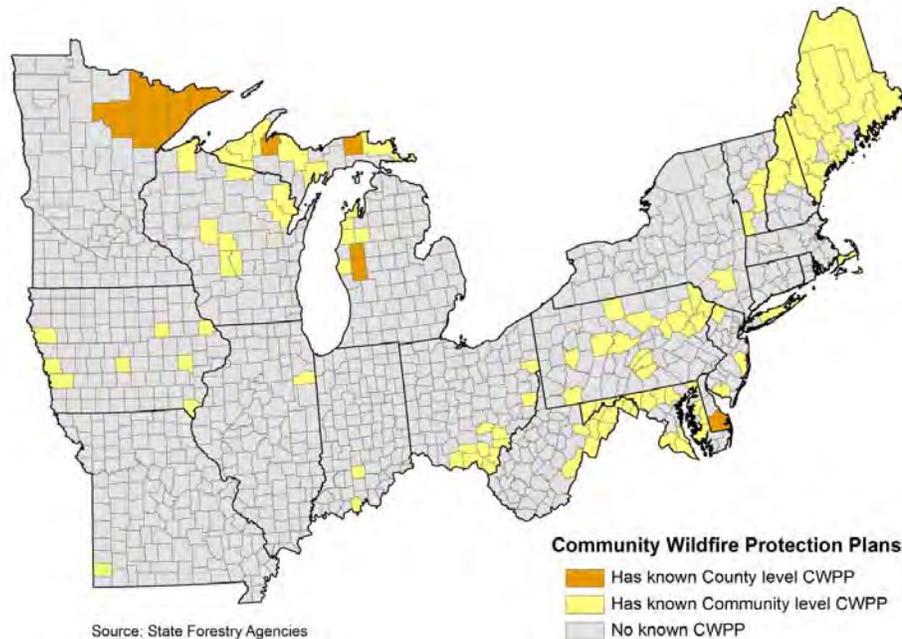
Figure a. Pine barrens vegetation woven in and among residential development in the village of Truro, on Cape Cod. (Fire Science Brief, Issue 13, September 2008)

Opportunities #2 - Community Wildfire Protection Plans (CWPPs) can serve as a tool to bring local state and federal actors to work together to address hazardous fuels reduction and mitigation efforts on public lands.

Identifying the Wildland-Urban Interface (WUI) in large landscape-level treatments or projects in scope gives communities and agencies an opportunity to make management distinctions between developed



space and public lands. Local government, local fire departments and local field-staff can play a key role in community boundary decisions for political reasons or local historical knowledge. After the large blowdown event in Minnesota in 1999, countywide CWPPs were developed for three of the northern counties, which identified WUI areas, and areas needing treatment on all ownerships. The Leech Lake Band of Ojibwe in Minnesota is moving forward with a reservation-wide CWPP which will cover parts of the Chippewa National Forest, and abut the county-wide CWPP in neighboring Itasca County.



Map b. Counties in the Northeast with one or more CWPPs in place.

CWPPs can provide the opportunity for local government to influence actions on adjacent public land, by establishing local boundaries of the WUI. (International Journal of Wildland Fire 2009)

Relationship to other options

Event Fuels - Goal 1, Option 1C emphasizes the importance of prioritizing the removal of event fuels when the proximity to homes and other infrastructure could lead to significant risk to life and property should fire occur. Event fuels mitigation project could be prioritized on public lands through evaluation of heavy, concentrated vegetation. Fortunately, heavy fuel loads from large blowdowns and other natural occurrences can be easily identified on public lands for treatments bordering communities. Incentive and collaborative policies intended to reduce national hazard risks at the local level are often met with considerable variation in local response (Berke 1998).

Develop Shared Response Capacity - Goal 3, Option 3C - Infrastructure of volunteer fire department jurisdictions and fire incidence are important WUI factors in addition to the presence of fuels and structures in determining where to place hazardous fuels reduction treatments.

Option 2C - Focus on promoting and supporting prevention programs and activities (targeting them toward reducing when and where fires occur)

Background - The Northeast Region as defined for the National Cohesive Wildland Fire Management Strategy, encompasses 20 Midwestern and Northeastern States and the District of Columbia. The 20 States comprise the most densely populated region of the nation, home for more than 41 percent of Americans. The vast majority of the land is in private ownership, and while wildfires occur year round, spikes occur in the spring and fall. Homes and infrastructure are involved in a high percentage of wildfires in the Region.

Current Situation - The Northeast Region is characterized as a cooler wetter climate and the surface fuels and vegetation result in many cases result in lower flame lengths permitting direct attack on many of the wildfires. The Northeast also has a large number of volunteer fire departments (VFDs) that quickly respond to fires in these rural areas. The number of wildfires that occur in this region is very difficult to calculate because the VFDs respond to and suppress a majority of the small wildfires and their completion of National Fire Information Reporting System (NFIRS) is very inconsistent. The combination of above conditions and circumstances results in a misconception of the wildfire risk associated with living in the Northeast. Due to the heavy population and large proportion of landscape in the WUI/intermix even the small wildfires threaten at least one and usually many structures which increases risk and complexity for fire fighters.

Risks/Barriers/Critical Success Factors - With the exception of northern Minnesota and Wisconsin, lightning starts less than 5% of the wildfires throughout the Northeast. Human caused ignitions include debris burning, intentional (incendiary), equipment (trains, ATV's, etc) and down power lines, smoking, children playing with fire, cooking, and heating appliances (figure a). One of the barriers to reducing unwanted fires is the average home owner does not perceive a high risk from wildfires in the Northeast which can lead to complacency in the use of fire while burning debris or use of equipment.

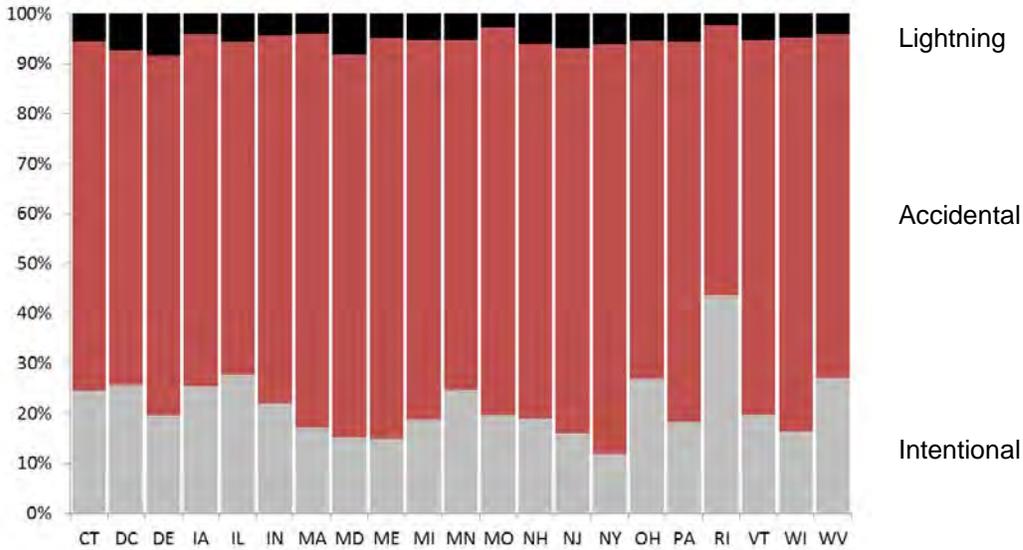
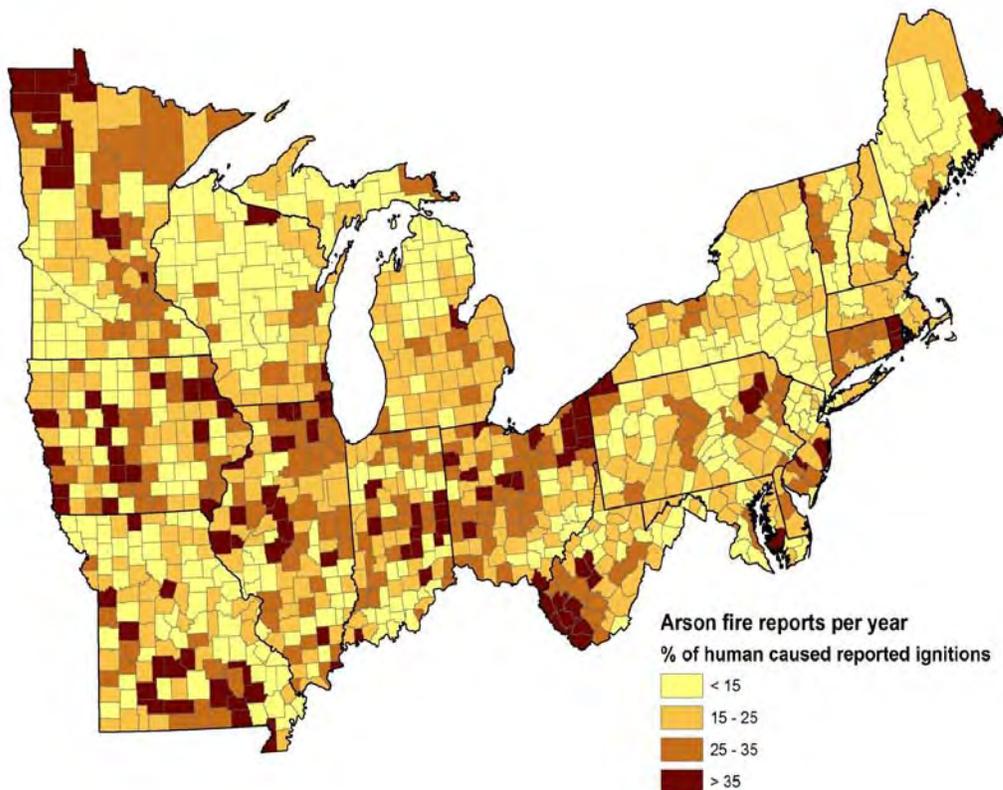


Figure a: *Percent of reported lightning, accidental and intentional fires of known cause for states in the Northeast Region based on federal, state, and local data*



Opportunities - Identifying and addressing causes of wildfires through prevention programs is an effective approach in reducing the number of wildfires and consequently risk to firefighters in the Northeast Region. Proper investigation of wildfire origin and cause is essential to determine when and where education and prevention programs can be targeted. When intentional fires are identified in an area the proper collaboration with law enforcement investigation, enforcement, and prosecution of arson cases can go a long way toward reducing fires and firefighter risk (Map a).



Map a: Percent of reported incidents of known human caused fires attributed to intentional ignitions for the Northeast based on state, federal and local data (NFIRS, NASF, Federal Record System).

Wildfire prevention programs such as Smokey Bear and Firewise community programs have been in place for many years, but the key is the ability to target the appropriate audience and provide the best fire prevention message with the proper timing. During the height of the spring wildfire season the state agency responsible for wildfire suppression is busy suppressing and investigating wildfires.



Pennsylvania Example: *An example of what can be done to help to get the prevention message out is the use of National Wildfire Prevention Team. Team members consist of individuals with expertise in fire prevention, public information, fire investigation and or other related subjects. The Pennsylvania Bureau of Forestry requested a team in 2009 and again in 2011 to assist the forestry department during the height of the spring wildfire season to address the 2 major causes of wildfire in Pennsylvania which are debris burning and suspicious (intentional) fires. The team concentrated their efforts in the Clearfield, Northumberland, and Schuylkill Counties. Funding for this assistance was provided by the United States Forest Service. The goals for the team were:*

- 1) Raise public awareness concerning escaped debris burns and suspicious fires.*
- 2) Develop fire prevention education messages for use statewide.*
- 3) Strengthen coordination and collaboration among agencies.*

The targeted prevention products the team developed are being used to provide outreach prevention messages to schools, communities, and homeowner associations. The improved networking with other agencies is being used and cultivated across the state.

Wildfire prevention programs increases personal contacts between authorities and citizens groups to promote shared responsibility and opens up a dialog to all aspects of fire adapted communities and fire response. By utilizing the county base level data, the Northeast can identify concentrations of arson and accidental human caused wildfires and direct prevention activities in the most needed areas.

As stakeholders become aware of the wildfire potential hazards and number of human caused wildfires throughout the Northeast through public contact prevention activities they will see the benefits to reducing human caused wildfires. By using the information provided by the NSAT, the Northeast states can concentrate their prevention activities to the highest need areas to reduce wildfire occurrence. *Preventing unwanted fires and increasing homeowner shared responsibility will reduce firefighter risk and decrease need for firefighting response.*

Relationship to other options - Prevention programs are a great way to begin conversations and builds relationships with citizens, community organizers, and volunteer fire departments to discuss other ways people can protect their homes and properties through **Fire Adapted Communities** – *Human populations and infrastructure can survive a wildland fire. Communities can assess the level of wildfire risk to their communities and share responsibility for mitigating both the threat and the consequences.*

Preventing human caused fires in the Northeast Region would greatly reduce the overall fire occurrence and need to respond to wildfires resulting in reduced risk to firefighters. Reducing the number of wildfire responses would greatly and enhance their ability to respond to other emergencies.



COHESIVE STRATEGY GOAL 3: Response to Fire – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildland fire management decisions.

Option 3A - Improve the organizational efficiency and effectiveness of the wildland fire community (pre-suppression and pre-planning; administration).

Areas to address include:

- a) Development of Memorandum of Understandings (MOU) and Memorandum of Agreements (MOA)
- b) Standardizing and streamlining training and qualifications
- c) Radio compatibility and interoperability
- d) Appropriate suppression and detection responsibilities regardless of landownership through agreements or contracts
- e) Sharing of personnel (co-funding or contracting)

Background - Success of the Cohesive Strategy and of this option depends on addressing one of the priority National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors, Investment in Firefighting Workforce (See appendix 10). This Critical Success Factor is described as follows:

“Investment in firefighting workforce - Need to invest in human capital at the field level. Budget cuts are reducing the number and quality of the on-the-ground firefighting workforce. Budget cuts always seem to land at the field more than at the national level.

Continued and increased investment in the firefighting workforce is necessary in order to maintain capacity to respond to wildfire, mitigate fire hazards, and restore/maintain landscapes. A lack of investment in the firefighting workforce will lead to fewer firefighters on the ground, reduced safety, reduced capability at accomplishing local projects, and reduced initial attack success. In the long term we face a generation gap in the fire workforce available for future leadership of the program.”

Impacts from a lack of adequate investment affect all agencies and organizations with wildland fire responsibilities – local, state and federal. There is a need to develop a wildland fire management program that focuses efforts on maintaining and developing field level leaders and workforce.

Current Situation - In the Northeast, working together at all levels from local up through the Eastern Area Coordinating group (EACG) depends on the leaders of the organizations. Successful, integrated fire programs throughout the Northeast all have the common denominator of having good leaders who are willing to work together. Budget reductions are reducing the number and quality of the wildland fire leaders. The Northeast needs to continue investing in leadership in order to implement this Cohesive Strategy. The State Compacts (EACG) including its Working Teams might be a logical method of implementing the Northeast Cohesive Strategy; however more participation from the local level would be needed.

Training opportunities and efficiency could be enhanced. The four Northeast fire compacts sponsor annual fire academies, and there is agency and interagency training throughout the year. Even though



there is an annual fire related training needs assessment compiled with information from all the federal and state partners, a broader dissemination of this assessment and tuition funding assistance could raise the awareness of these and other training opportunities.

Areas to Address in Option 3A include:

a) Development of Memorandum of Understanding (MOU) and Memorandum of Agreement (MOA) agreement templates that all entities can use. (State to federal billing issue; federal to state billing, i.e cost recovery)

Risks/Barriers/Critical Success Factors #1 - In the Northeast, the number of agreements and the number of entities is very large. Refer to appendix 7 for a Minnesota example of the agreement spider web. The workload and complexity of completing and maintaining agreements is significant. The ability to exchange funds between entities often fails due to differing fiscal years, differing financial process and programs, and personnel constraints. Currently, transferring funds between entities often requires more administrative work than the actual work itself.

This item is partially covered in the document: National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors): *Remove Policy Barriers and Process Complexities for Sharing Resources*. This Barrier states:

“Need to remove policy barriers and process complexities which affect the ability to effectively and efficiently share resources, not only for wildfire, but for fuels and prescribed fire work. The statutory authority for the US Forest Service (USFS) to pay for state resources responding to another state's incident, even though the receiving state reimburses the USFS for those responding resources, has been questioned.”

This item is also partially covered in the document: National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors: *Intergovernmental Wildland Fire Governance*. This Barrier describes the issue:

“Need an intergovernmental wildland fire governance structure to serve the needs of all jurisdictions in both wildland fire and all-risk incidents. The National Wildfire Coordinating Group (NWCG) does not satisfy this need fully; for example, each of the RSCs reported that municipalities do not feel they are adequately represented by NWCG, nor are the standards recognized.” The chart NWCG Organization Chart in Appendix 7 illustrates the complexity of NWCG governance.

Opportunities #1 - The following opportunities are described in the National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors document include:

“All stakeholders with wildland fire responsibilities would be represented by either NWCG or another entity that represents all interests. The current charter for NWCG requires national wildland fire management responsibilities”.

“Reexamine the membership of the NWCG Executive Board to ensure local government is adequately represented.”

Additional opportunities to address these barriers are:

- NWCG to complete revisions to the Master Cooperative Wildfire Management and Stafford Act Response Agreement.



- Rectify authority issues via federal legislation, for the USFS to mobilize state and local resources via the Master Cooperative Wildfire Management and Stafford Act Response Agreement, or implement a work around.
- Identify and correct policy barriers that prevent the effective sharing of resources.
- Local government needs national clarification on structure protection versus wildfire suppression and who pays.
- Identify complexities that need to be simplified in order to efficiently share resources.
- Maintain and enhance the role of the Eastern Area Coordinating Group and its Working Teams.

b) Standardizing and streamlining training and qualifications

Risks/Barriers/Critical Success Factors #2 - This item is identified in the document: National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors: *Inefficiencies in the National Qualification Standards*.

This barrier is described as:

“Inefficiencies in the national qualification standards and procedures must be addressed to increase response capabilities. Develop one wildland fire qualification standard for the federal, state, tribal, and local wildfire community. Currently NWCG PMS 310-1 provides qualifications for national mobilization and recognizes the ability to accept qualifications of local jurisdictions while in those jurisdictions. These standards are in sync with FEMA NIC efforts to bridge the gap with local government.”

Issues described in this Barrier include: Many resources that would otherwise be available for mobilization are unavailable because of cumbersome qualification standards and procedures. As a result, resources are not available for mobilization. Better coordination between and among local, state, tribal and federal agencies who are investing in training. A clear definition of position requirements for training and experience is needed.

This issue is also covered in this Barrier: *Intergovernmental Wildland Fire Governance* of the National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors document. This Barrier is described as:

“All stakeholders with wildland fire responsibilities would be represented by either NWCG or another entity that represents all interests. The current charter for NWCG requires national wildland fire management responsibilities. Reexamine the membership of the NWCG Executive Board to ensure local government is adequately represented.”

Refer to the attached National Wildfire Coordinating Group (NWCG) Organization chart for an example of complicated fire governance. Many resources that would otherwise be available for mobilization are unavailable because of cumbersome qualification standards and procedures. As a result, resources are not available for mobilization. Better coordination is needed between and among local, state, tribal and federal agencies who are investing in training.

In the Northeast this issue is critical because a high percentage of the responders are non-federal and in many cases are volunteer fire departments. The length of time and level of commitment required to achieve and maintain fire qualifications is not compatible with the responder workforce in the Northeast.



The NWCG Workforce Development Goal and Incident Management Team (IMT) Succession Project is under development but it will not resolve the issue in the Northeast when it comes to initial attack response. IMT successional planning is only a piece of a cohesive fire program however. There is also a need to maintain and increase investment in the field level firefighting workforce. This workforce trains for, prepares for, and responds to over 150,000 initial attack fires per year.

Opportunities #2 - Examples of ongoing successful IMT Workforce Development efforts in the Northeast are:

- For several years the Minnesota interagency group (MNICCS) has implemented an IMT Workforce plan that has successfully maintained NWCG qualified rosters for three type 2 Incident Management teams.
- For several years the Minnesota Department of Natural Resources has implemented an aviation management workforce plan that has resulted in a robust aviation program.

NWCG qualifications policy (Wildland Fire Qualification System Guide NWCG 310-1) allows local agreements on qualifications on local level incidents but this has not been implemented in very many places possibly due to concerns over liability. From the Guide: *“NWCG recognizes the ability of cooperating agencies at the local level to jointly define and accept each other’s qualifications for initial attack, extended attack, large fire operations, and prescribed fire.”* Concerns over liability of accepting each other’s qualifications need to be addressed in the Northeast.

There is a need to shorten the time for attaining qualifications which is part of the NWCG Workforce Development Goal and IMT Succession Project. Agency support for implementation of this effort is required.

The U.S. Fire Administration (USFA) has a fire crosswalk qualification system that is recognized by the NWCG and recognizes prior obtained skills of structure fire departments. This system has provided an avenue to incorporate fire personnel into interagency fire organizations where agencies have chosen to recognize them. However there is a concern at the local level that the crosswalk does not adequately acknowledge structural fire department training.

c) Radio compatibility and interoperability.

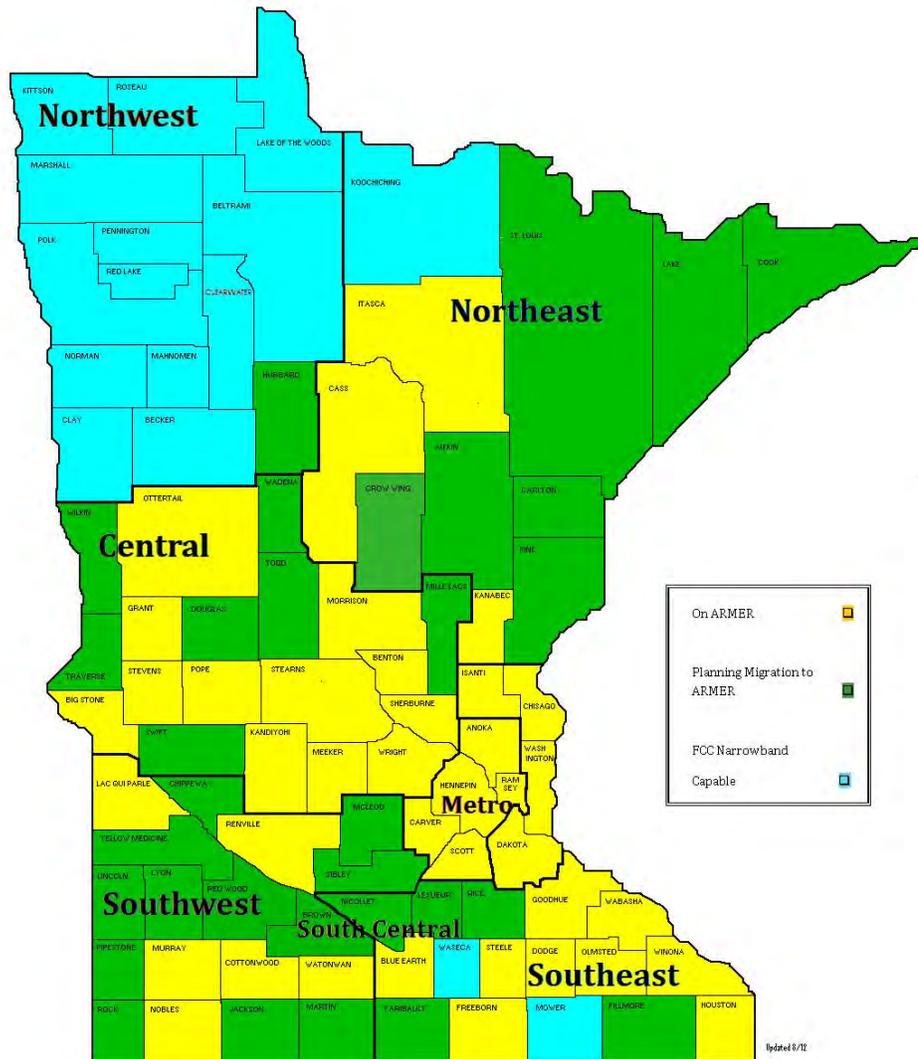
Risks/Barriers/Critical Success Factors #3 – Lack of radio compatibility and interoperability is a local issue occurring nationally. There is a need for radio compatibility between digital, analog, narrowband, 800 mgz, 700 mgz systems. Resolve and simplify frequency use authorization and licensing processes for all agencies (local, state, federal and tribal).

Good communications and reliable equipment to communicate with are a vital tool in successful emergency scene management and the safety of emergency workers and the general public. Structured, consistent means of managing communications resources are necessary, particularly during incidents involving multiple agencies.

In the Northeast there is an ever changing mix of communication systems between the wildland fire entities. These systems are not always interoperable with other emergency service entities or other fire entities. In some cases Homeland Security determines the system that Fire Departments can purchase and use. The level of complexity and cost to program and maintain communication systems is often beyond the capability of the user. On most wildfires in the Northeast there is a mix of responding fire agencies and emergency service personnel; all with potentially different communication systems. Frequency sharing and frequency use authorization is complicated. Some radio systems and agencies do

not allow field programming of radios thus compromising field user ability to adapt to emergency conditions.

For example; the State of Minnesota is progressing with an 800mhz communication system (See Map a below). As a result, interoperability between federal, tribal, State, and local emergency responders is very challenging. This is a barrier that the Northeast Region identified during Phase II of the Cohesive Strategy.



Map a. Minnesota 800 mgz 2012 Participation Map August 2012

Opportunities #3 – Through the implementation of the Cohesive Strategy, there is an opportunity to resolve and simplify frequency use authorization and licensing processes for all agencies (local, state, federal and tribal), but this issue needs recognition and action at the national level.

d) Appropriate suppression and detection responsibilities regardless of land ownership through agreements and contracts.

Risks/Barriers/Critical Success Factors #4 - This item is partially covered in the document: National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors as a priority Barrier titled: "Remove Policy Barriers and Process Complexities for Sharing Resources." There is a

"...need to remove policy barriers and process complexities which affect the ability to effectively and efficiently share resources, not only for wildfire, but for fuels and prescribed fire work. The statutory authority for the USFS to pay for state resources responding to another state's incident, even though the receiving state reimburses the USFS for those responding resources, has been questioned.

It is an appropriate and key role for the USFS and other federal agencies to maintain a national and regional mobilization system to facilitate the coordinated mobilization of suppression resources, including state-sent local resources, to support fire suppression efforts nationally. If not resolved, this issue is likely to restrict mobilization of key resources for the protection of private, state and local government lands. "

Opportunities #4 - Success at the local level includes examples such as the Northeast Minnesota Integrated Response Plan. This multi-partner effort includes Canadian partners and is maintained via an annual meeting.

Success across a statewide level is exemplified by the Minnesota Incident Command System (MNICS). This 30 year effort has resulted in lower suppression costs through resource sharing and collaboration.

Other examples of potential opportunities are:

- Fire Compacts within the Northeast that have been successful in sharing resources via state-to-state compact procedures.
- Maintaining and enhancing the role of the Eastern Area Coordinating Group and its Working Teams.
- Working at the local level to identify policy barriers that prevent the effective sharing of resources.
- Working at the local level to identify complexities that need to be simplified in order to efficiently share resources.
- Rectifying authority issues via federal legislation, for the USFS to mobilize state and local resources via the Master Cooperative Wildfire Management and Stafford Act Response Agreement, or implement a work around.

e) Sharing of Personnel (co-funding or contracting)

Risks/Barriers/Critical Success Factors #5 - Sharing of personnel is successful in the Northeast, but there is significant complexity in exchanging funds to pay for shared personnel. For example, personnel are co-funded in several dispatch centers in the Northeast. Often the financial processes between entities are slow and require multiple levels of follow up, routing, and approval. Administrative burden rates are charged by some federal agencies even though Service First authority exists. State Compact to Compact transactions are more successful than federal transactions.

Opportunities #5 - Within the Northeast; utilizing Compact to Compact transactions may be more successful than conducting direct transactions with the federal agencies.



External Factors – There are many policy, administrative, and possible legal barriers to attaining a more efficient and wildland fire management environment, most of which must be addressed nationally. There are some good examples of solutions at the local and regional level that should be examined to help overcome some of these critical barriers.

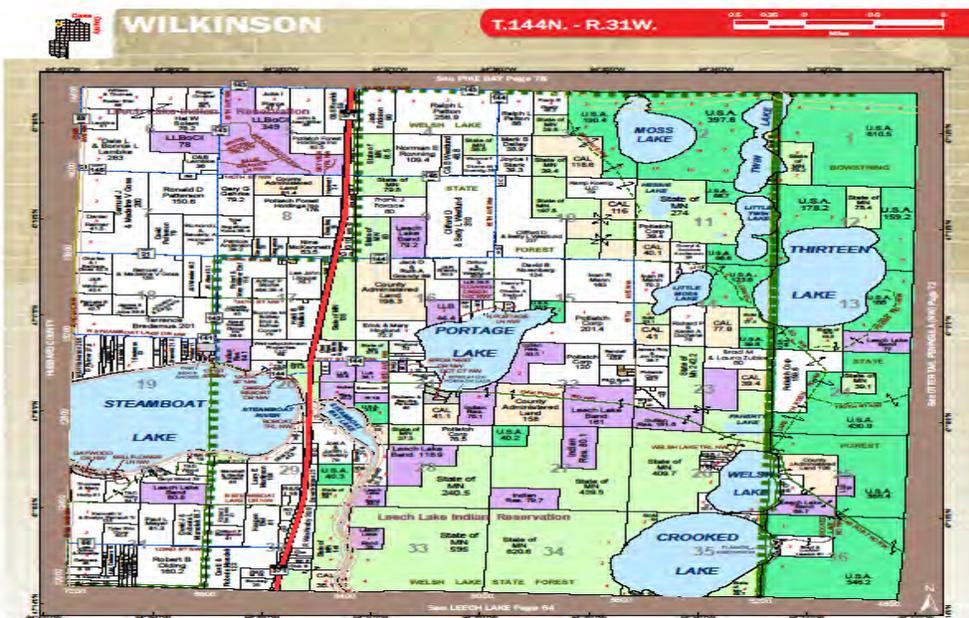


Option 3B - Increase the initial response capacity (initial attack)

Areas to address include:

- Support rural Fire Departments (FD) to include wildland fire training, personal protective equipment (PPE), equipment, risk of injuries
- Return to use of “militia” by all land management agencies with wildland fire responsibility
- Reduce redundant response and reallocate/increase resources to areas needing stronger initial attack.
- Use existing capacity without interference of certain issues

Background - The Northeast Region has unique challenges in wildland fire management, particularly in initial attack response. Landownership in the Northeast is overwhelmingly in private ownership, with less than 10% being publicly owned by federal, state or local governments. The majority of land is protected by local fire departments, not large land-management agencies. These rural fire departments may or may not have wildland fire training and adequate equipment. Additionally, where public and tribal lands do occur, land ownership is highly fragmented, resulting in many jurisdictions being responsible for initial and long term fire suppression response. Many of these jurisdictions go long periods without experiencing a significant wildland fire, even though they experience a high number of ignitions. These ignitions typically create the most damage within the first burning period, so often obtaining resources from outside the jurisdiction are not feasible. Maintaining or building capacity, particularly at the local level, is critical to the successful suppression of fires in the Northeast.



Map a. Map of Wilkinson Township, Minnesota showing typical fragmented land ownership and jurisdictions common across the Northeast Region. In this map light green is state forest, dark green is national forest, purple is tribal lands, beige is county land, and white is private land. Map courtesy of Cass County, MN.

Current Situation - Because of the high population density, fire protection units experience very high numbers of human-caused fires, with natural-caused fires constituting less than 5% of ignitions (Figure a). Although the standard fire response system is geared towards rapid response and suppression, the high volume of incidents often occur during concentrated periods of time. As a result, local suppression forces need the capacity to respond to numerous incidents of short duration, versus few incidents of long duration. This type of response situation often does not lend itself to the need, or the ability, to get long term assistance from outside the area. For this reason, long term support systems, specific to longer term campaign fires more typical of the West, are usually not feasible in the Northeast. Maintaining capacity at the local level, in the form of trained and equipped firefighters, is important to ensure the majority of these fires continue to be extinguished while small. Reductions in the number of volunteer firefighters, combined with reductions in state wildland fire staff that help train local firefighters, could lead to diminished capacity.

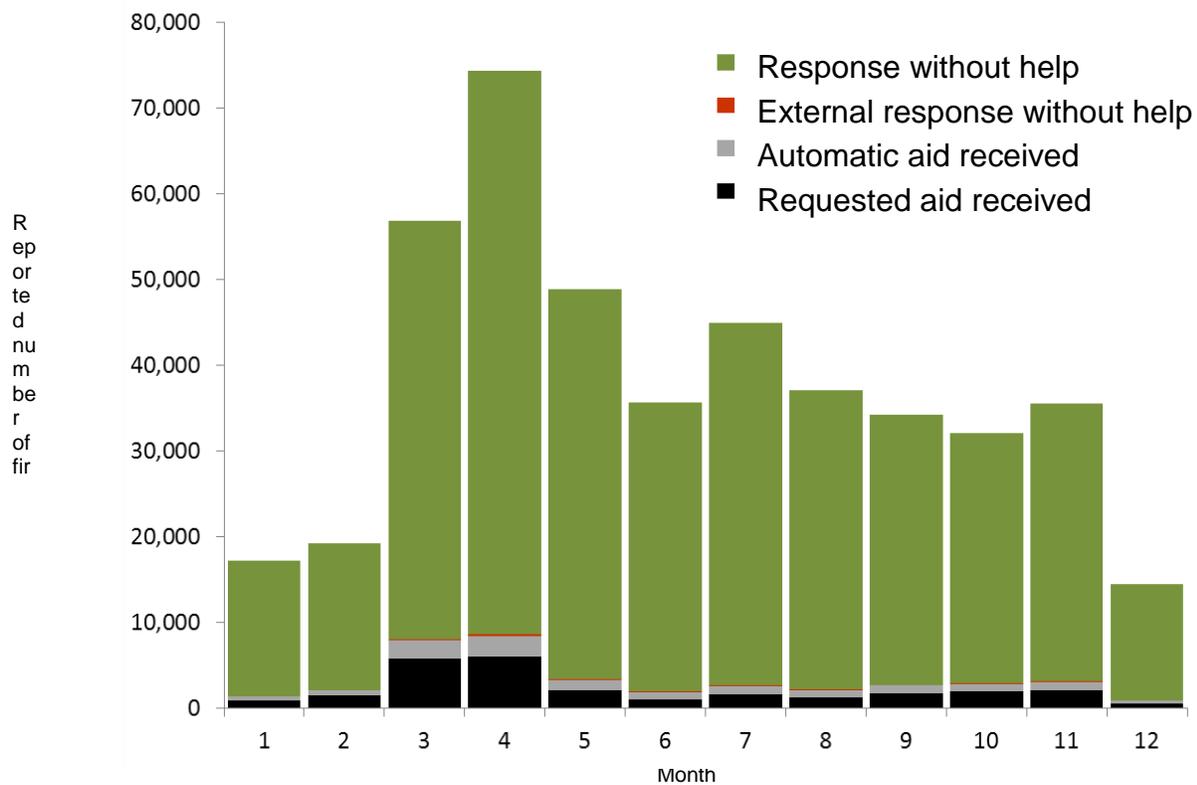


Figure a: *Reported fires in the Northeast region and type of response given or received for suppression-only activities (NFIRS dataset, 2006-2010). This data set shows not only the number and seasonality of fire responses in the region, but also the high number of ignitions that do not require mutual aid.*

Risks/Barriers/Critical Success Factors #1- State agencies and communities can be quickly inundated with multiple ignitions, and the damage to homes, high value property and forest land occurs in a short period of time. Particularly in spring and fall, the fire danger can increase so quickly that pre-positioning of resources may not be feasible. The need for a rapid response requires that wildland fire resources be close by without much reliance on resources from distant places. Recent program reductions and the resulting reduction of wildland fire resources in the Northeast have taken place over the past decade, due to a historically low incidence of campaign or large-fire activity. With smaller budgets and staff for



fire programs in the Northeast, agencies may need to look at other available staff who work in non-fire programs to help out on fires as a collateral duty (i.e. “militia”).

Risks/Barriers/Critical Success Factors #2 - Due to the many jurisdictions in highly populated areas sometimes experience a great than needed response to fires. It is not uncommon to have 4 or 5 fires departments, or more, respond to a small incident. Over-staffing a small incident can bring about cost inefficiencies, confusion of command, ineffectiveness, and cause some major safety problems. Local incident response plans need to be developed and coordinated to avoid this excessive response problem.

Risks/Barriers/Critical Success Factors #3- There are issues relating to firefighter qualification standards that impede the sharing of resources. While most states in the Northeast suppress their fires quickly and effectively, with minimal injuries and safety problems, many of these resources do not meet the existing national standard. The movement and sharing of resources to fires on federal land is very restrictive. Many local resources do not meet the federal standard, even though these resources are familiar and very effective in managing fires within the local geographic area on a continual basis. The different qualifications standards restrict the availability of many local resources that could be used for increased capacity, and sometimes require federal agencies to import resources from long distances when local resources could promptly and effectively provide the required incident response. A similar situation exists with the use of other regional resources, especially aircraft. While air tankers and helicopters of various sizes and capacity are available in the region from states and via the local provinces through forest fire compacts, these resources are typically not available to federal agencies unless they are adjacent to the federal ownership boundaries and agreements are in place. Streamlining federal policies and procedures could provide federal agencies greater access to these resources, and would be a more cost effective and more efficient response.

Opportunity #1- Local fire departments play a key role in initial attack success in the Northeast. The better equipped and trained they are, the better chance the fire will be brought under control quickly and safely, thereby mitigating the need for state and/or federal support for a larger fire. While statistics may show a high volume of responders in the Northeast, sheer numbers of firefighters is not the primary answer to capacity. Instead, the need is for well-trained, equipped and prepared wildland firefighters. However, the primary concern and priority of most fire departments is structural fire protection and emergency medical services (EMS). In order to maintain initial attack effectiveness at the local level, opportunities to ensure continued support for fire departments in the form of wildland fire training, equipment, personal protective (safety) equipment, and overall coordination will be crucial. This investment in the firefighting workforce at the field level has been identified as a national critical success factor (see appendix 10). Failure to maintain capacity at the local level will shift the burden to other jurisdictions such as the states and federal land management agencies, which already face their own capacity issues. These trained firefighters also build capacity for resource needs during busy fire periods and all-risk incidents nationally.



Figure b. Federal excess (FEPP) fire truck refurbished and equipped into a training unit for structural firefighters in New Hampshire to learn the basics of wildland firefighting, housed at the NH Fire Academy. Photo courtesy of the NH Division of Forests and Lands.

Although the bulk of the land is protected by local fire departments in populated areas, the Northeast also has large areas of private land protected by state and federal agencies. Typically states have ultimate authority on much of the land, even in municipalities where initial attack is a local responsibility. States usually have final responsibility for fires in municipalities by statute. Additionally, states have responsibility on much of the federal land by agreement. States need to ensure that they maintain the capacity to assist the local fire departments and have the training, experience, equipment, and overall readiness for those occasions when large and complex fires do occur, as historical records demonstrate. Agencies not prepared for the infrequent large fire or severe outbreak of multiple fires may quickly get overwhelmed. Opportunities to sustain wildland fire expertise at state and federal agencies will be important, particularly to help local agencies when conditions exceed their capacity.

Opportunity #2 - Within the region, there is a need to look closely at those areas that have greater initial attack demands to make sure that sufficient resources are available. This may mean a reallocation or shifting of resources within regions or sub-regions. Close attention should be paid to those areas where multiple agencies have jurisdiction, each with their own initial attack response resources. Some of these areas may be better off protected by one agency, thereby allowing the other resources to be moved to areas that are deficient. By consolidating the number of different jurisdictions, it may alleviate issues such as radio incompatibility, policy and training issues, equipment compatibility, and other problems typical of multi-jurisdictional response.

Opportunity #3 -The Northeast Region has been able to support large fire incidents on a national basis during periods of reduced local fire activity. The Northeast has rarely imported resources for campaign fires from outside the area in the past decade, but rather, has been a major exporter of resources to help with fires throughout the U.S. In addition to helping out at the national level, exporting resources maintains the skills and capacity of local resources for the major campaign fires that do break out locally. The Northeast region could assist the national mobilization needs on a greater basis if provisions were made to build in a more comprehensive national training plan. There is a need to increase the number of firefighters mobilized as trainees so that more personnel can meet federal qualifications standards and provide needed leadership during busy periods.



Figure c. Type VI Engine from State of New Hampshire assisting in wildfire suppression on the Mark Twain National Forest in Missouri (Summer, 2012). Firefighting resources from the Northeast region play a critical role each year in support of national wildland fire suppression and all-risk response efforts, reinforcing the need and importance of maintaining capacity within the region. Photo courtesy of the NH Division of Forests and Lands

Opportunity #4 - The Northeast Region is well organized sub-regionally with the existence of four forest fire compacts that cover all 20 states. For two of the compacts bordering Canada, the adjacent provinces are also included as members, thereby greatly expanding access to resources and bringing efficiencies in the form of common training, equipment standards, sharing incident management personnel, and coordinating forest fire management across all boundaries. Federal agencies are often part of each compact organization as associate members or ad hoc participants. These compacts have greatly increased available resources for fire management in the Northeast Region and need to be supported and enhanced. Coordination and agreements among the Compacts is a key opportunity in maximizing the effectiveness of these organizations as they serve each of the fire response agencies of the Northeast Region.



Option 3C - Further develop shared response capacity (extended attack; long duration fire potential). Areas addressed include:

- Improve mobility of resources to respond to larger, longer fires; better utilize Compacts
- Additional resources can be used for initial response, but would not be primary initial response resources
- Remove administrative and fiscal barriers that limit use of resources during extended or long-duration fires

Background - Sharing resources is standard operating procedure in the Northeast Region. It is an efficient and effective means of managing incidents while minimizing costs. Reductions in fire program budgets and fire staff, as well as the multi-jurisdictional nature of most incidents, have required an ongoing interagency response to incidents. Although the frequency of large incidents has been at historical lows over the last decade, the size of incidents is overshadowed by smaller very complex incidents and/or numerous incidents compressed into a short timeframe. These situations require the sharing of resources on a continual basis.

In addition to the local sharing of resources among local, state and federal agencies within a state, the Northeast Region has well established forest fire compacts that are utilized to share resources among the states and provinces. These governmental entities work well to coordinate and dispatch resources over a broad geographic area, and enhance resource sharing for efficient and effective response. There are, however, a few issues of liability yet to be resolved concerning the sharing of resources between Compacts and other administrative issues for sharing resources between compacts and federal agencies (see Map a).



West Virginia, Virginia and Mississippi are considered "bridge states" and each is a member of two compacts.

Map a. There are 8 Forest Fire Compacts in the United States which also include all of Canada except for one province and one territory. Four of these compacts are in the Northeast Region and include 6 provinces. Forest Fire Compacts have been in existence since 1949 and have continued to grow numbers and importance in cohesive forest fire management for North America.

Current Situation - The Northeast Region has generally adopted standardized National Wildfire Coordinating Group (NWCG) training as the basis for wildland firefighters. Standardized training takes place at the local, state, and federal levels so that resources can work together effectively. Occasionally, state agencies and municipalities provide wildland fire courses that are adapted for local needs. Although these courses do not lead to NWCG certification, NWCG standardized training is still the basis for course content. As part of the standardized system, much progress has been made using commonly accepted nomenclature and standard equipment on incidents. This means that overall; there is a good basis in place for resource sharing. However, there are some obstacles that must be overcome. These obstacles include: legal, administrative, fiscal and policy issues; varying qualification standards among agencies; deficiencies in available staffing; and inadequate staff training and experience opportunities.



Risks/Barriers/Critical Success Factors – Incompatible firefighter qualifications is probably the largest single barrier to sharing resources in the Northeast Region. While the NWCG qualifications standards work well for most national mobilizations, they have not been fine tuned for efficient use among the local, state and federal agencies in the Northeast Region. By necessity, most states maintain other qualification standards for use within their agencies, and most states accept each other's standards when sharing resources. This is not the case when resources are shared with a federal agency. While local resources have adapted to working in their geographic environment in a safe and effective manner, those standards do not necessarily meet the NWCG standard and the requirements of federal agencies. As a result, federal agencies often seek resources from distant locations that meet the national standards, rather than utilize local resources that could promptly and efficiently suppress the fires. A solution is needed that will allow better sharing of local resources with federal partners.

The national NWCG qualifications standards for sharing resources are difficult for Northeast regional firefighters to acquire and maintain. The standards were developed with long term campaign fires in mind. While the training courses can be obtained with reasonable success, acquiring and maintaining the experience requirements are difficult for the Northeast Region. Most states do not experience campaign fires with enough frequency to acquire and maintain the established experience qualifications.

Wildland fire suppression is inherently dangerous and requires well trained individuals who can work on fires safely and effectively. Most high level management positions on Incident Management Teams (IMT) require at least 15 years of training and experience under the current qualification system. Some IMT positions require well over 20 years of training and experience. Compared to other highly skilled professions, wildland firefighter qualifications are among the slowest and most difficult to obtain. Unfortunately, firefighter qualifications are earned from scratch for each individual, without a lot of credit for other learning and life experiences. This de facto approach is very expensive, and leads to an inefficient use of highly capable and highly skilled individuals. As a result, the cost of training firefighters to current standards is extremely high.

Firefighter safety is an issue of paramount importance. There have been instances of firefighter fatalities in every region of the U.S. After thorough investigations of the circumstances and decisions involved with specific fatalities, the solutions often include additional training requirements. Because of the inherent risks in wildland firefighting, it is difficult to refute the need for more training. However, there is a limit how much training a firefighter can receive in a given amount of time. Some investigations have found that many firefighter fatalities have occurred to highly trained and highly experienced personnel who were lacking information that was critical to their situation, and ultimately made bad decisions. There is also a question of how much risk a firefighter should be expected to take given the values at risk. Increased training requirements have led to reducing available resources and limited overall mutual aid capability.

There are a number of other barriers to greater sharing of resources in the Northeast Region. Among these are:

- The lack of liability laws that precludes the sharing of resources across state lines between most states and some compacts.
- Fund transfers are a problem for inter-state and inter-compact sharing. There needs to be a common funding transfer mechanism established for handling initial travel and lodging costs for firefighters going to incidents. This fund could be reimbursed by the receiving agency



- after the incident is over. Many states cannot pay for travel costs such as airline tickets, buses, rental cars etc. for entities outside their state.
- States need more authority to hire trained firefighters as project employees for local use and for export on regional and national incidents. Many states do not have the authority to hire qualified firefighters that are not already agency staff.
 - Some states have ceased to participate in mutual aid at the very time that it is needed such as when they anticipate another type of event such as a hurricane or other weather event. Wildland firefighters in nearby States are often left immobile.
 - Explore opportunities to share resources with other Emergency Management Agencies.
 - Explore ways to accept more credit for life experiences in meeting NWCG qualifications requirements.

Opportunities - Mobilizing firefighters and Incident Management Team members to other geographic areas for campaign fires is one of the few ways that NWCG qualifications can be acquired and maintained. These opportunities are sometimes hard to come by without personal contacts or a fair amount of luck. A more structured and effective national training and experience plan needs to be developed, and implemented, in order for the Northeast Region to be able to more effectively acquire and maintain resources that meet the national standards.

During periods of high fire activity, the Northeast Region is a major exporter of resources. These mobilizations help the national demand and help the Northeast Region acquire and maintain firefighter qualifications, but much more can be done to increase and improve the numbers of firefighters and Incident Management Teams that the Northeast Region has to offer. Building capacity for the Northeast Region is critical for handling local incidents and for supporting national resource demands in active years.

Typically, no single agency can afford to train and staff an adequate number of wildland firefighters to meet its needs during above average years. The most efficient way to achieve proper staffing is to rely on mutual aid from adjoining jurisdictions and cooperators. The cost effective way to provide wildland fire management is to do so by building partnerships and establishing mutual aid organizations and agreements. It is far cheaper to borrow another agency's well trained firefighters than to try to build your own. There is a danger of agencies reducing their workforce so deeply that it adversely impacts their neighbors, partners and cooperators. The full impact of these reductions may not occur for many years, until a larger geographic area experience a level of high fire activity at the same time.

External Factors - There are many external factors that impact adequate staffing and efficient sharing of wildland fire resources. In addition to the qualifications and training standards identified earlier, there are restrictions caused by administrative policies and political perceptions.

When the economy experiences difficulties, state and federal agencies often restrict the movement of fire personnel for training and mutual aid response. Since the wildland fire response system is built upon mutual aid and partnerships, these restrictions severely impact response capability. Declines in budgets and emphasis on building efficiencies over recent decades have led to more partnerships and mutual aid over larger geographic areas as a means to continue to adapt to budget cuts. Restricting the movement of resources during times of need will cause increased risks to the safety of the public and firefighters when major fire outbreaks occur, as history demonstrates they will.



Strengths and Limitations of the Options

Cohesive Strategy Goal 1

For Goal 1, Investment Option 1A, the focus is on the use of prescribed fire, where feasible, to achieve a wide range of resource management objectives including forest management (silvicultural), wildlife habitat maintenance or improvement, reduction of invasive plant species, and other resource management objectives. While fuels hazard reduction may not be a primary reason for prescribed burning under this option, it is certainly taken into account and recognized as an important benefit of this activity.

Investment Option 1B is characterized under goal 1 by focusing resource management treatments on restoring fire-dependent ecosystems where practical and consistent with land management objectives. We know that fire dependent ecosystems in the Northeast continue to change with lack of fire (Nowacki & Abrams, 2008). Fire-dependent plants are being replaced by shade-tolerant, fire-sensitive vegetation which is less flammable. Although less flammable vegetation change can be used to protect values at risk such as wildland urban interface (WUI), the impacts to fire dependent ecosystems are severe in terms of ecological function, plant and animal habitat and ecosystem services.

Under Goal 1, Investment Option 1C emphasizes mitigating “event” fuels as a potential wildfire hazard in areas impacted by incidents such as blowdowns, tornadoes, ice storms, and tropical storms or hurricanes. Fuels from these types of events are often, heavy, concentrated, and present a serious risk due to a significant mix of both fine easily ignitable, and lots amounts of flammable heavy fuels.

Cohesive Strategy Goal 2

For Goal 2, Investment Option 2A supports promoting activities that can be taken by local communities to address their particular needs in addressing any risks posed by wildland fire. Option A recognizes that wildland fire risk and hazard reduction through prescribed fire is less feasible for many communities in the Northeast than in other regions of the country due to limited prescribed burning opportunities, a high amount of wildland-urban interface area, and landscape fragmentation. Fragmentation occurs in two ways; by conflicting or discordance in landowner vision/objectives for their land, and parcelization by subdivision into smaller, patchy ownership patterns making planning and treatment activities time-consuming, complex, and expensive to complete.

Under Goal 2, Investment Option 2B emphasizes assisting communities in becoming more fire adapted, the focus is on treating hazardous fuels in, and adjacent to, WUI areas where practical and feasible to reduce the potential threat from a wildland fire. Due to variety of factors outlined in the Option 2B description, opportunities for implementing this option are limited, but where they exist, the benefits to communities can be significant.

Investment Option 2C is addressed by promoting and supporting fire prevention programs in local communities where there is evidence of higher than average wildland fire occurrences.

Cohesive Strategy Goal 3

For Goal 3, Investment Option 3A focuses on improving the efficiency and effectiveness of the local wildland fire response capability. It is recognized that for many communities and areas of the Northeast, the best strategy to maintain landscapes and assist communities to adapt to wildland fire is to maintain an efficient, trained, and effective response capability to insure that when wildland fires do occur, they can be attacked quickly and safely.



The focus for goal 3 under Investment Option 3B is on increasing the capacity of initial attack resources across the Northeast Region. Where present, having well-trained, properly equipped local fire fighting resources has proven effective in responding to wildland fires and protecting communities and landscapes. There are more than 13, 500 local fire departments across the Northeast, but not all are at the optimal level of capacity and capability that is envisioned by the Northeast Regional Strategy Committee. A number of activities are identified in this option to help address local fire departments achieve their needed capacity.

The focus of Investment Option 3C is on further developing the extended wildland fire attack capacity in the Northeast. The primary issue is that there are a number of administrative barriers currently impeding the ability of the Northeast to obtain needed resources for wildland fires that evade initial attack efforts, or more commonly to export additional resources where needed to support large wildland fires in other regions of the country.



Science Modeling Methodology

Various analytical models were constructed for the primary purpose of relating causal or contributing factors to variables which collectively index levels of risk. These risk metrics include measures of hazard such as frequency and magnitude of wildfire, any direct measures of loss or injury, and various measures related to exposure, such as the number or density of homes in the wildland-urban interface. Although hazard and loss are often combined into single measures of risk, such measures were not constructed in our analysis due in part to the county-level resolution of the original data. For example, we know that there are homes distributed throughout the wildland urban-interface and large wildfires are likely within the county, but we cannot tell which portion of the county is most likely to experience wildfire or which off-site effects of wildfire might be relevant to overall impacts. Such spatial interactions are important for producing an accurate and precise estimate of risk. Lacking more specific information, we use a more straightforward and simple assumption that the total risk is proportional to county-level hazard, exposure, and potential loss.

Five basic models or templates were created for use by the Northeast's Strategic/Technical Working Group in order to explore opportunities for reducing risk. They are described only briefly here. The first was an Ignition Model, which focused on understanding where human-caused wildfire ignitions occurred and where they might be reduced through targeted actions at preventing either accidental or intentional ignitions alone or in combination. The second template—Fire, Fuels, and Homes—explored the intersection of homes and wildfire and included variables that might suggest where either mechanical treatments or prescribed fire might be productively employed to alter the composition of surface fuels and affect wildfire behavior. Conversely, they could also be used to identify areas where such options are problematic. The third template—Prescribed Fire and Ecological Resiliency—focused more on the potential application of prescribed fire in areas removed from human communities where the primary goal might be to restore a fire regime more consistent with historical conditions. Fire Adapted Communities formed the basis of the fourth template, which used information about current programs to suggest the extent to which evidence of local actions are tied to socioeconomic factors as well as to factors more directly indicative of risk to human communities from wildfire. Finally, the fifth template emphasized Incident Response Capacity and Workload. The purpose of this template was to help understand the relative contribution of federal, state, and local departments to incident response and explore the factors contributing to variation in response metrics such as arrival and containment time and fire size.

These templates and associated data were customized for each region and shared with the regional work groups during a workshop in Denver in early September. Ensuing discussions with each workgroup led to the creation of a series of summary tables, graphs, and maps that highlighted findings relevant to objectives and goals articulated by each region. These summary products have been incorporated in the regional reports as noted.

How Decision makers can use the Alternatives

The alternatives and options presented above represent the three most common, feasible approaches to addressing the Cohesive Strategy goals according the Regional Strategy Committee and their colleagues across the fire community in the Northeast. These options are each considered feasible approaches to addressing each of the three goals depending on such factors as agency mission, geographic sub-region and forest ecotype, community support, available trained resources, proximity to population centers,



and a myriad of other factors. These are not the only possible options, and other combinations of options may be more appropriate for a given locality or jurisdiction depending on applicable laws, statutes, agency mission, local plans and objectives, immediate risks or threats, program direction and budgets, available resources, and other driving factors. These options are intended by the Northeast RSC to illustrate some feasible approaches and provide a starting point for any further local analysis or planning effort a federal, tribal, state or local jurisdiction wishes to undertake to address a wildland fire management set of issues through the Cohesive Strategy goals and framework. The Northeast RSC believes what is most important is the desired results represented by the Cohesive Strategy goals. The options outlined in this Risk Analysis Report represent some of the more successful approaches used by fire management specialists in the Northeast Region.

As the alternatives, options, actions and activities are presented to local decision makers, particularly at the county level, CWPPs or their equivalent should be developed and modified to reflect priorities determined by the local entity. In alignment with local community values and land management objectives, the various actions associated with these alternatives should help to guide practical and sensible decision-making. Collaborative groups that encompass larger areas, outside of a county geographic boundary, are also another valuable tool when discussing priorities at the landscape level. Collaborative groups have proven to be successful in identifying priority treatment areas and leveraging resources to accomplish hazardous fuels reduction treatments, as well as larger scale forest restoration and management across the landscape. Collaborative groups can also help development alternatives and priorities that are acceptable especially in multi-jurisdictional landscapes to present to local and state decision makers.

In the attempt to provide a higher level of wildfire protection for their community, many localities will find reduction of hazardous fuels on both private and public lands to be a very high priority. To achieve maximum results, it is often most productive to determine the best method of performing such tasks through collaborative efforts. In many cases, the most efficient of these methods could be through active forest management- commercial timber and salvage sales, which improve forest health and provide economic opportunities including biomass utilization. Although this may be simply accomplished on private, tribal, or state lands, it should be recognized that laws applying to federal and state lands will complicate, delay, or even preclude such activities. Fully implementing all existing authorities such as the Healthy Forest Restoration Act and Categorical Exclusions should be considered to accomplish landscape level treatments to restore forest health. Local governments, private forestland owners, interested parties, state agencies and federal agencies are encouraged to participate with collaborative efforts to expeditiously find local solutions that address barriers and reduce risk to communities.

There can be no standard approach that will serve as the best alternative and set of options in all areas. The alternatives and options can and should be used to evaluate procedures and methods to achieve local priorities as outlined and delineated in state action and community plans and through collaborative groups. As such, specific actions from the alternatives and options should inform decision-makers as they develop the most effective approach to accomplish local priorities across the landscape.



Description of Trade-offs and Strategic Investment Options for the Alternatives

The three alternative approaches to the Cohesive Strategy goals as described above represent sets of investment options agencies and jurisdictions can use to guide the investments they choose to make in addressing the three Cohesive Strategy goals as according to their plans and needs. In an analysis done by the RSC of the input from the fire community and their stakeholders, there are some interesting perspectives to point out that may be useful to decision-makers and fire management specialists. The approximate ranges of investment levels preferred by the Northeast Regional Strategy Committee, by Cohesive Strategy goal, on an annual basis are:

Goal 1: Resilient Landscapes	30-35%
Goal 2: Fire Adapted Communities	20-25%
Goal 3: Wildfire Response	40-50%

Among the three Cohesive Strategy goals there is a difference in preferred options for investing in the three Cohesive Strategy goals by agency – at the federal, state, tribal and local levels. There are some distinct differences in goal investment preferences with the Federal and Tribal agencies showing a more balanced distribution among the three goals, approximately a third for each goal. Federal agencies indicate the highest percentage of investment in fuel treatment activities. The State agencies prefer substantially less investment in goal 1 and would invest more in goal 3 as they have greater (and often mandated) protection responsibilities. This is true especially for local agencies as they are primarily responsible for protection of life and property.

There is also a difference in preferred options for investing in the three Cohesive Strategy goals by geographic sub-region within the Northeast U.S. The investments are much more balanced among sub-regions than among agencies and organizations within each sub-region. There is a noticeable difference between New England and New York, and the Mid-Atlantic and Mid-West in goal 1 investments (fuel treatments activities). This may be due to less available acreage to treat, a shorter burning “window” due to seasonal variability, and especially to a significantly higher population density limiting the feasibility of treatments due to proximity to urban areas and related health concerns to smoke from burning.

See the tables in Appendix 8 for more details regarding investment preferences in the Northeast Region.



National Performance Measures

In Phase I national goals and performance measures were established. The goals are ideals that we hope to move closer to by taking the specific actions that are set out in the regional and national action plans. It is assumed that if we can restore and maintain landscapes, and create more fire adapted communities and improved fire response, then we will be able to rein in escalating wildfire suppression costs. These are the National Goals and associated Performance Measures:

GOAL 1 - Restore and Maintain Landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.

Outcome-based Performance Measure:

- Risk to landscapes is diminished.

National output-based metrics, in support of the national measure, will center on risk to ecosystems at landscape scales.

GOAL 2 - Fire Adapted Communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.

Outcome-based Performance Measures:

- Risk of wildfire impacts to communities is diminished.
- Individuals and communities accept and act upon their responsibility to prepare their properties for wildfire.
- Jurisdictions assess level of risk and establish roles and responsibilities for mitigating both the threat and the consequences of wildfire.
- Effectiveness of mitigation activities is monitored, collected and shared.

National output-based metrics will include indicators relevant to communities with mitigation plans and planned or completed treatments.

GOAL 3 - Wildfire Response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

Outcome-based Performance Measures:

- Injuries and loss of life to the public and firefighters are diminished.
- Response to shared-jurisdiction wildfire is efficient and effective.
- Pre-fire multi-jurisdictional planning occurs.

National output-based metrics will reflect trends in changing risk to support the national measure. Indicators will include pre-season agreements and annual operating plans, integrated wildfire response scenarios, and shared training. Risk exposure to firefighters will be based on a balanced consideration of values protected and the probability of success.



Recommendations and Conclusions

In this report, the Northeast RSC has outlined a set of priority options to address the Cohesive Strategy goals on the basis of stakeholder input from the fire community throughout the Northeast Region. These options are each considered feasible approaches to addressing each of the three goals depending on such factors and agency mission, geographic sub-region and forest ecotype, community support, available trained resources, proximity to population centers, and a myriad of other factors. These options have been developed to help the Northeast wildland fire community address the risks and barriers outlined in this report.

These are not the only possible options, and other combinations of options may be more appropriate for a given locality or jurisdiction depending on local plans and objectives, risks, agency mission, available resources, and other driving factors. These options are intended to illustrate some feasible approaches and provide a starting point for any further analysis or planning effort a federal, tribal, state or local jurisdiction wishes to undertake to address a wildland fire management set of issues through the Cohesive Strategy goals and framework. The Northeast Regional Action Plan that follows this report later this year will provide additional details on key actions and activities designed to guide implementation of these options and other feasible combinations.

As these goals and options are presented to local decision makers, particularly at the county level, Community Wildfire Protection Plans (CWPP) or their equivalency should be developed and modified to reflect priorities determined by the local entity. In alignment with local community values and land management objectives, the various actions associated with these options should help to guide practical and sensible decision-making. Collaborative groups that encompass larger areas, outside of a county geographic boundary, are also another valuable tool when discussing priorities at the landscape level. Collaborative groups have proven to be successful in identifying priority treatment areas and leveraging resources to accomplish hazardous fuels reduction treatments, as well as larger scale forest restoration and management across the landscape. Collaborative groups can also help develop options and priorities that are acceptable especially in multi-jurisdictional landscapes to present to local and state decision makers.



Next Steps

In the next portion of Phase III of the Cohesive Strategy, each Region will develop an Action Plan based on this Regional Risk Analysis Report. The intent of the Regional Action Plan is to capture actions the RSC has agreed to pursue in the next five years to make progress in achieving the three goals of the Cohesive Strategy. Specific actions are likely to be about process improvements related to the immediate successes identified; the barriers and solutions within the region's decision space; pursuing one of the initial or refined options in whole or in part; information as a result of the regional or national risk analysis; feedback received through the communication and outreach effort; and input based on stakeholder involvement throughout Phase III. Regional Action Plans also are to include the identification of performance measures to be used to monitor progress.

The action plans will identify who will do what, where, and by when. The intent is to create a mechanism for recording commitments the RSCs have made and to ensure accountability in completing the actions. The actions in each Regional Action Plan document the initial efforts in implementation of the cohesive strategy at the regional and local level in an effort to make a positive difference on-the-ground.

At the national level, Phase III will continue with development of a national risk analysis and a national action plan. The National Science and Analysis Team (NSAT) will develop a comparative risk model using the data sets, and will develop a national trade-off analysis. When the comparative risk and trade-off analyses are complete, a National Phase III Risk Analysis Report will be written to bring together the issues and alternatives discussed in the three regional reports. A National Action Plan will be developed based on the national risk and trade-off analyses.



Appendix 1- Glossary

Abiotic – In biology, abiotic components are non-living chemical and physical factors in the environment.

Barriers - Policy or administrative impediments that must be removed in order for the Cohesive Strategy to be successful.

Biotic - Of, relating to, or resulting from living things, esp. in their ecological relations

Critical Success Factors - Policies, programs, agreements, partnerships, resources, and other factors that must be present for the Cohesive Strategy to be successful.

Fire-adapted community - Human communities consisting of informed and prepared citizens collaboratively planning and taking action to safely co-exist with wildland fire.

Fire-adapted ecosystem - An ecosystem is “an interacting natural system, including all the component organisms, together with the abiotic environment and processes affecting them.” (NWCG Glossary). A fire-adapted ecosystem is one that collectively has the ability to survive or regenerate (including natural successional processes) in an environment in which fire is a natural process.

Fire community - A term that collectively refers to all those who are engaged in any aspect of wildland fire-related activities.

Fire exclusion - The land management activity of keeping vegetation or ecosystems from burning in a wildland fire.

Fire management community - A subset of the fire community that is has a role and responsibility for managing wildland fires and their effects on the environment.

Fire science community - A subset of the fire community consisting of those who study, analyze, communicate, or educate others on the components of fire management that can be measured, such as fire behavior, fire effects, fire economics, and other related fire science disciplines.

Resilient - Generally referred to in this document as “resilient ecosystems,” which are those that resist damage and recover quickly from disturbances (such as wildland fires) and human activities.

Regime - A fire regime is the pattern, frequency and intensity of wildland fire that prevails in an area.

Risk - A situation involving exposure to danger; the possibility that something unpleasant or unwelcome will happen.

Stakeholder - A person or group of people who has an interest and involvement in the process and outcome of a land management, fire management, or policy decision.

Appendix 2 - Acronyms

BAER – Burned Area Emergency Rehabilitation
BAR – Burned Area Rehabilitation
CWPP – community wildfire protection plan
DOD - Department of Defense
EACG – Eastern Area Coordinating Group
FEMA – Federal Emergency Management Agency
FEPP - Federal Excess Personal Property
FFT2 – Firefighter 2
FFP - Fire Fighter Property
FLN – Fire Learning Network
FWS – US Fish and Wildlife Service
GACC – Geographic Area Coordination Center
IAFC – International Association of Fire Chiefs
IMT -- Incident Management Team
JFSP – Joint Fire Science Program
MAC – Multi-Agency Coordination
MNICS – Minnesota Incident Command System
MOA – Memorandum of Agreement
MOU – Memorandum of Understanding
NASF – National Association of State Foresters
NEMAC – National Environmental Modeling and Analysis Center (UNC Asheville)
NIFC – National Interagency Fire Center
NFPA – National Fire Protection Association
NGO – non-governmental organization
NPS – National Park Service
NSAT – National Science and Analysis Team (for Cohesive Strategy)
NWCG – National Wildfire Coordinating Group
PPE – personal protective equipment
RSC – Regional Strategy Committee
WG- Working Group
TNC – The Nature Conservancy
USFS – US Forest Service
VFA - Volunteer Fire Assistance
VFD – volunteer fire department
WFEC – Wildland Fire Executive Council
WFLC – Wildland Fire Leadership Council
WUI – wildland urban interface



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Appendix 4 – Communication Activities and Plans

Northeast Region Phase III Communication and Outreach Plan

The Northeast Regional Strategy Committee (NE RSC) desires to continue emphasizing stakeholder communication and outreach during Phase III of the National Cohesive Wildland Fire Management Strategy. Communication and outreach objectives identified in the Northeastern Region’s Phase II Outreach Communication Plan will persist and be built upon during Phase III, and include:

1. Engaging people affected by this strategy in its development within the timeframes identified by the Wildland Fire Leadership Council (WFLC).
2. Following a collaborative, rigorous, transparent development path.
3. Collecting data representing interests and opinions of stakeholders.
4. Using local, regional, and traditional knowledge and insights, as well as science and technology, to inform the Northeastern strategy assessment.
5. Disseminating clear and current information to stakeholders using multiple media on a routine basis.
6. Identifying and sharing on-the-ground success stories, including “key ingredients to success” that could be of immediate help to other communities or organizations.
7. Seeking input from stakeholders to develop Cohesive Strategy implementation plans, and applying their ideas and “key ingredients” associated with successful projects to implementation planning.

Desired Outcomes for Phase III Communication and Outreach

The Northeast Region Outreach and Communication Plan dovetails with and supports the objectives of the Cohesive Strategy National Communication Framework. A detailed action plan for the Northeast Region will be developed to support the updated Northeastern Region Outreach and Communication Plan. This update includes activities leading to and through Strategy Implementation (February 28, 2013).

Outreach and communication efforts during Phase II provided the NE RSC/WG with valuable information used to develop the Northeast Assessment. Efforts by the NE RSC/WG to fully engage all stakeholder groups across the Northeast was hampered by a combination of the time of year outreach was conducted and time limitations established by WFLC. As a result, opportunities remain to strengthen and expand stakeholder engagement during Phase III and set the stage for successful implementation of the Cohesive Strategy.

The NE RSC has identified the following desired communication and collaboration outcomes and activities to be achieved during Phase III:

- Strengthen and expand stakeholder support throughout the Northeast and ensure all affected stakeholder “voices” are heard and engaged.
 - Share the Northeast Assessment –expand the dialogue and stakeholder participation and continue to identify and add good ideas.
 - Seek specific input to the Goals, Objectives, Sub-Objectives, Actions and broad policy questions described in the Northeast Assessment.
 - Expand stakeholder support beyond that developed in Phase II by actively reaching out to engage “new voices” in the conversation.

- Continue to identify “Immediate Opportunities for Success” in the Northeast focused on those examples where the three national goals are being met.
 - Identify and describe “key ingredients” including performance measures and metrics that effectively work on the ground.
 - Actively share and expand the application of these techniques with willing stakeholder groups.
- Facilitate agency efforts to streamline processes and increase both pace and effectiveness of implementation by taking full advantage of existing authorities to accomplish goals outlined in the Strategy.
 - Solicit ideas from successful collaborative efforts on ways to cut through process and achieve results.
 - Identify perceived and actual procedural barriers to accomplishing work; provide guidance or materials that clarify procedural options and/or identify options to improve procedures.
 - Provide tools and materials to assist the NE RSC/WG in communicating with stakeholders regarding procedural options available to them.
- Actively engage with the Science Team during the Phase III effort.
 - Keep Northeast stakeholders updated on progress, products, and opportunities for input.
 - Clarify what the Phase III trade off analysis is, and provide tangible descriptions of Phase III’s expected outcomes to Northeast stakeholders.
- Continue to keep the CSSC, WFEC and other Regions apprised of Northeast Region communication and outreach efforts.
 - Coordinate Northeast-wide efforts with the national communication strategy and team.

Northeast Region Communication Strategy Working Group Goals

The Northeast Region Communication Strategy Working Group’s goals support the NE RSC’s desired outcomes for Phase III communication and outreach:

- 1) Strengthen and expand existing NE RSC/WG stakeholder engagement and support.
- 2) Improve elements of the Northeast Risk Analysis and Action Plan Reports by providing opportunity for stakeholder comment as part of the Phase III development work.
- 3) Create opportunities for continuous and expanded stakeholder involvement using multiple media and networks (newsletter/updates, website, social media, etc.).
- 4) Distribute accurate, timely information regarding Phase III objectives, progress, and participation opportunities.
- 5) Emphasize elements and tools for successful National Cohesive Strategy implementation that can be pursued immediately.
- 6) Provide direction and subject matter expertise in guiding the Communications Support Contractor.

Phase III Northeast Region Outreach and Communication Actions

A detailed action plan for the Northeast Region will be developed by the Communication Strategy Working Group to support the updated Northeast Region Outreach and Communication Plan. The following actions are not intended to be all-inclusive, but illustrate the range of actions that could be taken during Phase III. In some instances, actions can achieve more than one of the desired outcomes described above:

1. Provide communication support and assistance to the NE RSC/WG.



- Assist NE RSC/WG members assigned to maintain and pursue expanded stakeholder engagement by providing communication tools and outreach materials.
 - Maintain a calendar of Northeast CS engagements and track information from those engagements using a “trip report.” The trip report will be used to record discussion topics, identify additional communication support needs, and note any immediate success story leads.
 - Identify key opportunities for the RSC to provide NSAT with information needed to generate program option tradeoffs and performance measures and integrate those opportunities into the Northeast Region's communication and outreach plan.
 - Develop communication tools/messages to describe NSAT's role and purpose, and how the outcomes from the trade-off analysis may be used in implementation.
2. Provide stakeholders the opportunity to review and comment on the Northeast Region's Risk Analysis and Action Plan Reports. Analyze comments and provide the NE RSC a portrait of comments and stakeholder response.
3. Identify stakeholder groups that were not engaged or were inadequately represented in Phase II, and expand outreach to connect with these groups to ensure that the NE RSC/WG hears from these “new voices” and engages them in the process.
- Identify sub-regions and communities of interest not engaged (e.g., conservation groups and organizations, agency non-fire staff, business and industry, and urban stakeholders)
 - Attract and retain these groups’ attention. Strive for understanding, acceptance and support for the Northeast Region's Risk Analysis and Action Plan Reports and the Cohesive Strategy.
 - Identify success stories and examples of successful implementation that can be shared with Northeast stakeholders:
 - Identify groups and individuals that have demonstrated "on the ground" success in achieving the goals of the Cohesive Strategy, and encourage them to support the broader application of their successful methods throughout the Northeast.
 - Solicit ideas from successful collaborative efforts about their techniques to reduce process barriers and achieve results.
4. Use a variety of media to sustain and expand stakeholder outreach and communication to create the social connection and traction needed for a collaborative foundation for strategy implementation. Use these communication methods to enhance understanding of the Northeastern RSC and the Cohesive Strategy effort by filling in the picture of who we are, what we are doing and why.
- Develop monthly stakeholder update messages and materials. Develop coordinated messaging that considers: current work of the NSAT, activities of the Northeast Region Strategy and Technical Group, Communication Strategy Working Group, RSC/WG activities, and collaboration and outreach activities. The activities and products of these groups will all feed into the messages developed for internal and external use.
 - Maintain a current stakeholder mailing list to be used for outreach and updates
 - Maintain information on the Northeast Region's webpage regarding status, comment opportunities, and who and how to engage in development of the Northeast's strategy.
 - include current updates to reflect the status of the Cohesive Strategy Phase III
 - include success stories gleaned from around the Northeast

- describe immediate actions that can be taken to move communities toward the three goals of the Cohesive Strategy
- promote any opportunities for stakeholders to comment on the development of Phase III

B) Description of updates, success stories, and the website

Beginning August 1st, 2012, Northeast regional updates on strategy news are published on a monthly basis. They are posted to the NE website and have 4 basic components.

1. A main feature story
2. Summary of monthly engagements and stakeholder feedback
3. Science team engagement
4. Success story profiling

Additionally, a minimum of two success stories will be posted to the Web Site every month. These success stories will discuss locations, which of the three Strategy Goals are emphasized, what degree of collaboration was accomplished and with who. Another critical component of each success story is a description of the results, along with contact information for the reader to engage directly with those involved in the success.

The Northeast RSC’s website at <http://sites.nemac.org/northeastcohesivefire/> is a public resource for current information on the Cohesive Strategy in the Northeast, with connections to information for the other two Cohesive Strategy regions, national Cohesive Strategy resources and partner organizations. The site includes background information on developing the strategy, those involved in the regional committees, and how the public can get involved by joining the Northeast mailing list and engaging in ongoing dialogues including comment periods on strategy components. Success stories in the site’s “About You” section describe recent and ongoing achievements by collaborators in the region who are operating on the principles of the Cohesive Strategy to progress toward the one or more of the strategy’s goals. On the “Reports” page, Reports and Monthly Updates from the region show the visitor in detail the decision processes and factors considered in building the strategy so far, how they can be part of the process, and in what ways public participation is influencing the strategy as the implementation phase approaches.

The site houses this information in the following tabular scheme:

- Overview,
- About Us
 - How We Work
 - Wildland Fire in the Northeast
 - Members
- About You
 - Success Stories
- Reports
- Contact Us

In short, the regional website allows the public to view current information, give feedback, connect with partners, and be alerted to engagement opportunities with both the Northeast Region and the larger National strategy efforts. It is maintained regularly as an effort of the Communications Working Group.

C. Outreach Activities – Accomplishments to Date

Presentations:

Organization	Dates	Main topics
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Northeast Forest Fire Supervisors		
Northeastern Area Association of State Foresters		
Northeast Forest Fire Protection Compact		

Success Stories:

The NE RSC has completed and posted nine success stories on the NE RSC website. The success stories are located at: <http://sites.nemac.org/northeastcohesivefire/success-stories/>

NE RSC Update:

The Update has been distributed in August, September and October to a mailing list of more than 400 persons. The members of the NE RSC have provided the contacts for the mailing list.

Forums and a stakeholder comment:

Forums and a stakeholder comment period were held the first week of October 2012. 10 participated in the forums and 17 comments were received from the website outreach.



Cohesive Wildland Fire Management Strategy
National Goals; Collective Solutions

Response to Wildfire
Fire Adapted Communities
Resilient Landscapes
Supported by Science

Appendix 5 – Stakeholder Outreach and Feedback

Northeast Region



Cohesive Wildland Fire Management Strategy
National Goals; Collective Solutions

Response to Wildfire
Fire Adapted Communities
Resilient Landscapes
Supported by Science

Phase III • Draft Regional Risk Analysis Report Content analysis of stakeholder comments



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METI

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1.0 Introduction

This report documents stakeholder evaluation of and comments on the Draft Risk Analysis Report for implementing the Northeastern Regional Strategy and Assessment as part of Phase III of the Cohesive Strategy. **Phase III** involves creating a range of alternatives and performance measures that can be quantified using available science and information within each Region. The Northeast Regional Risk Analysis report includes a description of the issues being addressed by the Cohesive Strategy, a characterization of wildland fire risks, and three investment options available to address the risks. Comparing options and potential outcomes using the best available science to evaluate the consequences for different options will illustrate the relationships between goals, objectives and actions within each Region. This information will then be used to develop action plans that serve as the basis to align the actions of agencies, tribes, individuals, and groups working toward common goals and objectives of the Cohesive Strategy.

All options in Phase III are considered feasible approaches to addressing the Cohesive Strategy's three goals, as are possible combinations of the investment options. The Northeast Regional Strategy Committee (NERSC) will explore sets of management options within each Region and identify opportunities, risk factors, and barriers that may influence the ability to carry out these options. The committee will use this information to develop action plans that align the efforts of agencies, tribes, individuals, and groups working toward common goals of the Cohesive Strategy.

The NERSC will use stakeholder feedback to finalize the Regional Risk Analysis Report and as a starting point for developing a Regional Action Plan that will guide the Cohesive Strategy effort over the next 5 to 10 years.

The Northeastern Regional Strategy Committee and Working Group (WG) are comprised of representatives from federal, tribal, state and local governments and non-government organizations, and local natural resource and fire service agencies. Each member represents a wide range of communities of interest with extensive networks of practitioners and constituents. As chartered, the NERSC and WG members are charged with communicating the purposes of the Phase III effort as well as soliciting comments and suggestions regarding the Strategy and Assessment and its implementation. A list of the NERSC and WG members and their affiliations may be found at <http://sites.nemac.org/northeastcohesivefire/members/>.

The NERSC employed the services of Management and Engineering Technologies International, Inc. (METI) to assist with evaluating comments and preparing this content analysis report (see Appendix B).

1.1 Outreach Effort

The importance of bottom-up strategy development through stakeholder engagement is one of the key principles employed to develop the Cohesive Strategy. Continuing the collaborative dialogue begun in Phase I and II, the NERSC solicited stakeholder comment on the Draft Regional Risk Report through a web based comment form and on a Webinar conference call.

This step in the process was designed to collect feedback from stakeholders to help the committee:



- Understand major issues or areas of concern not captured or addressed in the characterization of the Northeast Region's fire situation in the risk report.
- Identify issues and concerns not addressed well by the options analyzed in the risk report.
- Identify examples of successful implementation and/or barriers to successful implementation that are consistent with the risk report.
- Identify crucial considerations for development of a Regional Action Plan.

This opportunity for comment reaffirmed the NERSC's desire to provide transparency and an opportunity to help shape the suite of potential solutions to best meet the Northeast's needs.

The dates of the comment period were noted in the NERSC monthly updates for September and October, respectively, and distributed to the NERSC stakeholder outreach mailing list of over 400 contacts. The NERSC update for October featured information on how to participate in the committee's interactive webinar for stakeholders to comment on the Draft Risk Analysis Report. Invitations were specifically sent to the following organizations to encourage participation:

- National Volunteer Fire Council
- National Fire Protection Association
- International Association of Wildland Fire

Individual NERSC members forwarded this invitation to their own networks, and the Northeastern Region's homepage also featured a link to the comment form and webinar signup, as available to view at:

<http://cohesivefire.nemac.org/webform/northeastern-comment-form>

On October 1st the NERSC opened a stakeholder comment period for reviewing the Draft Risk Analysis Report. Stakeholders were provided the **Draft Northeast Regional Risk Report**, including Appendices, and a web-based **Stakeholder Comment Form**. The comment period was held for one week, from October 1st to October 7th. Appendix A contains the background information provided and a stakeholder comment form used to solicit comments.

On October 4, 2012, the Northeastern Regional Strategy Committee hosted a webinar to solicit stakeholder feedback on the Northeast Region Risk Analysis Report. Invitations were extended to the contact lists referenced above. Nine participants joined the webinar. Comments from the webinar were recorded and incorporated into this report.

1.2 Outreach Summary

The number of outreach participants and the perspective of their comments represent only those who elected to participate. The result of the outreach effort by number of participants and affiliation group is presented in Table 1-1.

Table 1-1: Number of Stakeholders Commenting By Affiliation Group

Affiliation	Web-based	Webinar
Federal Government	1	6
Fire Department		
Forest Industry		
Homeowner/Landowner		
Local Government		
Non-Governmental Organization (NGO)		2
State Government		1
Tribal		
Totals	1	9

Stakeholder affiliations are consistent with those used in the Northeastern Region Phase II Content Analysis.

1.3 Document Organization

This report documents comments received during the outreach effort including e-mails and web-based solicitation. The information in content analysis report will be considered by the NERSC, Working Group, and the NSAT during their final edits and revisions to the Risk Analysis Report.

This document is organized into the following sections:

Section 1: Introduction describes the intent and process used to solicit feedback on this portion of Strategy development.

Section 2: Content Analysis describes the process used and provides a summary of comments received related to the NE Regional Draft Risk Analysis Report.

Section 3: Comment Evaluation describes the affiliation of those who commented and compares this to the previous outreach results.

Section 4: Major Comment Points summarizes key points heard from the stakeholders.

Appendices A and B: Include the background information provided to stakeholders and web-based comment form and the members of the METI content analysis team.



2.0 Content Analysis

Comments on Questions 2, 4, 6 and 7 are summarized below. Note that direct quotes from stakeholders are represented in italics. Because only one web-based comment was received, Questions 1 and 3 requesting stakeholder rating of the Risk Report and Options were not analyzed because of the low response rate.

Table 2-1 displays the number of distinct comments for each question where a written response was requested.

Table 2-1 – Number of Comments for Key Questions

Question Topic	Number of Comments	
	Webinar	Webpage
Areas of concern with Risk Analysis	4	1
Areas of concern with Options	4	
Barriers/Success Stories	1	2
Crucial Implementation Considerations	4	1
Total	13	4

Note to Reviewers

The information derived from the content analysis only represents a portrait of comments provided by those who elected to participate in the outreach effort. It is not a statistically valid sample of stakeholders affected by wildland fire issues in the Northeastern Region. However, it does provide information about the variety of perspectives and in some cases points of agreement on different issues.

Although every attempt was made to identify individual comments and categorize them correctly, error is inevitable and thus some mistakes in classification may have occurred despite quality control and reviews conducted during the analysis process.

2.1 Areas of Concern not Addressed in Draft Risk Report

Stakeholders were asked to comment on the following question:

Are there areas that are of concern that the draft risk report does not portray or address?

Four of the ten stakeholders provided comments on areas of concern. Key ideas that surfaced from stakeholders included:

- *“Like the other phases of the process, the risk analysis has very little substance to respond to. It’s so conceptual and lacking specifics that there is nothing to object to. I’d have to say that for the most part I agree with the risks that were identified, but what conclusions are being drawn? And it’s the conclusions that lead to actions. My concern is that we’ll move into the action planning phase and start moving in various directions without having had the chance to consider the implications.”*



- *“Concern that in the next step people may voice concerns based on things not presented in the current analysis – so the answer to the question “why didn’t you voice it before?” is that it was not presented as a point/information.”*
- National Fire Protection Association (NFPA) analyzed local fire department response to brush, grass and forest fires- 25% of all calls in the Northeastern Region were in response to wildland fires. Greater tendency for NE local departments to be the first responders in comparison to other regions. Consider this data in Risk Report and Action Plans.

2.2 Areas of Concern not Addressed by the Options in the Draft Risk Report

Stakeholders were asked to comment on the following question:

What issues or areas of concern are not addressed by the options analyzed in the draft report?

Three of the ten stakeholders provided comments on areas of concern not addressed by the options analyzed in the draft report. Key ideas that surfaced from stakeholders include:

- *“Unless it’s in 1B/1C I’m not seeing treatment options other than prescribed fire. What option includes thinning and mechanical treatment? Would be helpful to know where other treatment options go (under what options). Expand Option 1A to include fuel treatments and prescribed fire. Options 2 and 3 look pretty clean.”*
- *“How important is plausibility/ feasibility? I don’t want to choose an option that meets my management goals if it is not feasible. For example, I support option 1B, more fire-resistant ecosystems, but question the feasibility due to mixed land ownership, smoke issues etc. So as a manager how important is it to consider the realistic possibility of implementing these options?”*
- *“At the 30,000 [foot] level the strategy seems to make sense. The details will be interesting, but the options seem reasonable.”*

2.3 Examples of Successful Implementation Consistent with Options in the Draft Risk Report

Stakeholders were asked to comment on the following question:

Can you direct us to any current examples of successful implementation consistent with one or more of the options being considered in the draft NE Regional Risk Report? Please provide description and if possible, contact information.

One of the ten stakeholders provided comments on examples of successful implementation.

- *“Effective CWPPs would be good examples.”*



2.4 Examples of Barriers to Successful Implementation of Options

Stakeholders were asked to comment on the following question:

Can you direct us to any examples of barriers that you have encountered that would not allow implementation of one or more options analyzed in the draft NE Regional Risk Report?

Two of the ten stakeholders provided comments on barriers encountered. Key ideas that surfaced from stakeholders included:

- *“Yes - the lack of engagement from the various stakeholders. Isn't that the point of “cohesiveness”. The process has been too hurried to get full involvement.”*
- *“Pretty holistic view of the challenges the Region faces.”*
- *“Clarify difference between barriers and impediments. Are there 9 national barriers to implementation or just 9 impediments to prescribed burning? Is there a list of the National barriers?”*

2.5 Crucial Considerations for Development of Action Plan

Stakeholders were asked to comment on the following question:

What are the crucial considerations we must bear in mind as we move into developing an action plan?

Four of ten stakeholders provided comments on areas of concern. Key ideas that surfaced from stakeholders included:

- *“If you haven't gotten input from the all the stakeholders you won't get good buy-in or involvement in the implementation. And from what I've seen, there has NOT been comprehensive engagement. You're going to take this to the people and say "this is what you wanted" and they'll say, "I didn't ask for that." And it'll be same old, same old. Meet the new boss, same as the old boss.”*
- *“Lots of good work in the Cohesive Strategy but challenge remains how do you reach the people on the front lines- the 14,000 fire departments. Most wildland firefighters have not heard of or been involved with the strategy. Good involvement at the Federal, State and non-governmental organization level, but need more involvement at the local fire department level.”*
- *“If we stay on current course, in terms of losing property, products and people, what is the economic impact? Has anyone delved into economics of this?”*
- *“When I ask people to do conservation work, they often ask how much will it cost if we DON'T do anything? People need to be convinced that the work is essential. Case studies would help boil down reasons. Met with a UNC person who said cost of not restoring ecosystems in the east could be extremely costly.”*



- “Check the facts in the Risk Report where it states in Section 2 page 12 “2% of the NE area is prescribed burned” – check this fact as [it] seems like a high number.”

3.0 Comment Evaluation

This section is designed to take a broader look at stakeholder participation provided during the Phase III comment period. Participation declined significantly for Phase III in comparison to Phase II, and was heavily skewed towards federal involvement. A major challenge for the NERSC is to expand participation, particularly at the local level, for development of the Regional Action Plan.

Table 3-1 – Number and Percent of Stakeholders Participating by Affiliation

Stakeholder Affiliation	Phase II		Phase III		Cumulative Totals	
	Number	Percent	Number	Percent	Number	Percent
Federal Government	39	61	7	70	46	62
Tribal	3	5			3	4
State Government	14	22	1	10	15	20
Local Government	2	3			2	3
NGO	4	6	2	20	6	8
Forest Industry						
Fire Departments	2	3			2	3
Homeowner/Landowner						
Other						
Totals	64	100	10	100	74	100

4.0 Major Comment Points

The following points represent a summary of key comments raised by the stakeholders for consideration for the Final Risk Analysis Report and for the Northeast Region Action Plan development.

1. Continue to aggressively pursue expanded stakeholder engagement - The number of comments from stakeholders declined significantly from Phase II. The short timelines to respond combined with the more “abstract” nature of the Draft Risk Analysis Report were contributing factors. Non-federal stakeholder engagement decreased significantly, and the NERSC is faced with a major challenge to increase participation, particularly with local fire departments. Actively engaging with other stakeholder groups will become more critical as work on implementation planning and action plans commences. Participation from stakeholders in the Northeastern Region has been an on-going challenge. The NERSC should explore alternate ways to engage critical stakeholders in development of the Regional Action Plans.
2. Continue to recognize the role of local fire departments- The importance of local fire departments as first responders in the northeast has been a reoccurring theme mentioned by a broad range of



stakeholders. Engagement of this key stakeholder group in developing the Regional Action Plan will be crucial to effective implementation.

3. Emphasize the use of mixed treatments in all options - Clearly describe that a mix of vegetation and hazardous treatment types will occur under various options to restore resilient landscapes even though an option may emphasize one approach, e.g., prescribed fire.

Appendix A – Background and Stakeholder Comment Form

National Cohesive Wildland Fire Management Strategy – Phase III Stakeholder Comment Opportunity on the Draft Northeast Regional Risk Analysis Report

Development of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is designed to be an iterative process with affected stakeholders. The Northeast Regional Strategy Committee (NERSC) was chartered under the Federal Advisory Committee Act to provide direct participation by stakeholders and to facilitate opportunities for broader stakeholder representation and engagement during the development process. The Cohesive Strategy is being developed using a phased approach.

Phase I was focused on defining goals and guiding principles of the Cohesive Strategy, which were adopted by the Wildland Fire Leadership Council on November 10, 2011, as available at:

http://www.forestsandrangelands.gov/strategy/documents/reports/1_CohesiveStrategy03172011.pdf

Phase II involved the efforts of three Regions (Northeast, Southeast and Western) to engage stakeholders in assessing opportunities for implementation of the national goals and to define actions. Regional Assessments, objectives and actions were consolidated into a single national report that was adopted by the Wildland Fire Leadership Council on April 18, 2012 and is available at:

http://www.forestsandrangelands.gov/strategy/documents/wfec/meetings/04nov2011/ntlreport_cs_sc_presentation/phase2_report_finaldraft20111028.pdf

Phase III involves creating a range of investment options for each of the three Cohesive Strategy goals that can be supported using available science and information within each Region. This process is currently underway. All of the options are considered feasible approaches to addressing the three goals of the Cohesive Strategy, as are other possible combinations of the investment options. Comparative evaluations of the options will illustrate the relationships between goals and options within each Region as well as help to identify opportunities, risk factors, and barriers that may influence the ability to implement the option. This information will then be used to develop action plans that serve as the basis to align the actions of agencies, tribes, individuals, and groups working toward common goals of the Cohesive Strategy. The Northeast Region's draft Risk Analysis Report is available at:

<http://sites.nemac.org/northeastcohesivefire/about-you/>

The NERSC is seeking stakeholder review and thoughts and comments to help:



- Understand major issues or areas of concern not captured or addressed in the characterization of the NE region's fire situation in the risk report.
- Identify issues and concerns not addressed well by the options analyzed in the risk report.
- Identify examples of successful implementation and/or barriers to successful implementation that are consistent with the draft Report.

The NERSC will use your feedback to finalize the Regional Risk Analysis Report and as a starting point for developing a Regional Action Plan that will guide the Cohesive Strategy implementation effort over the next 5-10 years.

Please provide your thoughts and feedback on the Draft Regional Risk Analysis Report using the comment form located at <http://cohesivefire.nemac.org/webform/northeastern-comment-form>. Please keep in mind that your responses should align with the goals and options as described in the draft report.



Stakeholder Comment Form

How satisfied are you that the draft risk analysis report captures the overall situation that is facing the Northeast Region? (Select 1-5)

[1]	[2]	[3]	[4]	[5]
Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied

Are there areas that are of concern that the draft risk report does not portray or address? Concerns currently identified are located in Chapter B, Risk Assessment, Section B, Description of Wildland Fire Risks, Barriers, and Critical Success Factors for the Northeast U.S. Please explain. (Text box)

How well do the options analyzed in the draft report address your major issues or concerns? A description of the options analyzed is located in Chapter C of the report. (select 1-5)

[1]	[2]	[3]	[4]	[5]
Not addressed	Minimally addressed	Neutral	Partially addressed	Completely addressed

What issues or areas of concern are not addressed by the options analyzed in the draft report? A description of the options analyzed is located in Chapter C of the report. Please explain. (Text box)

Can you direct us to any current examples of successful implementation consistent with one or more of the options being considered in the draft NE Regional Risk Report? Please provide description and if possible, contact information. (Text box)

Can you direct us to any examples of barriers that you have encountered that would not allow implementation of one or more options analyzed in the draft NE Regional Risk Report? A description of barriers currently identified is located in Chapter B, Risk Assessment, Section B, Description of Wildland Fire Risks, Barriers, and Critical Success Factors for the Northeast U.S. Please provide description and if possible, contact information. (Text box)

What are the crucial considerations we must bear in mind as we move into developing an action plan? Please explain. (Text box)

Appendix B – Content Analysis Team Members

Members of the METI Content Analysis Team included:

- **Larry Timchak**, Natural Resource Management Specialist and consultant to METI, Inc., Kalispell, MT
- **Julie Woldow**, Communication Specialist and consultant to METI, Inc., Anchorage, AK
- **Rich Stem**, Senior Advisor for Natural Resource Management and consultant to METI, Inc., Alder, MT
- **Steve Solem**, Senior Advisor for Natural Resource Planning and Inventory and consultant to METI, Inc., Missoula, MT



Appendix 6: Links to the Phase I and II reports and other key national and regional documents

Forest and Rangelands website, www.forestandrangelands.gov

Northeast Regional Strategy Committee website, <http://sites.nemac.org/northeastcohesivefire/>

Fire Adapted Communities, www.fireadapted.org

United States Fire Administration, www.usfa.fema.gov

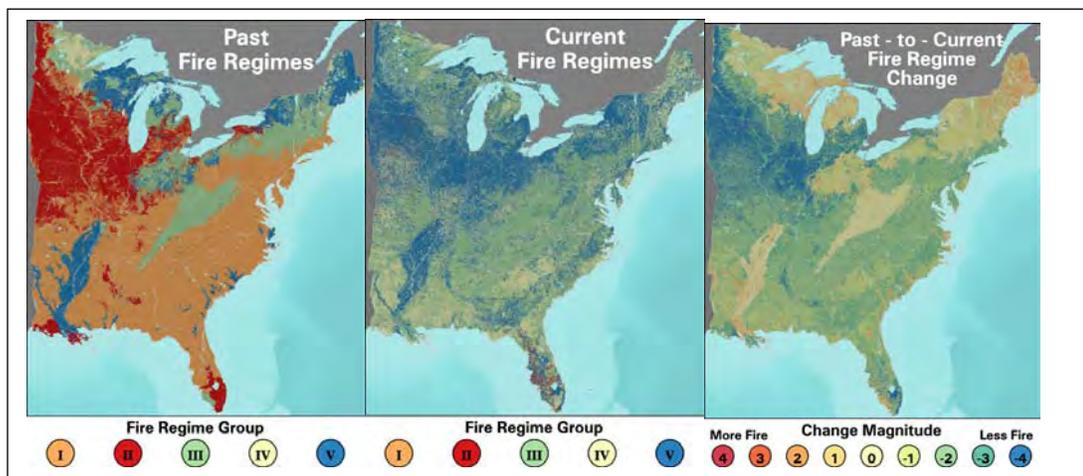
Firewise Communities, www.firewise.org



Appendix 7: Regional Risk Analysis Report Graphics

Fire Regime Graphics and Descriptions

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.



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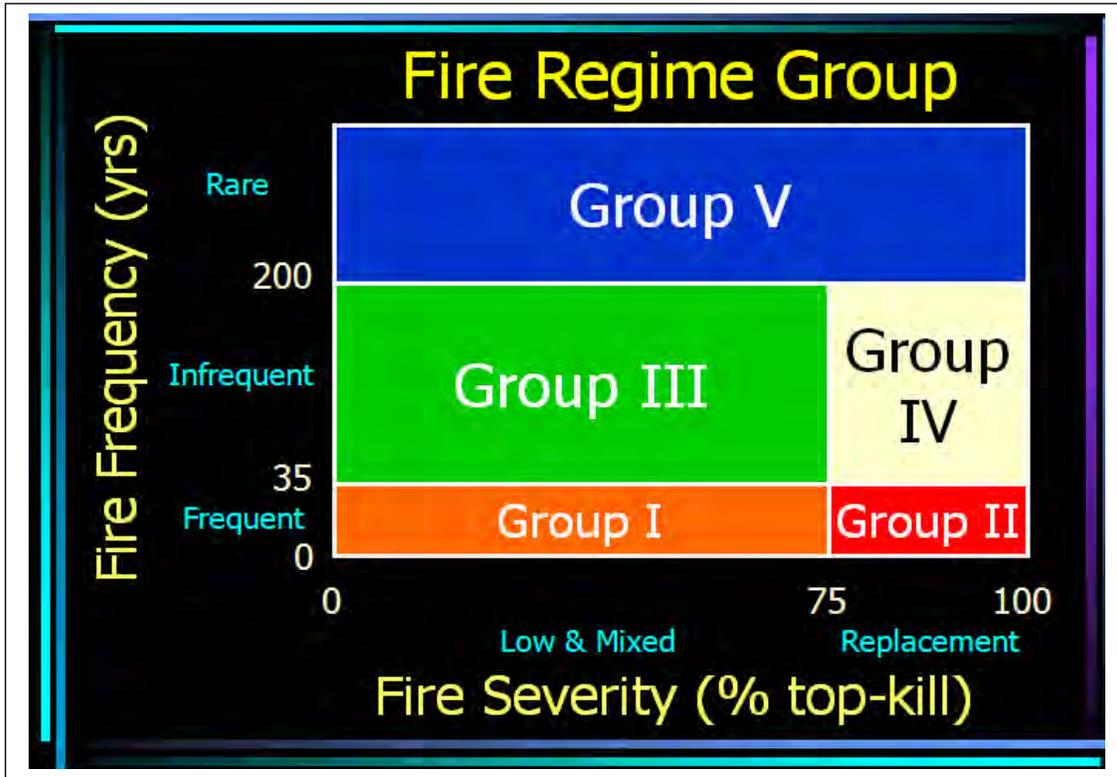
these five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- V – 200+ year frequency and high (stand replacement) severity.



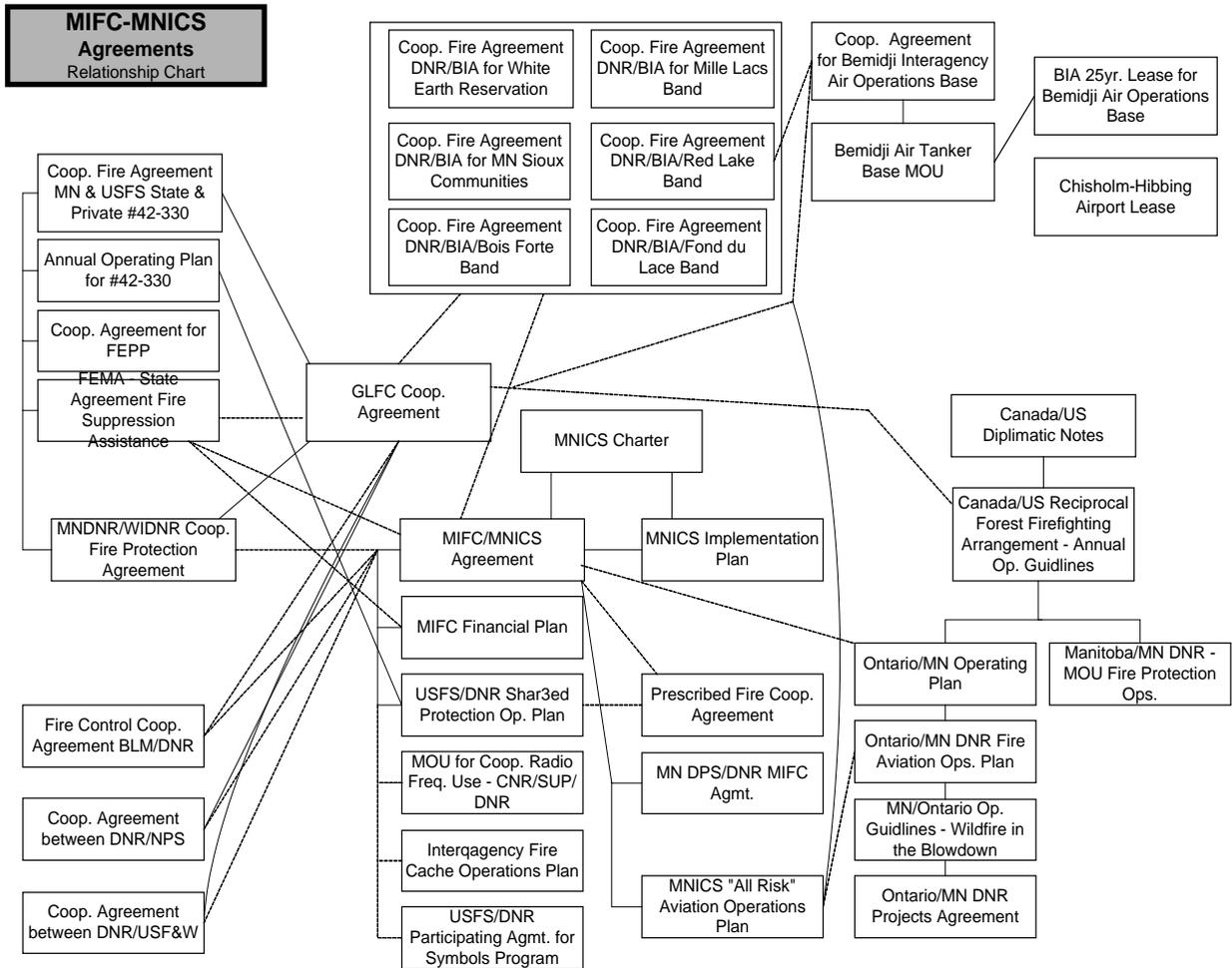
Fire Regime Condition Class (FRCC)

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy et al.





Graphic - Minnesota Agreements Relationship Chart (Option 3A)





Appendix 8 - Other pertinent regional information

Northeast Wildland Fire Cohesive Strategy
Phase III Alternatives Survey Analysis
August 31, 2012

Table 1: Goal and Preferred Options Alternatives for the Northeast Regional Cohesive Strategy (in order of response preferences)

Alternative 1:

<i>Cohesive Strategy Goals</i>	Goal Investment Percentage (out of 100%)
<i>GOAL 1: Restore and Maintain Landscapes – Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives.</i>	<u>32</u> %
Preferred Option for Goal 1	Priority (1, 2, 3, 4)
Focus use of prescribed fire for multiple benefits (hazardous fuels treatments; silvicultural)	1
<i>GOAL 2: Fire Adapted Communities – Human populations and infrastructure can survive a wildland fire. Communities can assess the level of wildfire risk to their communities and share responsibility for mitigating both the threat and the consequences.</i>	<u>24</u> %
Preferred Option for Goal 2	Priority (1, 2, 3)
Focus on promoting and supporting local adaptation activities to be taken by communities (where communities take action such as increasing capacity of VFDs, passing ordinances, developing CWPPs, joining Firewise, etc)	1
<i>GOAL 3: Response to Fire – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildland fire management decisions.</i>	<u>44</u> %
Preferred Option for Goal 3	Priority (1, 2, 3)



<p>Improve the organizational efficiency and effectiveness of the wildland fire community (pre-suppression and pre-planning; administration). Examples include:</p> <ul style="list-style-type: none"> • Development of MOU's and MOA's • Standardizing and streamlining training and qualifications • Radio compatibility and interoperability • Appropriate suppression and detection responsibilities regardless of landownership through agreements or contracts • Sharing of administrative personnel (co-funding or contracting) 	1
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Alternative 2:

<i>Cohesive Strategy Goals</i>	Goal Investment Percentage (out of 100%)
<i>GOAL 1: Restore and Maintain Landscapes – Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives.</i>	<u>32</u> %
Preferred Option for Goal 1	Priority (1, 2, 3, 4)
Focus treatments on fire dependent ecosystems (reintroducing fire, departure/structure/composition, protected areas, geology/soils, etc)	2
<i>GOAL 2: Fire Adapted Communities – Human populations and infrastructure can survive a wildland fire. Communities can assess the level of wildfire risk to their communities and share responsibility for mitigating both the threat and the consequences.</i>	<u>24</u> %
Preferred Option for Goal 2	Priority (1, 2, 3)
Focus on directing hazardous fuel treatments to the wildland-urban interfaces (WUI) (treatments of WUI lands can be in private and/or public ownership, but does not include small, individual residential lots)	2
<i>GOAL 3: Response to Fire – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildland fire management decisions.</i>	<u>44</u> %
Preferred Option for Goal 3	Priority (1, 2, 3)
<p>Increase the initial response capacity (initial attack). Examples include:</p> <ul style="list-style-type: none"> • Support rural FD's to include wildland training, PPE, equipment • Return to use of "militia" by all land management agencies with wildland fire responsibility • Reduce redundant response and reallocate resources to areas needing stronger initial attack. 	2



Alternative 3:

Cohesive Strategy Goals	Goal Investment Percentage (out of 100%)
GOAL 1: Restore and Maintain Landscapes – Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives.	<u>32</u> %
Preferred Options for Goal 1	Priority (1, 2, 3, 4)
Focus on mitigating “event” fuels (mechanical treatment, markets/timber sales to clean up, blowdowns, ice storms, etc.) to reduce potential fire hazard	3
Focus treatment on areas that contain significant invasive plant species that increase fire hazard	4
GOAL 2: Fire Adapted Communities – Human populations and infrastructure can survive a wildland fire. Communities can assess the level of wildfire risk to their communities and share responsibility for mitigating both the threat and the consequences.	<u>24</u> %
Preferred Option for Goal 2	Priority (1, 2, 3)
Focus on promoting and supporting prevention programs and activities (targeting them toward reducing when and where fires occur)	3
GOAL 3: Response to Fire – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildland fire management decisions.	<u>44</u> %
Preferred Option for Goal 3	Priority (1, 2, 3)
Further develop shared response capacity (extended attack; long duration fire potential). Examples include: <ul style="list-style-type: none"> • Improve mobility of resources to respond to larger, longer fires; better utilize Compacts • Additional resources can be used for initial response, but wouldn't be primary initial response resources • Remove administrative and fiscal barriers that limit use of resources during extended or long-duration fires 	3



Table 1 Summary:

- 51 responses were received with the following breakdowns, 22 from Federal agencies, 13 from State agencies, 7 from Local jurisdictions, 9 from Tribal jurisdictions, and none from non-governmental or other organizations.
- From locations provided, the following breakdown of responses by geographic sub-region was received: 14 from the Mid-Atlantic (OH, PA, WV, MD, DE, NJ), 24 from the Mid-West and Great Lakes (MN, MI, WI, IA, IN, IL, MO), and 13 from New England and NY (NY, MA, RI, NH, VT, ME, CT).
- The overall preferences of investment of resources for the three Cohesive Strategy goals on an annual basis is: 32 percent for goal 1, 24 percent for goal 2, and 44 percent for goal 3. Tables 2a and 2b show the breakdowns by organization and geographic sub-region respectively.
- Responses were also provided to indicate preferences for investment options within each goal. These options were developed by the RSC from the full suite of objectives developed in Phase II. These responses are analyzed in tables 3a and 3b.

NOTE: Some averages resulted in “ties” therefore occasionally the average results have the same numbers, i.e. 2, 1, 2 as in the options for goal 3 in table 1 above. Some responders also ranked more than 1 goal and/or option at the same priority.



**Northeast Wildland Fire Cohesive Strategy
Phase III Alternatives Survey Analysis**

August 31, 2012

Table 2a – Agency/Organization Goal Percentage Averages				
Organization Category	Number of Responses	Goal 1	Goal 2	Goal 3
Federal	22	42	26	32
State	13	20	23	56
Local	7	17	14	68
Tribal	9	35	28	34
Non-governmental	0	-	-	-
Overall Average	Total = 51	29	23	47

Table 2a summary:

- There were 51 responses as shown in table 2a above. This table illustrates the goal investment preferences by agency or organization with wildland fire management responsibilities. These differences are consistent with the varying missions among these levels and types of agencies and organizations, all with some measure of wildland fire management responsibilities.
- There are some distinct differences in goal investment preferences with the the Federal and Tribal agencies showing a more balanced distribution among the 3 goals, approximately a third for each goal. Federal agencies indicate the highest percentage of investment in fuel treatment activities. The State agencies prefer substantially less investment in goal 1 and add it to goal 3 as they have greater (and often mandated) protection responsibilities. This is true especially for Local agencies as they are primarily responsible for protection of life and property.
- Preferences for investment in goal 2 range from about 15-30 percent. With the highest for the Federal and Tribal entities and the lowest by the local agencies. This could be due primarily to funding availability (as these types of activities usually represent the lowest funding priority) and to meeting mandated protection responsibilities, not necessarily to preference or effectiveness of investments.



Table 2b – Geographic Goal Percentage Averages				
Sub-region	Number of Responses	Goal 1	Goal 2	Goal 3
Mid-Atlantic	14	40	29	31
Mid-West & Great Lakes	24	28	21	51
New England & New York	13	30	25	44
Overall Average	Total = 51	33	25	42

Table 2b summary:

- Table 2b above illustrates the variation of goal investment preferences by geographic sub-region within the Northeast U.S. The investments are much more balanced among sub-regions than among agencies and organizations within each sub-region.
- There is a noticeable difference between New England/NY and the Mid-Atlantic and Mid-West in goal 1 investments (fuel treatments activities). This may be due to less available acreage to treat, a shorter burning “window” due to climate, and especially to a significantly higher population density limiting the feasibility of treatments due to proximity to urban areas and related health concerns to smoke from burning.



Table 3a - Agency/Organization Goal/Option Preferences											
Organizational Category	Number of Responses	Goal 1				Goal 2			Goal 3		
		A	B	C	D	A	B	C	A	B	C
Federal	22	2	1	3	4	2	1	3	1	2	3
State	13	3	2	1	4	1	3	2	2	1	3
Local	7	3	1	2	4	1	2	3	2	1	3
Tribal	9	1	1	2	3	2	1	3	1	2	3
Non-governmental	0										
Overall Average	Total = 51	3	1	2	4	1	2	3	2	1	3

Table 3a Summary:

- table 3a illustrates the preferred options by goal for each level of agency and organization. The preferences within each goal are quite consistent with goal 1 option B, goal 2 option A, and goal 3 option B being the most preferred for each set of agencies and organizations.



Table 3b - Geographic Goal/Option Preferences											
Sub-region	Number of Responses	Goal 1				Goal 2			Goal 3		
		A	B	C	D	A	B	C	A	B	C
Mid-Atlantic	14	1	2	3	4	1	2	3	1	2	3
Mid-West & Great Lakes	24	2	1	3	4	3	2	1	2	1	3
New England & New York	13	3	1	2	4	1	2	2	1	2	3
Overall Average	Total = 51	3	1	2	4	1	2	3	1	2	3

Table 3b Summary:

- table 3b illustrates the preferred options by goal by Northeast geographic sub-region. The preferences within each goal show more variation than among the agencies within each sub-region with goal 1 option B, goal 2 option A, and goal 3 options A being the most preferred for each set of agencies and organizations. There is an indication, as borne out in other parts of this analysis for a preference to invest in options for goal 3, wildland fire response capability. This is consistent with the higher population and urban densities of the Northeast region, especially in New England.



Appendix 9: Northeast Regional Committee and Working Group Rosters

Appendix 10 - Regional Strategy Committee/Work Group Members Northeast Regional Strategy Committee			
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Appendix 10: National Barriers and Critical Success Factors

National Cohesive Wildland Fire Management Strategy Barriers and Critical Success Factors

August, 2012

During Phase II of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy), each of the three Regional Strategy Committees (RSCs) – Northeast, Southeast, and West – identified barriers and critical success factors that would impact their ability to be successful in implementing the Cohesive Strategy. The terms as used in this process are defined as:

Barriers – Must be removed in order for the Cohesive Strategy to be successful.

Critical Success Factors – Must be present for the Cohesive Strategy to be successful.

When the regional lists were combined into a master list, over fifty barriers and critical success factors had been identified by the regions. The Wildland Fire Executive Council (WFEC), through the Cohesive Strategy Subcommittee (CSSC), tasked the RSCs with further defining the factors and creating a sub-list targeting the highest priority factors that reasonably could be addressed within the next five years.

The row labels in the following tables were adapted from the original factor spreadsheet. Several of the labels are described in more detail below.

Impact – What are the potential implications or effect if the barrier is removed or the critical success factor is met?

Supporting Details – Additional information and references

Existing Groups and Past Efforts – Is there an existing group that could review and define proposed actions to address the barrier or critical success factor? Has there been a past effort(s) to address the barrier; and if so, by whom?

The last three rows – Impact on Achieving Objectives, Probability of Success, and Investment of Resources Versus Benefit – were added following the WFEC members' review of the highest priority barriers and critical success factors identified by the RSCs. The responses, when combined for each factor, represent the WFEC's assessment of the likelihood of achieving a positive outcome.

Each of the 11 barriers and critical success factors (CSF) that follow was selected by the RSCs as being the highest priority barriers/CSFs to be addressed in order to contribute to the successful implementation of the Cohesive Strategy. These barriers/CSFs were further stratified into two tiers.

Tier 1 (blue headings) – Contains the most urgent of the RSC's highest priority barriers/CSFs

Tier 2 (tan headings) – Contains the remainder of the RSC's highest priority barriers/CSFs

Finally, the number in parentheses in the heading of each table corresponds to the barrier or critical success factor number in the original master barrier and critical success factor spreadsheet.



CRITICAL SUCCESS FACTOR (5): Increase Fuels Management on Private Land	
Tier (Priority)	1
National Goals Addressed	<ul style="list-style-type: none"> • Landscapes • Fire-Adapted Communities • Response to Fire
Description	There is a need to increase private land management assistance to complement and implement broader fuel reduction management objectives across fire prone landscapes. Incentives for private landowners are needed to increase the fuels management on private lands. Incentives may include providing cost share funds through current landowner assistance programs. There is a need to integrate federal and state level fuels and prevention programs and provide fuels management incentives to mitigate undesired fire effects and property loss.
Impact	Increasing incentives for private lands fuels mitigation will result in more acres being mitigated of undesired fire effects to the landscape/watershed and reducing the probability of fire damage/loss. It can also bring about multiple program integration to reach the same outcome on a larger portion of the landscape with more efficient leveraging of funding sources. Treated areas must be maintained. Increases in the acres treated results in reduced wildfire risk to the public and firefighters and reduced wildfire suppression costs.
Supporting Details	Could be integrated with various private and public land conservation and stewardship programs. Integration and coordination of WUI planning with land management objectives. There is a need to integrate federal and state level fuels and prevention programs which integrate WUI protection planning with land management objectives. There must be social incentives in addition to financial incentives. The emphasis must be at the local level which requires active engagement with constituents at that level.
Existing Groups and Past Efforts	The NRCS currently has the Conservation Stewardship Program (CSP) that covers many of the natural resource and fuels reduction needs addressed here. It is specifically geared to tribal and private agricultural lands and non-industrial private forest landowners. Additionally, the USFS has the Forest Stewardship Program. This program has specifically been coordinated within the Northeastern and Midwestern U.S. and addresses the very needs that the Cohesive Strategy seeks, including, risk management, communication, natural resource management and fuels treatments across this landscape. States utilize hazardous fuels mitigation funds via State Fire Assistance (NASF-USFS).
Potential Action(s)	<ol style="list-style-type: none"> 1. Develop landowner incentives (e.g., tax breaks, free disposal of material, increased use of Wyden Amendment and other finance or cost-share authorities). 2. Integration of fuels reduction and defensible space principles with private land management programs. 3. Integrate USFS and NRCS funding and programs to achieve success. Work with NRCS, FSA, and other USDA agencies to better incorporate and/or incentivize prescribed burning on tribal and private lands. 4. Work with EPA to reduce restrictions to the use of prescribed fire due to smoke tolerance and emissions (air quality). Part is education of the general public; the



	other part is education/science working with EPA on short term effects verses long term impacts and extent of emissions.
Impact on Achieving Objectives	High
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (14): <i>Increase Fuels Management on Federal Land</i>	
Tier (Priority)	1
National Goals Addressed	<ul style="list-style-type: none"> • Landscapes • Fire-Adapted Communities • Response to Fire
Description	<ol style="list-style-type: none"> 1. Need revised standardized guidance and direction for fuels treatments on federal land to enhance fire adapted communities and landscapes. 2. Landscape scale restoration is often difficult to achieve due to the complex process requirements of federal laws, rules and policies. New interpretation and engagement with key partners can take advantage of flexibility that currently exists, but may not be exercised for fear of litigation.
Impact	<p>If guidance is revised, DOI agencies will be able to effectively target fuels treatment dollars to achieve integrated Cohesive Strategy goals for fire adapted communities and landscape resilience.</p> <p>Increased acres treated on federal lands reduces wildfire risk to the public and firefighters, and results in reduced wildfire suppression costs.</p>
Supporting Details	<p>Currently, guidance and direction comes from HFPAS and OMB. The emphasis is to prioritize WUI treatments, with approximately 90% of the HFR funds going to this endeavor. However, a gap exists between the DOI agency missions, which are different for NPS, FWS, BLM and BIA, and the WUI emphasis. For example, spending HFR funds in Yosemite to reduce fuels around structures in and adjacent to the park does not fully advance the NPS mission, and in fact could have severe consequences if a large portion of the park burns in a mega-fire and the critical values of Yosemite (including the tourism economy) are lost.</p>
Existing Groups and Past Efforts	<p>DOI Fire program Assessment. NWCG Fuels Committee has been involved with fuels allocations and processes. The use of the Good Neighbor authority was approved by Congress in 2009 for projects in Colorado and Utah. The authority enables state agencies to act as an agent for the federal agency to complete similar or complementary forest and land management activities across state, federal and private landowner boundaries. The Authority has not been widely used due to limited application and problematic contracting requirements.</p>
Potential Action(s)	<ol style="list-style-type: none"> 1. Move from a national criteria based allocation model to a process that considers the core principles of the Cohesive Strategy and funds the federal organizations at the regional levels, and that would also allow for management discretion at the local level that takes into account priorities, capabilities, and the changes in individual project dynamics. If standard guidance and direction for fuels treatments is modified it must be done at the Department level, between USDA and DOI, with discussion of the relationships to state, tribal and private partners. 2. Encourage federal agencies to use authorities under the Healthy Forest Restoration act (HFRA) and the Health Forest initiative (HFI) to expedite the planning /collaboration process to treat large landscapes. 3. Integrate Community Wildfire Protection Plans with agency land management and/or fire management plans to facilitate fuels treatments across multiple jurisdictions (RSC level). 4. Support the Good Neighbor Authority Act and broaden the use of the Act's provisions to other



	states where local interest and support exists. 5. Seek relief from impediments in the Forest Service Planning Rule for fuels management.
Impact on Achieving Objectives	High
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (20): <i>Growth Management, Land Development and Zoning Laws</i>	
Tier (Priority)	1
National Goals Addressed	<ul style="list-style-type: none"> • Fire-Adapted Communities • Response to Fire
Description	Need growth management, land development, and zoning laws that require defensible space and wildland fire risk reduction actions as communities develop; and the maintenance of wildland fire risk reduction practices, e.g., defensible space, fire resistant construction, hazard reduction, etc.
Impact	Reduced risk to firefighters and homeowners, reduced suppression costs, and lower insurance rates.
Supporting Details	Mostly a local government issue but national support and coordination are needed.
Existing Groups and Past Efforts	NFPA has completed national surveys on zoning laws. Additional information is available from the Fire Adapted Communities Coalition and NWCG WUI Committee. NACO, IAFC, NGA, and NLC have also contributed.
Potential Action(s)	<ol style="list-style-type: none"> 1. Work through NGOs (American Planners Association, builders and other organizations and NACO/League of Cities/Mayors Conference) at the national level to develop a list of best practices and model zoning laws/development standards. 2. Work with the insurance industry on products that motivate homeowners to create fire adapted homes/communities – create a model fire adapted community concept that can be replicated in high fire prone areas resulting in reduced fees and higher ISO ratings. 3. Construct a federal incentive program to reimburse for the creation of fire adapted communities through CWPPs and other comprehensive community planning practices (FEMA and/or USDA/DOI). 4. At Federal Agency, State and local government level develop codes and standards for developing and maintaining Fire Adapted Communities reflecting regional and local wildland fire risks to Human Communities, including landscape and structure components/issues.
Impact on Achieving Objectives	High
Probability of Success	Low
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



BARRIER (31): Inefficiencies in the National Qualification Standards

Tier (Priority)	1
National Goals Addressed	<ul style="list-style-type: none"> • Response to Fire
Description	Inefficiencies in the national qualification standards and procedures must be addressed to increase response capabilities. Develop one wildland fire qualification standard for the federal, state, tribal, and local wildfire community. Currently NWCG PMS 310-1 provides qualifications for national mobilization and recognizes the ability to accept qualifications of local jurisdictions while in those jurisdictions. These standards are in sync with FEMA NIC efforts to bridge the gap with local government.
Impact	<ol style="list-style-type: none"> 1. Many resources that would otherwise be available for mobilization are unavailable because of cumbersome qualification standards and procedures. As a result, resources are not available for mobilization. 2. Better coordination between and among local, state, tribal and federal agencies who are investing in training. A clear definition of position requirements for training and experience. 3. NWCG develops and maintains interagency qualifications and training standards. Implementation is the responsibility and decision of the individual agencies.
Supporting Details	<ol style="list-style-type: none"> 1. Build on existing success (Recognition of Prior Learning [RPL], Service First). Should accept experience, training and qualification classes, and nomenclature of DHS/NIMS as well as the U.S. Fire Administration. 2. We need to shorten time for qualifications which is part of the NWCG Workforce Development Goal and IMT Succession Project. Agency support for implementation is required.
Existing Groups and Past Efforts	<ol style="list-style-type: none"> 1. Past efforts have only looked @ NWCG affiliation. Currently, RPL has been modeled in the south and west and sponsored by BLM; FEMA is now completing the RPL guide materials. 2. The U.S. Fire Administration (USFA) has a fire crosswalk qualification system that is recognized by the NWCG and recognizes prior obtained skills of structure fire departments. This system has provided an avenue to incorporate fire personnel into interagency fire organizations where agencies have chosen to recognize them. 3. NWCG Evolving Incident Management (IMT Succession Project): strategic implementation plan is complete and work units with leads are identified.
Potential Action(s)	<ol style="list-style-type: none"> 1. WFEC should consider tasking the NWCG Executive Board to provide a plan for implementation of Section 5 Incident Capacity/Workforce Development/IMT Succession from the Evolving Incident Management Report 10/17/2011 (Single Qualification System, Alternative Qualification Pathways, Experimental Training, Wildfire and Incident Management Academies, Position Task Books, Previous Experience Credit, Mentoring Programs). 2. Build on existing success, e.g., Incident Qualification and Certification System (IQCS), Recognition of Prior Learning (RPL), and Service First, to develop a national qualification system to track federal, tribal, local, state, and private community responders. 3. Continue to utilize



	the USFA crosswalk as a component of the National Wildland Qualification System. Expand the concept.
Impact on Achieving Objectives	Medium
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



BARRIER (33): Remove Policy Barriers and Process Complexities for Sharing Resources	
Tier (Priority)	1
National Goals Addressed	<ul style="list-style-type: none"> • Landscapes • Response to Fire
Description	Need to remove policy barriers and process complexities which affect the ability to effectively and efficiently share resources, not only for wildfire, but for fuels and prescribed fire work. The statutory authority for the USFS to pay for state resources responding to another state's incident, even though the receiving state reimburses the USFS for those responding resources, has been questioned.
Impact	<ol style="list-style-type: none"> 1. Qualification standards pose barriers to sharing resources when the USDA Forest Service follows one set of rules, while all other state and federal agencies follow the Wildland Fire Qualification System Guide, PMS 310-1. (USFS requires 5901 but NWCG PMS 310-1 is the standard for national mobilization.) 2. It is an appropriate and key role for the USFS and other federal agencies to maintain a national and regional mobilization system to facilitate the coordinated mobilization of suppression resources, including state-sent local resources, to support fire suppression efforts nationally. 3. If not resolved, this issue is likely to restrict mobilization of key resources for the protection of private, state and local government lands.
Supporting Details	As budgets decline and skill gaps grow, reliance on a mobile skilled workforce is one option, while local expertise is developed. Processes for updating and revising agreements are slow and cumbersome.
Existing Groups and Past Efforts	<ol style="list-style-type: none"> 1. The guidance for state to state mobilization and fire billing cooperative fire agreements is currently under development and billing procedures have not yet changed. 2. A USFS/NASF task group has developed recommendations for addressing the authorities issues for the USFS, and developed a potential work around if needed. 3. NWCG task team has worked on revisions to the national template for the Master Cooperative Wildfire Management and Stafford Act Response Agreement. 4. Cohesive Strategy foundational documents: Mutual Expectations for Preparedness and Suppression in the Interface, The Responsibilities, Authorities, and Roles of Federal, State, Local and Tribal Governments.
Potential Action(s)	<ol style="list-style-type: none"> 1. NWCG to complete revisions to the Master Cooperative Wildfire Management and Stafford Act Response Agreement. 2. Rectify authority issues via federal legislation, for the USFS to mobilize state and local resources via the Master Cooperative Wildfire Management and Stafford Act Response Agreement, or implement a work around. 3. Identify and correct policy barriers that prevent the effective sharing of resources. 4. Local government needs national clarification on structure protection verses wildfire suppression and who pays. 5. Identify complexities that need to be simplified in order to efficiently share resources.
Impact on Achieving Objectives	High



Probability of Success	Medium
Investment of Resources versus Benefit	High
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (10): <i>Enforceable State/Local Ordinances</i>	
Tier (Priority)	2
National Goals Addressed	<ul style="list-style-type: none"> • Fire-Adapted Communities
Description	Need adequate state and/or local ordinances related to wildfire prevention which are enforceable.
Impact	Reduced number of human caused wildfires. Cost-benefit ratio of fire prevention versus the cost of fire suppression.
Supporting Details	Issue appears to reside at local and state level rather than federal level.
Existing Groups and Past Efforts	Southern WUI Center-Prestemon Study. Cooperative Forest Fire Prevention Committee-NASF, USFS. Ad Council may have additional information, as well as the NWCG Communication, Education and Prevention Committee. NACO, IAFC, NGA, and NLC have also contributed.
Potential Action(s)	<ol style="list-style-type: none"> 1. Implement coordinated information sharing between RSCs regarding successful state and local government community growth management planning and enforcement that results in sustainable wildfire risk reduction in WUI communities. 2. Work through NGOs (NACo, League of Cities, etc.) to develop a list of WUI Codes, growth management policies and land development regulations, special wildland fire risk reduction ordinances, and best management practices related to community risk reduction and prevention from wildfire from across the Nation, and develop into an information and education program to State and local government agencies responsible for community development. 3. Work with Congress and Federal agencies to tie incentive programs related to development (e.g., community development grants) to be scored higher for programs that incorporate prevention programs into their State and local government development requirements (the carrot). 4. Tie federal funding requirements to the presence of enforceable state and/or local community wildfire risk reduction ordinances with an emphasis on prevention (the stick).
Impact on Achieving Objectives	Medium
Probability of Success	Low
Investment of Resources versus Benefit	High
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (12): FEMA Pre-Disaster Mitigation Program	
Tier (Priority)	2
National Goals Addressed	<ul style="list-style-type: none"> • Fire-Adapted Communities
Description	Enhance FEMA pre-disaster mitigation program to maximize fuels reduction across the landscape with emphasis on private lands.
Impact	Currently FEMA has pre-disaster mitigation grants available but less than 1% of those funds go towards wildland fire mitigation. If those funds could be significantly increased, much more investments could go towards private lands.
Supporting Details	FEMA has very limited use of NEPA Category of Exclusions. Most projects funded by FEMA require them to go through an Environmental Assessment prior to award. Through their granting process FEMA will not fund prescribed fire or slash burning due to liability issues. It makes perfect sense for both existing and increases in this program to be "block grant" awarded to either federal or state agencies with expertise to complete the projects. Block grants to the states would eliminate the costly NEPA process of analyzing fuels reduction activities on private lands, and provide for the expertise that would allow other tools such as prescribed fire and slash pile burning.
Existing Groups and Past Efforts	This has never been attempted, so no previous action. Hazardous fuels mitigation on private lands is supported by National Fire Plan funding through State Fire Assistance from USFS.
Potential Action(s)	<ol style="list-style-type: none"> 1. Revise FEMA grant guidelines that require direct funding of projects on private lands, eliminating the need for NEPA, and to include funding for prescribed fire. 2. Transfer FEMA assistance program and funding to USFS State and Private programs or provide block grants to the states. 3. Increase the amount of FEMA funds available for pre-disaster mitigation. 4. If FEMA determines that it needs to directly fund projects, have FEMA establish NEPA Categories of Exclusion, which would reduce NEPA costs and timeframes, making more funds available for project work, and would accelerate project approval. 5. Have FEMA reduce the cumbersome reporting requirements for reimbursement.
Impact on Achieving Objectives	High
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (16): <i>Rating Fire Adapted Communities</i>	
Tier (Priority)	2
National Goals Addressed	<ul style="list-style-type: none"> • Fire-Adapted Communities
Description	Develop a common system to characterize and rate fire-adapted communities (FAC); track individual community progress; prioritize investment; and to allow for identification of trends across communities.
Impact	This would create a common understanding and mechanism for tracking progress in FAC in each region. The standards could also be used for investments from all stakeholders.
Supporting Details	NFPA and NWCG definition of Fire Adapted Communities. Maintain the full intent of the Cohesive Strategy goal of fire adapted communities.
Existing Groups and Past Efforts	The Fire Adapted Communities Coalition (USFS, NFPA, IAFC, NASF, IBHS, and others), the FireWise Community Program, along with IAFC Ready, Set, Go!, are all working toward this goal. NASF provides national guidance to states for identifying communities at risk and prioritizing risk reduction projects. NASF provides an annual report on the number of communities at risk to wildfire.
Potential Action(s)	Utilize Regional Strategy Committee Chairs, NFPA and the Fire Adapted Communities Coalition, IAFC, NASF, and other stakeholders to facilitate and devise this system.
Impact on Achieving Objectives	Medium
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (39): <i>Investment in Firefighting Workforce</i>	
Tier (Priority)	2
National Goals Addressed	<ul style="list-style-type: none"> • Landscapes • Fire-Adapted Communities • Response to Fire
Description	Investment in firefighting workforce. Need to invest in human capital at the field level. Budget cuts are reducing the number and quality of the on-the-ground firefighting workforce. Budget cuts always seem to land at the field more than at the national level.
Impact	Continued and increased investment in the firefighting workforce is necessary in order to maintain capacity to respond to wildfire as well as mitigate fire hazards. A lack of investment in the firefighting workforce will lead to fewer firefighters on the ground, reduced safety, reduced capability at accomplishing local projects, and reduced initial attack success. In the long term we face a generation gap in the fire workforce available for future leadership of the program.
Supporting Details	Impacts all agencies and organizations with wildland fire responsibilities – local, state and federal.
Existing Groups and Past Efforts	NWCG Evolving Incident Management (IMT Succession Project) strategic implementation is complete and assignments to work units with leads are in progress. Section 5 workforce development has not yet been officially tasked to a work unit. The USFS and others are developing Workforce Succession Plans.
Potential Action(s)	<ol style="list-style-type: none"> 1. Develop a fire program that focuses efforts on maintaining and developing field level leaders and workforce. 2. WFEC should task the NWCG Executive Board to provide a plan for implementation of Section 5 Incident Capacity/Workforce Development/IMT Succession from the Evolving Incident Management Report 10/17/2011 (Single Qualification System, Alternative Qualification Pathways, Experimental Training, Wildfire and Incident Management Academies, Position Task Books, Previous Experience Credit, Mentoring Programs).
Impact on Achieving Objectives	High
Probability of Success	Medium
Investment of Resources versus Benefit	High
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



CRITICAL SUCCESS FACTOR (42): <i>Improve Fire Data</i>	
Tier (Priority)	2
National Goals Addressed	<ul style="list-style-type: none"> • Landscapes • Fire-Adapted Communities • Response to Fire
Description	Landfire: The accuracy of various aspects of the Landfire data is questionable, even when used at intended scale. Landfire data is being used nationally to depict existing vegetation, surface and canopy fuels, fire regime condition class, and estimates of national fire hazard/risk. Without accurate data, many assumptions and actions based on this data will be compromised.
Impact	More realistic and accurate depiction of where wildland fire hazard/risk actually occurs across the country, which can be used to base decisions upon. More people willing to utilize this data for broader collaboration efforts.
Supporting Details	For the SE and NE regions particularly, Landfire data and the inaccurate analysis created at a national view are barriers to these two regions playing on a level field nationally. It is a barrier to being able to accurately predict and plan. Many state wildfire agencies have weighed in on the need to improve the accuracy of Landfire.
Existing Groups and Past Efforts	There is no effective, consistent way to provide feedback and critical review to the Landfire team. If feedback is given, there is no guarantee that suggested improvements will be conducted, and no feedback for why suggestions are not incorporated.
Potential Action(s)	Present the issues to the Landfire Executive Oversight Group.
Impact on Achieving Objectives	Medium
Probability of Success	Medium
Investment of Resources versus Benefit	Low
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.



BARRIER (28): Intergovernmental Wildland Fire Governance

Tier (Priority)	2
National Goals Addressed	n/a
Description	Need an intergovernmental wildland fire governance structure to serve the needs of all jurisdictions in both wildland fire and all-risk incidents.
Impact	All stakeholders with wildland fire responsibilities would be represented by either NWCG or another entity that represents all interests. The current charter for NWCG requires national wildland fire management responsibilities.
Supporting Details	NWCG does not satisfy this need fully; for example, each of the RSCs reported that municipalities do not feel they are adequately represented by NWCG, nor are the standards recognized.
Existing Groups and Past Efforts	Past efforts have only looked at NWCG affiliation. WFEC current tasking for governance is in progress.
Potential Action(s)	1. Reexamine the membership of the NWCG Executive Board to ensure local government is adequately represented . 2. WFEC report findings and recommendations on wildland fire governance to WFLC.
Impact on Achieving Objectives	Medium
Probability of Success	Medium
Investment of Resources versus Benefit	Medium
Recommended Disposition	Critical success factors and barriers could be integrated into regional and national analysis reports and action plans. WFEC/WFLC will determine how to proceed with those critical success factors and barriers national in scope.

The National Cohesive Wildland Fire Strategy: Northeast Regional Risk Analysis Report

November 1, 2012

Executive Summary

This Northeast Regional Risk Analysis has identified a set of feasible alternative approaches and options for addressing the Cohesive Strategy Goals in the Northeast U.S. For each of the investment options, the key risks, barriers, and opportunities are identified, and will be addressed in the Regional Action Plan to be developed.

The options for addressing each goal are:

Goal 1: Restore & Maintain Landscapes	Goal 2: Fire Adapted Communities	Goal 3: Response to Wildfire
Option 1A - Increase the use of prescribed fire where multiple benefits can be achieved.	Option 2A - Focus on promoting and supporting local adaptation activities to be taken by communities.	Option 3A - Improve the organizational efficiency and effectiveness of the wildland fire community.
Option 1B – Increase the extent of fire dependent ecosystems and expand the use of fire as a disturbance process.	Option 2B - Focus on directing hazardous fuel treatments to the wildland-urban interfaces.	Option 3B - Increase the initial response capacity (initial attack).
Option 1C - Focus on mitigating “event” fuels to reduce potential fire hazard.	Option 2C - Focus on promoting and supporting prevention programs and activities.	Option 3C - Further develop shared response capacity (extended attack; long duration fire potential).

These options represent alternative strategies that wildland fire management organizations, federal, state, and local governments, non-governmental organizations and local communities can adopt in any number and combination to best meet their objectives and address the risks they may face from potential wildfire impacts. This report, however, does not contain a quantitative cost trade-off analysis of the options as there was not time, capacity, or access to the needed information to be able to conduct such an analysis.

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. During Phase II, the National Science and Analysis Team (NSAT) examined various aspects of wildland fire and developed conceptual models specific to each component. The purpose of these models was to display the interactions and relationships among factors, such as the relationship between fuel treatments and the extent and intensity of wildfire. The NSAT also identified various data sets that might be used in Phase III to build analytical models consistent with the concepts articulated in Phase II. Building on these efforts, Phase III has involved an extensive effort to collect data necessary to quantify relationships and provide a rigorous examination of risk.



For each national goal, narratives of regional investment options for the Northeast are presented and accompanied by graphics, tables, and maps that highlight spatial differences and topical issues in the Northeast Region. These narratives also highlight the opportunities and potential barriers to achieving substantial reduction in regional wildland fire risks. Alternatives and options identify opportunities to focus the Cohesive Strategy on important regional values including: fire fighter and public safety, cultural values, ecological values, marketable products, and property owner values. The analysis looks at wildland fire related challenges, and identifies opportunities within the region, at the county level where information exists. The alternatives and options are not mutually exclusive. *There is no one preferred alternative to be applied across the Northeast region.* Instead the alternatives present investment options that need to be balanced to achieve each of the national Cohesive Strategy goals and implement effective wildland fire management consistent with the applicable land management objectives.

The wildland fire management community and those potentially affected by wildfire have expressed their order of preference for investing in these options by Cohesive Strategy goal in the Northeast given the landscape conditions and available resources that currently exist. The actual mix of investments is dependent on many factors such as, but not limited to: local land management objectives, specific community needs, agency mission, potential risks, existing barriers, available skills, qualified personnel, budgets, equipment, and other resources. The approximate ranges of desired investment levels expressed by the Northeast Regional Strategy Committee for each Cohesive Strategy goal on an annual basis are:

Goal 1: Resilient Landscapes	30-35%
Goal 2: Fire Adapted Communities	20-25%
Goal 3: Wildfire Response	40-50%

There are some distinct differences in goal investment preferences with the Federal and Tribal agencies indicating a more balanced distribution among the three goals, approximately a third for each goal. Federal agencies indicate the highest percentage of investment in fuel treatment activities. The State agencies prefer substantially less investment in goal 1 and would invest more in goal 3 as they have greater (and often mandated) protection responsibilities. This is true especially for local fire departments and agencies as they are primarily responsible for protection of life and property. Due to the relatively large amounts of wildland-urban interface in the Northeast and the associated complexities and risks to life and property, a rapid, effective response to wildfire is often the most cost effective and lowest impact approach to dealing with current wildland fire management issues on the Northeast.

There is also a difference in preferred options for investing in the three Cohesive Strategy goals by geographic sub-region within the Northeast U.S. The investments are much more balanced among sub-regions than among agencies and organizations within each sub-region. There is a noticeable difference between New England and New York and the Mid-Atlantic and Mid-West in goal 1 investments (fuel treatments activities). This may be due to less available and fragmented acreage to treat, seasonal variability of the “burning window”, and especially to a significantly higher population density limiting the feasibility of treatments due to proximity to urban areas and related health concerns to smoke from burning.

This identification of alternative approaches and options, along with an analysis of risk, barriers, critical



success factors and opportunities is intended for use by agencies, organizations and communities at the federal, state, and local levels for their individual and collaborative wildland fire and other land management planning efforts. This risk analysis will also serve as a foundation for the Northeast Regional Action Plan report to be developed later this year.

At the national level, Phase III will continue with development of a national risk analysis and a national action plan. The National Science and Analysis Team (NSAT) will develop a comparative risk model using the data sets, and will develop a national trade-off analysis. When the comparative risk and trade-off analyses are complete, a National Phase III Risk Analysis Report will be written to bring together the issues and alternatives discussed in the three regional reports. A National Action Plan will be developed based on the national risk and trade-off analyses.



Status Report

Date: November 2, 2012

Subcommittee: Northeast RSC

Accomplishments Since Last Report:

- ⤴ The NE RSC has included final edits and updates from the NSAT and others, and completed the NE Regional Risk Analysis Report. The Executive Summary of the NE report has been provided to the WFEC for review.
- ⤴ The NE RSC Chair and Coordinator participated via conference phone and live meeting in the CSSC meeting held Oct 24-25 in Washington, DC.
- ⤴ The NE RSC communications and outreach work group, with support by METI, have produced its Phase III monthly update for November and it has been distributed to a wide range of stakeholders. The NE Region website link to Forest and Rangelands.gov continues to be updated.
- ⤴ Working with METI, the NE RSC has begun working on a 2 track approach to both developing a draft regional action plan, and simultaneously obtaining internal and external stakeholder input.

Planned Activities for Next Reporting Period:

- ⤴ Begin gathering information for the NE regional action plan on possible actions to address the identified risks, barriers, critical success factors, and opportunities.
- ⤴ Coordination with the West and Southeast continues through the National Writer/Editors team on the national risk analysis report and the development of the regional action plans.
- ⤴ The Northeast RSC continues weekly or bi-weekly conference calls as needed and continues participating in the CSSC and WFEC scheduled calls.

Issues Identified:

None

WFEC Decisions/Approvals Needed:

None

References:

NE Risk Analysis Report – Executive Summary

Contact Information:

Brad Simpkins or Larry Mastic

THE NATIONAL COHESIVE WILDLAND FIRE STRATEGY

Southeast Regional Risk Analysis Report



Phase III
Science-
Based
Report



RESILIENT LANDSCAPES
FIRE-ADAPTED COMMUNITIES
FIREFIGHTER SAFETY

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EXECUTIVE SUMMARY

Wildland fire management in the Southeastern United States is complex and multi-faceted. The significant threat posed by unplanned or undesirable fires threatens the lives and well-being of emergency responders and the public, and damages or destroys homes, property, and other values-at-risk. Although the Southeastern region includes just thirteen states, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands, it leads the nation in the number of annual wildland fire ignitions (Fig. 1), with an average of 41,500 unplanned ignitions burning a total of 1.9 million acres every year (NICC 2012).

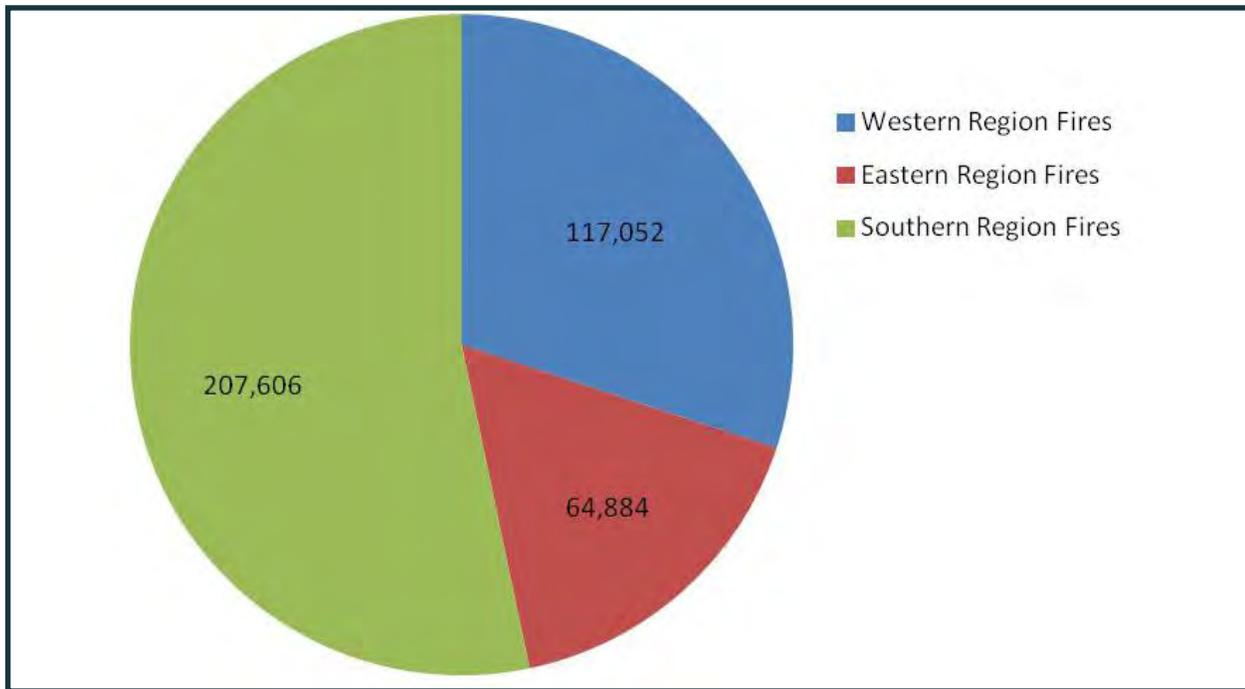


Figure 1. Number of fires by region, 2007–2011 Source: NICC 2012

This management challenge is exacerbated by rapid population growth, rapid expansion of wildland urban interface (WUI) areas, and the fragmentation of land ownership in the region. In 2011, 10 firefighters lost their lives during wildfire management in the Southeast (NIFC 2011). During that same year, in Texas alone 3,993,716 acres were burned by wildland fires, with 5,738 structures destroyed, including 2,946 homes (Texas Forest Service 2012). Today 118,083 Southeastern communities are considered at risk from wildfire (Southern Wildfire Risk Assessment 2006). Of these, 43 percent are assessed as being at very high or high risk from wildfire (Andreu 2008). Wildfire threat to homes is consistently above average due to the number and density of homes throughout the Southeast (Fig. 2).

Over the past decade, population growth in the Southeast has outpaced any other region in the country. According to the 2010 U.S. Census, the South's population grew 14.3 percent between 2000 and 2010 to reach 114.6 million inhabitants at the end of the decade (Fig. 3). As of 2010, six of the ten fastest growing counties were in Southeastern states along with a total of 36 percent of the nation's population (U.S. Census Brief 2010).

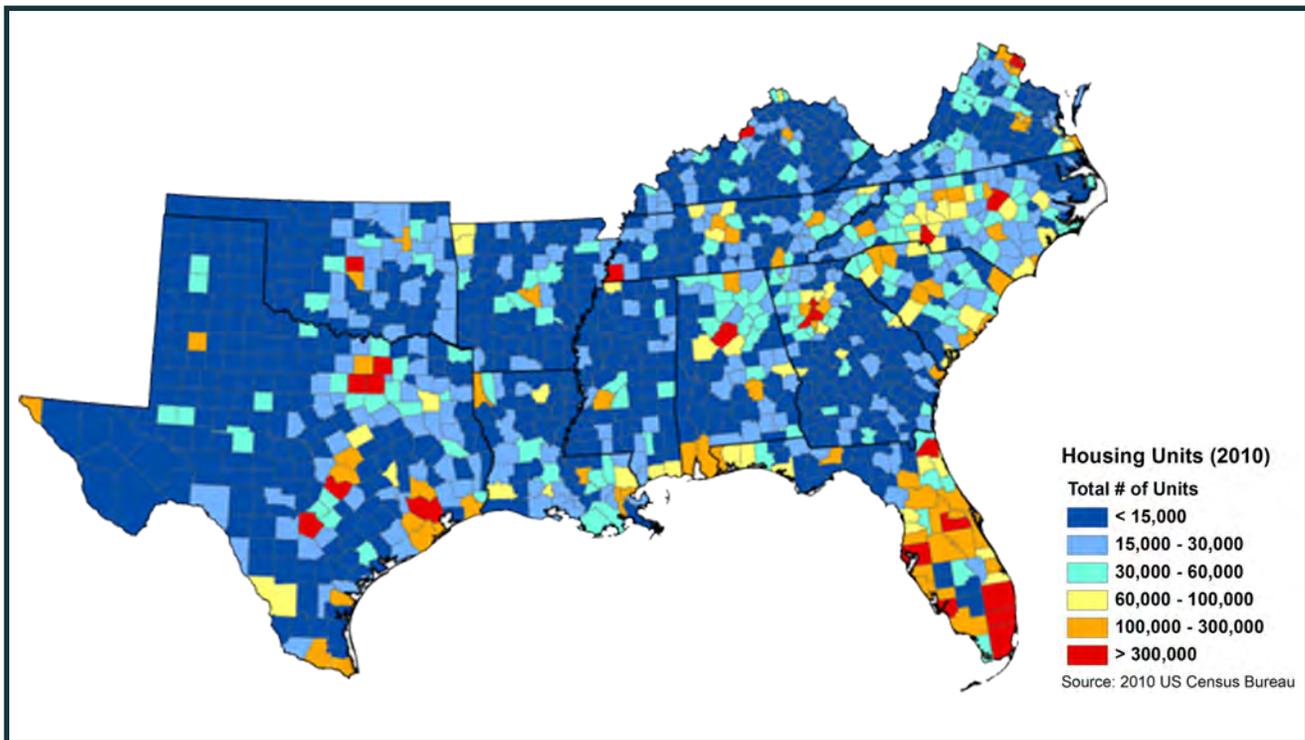


Figure 2. Number of housing units per county in the Southeast

In the past, the Southeastern fire and land management community has relied on cultural and historical acceptance of land management activities including prescribed fire to facilitate their implementation of appropriate management activities. New residents, however, are often unfamiliar with the use of fire as a valuable management tool. This population and an accompanying significant demographic shift, along with other factors, are creating new challenges for the fire management community. It is increasingly more difficult for agencies, organizations, and landowners to plan for and respond effectively to wildfire, while protecting vulnerable WUI communities and providing for firefighter safety. The Southeast has a complex fire environment unlike any other in the nation, with interrelated critical controlling factors influencing wildland fire management including:

1. **Wildfire Activity:** Between 2001 and 2010 nearly half of all national ignitions and over 40 percent of the country's large wildfires occurred in the Southeast.
2. **Large and Rapidly Expanding WUI:** As of 2000, more than half of WUI acres were located within the Southeast.
3. **Smoke Management Challenges:** Smoke impacts safety, health, and quality of life. Smoke-related impacts challenge the fire management community to implement management and response activities safely.
4. **Year-round Fire Season:** Wildland fires burn all 12 months of the year in the Southeast, stressing firefighting capacity and resources.
5. **Area Protected:** More than 420 million terrestrial acres are protected from wildfire by federal, Tribal, and state agencies with just under half (200 million acres) being forested lands.

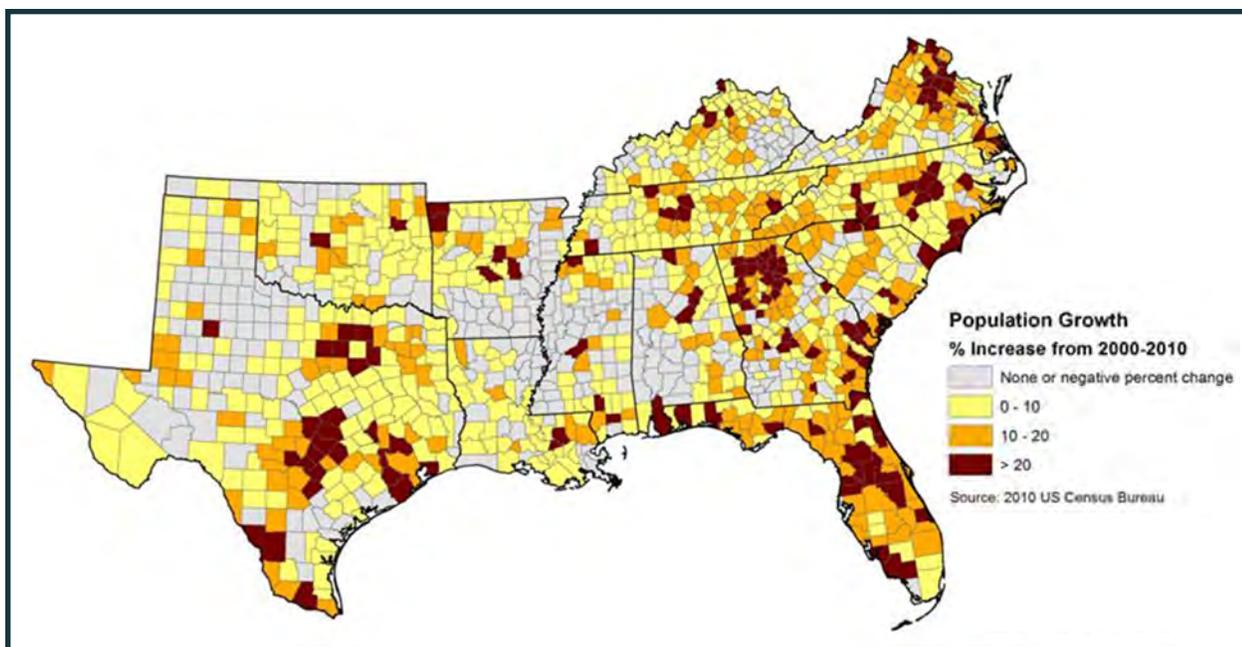


Figure 3. Population growth in the Southeast between 2000 and 2010

6. **Privately Owned Forestland:** Nearly 90 percent of forestland in the Southeast is owned by more than five million private landowners.
7. **Prescribed Burning:** The Southeast leads the nation in prescribed burn acres accomplished on silvicultural land; but issues related to capacity, smoke, and liability are significant obstacles to encouraging practitioners to increase prescribed burning. Prescribed fire must occur at a much greater frequency than elsewhere in the country as a result of the region's rapid vegetation regrowth rate.
8. **Invasive Species:** Many invasive species spread quickly after a wildfire event, contributing to fuel loading and otherwise influencing forest health (e.g., cogongrass (*Imperata cylindrica*)).
9. **Working Forests:** Traditional and new economically viable forest markets support local economies, help curb hazardous fuel accumulation, and serve as a source of local wildfire knowledge, but the long-term strength of these markets is unknown.
10. **Strong Relationships in the Fire Management Community:** An extensive history of excellent cooperation and working relationships exists between agencies, organizations, and local fire departments with other wildland fire management organizations, resulting in a safer, more effective response and collaborative planning for future occurrences.
11. **Rural Fire Departments:** An extensive network of rural fire departments, including many volunteer fire departments, are responsible for many initial responses to wildfires throughout the region.

No single agency, organization, or landowner can adequately address these complex and related challenges on their own. The National Wildland Fire Management Cohesive Strategy (Cohesive

Strategy) is a collaborative, three-phase effort to create a landscape-level national fire strategy that addresses these increasingly complex challenges of wildland fire management in the United States. This national effort is novel in that it has encouraged participation by all individuals and entities with a stake in fire management as partners during the strategy’s development. This diverse stakeholder group includes federal and state land management agencies, local governments, private landowners, environmental groups, Tribal groups, fire professionals, non-governmental organizations, and others. The Cohesive Strategy effort also marks the first time that regions of the country have had an opportunity to provide locally specific input for incorporation into a national strategy. Stakeholders from the Southeast have engaged in the Cohesive Strategy effort during the entire process. During Phase I, national goals were established and a framework for the creation of the strategy was developed. In Phase II, the Southeastern region identified three regional goals and objectives that highlighted challenges, resources, and evolving opportunities unique to the South. The goals identified are:



1. ***Restore and Maintain Landscapes:*** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
2. ***Create Fire-Adapted Human Communities:*** Human populations and infrastructure can withstand a wildfire without loss of life and property.
3. ***Respond to Fire:*** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

During the past ten months, the Southeastern region has been in the process of selecting regional alternatives as part of the Phase III process. These regional alternatives focus on identifying specific actions and activities that would best help achieve regional objectives while retaining maximum flexibility for land managers to determine the most appropriate management activities for their property. Six key values important to Southeastern stakeholders were identified early in the Cohesive Strategy process, and helped guide the development of regional alternatives, along with the regional goals and objectives developed during Phase II. For the purpose of this report, those six items were consolidated into five values:

1. ***Firefighter and Public Safety***
2. ***Marketable Products***
3. ***Ecological Services***
4. ***Cultural values***
5. ***Property Loss***

Three Goals of the Southeastern Cohesive Strategy

1. Restore and maintain landscapes
2. Create fire-adapted human communities
3. Respond to fire

Actions and activities from Phase II that were considered best able to enhance regional values and make progress towards achieving regional goals were identified for each of the five value areas. The goal of this process was to identify emphasized alternatives which, using a scientifically-informed approach, would potentially have the greatest positive impact in each value area, developing a suite of potential choices to be used in combination or singly. The diversity of ecosystems, land management goals, and landscapes across the Southeast means that a single solution will not work for everyone. Additionally, with nearly 90 percent of Southeastern land owned privately, decisions cannot be made at the state or regional level for the vast majority of landholdings.



Instead, partners in the Cohesive Strategy may, moving forward, work collectively with land managers and landowners, using the best available information, to encourage and inform their decision-making process to help address issues and challenges related to wildland fire. Several tools have been developed and made available that will continue to inform the decision-making process in the future. Twenty-five actions and activities were identified from the Phase II report and are included in the Alternatives section of this document.

Each decision includes trade-offs and associated costs. Having a number of feasible options that are efficient and effective at focusing on regional goals and values will be valuable for stakeholders. The Southeastern group, with the assistance of regional stakeholders, found several broad themes that ran throughout the actions and activities identified. These themes included:

- 1. Prescribed fire and fire use*
- 2. Fuels treatment other than fire*
- 3. Working forests*
- 4. Planning for fire, forest resiliency and community safety*
- 5. Incentives for fuels management*
- 6. Treatment and restoration of areas affected by natural events and fire*
- 7. Community protection and prevention programs, ordinances and construction, homeowner responsibility, fire prevention*
- 8. Community preparedness, evacuation, and planning by responders*
- 9. Use of technology to inform community leaders*
- 10. Specialized response equipment, training, developing and ensuring adequate staffing of responders*
- 11. Interagency suppression cooperation, MOUs, and Mutual Aid*

The Southeast faces significant and growing challenges related to wildland fire management. Decision-makers and land managers at all levels must weigh trade-offs, goals, and values-at-risk in order to select the most appropriate suite of alternatives that best serve to accomplish land management goals safely and effectively. However, faced with burgeoning population and rapidly growing WUI areas, along with climate change, land ownership fragmentation, decreasing budgets, and other concerns, it is clear that collective action is required. The National Cohesive Wildland Fire Management Cohesive Strategy serves as both a framework as well as a mechanism through which stakeholders in fire management can work together to prepare and protect vulnerable populations from wildfire risk, ensure effective wildfire response, and restore and maintain some of the most intact and extensive fire-adapted landscapes in the United States.

A. INTRODUCTION

The National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is an innovative national approach to the increasingly complex reality of wildland fire management in the United States. The Cohesive Strategy was developed in response to growing concern over mounting annual costs of fighting wildfires and devastating wildland fire losses to communities and values-at-risk. The Cohesive Strategy acknowledges the reality that fire is a natural process necessary for the maintenance of many ecosystems, and focuses on attempting to reduce the conflict between fire-prone landscapes and people. By simultaneously considering the role of fire in the landscape, the ability of humans to plan for and adapt to living with fire, and the need to be prepared to respond to fire when it occurs, the Cohesive Strategy takes a holistic approach to wildland fire.

The Cohesive Strategy encourages a broad range of stakeholders with an interest in wildland fire or responsibility to help manage fire, to discuss goals and collaboratively develop shared objectives. The Cohesive Strategy effort also engaged natural and social scientists to utilize a novel, facilitated decision making process. This process utilized stakeholder input, expert opinion and a powerful data driven modeling system to demonstrate impacts and tradeoffs around implementation of the Cohesive Strategy. Working through regional strategy committees representing the three distinct regions of the country – the Northeast, the Southeast, and the West, these groups are devising a shared strategy that will guide decision-making to best use ecological, social, and economic resources in preparing for, responding to, and recovering after inevitable wildland fires. The Cohesive Strategy effort in the Southeast owes a great deal to the strategic planning tools already being used by the fire management community in the region, including the Southern Wildfire Risk Assessment (SWRA), Southern Forest Futures, as well as state Forest and Wildlife Action plans. These documents represent valuable resources that are reflected in Southeastern values, and which guide regional and local action by decision-makers and land managers, and will be crucial to developing the Phase III implementation plan.

The Cohesive Strategy differs from previous fire strategies by taking an “all lands” view of wildland fire management. Fire recognizes no boundaries– neither ownership lines, nor jurisdictional borders. Policymakers must take a landscape-level approach and work across boundaries to implement effective management techniques. And all interested stakeholders must be incorporated, including those who own the land, those who use the land, and those who manage the land. The Cohesive Strategy is unprecedented in its focus on initiating dialogue and collaboration on a national scale.

This report will summarize the work done in the Southeast region during the first half of Phase III of the Cohesive Strategy. Actions from Phases I and II also will be described briefly in this report. More information on Phases I and II can be found on the website www.ForestsAndRangelands.gov, including the foundational national documents and Phase I and Phase II reports.

“The Cohesive Strategy differs from previous fire strategies by taking an ‘all lands’ view of wildland fire management.”



ForestsAndRangelands.gov

Three Phases of the Cohesive Strategy

The Cohesive Strategy has been developed in three phases. In Phase I, stakeholders met to develop national goals, identify broad performance measures, and establish the guiding principles of the Cohesive Strategy. Phase I also created a framework under which the three regions would create individual assessments and strategies tailored to their unique needs. During Phase II, diverse groups of stakeholders representing each region met independently to identify regional challenges and opportunities as well as key priorities. They developed regional goals, which for the most part are identical to the national goals. The regions focused on how the processes of wildland fire, or the absence thereof, affect their values-at-risk. In Phase II, the Southeastern region broadly defined its objectives and identified actions and activities necessary to achieve those objectives. Phase III will serve as the conclusion of the planning stage of the Cohesive Strategy, during which the goals and objectives are analyzed scientifically, and a thorough risk assessment is added to select alternatives for implementation.

1. Cohesive Strategy Vision, Goals, Performance Measures and Objectives

Core Values and Vision for the Future

The Cohesive Strategy is built on core principles and values, including engaging stakeholders, managers, and scientists; using the best available science, knowledge, and experience; and emphasizing partnerships and collaboration. The Cohesive Strategy sets out a vision for the future of wildland fire management. The vision for the next century is to: “Safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, live with wildland fire.”

Guiding Principles

The following guiding principles were crafted with stakeholders in Phase I. These precepts are a central set of principles that broadly apply to stakeholders in the wildland fire and land management community. The guiding principles are centered on the Cohesive Strategy’s three core focus areas: resilient landscapes, fire-adapted communities, and wildfire response. These core values were developed at the national level and were also adopted by the three regions as regional guiding principles:

1. *Reducing risk to firefighters and the public is the first priority in every fire management activity.*
2. *Sound risk management is the foundation for all management activities.*

NATIONAL COHESIVE STRATEGY VISION

To safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and, as a nation, to live with wildland fire.

3. *Actively manage the land to make it more resilient to disturbance, in accordance with management objectives.*
4. *Improve and sustain both community and individual responsibilities to prepare for, respond to and recover from wildfire through capacity-building activities.*
5. *Rigorous wildfire prevention programs are supported across all jurisdictions.*
6. *Wildland fire, as an essential ecological process and natural change agent, may be incorporated into the planning process and wildfire response.*

Three National Goals

Three primary focus areas were identified for the Cohesive Strategy. They are: restoring and maintaining resilient landscapes, creating fire-adapted communities, and responding to wildfires. Flowing from the guiding principles and core values, and focusing on the three primary focus areas, three national goals were adopted in Phase I. The three national goals are:

1. ***Restore and Maintain Landscapes:*** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
2. ***Fire-Adapted Communities:*** Human populations and infrastructure can withstand a wildfire without loss of life and property.
3. ***Wildfire Response:*** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

Three Goals of the National Cohesive Strategy

1. Restore and maintain landscapes
2. Fire-adapted communities
3. Wildfire response

In Phase II of the Cohesive Strategy, each of the regions adopted these goals with some modest changes, used them to define objectives and actions, and proposed performance measures and preliminary alternative implementation scenarios.

2. Cohesive Strategy Significance

The Cohesive Strategy represents a novel approach to wildland fire management. It differs from previous efforts in that it includes all the stakeholders as partners and is not focused on landscape management by single government agencies. This strategy is also firmly based on the compilation and analysis of an unprecedented amount and array of data, and uses a uniquely powerful data based analysis of tradeoffs, risks and impacts around the implementation of the strategy. This strategy is based on the best available science, and organized around how the broad consortium of stakeholders with an interest in wildland fire management will corporately approach decision-making. This new approach may not change tactics

that are used on the ground to deal with fire – the programs which exist to reduce excess fuels, to prepare and protect communities, or to suppress fires. It is a strategy, a way of looking at a national challenge and considering landscape-scale solutions that includes all interested stakeholders. The publication of the Phase III reports is not the end of the Cohesive Strategy process. It is only the end of the planning stage of the strategy development. A trade-off analysis process will be developed at the national process and included in the National Risk Analysis Plan to be completed in 2013. Implementation of the strategy by the diverse partners that have been involved in its development will continue.

This Southeastern Regional Risk Analysis report includes a description of the issues being addressed by the Cohesive Strategy, alternative approaches with emphasized actions grouped in five value sets available to address the risks, and a characterization of wildland fire risks. This report identifies and evaluates variables and the results will enable decision-makers to prepare communities for inevitable wildfire events without loss of life or critical infrastructure while decreasing the potential for extreme wildfire behavior through hazardous fuels reduction treatments.

America's wildland fire challenges are complex and difficult to solve independently. The risk analysis will also improve Southeastern stakeholders' collective understanding of the extent and geographic locations of risks and opportunities that could influence wildland fire management decisions. Risk assessment and analysis provides scalable information to managers for reducing risk at the national, regional, and local levels. Alternatives represent opportunities to focus on various regional Cohesive Strategy values that might be of particular interest to a stakeholder: cultural values, firefighter safety, marketable products, ecological values, and property loss. The analysis looks at wildland fire-related challenges and identifies opportunities managers at any level can use within the Southeastern region. The alternatives are not mutually exclusive, and there is no one preferred alternative to be applied across the Southeast. Rather, the emphasized alternatives present investment options that are believed to offer the greatest positive impact. They need to be balanced to achieve strategic goals and implement effective wildland fire management.

Narrative accompanied by graphics, tables, and maps are presented that highlight spatial differences and topical issues in the Southeastern Region. These narratives also highlight the opportunities and potential barriers to achieving substantial reduction in regional wildland fire risks. The intent of the risk analysis is not to make a final decision as to which alternative management options will be selected. Rather, the intent is to derive information useful for further deliberations among stakeholders, partners, agencies, and policymakers at all levels. This report is intended to enable Cohesive Strategy partners to understand how their choices might align with reductions in risk, given a common understanding of regional and national wildland fire risks across the landscape, supported by scientific analysis.





The Cohesive Strategy Phase III risk analysis and report establishes a new approach to implementing a national wildland fire management strategy by recognizing the significant differences in stakeholders, wildland fire challenges, and opportunities across the various regions of the Southeast. Success in achieving the three broad goals of the Cohesive Strategy is a long-term proposition – no single decision by policymakers or management action by land managers will solve

the nation’s complex wildland fire issues. The strength and success of this Phase III report will lie in its ability to motivate collaborative action to reduce wildland fire risk by the diverse agencies, organizations, and partners involved in the wildland fire issue.

Alternatives neither identify specific implementation actions (i.e., who will do what, where, how, and when), nor specific process actions. However, it is expected that the analysis will inform specific actions the region may wish to pursue, such as increasing investments that improve the capability of local fire departments to assist with wildland fire suppression, or fostering collaborative action by communities that reduces their exposure to wildland fire risk. These types of specific actions will be identified as part of the Southeastern Regional Action Plan, developed by the Southeastern Regional Strategy Committee (RSC) in parallel with the other two regions.

Future Steps in Phase III

The Southeastern Risk Analysis, along with the other two regional risk analyses, will inform a national effort to assess and define national findings. The resulting national report will provide an executive summary of the regional risk analyses; document the risk analysis process including an explanation of risk characterization; summarize the regional analyses; describe the national-level findings and commitments based on regional risk analyses; and identify next steps for the Cohesive Strategy effort.

A Southeastern Regional Action Plan will follow the creation of the regional risk analysis focused on capturing actions the RSC has agreed to pursue during the next five years to make progress towards achieving the three national goals of the Cohesive Strategy. The action plan will develop a program of work and identify which stakeholders will be responsible for accomplishing specific plan elements along with a timeline for completion. The intent is to create a mechanism for recording commitments the RSC has made and to ensure accountability in completing the actions.

The actions outlined in the Regional Action Plan document are the initial efforts for implementation of the Cohesive Strategy at the regional and local levels, in an effort to make a positive difference on the ground. Specific actions will likely focus on process improvements related to the immediate opportunities for successful risk-reduction that were identified; the barriers and solutions within the region's decision space; pursuing the alternatives in whole or in part; providing information as a result of the regional or national risk analysis; presenting feedback received through the communication and outreach effort, and/or feedback based on stakeholder involvement throughout Phase III.

3. Role of Science in the Development of the Cohesive Strategy

Wildland fire is a complex issue that involves multiple interacting variables spanning the natural, human, and constructed environments. Over the past year, the National Science and Analysis Team (NSAT) has developed conceptual models to examine the interactions and relationships among variables related to wildland fire and risk. The NSAT identified a significant number of factors relevant to wildland fire management in the Southeastern region, and gathered data related to those factors. After amassing those data, the NSAT went through an expert-driven process to correct errors, eliminate gaps and standardize data resulting in a picture of wildland fire factors throughout the United States at the county level. Working closely with the RSC, the NSAT pared down the amount of data being considered to factors identified as clear priorities in the Southeast. In September 2012, the NSAT presented the results of their efforts to the RSC and engaged in a collaborative effort to identify regional alternatives using Bayesian Belief Networks (BBNs) to visually illustrate and explore relationships between the data. As a part of the Comparative Risk Analysis Framework and Tools (CRAFT) process (detailed below), this powerful approach has application well beyond this phase of the strategy. Moving forward, stakeholders in the Cohesive Strategy will have the opportunity to use BBNs and the CRAFT associated tools to understand the interactions and tradeoffs of these complex factors at the county, state and landscape level which should help guide management decisions at all levels.



B. SOUTHEASTERN PHASE III REGIONAL REPORT

DRAFT ALTERNATIVES

Introduction

Managing fire in the Southeastern United States is complex. No single management scenario will adequately meet the various needs of all interested stakeholders and the public. The Southeastern mainland includes four geophysical zones and 19 ecological sections across 13 states with 86 percent of the forests in private ownership (Forest Futures 2011, Gramley 2006, Butler and Wear 2011, Wear and Greiss 2011). Prior to developing alternative management strategies, it was necessary to determine what drives the decision-making process for the wide variety of landowners across the diverse Southeastern landscape. Six values important to stakeholders across the region were identified (Fig. 4) at the onset of the Cohesive Strategy (for the purposes of this report Firefighter and Public Safety have been combined), including:

1. *Firefighter and Public Safety*
2. *Marketable Products*
3. *Property Loss*
4. *Ecological Services*
5. *Cultural values*

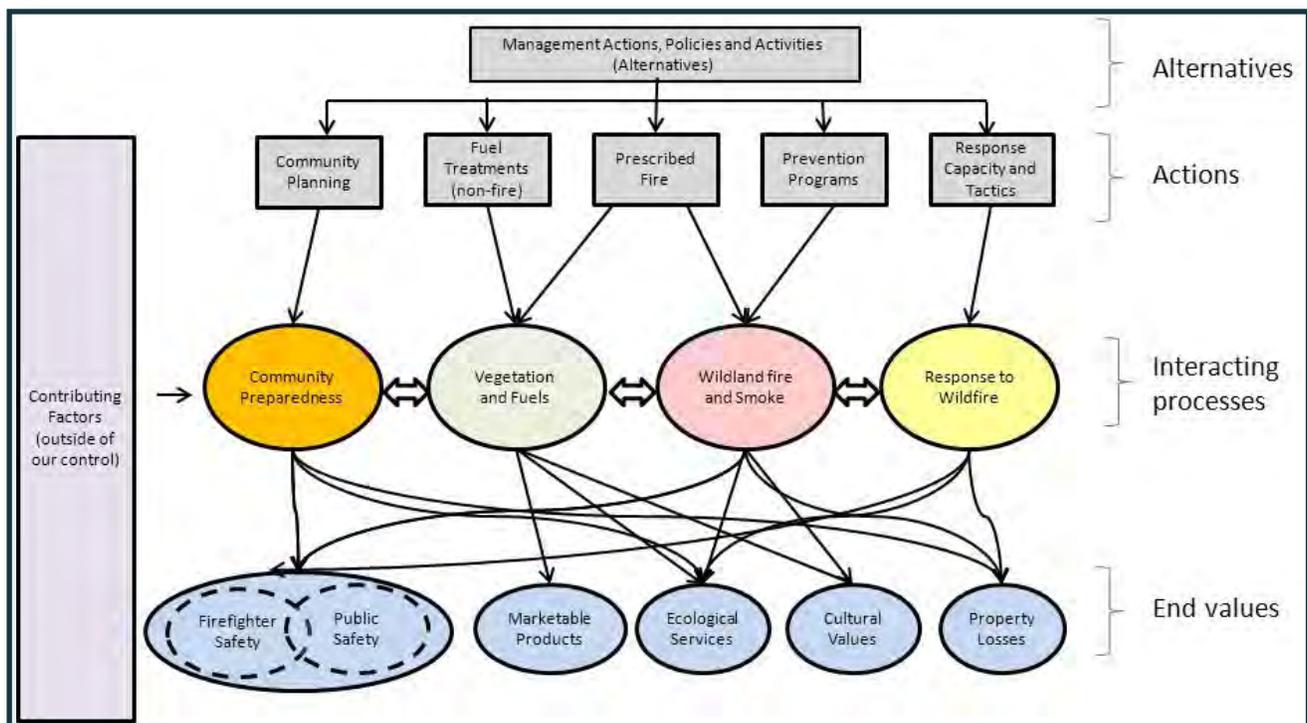


Figure 4. Roadmap infographic

When developing alternatives to current management scenarios, the foci were to improve or sustain these regional values while working toward accomplishing the Cohesive Strategy's three goals.

A key difference between the Cohesive Strategy effort and past collaborative planning efforts was the methodology employed for planning and analysis. A comparative risk assessment tool was used in Phases II and III, which built in the ability to comparatively evaluate the results of various alternative wildland fire management strategies. The Comparative Risk Assessment Framework



and Tools (CRAFT) planning and analysis process, implemented in Phase II, guided each region in identifying values, goals, objectives, actions, and activities. Using the CRAFT framework for Phase III, the Southeastern RSC was able to develop multiple management scenarios to aid in producing alternatives which could aid the region in meeting Southeastern identified goals and objectives. Multiple alternative strategies were developed for stakeholders and managers to consider in a risk trade-off analysis.

Given the premium placed on collaboration and engagement within the Cohesive Strategy, it was important that the quantitative aspects of risk assessment be embedded within a broader social discussion of values, options, potential consequences, and trade-offs. CRAFT is a structured process and set of tools designed to meet the needs of collaborative efforts to tackle complex resource management issues with conflicting values at stake and high levels of uncertainty.

The CRAFT framework provided a list of 26 questions for the Southeastern region to consider in the development of the Southeastern risk assessment during Phase II. The questions were developed in order to identify regional challenges and opportunities. This process included engagement in forums and the solicitation of stakeholder comments, which constituted an integral part of the risk assessment development. This effort yielded specific regional priority values and management objectives aimed at achieving the three regional goals of the Cohesive Strategy. Six values were developed; two (Firefighter and Public Safety) were combined for the purposes of this report.

By scoring the actions identified in phase II within each objective with the potential impact it had on each value, the stakeholders represented on the RSC were able to develop a process for determining regional investment options and alternatives to achieve the Cohesive Strategy goals in the Southeast. Due to time constraints, an analysis of different alternatives using the alternatives matrix described above was completed to assist in determining appropriate investment options. The process involved assigning numerical assessments of importance to the intersection of each value and management objective. The guidelines for completing this process are described in Appendix 9. The set of numbers after each activity and action listed for the regional values is consistent with the numbering from the Phase II Regional Assessment. Discussed below are the emphasized actions and activities separated into each of the five value sets. By grouping them by value set, stakeholders can easily associate with a value or two and easily focus on actions applicable to each value

Firefighter and Public Safety

Firefighters and the public throughout the Southeast are impacted by an increasingly complex, rapidly evolving fire environment. Population growth in the region has accelerated the development and growth of the WUI as well as increasing fragmentation and change in ownership of lands (Fig. 5 – Note that this is a map derived for the Southeast using the BBN approach as discussed in the Risk Analysis).

The WUI Area map was constructed using statistical techniques that produce a composite index based on a linear combination of multiple variables. These variables collectively characterize the spatial distribution of urban, rural, and agricultural communities and the proportions of homes within each.

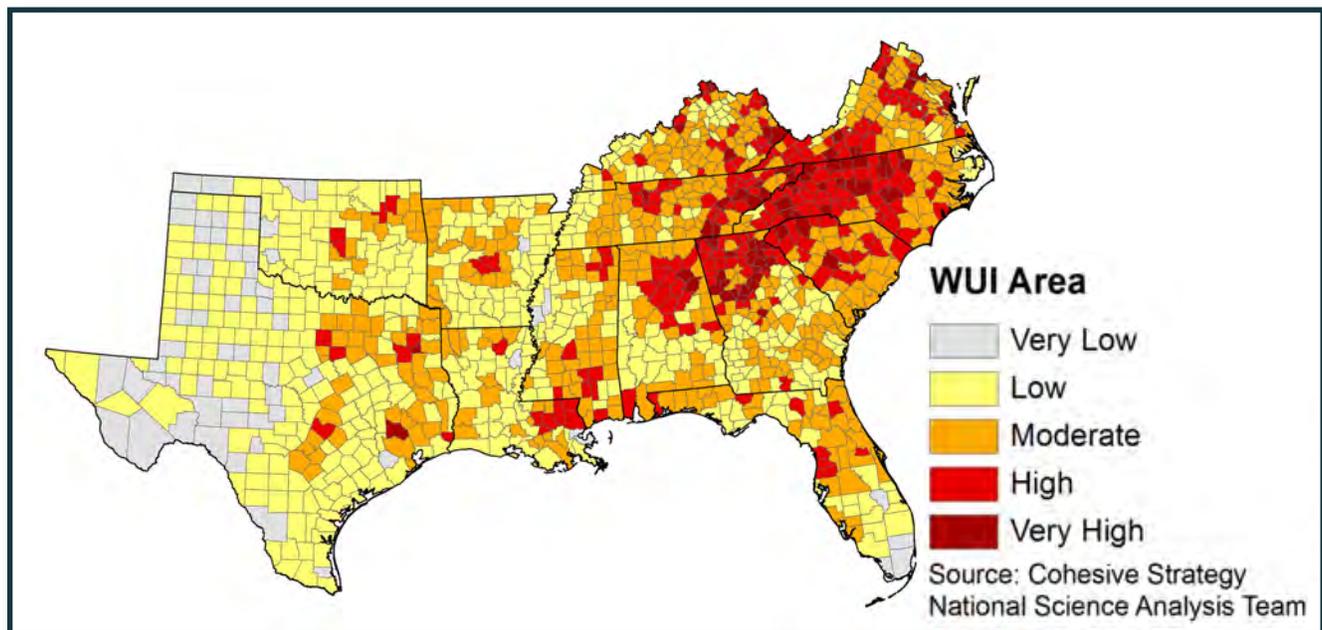


Figure 5. WUI area in the Southeast

This particular map is highly correlated with the amount of area within each county that is located within the wildland urban interface and moderately correlated with the proportion of homes located there. The map shows that the Southeast generally has a large percentage of total land area in a WUI setting. In other words, due to the high level of private ownership in the southeast, much of the rural landscape is characterized by homes in the forest.

More than 88 million acres in the Southeast are classified as WUI, which is characterized by homes or communities adjacent to or within fire-prone natural areas (Andreu 2008). Along with the increase in management complexity related to the growth of the WUI, fire management organizations face increased expectations and dwindling resources. Today, fire responses comprised of multiple agencies and organizations are standard, and ensuring firefighter safety depends on interagency training. This standardized training ensures effective communications and interoperability across agencies and jurisdictions. Capacity and capability building is also necessary to ensure adequate resources are available for a safe response, in addition to awareness of personal responsibility for safety during all fire management activities. Despite this preplanning and continuous training, each year emergency responders in the region suffer injuries and fatalities. Injuries and fatalities to emergency responders pose

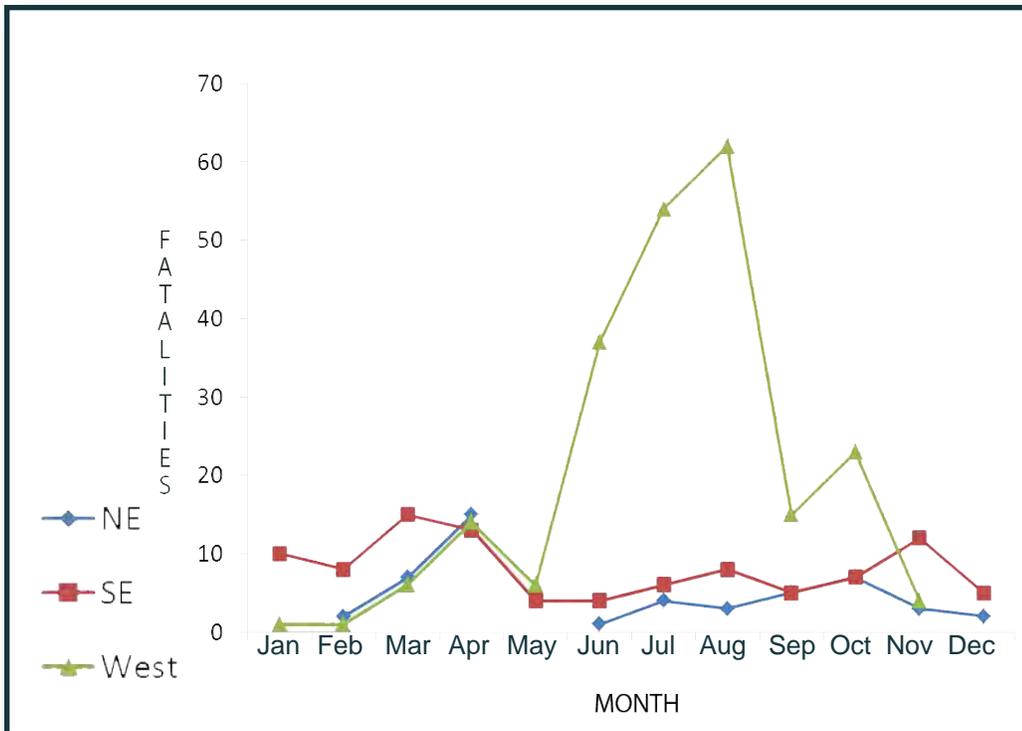


Figure 6. Monthly fatalities of firefighters responding to outdoor fires by region (1990 - 2002).

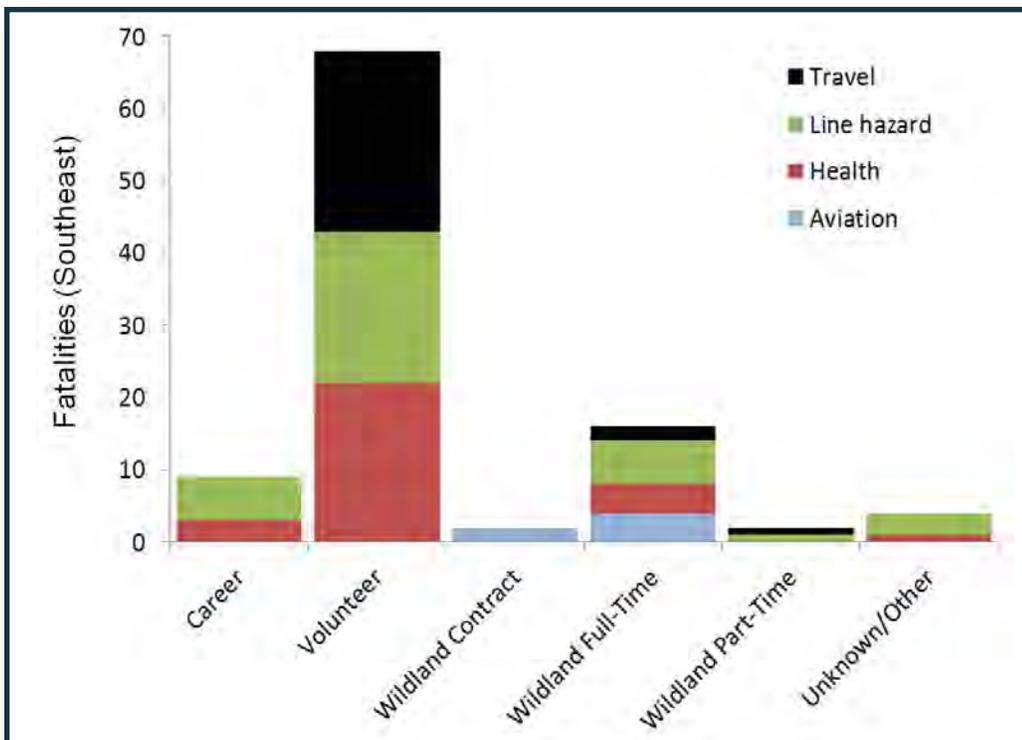


Figure 7. Firefighter fatalities during wildland fire response by occupation and activity (1990 - 2001)

a particular issue in the fire-prone Southeast, where wildfires burn twelve months out of the year (Fig. 6).

All emergency responders must maintain alertness and readiness for a safe fire response year-round. However, in the Southeast region, volunteer firefighters are at particularly high risk of death during wildfire response (Fig. 7).

The data analyzed by the NSAT demonstrate that volunteer firefighters experience higher occurrences of injuries or fatalities during wildland fire response. Risk to younger firefighters can be eased through capacity-building and training, but older firefighters require health screening to reduce the risk of injuries or death. Southeastern residents also are at risk of injury or death due to

wildland fire. One way to look at this risk is by examining demographic stress in the region. One of the key factors calculated in the NSAT's BBN analysis is a county-level understanding of demographic stress in the Southeastern region (Fig. 8).

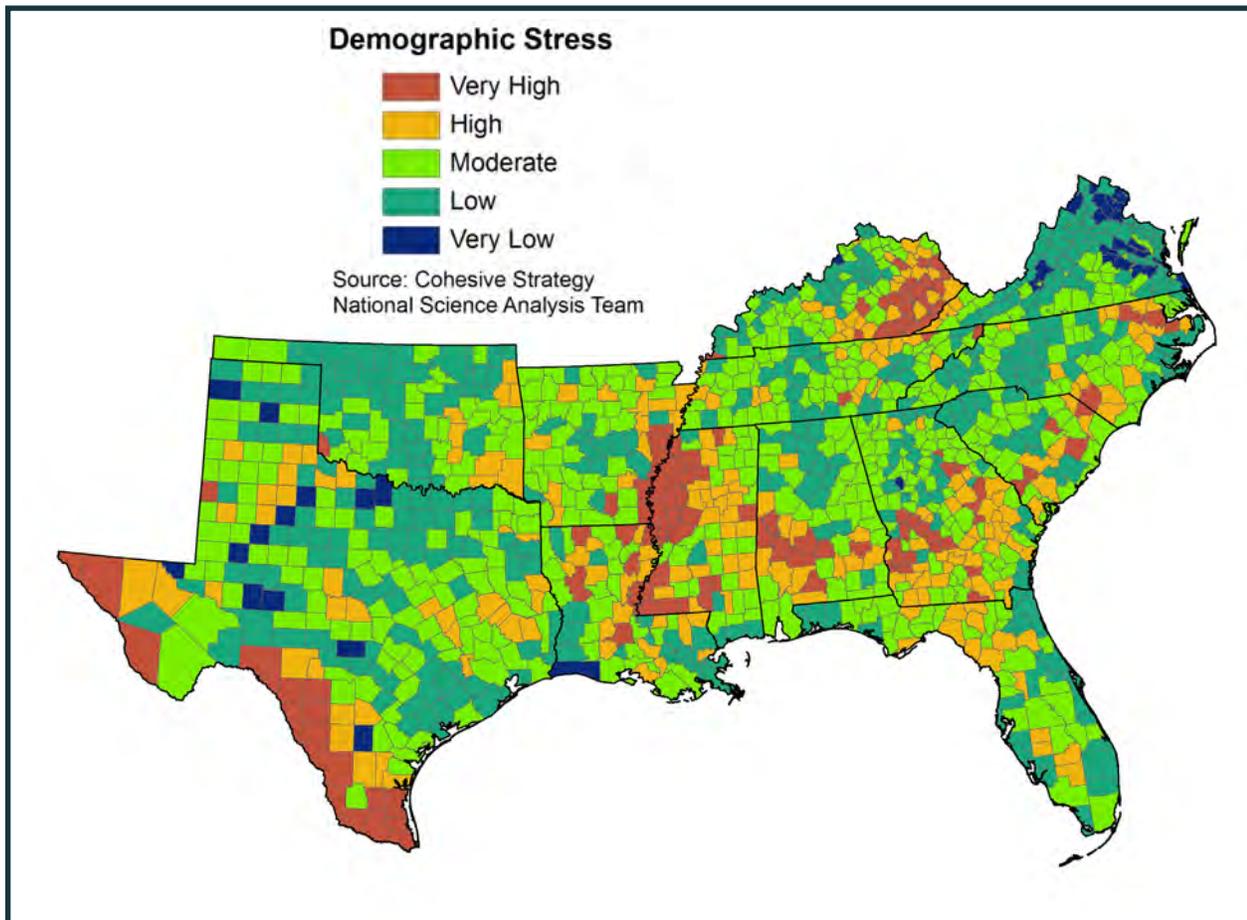


Figure 8. Demographic stress in the Southeast

The populations within these counties have high stress factors (i.e., overall low income, poor education, and experience high rates of unemployment, along with other demographics) that limit the ability of the local population to assume proactive personal responsibility to keep their families and their communities out of harm's way.

Feasible alternatives to the status quo would focus on actions and activities that reduce the risk of injury to firefighters and the public while eliminating loss of life during wildfire response. Actions and activities that would have the most significant impact on enhancing firefighter and public safety, as well as achieving regional goals, have been identified from the Phase II Regional Assessment and are as follows:

1. Utilize prioritization in SWRA and other efforts to identify and treat wildland fuels in areas that will facilitate tactical defense of human communities or ecological values and services from wildfire (tactical fuel breaks). (1.2.2)

2. Increase community preparedness and mobilization abilities (e.g., evacuation) and increase coordination and planning between local, state, and federal responders prior to wildfire ignition. (2.2.3)
3. Train, develop, and increase state, federal, Tribal, and local agencies and cooperating entities capacity for wildland fire management to ensure staffing levels meet operational needs. Utilize training academies and improved MOUs to increase response capacity, including awareness of risk management techniques. (3.1.1)
4. Investigate and invest in the development and deployment of specialized fire suppression equipment to increase the efficiency and effectiveness of wildland fire suppression activities. Ensure that specialized equipment is available to all entities that have a role in wildland fire suppression. (3.2.2)
5. Utilize relationships to increase interagency cooperation during wildland fire suppression. Develop/encourage the implementation of statewide mutual aid agreements and cross-jurisdiction MOUs, including Cooperative Fire Agreement billing. Support development of interagency all hazard Type 3 IMTs. (3.2.4)

SHARING SUCCESSES —

EXPANDING OPPORTUNITIES

- *SouthWRAP* – This forthcoming update to the Southern Wildfire Risk Assessment (SWRA) will make SWRA data and reports accessible to community planners, wildfire responders, homeowners, and other interested stakeholders online. This development serves to significantly expand the utility of this valuable fire planning tool.
- *Texas Insurance Fund for Rural Fire Department (RFD) Support* – Since the beginning of the Rural Fire Department Assistance Program a decade ago, Texas A&M Forest Service has distributed grants to 1,683 different RFDs. These grants have been used to purchase much-needed equipment and provide training for the volunteers that staff them. Of the RFDs receiving grants, 1,415 have used them to purchase fire trucks, and 29 RFDs received emergency grants to replace damaged fire trucks. This innovative program might be used as a model for other Southeastern states interested in developing similar programs.

Fire response in the Southeast has historically depended on close collaboration between a variety of responders including federal, state and local government, volunteers, private industry and non-governmental organizations (NGO). Federal and state governments do not own large contiguous land-holdings in the Southeast but a patchwork of holdings spread across the landscape (Fig. 9). Thus, initial response is mostly local. The family segment of this figure represents more than three million families and individuals. The 29% that is held by corporate owners continues to shrink and become more fragmented.

Additionally, as fragmentation of private land in the Southeastern United States continues, challenges associated with land management and wildfire response are only expected to increase (Fig. 10).

Further expansion of the WUI is increasing the workload on fire management organizations at all levels. At the same time, agencies and organizations have experienced constrictions on available resources with which to accomplish wildland fire response and management. Today, rural fire departments are

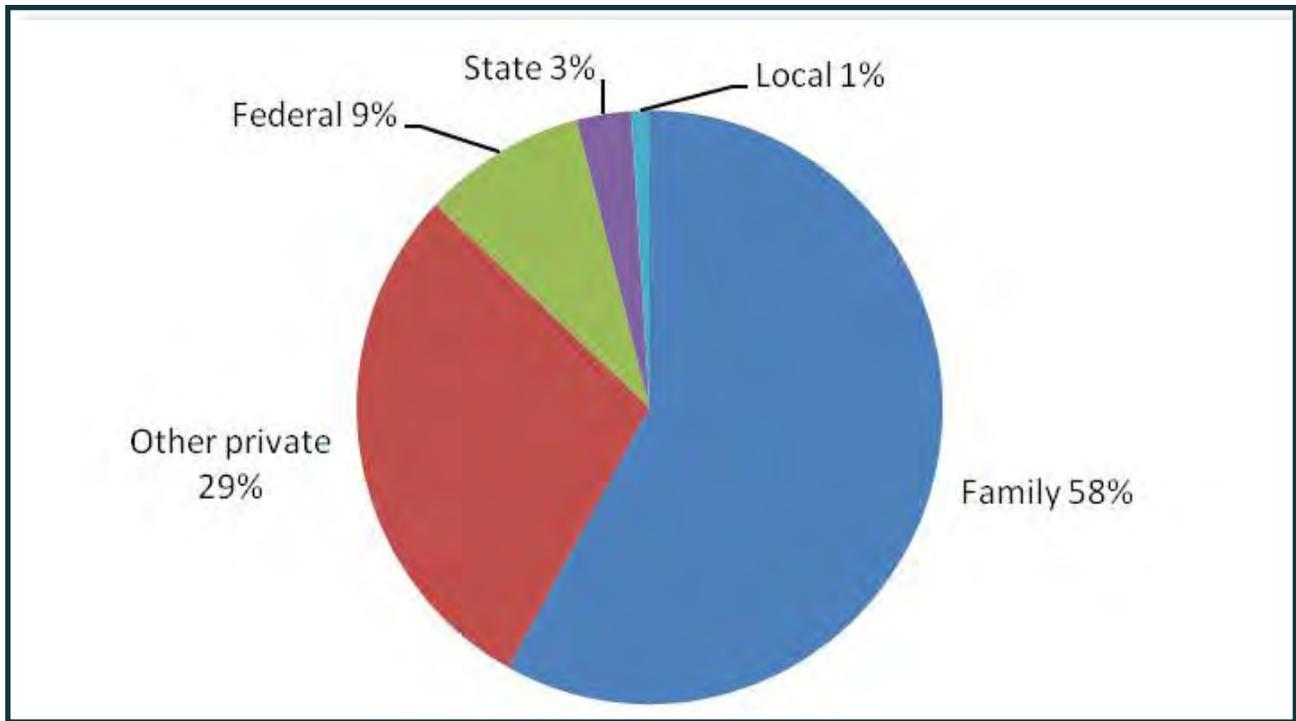


Figure 9. Distribution of forest ownership in the Southern U.S. 2006. Source: Southern Forest Futures Project.

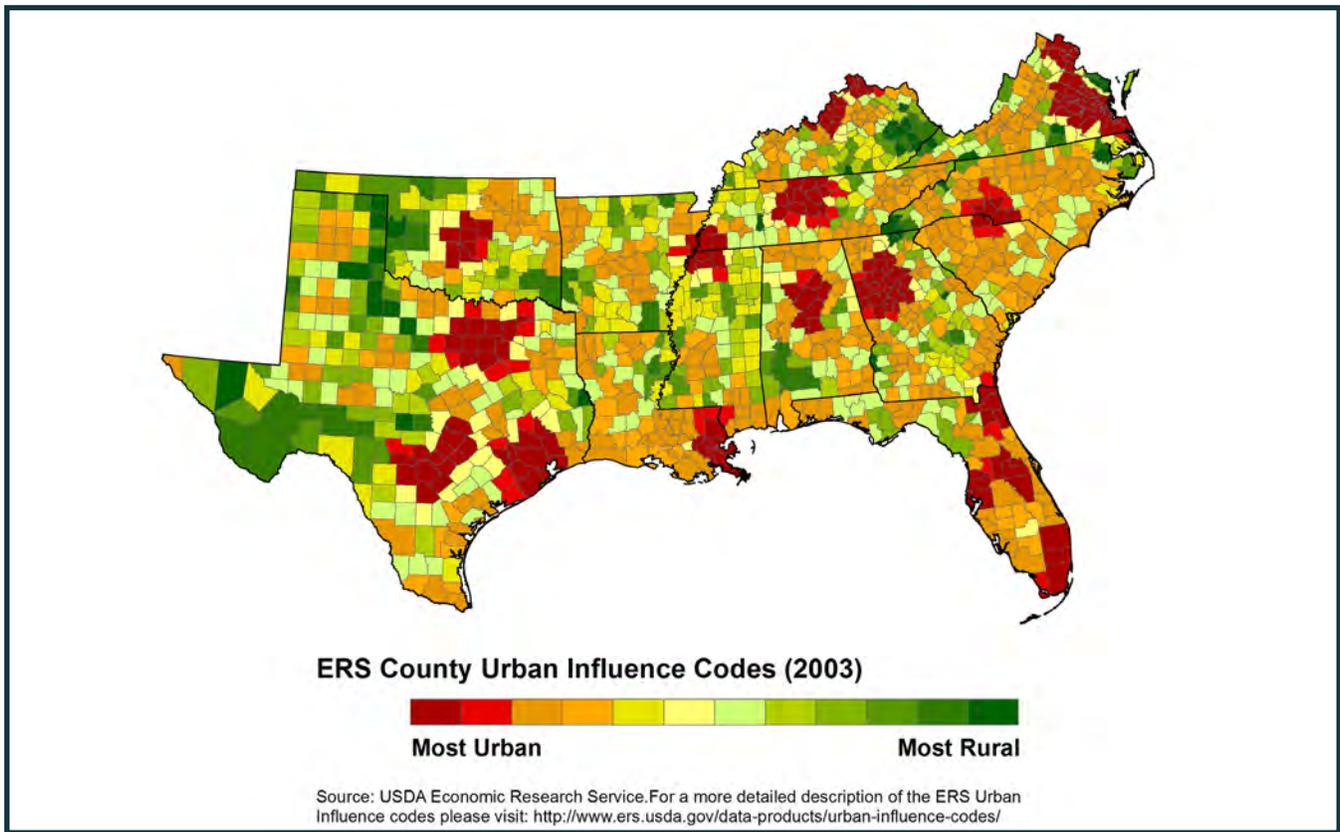


Figure 10. Urban to rural gradient map illustrating urban influence by county in the Southeast

increasingly responsible for initial response to wildfires throughout the Southeast, meaning the need for capacity-building and training is significant throughout the region. Too, in many areas of the Southeast, volunteer and rural fire departments are geographically distant from each other, increasing strain and risk on responders (Fig. 11).

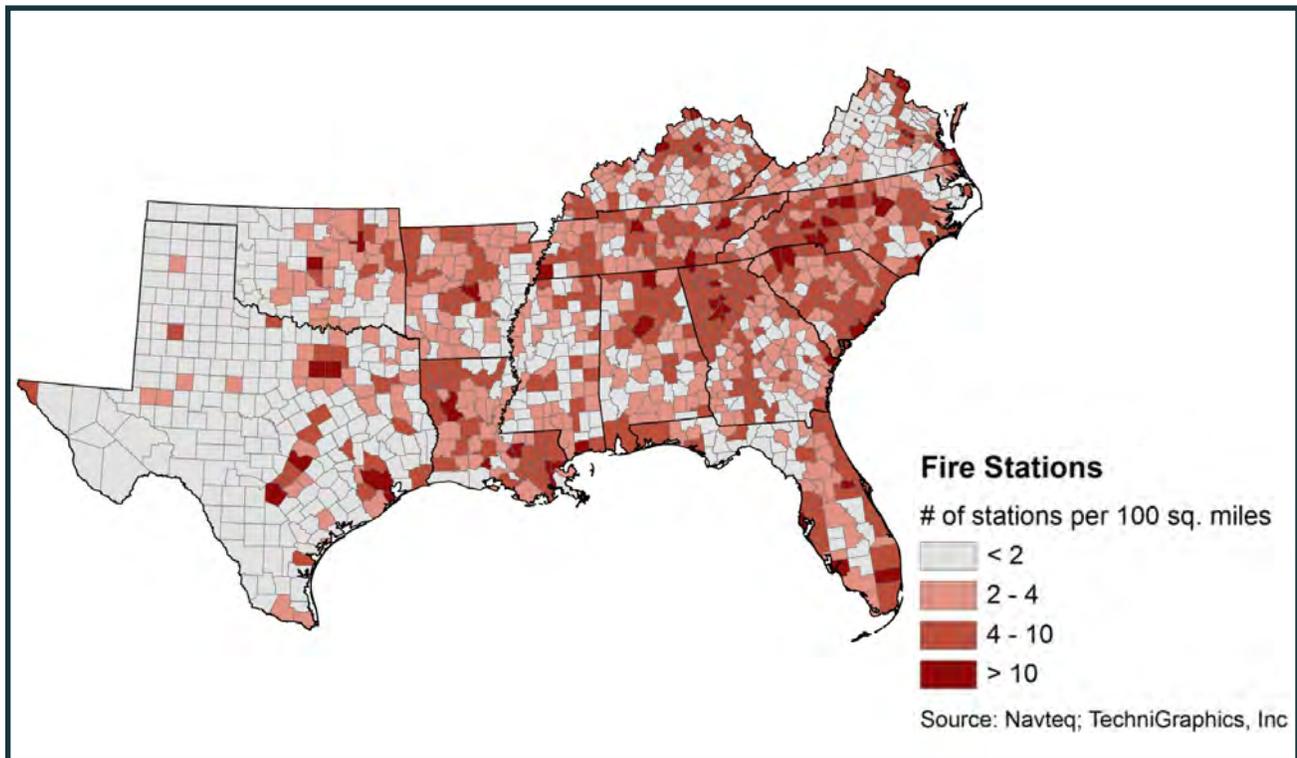


Figure 11. Fire stations in the Southeast

Continuous interagency training that emphasizes interoperability and interdependence may be the only way to ensure a safe and effective response to fire. Agencies and organizations may realize cost savings through cost pooling, by utilizing common resources and by conducting training in partnership with multiple fire management organizations. These multi-agency/organization trainings also provide opportunities to develop professional relationships between agencies, organizations and first responders at all levels.

The current environment of limited resources requires prioritizing fuel treatments to achieve the greatest return on investment. Regional tools have been developed to guide the effective location and implementation of wildland fuels treatments, such as the SWRA and other documents. The SWRA provides a strategic view for wildland fire and environmental managers who are focused on improving public safety, and protecting Southeastern states from significant property losses (Spencer 2010). State forest action plans and wildlife action plans also serve as significant resources in setting management priorities.

The rapid growth of the WUI in the Southeast means that firefighters responding to wildfires are increasingly responding to WUI fires, in which fire is burning in both undeveloped vegetation as well as endangering or burning managed vegetation or human structures (Fig. 12).

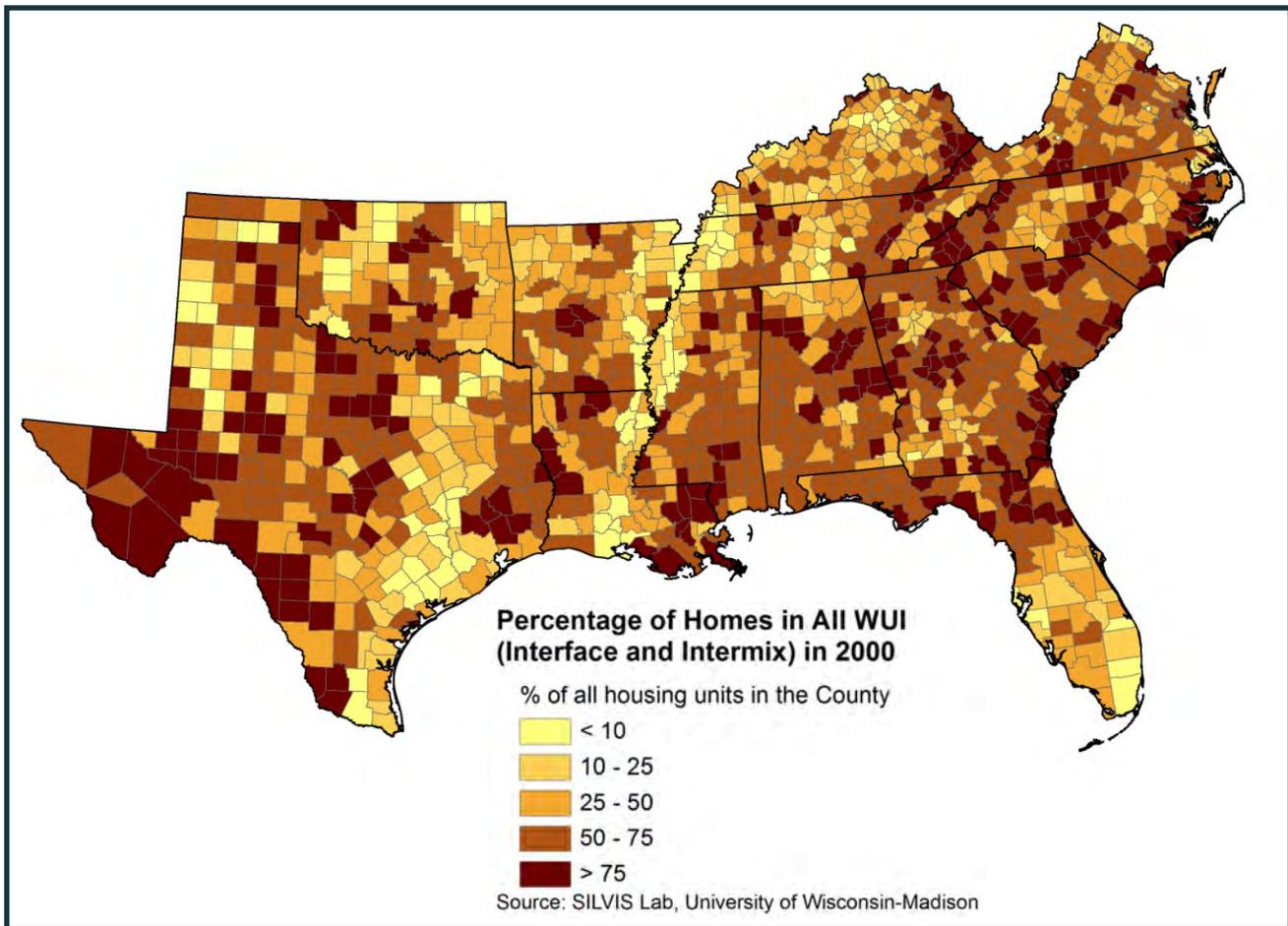


Figure 12. Percent of homes in all WUI (interface and intermix) in 2000 in the Southeast

The WUI environment is a more complex and potentially more dangerous environment than the traditional wildland environment. In the Southeastern U.S., 43 percent, or more than 50,000 communities, are at high to very high risk of wildfire damage (Andreu 2008). Outreach to those who live and work in WUI areas and development of preparedness and evacuation plans results in safer and faster public egress from WUI areas, as well as safer ingress for first responders. Numerous efforts focused on community engagement exist, including Firewise Communities/USA®, “Ready, Set, Go!” and the “One Message, Many Voices” campaign. Figure 13 shows fire hazard (based on the combined wildfire and outdoor fire occurrence records in federal, state and local (NFIRS) datasets) relative to known Fire-Adapted Communities (FAC) programs.

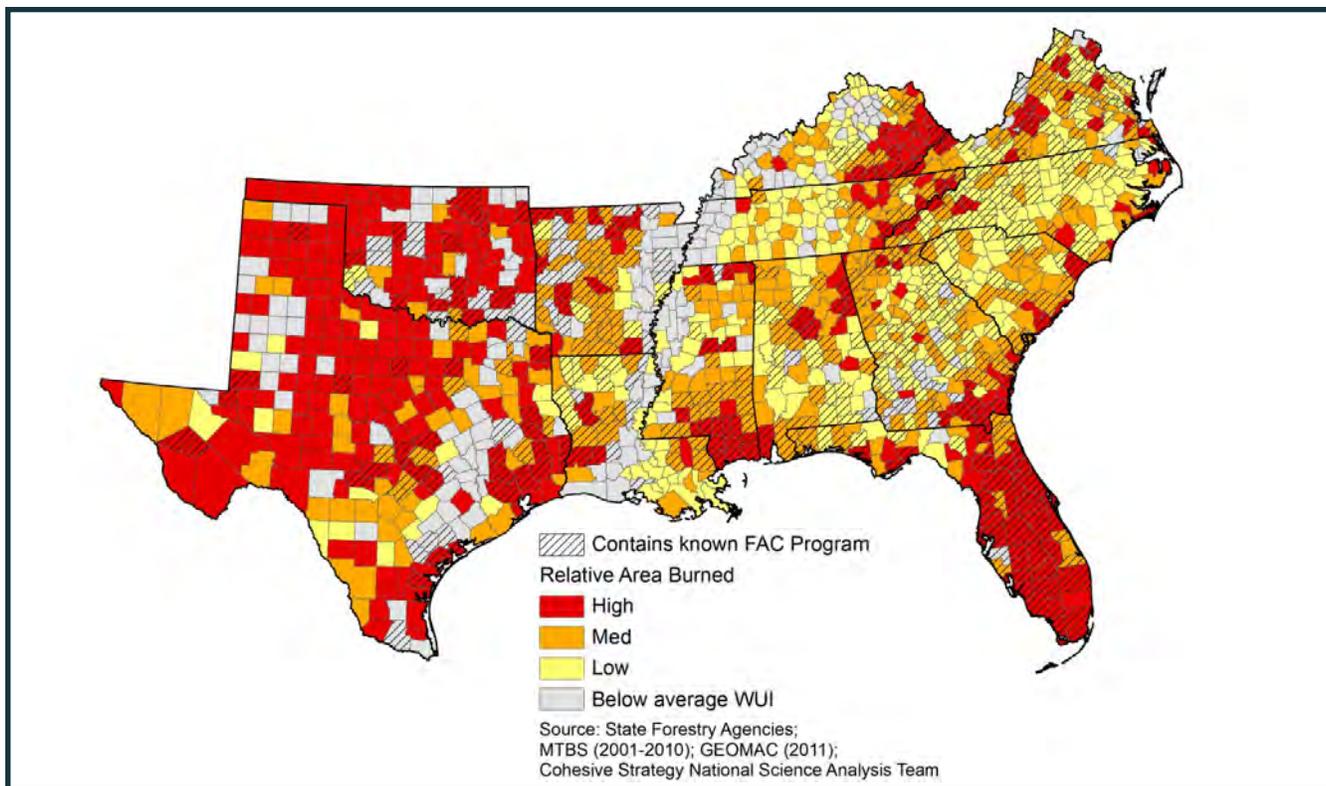


Figure 13. Fire-Adapted Community (FAC) programs and fire risk for the Southeast.

Prestemon et al. (2010) showed that increasing wildfire prevention education (WPE) could lead to benefits (i.e. a reduction in damages caused by wildfires) that were 35 times more effective than the additional spending associated with the increased education. In addition to community outreach, fire management agencies and organizations at all levels may realize substantial returns on investment by engaging in proactive planning with government and non-governmental emergency response partners prior to an ignition.

Developing professional relationships among incident responders and between responders and the public, creating the tools necessary to increase efficiency and effectiveness during a response, increasing community preparedness, and treating fuels could increase safety for the public and firefighters.

Mitigating risk of injury or death to responders as well as the public as a result of fire management activities is of key importance in the Southeast. These selected actions and activities may, as part of a suite of other alternatives, serve to reduce the risk to responders and the public during wildfire response.

At the national level, Phase III will continue with development of a national risk analysis and a national action plan. The NSAT will develop a comparative risk model using the data sets, and will develop a national trade-off analysis. When the comparative risk and trade-off analyses are complete, a National Phase III Risk Analysis Report will be written to bring together the issues and alternatives discussed in the three regional reports. A National Action Plan will be developed based on the national risk and trade-off analyses.

Marketable Products

Though the Southeast has significant and diverse number of marketable products that directly or indirectly are sourced from forest products, ranging from traditional goods such as baskets woven by Tribal crafters to wild-crafted products harvested from forest lands, timber production constitutes the largest market in the region. Forest landowners in the Southeastern U.S. produce more timber than any country outside the United States (Fig. 14). Favorable climate, soils, and species composition coupled with effective forest management has led to steady increases in growing stock volume over the past century (Wear et al. 2011).

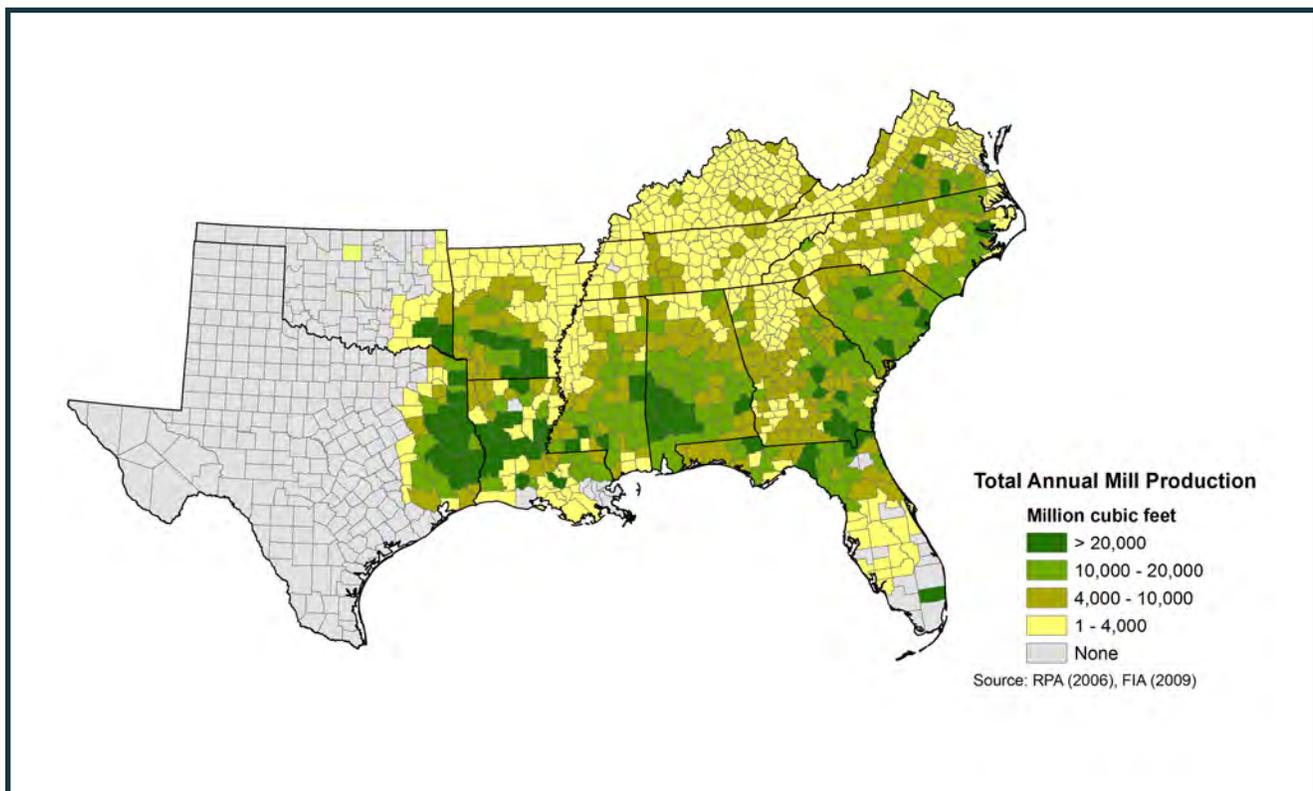


Figure 14. Timber production in the Southeast

Marketable products provide an opportunity for mechanical fuel treatments in the Southeast. As individuals and communities, especially in the WUI, look for ways to treat their fuel problems, the economic markets available in the Southeast may offer the greatest number of viable options. The timber produced has been used primarily for traditional purposes, such as lumber and pulp. Recently, contraction of the national housing market has caused a reduction in market demand for timber, and thus a drop in falling lumber values, resulting in decreased timber harvesting in the region. However, other potential

opportunities exist for landowners outside traditional timber markets including agroforestry systems, specialized forest products, biomass-based energy (Fig. 15), and CO₂ sequestration.

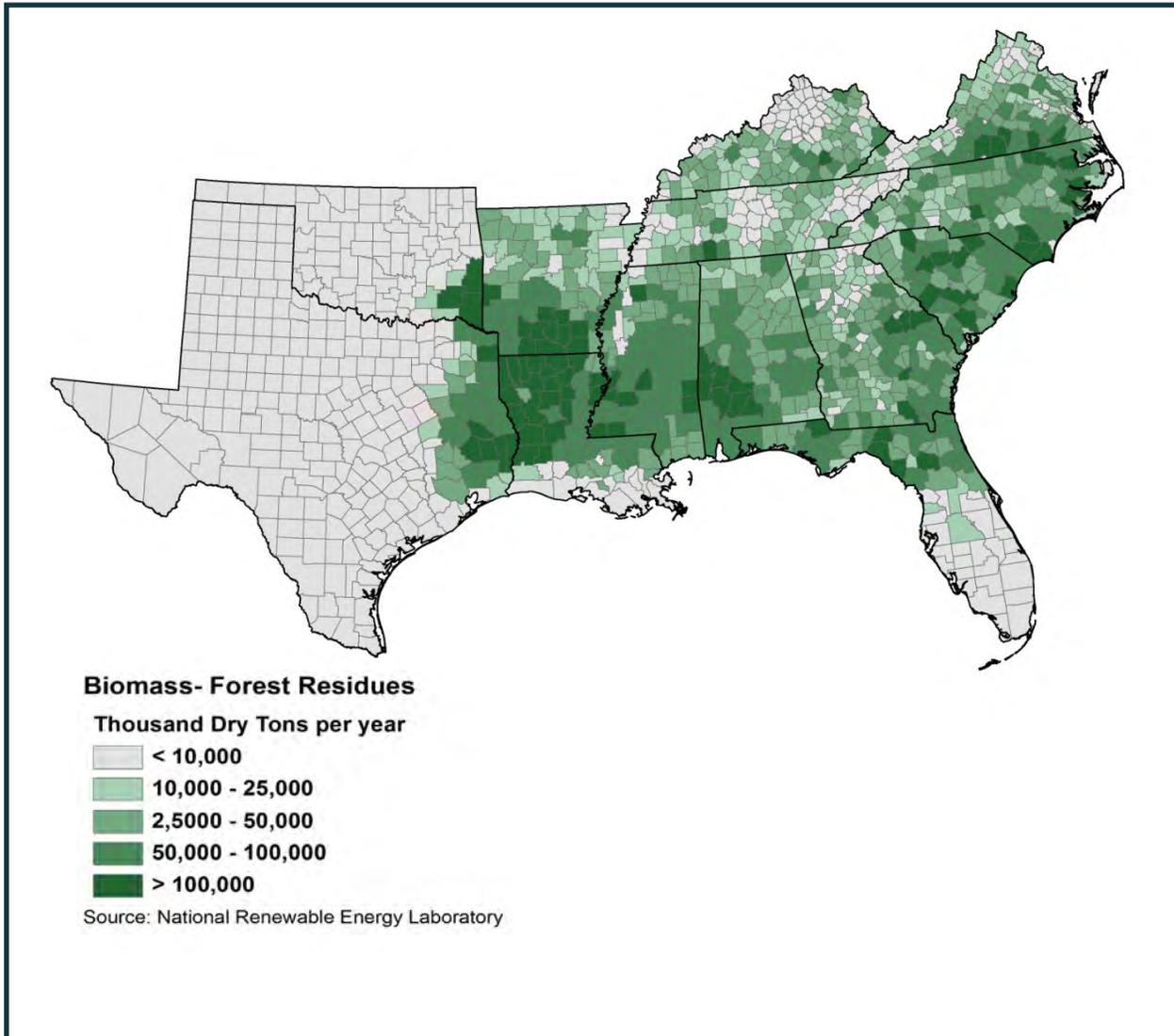


Figure 15. Southeastern biomass – forest residues, in thousand dry tons per year.

Fire management programs that include hazardous fuels reduction objectives have an opportunity to contribute to traditional and non-traditional forest product markets in the region by providing the supply for non-traditional products.

Feasible management alternatives to the status quo would focus on actions and activities that encourage development and sustainable production of marketable products from Southeastern landscapes. Actions

and activities that would have the most significant impact on marketable products, as well as achieving regional goals, have been identified from the Phase II Regional Assessment and are as follows:

1. Encourage the use of alternative management techniques (mechanical, grazing, etc.) to restore and maintain fire dependent ecosystems where fire is not feasible or desirable. (1.1.4)
2. Use education and incentive programs to encourage new and nontraditional private landowners to manage their lands to contribute to resiliency while providing forest products and expanding ecosystem markets. (1.1.5)
3. Encourage traditional and developing economic markets, such as biomass, to enhance economic viability of timber harvesting and mechanical fuel treatments. (1.2.4)
4. Encourage landowners, particularly new and non-traditional landowners to deliberately actively manage land regardless of ownership objectives, including fuels management. (1.2.5)
5. Control invasive species that alter fire regimes and ecosystem function. (1.5.2)

Traditional timber market demand in the Southeast is closely linked with the housing market and pulp production. Both housing market demand and pulp production have decreased considerably over the last decade while the available timber supply has increased. Effective forest management, an increase in intensively managed plantations, conversion of agricultural land to forest, and the success of traditional and emerging genetic breeding programs have led to greater production. New markets for woody products have emerged, but the success of these markets is largely

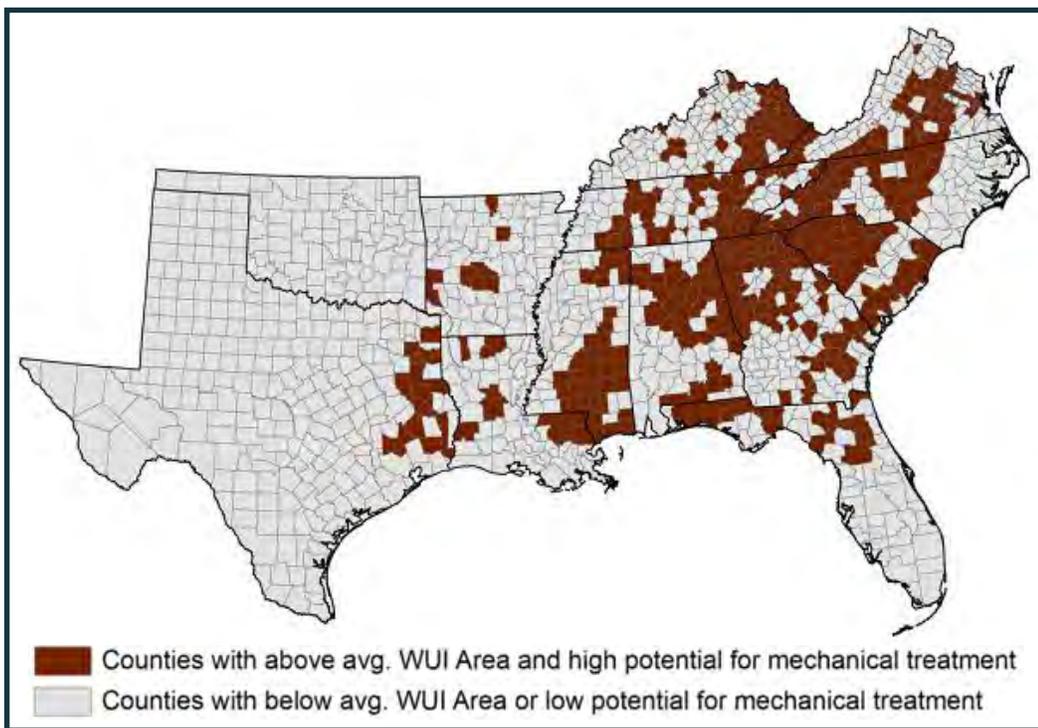
SHARING SUCCESSES — EXPANDING OPPORTUNITIES

- *Changing Roles: Wildland Urban Interface Development Program* – This is a multi-organizational partnership between the Southern Group of State Foresters, the U.S. Forest Service, the Florida School of Forest Resources, and the U.S. Fish and Wildlife Service. Each module in the multi-module program is designed to target a specific area of issues and opportunities. Module 2 specifically addresses managing interface forests and presents ways to address new and non-traditional landowners in practicing silviculture, small scale harvesting, managing for fire and wildlife among other activities. The program can be targeted to specific audiences or as an introduction to issues faced throughout the Southeast in the WUI.



dependent on public policy and land ownership. Several policies have been implemented at the federal level to encourage biofuels markets. Specifically, the 2002 Farm Bill, 2005 Energy Policy Act, the 2007 Energy Independence Security Act, and the 2008 Farm Bill all include provisions encouraging cellulosic biofuels production.

Woody biomass can be used to generate heat and electricity through co-firing with coal, as a stand-alone supply of cellulose, and in combined heat and power plants. Each of these methods is currently employed in the Southeast and there are at least 27 co-fired plants in operation (Alavalapati et al. 2011). Also, Alavalapati et al. (2011) conducted a demand analysis that indicated harvesting residues or biomass from timber markets would be required for wood from bioenergy markets as early as 2013 (Fig. 13). Woody biomass for energy production and bio-char are promising new markets that could use material from mechanical fuel reduction projects or harvests that would promote resilient and sustainable forests in addition to providing income for landowners. Reducing available fuel in the WUI would also decrease the probability of wildfire damages or losses. Figure 16 displays the Southeastern counties with the highest percentage which has both an above average WUI area and high potential for mechanical treatment.



Educating landowners and using incentive programs to enhance traditional and non-traditional markets could benefit fire management programs in the Southeast by reducing hazardous fuel loading. Currently, it is not economically feasible to implement large-scale mechanical fuel reduction treatments and these treatments have fewer ecosystems benefits than prescribed

Figure 16. Areas with above average WUI area (see Figure 5) that have high potential for mechanical treatment (at least 50 percent of county) (see Figure 17)

fire (Stanturf 2011). However, encouraging and supporting policy initiatives that help develop new markets could result in increased prosperity for landowners while positively impacting local and regional economies.

An additional forest product that requires consideration is clean water. By maintaining resilient forests through management and reduction of risk from fire, water supply managers can save costs from rebuilding natural systems disturbed by wildfire. Mechanical treatments and development of new markets

could also help mitigate climate change and encourage the development of resilient and sustainable ecosystems, especially in areas where prescribed burning is not feasible (Fig. 17).

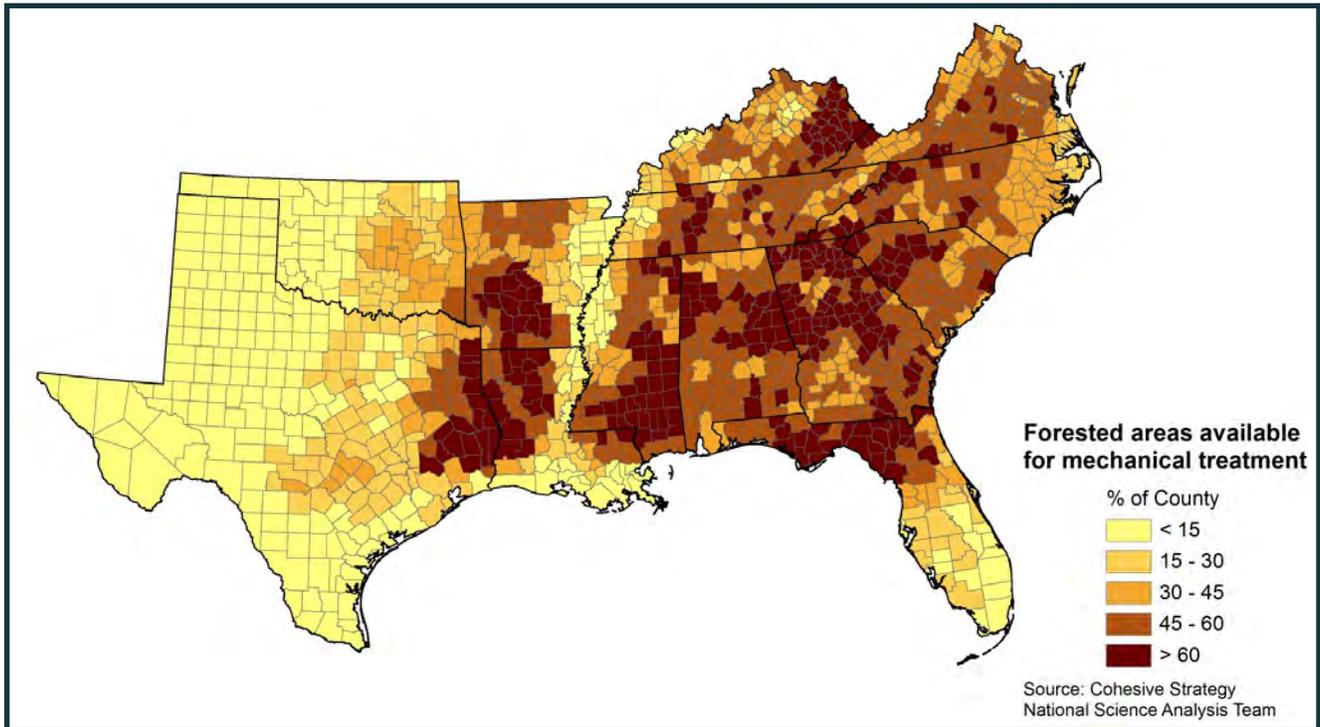


Figure 17. Forested area available for mechanical fuels treatments in the Southeast based on burnable fuels, road and slope access, and jurisdictional and legal constraints using non-federal wilderness areas and non-inventoried roadless areas on Forest Service lands.

If implemented, these selected actions and activities might serve to emphasize existing and assist in the development of new markets that use forest products in the Southeast, including not only large markets such as lumber and pulp but also specialty products such as Tribal woven baskets and new evolving markets such as biomass.

Ecological Services

Forests in the Southeastern United States provide a host of diverse ecological services. These services have been identified as an important value that should receive consideration when developing strategic land and fire management plans. Resilient ecosystems protect and enhance critical watersheds, ensure diverse recreational opportunities across the landscape, mitigate the impacts of climate change, provide habitat for wildlife, protect threatened and endangered plant and animal species, maintain and improve air quality, and offer protection from natural disturbances, such as hurricanes and flooding. Recognizing the value of these services, fire management programs and stakeholders throughout the Southeast can contribute to their sustainability and enhancement. Figure 18 displays the proportion of counties for whom surface drinking water is vitally important, demonstrating the value of maintaining clean drinking water.

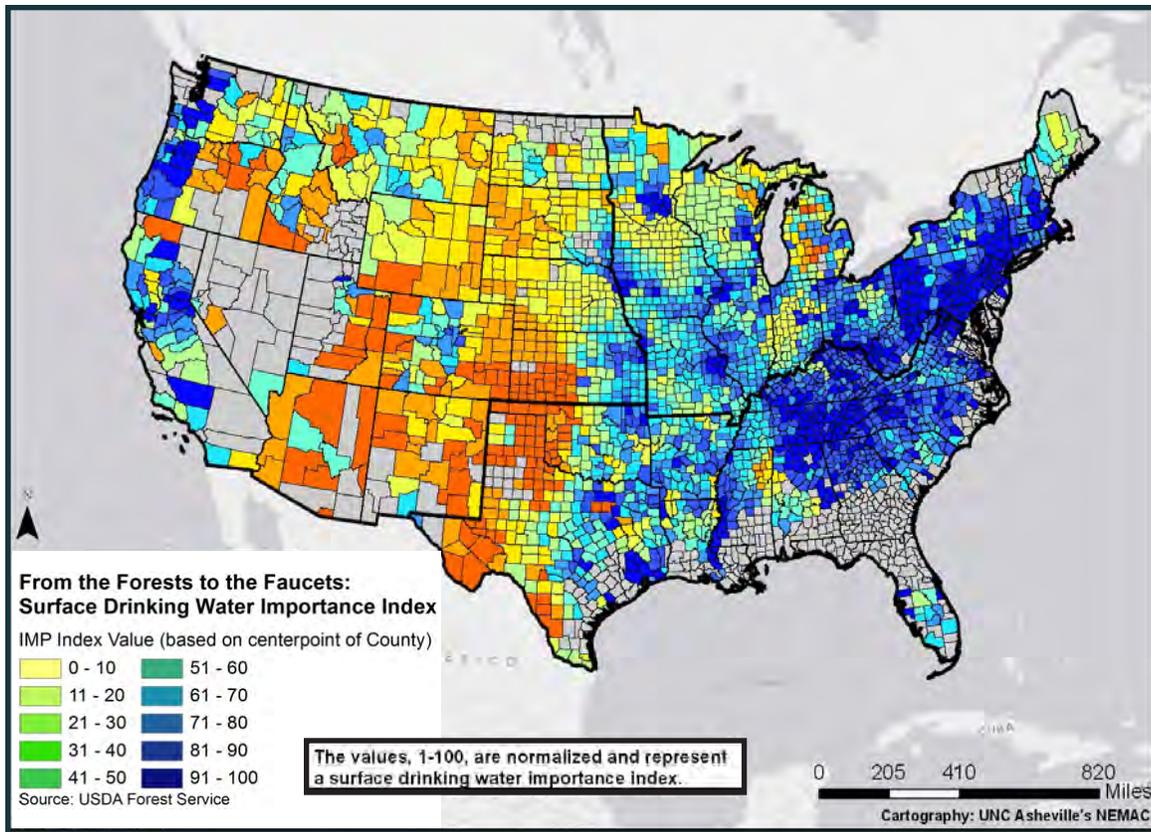


Figure 18. Forests to Faucets Importance Index

Feasible management alternatives to the status quo would focus on actions and activities that improve the ecological services of Southeastern landscapes. Actions and activities that would have the most significant impact on enhancing ecological services, as well as achieving regional goals, have been identified from the Phase II Regional Assessment. Some of these actions and activities have been slightly revised to reflect the changing needs perceived by stakeholders involved in the Cohesive Strategy process. The identified actions and activities are:

1. Promote and use fire to emulate natural disturbance patterns to maintain and improve ecological systems, balancing social, cultural, and economic needs, especially over large contiguous landscapes. (1.1.1)
2. Plan and implement post-fire stabilization and rehabilitation activities and education to reduce site degradation and potential impact from

SHARING SUCCESSES — EXPANDING OPPORTUNITIES

- *Coming Together to Address Smoke Management Issues while Supporting Longleaf Pine Restoration* – EPA is fully engaged with federal, state, and non-governmental organization (NGO) partners in longleaf pine ecosystem restoration efforts. Prescribed burning is a necessary component of longleaf restoration and maintenance. EPA Region Four supports increased prescribed burning for achieving the longleaf restoration goals, provided that smoke management procedures are followed to minimize impacts on air quality and human health.

hydrological events, invasive plant infestations, and other events that follow severe fires. (1.1.6)

3. Support efforts to increase prescribed burning for ecosystem restoration (e.g., SERPPAS efforts for Longleaf pine restoration). (1.1.7)
4. Work with regulatory agencies and entities (i.e., air quality) to ensure that prescribed fire remains a viable management tool and maximize flexibility for its use (including liability issues). (1.2.3)
5. Control invasive species that alter fire regimes and ecosystem function. (1.5.2)

Effective working relationships with air quality agencies and other regulatory agencies to ensure prescribed burning remains a viable land management option is key in the Southeast. Burning vegetation can be a source of air pollution, producing fine particulate matter (PM_{2.5}), CO₂, and CO. Large fires consuming above average fuel loads can far surpass regulatory agency standards for air quality. Further complicating regional air quality issues are drier conditions, which are predicted to worsen in the coming decades, resulting in increased fuel consumption and emissions (Stanturf 2011). Focusing on maintaining fire adapted ecosystems can mitigate the effects of increasing emissions through smoke management techniques such as prescribed burning when atmospheric

conditions are optimal and conducting more frequent, low intensity burns to maintain a fuel load that results in lower emissions when consumed. Working with air quality agencies to ensure that prescribed fire is a viable management tool, even as emission thresholds are decreased, should be an important part of strategic land management plans (Fig. 19).

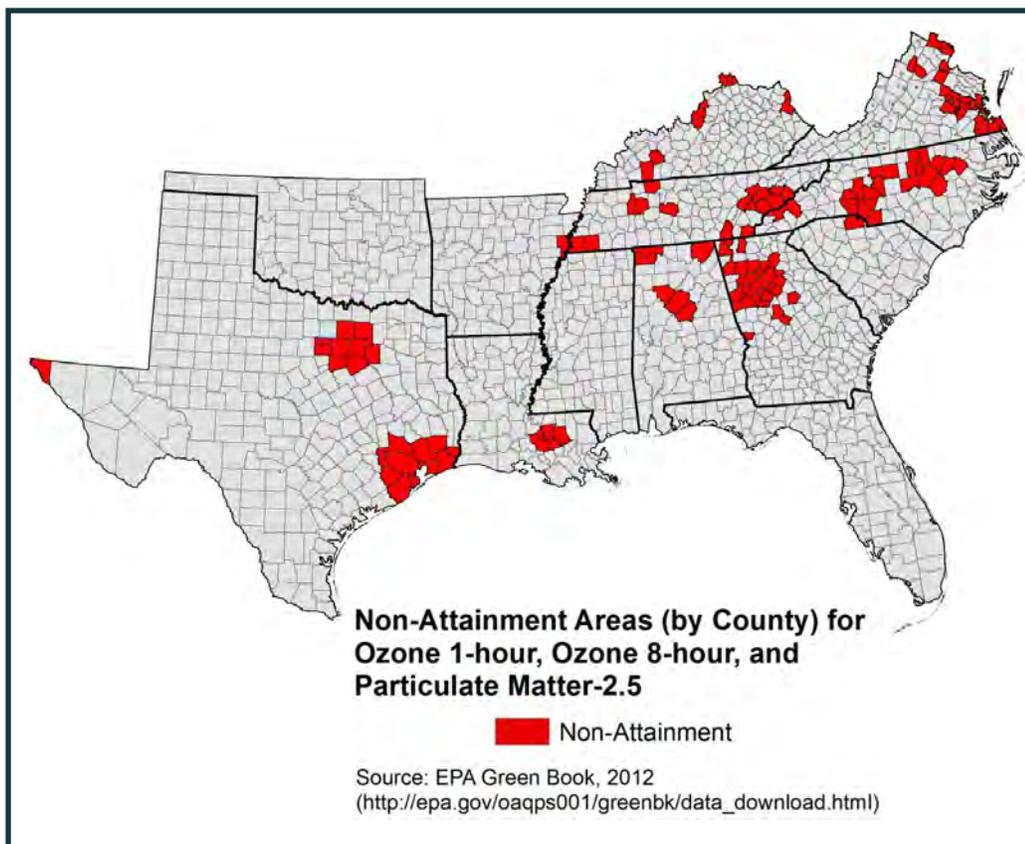


Figure 19. Non-attainment areas by county for ozone 1-hour, ozone 8-hour, and particulate matter 2.5 (N=553)

Most ecosystems in the Southeastern U.S. are fire adapted, many relying on frequent, low intensity fires to maintain characteristic ecosystem structure. These fires reduce vegetative competition, release seeds from serotinous cones, stimulate seed germination, improve regeneration, provide habitat and food for a variety of wildlife species, and increase soil fertility while aiding nutrient cycling. Excluding fire from these ecosystems decreases their resiliency and negatively impacts ecosystem services. For example, several species of wildlife depend on grasses and other herbaceous plants for food or cover that becomes abundant after a fire. In ecosystems where fire has been excluded, a developed mid-story prevents needed sunlight from reaching the forest floor, effectively eliminating the grass and herbaceous component, and significantly increasing wildfire risks. Promoting and using fire to emulate natural disturbance patterns naturally encourages an array of valuable ecological services (Fig. 20).

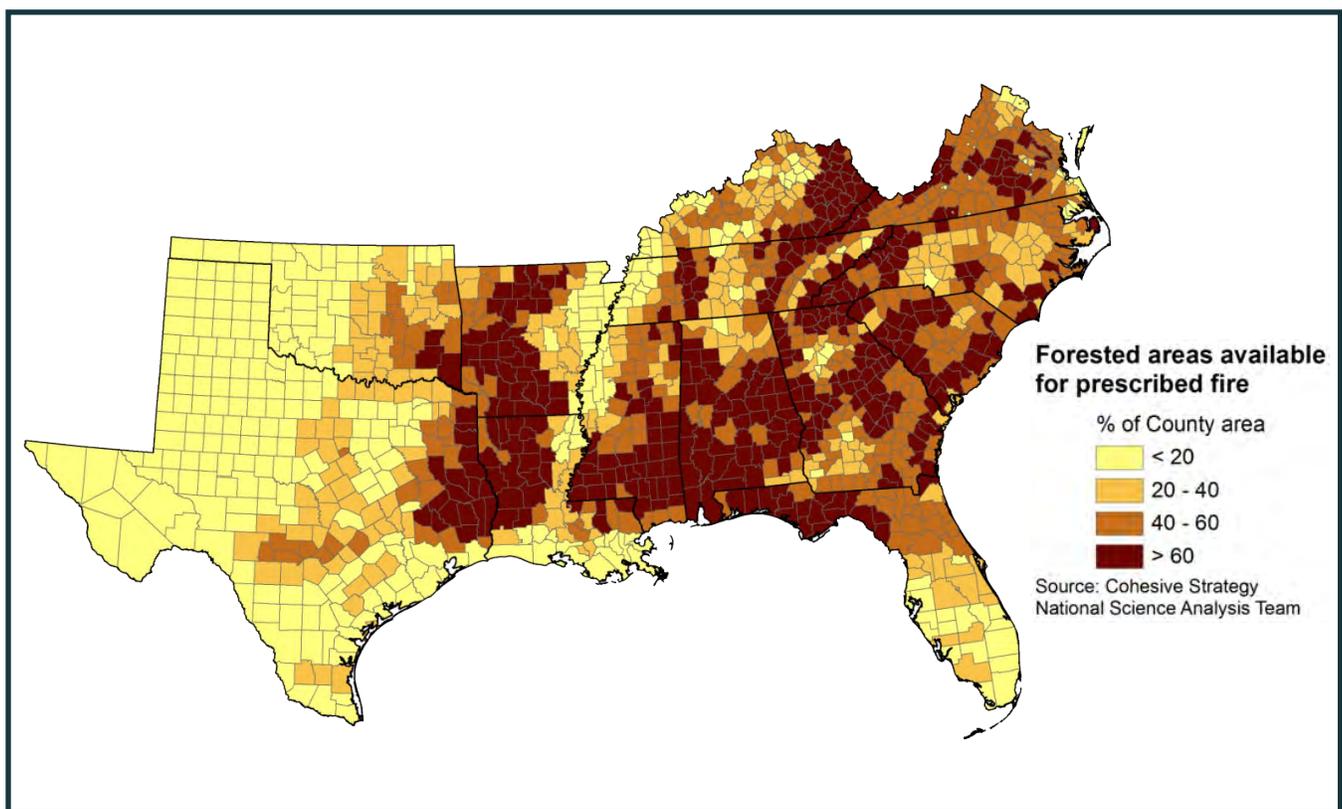


Figure 20. Percent of Southeastern counties generally available for prescribed fire that are forested based on historical fire regime groups 1-4 and a filter removing urban, agricultural and mixed-use land cover types

People depend on forests to help clean the air they breathe of harmful pollutants such as CO₂, SO₂, and ozone. Trees capture gaseous pollutants through their stomata and transport them to the soil to be broken down and utilized by microbes or stored in the soil. They can also capture larger pollutants on their leaves and branches that are then incorporated into the forest floor after rain, helping to prevent inhalation by humans and animals. Urban forests provide shade that reduces temperatures, evaporation of hydrocarbons, and use of electricity to cool structures (decreasing emissions from fossil fuel based power production facilities).

Invasive species potentially have the greatest negative impact on the ecological services that Southeastern forests and grasslands provide. Invasive species can reduce biodiversity, stop natural regeneration, negatively impact ecological processes ranging from soil formation to microbe population, and limit access to land for recreational purposes. Landscapes are particularly vulnerable to invasive species after disturbance because these species tend to have accelerated early growth rates and tolerance to environmental extremes, such as temperature and precipitation (Miller et al. 2011). For example, cogongrass (*Imperata cylindrical*) grows rapidly in disturbed ecosystems in the Southeast and forms dense mats of rhizomes that exclude native species.



Also, cogongrass burns much hotter than native Southeastern plant species, even in winter, creating more areas of disturbance available for species propagation. Controlling or eliminating the spread of non-native invasive species facilitates normal ecosystem function and utilization of the services they provide.

Protecting ecosystems from further disturbance after fire ensures continuation of ecological services and decreases the recovery time toward realizing maximum service benefits. Protecting forest soils and adjacent water supplies, preventing non-native species infestations, and encouraging regeneration promote reestablishment of healthy ecosystems that are resilient to future disturbance.

As an example, another activity that would enhance the Southeastern forest ecological services is increasing prescribed burning to promote longleaf pine (*Pinus palustris*) restoration. Longleaf pine ecosystems are estimated to have covered 90 million acres or more historically while only covering roughly three million acres today (Frost 1993). These ecosystems are some of the most diverse in North America, and provide habitat for numerous threatened and endangered plant and animal species. Longleaf pine ecosystems are dependent on frequent fire, and have suffered as a result of aggressive fire control and a reduction in prescribed burning. Restoring these ecosystems would increase plant and animal diversity throughout the Southeast, while providing wildlife habitat and other ecological services (Fig. 21).

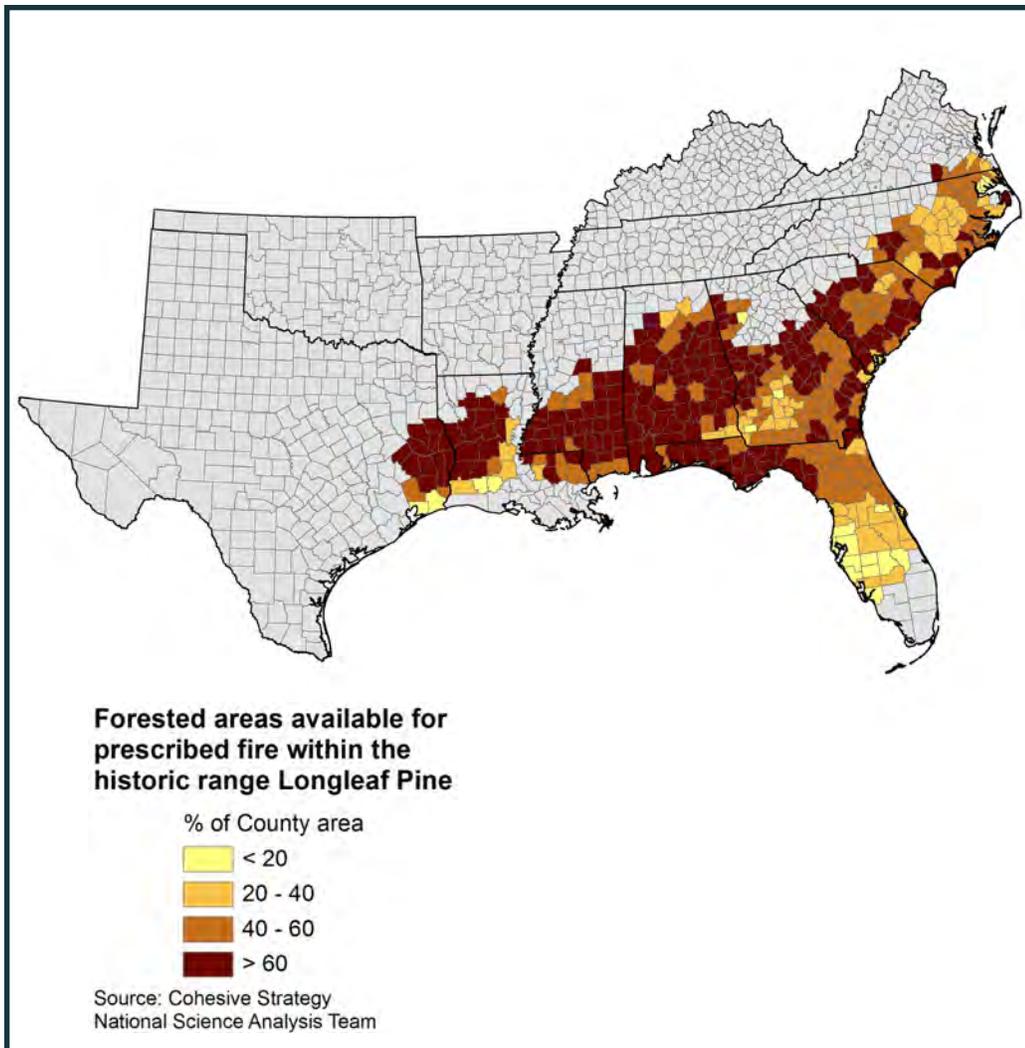


Figure 21. Potential for prescribed fire by county in historic longleaf pine range

(SERPPAS) group, Longleaf Alliance, America’s Longleaf Restoration Initiative (ALRI), etc.) with an ambitious goal of restoring and increasing Longleaf pine to eight million acres in the coming decade. An increase in prescribed fire acres will facilitate an increase in longleaf pine acres.

The Southeast includes a diverse range of ecosystems – (e.g. coastal marshes, pocosin wetlands, longleaf pine forests, oak savannas, cedar glades, and cove forests). Finding ways to support ecological services are of significant importance to protecting the quality of life of local residents, as well as the local environment. Should they be selected and implemented, these actions and activities could serve to restore and protect key ecological services considered priorities by Southeastern residents, from clean drinking water to wildlife habitats to air quality.

Significant opportunities still exist, though, to restore longleaf pine ecosystems in the Southeast. Prescribed burning is the primary land management tool used in the restoration of longleaf pine and other fire-adapted species in the Southeast. Key Southeastern conservation and management partners have cooperated through many unified efforts and programs (i.e., the Southeast Regional Partnership for Planning and Sustainability

Cultural Values

Fire is embedded in Southeastern history and culture. Residents traditionally have a strong relationship with prescribed burning and the wildfires that recur in the region's fire-prone ecosystems. Cultural values that are important to residents include aesthetics, Tribal land uses, traditional land uses such as hunting, fishing, recreation, grazing, and farming, and private property rights including ability to burn and manage land. The Forest appendix of the 1880 U.S. Census included a map displaying the amount of forestland burned during a single year (Fig. 22).

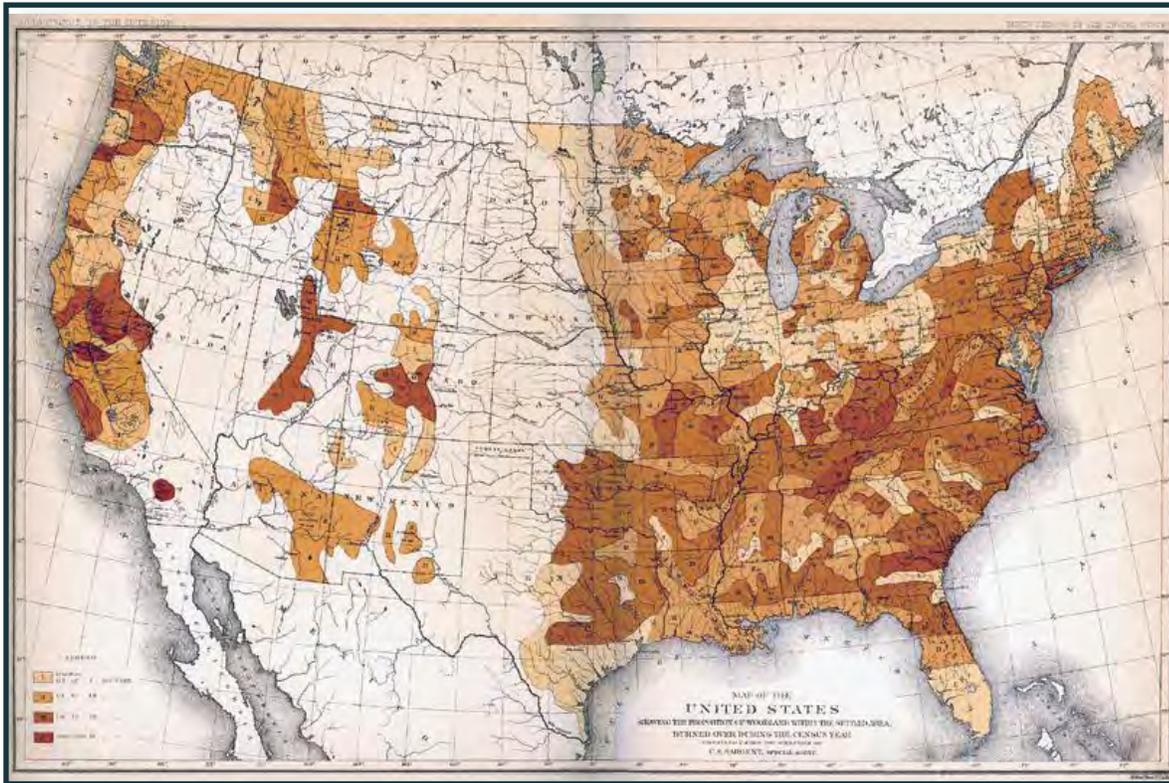


Figure 22. Map of the United States showing the Proportion of Woodland Burned During the Census Year 1880 Source: Forest History Society

Maintaining cultural values in the Southeastern region has become increasingly challenging due to land use changes and an influx of new residents lacking exposure to or experience with Southeastern culture such as understanding prescribed fire or wildland fire. It is important to involve communities when developing prescribed fire plans that encourage sustainable, resilient ecosystems that enhance these values. Engaging communities during the planning phase provides an opportunity to share what potential ecological benefits will be realized from fuels treatments. It is also an opportunity to discuss possible negative outcomes for communities from wildfire. Open discussions with community participation could lead to a greater acceptance of burning, which would lead to healthier ecosystems and enhance regional cultural values.

Feasible alternatives to the status quo would focus on actions and activities that protect and maintain cultural values. Actions and activities that would have the most significant impact on protecting and enhancing cultural values, as well as achieving regional goals, have been identified from the Phase II regional assessment and are as follows:

1. Use education and incentive programs to encourage new and nontraditional private landowners to manage their lands to contribute to resiliency while providing forest products and expanding ecosystem markets (“working forests”).
 - Support the “One Message, Many Voices” campaign and development of other unified prescribed fire education programs. (1.1.5)
2. Support efforts to increase prescribed burning for ecosystem restoration (e.g., SERPPAS efforts for Longleaf pine restoration). (1.1.7)
3. Work with regulatory agencies and entities (i.e., air quality) to ensure that prescribed fire remains a viable management tool and maximize flexibility for its use (including liability issues). (1.2.3)
4. Appropriately use cost-effective technology (social media, SWRA, etc.) and systems to ensure decision-makers (county commissioners, urban planners, town councils, etc.) have access to information in a timely manner. (2.3.2)

The Southeastern U.S. is unique in that 86 percent of the over 200 million acres of forested lands are privately owned (Butler 2011). Deliberate management of privately held forest lands helps contribute to resiliency and is necessary to conserve cultural values. Forest ownership dynamics across the region have changed dramatically over the past decade as forest industry has divested 75 percent of their ownership, and family forests are fragmented through estate disposal and urban development (Butler 2011). As fragmentation of privately held lands continues alongside an influx of new landowners who lack experience with forest management, it is critical to use education and incentive programs such as the “One Message, Many Voices” campaign to encourage new landowners to engage in active land management. Given the patchwork of management in the Southeast, implementing these programs requires involving a variety of partners (Fig. 23).

SHARING SUCCESSES — EXPANDING OPPORTUNITIES

- *State Certified Burn Manager Programs* – Several Southeastern states have Certified Prescribed Burn Manager programs. Although the programs vary somewhat from state to state, they generally provide some protection from liability if the burn manager is certified by meeting training requirements, has a written burn plan, and follows all applicable laws.
- *One Message, Many Voices Campaign* – This project of the Southeastern Group of State Foresters and Tall Timbers Research Station and Land Conservancy is designed to provide a consistent message about the value of prescribed burning. Advertisements encourage visiting a website for information on outdoor recreation opportunities (visitmyforest.org). Viewers are then encouraged to learn more about “good fire” by visiting goodfires.org.

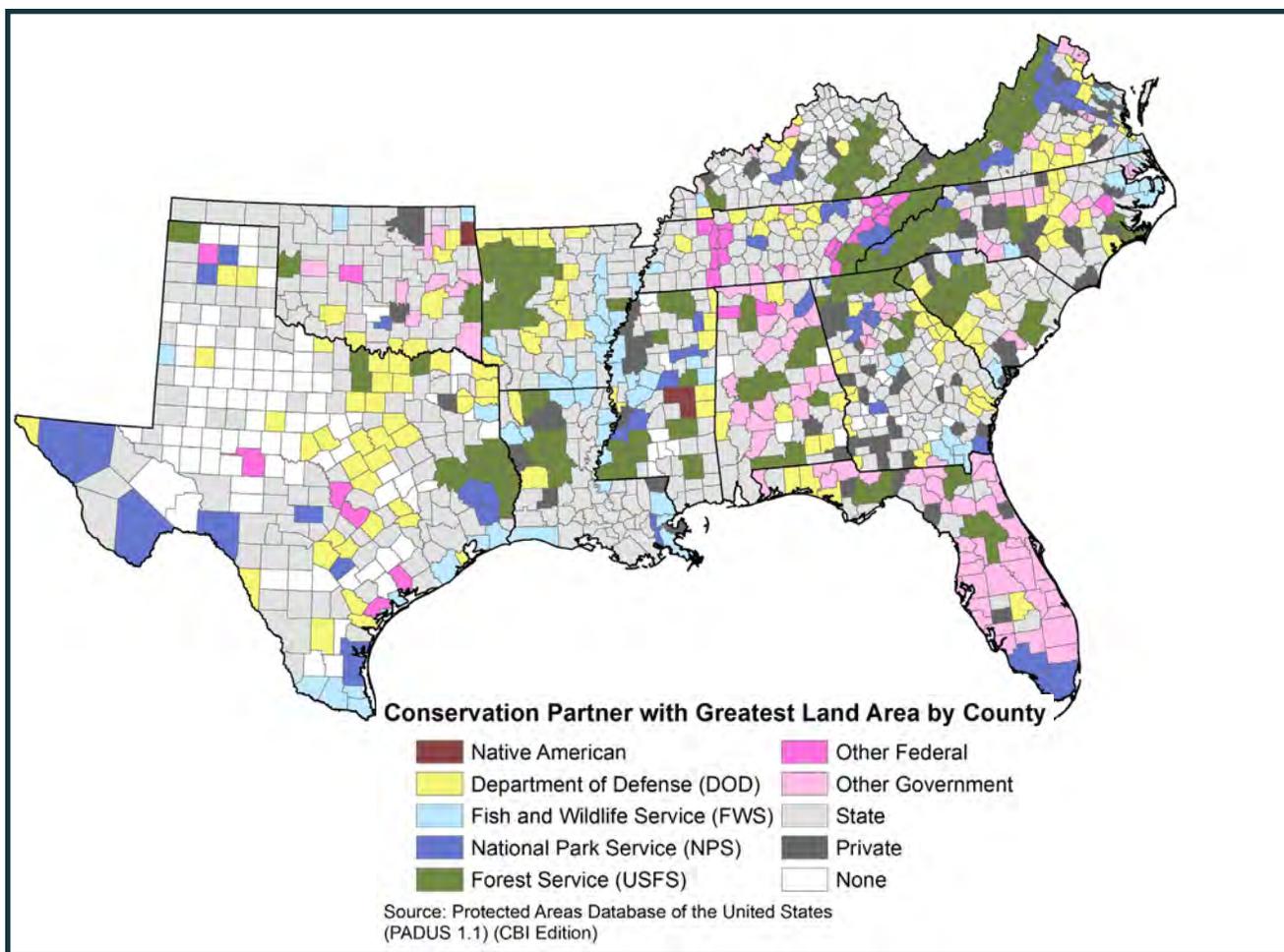


Figure 23. Dominant conservation partner in the Southeast

These landowners can participate in sustaining traditional markets and creating new markets for products. The associated management practices would contribute to the growth of the local and regional economy and add to ecosystem resiliency while reducing the risk of wildfire.

The Southeastern American population has grown considerably faster than the nation as a whole in recent years and is expected to grow 60 percent by 2060, compared with a 47 percent increase for the rest of the country (Cordell 2011). Rapid regional population growth and turnover coupled with diminishing outreach resources will require fire management organizations to find creative ways of engaging and educating the public. Effective communication and collaboration with local governments and communities using cost-effective technology is one way the fire and land management community can leverage limited resources.

Southeastern residents have long-held cultural values associated with the deliberate use of fire to maintain ecosystems, aid in farming and range management, silviculture, and a host of other activities. Selecting actions and activities that help to maintain cultural values in the Southeast is a significant priority for regional residents as well as the fire and land management community.

Property Loss

Property loss due to wildfire in the Southeastern United States is a costly and constant challenge. Annual structural losses are disproportionately greater in the Southeastern region as a result of nearly 45,000 annual wildfires, a figure which leads the nation (Gramley 2005, Monroe 2002). Unlike other regions of the country, wildfire ignitions in the Southeast take place throughout the year thereby increasing the challenges on personnel and resources. Fire-adapted ecosystems require regular fire or treatment with fire surrogates. Losses increase when wildfire complexity and size are amplified by quick hazardous fuel build-up triggered by frequent and large scale natural disturbances (e.g., hurricane, tornado, drought, insect, disease).

In recent decades, rapid population growth and corresponding community development have dramatically increased property exposure to wildland fire. Today, the Southeast contains 88 million WUI and intermix acres, more than any other region of the country (Andreu 2008). As a result of this WUI expansion, the region has 118,000 communities at risk of wildfire losses, and of those, 43 percent are considered to be at high to very high risk (Andreu 2008). Life and property exposure to wildland fire risk and potential loss is only projected to increase as population growth and development continue.

Protecting life and property are critical values. Enhancing community and firefighter capability and capacity to prevent, mitigate, and prepare for wildland fires regardless of compounding factors is essential to protecting life and property. Proactive firefighter, community, and individual awareness and actions are vital to protecting this value.

Building all components of a fire-adapted human community is extremely important. Properly managed forests, fuels reduction, defensible space, community planning and fire resistant construction all contribute to a community that has a greater chance of withstanding a destructive wildfire.

Feasible alternatives to the status quo would focus on actions and activities that protect life and property. Actions and activities that would have the most significant impact on protecting property, as well as achieving regional

SHARING SUCCESSES — EXPANDING OPPORTUNITIES

- *Marion County, Multi-Agency Wildfire Task Force* - Marion County, Florida established this task force to coordinate wildfire response resources and management among the USDA Forest Service, the Florida Forest Service, and the Marion County Fire Rescue Department. The Task Force meets regularly to review wildfire conditions and forecasts, plan for wildfire response, determine needs for training of local firefighters, and to plan and coordinate prevention activities within the County. Perhaps the greatest benefit of the Task Force is the creation of a “stakeholder environment” amongst the participating agencies (including federal, state, and local agencies) that enhances response, command and control, and firefighter and public safety. There is an opportunity in many other locations throughout the region to create similar taskforces for mutual benefit.

goals, have been identified from the Phase II Regional Assessment and are as follows:

1. Utilize prioritization in SWRA and other efforts to identify and treat wildland fuels in areas that will facilitate tactical defense of human communities or ecological values and services from wildfire (tactical fuel breaks). (1.2.2)
2. Promote establishment of insurance incentives, building and landscape ordinances, and ignition resistant construction techniques through communication and collective action with planners and insurers, emphasizing Firewise concepts when planning communities and building homes to reduce wildfire impacts. (2.1.3)
3. Increase awareness of community and homeowner responsibility for fire preparedness and prevention. (2.1.4)
4. Encourage development and implementation of CWPP and Firewise or equivalent concepts, prioritizing CARs in greatest need of CWPPs. (2.1.5)
5. Increase community preparedness and mobilization abilities (e.g., evacuation) and increase coordination and planning between local, state, Tribal, and federal responders prior to wildfire ignition. (2.2.3)

Federal, State, Tribal, and local fire managers have worked diligently with hundreds of communities and thousands of homeowners and landowners throughout the Southeast to increase wildland fire hazard prevention, mitigation, and preparedness awareness and actions, such as Community Wildfire Protection Plans (Fig. 24).

SHARING SUCCESSES — EXPANDING OPPORTUNITIES

- *Taylor Community Wildfire Protection Plan* - The rural unincorporated community of Taylor, Florida, rests in the midst of large national forest, state forest, national wildlife refuge, and commercial and private forest holdings in northeast Florida, an area with frequent ignitions and large wildfires. The CWPP is alive with regular community meetings between the CWPP officers, the local fire department, and representatives of the national forest, state forest, national wildlife refuge, and local county and community Fire Chiefs. The fuel breaks established through the CWPP are maintained several times annually through community work days, as are structure protection fuel breaks. Community residents maintain a high situational awareness through regular meetings where current wildfire conditions and forecasts are discussed, resulting in prepared residents who are active in preventing unwanted ignitions and reliably report wildfires and smoke within or near their community. This is an excellent example of a living CWPP with a strong shared understanding of roles and responsibilities built on mutual respect.

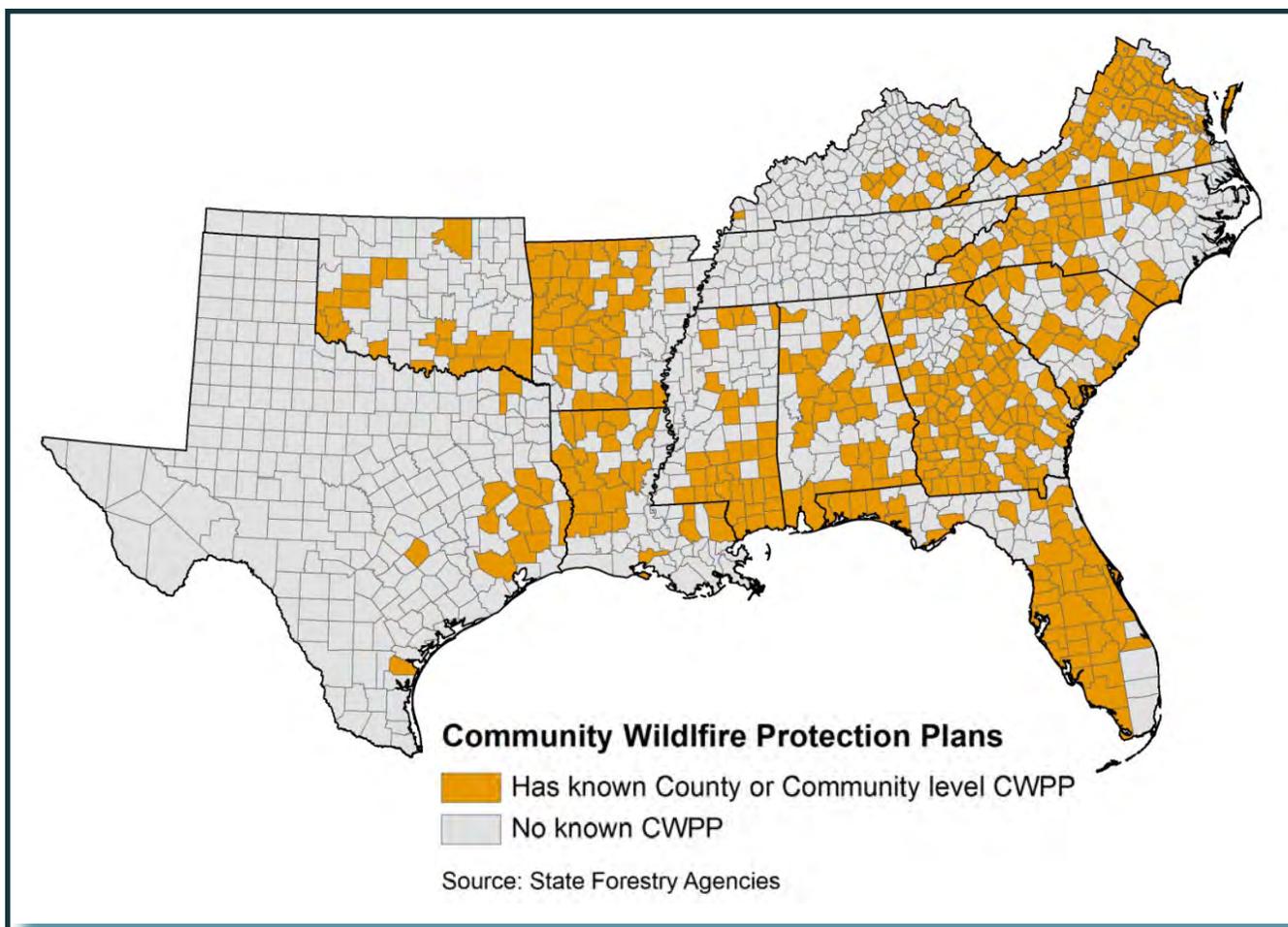


Figure 24. CWPP by county in the Southeast

As of 2011, 4,494 communities at risk in the Southeast were covered by a CWPP. Funding through various sources, including the National Fire Plan, has supported thousands of projects to mitigate hazards in communities across the Southeast. However, finite budgets and existing efforts are not able to keep up with WUI growth. There is a need to focus the limited funding and resources on prevention, mitigation, and preparedness actions identified in this document. Protecting property must be a joint venture between personal responsibility and effective response organizations. By working collaboratively, the negative impacts of wildfire can be lessened.

Around the region, tens of thousands of Southeastern communities are considered at high or very high risk of damage from fire. Each year, wildfires destroy thousands of homes and other structures as well as damage or destroy other valued property. Selecting actions and activities that assist in mitigating damage to property is of key concern throughout the region.

Across Regional Values

Five activities and actions were identified from the Phase II report that would have a positive impact across all five of the regional values as well as region goals identified during the Cohesive Strategy development. Understanding these broad themes can help stakeholders identify additional actions from Phase II that address each specific theme. These actions and activities are:

1. Use education and incentive programs to encourage new and nontraditional private landowners to manage their lands to contribute to resiliency while providing forest products and expanding ecosystem markets. (1.1.5)
2. Encourage planning efforts across landscapes between practitioners and land managers to address wildland fire and landscape resiliency and community safety balancing other concerns, emphasizing plan development in high risk areas. (1.2.1)
3. Work with regulatory agencies and entities (i.e., air quality) to ensure that prescribed fire remains a viable management tool and maximize flexibility for its use (including liability issues). (1.2.3)
4. Encourage greater public smoke tolerance through outreach and understanding. (1.4.2)
5. Control invasive species that alter fire regimes and ecosystem function. (1.5.2)



Though each of the numerous actions and activities identified are considered fundamental to addressing regional values, these five cross-cutting actions and activities simultaneously address all five regional values. Implementing any of these actions and activities would significantly help address regional goals and objectives.

Broad Themes within the Alternatives

Similar or related actions and activities from the Phase II Objectives Hierarchy were group together to form broad themes within the alternatives.

1. Prescribed Fire and Fire Use - 1.1.1, 1.1.2, 1.1.3, 1.1.7, 1.2.3, 1.3.1
2. Fuels Treatment Other Than Fire – 1.1.4
3. Working Forest - 1.1.5, 1.2.4, 1.2.5
4. Planning For Fire, Forest Resiliency and Community Safety - 1.2.1, 1.2.2
5. Incentives for Fuels Management - 1.4.3
6. Treat and Restore Areas Affected by Natural Events and Fire – 1.5.1, 1.5.2
7. Ordinances and Fire Safe Construction, Homeowner Responsibility, Fire Prevention, CWPPs - 2.1.3, 2.1.4, 2.1.5, 2.2.1
8. Community Preparedness, Evacuation and Planning by Responders – 2.2.3
9. Use of Technology to Inform Community Leaders – 2.3.2
10. Specialized Response Equipment, Train, Develop and Ensure Adequate Staffing of Responders – 3.1.1, 3.2.2
11. Inter-Agency Suppression Cooperation, MOUs, Mutual Aid, Coop Fire Agreement Billing, Type 3 IMTs – 3.2.3

Trade-offs

The goal of the alternatives section is to provide stakeholders across the Southeast a suite of strategic options for managing fire, a complex task that does not lend itself to a single solution. Simplifying the decision-making process by actions and activities grouped by value can inform stakeholder decisions that would accomplish both value enhancement and progress towards regional goals. The management activities that would be most efficient and effective should be evaluated based on the situation, and at the appropriate scale. There are trade-offs and opportunity costs for every decision. Hopefully identifying the values most important to the stakeholders will help focus on specific actions and activates discussed above.



Barriers

This report identifies actions at the local to regional level that can have the most impact on advancing Southeastern issues, however, there are multiple challenges and barriers associated with these opportunities. Addressing these barriers at the national level, where possible, is necessary to further the success of the strategy. The top tier opportunities for impacting fire issues in the Southeast are listed below. The major challenges and barriers are listed as sub bullets, and would need to be addressed to maximize the opportunities.

1. Increase fuels management on private land
 - Smoke and fire liability issues
 - EPA restrictions associated with smoke
 - Incorporate or incentivize prescribe burning in additional federal programs (USDA Natural Resources Conservation Service, etc.)
2. Encourage state and local ordinances related to fire prevention to be enforceable
 - Coordinate new ordinances where desired
 - Develop best practices that reduce potential spread of wildfire
 - Incentivize the creation of enforceable state and/or local ordinances
 - Tie federal funding to activity that falls within best practices (e.g., development loans)
3. Incentivize the development of laws that require wildland fire risk reduction activities and the maintenance of wildland fire risk reduction practices
 - Develop best practices at the national level with appropriate organizations (American Pyrotechnics Association)
 - Work with the insurance industry on products that motivate homeowners to create fire-adapted homes
 - Construct a federal incentive program to reimburse for the creation of fire-adapted communities through CWPPs and other comprehensive community planning practices
4. Increase effectiveness and efficiencies in sharing of resources among agencies and groups with appropriate capabilities
 - Resolve the Coop Fire Billing issue
 - Overcome barriers to qualification standard inconsistencies
 - Address preparedness strategically
 - Improve the process for training and sharing prescribed fire resources

These top tier opportunities and barriers identified in the Southeast will be matched with input from the other regions and presented to the Wildland Fire Leadership Council and other national organizations. This will hopefully aid in finding solutions to these barriers and decreasing or eliminating any negative impacts. Additional opportunities and barriers can be found in Appendix 11. The Southeast will continue to work within the Cohesive Strategy structure to emphasize the importance of Southeastern regional barriers at the national level, and to enhance partnerships regionally and nationally to move these issues forward.

Outreach and Communications

The Cohesive Strategy has been developed as a landscape-level effort inclusive of all lands and a diversity of stakeholders. The ambitious vision of the Cohesive Strategy requires collaboration between an array of partners and stakeholders locally, regionally, and nationally to be implemented successfully. It must be relevant to stakeholders and their needs, adaptable and dynamic in its approach, and reflect and include regional perspectives. Extensive outreach efforts have been conducted to engage stakeholders in all phases of the Cohesive Strategy.

The Cohesive Strategy has been a three phase process. During Phase I, 14 regional forums were held around the country involving stakeholders in developing the Cohesive Strategy framework, and identifying guiding principles and national goals. In Phase II, regional goals were established, and regional challenges and opportunities were identified as part of the development of regional objectives. Regional alternatives containing emphasized actions and activities were enumerated in Phase III as part of expert-driven process to select options with the potential to realize Southeastern objectives.

The Southeast has a history of collaboration among fire managers, agencies, and prescribed fire councils with a wide network of collaborators. This network helped launch the Phase II regional outreach effort during the summer of 2011. Two public meetings and an online survey gathered input or comments from more than 400 individuals and organizations in July and August of that year. Since then, updates of regional work have been available to stakeholders at the following website: <http://www.ForestsAndRangelands.gov/strategy/index.shtml>. Beginning in Phase III, a monthly electronic newsletter has kept Cohesive Strategy contributors and stakeholders informed and engaged. In September, four focus groups held in Texas, Mississippi, Georgia, and South Carolina resulted in over 100 individuals providing direct feedback on proposed strategies and actions.



A social network analysis of Southeastern stakeholders with three focal groupings (Fire Resilient Landscapes, Fire-Adapted Human Communities, and Response to Fire) is under way and expected to be completed by spring 2013. This analysis is intended to broaden the network and develop an understanding of how communication flows among stakeholders. Both steps are essential to ensure key stakeholders are informed and engaged in implementing the Cohesive Strategy in the future. See Appendix 5 and 6 for further detail on stakeholder input and outreach efforts.

ForestsAndRangelands.gov/strategy/index.shtml

C. RISK ANALYSIS SECTION

Introduction

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. The Cohesive Strategy process has allowed the Southeast to broaden understanding of complex fire issues utilizing the best available data and science. A consistent framework (CRAFT) has guided the identification of goals and objectives, formulation of alternatives, and evaluation of the possible consequences of these alternatives. The alternatives described in the previous section reflect the collective regional experience of the Southeastern fire community and stakeholders consulted in Phase II and III, and are designed to promote specific regional goals and objectives. The NSAT compiled, summarized, and edited data specific to the goals, values, actions and alternatives identified by the regional committees. Many of these data were used in preceding sections to describe current conditions or illustrate the rationale for various proposed alternatives. In this section these data are used to better understand the factors contributing to risk across Southeastern landscapes, and to demonstrate how quantitative modeling may be used to explore options for reducing risk. Example analyses are presented to illustrate the use of this modeling approach. Further examples will be created as this risk analysis process is used more extensively across the region in the future.

1. Key Questions

Why is wildland fire an issue in the Southeast?

Among the many components of wildland fire, wildfires are the most visible and destructive component, threatening homes, lives, and property throughout the Southeast, and altering landscapes regardless of ownership. Every year, federal, state, and local fire departments in the Southeast respond to tens of thousands of wildland fires. Historically there are 70,000 reported wildland fire ignitions reported per year, but a compilation of current data from NFIRS, NASF, and other federal records suggests that number may comprise more than 150,000 annual ignitions. Although most large wildfires ignite in the spring or fall, wildfires can occur 12 months out of the year in the Southeast. Compounded effects of land cover and land use changes, climate change, extreme weather conditions, invasive species, and population growth contribute to the complexity of wildland fire management. The past two decades have seen an increased occurrence of extreme fire behavior, increased risk to responders, home and property losses, and more frequent threats to communities and landscapes (Fig. 25).

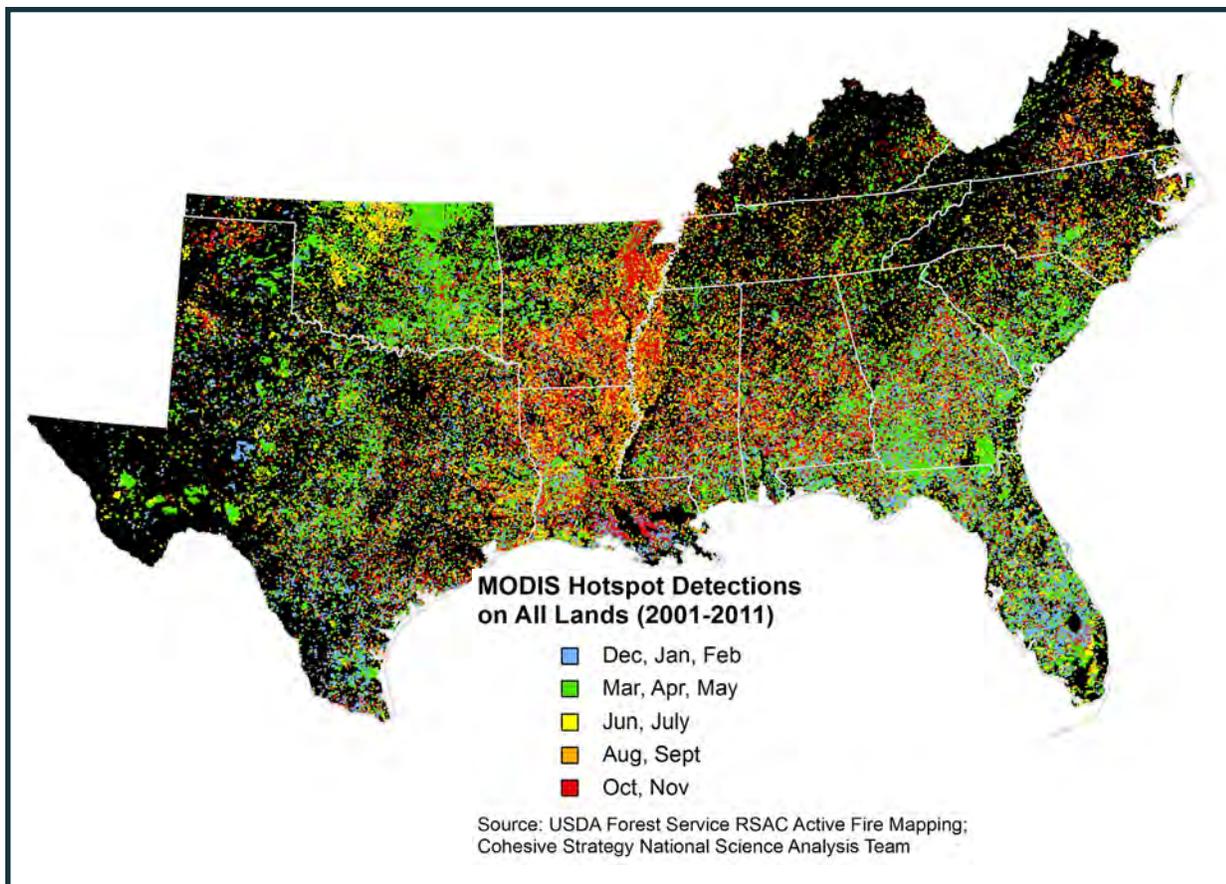


Figure 25. The seasonality of fire from space

How does wildland fire vary across the landscape?

Wildland fire varies greatly across the landscape, depending in part on vegetative type, local climate, fuel conditions, population density, and a myriad of other factors. Additionally, fire and land management objectives and goals play a fundamental role in how wildland fire is managed across the landscape. The diversity and uniqueness of systems of the Southeast are evidenced by the wide range of fire dependent habitats within the region, ranging from the saw grass (*Cladium jamaicense*) prairies of South Florida to the oak-hickory forests of the Appalachian Mountains. Prescribed burning has traditionally been used extensively within these systems for various reasons. The Southeast implements more silvicultural prescribed burns, with more acres treated than any other region of the country, with 6.5 out of the total 7.8 million acres treated in 2011 (National Prescribed Fire Use Survey Report 2012). Due to biophysical settings and climatic conditions, vegetation recovers quickly from fire or mechanical fuel reduction treatments in many Southeastern ecosystems. Frequent fires are critical to maintaining wildlife habitat and biodiversity in the Southeast, from the coastal swamps of Louisiana to the pocosin wetlands of North Carolina to the longleaf pine (*Pinus palustris*) forests of North Florida. Wildland fire is a key process in most Southeastern ecosystems, maintaining resiliency, ecosystem health, wildlife habitat, and providing critical ecosystem services. Southeastern land managers conduct more prescribed burning

in forested landscapes than any other region (NICC 2012). Appropriate wildland fire management is integral to the sustenance of the timber production industry, to reduce hazardous fuels and lower the risk of damaging wildfires to valuable timber stock.

How can our management actions mitigate the impacts of wildland fire?

Though fire is a natural part of the Southeastern landscape, the negative impacts of wildfire can be mitigated through proactive management. In the Southeast, 43 percent of communities are deemed at high or very-high risk from wildfire (Southern Wildfire Risk Assessment 2006). Most of these ignitions are caused by human activities and start near homes or developed areas (Fig. 26).

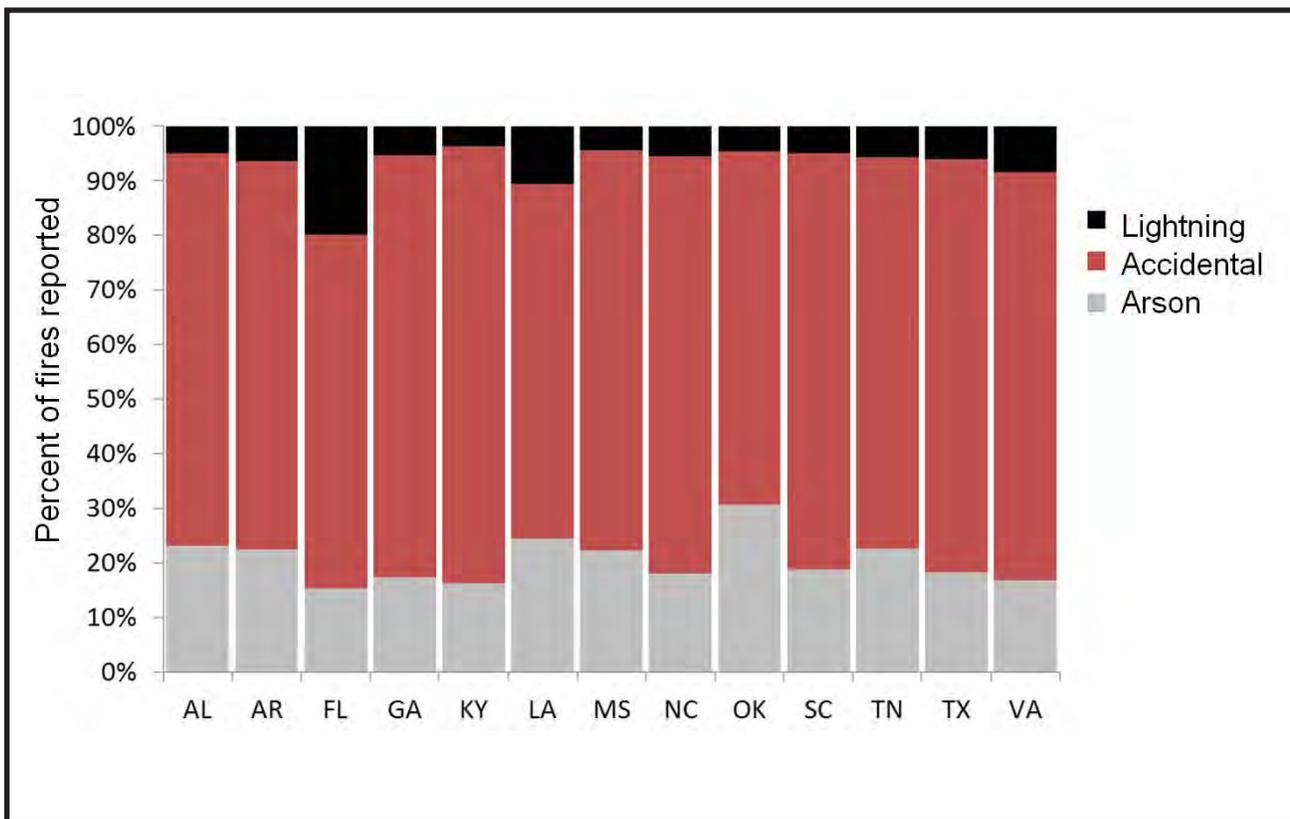


Figure 26. Percent of reported fires caused by lightning, accidental and arson per year for states in the Southeast using state, federal and local for data (NFIRS, NASF, Federal Reporting System).

Cooperation between the wildland fire management community and local community members can help them prepare their homes and communities for fire.

2. Characterization of Wildland Fire Risk

Understanding risk begins with a conceptual model that simplifies the problem into a set of basic components which provide a framework for discussing strategic options. An example of such a model can be based on understanding a wildfire event. Taken without context, wildfire ignitions are simply events. Each event can be characterized by its fire behavior, which depends on the interactions of five interrelated factors: the ignition source, available fuels, topography, weather, and suppression response. It can also be described by its location, intensity, duration, extent, or other attributes, but it has no normative value—it is neither good nor bad. The consequences matter, however, whenever values-at-risk are threatened. Naturally, the extent of the loss of value depends on the extent and intensity of the fire and what values-at-risk are affected.

This simple model of risk can be completed by adding consequences (value changes) and management options available that might directly affect factors contributing to risk (Fig. 27). For example, a fire prevention program could diminish the probability of human-caused ignitions. Similarly, a fuels treatment program might alter fire behavior and make ignitions less damaging or easier to suppress. Another way to impact factors contributing to risk might be to consider investing in firefighting capacity so that wildfires may be more frequently contained before they grow large and damaging. Additionally, consideration could be given to reducing the likelihood of a wildfire damaging homes or other structures by creating communities adapted to fire, or by focusing protection and prevention activities in the immediate area adjacent to values-at-risk.

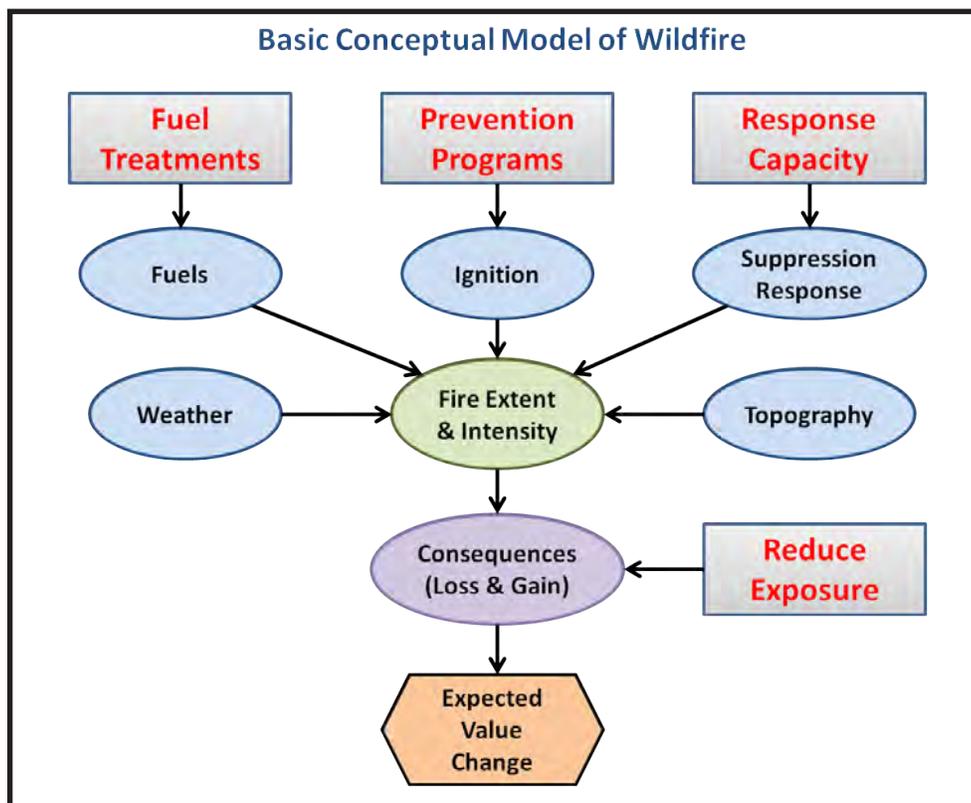


Figure 27. A simple conceptual model of wildfire, its contributing factors, consequences, and management options

During Phase II, various conceptual models were developed to examine different aspects of wildland fire. The purpose of these models was to display the interactions and relationships among factors, such as the correlation between fuel treatments and the extent and intensity of wildfire.

The next step in the comparative risk assessment was translating the conceptual models into quantitative, probabilistic models. These analytical models

were constructed for the primary purpose of relating causal or contributing factors to variables which collectively index levels of risk. These risk metrics include measures of hazard such as frequency and magnitude of wildfire, any direct measures of loss or injury, and various measures related to exposure, such as the number or density of homes in the WUI. Although hazard and loss are often combined into single measures of risk, such measures were not constructed in the NSAT's analysis due in part to the county-level resolution of the original data. For example, the data for a particular county demonstrated that there were homes distributed throughout the WUI and large wildfires were likely within the county, but it was not able to predict which portion of the county is most likely to experience wildfire or which off-site effects of wildfire might be relevant to overall impacts. Such spatial interactions are important for producing an accurate and precise estimate of risk. Lacking more specific information, the NSAT used a more straightforward and simple assumption that the total risk was proportional to county-level hazard, exposure, and potential loss.

Models were parameterized and validated using rigorous statistical methods, and checked against empirical data to meet the standard of high-quality risk assessment tools. Determining the appropriate balance between model complexity, data demands, and utility posed a significant challenge. The resulting analyses helped further the process of identifying and describing alternatives that addressed various levels of wildland fire risk across the Southeastern region.

3. Modeling

Many of the analytical models used in the Phase III analysis were constructed using Bayesian networks. Bayesian networks are decision analysis tools that use conditional probabilities to link variables together and express the degree of relationship between them. They provide a highly flexible modeling environment that works equally well with simple and complex problems. Bayesian networks begin with simple graphs such as in Figure 28, but explicitly define the nodes and quantify the relationships using empirical data or expert opinion. Each node in the network can be represented by a single quantitative variable. Arrows are used within the Bayesian networks to identify conditional dependencies, much as the arrows in Figure 28 are used to relate one variable to another. The direction of the arrows are important, in that they indicate causal dependencies as well as determine how information can flow from one node to another. Probability histograms are used to indicate both the various states or values possible within each node and the level of uncertainty associated with them (Fig. 28). For a more complete explanation of Bayesian Belief Networks and the NSAT process, see Appendix 4.

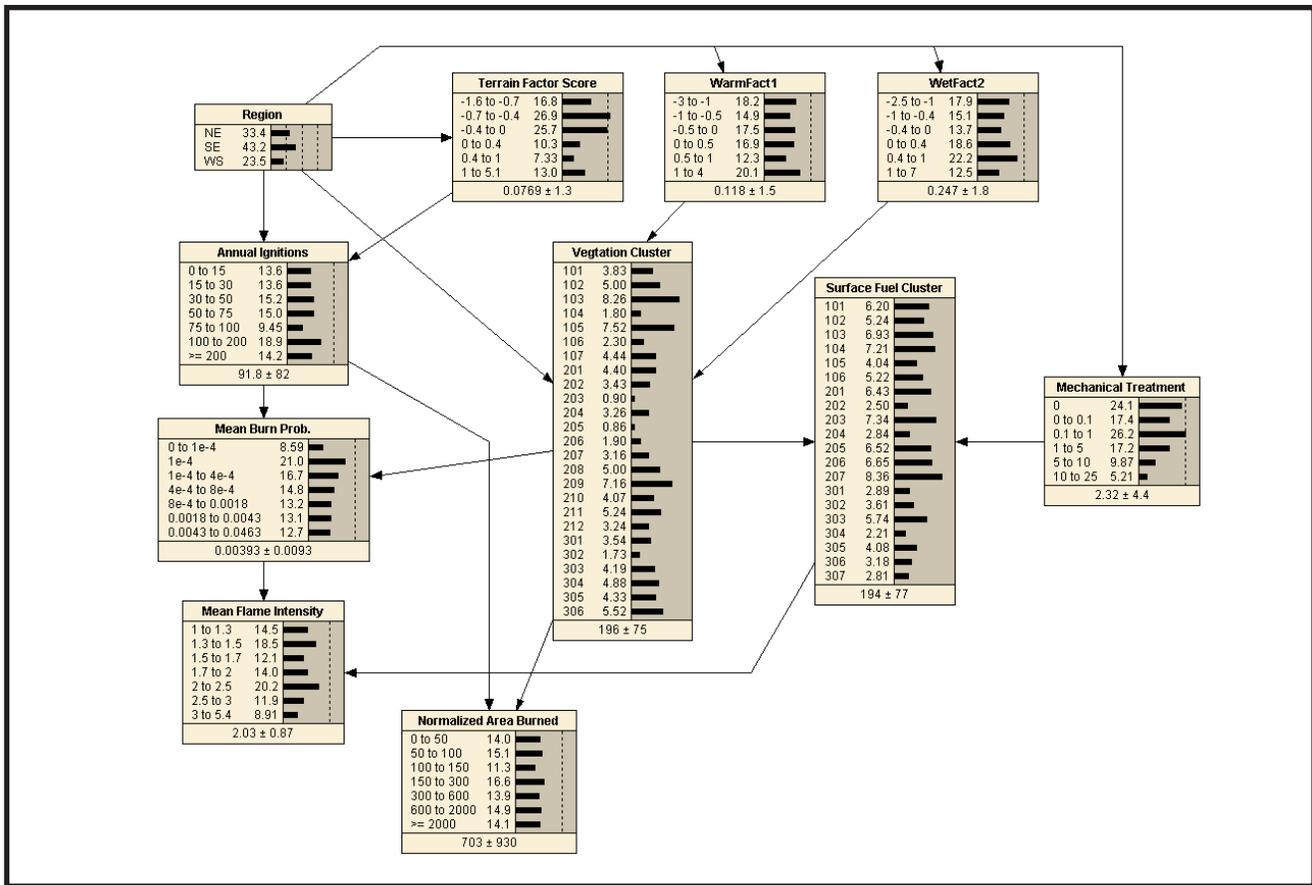


Figure 28. Example Bayesian Belief Network

The primary value of a Bayesian network is that it allows one to view the relationships among many variables simultaneously. Such analyses are made easier by having all data summarized at a common scale. Data from all available sources were processed to fit within a common sampling frame—the county. For some data sets, for example many of the social economic variables, data were originally provided at the county level and no reformatting was necessary. Other, higher-resolution data were processed using GIS techniques to provide a county-level summary. The county-level resolution was chosen for purposes of intra-, and inter-regional comparisons; as well as intra-, and inter-state comparisons. Maps and other graphical representations of the data were produced to aid in review of the results.

The following figure shows the relationship of one of the BBNs that the Southeast RSC used to explore the relationship between key drivers for an alternative related to mechanical thinning to reduce risk in the WUI. Three nodes were selected (WUI area factor, Mechanical Treatment in Forested Areas, and Area Burned Index) and a map created to show the prime areas where this alternative would be most effective. The resultant map (Fig. 28) shows that this alternative is very worthwhile to explore through many parts of the Southeast and would be viable to consider in future risk analysis.

Southeast Fires, Fuels, and Homes BBN

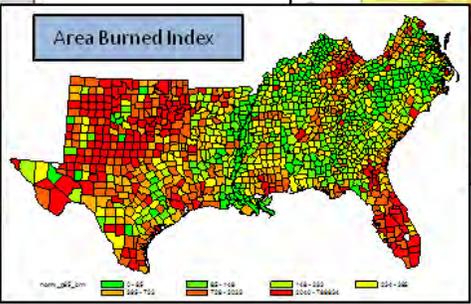
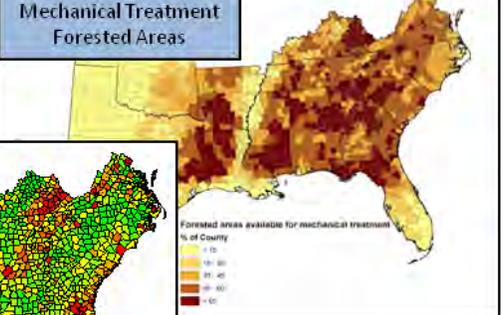
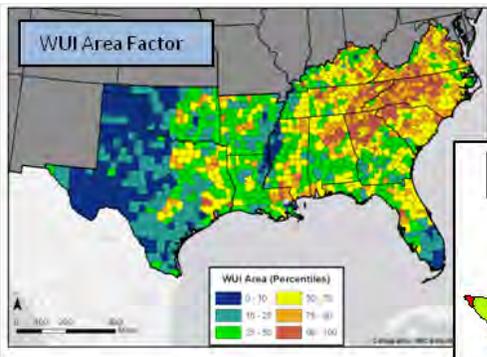
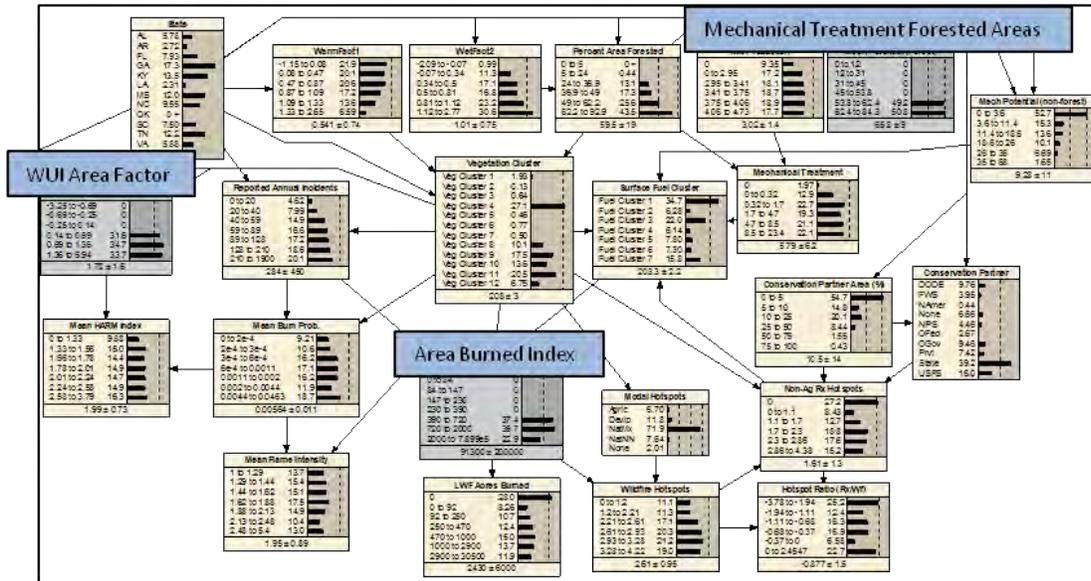
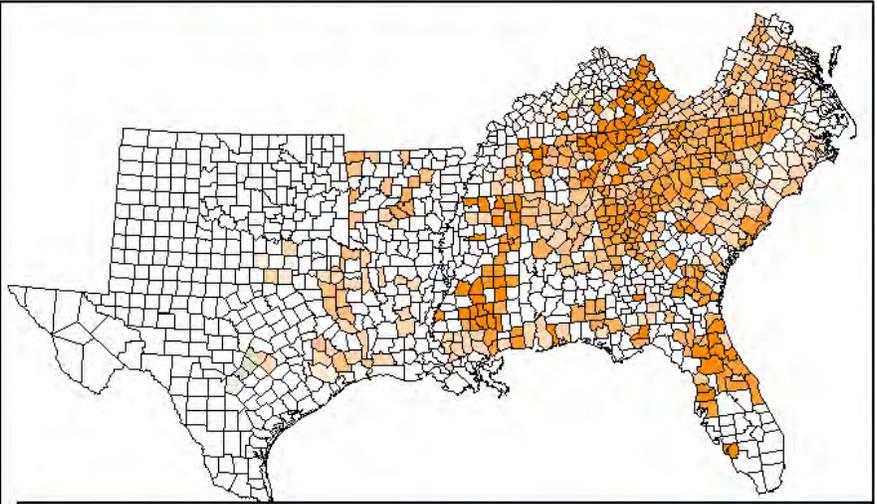


Figure 29 - By using the BBN for Fire, Fuels and Homes that the NSAT generated, the SE RSC was able to determine the primary areas that faced a high risk of fire and that could effectively use mechanical treatments to reduce fuel loads in the WUI.



Counties that possess the greatest risk of fire and the greatest possibility of using mechanical treatments to reduce fuel loads in the WUI.

The WUI influence represents just one of the many interconnected components that help tell the story of the Southeastern region in the risk analysis. The varying shades of blue indicate that WUI is a key issue across the Southeastern region (Fig. 30).

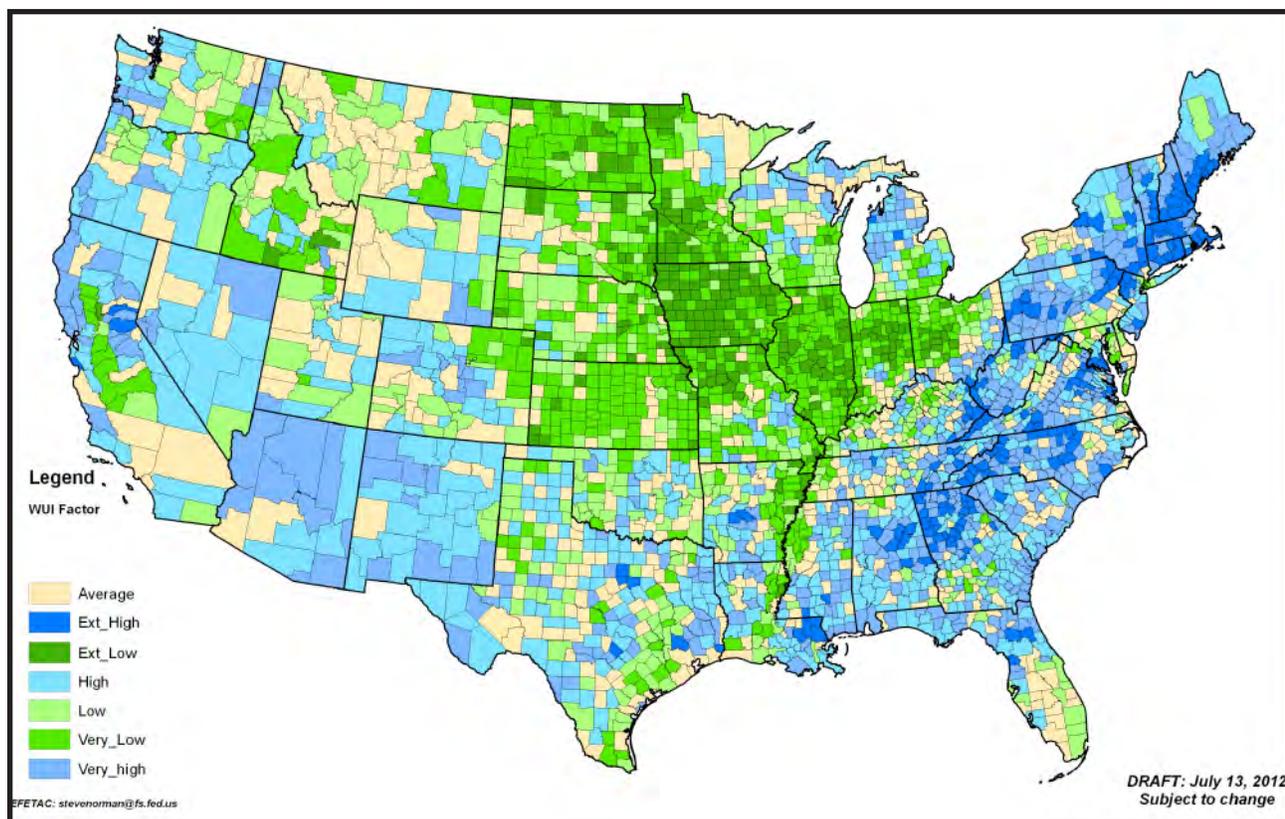


Figure 30. WUI area in the Southeast

Each of the factors influences the overall belief network, and may be graphically represented to understand the relationships between the components (Fig. 31).

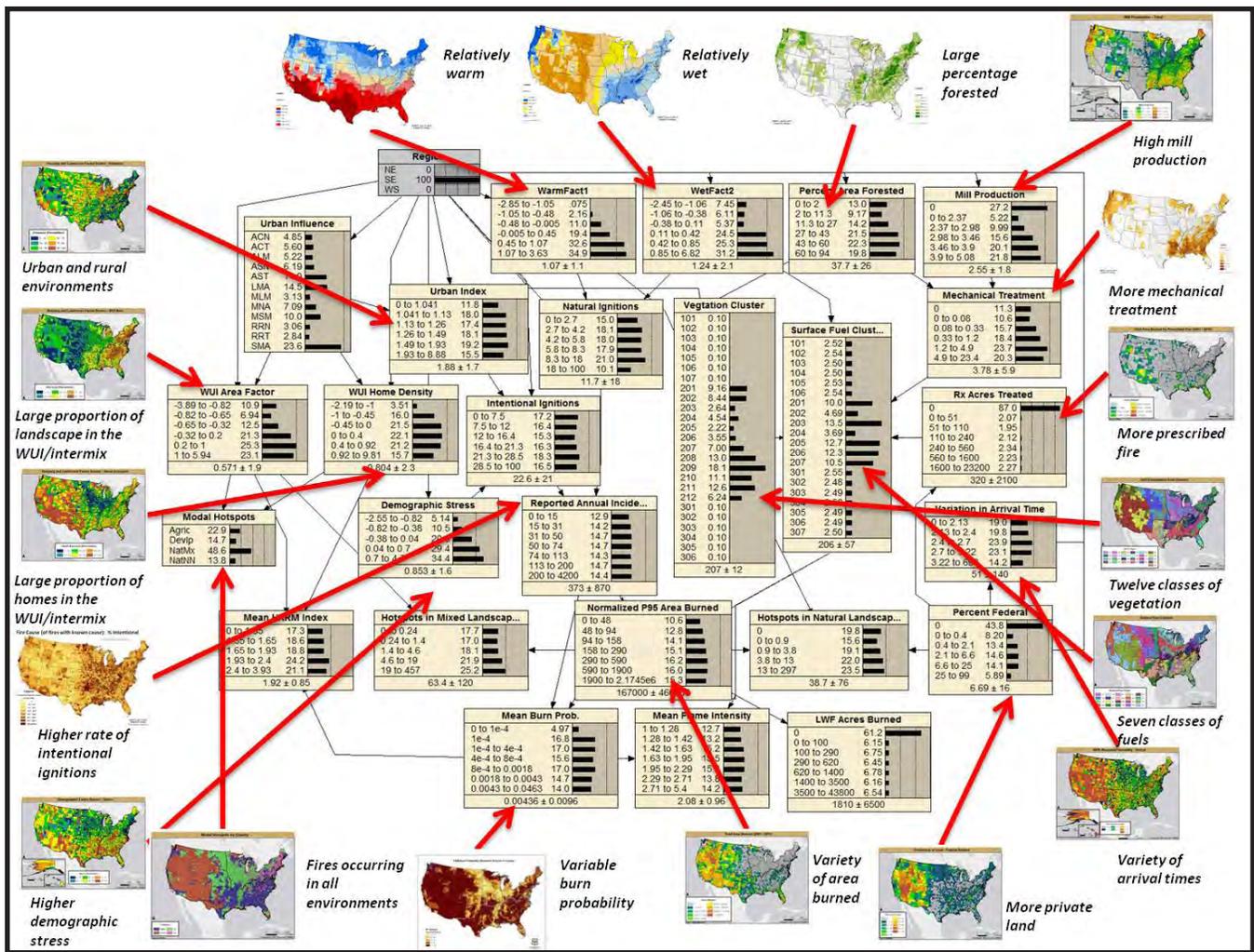


Figure 31. What makes the Southeast unique

Taken together, a picture of the Southeastern region begins to emerge. These key elements that make the Southeast unique include:

1. Characterized by warm and relatively wet weather
2. Weather supports a large area of different forested types
3. High mill production
4. Prescribed fire usually done on smaller parcels of land
5. Variety of vegetation classes provides a variety of fuel types
6. Variety of arrival times for wildland fire response
7. More private land

8. Variable burn probability with variety of area burned
9. Fires occur in all environments
10. Higher rate of intentional ignitions than the other regions
11. Large proportion of homes in the wildland urban interface/intermix
12. Large proportion of the landscape in the WUI/intermix
13. Higher demographic stress

The NSAT risk analysis reveals a region with pressures both on the environment and the people who live here. It is a region with significant forested area that supports high mill production, a large number of homes and communities in the WUI, and a significant rate of fire occurrence. To achieve the Cohesive Strategy goals of Restore and Maintain Landscapes, Fire-adapted Human Communities, and Response to Fire, the RSC will use findings from the risk analysis along with trends in the values matrix to develop management and investment options for the Southeastern region.

Additional tools available to the region are the Southern Wildfire Risk Assessment (SWRA), the State Forest Resource Assessments, and the State Wildlife Action Plans. The SWRA was created by the Southern Group of State Foresters (SGSF) and their federal partners to assess the wildland fire risk footprint across the region. With a thirty meter resolution, it allows for analysis of wildfire risk down to the community level. The latest update to the SWRA called SouthWRAP includes a tool called Community Editor, which will allow individual states to assess risk to communities and assist them in helping raise awareness across the region. It is designed to allow local planners access to the fire risk data from the SWRA, and incorporate it into their hazard mitigation and community wildfire protection plans (CWPP). Additionally, forest action plans and wildlife action plans were created at the state level to help managers prioritize decisions, including land management and wildfire actions. State Forest Resource Assessments were developed by each state in response to the Forest Service's State and Private Forestry redesign program in 2008. Under this program, each state was required to analyze its forest conditions and trends over the entire state, and delineate priority rural and urban forest landscapes (Fig. 32).

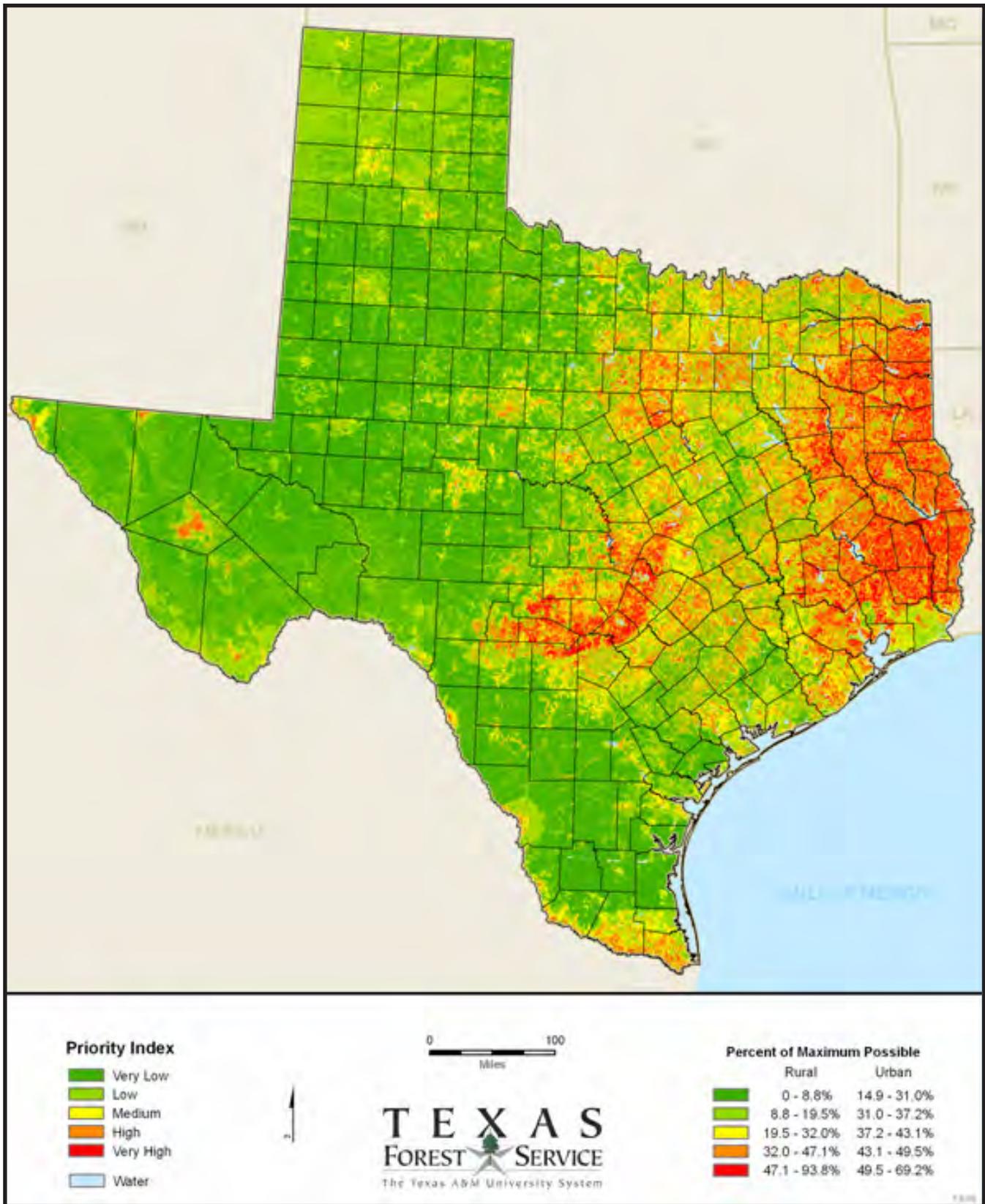


Figure 32. Texas rural and urban analysis combined map, state forest resource assessment

These plans were focused on three national themes: conserve working forests, protect forests, and enhance benefits from trees and forests. Each state assessment identifies primary issues impacting these themes within their respective states, and lays out an action plan to help inform and guide planning and mitigation efforts. Additional resources are the State Wildlife Action Plans. State Wildlife Action plans resulted from the 2008 Farm Bill, which directed each state to examine the health of wildlife and prescribe actions to conserve wildlife and vital habitat before they become more rare and costly to protect. The action plans contain two sets of priorities: terrestrial conservation and inland aquatic conservation. States are intended to include the Wildlife Action Plan in with their forest resource planning efforts.

The process for evaluating risk across the Southeast will be iterative and continuous. The BBNs and other tools described above will allow managers easier access to greater amounts of data in a spatially driven and understandable manner. As the Cohesive Strategy moves into implementation, these tools will help drive the priorities and actions in the Southeast.

D. PERFORMANCE MEASURES

The level of annual fire activity is directly correlated to the amount of risk to which firefighters are exposed and can be correlated to the impact on communities. Similarly, weather patterns are correlated with the number of acres treated for hazardous fuels reduction and the level of wildfire activity. The annual variability within these factors decreases the confidence that an individual year’s “measurement” is representative of whether or not a particular goal/objective is being reached. Trend data (i.e., rolling 10 year average) would better describe progress towards an objective.

The performance measures listed below can be considered a temporary surrogate until systematic measures can be developed. Trying to determine performance measures has not only highlighted inconsistencies in how different entities collect the same type data, but also the absence of data collection. Scientists and statisticians will need to explore various tools (e.g., remote sensing) to develop measures that are systematic and independent of all but the most dependable data sources.

Restore and Maintain Landscapes

National Performance Measure

Risk to Landscapes is Diminished

The majority of Southeastern landscapes are dependent on fire to maintain characteristic ecosystem structure. Excluding fire from these habitats threatens values-at-risk by magnifying the consequences of undesirable ignitions. High rates of fuel production in these ecosystems can result in hazardous levels of fuel accumulation if historic fire regimes are altered, or fire is excluded. In addition to rapid fuel accumulation, it is possible to have wildfire ignitions 12 months a year in the Southeast. Absent prescribed burning, wildfire, or a surrogate fuels reduction treatment, the potential for severe, catastrophic wildfires that can damage the forest and surrounding areas, or even damage the soil system increases exponentially. Sustained periods of fire exclusion will result in wholesale landscape alternation, called type conversion. Fire helps to maintain pine forest by removing competition from long-lived species. Infrequent ignitions would result in a shift in pine forests towards hardwood-dominated landscapes. This shift would have significant impacts on the diversity of ecosystem flora and fauna.

While wildland fire is the most efficient tool for reducing fuel loading, other management tools can mimic wildland fire’s role on the landscape. Examples would include thinning forests to remove live fuel or using mechanical mulchers to decrease hazardous fuel loading by rearranging understory vegetation in areas where prescribed burns are not feasible.

Regional Performance Measures for Objective 1.1

1. Acres burned or otherwise treated [to reduce hazardous fuels and improve ecosystem function]
2. Acres under stewardship programs or equivalent certifications

The number of acres treated in any way to reduce hazardous fuel loading directly reduces the risk to the landscape. Though all states and Tribes can track acres burned through internal permitting systems, data collection and management is not consistent across states and Tribes and permitting systems do not capture non-fire treatments. While the challenge of tracking non-fire treatments has not been addressed, efforts are underway to consolidate and standardize prescribed fire data regionally and nationally.

Acres in stewardship programs are deliberately managed to minimize risk to forest health using wildland fire and fire surrogates. Registries of stewardship or easement programs must be developed that accurately estimate the amount of forest being actively managed.

Fire Adapted Communities

National Performance Measures

1. Risk of wildfires to communities is diminished
2. Individuals and communities accept and act upon their responsibility to prepare their properties for wildfire
3. Jurisdictions assess level of risk and establish roles and responsibilities for mitigating both the threat and the consequences of wildfire
4. Effectiveness of mitigation activities is monitored, collected, and shared.

The Southeast experiences significant wildfire activity year-round. More than half of the nation's wildfire ignitions and more than 40 percent of large fires occur in the region. Because of this wildfire activity and the rapidly increasing WUI, the risk to communities is steadily increasing. As more development has occurred adjacent to historically agricultural/rural areas, the management of smoke from wildfires and prescribed fires has become an ever more significant challenge for land managers, the fire community, as well as the public at large.

With coordination among fire managers, community planners, policymakers, landowners, and area residents, communities can adapt to inevitable wildfire incidents without loss of life or significant damage to infrastructure. Effective education efforts are critical in accomplishing this effort. These adapted communities will recover more rapidly and thrive economically while allowing fire to assume its natural function as a component of healthy ecosystems.

Regional Performance Measures for Objective 2.1

Number of communities-at-risk (CAR) covered by a Community Wildfire Protection Plan (CWPP) or equivalent.

Evidence that a community is improving its wildland fire preparedness can be represented by any of the following:

1. Adoption of Firewise or equivalent principles to safeguard homes.
2. Adoption of “Ready, Set, Go!” or equivalent principles to prepare for fire and evacuation.
3. Enaction of mitigation/fire prevention ordinances.
4. High priority hazardous fuels identified in a CWPP or equivalent are reduced or appropriate fuel levels on such lands are maintained in accordance with a plan.

Today 43 percent of the communities in the Southeast are considered to be at high or very high risk of damage from wildfire (Andreu 2008). Communities at risk from wildfire can work collaboratively with wildland fire agencies, local fire departments, and other entities to prepare their homes and neighborhoods, to reduce losses during a fire, and to accelerate post-fire recovery. The fire management community must work to engage communities with moderate to high risk of wildfire and encourage the adoption of Firewise, Ready, Set, Go, and similar programs. State fire management agencies and other organizations, such as Firewise U.S.A., maintain records of communities that participate in these fire risk-abatement programs. These data can be used to track longevity of participation of existing communities, and the number of new communities involved in such efforts at the regional, state, Tribal, and county level.

Leaders in the fire management community must work in partnership with policymakers to develop ordinances that encourage wildfire prevention and mitigation activities. While no central registry of local ordinances exists, state wildland fire management agencies are familiar with most fire-related county ordinances.

Wildfire Response

National Performance Measures

1. Injuries and loss of life to the public and firefighters are diminished
2. Response to shared-jurisdiction wildfire is efficient and effective
3. Pre-fire multi-jurisdictional planning occurs.

Firefighter and public safety are the primary objectives in every Incident Action Plan. Though risk management is increasingly emphasized throughout the fire management community, avoidable accidents continue to occur, and every year firefighters and members of the public lose their lives or are injured during fire events. Tracking the number of fire personnel injuries and accidents, particularly as a

percentage of assignments, may be an effective way to measure the success of the safety message as well as the risk-based decision-making process.

In the South, the juxtaposition of jurisdictions requires the various suppression agencies to coordinate efforts to effectively and efficiently respond to wildfire. Preplanning among these agencies offers opportunities for incident responders to develop professional relationships. These relationships increase interoperability and ensure effective communications during wildfire response, decreasing the risk of accidents or injuries.

Regional Performance Measure for Objective 3.1

Trend change in number of firefighter injuries and firefighter fatalities during wildfire suppression activities compared to previous years.

Studying the trend in the numbers of firefighters killed or injured during wildfire response is critical to reducing the risks related to wildfire response, identifying interagency lessons learned, and communicating an effective safety message throughout the wildfire management community (Fig. 33).

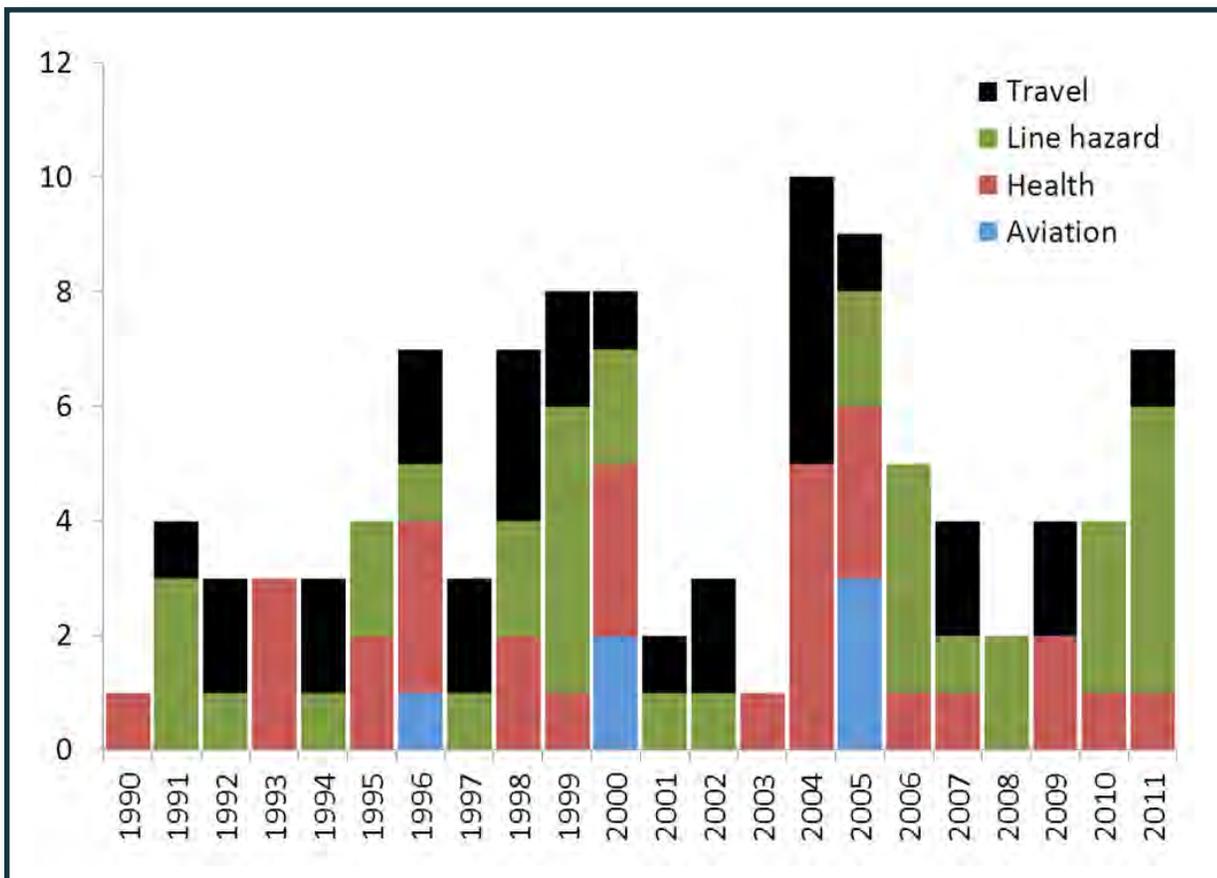


Figure 33. Wildland and outdoor firefighter fatalities for the Southern area (1990 - 2011). Source: National Fallen Firefighters Foundation. www.firehero.org

This performance measure parallels a national performance measure. Annual statistics related to firefighter injuries and fatalities can be easily and accurately tracked using national databases.

Regional Performance Measures for Objective 3.2

Percent increase in the number of firefighters receiving wildland fire training compared to previous years

Increasing the number of firefighters who receive proper training in wildland tactics will reduce the numbers of injuries and fatalities experienced by firefighters and the public. Most professional wildland firefighters' qualifications can be tracked in the Incident Qualifications and Certification System (IQCS), for federal responders, or Incident Qualification System (IQS) for state responders. Structural fire departments have a different qualification tracking system, but basic wildland firefighter training can be studied in order to ascertain trends.

Structures and other values-at-risk saved from damage or destruction by wildland fire are recorded inconsistently throughout the Southeast. It is particularly challenging to estimate the values-at-risk protected given the significant number of wildfire ignitions that are quickly suppressed and never recorded. The Southeast has a culture of independence and self-sufficiency, and it is rare that a rural inhabitant would see a small fire and fail to stop and extinguish it. These ignitions are virtually never reported to any fire management organization. It is likely that the actual number of wildfire ignitions in the Southeast is significantly larger than the 41,500 that are recorded on average each year. Generating an accurate estimate may require the creation of a geospatial database containing wildfire origins throughout the region.

Statewide Mutual Aid Agreements increase the ability of wildland fire managers and responders to safely and effectively respond to wildfires across jurisdictional lines.

Prevention is also an essential element of wildfire abatement in the Southeast, and effective prevention programs may significantly reduce human-caused wildfire incidents.

The Southeastern performance measures are designed to be strategic, outcome-oriented measures that will assist the region in achieving national and regional objectives. Paired with the national performance measures, these performance measures are intended as interim measures which may be updated or replaced as scientists and researchers develop more sophisticated approaches using remotely sensed data and other tools. These performance measures will provide key guidance in the development and implementation of the Phase III Southeastern action plan.

E. CONCLUSIONS

The Cohesive Strategy in the Southeast has been developed for use by managers at any level. The Southeast has regionally attempted to evaluate and determine which actions and activities from Phase II would have the most significant positive impact and to encourage managers at all levels to consider those that were identified when planning on the ground activity. These actions and activities were selected as the Southeast's emphasized alternatives. It is important to note, however, that with nearly 90 percent of the forested landscape held in private ownership, much of the responsibility and opportunity for action must occur in a collaborative manner. Private property rights are an important part of Southeastern culture and must be respected in decision-making.

The Southeast is facing many challenges as it relates to wildfire such as:

1. Diminishing capacity of response organizations and land management agencies
2. Weakening traditional markets due to the global economy
3. New landowners who do not understand land management decision-making
4. New residents who do not have the historical cultural background of the Southeast (i.e., intolerance of fire and smoke)
5. Rapidly increasing WUI extent throughout the region

Additionally, a list of barriers were developed to better articulate specific challenges that need direct assistance to be addressed at the national level. Along with the challenges come unique opportunities. By working together with partners not only in fire management but also in community planning, ecological management, and other areas, Southeastern stakeholders can collectively capitalize on the opportunities while addressing the challenges.

The information and tools provided by the NSAT offer data that can easily be understood, analyzed, and used by stakeholders. The emphasized alternatives that were developed will continue to be emphasized across the region at all levels. The benefit of the Cohesive Strategy is the development of a network of partners that understand each other's issues and the importance of implementing landscape-scale solutions. What has developed over the past year is something that is difficult to capture in a technical report. An extension of partnerships built on trust is what will ultimately benefit the residents and the forests in the South.

The development of the strategy is merely a starting point. Emphasized alternatives are a way of capturing those actions believed to have the greatest impact. By continuing to use the best available science to inform decisions, and leveraging the diverse Southeastern partnership base, the region will continue to make strides in policy, planning, and management that result in a positive impact to protecting lives and property, reducing risk and constructing landscapes and communities resilient to fire.

F. NEXT STEPS

Over the past 10 months the Southeastern region has been engaged in Phase III of the Cohesive Strategy development, planning for the regional implementation of the strategy. The Southeastern Risk Analysis uses current and potential strategies from the wildland fire management community in an attempt to synthesize wildfire risk on the landscape. The alternatives developed through the Phase III process constitute current and emerging opportunities that, singly and in combination may be used by wildland fire managers and other stakeholders to address the challenges of wildland fire management in the Southeastern United States. The Southeastern Risk Analysis Report, together with the reports developed by the Northeast and the West will inform the development of a National Risk Analysis document, which will be drafted in the winter of 2012-13 with input and assistance from key Southeastern stakeholders.

With the completion of the Southeastern Risk Analysis, the Southeastern Region will focus on the development of a regional Action Plan and begin formulating next steps. This Southeastern Action Plan will target feasible means of implementing the emphasized alternatives identified in the Risk Analysis to move towards achieving the three regional and national goals of the Cohesive Strategy. The Southeastern Action Plan will specifically identify what actions will be taken around the region, which stakeholders will be involved in the actions, and where the actions may occur. The Southeastern Action Plan will focus on achievable and tangible successes that move stakeholders and the region towards accomplishing the three key goals.

While execution of the identified actions has already begun, with the completion of Phase III, the entire focus will be on the implementation of the Southeastern Action Plan. The networks that have been developed over the last three years will be nourished through regional newsletter updates. The newsletter will highlight successes and share emerging opportunities, facilitating communication between diverse stakeholders. Beyond 2013, the focus of the Cohesive Strategy effort in the Southeast will be implementation of the actions and activities recommended in the Risk Analysis and periodic evaluation of the results of implementation on achieving regional and national goals.

G. APPENDICES

APPENDIX 1 – GLOSSARY

The National Wildfire Coordinating Group (NWCG) maintains an extensive glossary of fire management terminology and acronyms (found at www.nwcg.gov/pms//pubs/glossary/index.htm). Some terms used in this document that have specific meaning in the context of wildland fire management, but are not found in the NWCG glossary are defined below.

Affected party: A person or group of people who are affected by the outcome of a decision or action.

Biomass: Any organic matter that is available on a renewable or recurring basis. Under the Farm Security and Rural Investment Act of 2002 (Title IX, Sec. 9001), biomass includes agricultural crops, trees grown for energy production, wood waste and wood residues, plants (including aquatic plants and grasses), residues, fibers, animal wastes and other waste materials, and fats, oils, and greases (including recycled fats, oils, and greases), but not recycled paper or unsegregated solid waste. (From Farm Bill Glossary on the National Agricultural Law Center website <http://nationalaglawcenter.org/#>.)

Fire-adapted community: Human communities consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire.

Fire-adapted ecosystem: An ecosystem is “an interacting, natural system, including all the component organisms, together with the abiotic environment and processes affecting them” (NWCG Glossary). A fire-adapted ecosystem is one that collectively has the ability to survive or regenerate (including natural successional processes) in an environment in which fire is a natural process.

Fire exclusion: Land management activity of keeping vegetation or ecosystems from burning in a wildland fire.

Fire management community: A subset of the fire community that has a role and responsibility for managing wildland fires and their effects on the environment [according to the Phase I report glossary].

Fragmentation: Physical process whereby large, uniform areas are progressively divided into smaller fragments that are physically or ecologically dissimilar. Fragmentation can occur through natural disturbances such as wildfire, or more commonly, through land use conversion by humans (e.g., urbanization).

Landscape resilience: The ability of a landscape to absorb the effects of fire by regaining or maintaining its characteristic structural, compositional and functional attributes. The amount of resilience a landscape possesses is proportional to the magnitude of fire effects required to fundamentally change the system.

Parcellation: Process of subdividing a large, intact area under single ownership into smaller parcels with multiple owners. The term can also apply to an administrative process of dividing a landscape into multiple management units with different management objectives. Parcellation is often a precursor of fragmentation because of differences in management priorities among property owners.

Prescribed Fire: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.

Silviculture: “The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis” - definition from John A. Helms, ed., 1998. The Dictionary of Forestry. The Society of American Foresters, Bethesda, Maryland.

Stakeholder: A person or group of people who has an interest and involvement in the process and outcome of a land management, fire management, or policy decision. Viewshed An area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

Wildfire: An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

Wildland Fire: Any non-structure fire that occurs in the wildland. Three distinct types of wildland fire have been defined and include wildfire, wildland fire use, and prescribed fire.

APPENDIX 2 – ACRONYMS

BIA	Bureau of Indian Affairs
CAR	Community at Risk
CWPP	Community Wildfire Protection Plan
DAG	Directed Acrylic Graph
DOD	Department of Defense
DOI	Department of the Interior
EMAC	Emergency Management Assistance Compact
EMDS	Ecosystem Management Decision Support system
FLAME	Federal Land Assistance, Management and Enhancement Act
FPA	Fire Program Analysis
FPU	Fire Planning Unit
FWS	Fish and Wildlife Service
GAO	General Accounting Office
HVR	Highly Valued Resource
IAFC	International Association of Fire Chiefs
ICS	Incident Command System
IMT	Incident Management Team
IQCS	Incident Qualifications and Certifications System
IQS	Incident Qualification System
MOU	Memorandum of Understanding
NASF	National Association of State Foresters
NFPA	National Fire Protection Association
NGO	Non-Governmental Organization (e.g. nonprofit)
NICC	National Interagency Coordination Center
NIFC	National Interagency Fire Center

NPS	National Park Service
NSAT	National Science Assessment Team
NVC	Net Value Change
NWCG	National Wildfire Coordinating Group
PDSI	Palmer Drought Severity Index
ROSS	Resource Ordering Status System
RFD	Rural Fire Departments (including volunteer fire departments)
RSC	Regional Strategy Committee
SERPPAS	Southern Regional Partnership for Planning and Sustainability
SGA	Southern Governors' Association
SGSF	Southern Group of State Foresters
SWRA	Southern Wildfire Risk Assessment
TIMO	Timber Investment Management Organizations
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USFS	United States Forest Service
VFD	Volunteer Fire Department
WFDSS	Wildfire Decision Support System
WFEC	Wildland Fire Executive Council
WFLC	Wildland Fire Leadership Council
WPE	Wildfire Prevention Education
WUI	Wildland-Urban Interface

APPENDIX 3 – REFERENCES

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APPENDIX 4 – AVAILABLE SCIENCE/MODELS TO BETTER INFORM THE DECISIONS FOR IMPLEMENTING ALTERNATIVES, MONITORING DATA AND PERFORMANCE MEASURES

Data and Methods for Exploring Opportunities to Reduce Risk

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. During Phase II, the NSAT examined various aspects of wildland fire and developed conceptual models specific to each component. The purpose of these models was to display the interactions and relationships among factors, such as the relationship between fuel treatments and the extent and intensity of wildfire. The NSAT also identified various data sets that might be used in Phase III to build analytical models consistent with the concepts articulated in Phase II. Building on these efforts, Phase III has involved an extensive effort to collect data necessary to quantify relationships and provide a rigorous examination of risk.

The types of data collected can be broadly categorized into five general types: biophysical, socioeconomic, land-use and ownership, wildfire frequency and extent, and incident response. Biophysical variables include physical measures such as precipitation, temperature, and terrain. They also include characteristics of vegetation that contribute to wildfire behavior. Socioeconomic variables describe the demographic and economic characteristics of populations and communities within each county, and also describe the distribution of homes within the wildland-urban interface. Land-use and ownership describes the mixture of public and private lands and also helps quantify the extent to which lands might be suitable for active management, e.g., by highlighting areas that historically supported timber harvest. Variables describing wildfire frequency and extent have been gathered from various reporting systems that have been put in place by federal, state, Tribal, and local fire departments. They also include data from independent monitoring systems that track wildfire using satellites and other remote devices. Finally, they include a series of modeled products from governmental and private entities. Similarly, incident response information has been gathered from many of the same reporting systems. These variables track who responded to wildfire, how long they took to arrive on site, and how long was required before the fire was contained. Information on injuries and casualties can also be found in these same reporting systems. All of the variables available for use in the Phase III analyses are listed at the end of this Appendix.

Before data were used in analysis, three additional steps were accomplished. The first step was one of quality control. Obvious errors in the data were corrected where it was apparent that the corrections would enhance the fidelity of the original data. In some cases limited numbers of observations were omitted from further consideration due to obvious mistakes that could not be corrected or missing information. The second step involved compiling, reformatting, or summarizing data to fit within a common sampling frame—the county. For some data sets, for example many of the social economic variables, data were originally provided at the county level

and no reformatting was necessary. Other, higher-resolution data were processed using GIS techniques to provide a county-level summary. Many data were also normalized to provide comparative area-based or incident-based metrics such as acres burned per hundred square miles or firefighter injuries per 1000 incidents.

The third step in data preparation involved filtering and consolidation. In this step, a preliminary correlation analysis was used to identify common patterns among the data that allowed a subset of the data to be used to characterize conditions efficiently. That is, a smaller set of variables were identified that were highly correlated with other variables and could be used alone without significant loss of information. Statistical techniques including factor analysis and clustering were used to reduce the number of variables further by creating super variables that were either linear combinations of other variables (from factor analysis) or categorical groupings of counties based on their similarities (using cluster analysis). The combination of filtering and consolidation techniques allowed the total number of variables considered to be reduced by nearly two-thirds. Even so, there were more than 100 variables available for potential analysis.

Modeling

Various analytical models were constructed for the primary purpose of relating causal or contributing factors to variables which collectively index levels of risk. These risk metrics include measures of hazard such as frequency and magnitude of wildfire, any direct measures of loss or injury, and various measures related to exposure, such as the number or density of homes in the wildland-urban interface. Although hazard and loss are often combined into single measures of risk, such measures were not constructed in the NSAT's analysis due in part to the county-level resolution of the original data. For example, when analyzing data for a particular county, it is evident that are homes distributed throughout the WUI and large wildfires are likely within the county, but which portion of the county is most likely to experience wildfire or which off-site effects of wildfire might be relevant to overall impacts cannot be discerned. Such spatial interactions are important for producing an accurate and precise estimate of risk. Lacking more specific information, the NSAT used a more straightforward and simple assumption that the total risk is proportional to county-level hazard, exposure, and potential loss.

Many of the analytical models used in the NSAT's analysis were constructed using Bayesian networks. Bayesian networks are decision analysis tools that use conditional probabilities to link variables together and express the degree of relationship between them. They provide a highly flexible modeling environment that works equally well with simple and complex problems. Here, the NSAT used a simple example using climate, fuel, and wildfire to illustrate the basics behind a Bayesian network. Consider the two graphs shown in Figure 1. In the first graph on the left, it is assumed that climate affects both vegetation (fuels) and wildfire, but vegetative fuels and wildfire are independent given climate (i.e., there is no connection between fuels and wildfire that does not pass through climate). The second graph uses the same three nodes, but specifies a different relationship in that vegetative fuels and wildfire are both related to climate, but vegetation has an additional direct on wildfire. The principal difference in the two graphs is that the first graph suggests that manipulation of vegetation would have no measurable effect on wildfire. Only by changing climate could one expect wildfire to change. In contrast, the second graph allows for changes in vegetation to have an effect on wildfire independent of changes in climate. Importantly, quantitative models based on either graph could be based on exactly the same data, but they would have very different implications for management.

Bayesian networks begin with graphs like these, but then quantify the relationships using empirical data or expert opinion. Each node in the network can be represented by a single quantitative variable. Arrows are used within the Bayesian networks to identify conditional dependencies, much as the arrows in the graph above are used to relate one variable to another. The direction of the arrows are important, in that they indicate causal dependencies as well as determine how information can flow from one node to another. In this context, information is defined explicitly as that which causes a change in probability assignment. To facilitate calculation—as well as communication—continuous variables are often broken into discrete classes; discrete or categorical variables require no such modification.

As an example, consider the Bayesian network shown in Figure 2 and Figure 3. This simple network has three nodes: *Region*, *Annual Ignitions*, and *Normalized Area Burned*. *Region* simply refers to the three regions identified within the Cohesive Strategy. *Annual Ignitions* is the mean number of outdoor fires reported per year, summed from three separate reporting systems representing federal, state, Tribal, and local response units. *Normalized Area Burned* is an estimate of the expected number of acres burned in these reported incidents during a high-fire-occurrence year (i.e., the 95th percentile). This network was parameterized (trained) using data from all of the counties in the conterminous United States (lower 48 states), where each county was treated as a single observation and weighed equally regardless of area. The unconditional network (Figure 2) shows the marginal distributions of the values of each variable. One can see from the probability histograms, for example, that 33.4 percent of the counties are in the Northeast, 15 percent of the counties reported between 50 and 75 outdoor fires per year, and 14.3 percent of the counties might expect to burn 2000 or more acres (much more in some counties) in a bad wildfire year. Conditioning on region (Figure 3) provides a quick visual comparison of the differences among regions. For example, the West stands out in that it has a higher than normal percentage of counties with relatively few incidents, but also higher than average numbers of counties with very high expectations for area burned.

The Bayesian networks constructed for the NSAT's analyses are necessarily more elaborate than the simple graphs depicted above, but they use the same basic concepts. For example, the network depicted in Figure 4 uses logic similar to Figure 1 regarding the relationship between climate, fuels, and wildfire, but expands that concept by using multiple nodes or variables for each component. This particular network uses three super variables (*Warmness Factor 1*, *Wetness Factor 2*, and *Terrain Factor 3*) from a factor analysis of physical attributes including seasonal precipitation and temperature, elevation, and slope, and regional cluster analyses of vegetation and surface fuels. It also includes *Region*, *Annual Ignitions*, and *Normalized Area Burned* from Figures 2 and 3, and additional nodes from an independent modeling exercise, *Mean Burn Probability* and *Mean Flame Intensity*. A primary difference between the networks in Figure 4 and Figure 2 is the relationship between *Region* and *Normalized Area Burned* now passes through a series of intermediate nodes related to climate and vegetation, which allows for greater exploration of the causal factors influencing area burned by wildfires.

Five basic models or templates were created for use by the Southeast in order to explore opportunities for reducing risk. They are described only briefly here. The first was an Ignition Model, which focused on understanding where human-caused wildfire ignitions occurred and where they might be reduced through targeted actions at preventing either accidental or intentional ignitions alone or in combination. The second template—Fire, Fuels, and Homes—explored the intersection of homes and wildfire and

included variables that might suggest where either mechanical treatments or prescribed fire might be productively employed to alter the composition of surface fuels and affect wildfire behavior. Conversely, they could also be used to identify areas where such options are problematic. The third template—Prescribed Fire and Ecological Resiliency—focused more on the potential application of prescribed fire in areas removed from human communities where the primary goal might be to restore a fire regime more consistent with historical conditions. Fire Adapted Communities formed the basis of the fourth template, which used information about current programs to suggest the extent to which evidence of local actions are tied to socioeconomic factors as well as to factors more directly indicative of risk to human communities from wildfire. Finally, the fifth template emphasized Incident Response Capacity and Workload. The purpose of this template was to help understand the relative contribution of federal, state, Tribal, and local departments to incident response and explore the factors contributing to variation in response metrics such as arrival and containment time and fire size.

These templates and associated data were customized for each region and shared with the regional work groups during a workshop in Denver in early September. Ensuing discussions with each workgroup led to the creation of a series of summary tables, graphs, and maps that highlighted findings relevant to objectives and goals articulated by each region. These summary products have been incorporated in the regional reports as noted.



Figure 1. Simple graphical models of two possible hypotheses of the relationships among climate, vegetative fuels and wildfire.

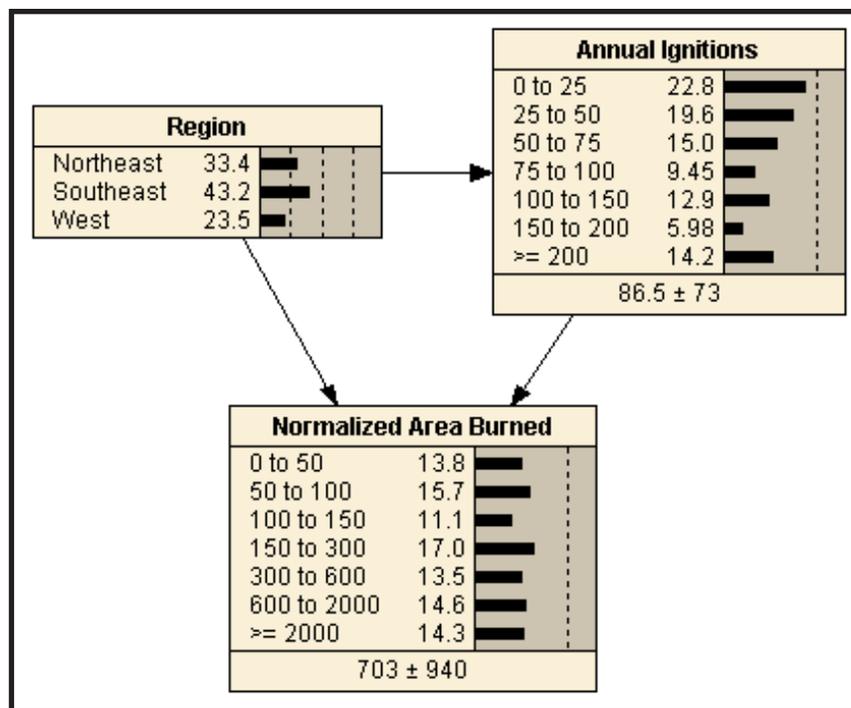


Figure 2. Simple Bayesian network illustrating the relationships among Cohesive Strategy region, annual ignitions, and normalized area burned. Probability histograms represent the percent of the counties within the conterminous United States within each class.

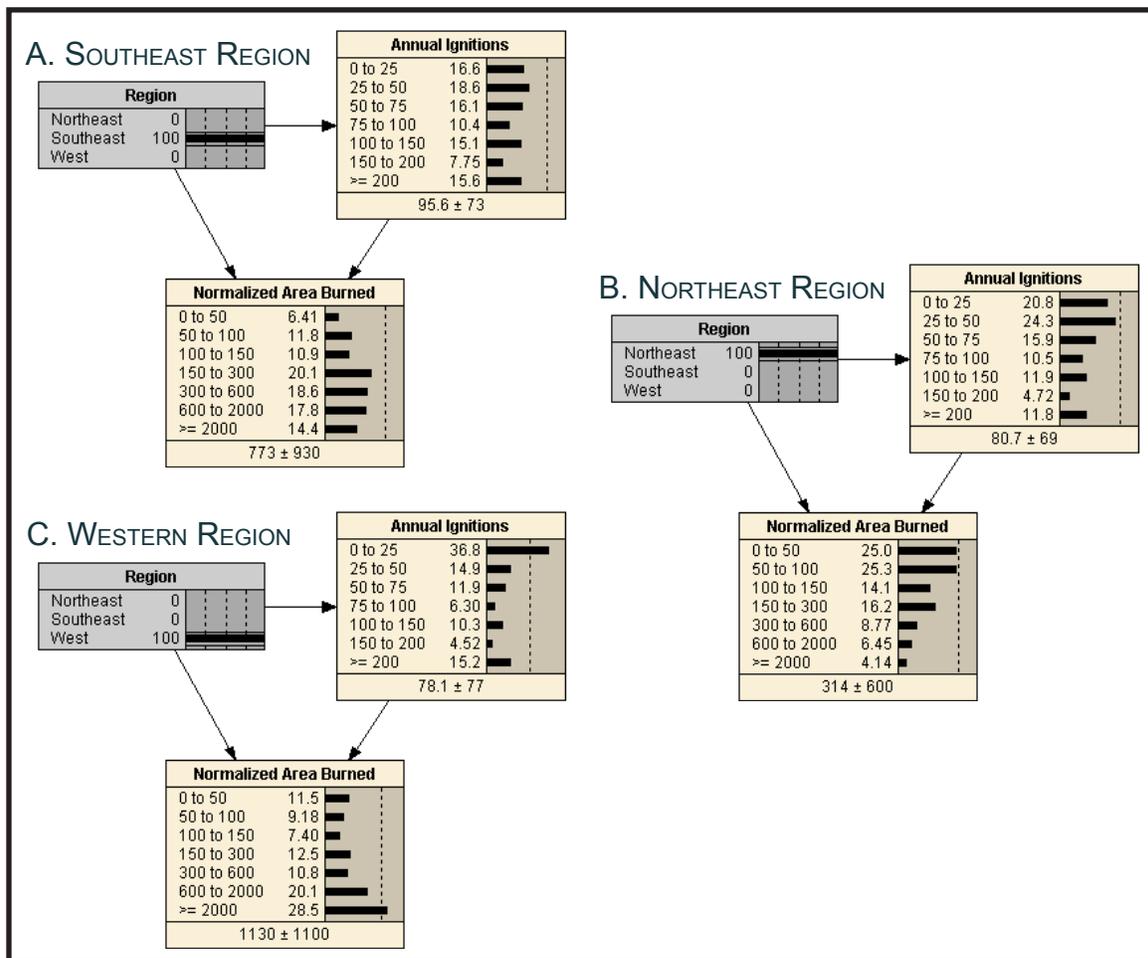


Figure 3. Simple Bayesian network illustrating the relationships among Cohesive Strategy region, annual ignitions, and normalized area burned, conditioned on region. Probability histograms represent the percent of the counties within each region within each class.

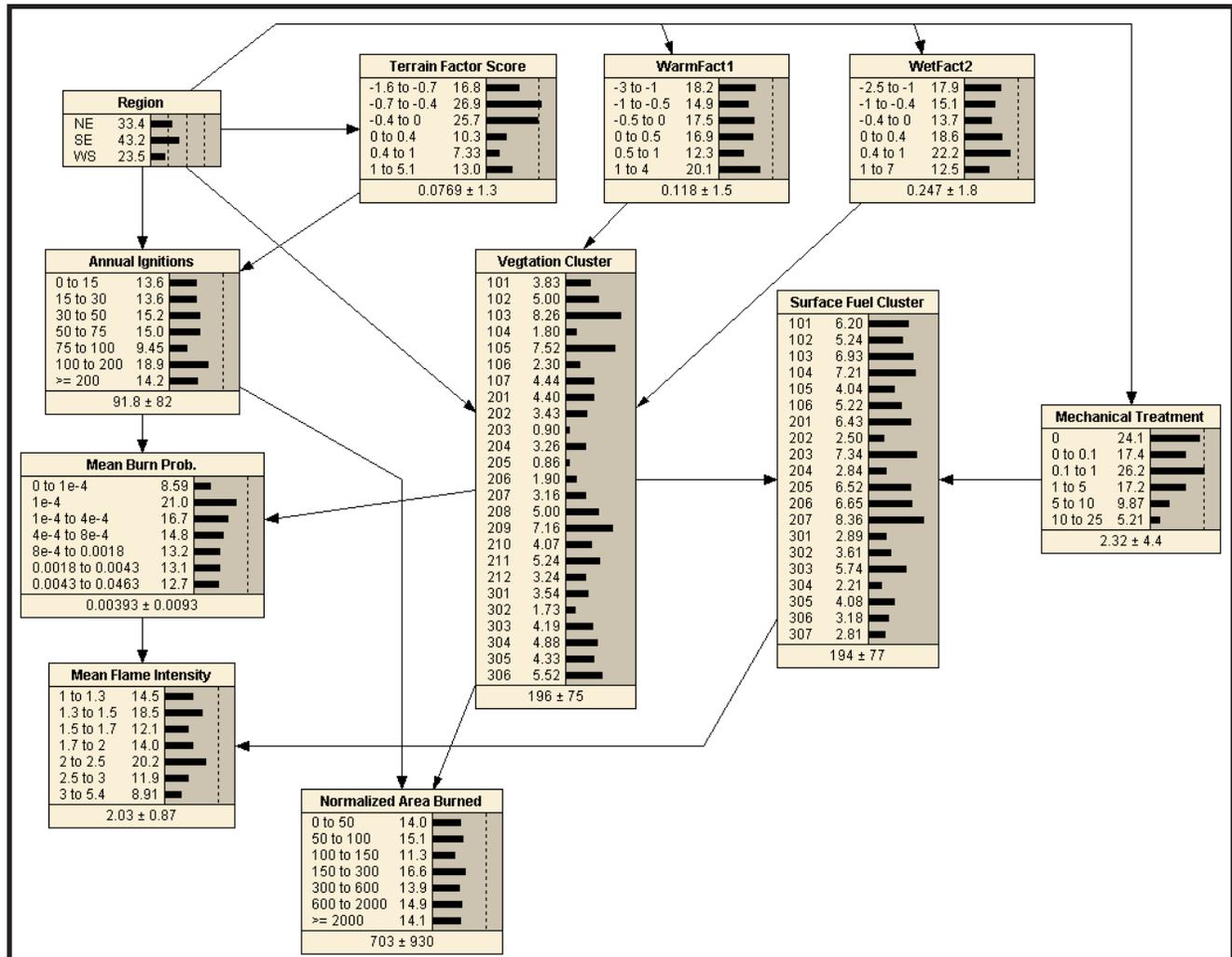


Figure 4. Bayesian network illustrating relationships among variables reflecting the physical environment, vegetation and surface fuels, mechanical treatments in forested areas, wildfire ignitions, and various measures of wildfire extent and intensity.

Variables available for use in the Phase III analyses.

Variable	Group	Description
COUNTY	A	County FIPS code
FIPS5	A	5-digit state and county combined FIPS code
STATE	A	State FIPS code
D_Mchn_pct	B	Landfire disturbance by mechanical treatment (%)
Dom_PAD	B	primary conservation partner
Log_All_Prds	B	index of forest product production
rdbuff_pct	B	percent of county withn 540 m of road
region	B	Cohesive Strategy region
SQMI	B	area of county in square miles
stateabv	B	state abbreviation
tot_dstb_pct	B	Landfire disturbance by all causes (%)
tot_pct_fed	B	federal ownership (% of area)
Tot_Pct_PAD	B	total conservation partner (% of area)
fmech_35	B	forested area available for mechanical treatment (% of county)
nfmech_35	B	non-forested area available for mechanical treatment (% of county)
Ecoregion	C	Bailey's ecoregion (modal value)
FuelClusR	C	Surface fuel cluster
FuelDist	C	deviation from cluster mean
ModeFRG	C	modal fire regime group
pct_forest	C	forested area (% of county)
TerrFact3	C	physical factor score weighted to terrain and summer precip.
VegClusR	C	existing vegetation cluster
VegDist	C	deviation from cluster mean
WarmFact1	C	physical environment factor score weighted to seasonal temperature
WetFact2	C	physical environment factor score weighted to seasonal precip.
Avg_vdep_NN	C	mean veg departure in natural areas
STD_vdep_NN	C	STD of veg departure in natural areas
Avg_vdep_Nm	C	mean veg departure in mixed natural areas
STD_vdep_Nm	C	STD of veg departure in mixed natural areas
APG90_10	D	annualized population growth 1990 - 2010
DemoFact1	D	demographic factor score (stress)
DemoFact2	D	demographic factor score (advantage)
EconType	D	dominant economic activity
HUWUI00	D	housing units within WUI 2000
MeanUrban	D	Mean urban value from Hargrove and Edwards map
Pct_Tmbr_Jbs	D	Forest industry jobs (% of employment)

Variable	Group	Description
Timber_Jobs	D	Number of forest industry jobs
Total_Popu	D	total population 2010
UrbanInf	D	Urban economic influence (ERS typology)
WUIFact1	D	WUI factor score (WUI area weighted)
WUIFact2	D	WUI factor score (weighted toward urban or % agriculture)
WUIFact3	D	WUI factor score (home density in interface and % of homes)
Pct_Nm	D	area in mixed-natural landcover (%)
Pct_NN	D	area in natural vegetation landcover (%)
FAC_index1	D	fire adapted community index (version 1)
FAC_index2	D	fire adapted community index (version 2)
Avg_HARM	E	mean HARM values from Anchorpoint product
b_fil_pct	E	area of county with burnable fuel types (%)
bp_b_MEAN	E	mean burn probability of burnable area
bp_b_STD	E	STD of burn probability of burnable area
D_fire_pct	E	Landfire disturbance by fire (%)
MeanFIL	E	mean fireline intensity level (FSIM modeled)
mode_HS	E	landcove type with most hotspots
NHrm_HPlus	E	area with high or greater HARM index (%)
norm_avg_brn	E	mean normalized area burned
norm_p95_brn	E	95th percentile of normalized area burned
nrmHS_A	E	hotspot density in agricultural areas
nrmHS_All	E	hotspot density in all areas
nrmHS_D	E	hotspot density in developed areas
nrmHS_Nm	E	hotspot density in mixed-natural areas
nrmHS_NN	E	hotspot density in natural areas
PrbFIL_4P	E	proportion of county with FIL => 4
PrbFIL_5P	E	proportion of county with FIL => 5
RX_ac_100sm	E	MTBS prescribed fire per unit area
RxF_pct	E	MTBS prescribed fire in forested area (% of Rx fire)
WF_ac_100sm	E	MTBS wildfire per unit area
for_rx	E	area available for prescribed fire in forested landscapes (%)
nfor_rx	E	area available for prescribed fire in non-forested landscapes (%)
RxSum	E	Hotspots attributed to prescribed fire
WfSum	E	Hotspots attributed to wildfire
log10_RxHS	E	Index of hotspot density (wildfire)
log10_WfHS	E	Index of hotspot density (Rx fire)
RxWf_HSratio	E	ratio of prescribed fire to wildfire

Variable	Group	Description
arv_ratio	F	index of variation in containment time (NFIRS)
cnt_ratio	F	index of variation in arrival time (NFIRS)
Combined_FPY	F	incidents per year, all sources combined
FED_FPY	F	federal incidents per year
FF_DEATH	F	fire-fighter injuries per 1000 incidents (NFIRS)
FF_INJ	F	fire-fighter deaths per 1000 incidents (NFIRS)
max_fsz_fed	F	max fire size, federal records
max_fsz_sf	F	max fire size, NASF records
med_arv_nfir	F	median arrival time, NFIRS (minutes)
med_cnt_nfir	F	median containment time, NFIRS (minutes)
med_dur_fed	F	median incident duration, federal (days)
med_dur_sf	F	median incident duration, NASF (minutes)
med_fsz_fed	F	median fire size, federal
med_fsz_nfir	F	median fire size, NFIRS
med_fsz_sf	F	median fire size, NASF
NASF_FPY	F	fires per year, NASF
NFIR_FPY	F	fires per year, NFIRS
p95_arv_nfir	F	95th percentile for arrival time, NFIRS
p95_cnt_nfir	F	95th percentile for containment time, NFIRS
p99_fsz_nfir	F	95th percentile for fire size, NFIRS
pct_int_HCF	F	intentional fires as percentage of human-caused ignitions
pct_nat_KNF	F	natural ignitions as percentage of all known causes
PctRep_FED	F	federal response as percent of total reported incidents
PctRep_NASF	F	state response as percent of total reported incidents
PctRep_NFIR	F	local (NFIRS) response as percent of total reported incidents
pers_p_100sm	F	first responders per 100 square miles
stat_p_100sm	F	fire stations per 100 square miles
stat_p_10Kpop	F	fire stations per 10,000 people in county
SUP_PER	F	total suppression personnel in county
TOTALPERS	F	total response personnel in county
bldg_p_1K	F	mean buildings involved per 1000 incidents (NFIRS)
Natural_FPY	F	natural caused fires per year (total, extrapolated)
Human_FPY	F	human caused fires per year (total, extrapolated)
Arson_FPY	F	intentional human caused fires per year (total, extrapolated)

APPENDIX 5 – STAKEHOLDER INVOLVEMENT

Summary of Phase III Outreach Forums – National Wildfire Management Cohesive Strategy – Southeastern Region

Four forums were organized and held throughout the Southeast to more fully engage key partners and stakeholders at the local level. The forums, held in Longview, Texas (September 21st, 2012), Pearl, Mississippi (September 25th, 2012), Tifton, Georgia (September 26th, 2012), and Greenville, South Carolina (September 27th, 2012), included the opportunity to call in on a toll free line or utilize a webinar service online at <http://go.ncsu.edu/fire>. In summary, over 100 individuals had the opportunity to listen to the key points of the Strategy and provide input into the Core Values and Alternatives. Overall, those in attendance were supportive of the Strategy and Alternatives. Several individual comments and points were made and captured in a ten-page document that will be used to update the Strategy. In addition, a few key points are summarized in the ensuing paragraphs.

Key comments from the forums included the need to include more grazing and rangeland discussion in the alternatives, a strong desire to include the management strategies and culture of those within the land management sections of the timber investment management organizations (TIMO), and a stronger emphasis on the need for and resulting benefits associated with prescribed fire. Prescribed fire, many believe, ties many of the cultural, property and ecological services together.

There was also a concern from several participants that liability protection strategies were important and should be included to a greater extent in the Plan, that relying too much on the services of Volunteer Fire Departments (VFD) was dangerous due to overloading, and that the Plan focused heavily on training, development and increasing capacity at a time when most agencies are reducing capacity. Several in attendance at the forums noted the need to ensure that the Strategy adequately deals with public health, and specifically air and water quality, and emergency preparedness.

Finally, there were comments concerning the need for coordinated databases, training, education, equipment and expertise sharing, and shared MOU's.

In addition to the forums, an informal social network analysis SNA was conducted via phone interviews with initial Southeastern Region Strategy Committee team members in the South. The goal of this phase of the analysis was to determine the potential networks and audiences that will need to be reached in order for successful implementation of the Strategy. This initial analysis resulted in a database of several hundred individuals and agencies.

APPENDIX 6 – COMMUNICATIONS ACTIVITIES

Communications and outreach activities have been a critical component in the development of the regional risk analysis. In addition to stakeholder engagement through cohesive strategy specific forums and the ongoing work with our social network analysis, multiple communications activities, both direct and indirect, have occurred to further the reach and involvement with partners in development of the strategy.

Directly, members of the RSC and WG have been outgoing during Phase III in presenting or participating in many meetings where Cohesive Strategy has been on the agenda. Organizations that have included Cohesive Strategy discussions include, but not limited to: Association of Fish and Wildlife Agencies, Natural Areas Association, SGSEF, The Nature Conservancy, multiple state prescribed fire associations, International Association of Fire Chiefs, Fire Learning Network, federal FMO meetings, FWS Refuge Leadership, regional federal agency directors strategic meeting, Southeast Regional Planning Partnership for Sustainability, Southeast Natural Resource Leaders Group, National Council of Forestry Association Executives, Forest Landowners Association, Southeast Association of University Forest Resource Programs among others.

Beginning in Phase III, the Southeast began distributing monthly newsletters during Phase III. These newsletters were electronically circulated to all stakeholders involved in current or past phases of the Cohesive Strategy as well as the increasing list of interested organizations and individuals. A particular target for outreach and communications activities were regional and state organizations which present efficient network by which to distribute information and building partnerships with regional leadership. A secondary benefit of the newsletter is the formation of an active, engaged network of collaborators that will remain vital and active well after the Cohesive Strategy is fully implemented in 2013 and beyond.

Another new activity in Phase III has been identifying and highlighting regional success stories. This presents as an opportunity for stakeholders to learn about effective activities others within the region are engaged in as well as to help offer ideas that may be implemented in various locations across the region. As a result, groups and organizations may be able to read about a program or activity elsewhere in the region and develop a similar project locally. As the implementation of the strategy fully begins, the leadership of the regional strategy committee will work more directly in helping to identify these opportunities and working with local partners in their development.

APPENDIX 7 – LINKS TO THE PHASE I AND II REPORTS AND OTHER KEY NATIONAL AND REGIONAL DOCUMENTS*

*Web links valid as of September, 2012

A Cohesive Wildland Fire Management Strategy. Phase I Report. Available at http://forestsandrangelands.gov/strategy/documents/reports/1_CohesiveStrategy03172011.pdf

The Federal Land Assistance, Management and Enhancement Act of 2009 Report to Congress. Phase I Report. Available at http://forestsandrangelands.gov/strategy/documents/reports/2_ReportToCongress03172011.pdf

Southeast Regional Assessment. Phase II Report. Available at http://www.forestsandrangelands.gov/strategy/documents/wfec/meetings/04nov2011/regreports_presentations/cs_sersc_presentation20111007.pdf

A National Cohesive Wildland Fire Strategy: Southeastern Regional Assessment. Phase II Report. Available at http://www.forestsandrangelands.gov/strategy/documents/wfec/meetings/04nov2011/regreports_presentations/phase2_report_se20110930.pdf

Cohesive Wildland Key national and foundational documents

A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-Year Strategy. Western Governors Association, 2001

Quadrennial Fire and Fuel Review Final Report 2005. The National Wildfire Coordinating Group Executive Board, July 2005. Available at http://www.nafri.gov/Assets/QFFR_Final_Report_July_19_2005.pdf

Protecting People and Natural Resources – A Cohesive Fuel Treatment Strategy, US DOI, Released April 2006.

Restoring Fire-Adapted Ecosystems on Federal Land. U.S. Department of the Interior and USDA Forest Service, 2002

Wildland Fire Protection and Response in the United States, The Responsibilities, Authorities, and Roles of Federal, State, Local, and Tribal Government, <http://www.forestsandrangelands.gov/strategy/documents/ildlandfireprotectionandresponseusaug09.pdf>

Cohesive Strategy Southeastern key and foundational documents

Andreu, A. and L. A. Hermansen-Baez. 2008. Southern Group of State Foresters. Fire in the South 2. The Southern Wildfire Risk Assessment.

Briefing paper: Identifying Communities at Risk and Prioritizing Risk-Reduction Projects, July 2010 <http://www.stateforesters.org/files/201007-NASF-CAR-Briefing-Paper.pdf>

Buckley, D., Carlton, D., Krieter, D., and K. Sabourin. (2006). Southern Wildfire Risk Assessment Final Report. <http://www.southernwildfirerisk.com/reports/projectreports.html>

Hermansen-Baez, L.A., Prestemon, J.P., Butry, D.T., Abt, K.L., Sutphen, R. The Economic Benefits of Wildfire Prevention Education. 2011. http://www.interfaceSoutheast.org/products/fact_sheets_the-economic-benefits-of-wildfire-prevention-education/ or www.srs.fs.usda.gov/pubs/ja/ja_hermansen002.pdf

Prestemon, J.P., Butry, D.T., Abt, K.L., and R. Sutphen. 2010. Net benefits of wildfire prevention education efforts. *Forest Science* 56 (2): 181-192.

Wear, D. N. and J. G. Greis. 2011. The Southern Forest Futures Project Summary Report (Draft). U.S. Forest Service.

Appendix 8 — Graphics

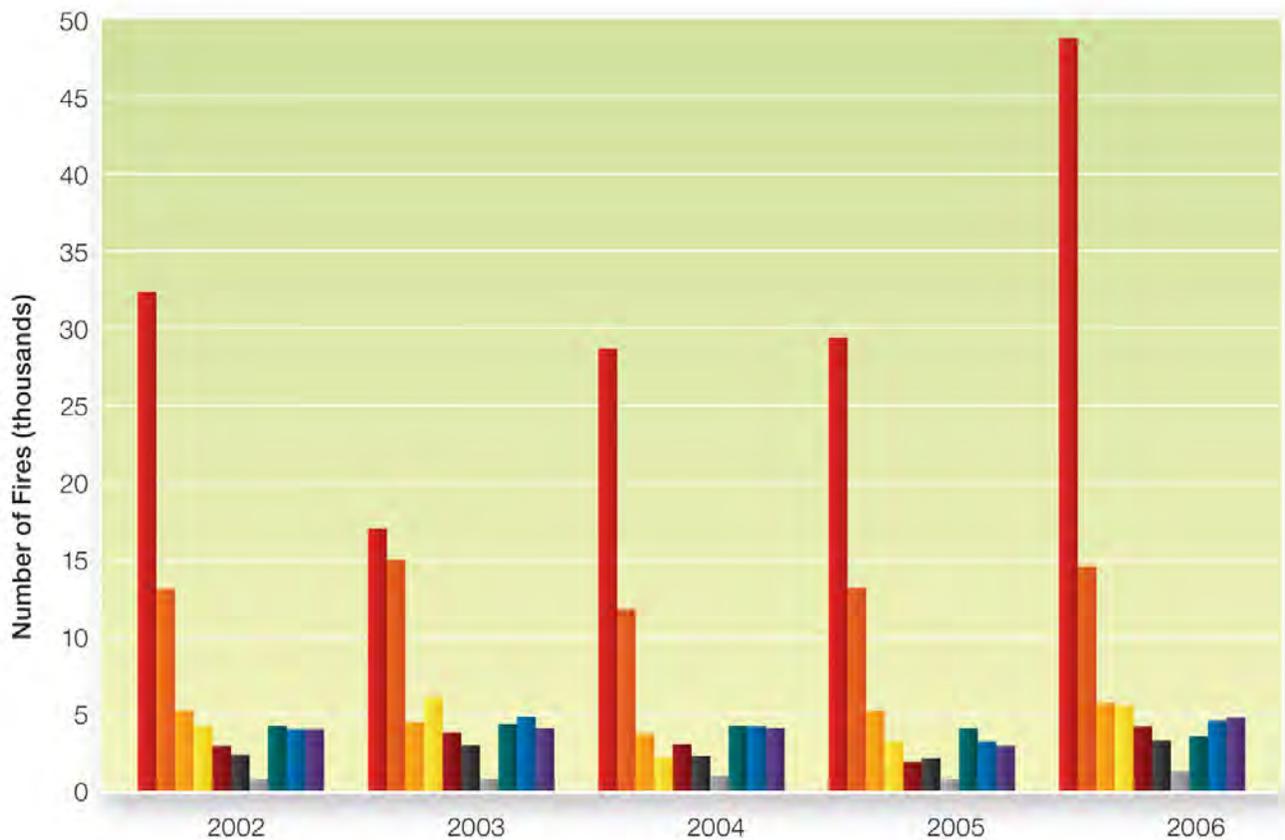
Wildland-Urban Interface Acreage and Percent by State		
	WUI Acres	Percent
Alabama	7,717,348	8.70%
Arkansas	3,707,445	4.20%
Florida	6,455,596	7.30%
Georgia	9,012,124	10.20%
Kentucky	6,011,150	6.80%
Louisiana	3,814,381	4.30%
Mississippi	5,139,675	5.80%
N. Carolina	12,772,497	14.40%
Oklahoma	2,850,113	3.20%
S. Carolina	6,468,498	7.30%
Tennessee	7,820,454	8.80%
Texas	8,006,315	9.10%
Virginia	8,658,057	9.80%

Graphic 1. Wildland urban interface (WUI) acreage and percent of total Southeastern WUI acres by state (SWRA).



Source: National Interagency Fire Center, Wildland Fire Statistics (http://www.nifc.gov/fire_info/fire_stats.htm)

Note: The geographic areas are defined by the Geographic Area Coordination Center boundaries used to collaboratively manage wildfire incident management. Western Texas and Western Oklahoma are not included in the southern geographic area, although they are included in the Southern Wildfire Risk Assessment.



Graphic 2. The number of fires by year (2002 - 2006) for geographic areas of the United States.

APPENDIX 9 – OTHER PERTINENT REGIONAL INFORMATION

Phase III Alternatives Matrix Instructions

The Southeastern Regional Strategy Committee identified priorities for consideration of management alternatives for inclusion in the Phase III report. Emphasizing management activities that achieve objectives identified in the Phase II report and will represent “Alternatives” for the purposes of this report. Ratings will reflect the effectiveness of each objective/alternative in addressing the regional issue in the table. Results will be used to guide the alternatives narrative and trade-off analysis that will be submitted to the RCSC for review and recommendations.

In the intersecting box for each alternative/issue, please enter the appropriate number using the following scale:

- 9 – Most Significant Impact
- 8 – Very Significant Impact
- 7 – Significant Impact
- 6 – Somewhat Significant Impact
- 5 – Neutral or No Impact
- 4 – Somewhat Negative Impact
- 3 – Negative Impact
- 2 – Very Negative Impact
- 1 – Most Negative Impact

These results represent the opinion of experienced and knowledgeable fire professionals and serve as a starting point for the Phase III process.

All individual matrixes were compiled, then added together to calculate an average value for each box in the matrix itself.

From the compiled matrix, an analysis was completed by the RSC and Southeastern Technical Group to identify potential trends. Trends identified were color-coded as follows:

<u>COLOR</u>	<u>TREND</u>
Light Blue	Top actions overall
Light Green	Action high for value
Light Red	Action low for value
Light Brown	Low actions overall

APPENDIX 10 – REGIONAL STRATEGY COMMITTEE/ TECHNICAL GROUP MEMBERS

Southeast Regional Strategy Committee

Mike Zupko	RSC Chair, Southern Governors' Association Representative
Liz Agpaoa	RSC Co-Chair, Regional Forester, Southern Region, USDA - Forest Service (FS)
Forrest Blackbear	Bureau of Indian Affairs (BIA)
Tom Boggus	Texas State Forester, National Association of State Foresters (NASF)
Rob Doudrick	Station Director, Southern Research Station (SRS), USDA - FS
Wade Johnson	National Association of Counties (NACo)
Jim Karels	Wildland Fire Executive Council Liaison, Florida State Forester
Kier Klepzig	Assistant Director, SRS, USDA - FS (SRS Alternate)
Pete Kubiak	Chief, Division of Fire Management, US Fish and Wildlife Service (FWS)
Samuel Larry	National Park Service (NPS)
Tom Lowry	Choctaw Nation
Will May	International Association of Fire Chiefs (representing local Fire Service)
Alexa McKerrow	Biologist, US Geological Survey (USGS)
Dan Olsen	Deputy Director, Fire & Aviation Management, Southern Region USDA - FS
Alan Quan	USDA - FS
Shardul Raval	Assistant Director, Fire & Aviation Management, Southern Region, USDA - FS (FS Alternate)

Southeast Technical Group

David Frederick	Chair, Fire Director, Southern Group of State Foresters
Darryl Jones	Vice Chair, State Fire Chief, South Carolina Forestry Commission, Southern Group of State Foresters (SGSF)
Tom Spencer	Vice Chair, Predictive Services Department Head, Texas Forest Service, SGSF
Margit Bucher	North Carolina Fire Manager, The Nature Conservancy
Vince Carver	Regional Fire Ecologist, FWS
Scott Goodrick	Research Meteorologist, USDA - FS
Wade Johnson	NACo
Reese Kerbow	Fire Management Officer, BIA
Alexa McKerrow	Biologist, USGS
Daniel McInnis	Biologist, USDA - FS
Mark Melvin	Jones Research Station, Prescribed Fire Councils
Shardul Raval	Assistant Director, Fire & Aviation Management, Southern Region, USDA - FS
Rachel C. Smith	Emergency Operations Specialist, USDA - FS
Liz Struhar	Fire Planner, NPS
Ronda Sutphen	Florida Department of Forestry
Marshall Williams	Department of Defense

APPENDIX 11 – ACKNOWLEDGEMENTS

Alabama Forestry Commission
Alabama Prescribed Fire Council
Arkansas Forestry Commission
Arkansas Prescribed Fire Network
Bureau of Indian Affairs
Central Florida Prescribed Fire Council
Firewise Communities U.S.A.
Florida Forest Service
Forest History Society
Georgia Forestry Commission
Georgia Prescribed Fire Council
International Association of Fire Chiefs
Jones Research Center
Kentucky Division of Forestry
Kentucky Prescribed Fire Council
Louisiana Department of Agriculture and Forestry
Louisiana Prescribed Fire Council
Mississippi Forestry Commission
Mississippi Prescribed Fire Council
North Carolina Forest Service
North Carolina Prescribed Fire Council
Northern Florida Prescribed Fire Council
Oklahoma Forestry Service
Oklahoma Prescribed Fire Council
Prescribed Burn Alliance of Texas
Puerto Rico Forest Service
South Carolina Forestry Commission
South Carolina Prescribed Fire Council
Southern Florida Prescribed Fire Council
Southern Group of State Foresters
Southern Governors' Association
Texas A&M Forest Service
Tennessee Division of Forestry
The Culinary Institute of America
The Nature Conservancy
University of Georgia Southern Region Extension
U.S. Department of Agriculture Forest Service
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. National Park Service
Virginia Department of Forestry
Virginia Prescribed Fire Council

APPENDIX 12 – COMPLETE LIST OF SOUTHEASTERN BARRIERS AND OPPORTUNITIES

The intent of listing these as priority national barriers from the Southern perspective is the fact that they need to be addressed at the national level to be most effective.

5	Need incentives to increase fuels management on private land.	<ol style="list-style-type: none"> 1. Develop landowner incentives (e.g., tax breaks, free disposal of material, increased use of Wyden Amendment and other finance or cost-share authorities). 2. Work with NRCS, FSA and other USDA agencies to better incorporate and/or incentivize prescribed burning on tribal and private lands. (e.g. Rx ranking for landowners wanting to use could be weighted higher) 3. Work with DOI to develop additional programs for fuels management on private lands in proximity to federal holdings. 4. Work with EPA to reduce restriction to use of prescribed fire due to Smoke tolerance and emissions (air quality) this is both for wildfires and prescribed fires. Part is education of the general public – the other part is education/science working with EPA on short-term effects v long-term impacts and extent of emissions. 5. Address the smoke and fire liability issue that is a hindrance to both landowner performing prescribed burns and practitioners in offering burning as a service. 6. Require federal lands to use the fire frequency as set in their approved management plans. Tie execution to performance evaluations. 7. Work with FEMA to maximize fuels reduction across the landscape.
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10	Need adequate state and/or local ordinances related to wildfire prevention which are enforceable.	<ol style="list-style-type: none"> 1. Determine use and effectiveness of existing state and/or local ordinances related to prevention. 2. Establish/coordinate new state and/or local ordinances (or nationally best practices) related to wildfire prevention. 3. Issue authorities (or incentivize the creation) to enforce state and/or local prevention ordinances. 4. Develop extensive listing of lessons learned and model ordinances that can be shared nationally. 5. Evaluate practices such as permanent fuel breaks, property edge setbacks, and access for emergency response resources as potential future BMPs to reduce the potential spread of wildfire.
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20	Need growth management, land development, and zoning laws that require defensible space wildland fire risk reduction actions as communities develop, and the maintenance of wildland fire risk reduction practices prior to development. ¹	<ol style="list-style-type: none"> 1. Work with planners/developers to develop best practices at the national level (e.g. APA) 2. Work with insurance industry on products that motivate homeowners to create fire adapted homes 3. Create a model fire adapted community concept that can be replicated in planning and target in fire-prone areas with reduced fees and higher ISO ratings (compared to locale). 4. Encourage and incentivize homeowners to create both managed natural and landscaped plantings, trees and shrubs on parcels, and build/retrofit the exterior of structures with fire resistive materials and protected ventilation openings resulting in greatly diminished risk from wildland fire through aggressive and long term sponsored education programs 5. Construct a federal incentive program to reimburse for the creation of fire adapted communities through CWPPs and other comprehensive community planning practices. 6. Work with States and local governments to require comparable fire response growth with Community growth. 7. At Federal Agency, State and local government level develop codes and standards for developing and maintaining Fire Adapted Communities reflecting regional and local wildland fire risks to Human Communities, including landscape and structure components/issues.
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33	<p>Must be able to effectively and efficiently share resources. Need to remove policy barriers and process complexities which affect the ability to effectively and efficiently share resources, not only for wildfire, but for fuels and prescribed fire work.</p>	<ol style="list-style-type: none"> 1. Identify policy barriers that prevent the effective sharing of resources – then change those policies at the national level (such as FS cooperative fire billing agreements). 2. Overcome barriers to qualification standard inconsistencies within federal agencies as well as between federal agencies and non-federal firefighters that pose challenges during the sharing of resources. 3. Identify complexities that need to be simplified in order to efficiently share resources 4. Improve organizational efficiencies and wildfire response effectiveness. 5. Address preparedness strategically for greater efficiency and cost effectiveness. 6. Develop a flexible and mobile response capacity to better utilize local resources. 7. Create an improved process for the sharing of trained prescribed fire resources including, but not limited to, utilization of the national prescribed fire training center. (and make sure it is consistent among all federal agencies) 8. Interoperability radio issues (not sure if this ties to original intent of the barrier, but may be appropriate here as well)
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Second Tier

2	x					<p>Need new technologies and local infrastructure for biomass removal and utilization.</p>			<ol style="list-style-type: none"> 1. Identify new technologies, 2. Identify existing technologies which are unutilized. 3. Encourage incentives through existing legislation or enact new legislation such as Farm/Energy Bill incentives that address industry needs.
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11		x						<ol style="list-style-type: none"> 1. Engage elected officials at all levels – city, county, state, tribal, and federal. 2. Actively encourage State, Tribal and local governments and officials to adopt WUI Codes, Growth Management Policy for the WUI, and associate Land Development Regulations, and enforcement of all. The Federal government must take a lead roll in this and all WUI and FAC endeavors. 3. State and local governments must implement increased response capability with every WUI develop plan approved to become available as 50% of the development is completed/occupied. 4. Increased social science research to learn more about WUI residents and potential new WUI residents and why they want to live in the WUI, and how to advise them to accept their share of the risk and mitigation of the risk.
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31			x	x		<p>Inefficiencies in the national qualification standards and procedures must be addressed to increase response capabilities.</p>	<p>Responding to wildland fire events is a complex, interagency task. Many resources that would otherwise be available for mobilization are unavailable because of cumbersome qualification standards and procedures. As a result, resources are not available for mobilization.</p>	<p>Build on existing success (e.g., IQCS, Recognition of Prior Learning (RPL), Service First).</p> <p>We have a national tracking system for resource mobilization which is ROSS. We need to shorten time for qualifications which is part of the NWCG Workforce Development Goal and IMT Succession Project so work is in progress.</p>	<ol style="list-style-type: none"> 1. Build on existing success (e.g. Incident Qualification and Certification System (IQCS), Recognition of Prior Learning (RPL), and Service First to develop a national qualification system to track federal, tribal, local, state, and private community responders 2. Refine and implement RPL as a tool for assessing skills and knowledge associated with Position Task Books (PTB's); and to assess and recognize a FF's learned "competencies" for wildland fire positions 3. Expand the application of the Crosswalk for Wildland Fire, providing nationwide marketing to the structure fire community to expand the numbers of local responders qualified for wildland fire response assignment.
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THE NATIONAL COHESIVE WILDLAND FIRE STRATEGY

Southeast Regional Risk Analysis Report



Phase III
Science-
Based
Report



RESILIENT LANDSCAPES
FIRE-ADAPTED COMMUNITIES
FIREFIGHTER SAFETY

EXECUTIVE SUMMARY

Wildland fire management in the Southeastern United States is complex and multi-faceted. The significant threat posed by unplanned or undesirable fires threatens the lives and well-being of emergency responders and the public, and damages or destroys homes, property, and other values-at-risk. Although the Southeastern region includes just thirteen states, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands, it leads the nation in the number of annual wildland fire ignitions (Fig. 1), with an average of 41,500 unplanned ignitions burning a total of 1.9 million acres every year (NICC 2012).

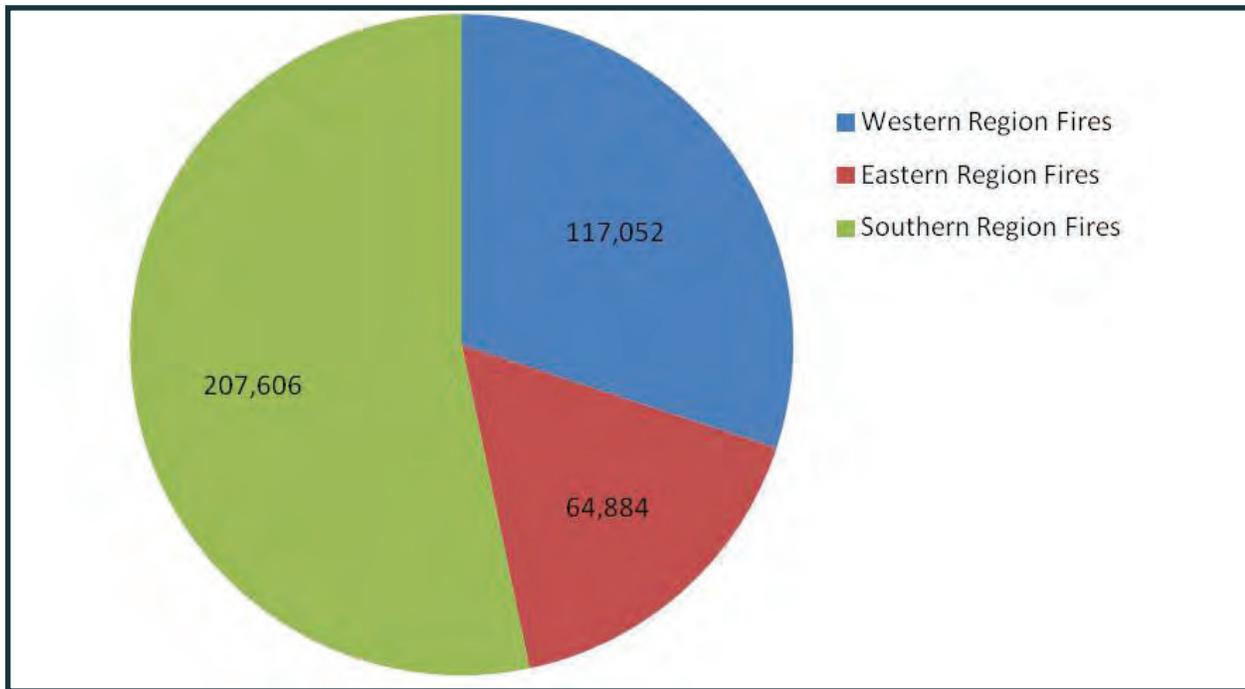


Figure 1. Number of fires by region, 2007–2011 Source: NICC 2012

This management challenge is exacerbated by rapid population growth, rapid expansion of wildland urban interface (WUI) areas, and the fragmentation of land ownership in the region. In 2011, 10 firefighters lost their lives during wildfire management in the Southeast (NIFC 2011). During that same year, in Texas alone 3,993,716 acres were burned by wildland fires, with 5,738 structures destroyed, including 2,946 homes (Texas Forest Service 2012). Today 118,083 Southeastern communities are considered at risk from wildfire (Southern Wildfire Risk Assessment 2006). Of these, 43 percent are assessed as being at very high or high risk from wildfire (Andreu 2008). Wildfire threat to homes is consistently above average due to the number and density of homes throughout the Southeast (Fig. 2).

Over the past decade, population growth in the Southeast has outpaced any other region in the country. According to the 2010 U.S. Census, the South's population grew 14.3 percent between 2000 and 2010 to reach 114.6 million inhabitants at the end of the decade (Fig. 3). As of 2010, six of the ten fastest growing counties were in Southeastern states along with a total of 36 percent of the nation's population (U.S. Census Brief 2010).

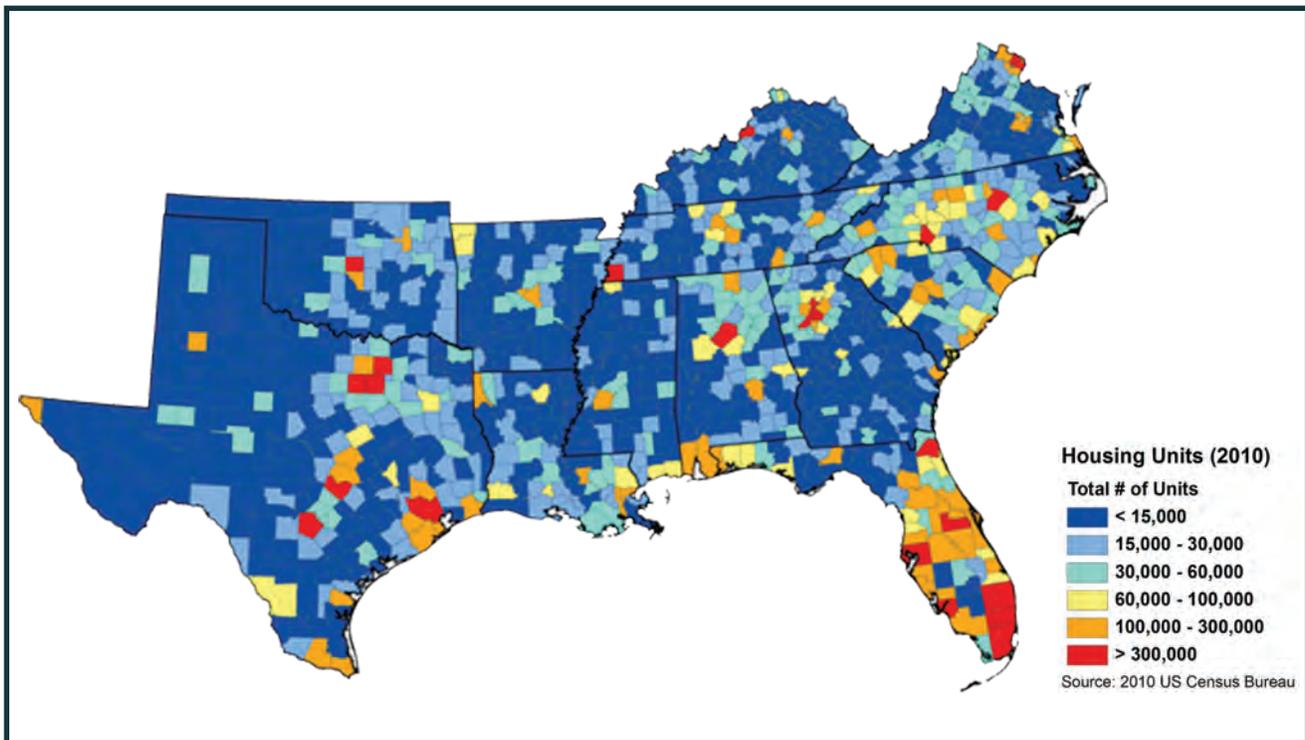


Figure 2. Number of housing units per county in the Southeast

In the past, the Southeastern fire and land management community has relied on cultural and historical acceptance of land management activities including prescribed fire to facilitate their implementation of appropriate management activities. New residents, however, are often unfamiliar with the use of fire as a valuable management tool. This population and an accompanying significant demographic shift, along with other factors, are creating new challenges for the fire management community. It is increasingly more difficult for agencies, organizations, and landowners to plan for and respond effectively to wildfire, while protecting vulnerable WUI communities and providing for firefighter safety. The Southeast has a complex fire environment unlike any other in the nation, with interrelated critical controlling factors influencing wildland fire management including:

1. **Wildfire Activity:** Between 2001 and 2010 nearly half of all national ignitions and over 40 percent of the country's large wildfires occurred in the Southeast.
2. **Large and Rapidly Expanding WUI:** As of 2000, more than half of WUI acres were located within the Southeast.
3. **Smoke Management Challenges:** Smoke impacts safety, health, and quality of life. Smoke-related impacts challenge the fire management community to implement management and response activities safely.
4. **Year-round Fire Season:** Wildland fires burn all 12 months of the year in the Southeast, stressing firefighting capacity and resources.
5. **Area Protected:** More than 420 million terrestrial acres are protected from wildfire by federal, Tribal, and state agencies with just under half (200 million acres) being forested lands.

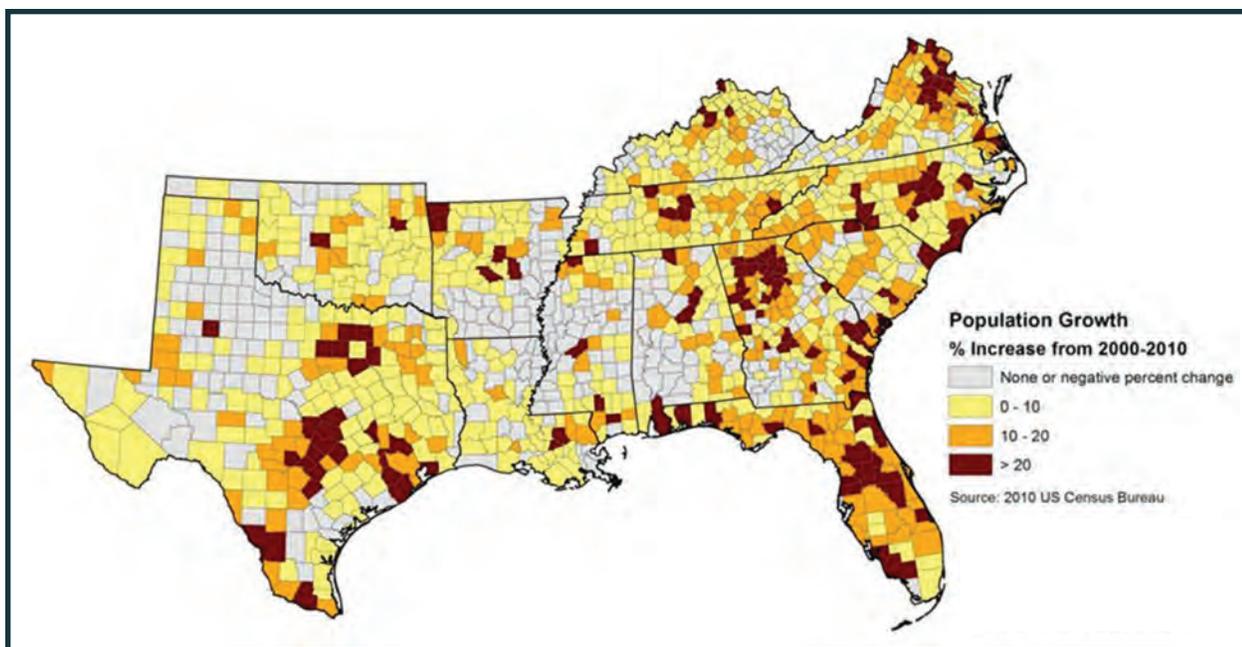


Figure 3. Population growth in the Southeast between 2000 and 2010

6. **Privately Owned Forestland:** Nearly 90 percent of forestland in the Southeast is owned by more than five million private landowners.
7. **Prescribed Burning:** The Southeast leads the nation in prescribed burn acres accomplished on silvicultural land; but issues related to capacity, smoke, and liability are significant obstacles to encouraging practitioners to increase prescribed burning. Prescribed fire must occur at a much greater frequency than elsewhere in the country as a result of the region’s rapid vegetation regrowth rate.
8. **Invasive Species:** Many invasive species spread quickly after a wildfire event, contributing to fuel loading and otherwise influencing forest health (e.g., cogongrass (*Imperata cylindrica*)).
9. **Working Forests:** Traditional and new economically viable forest markets support local economies, help curb hazardous fuel accumulation, and serve as a source of local wildfire knowledge, but the long-term strength of these markets is unknown.
10. **Strong Relationships in the Fire Management Community:** An extensive history of excellent cooperation and working relationships exists between agencies, organizations, and local fire departments with other wildland fire management organizations, resulting in a safer, more effective response and collaborative planning for future occurrences.
11. **Rural Fire Departments:** An extensive network of rural fire departments, including many volunteer fire departments, are responsible for many initial responses to wildfires throughout the region.

No single agency, organization, or landowner can adequately address these complex and related challenges on their own. The National Wildland Fire Management Cohesive Strategy (Cohesive

Strategy) is a collaborative, three-phase effort to create a landscape-level national fire strategy that addresses these increasingly complex challenges of wildland fire management in the United States. This national effort is novel in that it has encouraged participation by all individuals and entities with a stake in fire management as partners during the strategy’s development. This diverse stakeholder group includes federal and state land management agencies, local governments, private landowners, environmental groups, Tribal groups, fire professionals, non-governmental organizations, and others. The Cohesive Strategy effort also marks the first time that regions of the country have had an opportunity to provide locally specific input for incorporation into a national strategy. Stakeholders from the Southeast have engaged in the Cohesive Strategy effort during the entire process. During Phase I, national goals were established and a framework for the creation of the strategy was developed. In Phase II, the Southeastern region identified three regional goals and objectives that highlighted challenges, resources, and evolving opportunities unique to the South. The goals identified are:



1. ***Restore and Maintain Landscapes:*** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
2. ***Create Fire-Adapted Human Communities:*** Human populations and infrastructure can withstand a wildfire without loss of life and property.
3. ***Respond to Fire:*** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

During the past ten months, the Southeastern region has been in the process of selecting regional alternatives as part of the Phase III process. These regional alternatives focus on identifying specific actions and activities that would best help achieve regional objectives while retaining maximum flexibility for land managers to determine the most appropriate management activities for their property. Six key values important to Southeastern stakeholders were identified early in the Cohesive Strategy process, and helped guide the development of regional alternatives, along with the regional goals and objectives developed during Phase II. For the purpose of this report, those six items were consolidated into five values:

1. ***Firefighter and Public Safety***
2. ***Marketable Products***
3. ***Ecological Services***
4. ***Cultural values***
5. ***Property Loss***

Three Goals of the Southeastern Cohesive Strategy

1. Restore and maintain landscapes
2. Create fire-adapted human communities
3. Respond to fire

Firefighter and Public Safety

Actions and activities that would have the most significant impact on enhancing firefighter and public safety, as well as achieving regional goals, have been identified from the Phase II Regional Assessment. The numbering reflects their location in the Phase II report. The emphasized actions and activities are as follows:

1. Utilize prioritization in SWRA and other efforts to identify and treat wildland fuels in areas that will facilitate tactical defense of human communities or ecological values and services from wildfire (tactical fuel breaks). (1.2.2)
2. Increase community preparedness and mobilization abilities (e.g., evacuation) and increase coordination and planning between local, state, and federal responders prior to wildfire ignition. (2.2.3)
3. Train, develop, and increase state, federal, Tribal, and local agencies and cooperating entities capacity for wildland fire management to ensure staffing levels meet operational needs. Utilize training academies and improved MOUs to increase response capacity, including awareness of risk management techniques. (3.1.1)
4. Investigate and invest in the development and deployment of specialized fire suppression equipment to increase the efficiency and effectiveness of wildland fire suppression activities. Ensure that specialized equipment is available to all entities that have a role in wildland fire suppression. (3.2.2)
5. Utilize relationships to increase interagency cooperation during wildland fire suppression. Develop/encourage the implementation of statewide mutual aid agreements and cross-jurisdiction MOUs, including Cooperative Fire Agreement billing. Support development of interagency all hazard Type 3 IMTs. (3.2.4)

Marketable Products

Actions and activities that would have the most significant impact on marketable products, as well as achieving regional goals, have been identified from the Phase II Regional Assessment and are as follows:

1. Encourage the use of alternative management techniques (mechanical, grazing, etc.) to restore and maintain fire dependent ecosystems where fire is not feasible or desirable. (1.1.4)
2. Use education and incentive programs to encourage new and nontraditional private landowners to manage their lands to contribute to resiliency while providing forest products and expanding ecosystem markets. (1.1.5)
3. Encourage traditional and developing economic markets, such as biomass, to enhance economic viability of timber harvesting and mechanical fuel treatments. (1.2.4)
4. Encourage landowners, particularly new and non-traditional landowners to deliberately actively manage land regardless of ownership objectives, including fuels management. (1.2.5)
5. Control invasive species that alter fire regimes and ecosystem function. (1.5.2)

Property Loss

Actions and activities that would have the most significant impact on protecting property, as well as achieving regional goals, have been identified from the Phase II Regional Assessment and are as follows:

1. Utilize prioritization in SWRA and other efforts to identify and treat wildland fuels in areas that will facilitate tactical defense of human communities or ecological values and services from wildfire (tactical fuel breaks). (1.2.2)
2. Promote establishment of insurance incentives, building and landscape ordinances, and ignition resistant construction techniques through communication and collective action with planners and insurers, emphasizing Firewise concepts when planning communities and building homes to reduce wildfire impacts. (2.1.3)
3. Increase awareness of community and homeowner responsibility for fire preparedness and prevention. (2.1.4)
4. Encourage development and implementation of CWPP and Firewise or equivalent concepts, prioritizing CARs in greatest need of CWPPs. (2.1.5)
5. Increase community preparedness and mobilization abilities (e.g., evacuation) and increase coordination and planning between local, state, Tribal, and federal responders prior to wildfire ignition. (2.2.3)

Ecological Services

Actions and activities that would have the most significant impact on enhancing ecological services, as well as achieving regional goals, have been identified from the Phase II Regional Assessment. Some of these actions and activities have been slightly revised to reflect the changing needs perceived by stakeholders involved in the Cohesive Strategy process. The identified actions and activities are:

1. Promote and use fire to emulate natural disturbance patterns to maintain and improve ecological systems, balancing social, cultural, and economic needs, especially over large contiguous landscapes. (1.1.1)
2. Plan and implement post-fire stabilization and rehabilitation activities and education in order to reduce site degradation and potential impact from hydrological events, invasive plant infestations, and other events that follow severe fires. (1.1.6)
3. Support efforts to increase prescribed burning for ecosystem restoration (e.g., SERPPAS efforts for Longleaf pine restoration). (1.1.7)
4. Work with regulatory agencies and entities (i.e., air quality) to ensure that prescribed fire remains a viable management tool and maximize flexibility for its use.
5. (including liability issues). (1.2.3)
6. Control invasive species that alter fire regimes and ecosystem function. (1.5.2)

Cultural values

Actions and activities that would have the most significant impact on protecting and enhancing cultural values, as well as achieving regional goals, have been identified from the Phase II regional assessment and are as follows:

1. Use education and incentive programs to encourage new and nontraditional private landowners to manage their lands to contribute to resiliency while providing forest products and expanding ecosystem markets (“working forests”).
2. Support the “One Message, Many Voices” campaign and development of other unified prescribed fire education programs. (1.1.5)
3. Support efforts to increase prescribed burning for ecosystem restoration (e.g., SERPPAS efforts for Longleaf pine restoration). (1.1.7)
4. Work with regulatory agencies and entities (i.e., air quality) to ensure that prescribed fire remains a viable management tool and maximize flexibility for its use (including liability issues). (1.2.3)
5. Appropriately use cost-effective technology (social media, SWRA, etc.) and systems to ensure decision-makers (county commissioners, urban planners, town councils, etc.) have access to information in a timely manner. (2.3.2)

Actions and activities from Phase II that were considered best able to enhance regional values and make progress towards achieving regional goals were identified for each of the five value areas. The goal of this process was to identify emphasized alternatives which, using a scientifically-informed approach, would potentially have the greatest positive impact in each value area, developing a suite of potential choices to be used in combination or singly. The diversity of ecosystems, land management goals, and landscapes across the Southeast means that a single solution will not work for everyone. Additionally, with nearly 90 percent of Southeastern land owned privately, decisions cannot be made at the state or regional level for the vast majority of landholdings. Instead, partners in the Cohesive Strategy may, moving forward, work collectively with land managers and landowners, using the best available information, to encourage and inform their decision-making process to help address issues and challenges related to wildland fire. Several tools have been developed and made available that will continue to inform the decision-making process in the future. Twenty-five actions and activities were identified from the Phase II report and are included in the Alternatives section of this document.



Each decision includes trade-offs and associated costs. Having a number of feasible options that are efficient and effective at focusing on regional goals and values will be valuable for stakeholders. The

Southeastern group, with the assistance of regional stakeholders, found several broad themes that ran throughout the actions and activities identified. These themes included:

1. *Prescribed fire and fire use*
2. *Fuels treatment other than fire*
3. *Working forests*
4. *Planning for fire, forest resiliency and community safety*
5. *Incentives for fuels management*
6. *Treatment and restoration of areas affected by natural events and fire*
7. *Community protection and prevention programs, ordinances and construction, homeowner responsibility, fire prevention*
8. *Community preparedness, evacuation, and planning by responders*
9. *Use of technology to inform community leaders*
10. *Specialized response equipment, training, developing and ensuring adequate staffing of responders*
11. *Interagency suppression cooperation, MOUs, and Mutual Aid*

The Southeast faces significant and growing challenges related to wildland fire management. Decision-makers and land managers at all levels must weigh trade-offs, goals, and values-at-risk in order to select the most appropriate suite of alternatives that best serve to accomplish land management goals safely and effectively. However, faced with burgeoning population and rapidly growing WUI areas, along with climate change, land ownership fragmentation, decreasing budgets, and other concerns, it is clear that collective action is required. The National Cohesive Wildland Fire Management Cohesive Strategy serves as both a framework as well as a mechanism through which stakeholders in fire management can work together to prepare and protect vulnerable populations from wildfire risk, ensure effective wildfire response, and restore and maintain some of the most intact and extensive fire-adapted landscapes in the United States.

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- 3. Working forests*
- 4. Planning for fire, forest resiliency and community safety*
- 5. Incentives for fuels management*
- 6. Treatment and restoration of areas affected by natural events and fire*
- 7. Community protection and prevention programs, ordinances and construction, homeowner responsibility, fire prevention*
- 8. Community preparedness, evacuation, and planning by responders*
- 9. Use of technology to inform community leaders*
- 10. Specialized response equipment, training, developing and ensuring adequate staffing of responders*
- 11. Interagency suppression cooperation, MOUs, and Mutual Aid*

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Thoughts Regarding Additional Steps Needed within Phase III

Danny Lee and Tom Quigley

The draft regional reports submitted on October 15, 2012, reflect tremendous effort, energy, and thought given to the issues of wildland fire management throughout the regions. These documents and the collaborative efforts required to create them will have substantive and lasting value as the Cohesive Strategy moves forward. When compared to the expectations articulated for Phase III in the Phase II report, however, the current reports fall short of expectations. Consider this excerpt taking from pages 46 and 47 of the Phase II final report.

[Begin Excerpt from the Phase II National Report]

The NSAT will develop analytical models and interact with the RSCs and work groups to explore alternative management strategies (alternatives) for each region, based on application and utility of the models. To complete these analyses, the WFEC, CSSC, and RSCs will engage with the NSAT to do the following:

1. Translate the conceptual models developed in Phase II into quantitative and qualitative models, as appropriate. Create a nationally consistent set of analytical models that can operate at regional scales using regionally specific data, relationships, and assumptions. Retain the individuality of the regions, recognizing regional differences, while employing a consistent analysis across the Nation.
2. Compile and integrate appropriate data to quantify and validate the relationships presented in the models, using both Federal and state data sources. Specific data, relationships, and information needed to run the analytical models will be brought together for initial tests.
3. Identify performance measures that can be used across all regions and within a given region.
4. Identify geographic variations in the models to reflect appropriate differences across the regions. Variations in wildland fire and wildland fire management are apparent across the major regions. It is important that analytical models reflect appropriate variations.
5. Interact with the RSCs to validate that the modeled relationships are reasonable. Validation of the models and the data will be conducted with the RSCs and the working groups.

6. Explore specific alternatives developed by the RSCs through regional analysis. Alternatives are strategic management options that reflect the decision space available for broad national and regional choices related to wildland fire management and policies. Initial regional alternatives, coupled with additional alternatives developed nationally, will be analyzed to explore the potential outcomes and associated trade-offs of different choices, using the models to predict outcomes.

7. Interact with the RSCs to revalidate analysis models and iteratively refine regional alternatives to be included in the comparative risk analyses—national trade-off analysis. Study analysis models via beta testing before refining alternatives. Refine alternatives to include in the comparative risk analyses and national trade-off analysis. Illustrate the trade-offs—benefits and consequences with regard to modeled performance outcomes—associated with each alternative to inform policy managers and decisionmakers.

8. Conduct and document the comparative risk analyses—national trade-off analysis. Coordinate efforts with other committees to report on results of the national trade-off analysis. Utilize models to project how risk varies under each alternative. The risk trade-off analysis will allow for a comparison of the performance outcomes of each alternative, based on a modeling projection. The trade-offs—benefits and consequences—of each alternative are intended to be useful for further deliberations among stakeholders, partners, agencies, and policymakers, as decision processes move forward. A report will document the processes, analyses, and results of the regional and national science-based risk analyses.

[End Excerpt]

In our opinion, current progress could be characterized as falling somewhere in the early stages of step six. That is, some analysis of the alternatives articulated by the regions has taken place, but the analysis is incomplete. There are various reasons that could be identified as to why progress has fallen short of expectations, but lack of effort from any of the involved groups is not the culprit. One unanticipated issue that has contributed to the current status has been the lack of clear spatial priorities within the alternatives. Simply stated, it's hard to judge the effects of a series of actions without knowing where and to what extent those actions would be implemented. General guidelines can only be taken so far without making a series of major assumptions. Thus, much of the work of the NSAT in recent months has been to develop a series of tools that would allow the regions to carefully and rationally identify criteria that would in turn lead to spatial prioritizations. Unfortunately, there has not been sufficient time to exercise these tools with the regional strategy committees. Such an exercise could be an informative step in trying to understand possible consequences of the different alternatives.

During the CSSC and WFEC discussions of October 17 and 19, 2012, several different options were voiced regarding various forms of regional analyses that might be pursued—with no clear consensus emerging. In contrast, there seemed to be more general agreement about the need for a national trade-off analysis that would specifically include federal policy choices and their associated costs. We believe that the information exists for supporting both regional and national analyses, but it will be challenging—especially within the timeframes under consideration. Below we identify several key issues that have to be resolved before we can expect to make timely progress.

The first issue is to define exactly what is meant by a regional trade-off analysis and how such analyses compare to a national analysis. The assumption going into Phase 3 is that regional and national “alternatives” would be sufficiently dissimilar such that one could readily see how different policy choices had been incorporated, and what the subsequent consequences would be of these choices. Trade-offs would be inherent in the mix of projected outcomes resulting from each alternative, measured using several different metrics associated with risk. The idea was to compare alternatives much as one might compare different shopping carts filled with different mixes or quantities of the same set of items. In such comparisons, cost is but one of many criteria and perhaps not even the most important.

The two primary components of such an analysis are the alternatives and the method used to estimate consequences. They work hand-in-hand in that the analytical method has to be tailored to the alternatives, and vice versa. Thus far, the NSAT has emphasized the use of empirical data in the development of its analytical methods. The value of such an approach is that results are consistent with patterns seen in real data, not based on assumptions or unsupported hypotheses. The downside is that variation or errors in data can obscure underlying relationships, resulting in a reduced signal-to-noise ratio. The net result is that the alternatives must be sufficiently dissimilar, indeed exaggerated, to the point that the projected effects are large enough to overcome the noise inherent in the data.

The value of such an analysis is not to prescribe an exact solution, but rather to lay out the range of policy options that might be available and the potential consequences of moving in a different direction from the status quo. Such an analysis would include options that stretch the bounds of practicality. Indeed it may even examine options that would be inconsistent with existing laws or statutes. Whether such an analysis is essential or even useful within a regional report is an open question. The value of a national analysis is more readily apparent. Hard questions have been asked regarding the sustainability and effectiveness of the current national approach to managing wildland fire. A national analysis could help inform that conversation, even if it fails to provide an exact, optimal solution.

Proposed Process

So how can we proceed in developing a national analysis? We propose a national analysis that would proceed in a series of four steps. The process outlined below is an alternative to the original eight-step process, but ultimately produces similar information—albeit in a different order. In this revised process, a national analysis precedes any further quantitative analysis of regional alternatives. The purpose of the national analysis is to examine trade-offs among broad policy choices and to specifically identify the implications of alternative federal investment options. The results from the national analysis could then be disaggregated to create regional summaries that would be useful at that level.

Step 1: The first step would involve a greater in-depth analysis of wildland fire issues and interrelationships among biophysical and social economic drivers. The intent would be to seek understanding about how current policies and available resources across multiple sectors (both public and private) are linked to wildland fire. This effort would build directly on the work of the regional strategy committees and their associated work groups, but would go further into understanding the issues using data that have been assembled. Bayesian networks would be the primary mode of analysis that would be used to identify and quantify interrelationships. This step completes the analysis originally expected in steps 1-4 from the Phase II report, but shifts to a national perspective.

Step 2: The next step would be to lay out the broad policy options that would be considered within the national analysis. These policy options would involve multijurisdictional choices, in that they would go beyond options that affect only federal agency prerogatives and include actions that span national to local entities. The federal component could be specifically identified for the purposes of additional cost analysis. Again, these national policy options could be based in part on the work of the regions, but would likely include options that were not explicitly addressed within the regional reports.

Step 3: The third step would be to project the effect or consequences of the policy options using the networks that were developed in step one, in combination with a set of ancillary models or assumptions that would have to be made in order to link various actions to the primary drivers. Consequences would be described using a common set of quantitative and qualitative metrics. Maps, charts, and tables would be used as appropriate to characterize results and display trade-offs inherent in choosing among the options.

Step 4: The final step would be the preparation of a national report(s). More than one report may be essential because any report that accurately describes the national analysis is likely to be both lengthy and technical. It also should be peer-reviewed in order to ensure credibility. A

summary report that is written for more general audiences could be produced. Adequate time must be allotted in order to produce these reports once the analyses are completed.

The process to accomplish these four steps could include naming a small group that would work with the NSAT to complete the analysis and write the reports. This group would include representatives from each RSC and individuals with national-level responsibilities. The RSCs would be asked to track progress, discuss findings, and understand the outcomes, but would not be directly responsible for the analyses.

Defining national policy options will be both essential and potentially difficult. We expect to use what has been learned to date in the Cohesive Strategy with respect to regional differences in addition to national perspectives. The options are national in that they are strategically important across the country, not that they are a one size fits all prescription that ignores important regional or local differences.

We might begin the discussion about policy options for the national analysis by considering common themes arising from the regional analyses and the discussions leading to the draft Phase III reports. For example, five of the major issues that are commonly expressed include: 1) loss of fire resilient landscapes; 2) human caused ignitions; 3) the risk of wildfires damaging communities; 4) uneven response capacity; and 5) rising suppression costs.

Potential policy options might be explored linked to these common themes. For instance, policy choices might include:

1. Focus on improving resiliency on federal or state administered lands through the use of active fire and fuels management. Estimate the amount of treatment that might be required to change the fire dynamics of these landscapes. In turn, ask what the effect on risk to nearby human communities might be of this emphasis. Also, what effect would it have on suppression costs in both the near and long term?
2. Focus on prevention of human-caused ignitions across all landscapes. Ask where prevention programs would have the greatest effect on reducing risk to communities and fire fighters. What are the practicalities and consequences of reducing human-caused ignitions by a large amount, say 50%?
3. Focus on communities at risk. Thoroughly and rigorously examine and identify those factors that most contribute to risk and how these factors vary across the country. Ask how coordinated actions at the national, state, local, and individual homeowner level can affect risk. Where are the greatest needs? Where can national policy choices have the greatest effect?

These three examples illustrate the types of questions that could be examined with a national analysis. In addition, the result of the national analysis can be disaggregated and summarized by region. The regional summarized could then be used by the RSC's as they choose.

Timeline

The time required to complete the effort described here will depend on a variety of factors, including the degree and efficiency of interactions between/among the NSAT and other groups. Assuming such interactions work smoothly, six months is a reasonable length of time to expect to complete the analyses and accompanying reports. Our expectation is that all work would be completed and reports submitted to the CSSC in time to submit a final draft to the WFEC by June 1, 2013.

The National Cohesive Wildland Fire Management Strategy: Phase III Western Regional Science-Based Risk Analysis Report



Draft Report of the Western Regional Strategy Committee
October 29, 2012

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Executive Summary

The National Cohesive Wildland Fire Management Strategy: Phase III Western Regional Science-Based Risk Analysis Report (Western Regional Risk Report) has been developed by representatives of federal, state, local, and tribal governments, interested governmental and non-governmental organizations, businesses and industries to comprehensively address issues relating to wildland fire in the West. The Western Regional Strategy Committee (WRSC) was developed to provide inclusiveness and transparency to stakeholders in the process of addressing the wildland fire challenge, while focusing on the three goals of the Cohesive Strategy: Restoring and Maintaining Resilient Landscapes, Creating Fire Adapted Communities, and Responding to Wildfires. Stakeholder input has been instrumental in forming the risk analysis and alternatives to address the wildland fire management issues in the 17 Western states.

The Western landscape is diverse and reaches from the plains states of Kansas and Nebraska to Hawaii, Alaska and the western pacific islands such as Guam and American Samoa. This diverse landscape creates strengths and weaknesses. One identified weakness concerns availability of data across all lands. A need for data from our island partners and Alaska has been identified, and the Western region will work to address this need in the future.

The Western Region contains a vast amount of land administered by federal agencies, which creates opportunities and challenges. The West has significant wildland fire risks from overstocked fuel conditions, insects and disease, invasive species, and urban development in wildland urban interface areas (WUI). Restoring landscapes to a healthy, resilient state would generate important environmental and social benefits, create much-

needed jobs and revenue for rural economies, and lead to tremendous cost savings in wildfire suppression efforts.

The *Western Regional Risk Report* aims to explore and characterize strategies that stakeholders, communities, agencies and all partners can use to address the three goals. The maps and charts in this document give us a generalized picture across the entire region, while identifying existing biophysical and social conditions and relationships among factors. The analysis shows us where fires are occurring, where future fires are likely to occur, and where we might be able to intervene with mitigation efforts to reduce fuels to reduce the severity of future fires. The landscape needs active management to reduce fuels in order to reduce losses of homes, lives, and resources to wildfire. Experience with fuels treatment projects has demonstrated the value of fuels reduction to reduce suppression costs and protect land and resources, and the importance of collaborative groups, which bring a variety of stakeholders to the table to forge agreements on how to restore landscapes and reduce wildfire risk.

The risk analysis in this report summarizes three alternatives in relation to the three Cohesive Strategy goals and social, economic, and ecological conditions. This Phase III effort builds on the Phase II *Western Regional Assessment and Strategy Report*. The National Science Analysis Team has assembled a library of data and tools that can be used to inform decision-makers in making land management choices.

As part of the Cohesive Strategy planning process, the Western Regional Strategy Committee reviewed and analyzed the data to refine Alternatives 1, 2 and 3, which represent three different focus areas to address in the future development of specific Action Plans. Like the three goals, the three alternatives are not mutually exclusive. Resilient landscapes, fire adapted communities, and improved fire response work together to mitigate the risk of wildfire. There is no one preferred alternative to be applied across the West. Rather, the three alternatives present investment options that are believed to offer the greatest positive impact. The value of employing a blend of the goals and alternatives has applicability across the vast geographic landscape of the West.

- Alternative #1 emphasizes landscape resiliency and recommends activities that contribute to improvements in forest and rangeland health.
- Alternative #2 emphasizes fire-adapted communities in which all stakeholders and affected publics are collaboratively engaged in protecting communities and WUI residents from wildland fire and in fulfilling a stewardship role for their surrounding landscape.
- Alternative #3 emphasizes increased stakeholder effectiveness in risk-based wildland fire response that enhances the effectiveness of firefighter and public safety.

Recommendations

Following from the alternatives are recommendations to address each alternative, plus overarching recommendations that address all facets of the Cohesive Strategy. The following recommendations are broad based.

Overarching Recommendations

- Recognize the depth and importance of the communications framework and provide resources to implement communications recommendations, as it establishes the foundation of our collaborative process.
- Ensure the coordinated implementation of the Cohesive Strategy among all stakeholders.
- Enhance collaboration through incentives.
- Emphasize landscape treatments where existing collaborative groups have agreed in principle on management objectives and areas for treatment, and encourage and facilitate the establishment of collaborative groups.
- Expand collaborative land management, community and fire response opportunities across all jurisdictions, and invest in programmatic actions and activities that can be facilitated by Tribes and partners under the Indian Self-Determination and Education Act (as amended), the Tribal Forest Protection Act, and other existing

authorities in coordination with the UN Declaration on the Rights of Indigenous Peoples.

- Address identified barriers and promote critical success factors across the region and at all levels.
- Provide resources to support local government officials, such as fire chiefs, in the integration of the Cohesive Strategy into their communities and operations – i.e., support the development of an International Association of Fire Chiefs (IAFC) Leaders' Guide for the Cohesive Strategy.
- Formalize a comparative risk model that includes federal, state, and local costs. Use the model to complete a trade off analysis and establish a risk base point.
- Establish the use of the model, including training and data descriptions for local decision makers, such as counties. Facilitate local updates to the models to enable updates to the national models.
- Identify data gaps and inconsistencies, including describing the purpose of the data in monitoring and evaluating progress to accomplishing the goals of the Cohesive Strategy. Prioritize action toward addressing gaps and inconsistencies.

Landscape Resiliency Recommendations

- Encourage US Forest Service and Department of the Interior/Bureau of Land Management to use existing authorities under Healthy Forest Restoration Act, Healthy Forest Initiative, and other contracting authorities to expedite fuels treatments. Assess what is currently being spent on these tools and increase that amount. Project criteria to be worked out during action planning may include: Project has to be 5,000 acres or larger, reduces risk to landscapes and/or communities by focusing on areas that have a high burn probability or departure; has to be initiated within 2 years; and is based on collaborative processes.
- Explore data to identify and prioritize landscapes for treatment. This information would be provided to sub-geographical stakeholders, decision makers, as well as state and federal officials for their consideration and use.
- Expedite coordinated identification, prioritization, and restoration of damaged

landscapes as a result of natural disturbances including, insect/disease, hurricanes, wildfire, invasives, changing climatic conditions. Identify where investments are not likely to restore areas to assist in prioritization of resources.

- Work with Council on Environmental Quality (CEQ) in developing categorical exclusions for landscape restoration.
- Where appropriate, utilize CEQ alternative arrangements when restoring damaged landscapes as a result of natural disturbances.
- Examine legislative related barriers that are impeding implementation of collaboratively developed landscape health related projects and pursue reform of the existing process to increase our effectiveness in active forest and rangeland management. (e.g., Endangered Species Act, Equal Access to Justice Act, National Environmental Policy Act (NEPA)). Encourage and enlist local, state, tribal, and federal environmental regulatory agency representatives to participate actively in collaborative efforts to restore resilient landscapes.

Fire Adapted Communities Recommendations

- Accelerate achievement of fire adapted communities using existing tools; offer incentives, such as chipping/disposal and incentives for collaboration, etc.
- Enhance campaigns to educate the public about the urgent need for homeowners to take action, including having statewide, Western, and other coordinated campaigns. Use videos such as how to protect homes from fire, the importance of fire in nature, and the need to live with fire.
- Facilitate shared learning among communities for fire adaptation.
- Continue to create and update Community Wildfire Protection Plans (CWPPs) using Secure Rural Schools Community Self-Determination Act and identify new funding sources. Be sure to include offices of emergency management and local response entities, such as the sheriff's office in planning efforts. Update CWPPs in areas that have had a wildfire event.
- Review and modify requirements for technical and financial support of communities through Federal Emergency Management Agency (FEMA), i.e. NEPA administrative processes, and applications for funding.

- Develop and promote local collaborative capacities to implement fuels treatments and respond to fires.

Fire Response Recommendations

- Improve response effectiveness by convening state level groups to identify where fire protection exists for all areas within each state. Eliminate unprotected areas by establishing/extending jurisdictional responsibilities. Response cooperators in each state should identify those voids and negotiate to ensure that every acre within the state has designated protection. Promote realignment of protection responsibilities to the organization that is best suited to provide protection (e.g., block protection areas, offset protection agreements, protection contracts).
- Improve firefighter and public safety. Maintain and/or improve an aggressive human caused ignition prevention program. Involve all stakeholders in the prevention campaign.
- Integrate local, state, federal, and tribal response capacity. Identify where the greatest opportunities exist in communications, training, qualifications, mobilization, and instruments.
- Increase capacity where necessary in order to improve overall local response effectiveness and reduce the need for external (non-local) resources.

Next Steps

The Western Region will use the Phase III report in conjunction with the objectives outlined in the Phase II report, *A National Cohesive Wildland Fire Management Strategy: Western Regional Assessment and Strategy* to develop a Regional Action Plan that addresses the needs of landscapes, communities at risk, and fire response. The Action Plan will be developed with stakeholder input, in an inclusive and transparent process, and will be completed in early 2013.

Experience has shown us that collaboration does not spontaneously happen. It requires structure, process, focus, and resources. To that end, the next step for the Western Region

is to establish a coordination structure that will exist under the umbrella of the Wildland Fire Executive Council (WFEC). This structure will facilitate the broad scale implementation of the recommendations identified in the Western Regional Risk Report.

It is envisioned that the structure will be a coordinating body, composed of representatives of the decision-making and jurisdictional authorities in the West. This regional coordinating body will need resources, a full-time staff lead, and a communications component. It is recommended that these resources be acquired through new or existing agreements with the Western Governors' Association and/or Western Forestry Leadership Coalition. The objective of the coordinating body will be to facilitate the development of the action plan and its implementation, provide consistent communications with stakeholders, and foster true collaboration.

At the national level, Phase III will continue with development of a national risk analysis and a national action plan. The NSAT will develop a comparative risk model using the data sets, and will develop a national trade-off analysis. When the comparative risk and trade-off analyses are complete, a National Phase III Risk Analysis Report will be written to bring together the issues and alternatives discussed in the three regional reports. A National Action Plan will be developed based on the national risk and trade-off analyses.

The National Cohesive Wildland Fire Management Strategy: Phase III Western Regional Science-Based Risk Analysis Report



Draft Report of the Western Regional Strategy Committee
October 29, 2012

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It is envisioned that the structure will be a coordinating body, composed of representatives of the decision-making and jurisdictional authorities in the West. This regional coordinating body will need resources, a full-time staff lead, and a communications component. It is recommended that these resources be acquired through new or existing agreements with the Western Governors' Association and/or Western Forestry Leadership Coalition. The objective of the coordinating body will be to facilitate the development of the action plan and its implementation, provide consistent communications with stakeholders, and foster true collaboration.

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Introduction

The National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is a bold, new national approach to the increasingly complex reality of wildland fire and land management, and fire response. The Cohesive Strategy is being developed in response to a mandate under the Federal Land Assistance and Management and Enhancement Act (FLAME Act). The Cohesive Strategy was developed in response to growing concern over mounting annual costs of fighting wildfires, devastating wildland fire losses to communities, and concern about overall landscape health. The Cohesive Strategy recognizes that fire is a natural process, necessary for the survival of many ecosystems, and focuses on attempting to reduce the conflict between fireprone landscapes and people. The Cohesive Strategy takes a holistic approach by simultaneously looking at the role of fire in the landscape, the ability of humans to actively manage these landscapes, plan for and adapt to living with fire, and the need to be prepared to respond to fire when it occurs.

The Cohesive Strategy brings together representatives of the many stakeholders – federal and state land management agencies, local governments, landowners, environmental groups, tribal groups, fire professionals, and non-governmental organizations and other entities, to discuss goals and work collaboratively to develop shared objectives. The top-down, bottom-up approach of the Cohesive Strategy brings local knowledge about landscapes and fire to the highest levels of decision-making. And it brings together natural and social scientists to employ a scientific model to inform the deliberations with the best available science, designed to help determine the best path forward in addressing the complex issues relating to wildland fire. Working through regional strategy committees representing the three distinct regions of the country – the Northeast, the Southeast, and the West- these groups are devising a shared strategy that will inform decision-making to best use our ecological, social, and economic resources in preparing for, responding to, and recovering after inevitable wildland fires.

The Cohesive Strategy takes an “all lands” view of wildland fire management. Fire knows no political or social boundaries -- not ownership boundaries, not state boundaries. Policymakers must take a landscape-level approach and work across boundary lines to implement effective management techniques. And, it is important to include all the stakeholders to reach decisions that are supported by the community at large. The Cohesive Strategy solicited feedback from a wide variety of stakeholders and used their feedback to help develop alternatives. The Cohesive Strategy is unprecedented in its effort to initiate dialogue and effect collaboration on a national scale.

Annual fire suppression and preparedness costs are high. In 2003, the cost of suppression to the federal government was \$1.7 billion. In 2008, state and local governments spent over \$1.6 billion on suppression and wildland fire mitigation. However, according to the recent study, *The True Cost of Wildfire in the Western United States*, by the Western Forestry Leadership Coalition, fire suppression costs are only a small portion of the true costs of a wildfire event. There are many costs borne by individuals that extend far beyond the scope of fire suppression. Direct costs reflect the cost of suppression, but the following costs are generally not included in direct cost estimates: rehabilitation costs, post-fire flooding, and watershed degradation costs. Other costs that go unaccounted for are indirect costs, such as lost tax revenues, business revenues, and property losses. And additional costs including loss of human life, ongoing health problems for the young, old, those with weak respiratory and immune systems, and mental health issues are also not included in estimates. A synthesis of six case studies in the report reveals a range of total wildfire costs anywhere from 2 to 30 times greater than the reported suppression costs (WFLC, 2010).

The National Fire Plan of 2001 began a strong effort to reduce losses to communities from wildland fire. In the twelve years since the inception of the National Fire plan, state and federal agencies, local government, the private sector, communities, tribes, and non-governmental organizations (NGOs) have worked diligently to improve the conditions of the lands, make communities fire safe, and develop a strong fire response capability.

One of the strengths of work done under the National Fire Plan and the 10-Year Implementation Strategy was the development of Community Wildfire Protection Plans (CWPPs) for communities at risk throughout the country. CWPPs are planning documents developed at the local level by community members working together to assess the risk to their community or county, and develop mechanisms to reduce risk, including: education of residents, reducing fuels around structures, identifying methods to reduce structural ignitability, and prioritizing fuels treatments in and around the community or county. The map below shows the geographic areas that have CWPPs today, at either the county or community level.

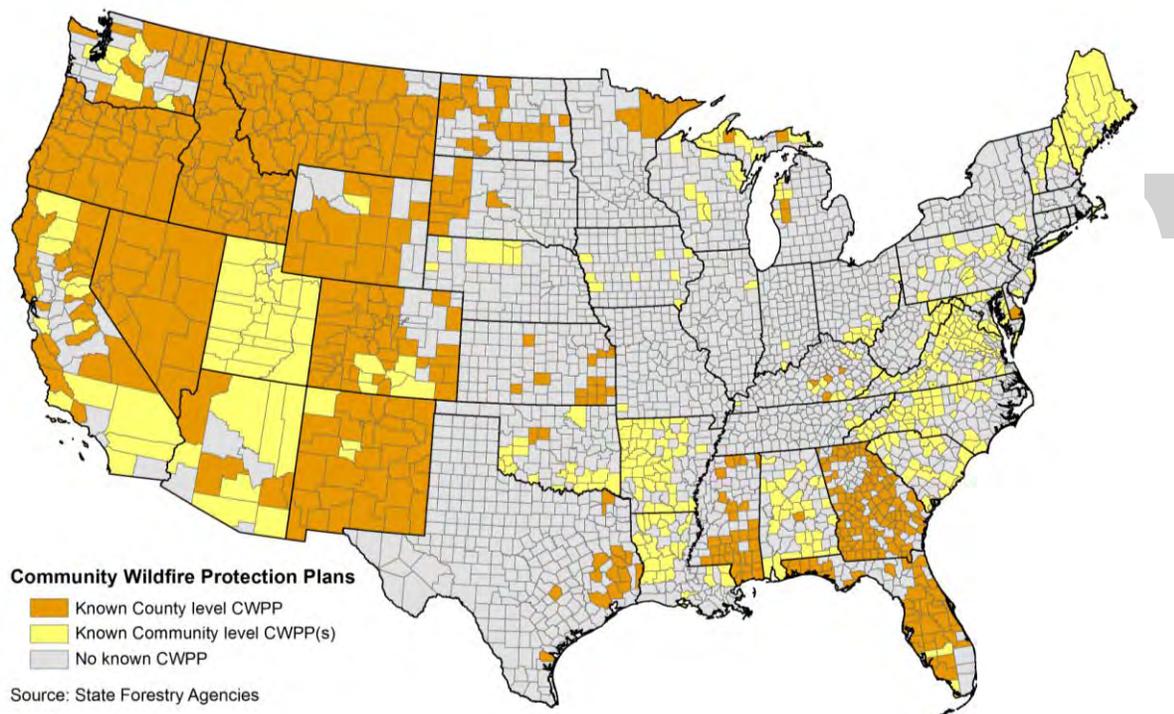


Figure 1. Counties that have CWPPs or community CWPPs within them.

Source: State Forestry Agencies

Large areas of the West have at least one CWPP within each county. This shows both the commitment of the Western states, counties and communities to take action to do what they can to reduce wildfire risk, and it also illustrates the need to further the extent of this work to all areas affected by wildfire risk.

Under the National Fire Plan, a lot of very good work was done, but some stakeholders say

there is room for improvement. One concern expressed by stakeholders is that fuels treatments, community protection planning, and fire response efforts were led by separate agencies or groups, and not coordinated with the actions being done by other agencies or groups. This is sometimes referred to as “stove piping” within agencies.

The Cohesive Strategy brings the stakeholders together to form partnerships and to weave these separate pieces together. In doing so everyone benefits by gaining leverage, efficiencies, and reduced risk. Previous collaborative efforts highlight the need for shared responsibilities, effective partnerships, improved interagency coordination and response, and active land management. They create an imperative for a new direction in expectations for federal, state, tribal, and local wildland fire protection agencies and organizations to address our nation’s wildland fire problems in a more efficient way. An increased level of collaboration has developed among stakeholders that will carry into the implementation stage.

This report will summarize the work done in the Western region during Phase III of the Cohesive Strategy. Decisions from Phase I and Phase II will be briefly described in this report. More information on Phases II and I can be found on the website, www.forestsandrangelands.gov, including all the Phase I and Phase II reports and foundational national documents.

Three Phases of the Cohesive Strategy

The Cohesive Strategy has been developed in three phases. In Phase I, stakeholders met to develop national goals and performance measures, and agree upon the guiding principles of the Cohesive Strategy. Forums were held throughout the country to learn the values, objectives, perceived barriers and desired actions of the stakeholders. Phase I also created a framework under which the three regions would create individual assessments and strategies tailored to their unique, regional needs. In Phase II, diverse groups of stakeholders representing each of the three regions met independently, identifying regional challenges and opportunities as well as key priorities. They agreed upon regional goals, which for the most part are the same as the national goals. The regions focused on how the processes of wildland fire, or the absence of fire, affect their values-at-risk. In

Phase II, the Western region articulated its broad objectives and actions required to achieve those objectives. The size, scope, amount of federal land, and diversity of the landscapes in the West were identified as key components that make the West unique. Immediate opportunities for success were identified. Phase III serves as the conclusion of the planning period of the Cohesive Strategy, during which the scientific analysis and risk assessment are added to the goals and objectives. In this phase, alternatives for emphasis and action plans will be developed as we approach the implementation phase.

Core Values and Vision for the Future

The Cohesive Strategy is built on several principles and values, including engaging stakeholders, managers, and scientists; using the best available science, knowledge, and experience; and emphasizing partnerships and collaboration. The Cohesive Strategy sets out a vision and actions for the future of wildland fire management.

The vision for the next century is to: “Safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, live with wildland fire.”

Guiding Principles

The following guiding principles were crafted through discussions with federal, state, tribal, and local governmental and non-governmental organizational representatives in Phase I. Stakeholder input received during Phase I forums was used in developing the guiding principles, which are an overarching set of principles that apply to all stakeholders in the wildland fire management community. The guiding principles apply to the different elements of the strategy: resilient landscapes, fire-adapted communities, and wildfire response. These guiding principles and core values were developed at the national level and were also adopted by the three regions as the regional guiding principles:

- Reducing risk to firefighters and the public is the first priority in every fire management activity.
- Sound risk management is the foundation for all management activities.

- Actively manage the land to make it more resilient to disturbance, in accordance with management objectives.
- Improve and sustain both community and individual responsibilities to prepare for, respond to and recover from wildfire through capacity-building activities.
- Rigorous wildfire prevention programs are supported across all jurisdictions.
- Wildland fire, as an essential ecological process and natural change agent, may be incorporated into the planning process and wildfire response.
- Fire management decisions are based on the best available science, knowledge, and experience, and used to evaluate risk versus gain.
- Federal, local, state, and tribal governments support one another with wildfire response. They engage in collaborative planning and the decision-making processes that take into account all lands and recognize the interdependence and statutory responsibilities among jurisdictions.
- Where land and resource management objectives differ, prudent and safe actions must be taken through collaborative fire planning and suppression response to keep unwanted wildfires from spreading to adjacent jurisdictions.
- Safe, aggressive initial attack is often the best suppression strategy to keep unwanted wildfires small and cost down.
- Wildland fire management programs and activities are economically viable and commensurate with values to be protected, land and resource management objectives, and social and environmental quality consideration.

The Three National Goals

Three factors were identified as the primary focus areas for the Cohesive Strategy. They are: restoring and maintaining resilient landscapes, creating fire adapted communities, and responding to wildfires. Flowing from the guiding principles and core values, and focusing

on the three factors, three national goals were adopted in Phase I. The three national goals are:

- **Restore and Maintain Landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- **Fire-Adapted Communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.
- **Wildfire Response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

In Phase II of the Cohesive Strategy, each of the regions adopted these goals and used them to define objectives, actions, and preliminary alternatives for implementation.

Stakeholder Engagement

Stakeholder involvement forms the foundation of the National Cohesive Wildland Fire Management Strategy. The Western Regional Strategy Committee has worked toward inclusiveness and transparency to further understanding and involvement among shared interests. Stakeholder input received during forums and comment periods has outlined the objectives, values, barriers and actions to address wildland fire management issues in the 17 Western states that form the Western Region. Additionally, stakeholder input was used to create the national and regional guiding principles and areas of concern for the development of the Phase II assessment. In the future, it is expected public comment will continue to shape the direction of the strategy in the West. A complete description of outreach and comments can be found in Appendices 5 and 6 of this report.

The public involvement process used to plan fuels management projects varies greatly among federal, state, tribal and local lands, affecting each agency's ability to implement on-the-ground treatments in a timely manner. State, local and tribal leadership is important in land use issues for most of the private land in the West as it affects the extent and growth of the WUI, adoption of fire-adapted communities and building codes, development and concurrence of Community Wildfire Protection Plans (CWPPs), local volunteer and

professional response to fire and all-risk incidents, support of collaborative efforts, and the viability of fuel reduction and larger landscape restoration projects. Engaging elected officials at multiple levels is critical to success.

Collaboration Focus of the Cohesive Strategy

The foundation of the Cohesive Strategy is collaboration. The Western Governors' Association Forest Health Advisory Committee, found that landscape-scale forest restoration must be supported by meaningful, ongoing collaboration that serves to accelerate the restoration process in a socially, ecologically and economically viable fashion. The more inclusive the group and the greater the diversity of interests involved, the more likely it is to be representative of the community as a whole and to find broadly acceptable, mutually agreeable solutions. Such collaboration can help identify areas of the greatest need, focus treatments for maximum benefit, increase participation in management decisions, and provide for more opportunities to reach agreement on management practices. Collaborators should define restoration of forest health for their area. This will help identify a "zone of agreement" that will avoid the gridlock challenging many public lands management initiatives. The Western Region's strategy is in agreement with the Western Governors' Association. Landscape treatments should be emphasized in areas where existing collaborative groups have agreed in principle on management objectives and areas for treatment. New collaborative groups should be encouraged and facilitated for future involvement in active management of the landscape.

Phase III is not the end but a beginning

The publication of the Phase III report is not the end of the Cohesive Strategy process. Immediately following the release of this report, the WRSC will begin developing an action plan with stakeholder involvement to be completed in early 2013. Implementation of the strategy by the diverse partners that have been involved in its development will continue in the decisions that are made, informed by a scientific method, to effectively prepare for, utilize and respond to wildland fire.

Phase III of the Cohesive Strategy represents the first time that datasets from the various land and fire management agencies, NGO's, and the private sector have been brought together to create one tool that can be employed to identify key factors, issues and risks that affect wildland fire management across the nation. This robust new tool for landscape, social and fire analysis will continue to be used into the future.

The scientific model will continue to be refined and a trade-off analysis process will be developed at the national level. This will be contained in the National Risk Analysis Report to be finished in 2013, and a National Action Plan will describe actions for implementation of the Cohesive Strategy at the national level, and will be completed before the end of 2013. These developments may have some impact on the regional analysis and the action plan in the future; updating will be a continuous process as new information is received by the WRSC.

Data and Methods for Exploring Opportunities to Reduce Risk

Introduction

Wildland fire is a complex issue that involves multiple interacting factors spanning the natural, human, and built environments. During Phase II of the Cohesive Strategy, the National Science Analysis Team (NSAT) examined various aspects of wildland fire and developed conceptual models specific to each component. The purpose of these models was to display the interactions and relationships among factors that may influence risk, such as the relationship between fuel treatments and the extent and intensity of wildfire. The NSAT also identified various data sets that might be used in Phase III to build analytical models consistent with the concepts articulated in Phase II. Building on these efforts, Phase III has involved an extensive effort to collect data necessary to quantify relationships and provide the ability to rigorously examine wildland fire and risk.

The types of data collected can be broadly categorized into five general types: biophysical, socioeconomic, land-use and ownership, wildfire frequency and extent, and incident

response. Biophysical variables include physical measures such as precipitation, temperature, and terrain. They also include characteristics of vegetation that contribute to wildfire behavior. Socioeconomic variables describe the demographic and economic characteristics of populations and communities within each county, and also describe the distribution of homes within the wildland-urban interface. Land-use and ownership describes the mixture of public and private lands and also helps quantify the extent to which lands might be suitable for active management, e.g., by highlighting areas that historically supported timber harvest. Variables describing wildfire frequency and extent have been gathered from various reporting systems that have been put in place by federal, state, and local fire departments. They also include data from independent monitoring systems that track wildfire using satellites and other remote devices. Finally, they include a series of modeled products from governmental and private entities. Similarly, incident response information has been gathered from many of the same reporting systems. These variables track that responded to wildfire, how long they took to arrive on site, and how long was required before the fire was contained. Information on injuries and casualties can also be found in these same reporting systems.

While the data sets included in this analysis represent the most comprehensive national wildland fire related information assembled at the county level to date, each individual data set has recognized shortcomings. Recommendations from the analysis include prioritizing data gaps and further analysis. Each layer of information comes from an organization that has collected and maintains the data. Improvements in the base data sets would involve action by the organization that is the custodian of the data.

Before data were used in analysis, three additional steps were accomplished. The first step was one of quality control to eliminate obvious errors. The second step involved compiling, reformatting, or summarizing data to fit within a common sampling frame—the county including processing higher resolution data into county level summaries and normalizing for comparative purposes. The third step in data preparation involved filtering and consolidation using statistical techniques – reducing the total number of variables considered by nearly two thirds.

Through a series of interaction with the WRSC and technical team a series of summary tables, graphs, and maps were developed that highlighted findings relevant to objectives and goals articulated by the region.

Data Gaps

The extensive data assembled for the Cohesive Strategy process revealed relationships among factors that influence risk but also revealed data gaps. This section addresses incomplete, inaccurate, and missing information. The all lands approach revealed that some jurisdictions maintain data that is not available on other jurisdictions, that some data elements are inconsistently reported, and some data elements are not required for each reported incident.

No effort is made here to prioritize the data gaps by any specific criteria. In some instances there are efforts underway to remedy the recognized gaps while in other instances no current efforts are being made to address them. The recognized data gaps include:

- ☐ No consistent record of standing fuels from previously burned areas
- ☐ Limited spatial information on beetle kill areas across all ownerships
- ☐ Inconsistent and missing information on ignitions and fire across all ownerships – some jurisdictions have substantial records but when all jurisdictions are considered there are inconsistencies in reporting spatial, temporal, and fire characteristics
- ☐ Cost and spatial information on investments across all jurisdictions is inconsistently available – fuels treatments, mitigation actions, prevention efforts, response resources, and assets available for suppression
- ☐ spatial information on unprotected lands and spatial information on protection assignments spatially
- ☐ Fuels treatment effectiveness monitoring data

- ☐ Litigation on treatment proposals
- ☐ Specifics on use of Categorical Exclusions and Environmental Assessments
- ☐ Specific communities that have adopted ordinances in response to fire risk and specific communities that have prepared and are implementing CWPPs
- ☐ the number, location, and size of fires that provide resource benefits
- ☐ Location and number of homes and structures burned in wildfire
- ☐ spatial information on smoke extent, duration, and drift
- ☐ Specific watershed conditions with respect to resiliency
- ☐ spatial information on high value areas and the extent fire influences values
- ☐ across all ownerships – response capacity and resources – numbers and costs
- ☐ a lack of information on fuels, fire occurrence, values at risk, response, preparedness, community wildfire protection activities, and prevention activities in Alaska and the Pacific Islands

Some information is important from a monitoring perspective to understand how risk changes through time and under varying management activities while other information is important to understand fundamental values at risk. The Cohesive Strategy process has been valuable in recognizing the importance of information across all ownerships and how inconsistencies complicate the ability to better inform decision-making at all levels.

The Risk Analysis

Wildland Fire is an Important Western Issue

Fire is a natural process and a mechanism for biological renewal across forest and rangeland ecosystems. In the Western United States, a century of widespread fire exclusion

and the more recent severe reduction of active forest management, have resulted in a build-up of surface fuels (downed wood, litter and duff) and the overstocking of forests with trees and ladder fuels. Those conditions, exacerbated by other stressors such as drought; insects and disease; invasive species; and changing climate conditions have led to uncharacteristically large, severe, and costly wildfires that threaten homes, communities, and cultural and resource values, and can cause widespread property and environmental damage. These environmental conditions along with the effects of an expanding wildland urban interface underlie four broad areas of risk: risk to firefighters and civilian safety, ecological risks, social risks, and economic risks. Air quality, water quality/quantity, sensitive species, natural and cultural resources, as well as human communities and associated values, are all at risk. Ignitions, fuels, insects, disease, terrain, climate change, responder availability, ecological departure, and other factors all contribute to such risk.

Managing wildfires in the West is becoming increasingly complex and consumes the majority of suppression dollars spent nationally. The influence of human community development and particularly, the more recent expansions of the WUI areas, contribute to challenges of wildland fire management and suppression. While significant interagency and interstate efforts have been made over the past decades to facilitate cross-boundary work, important issues regarding risk to communities, fire protection services, the ability to use wildland fire as a management tool, and smoke management and air quality continue to be raised, posing prevention and mitigation problems for the foreseeable future.

Wildland Fire Varies Across the Landscape

Fire behavior differs by region due to the type of vegetative fuels, topography, and climate. Trees, shrubs and grasses (both live and dead) all provide fuel for fires. Wildland fire management varies significantly based on jurisdictional mission, proximity to communities and values to be protected, and the potential for fire to spread onto jurisdictions with different ownerships, missions, and management responsibilities. The WUI includes all places where forests and human communities are next to or intermingled with each other. The WUI is not limited to forested areas. Land areas dominated by grasses and shrubs are also WUI, and may pose significant wildfire risk to neighboring communities. People who

live in areas prone to fire need to be aware of the risk and prepare their homes and property for wildland fire events. While many areas have paid or voluntary fire departments, there are also areas of the country, particularly large areas of the West, which are unprotected or under protected from fire.

Landscape Management Can Reduce Wildfire Severity

Wildfire is natural and occurs at fairly regular return intervals that vary across the landscape. For example, historically, some areas have seven year fire return intervals, while others have 100-year return intervals, or longer. When these natural fires are suppressed, it allows more surface fuels to build up between fires, which makes it more difficult and more expensive to suppress the next fire. Suppressing all fires has the inevitable outcome of larger, more dangerous fires in the future. Through active management of our forests and rangelands, reducing fuels by either prescribed fire or mechanical means, the severity of future fires can be reduced. Active management of the landscape reduces the fuel for a wildfire, which reduces flame lengths and fire behavior, which in turn can reduce the potential impact of wildland fire on communities. Reducing the fuels near communities and preparing the area residents' homes to better withstand the inevitable fires through the creation of defensible space and use of fire resistant building materials can allow communities to reduce structural losses and reduce deaths or injuries.

There are vast expanses of federal lands and wilderness areas where access is extremely limited and distances to communities and community values to be protected are great. In these areas, where limited access, travel times, communication difficulties, and other factors simply place firefighters at too much risk, wildland fire management may focus on achieving ecological objectives rather than a suppression response. On these lands, fire may be included intentionally as a natural landscape component and change agent to achieve multiple objectives. There are also large expanses of land that are sparsely populated and have limited wildland fire response capability, frequently resulting in slower response times and escaped initial attack fires. Rugged topography can create natural access difficulties, further impacting response times and options, and in many cases contributing to larger and longer duration wildfires, threatening communities and

community values to be protected. These challenges are compounded due to much of the West being arid and semi-arid, with long natural disturbance recovery times that, in some cases exceed one hundred years. The non-full-suppression objectives described above routinely pose challenges in mixed ownership areas and require pre-planning and collaboration to reduce objective and value-based conflicts, including recreation, timber, forage, tourism values and the potential of transferring risk and costs to neighboring landowners.

Addressing the Middle Ground

People of the West are concerned about more than just the physical structure of their communities. In the stakeholder input process, the tribes and local residents made it clear that the “middle ground” or “middle lands” also require protection and management.

“Middle lands” are those nearby areas that contribute to the identity, structure, culture, organization, and wellbeing of a community, and are often considered essential to its economic, social, and ecological viability. The middle ground contains many values at risk such as watersheds, viewsheds, evacuation routes, private forests, wildlife habitat, utility corridors, cultural grounds and more. Middle ground areas can be included in CWPPs for prioritization in active management of WUI areas. Tribal members and partners often describe the community as the “home” and the surrounding middle lands as the “homeland”. The landscape is an integral part of the community, and the community is part of the landscape. The tribes’ knowledge that they have handed down about the country’s landscapes and natural resources, along with their ethic of stewardship of the land, are invaluable assets that can be incorporated in the Cohesive Strategy.

The Management Alternatives

This report examines wildland fire-related challenges and identifies opportunities managers at any level can use within the Western region. Three discrete alternatives are delineated. Each of the three alternatives combines important elements to address all three goals. However, each alternative has a single goal, which it emphasizes: resilient landscapes, fire adapted communities, and response to wildfire. The alternatives were developed early in Phase III and considered stakeholder feedback and informed data to address risk in each goal area. The alternatives are not mutually exclusive, and there is no one preferred alternative to be applied across the West. Rather, the emphasized alternatives present investment options that are believed to offer the greatest positive impact. They will need to be balanced to achieve strategic goals and implement effective wildland fire management.

The strategy is designed to be responsive to the specific needs of each geographic area, based on consideration of relevant biophysical, social and economic information at the county level. When local decisions need to be made, a more detailed study of the specific area will necessarily be part of the decision making process.

The appropriate blend of goals and alternatives should be determined locally, depending on the local conditions being addressed. For instance, in some areas, an emphasis on restoring and actively managing landscapes might be the preferred alternative to create the wanted desired future condition, but fire response would still be a necessary element of the area's strategy, as would be work toward creating fire adapted communities. Conversely, other areas might need more emphasis placed on the creation of fire adapted communities. As one thinks and works through the possibilities of different alternatives, options, and actions, it is quickly recognized that greater emphasis needs to be placed on all three goals and the alternatives docked underneath them.

Alternatives neither identify specific implementation actions (i.e. who will do what, where, how, and when), nor specific process actions. However, it is expected that the analysis will inform specific actions the region may wish to pursue. Those specific actions will be developed in the Regional Action Plan to be accomplished in the near future.

Alternative #1: Landscape Resiliency

Alternative #1 emphasizes landscape resiliency and recommends activities that contribute to improvements in forest and rangeland health. This alternative uses active management to accomplish landscape resiliency through a variety of different management tools including mechanical, prescribed fire and other treatments. Much of the work to impact landscape resiliency will occur within the middle lands through active forest, rangeland and fuels management. Treatments in wilderness will occur through wildfires and prescribed fires, while other special land use designations may use a suite of appropriate options. The outcome of more actively managing the landscapes in the West will have positive benefits for all three goals of the Cohesive Strategy. The middle lands are especially important, when considering the spatial extent of many large wildfires and rapid rates of spread that directly impact fire adapted communities, as well as the adverse impacts on private timber and grazing lands, natural resources, cultural and watershed resources that support these communities. A cohesive strategy must ensure that commitments to collaborative efforts and partnerships that have developed in treating areas outside of the WUI are maintained. Over time this alternative significantly reduces/modifies the impacts of wildfire, the level of required response, and helps to protect fire adapted communities.

Focus areas:

- 1. Provides for collaborative fuels and prescribed fire strategies for the restoration and maintenance of resilient forest and rangelands through active management.**

- a. Employ a variety of vegetation management applications and treatments through mechanical treatments, grazing, prescribed fire and cultural fires, natural fires, and any other combination of tools that may be appropriate for a given geographic region or fuel type in the West. Management options and treatments are located to protect values at risk and implemented at a landscape scale, especially in areas with a history of large wildfire occurrence.
- b. Enable land owners/managers to develop and implement more appropriate actions to achieve healthy and resilient forest and rangeland landscapes.
- c. Emphasize vegetation treatment projects with a positive net revenue that will improve vegetative landscapes to the largest extent possible.
- d. Prioritize treatments geographically by existing forest and range conditions and by opportunities to stimulate local and regional economic activity.

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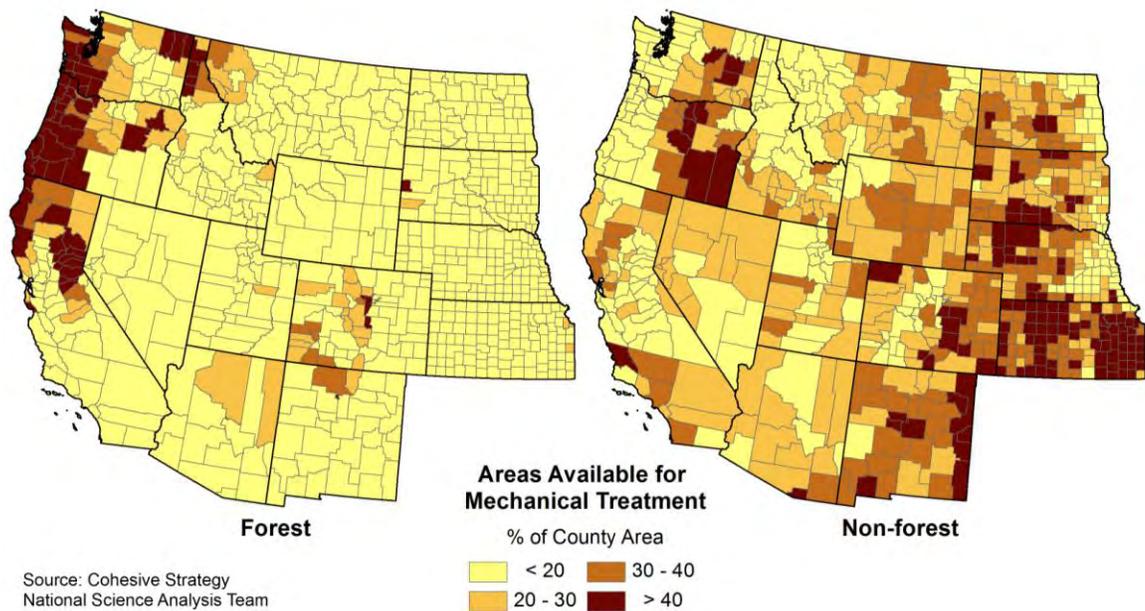


Figure 2. Areas Available for Mechanical Treatment

The percent of county area generally available for mechanical treatment - for forested (left) and non-forested (right) burnable fuels - based on legal or policy restrictions, slope, accessibility and land cover. The map does not reflect the availability of markets or capacity to plan and conduct treatments.

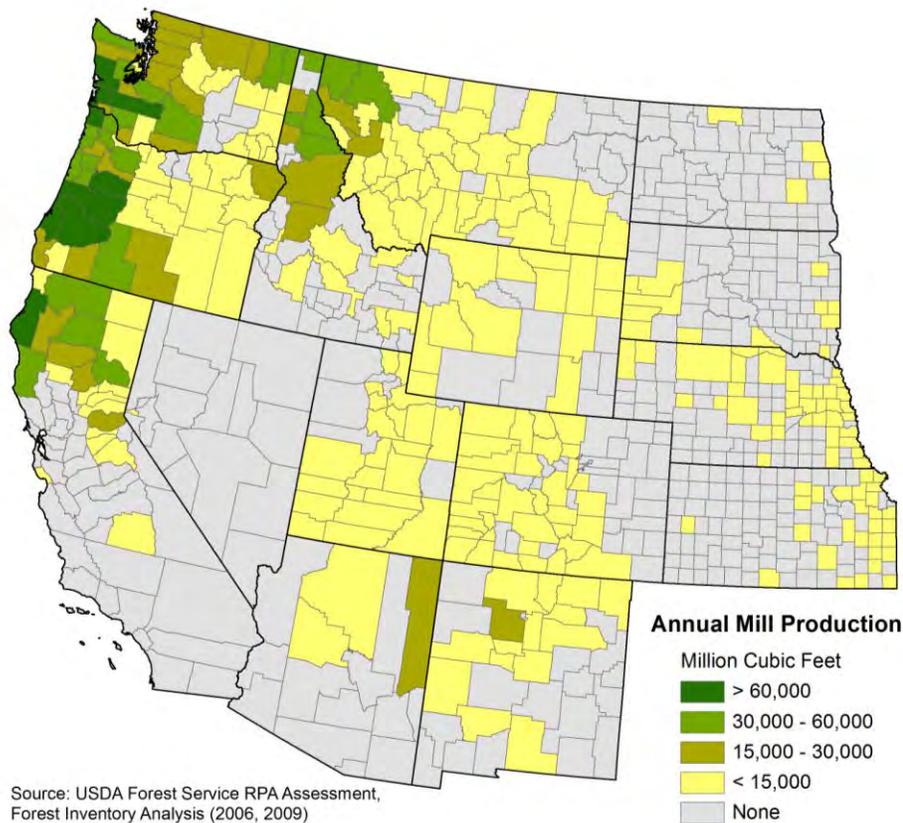


Figure 3. Annual Mill Production

Annual forest products produced by mills.

Mechanical fuels treatment can be used as one tool to protect, maintain, and restore landscapes. Mechanical fuels treatments can also provide side benefits of local employment, and revenues to offset the cost of treatments. Within the West, there are areas with the infrastructure in place and markets for biomass that will facilitate landscape scales treatments. Conversely, there are large portions of the West that lack the infrastructure and biomass markets, which reduces the capability of these areas to conduct

mechanical treatments on a large scale. These maps provide a general description of where mechanized treatments could be an option to reduce risks.

- e. Utilize prescribed fire where and when appropriate to enhance landscape restoration and simulate natural disturbance or historic fire regimes.

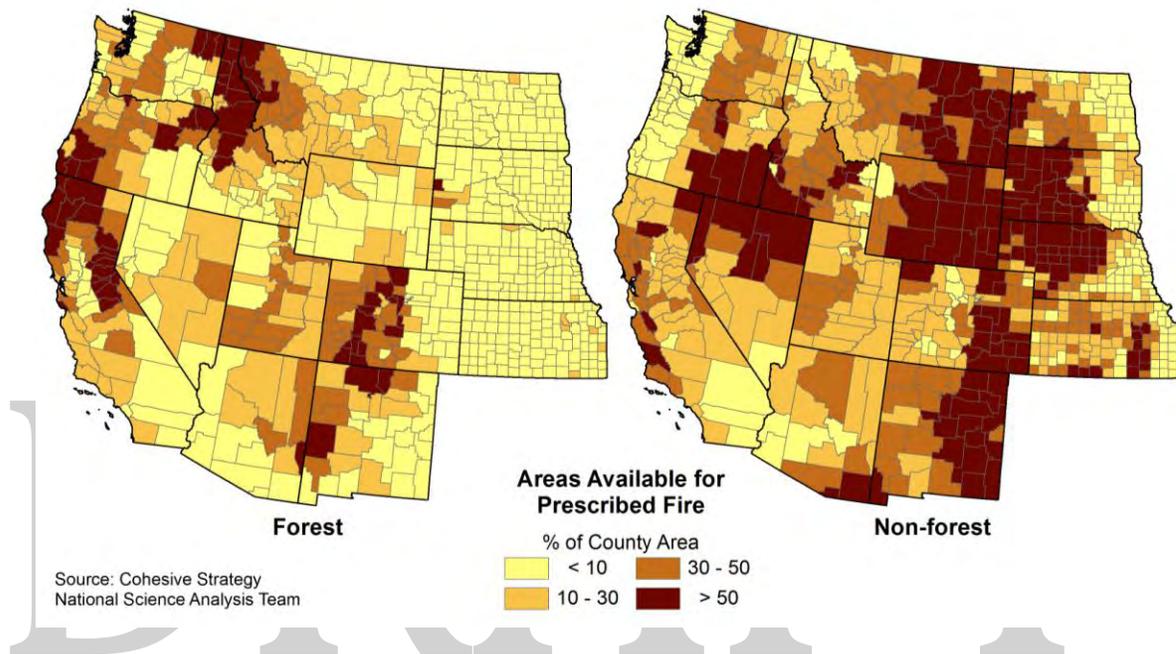


Figure 4. Areas Available for Prescribed Fire

Western counties categorized by the percent of the area within each county that is generally available for prescribed fire that are forested (left) and burnable non-forest (right) based on historic fire regime groups 1-4 and a filter removing urban, agricultural and mixed land use cover types. These do not reflect local restrictions or workforce capacity. There are significant forested areas in the west where prescribed fire potential exists to treat fuels, reduce fire risk, and improve landscape resilience. Prescribed fire opportunities are more likely to exist in the forest and non-forest environments in the highlighted counties.

Prescribed fire treatments can also be used as a tool to protect, maintain, and restore landscapes. Within this focus area, these maps provide a general description of where prescribed fire treatments could be an option to reduce risks.

- f. Consider opportunities for wildland fire use for resource benefit and balanced with considerations of values at risk, transference of risk, and aggressive wildland fire suppression.
- g. When conditions have experienced significant historical departure, hazardous fuels treatments will often be required within altered fire regimes before appropriate ecological responses can occur under wildfire response strategies to achieve resources objectives.
- h. Appropriate landscape restoration and maintenance treatments can preserve or enhance important habitats and diminish threats to these habitats.

2. Ecological Health- leverage collaborative efforts and actions to focus on lands damaged by severe wildfire, post fire rehabilitation, areas significantly departed from historical conditions, areas of insect and disease infestation and non-native species site invasion.

- a. Vegetation structure, age class, and species diversity is the focus for post-fire rehabilitation of forest and rangeland health and the restoration and maintenance of resilient landscapes.
- b. Post fire rehabilitation should consider salvage and fuels management opportunities, road infrastructure opportunities across boundaries, and watershed protection and stabilization.
- c. Site rehabilitation activities should focus on areas that are similar to those that have experienced large damaging fires in the past, pose the greatest risk of damaging environmental impacts, and have a track record of successful past rehabilitation efforts.
- d. Consider ecological community interactions and strive to balance human needs with ecological function and resilience.
- e. For permittees and users impacted by wildland fire, work to mitigate displaced use. Emphasis should be placed on the prioritization of new stewardship contract opportunities lost due to damage.

- f. Mitigate cultural impacts through appropriate site, artifact and cultural use protection, restoration or enhancement.
- g. Prioritize rehabilitation treatments on areas which have a high probability of success. In assessing rehabilitation efforts in areas of invasive species, caution should be used to prevent spread.
- h. Prioritize land where there is a risk of transferring insect, disease and mortality issues to other ownerships.
- i. Infestations pose risks to the forests and to the WUI, and require specific treatments; treatment objectives and priorities should be public safety, biological necessity and commerce. Public safety treatments reduce the risk to humans from the effects of the infestation. Biological functions involve vegetation or animal communities threatened by an infestation. Commerce protection includes treatment of an infestation that threatens a transportation system, energy production, water sources, or timber production. Treatments are prescribed, based on these classifications and in conjunction with science.

3. Increase focus on stakeholder collaborations and the leverage partnerships across all ownerships.

- a. Landscape restoration and maintenance activities should protect, promote and enhance high value resources such as watersheds, forest and rangelands, wildlife habitat, cultural use areas and sites, recreation sites, and community infrastructure.
- b. Treatments should be coordinated and planned across ownership boundaries.
- c. Engage in collaborative management activities that blend traditional ecological knowledge (TEK) with western science, to restore and maintain historical fire regimes across landscapes.
- d. Encourage public and private sector involvement in risk and mitigation activities.
- e. Treatment opportunities need to consider smoke management impacts with collaboration amongst all stakeholders, balancing negative impacts from wildfire versus positive outcomes from fuels treatments and prescribed fire.

- f. Collaboratively review and update air quality implementation plans where appropriate, to ensure prescribed fire objectives are given a high priority compared to the negative impacts of large wildfires. Transference of risk from smoke impacts within the natural or historic fire return interval could be addressed through re-ignition capability in natural areas that experience suppressed natural fire.

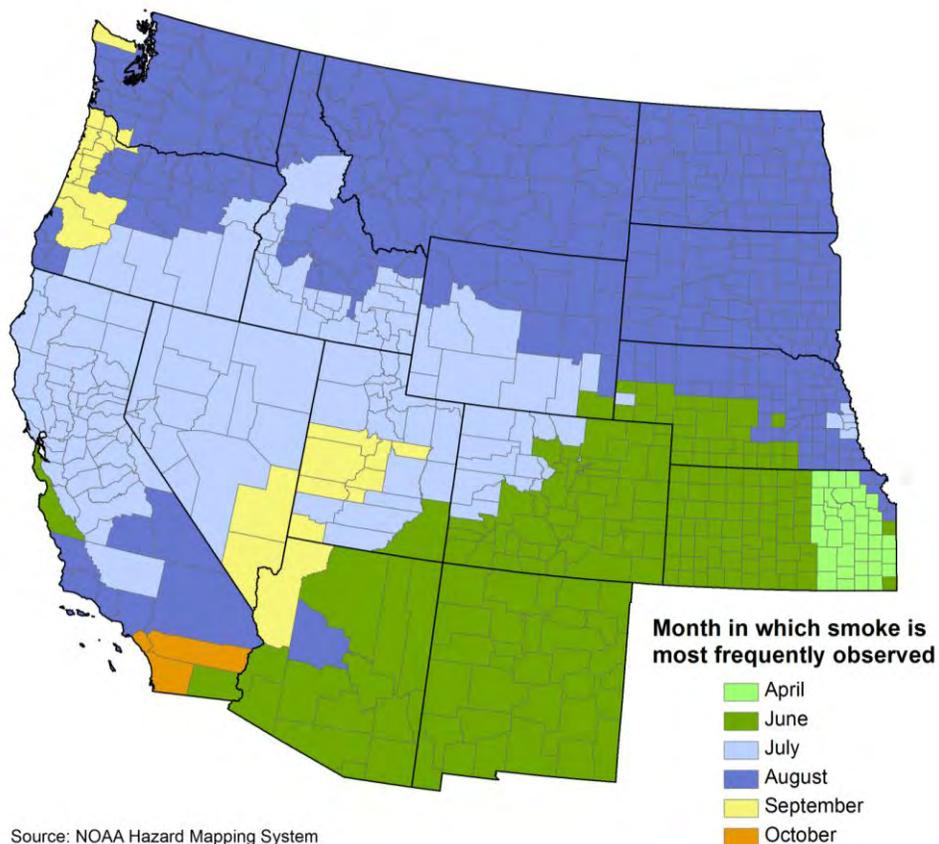


Figure 5. Smoke Plume Seasonality

Western counties categorized by the modal (most frequent) month when smoke originates within, or passes over each county. Summarized from satellite observations.

This map identifies the month in which smoke is most frequently observed, shown by county in the West. Outside of these months opportunities may exist for additional prescribed fire uses with limited smoke impacts. It is interesting to note that no area of the West sees its heaviest smoke concentrations during the month of May.

Resilient Landscapes

Resilient landscapes or ecosystems are forest or rangelands that resist damage and recover quickly from disturbances. Such resilience is related to the natural and historical fire regime in which the disturbance occurs, and the potential need to assist the ecosystem in restoring it to a resilient state. Ecological disturbance can have an impact on the social and economic systems of local communities. In resilient landscapes, the impacts of disturbances can be lessened at a local and regional level through active management. Ecological restoration efforts can have a positive impact on local economies and the social health of communities. Sustaining and restoring landscape resiliency and recognizing the role of wildland fire as a critical ecological process are important goals in the near- and long-term for reducing wildfire hazards and risks. Resilient landscapes, adapted to wildland fire, can protect and enhance important values through management or disturbance.

Factors were identified that contribute to healthy resilient landscapes as part of this analysis. These major factors are; fuels and climate, ecological health, topography and geographical vastness, natural fire starts, high percentage of acres burned and severity, and ownership patterns, uniqueness, smoke impacts, and cultural aspects. These identified key factors all contribute to local and regional risks to watersheds, including issues relating to water quality and quantity, air quality, vegetative health, natural habitats, and economic impacts.

Fuels and Climate

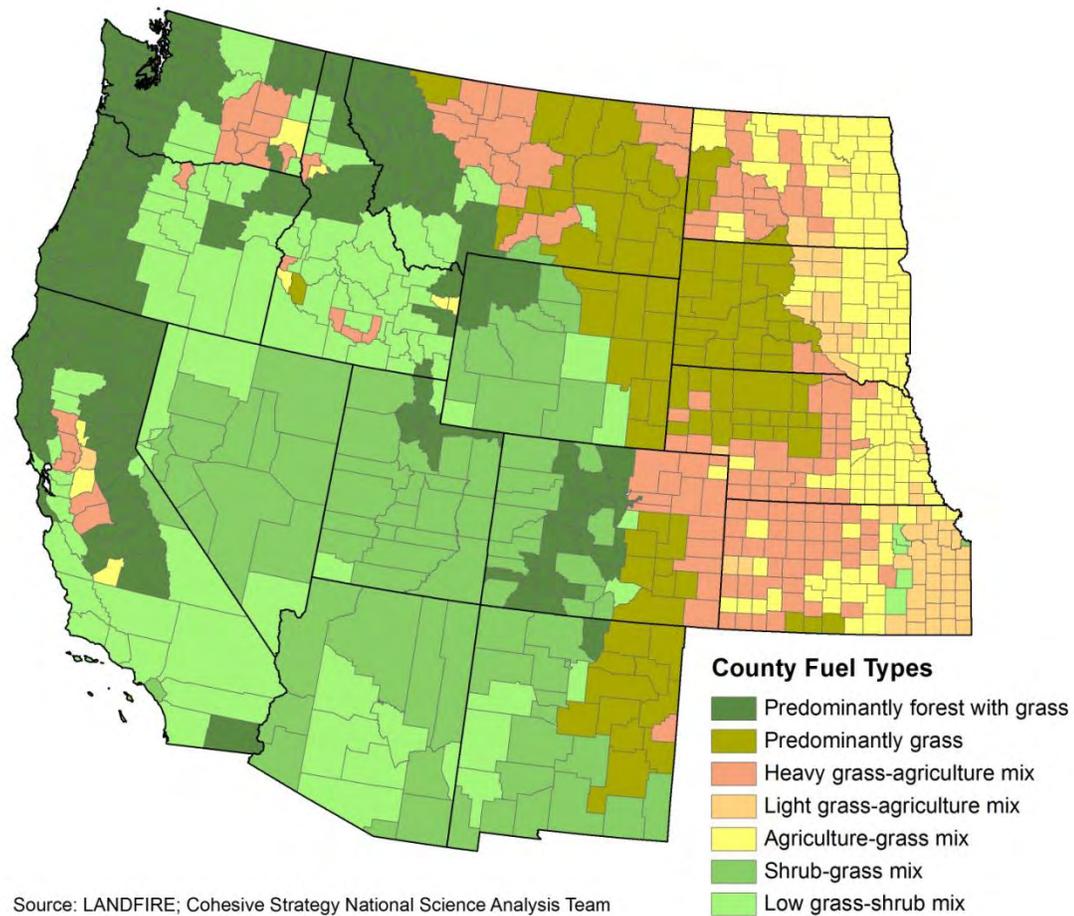


Figure 6. Surface Fuel Type

Source: LANDFIRE and Cohesive Strategy NSAT. Western counties categorized in seven broad surface fuel types, grouped by proportion of area in each county.

The Surface Fuel Type map shows a spatial representation of fuels, categorized in seven broad surface fuel types, and grouped by proportion of area in each county. Diverse forest and rangeland vegetation types, with mosaics of complex fuel structures, characterize Western fuels. These environments are increasingly departed from historical conditions, and are experiencing declining forest and rangeland health conditions, that are resulting in a cumulative buildup of fuel loadings.

The Average Summer Precipitation Map, Figure 7, shows that much of the West tends to be dry and arid. Vegetative environments that occur in relatively warm and dry Western

climates are highly conducive to fire ignitions and wildfires, with a high potential for intense fire behavior and spread. Wetter areas that experience high ignition frequencies and large fire occurrence may require additional focus, as growing conditions enable rapid growth with fuels accumulation, which may trigger the need for shorter management intervals.

A century of fire exclusion and lack of fuels management has resulted in many forest types seeing dramatic increases in tree density, with ladder fuels and increasing amounts of surface fuel loading and understory brush, that has led to an increased incidence and spread of uncharacteristically large and severe wildfires. This rapid escalation of severe wildfire behavior has resulted in increased wildfire suppression costs, greater fire severity, significant home and property losses, and increased threats to communities.

Abnormally large and long-duration fires have been prevalent in the past two decades due to a variety of factors, such as fuels accumulations and changing climatic conditions. Stressed forest or rangeland vegetated landscapes are increasingly susceptible to infestations of insects, pathogens, disease, and invasive exotic species, which in some areas, have left millions of acres of dead, standing trees that experience wildfire with increased frequency, intensity, and severity.

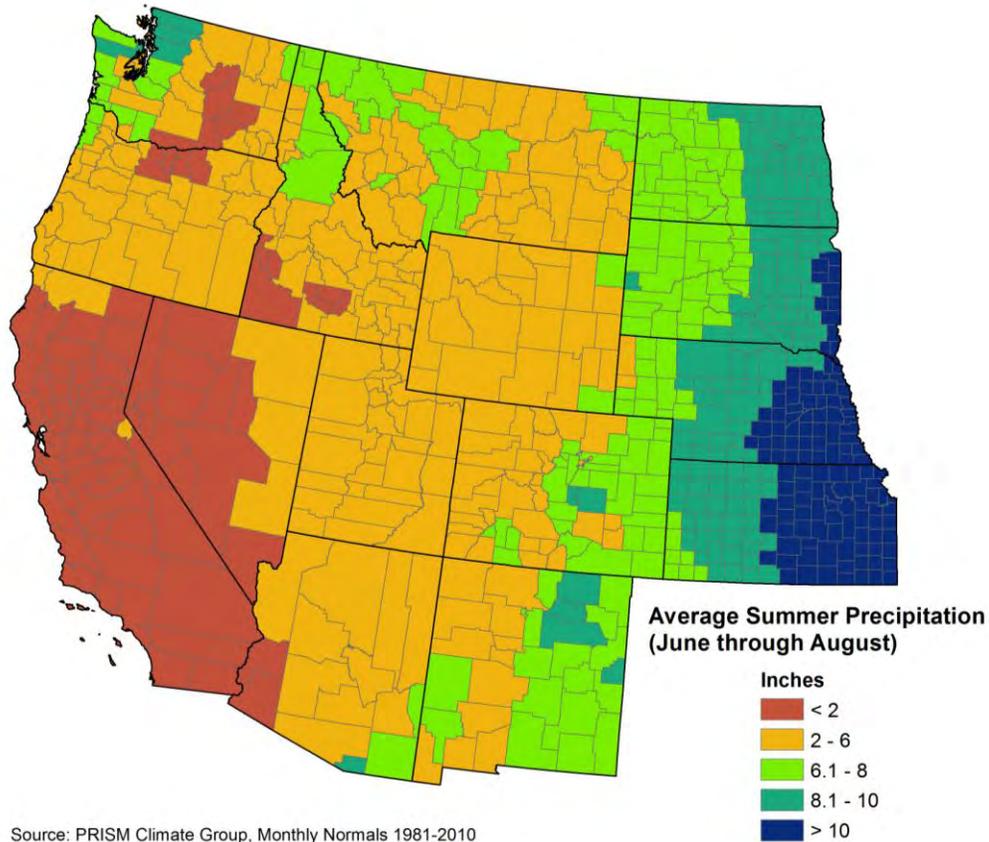


Figure 7. Average Summer Precipitation

Western climate is generally warm and dry with seasonal and extended drought conditions. Coastal and mountainous areas, especially the Pacific Northwest and Northern Rockies, are identified in Figure 7 as wetter areas with fire regimes that experience lower fire frequency. Yet when fire does occur, it is characterized by large fires with high intensity.

Healthy, functioning ecosystems are vitally important to the ecological, social, and economic values in the West. The West needs landscape scale changes in vegetative structure and fuel loadings to significantly alter wildfire behavior, reduce wildfire losses, and ensure firefighter and public safety, while achieving longer term landscape resiliency. Some challenging aspects of fuels mitigation actions include steepness of terrain, access limitations, changing climate, and reduced budgets for fuels management, and increasing fuels treatment costs. Some of the physical characteristics, such as large inaccessible

landscapes, provide challenges and opportunities for the unprecedented use of fire at the scales at which dominant disturbances are occurring.

Ecological Conditions

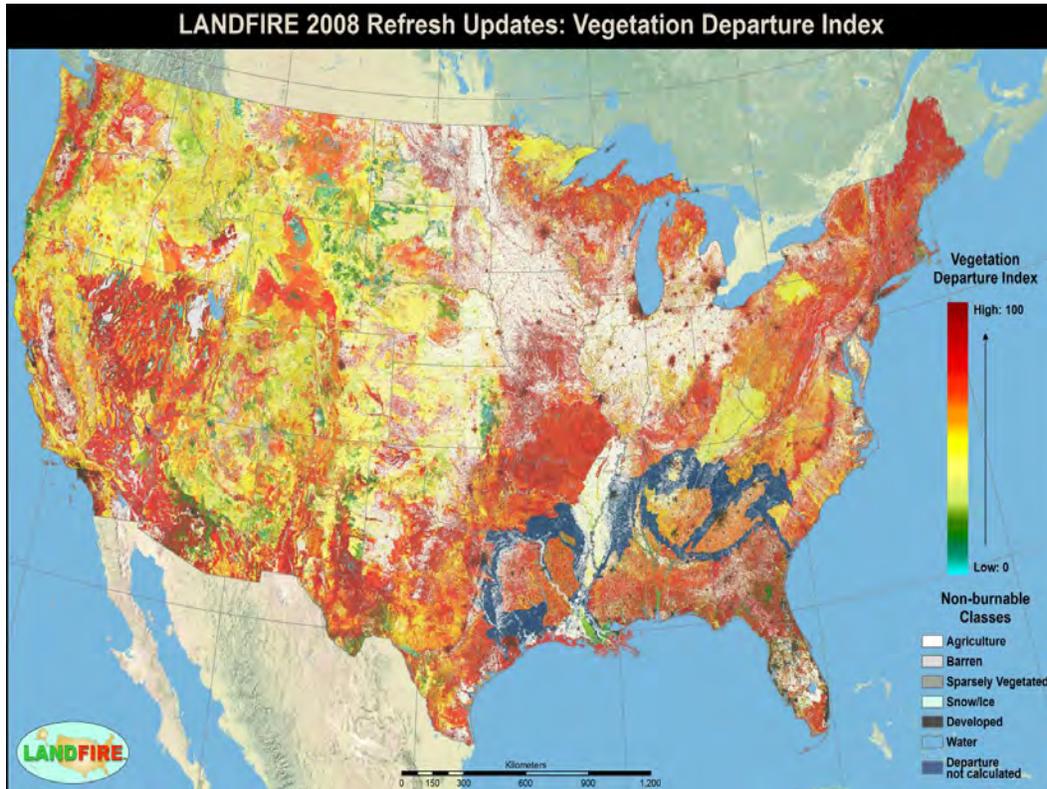


Figure 8. Vegetation Departure Index Map

Source: LANDFIRE Vegetation Departure layer

Western forest and rangeland ecological types are varied and expansive across Western landscapes. Western wildland environments are characterized by diverse forest and rangeland vegetation with mosaics of complex fuel structures with habitats that are increasingly departed from historical conditions. The Vegetation Departure Index Map, Figure 8, depicts the amount current vegetation has departed from simulated historic vegetation reference conditions. This departure results from changes to species composition, structural stage, and canopy closure. Many of these landscapes with high departure are experiencing declining forest and rangeland health conditions and a cumulative buildup of fuel loadings.

Stagnant, overgrown forests with increased insect and disease infestations, and rangeland sites being occupied by invasive species are but a few symptoms of widespread ecological health problems in the West Region. The forest and rangeland health problems in the West are widespread and increasing, affecting wildlife habitat, water quality and long-term soil productivity, while providing conditions for uncharacteristically large, severe, and costly wildfires with increasing threats to human life and property.

Healthy ecosystems include values associated with biodiversity, wildlife habitat, and healthy forest and rangeland landscape conditions. As an important value in the West, healthy ecosystems provide numerous ecological services, support a variety of land uses, offer a desirable backdrop and physical setting for homes and communities, and support a great number of historic, spiritual, and cultural resources. Healthy forests support clean water in the form of runoff to local streams and lakes. Surface water is an important drinking water source across the West. Watersheds important for drinking water are shown in Figure 9.

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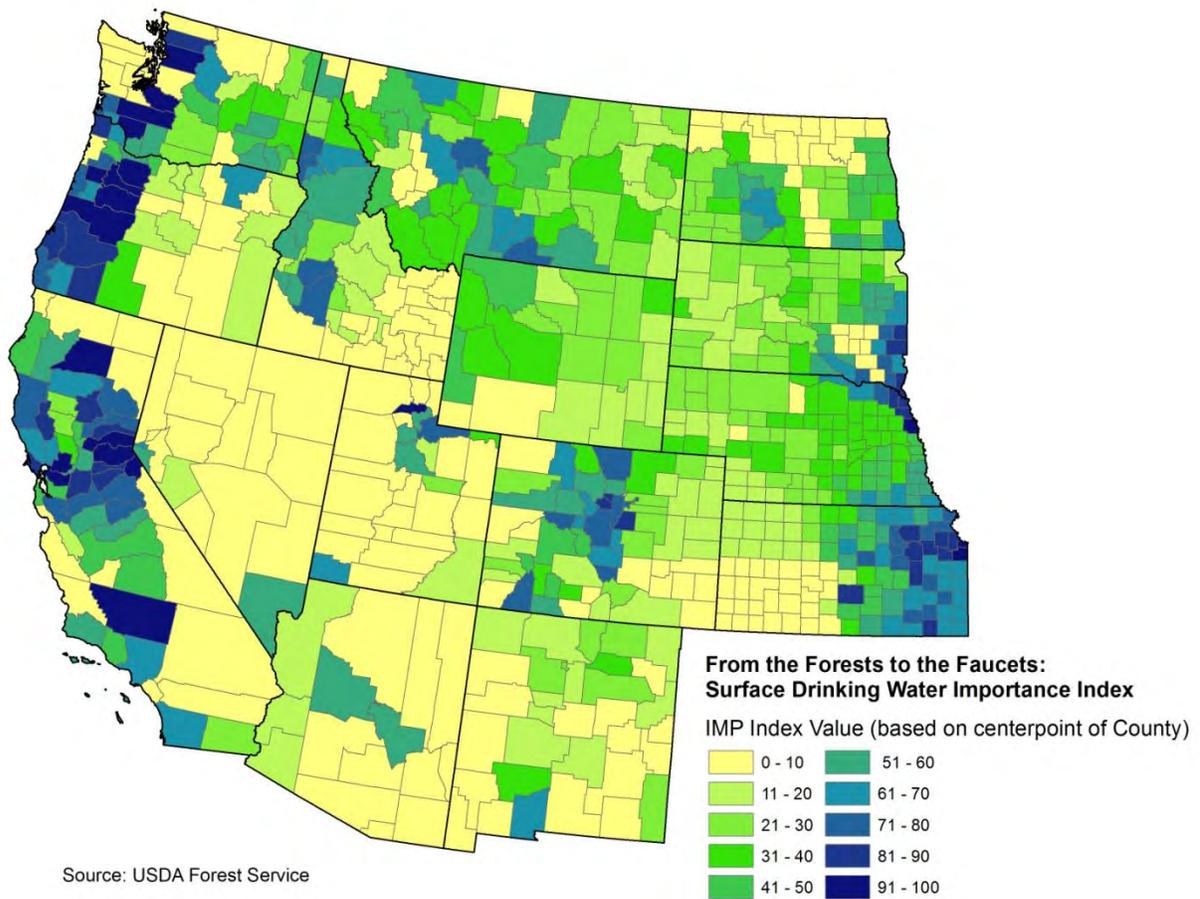


Figure 9. From the Forests to the Faucets: Surface Drinking Water Importance Index, IMP. Areas with higher (blue) values represent areas most important for surface drinking water. Source (USDA Forest Service)

Insects and Diseases

The USDA Forest Service reports that insects and diseases play critical roles in both maintaining balance in healthy functioning forests and causing catastrophic outbreaks and forest loss. These critical roles affect the more than 750 million acres classified as forest land, and millions more acres with trees in urban areas, that provide a wide array of services and commodities, such as timber and other forest products, recreation, wildlife, clean water, energy and jobs. Determining the extent and intensity of insects and diseases through surveys is an important tool to help prioritize actions to be taken by federal

agencies, states, and other stakeholders. As occurs with most biological systems, the overall mortality that insects and diseases cause varies from year to year and pest to pest. Figure 10 illustrates how mortality has varied over the past 14 years. In 2011, mountain pine beetle accounted for 59% of areas mapped with excessive forest mortality for the year. (USDA Forest Service, 2012).

Figure 1.—*Surveyed acres of mortality from 1998 to 2011.*

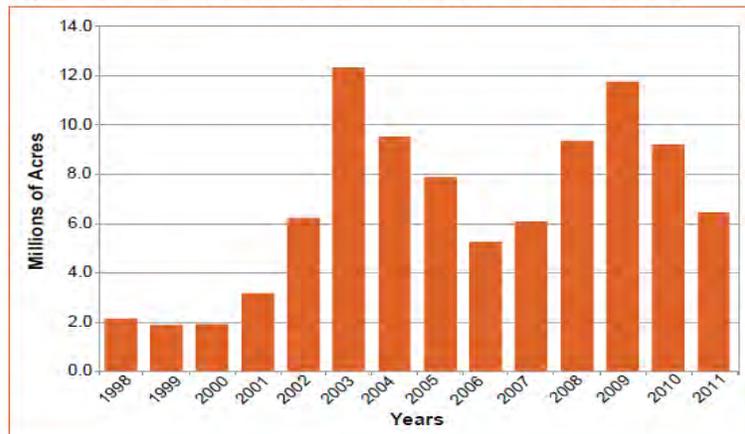


Figure 10. Annual extent of insect and disease forest mortality summarized from the annual survey 1998 to 2011.

Source: Major Forest Insect and Disease Conditions in the United States: 2011, USDA Forest Service.

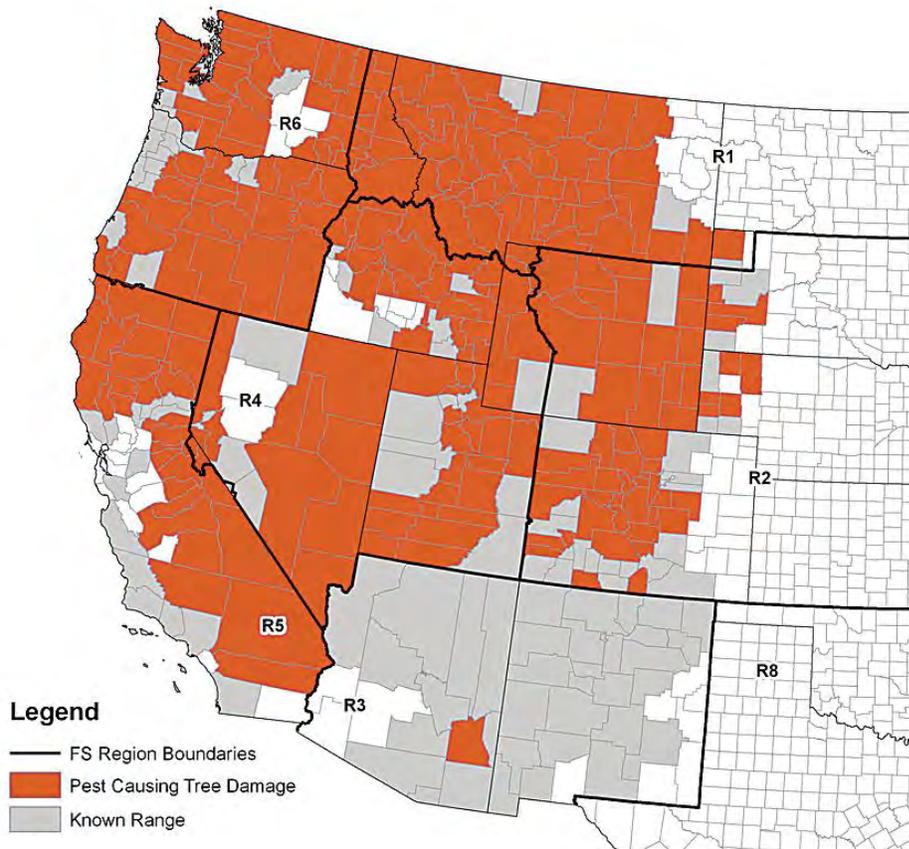


Figure 11. Counties reporting mountain pine beetle in 2011.

Source: USDA Forest Service, 2011.

The extent of the historical departure is compounded by the impact invasive species are having within the Western region. These invasive non-native species, such as cheat grass, red brome, and tamarisk, are having a major impact on Western fire regimes. These exotics are creating ecological deserts where the native species, not adapted to frequent fire in dry ecosystems, are being replaced. The invasive species are also creating fire suppression issues and impacting overall firefighter and public safety. These Western invasive species are having an overarching impact on all three elements of the Cohesive Strategy. This impact from invasive species is unlike the other two regions, especially when the vast spatial extent of the infestations is considered.

Ignitions, Burn Probability and Acres Burned

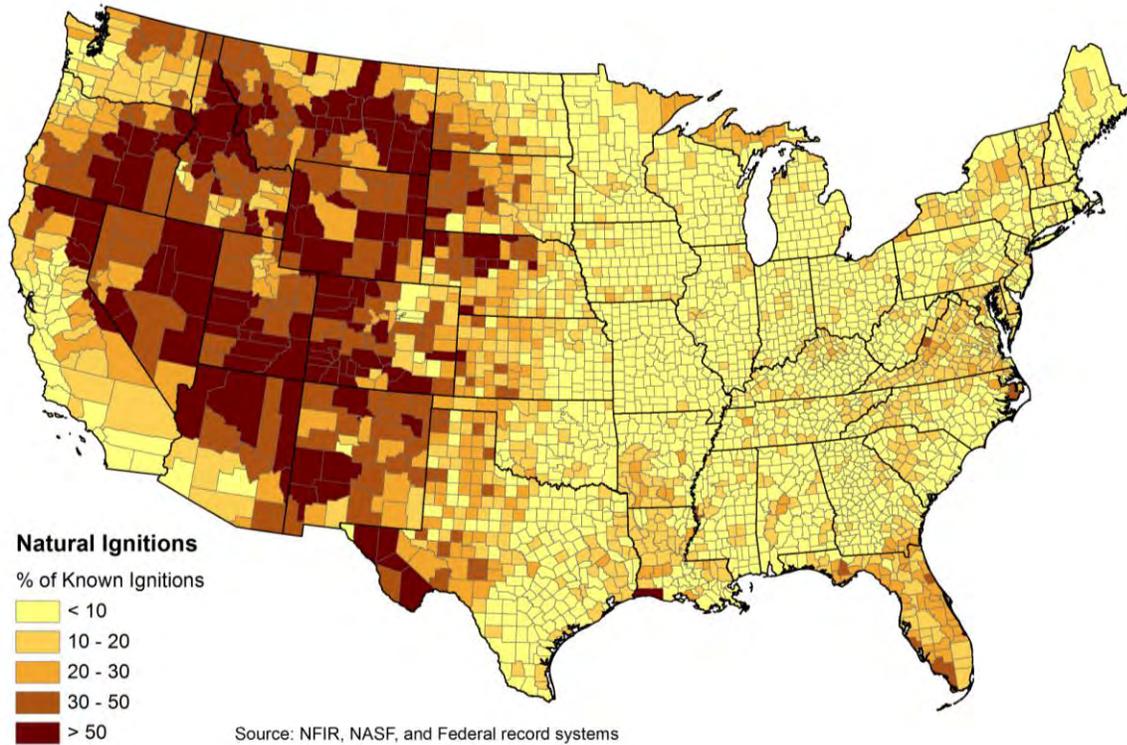


Figure 12. Percent of known fire causes from natural ignitions including lightning.
 Source: Combined local reports (NFIRS, NSAF, Federal Record System).

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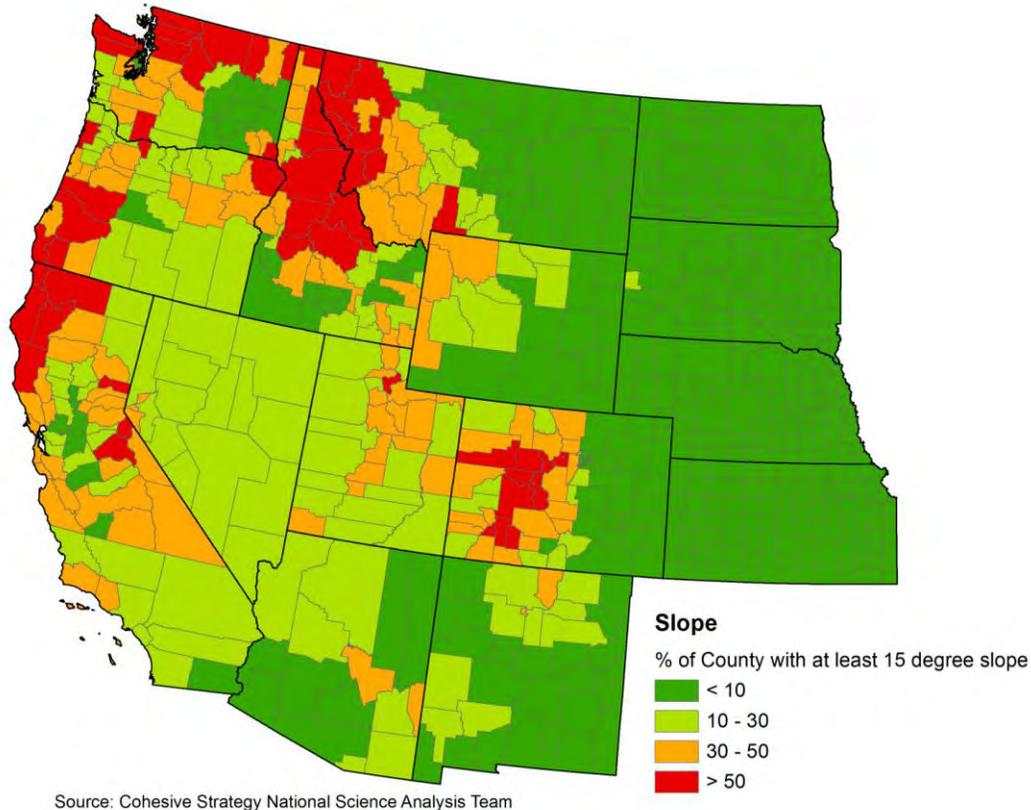


Figure 13. Western counties categorized by the percent of county area with slopes exceeding 15 percent.

Natural ignitions or lightning ignitions are a key contributor to fire issues. For the Western region, lightning ignitions pose additional barriers to suppression in that they often occur in events, causing multiple starts that can quickly exhaust the initial attack capability of a geographic area. In addition, lightning ignitions frequently occur in steep terrain with little to no access, which limits the ability of initial attack suppression resources to suppress the fire. The Natural Ignitions Map, figure 12, indicates that lightning ignitions are not confined to a specific geographic, but occur throughout most of the West.

Lightning ignitions are also a potential solution to the wildland fire issues in the West. The potential solution comes from creating opportunities for beneficial fires where conditions are right.

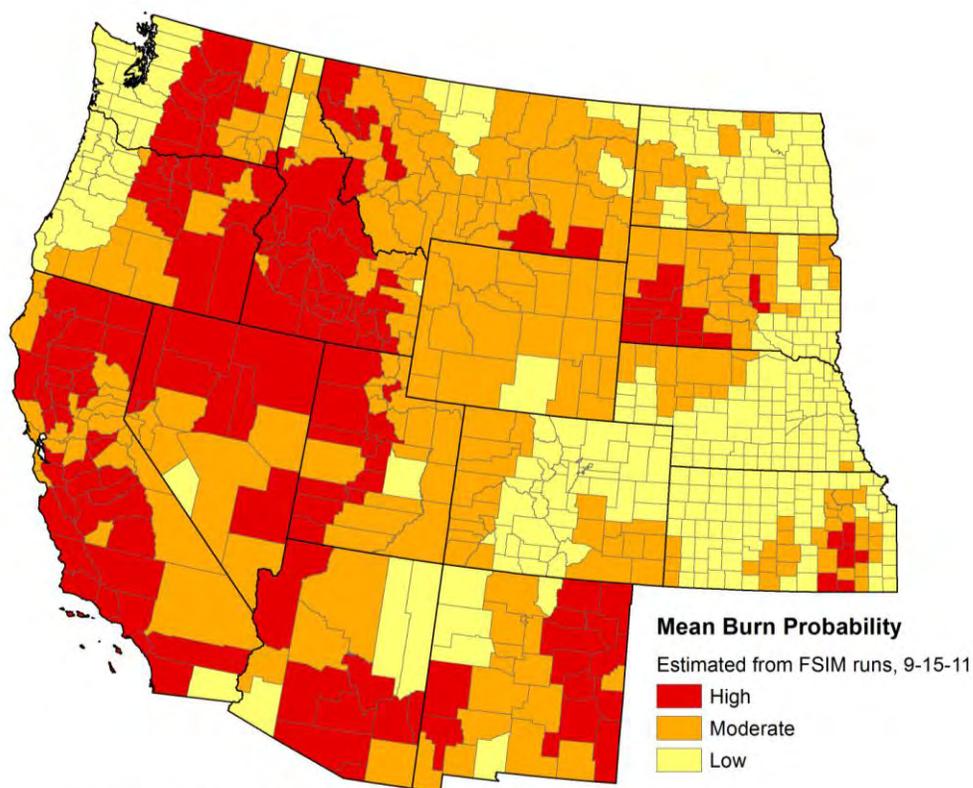
The following table displays sources of ignition and number of acres burned, nationally and within the Western region. It is interesting to note that in the Western Region, approximately two thirds of all ignitions are human caused, and lightning causes one third. Yet 71% of the acres burned are from lightning caused fires, and 28% are from human caused fires.

Table 1. A Decade of Fire Causes and Number of Acres Burned in the West

Total NIFC National 2001-2011	Number of Fires or Acres	Percentage	Average acres burned per fire
Total Human-caused fires	717,527	85.5%	
Total lightning	121,849	14.5%	
Human-caused Acres	29,251,317	39.6%	41
Lightning AC	44,670,701	60.4%	367
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Fires cause and acres in the Western Regional Strategy Committee area.			
Total Human caused fires	184946	63.7%	
Total lightning	105495	36.3%	
Human caused Acres	16,182,719	28.1%	87
Lightning Acres	41,319,501	71.9%	392

- http://www.nifc.gov/fireInfo/fireInfo_stats_lightng.html
- The NIFC lightning and human caused fires and acres data located at http://www.nifc.gov/fireInfo/fireInfo_stats_lightng.html is cumulative including the years 2001 to 2011.

Many areas of the West are subject to moderate to high burn probability in any given fire season. Burn probability is estimated using simulation and represents the likelihood of an area burning during large wildland fires. Burn probability can be relatively high in areas with large fires, even though ignition probability is low. In the Mean Burn Probability Map, figure 14, the counties are categorized as high, moderate, or low average burn probability. Fire was simulated with FSIM at 270 meter resolution with burn probability averaged across all the pixels within a county.



Source: USDA Forest Service FPA Fire SIMulation system

Figure 14. Mean Burn Probability

The magnitude of the large wildfire problem in the West is demonstrated with the Large Wildfire Acres Burned Map, figure 15. This map shows that excluding Florida, almost all the large fires nationally, per year, are in the Western states.

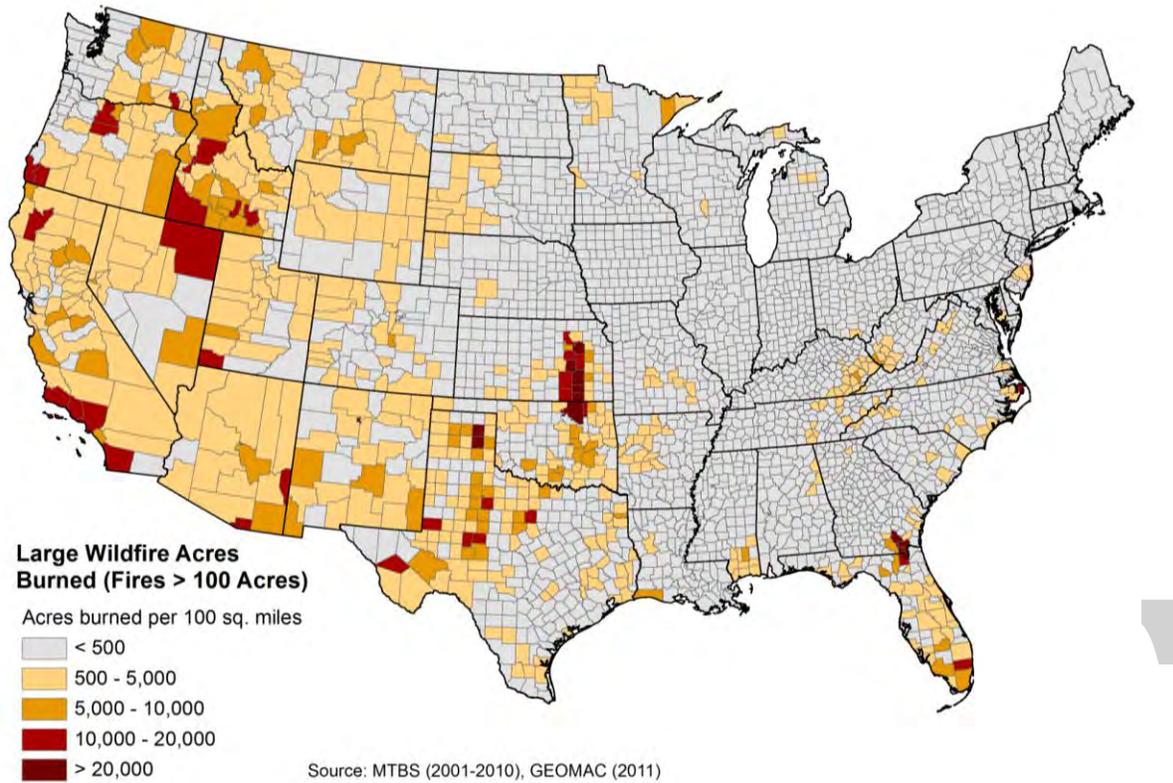


Figure 15. Acres burned per 100 square miles by large fires (300 acres or greater in size) between 2001 and 2011.

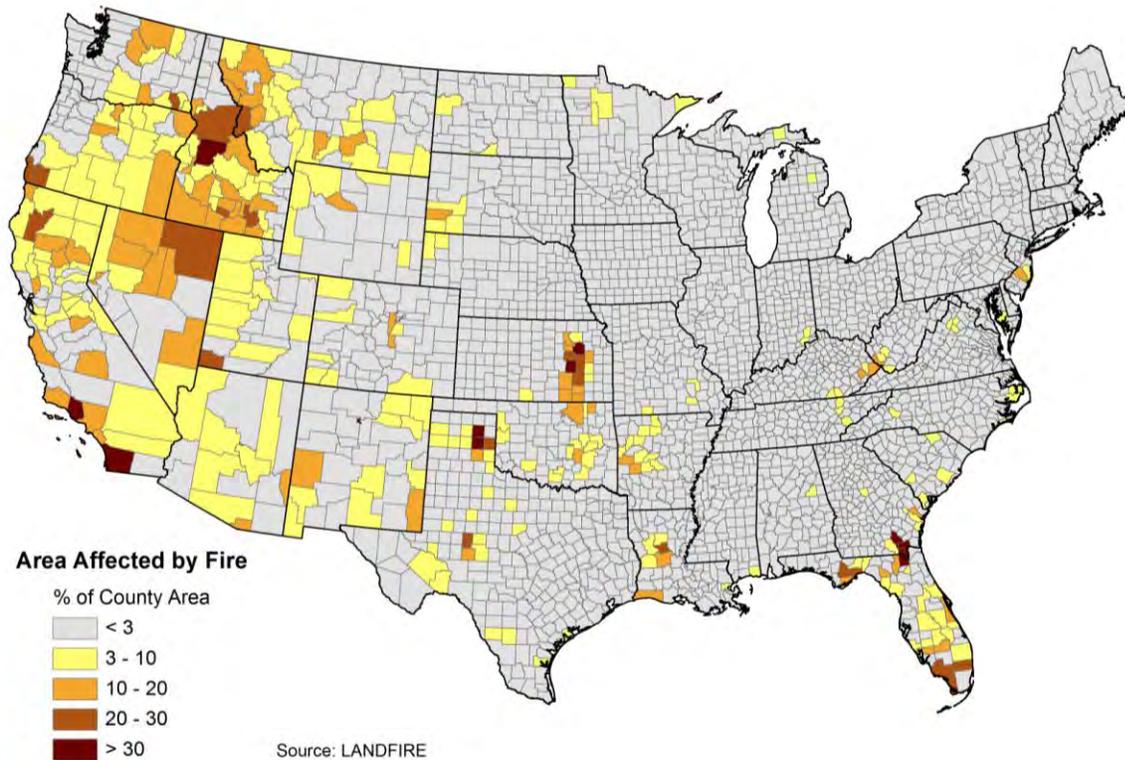


Figure 16. Percent area within each county disturbed by fire shown in eight broad categories.

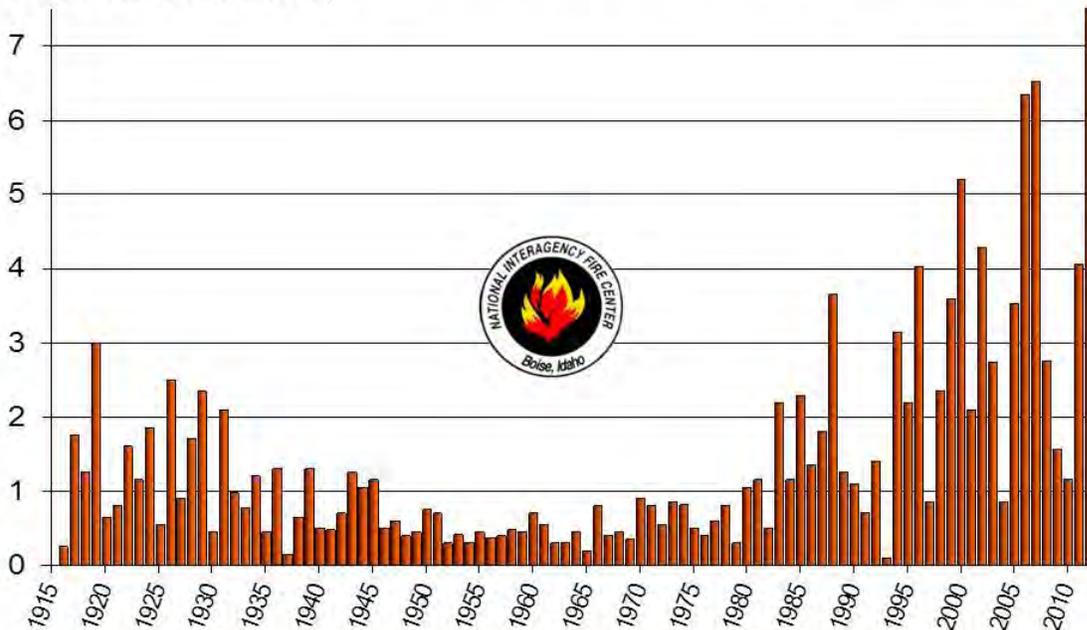
Figure 16, Area Affected by Fire, is based on LANDFIRE data. The map shows the extent of areas within the West affected by wildland fire as compared to the rest of the United States. The spatial extent of these Western wildfires is much greater than other parts of the United States. This is exemplified with seven out of the nine wildfires studied as part of the Mega-Fire project occurring throughout the Western states (Valley Complex (212,030 acres, Montana 2000), Hayman Fire (137,760 acres, Colorado 2002), Rodeo-Chediski Fire (468,638 acres, Arizona 2002), Biscuit Fire (499,965 acres, Oregon 2002), Ponil Complex (92,522 acres, New Mexico 2002), and the Boise National Forest portion of the Cascade Complex (302,376 acres, Idaho 2007). Since the study, Arizona, New Mexico, Utah, Colorado, and Idaho have all had new megafires that have exceeded the size of previous state records for the largest fire within the respective state.

Figure 17 shows the number of acres burned each year for the most of the last century in eleven Western states. In the early part of the 20th century, the West experienced

numerous large fire seasons highlighted with the fires of 1910. Following World War II until the late 1980's, the extent of wildfire occurrence throughout the West decreased significantly, with an upswing in acres burned throughout the West exceeding five million acres in 2001 and then six million acres burned annually in 2006 and 2007. In the West, 2012 was the worst fire season on record. Western wildfires accounted for 91 percent of total acreage burned in the U.S., with the average-sized western wildfire at least ten times larger than wildfires in the Northeast or Southeast. Table 2 shows the total number of wildfires for each region, average acres burned, and average wildfire size. While figure 17 depicts only eleven Western states, table 2 includes all 17 Western states.

Wildfires in 11 Western States,* 1916-2012†

Acres burned (millions)



*Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

† 2012 data through October 9. Prepared by Jay O'Laughlin, University of Idaho.

Figure 17. Acres burned in the 11 Western States between 1916 and 2011.

Table 2. U.S. wildfire statistics by region, 2012.				
	Northeast	Southeast	West	Total U.S.
Number of wildfires	10,053	16,316	23,203	49,572
Acres burned by wildfires	350,954	444,184	8,050,685	8,845,823
Average wildfire size	35 acres	27 acres	347 acres	178 acres

Table 2. Wildfire Statistics by Region. Source: NIFC, 2012 data through October 9.

Land Ownership – The West is Unique

Not only is the West unique, diverse and vast it also has an ownership pattern that is comprised of predominately federal lands, as compared to other two geographic areas. Public lands comprise more than half the total land area of within the West. In many of the far western states the public ownership is over 60% with Nevada the highest at 83%. When compared to other areas of the country this is a significant component and critical factor when looking at active management and landscape level treatments in the West.

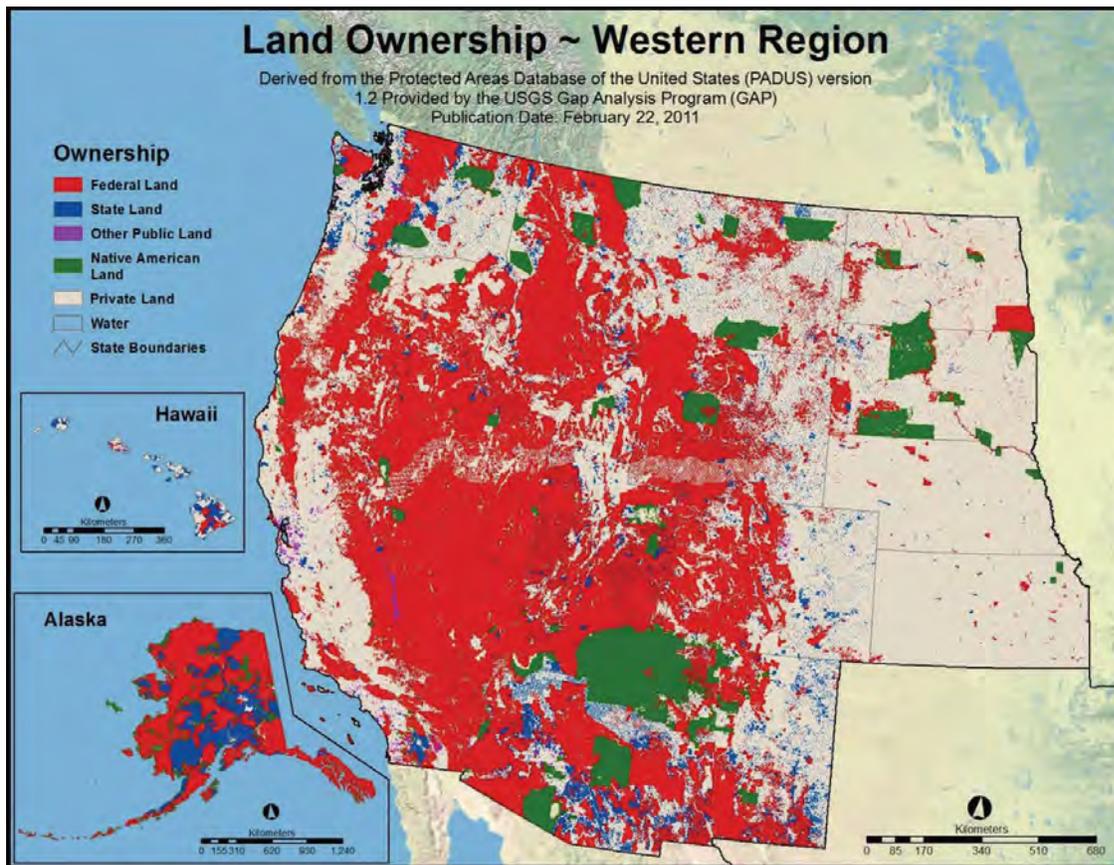


Figure 18. Land ownership in the Western US.

Derived from the Protected Areas Database of the United States (PADUS) version 1.2 provided by the USGS Gap Analysis Program, production date February 22, 2011.

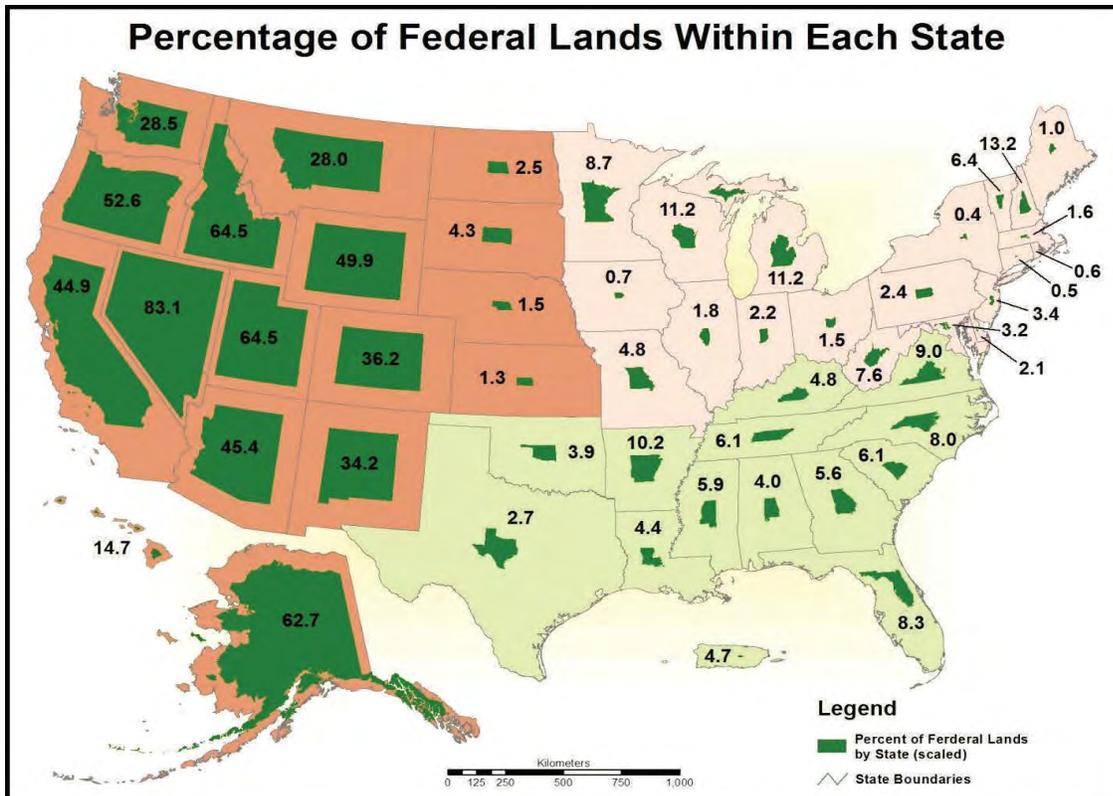


Figure 19. Percentage of each state administered by the federal government.

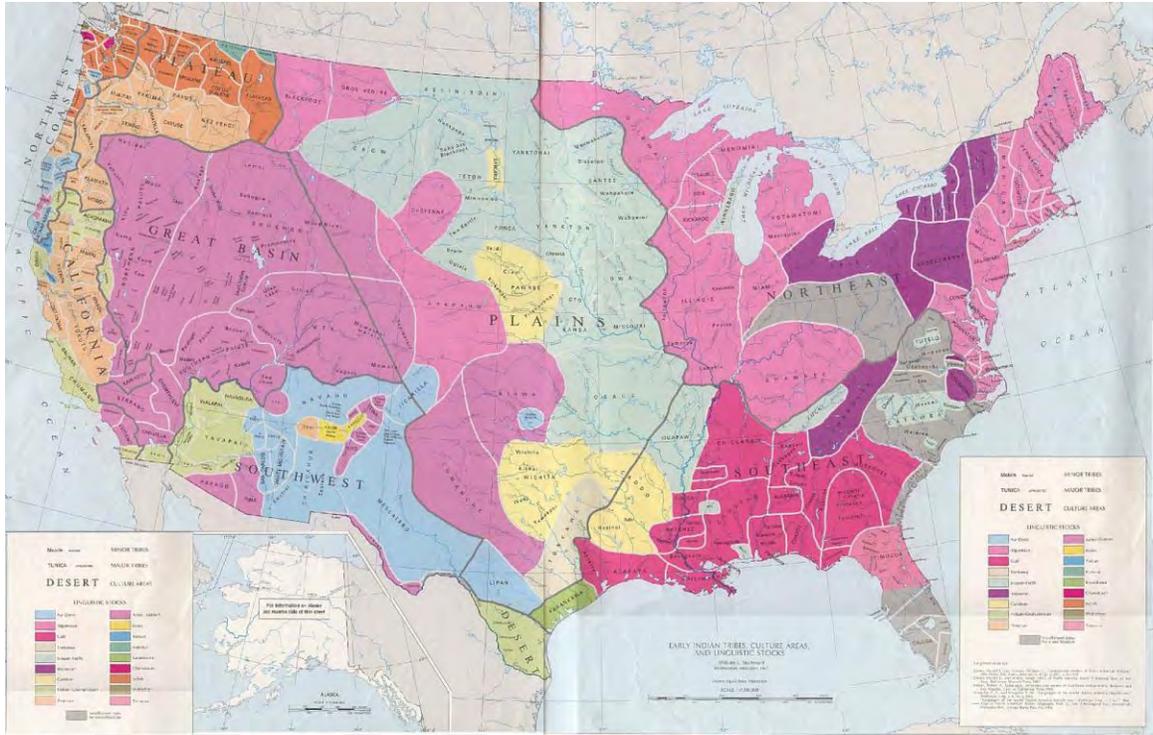
Source: Dr. Jay O’Laughlin, University of Idaho.

This ownership pattern creates many thousands of miles of common boundaries between federal lands, other lands and state or private forest and rangelands. Often times the different ownerships have differing management and suppression objectives and rules and laws that govern management. The ability to work across borders from state and private lands to federal lands will be critical in creating a cohesive strategy to implement large landscape level treatments. Currently, large areas of public lands are at risk for catastrophic wildfire and have many insect and disease issues, with a significant decline in forest health and resilience. Primarily due to the lack of an integrated active management approach, these lands which comprise over half of the West, are in need of increased active forest and range management -- fuels management. This can be accomplished through prescribed fire or natural fires that can have positive benefits in restoring healthy landscapes, while not transferring risk.

Due to the vast ownership of public lands, forest and range health conditions, potential transference of risk, and communities adjacent to public lands, it is very important that a more active management posture is achieved in Goal 1, as a key factor in reducing long term risk.

Native American Cultural History

Native American cultural identity is at risk throughout the West. The territorial map figure 20 shows the historical tribal linguistics patterns across the United States and approximates individual tribal territorial boundaries. Each tribe within the linguistic group delineations is a distinct political community with unique traditional management practices. Practices such as pruning, burning and coppicing at regular intervals once contributed significantly to historic landscape resiliency and community livelihood. Access to abundant and quality hunting, fishing, and gathering areas as well as other traditional, ceremonial, or religious fire use factors have experienced significant decline following fire exclusion. The Traditional Ecological Knowledge (TEK) that is maintained in the West is at risk of loss if incorporation of this knowledge to practice, utilization, and adaptation cannot be revitalized. To mitigate this risk, the focus needs to be at the homeland scale as an intergenerational process within tribal communities that wish to uphold their inherent responsibilities over tribal lands, territory, and resources. The land administered by the BIA and Tribal Lands Map, figure 21, displays lands administered by the BIA and recognized tribal lands on a percent county basis. The map also shows an approximate location where tribal community TEK based collaborations could revitalize cultural land and fire use practices to restore resilient landscapes and to reduce wildfire risks.



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Figure 20. Native American Linguistic map.

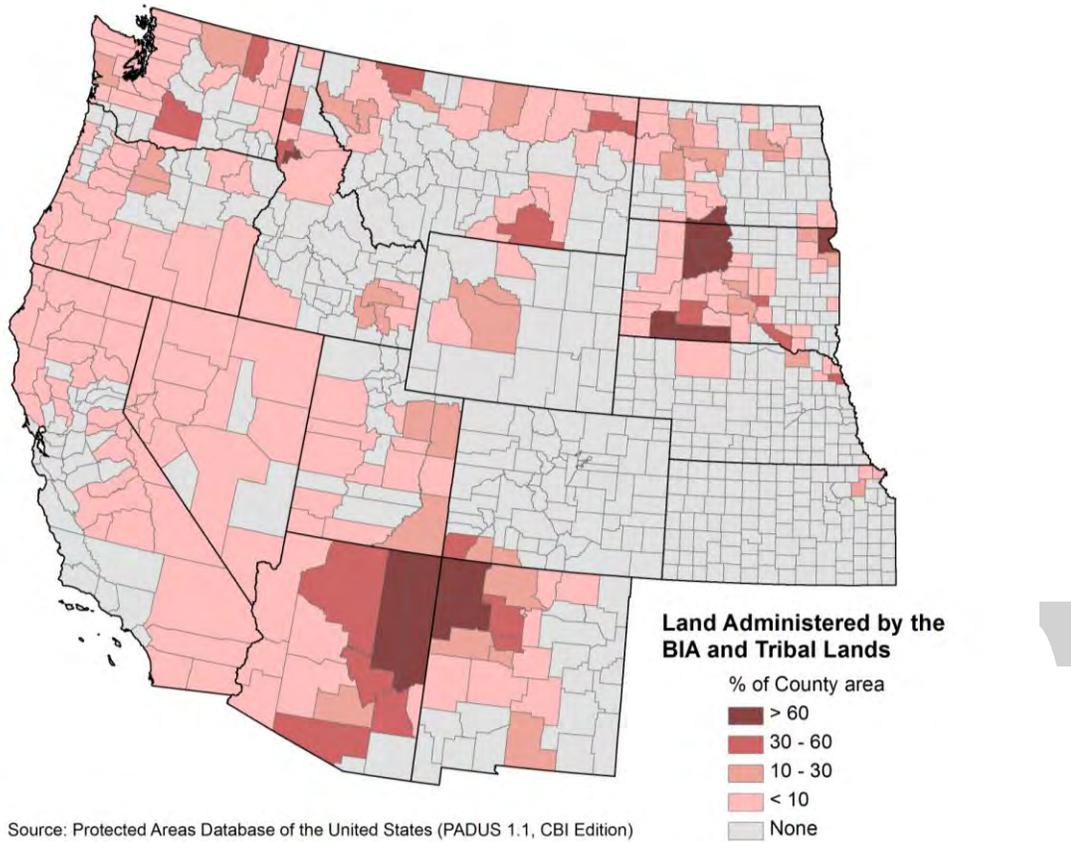


Figure 21. Percent of county land area administered by the BIA and recognized tribal lands.

Smoke Management

Smoke management is a concern throughout the West as concentrations of smoke can cause human health impacts and impair visual quality. High concentrations of smoke from wildfires with high fuels accumulations are both a nuisance and a health hazard to the public. Smoke management is an important consideration in using fire to restore and maintain resilient landscapes. Figure 22 shows the mean annual count of smoke plumes passing over each county. While the entire West is affected by smoke, the northwestern section has the largest number of annual smoke plumes.

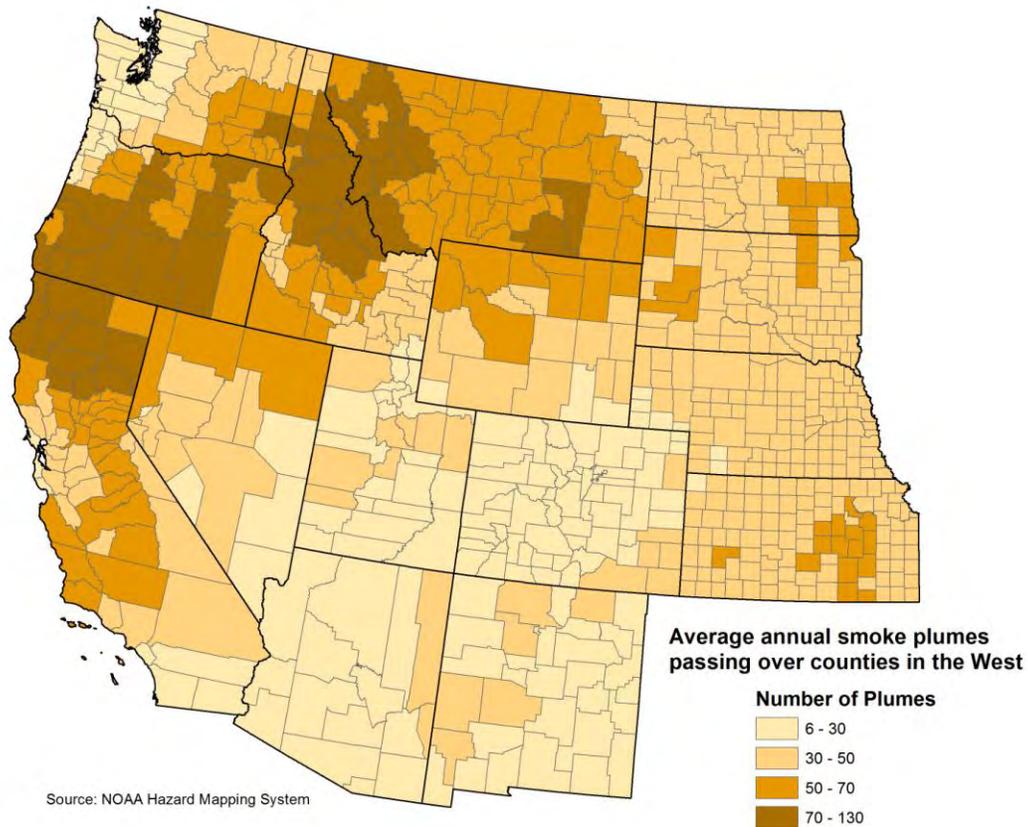


Figure 22. Average annual number of smoke plumes passing over counties.
 Source: Summarized from NOAA Hazard Mapping System.

Alternative #2: Fire Adapted Communities

Alternative #2 emphasizes fire-adapted communities in which all stakeholders and affected publics are collaboratively engaged in protecting communities and WUI residents from wildland fire and in fulfilling a stewardship role for their surrounding landscape. A fire adapted community carries out an integrated plan of action, working in cross jurisdictional partnerships to achieve all three goals of the Cohesive Strategy. The degree of adaptation

among communities varies, depending upon the relationship of each community to its surrounding landscape and the capacity of its citizens to prepare for and respond to fire. Complete fire adaptation is an ideal state to be worked toward through collaborative efforts within the community. By working together, communities can reduce their risk of catastrophic losses to of life, property, and way of life.

Focus areas:

1. Community wildfire and disaster preparedness planning:

- a. State and local representatives, tribes, community members and stakeholder groups, federal and state land managers, and other concerned interests collaborate in developing and carrying out a CWPP or equivalent.
- b. Community response planning includes establishment of adequate local response capabilities and a joint community wildfire response plan that links CWPPs with federal, tribal, and state fire management and all-hazard plans.
- c. Multi-scale risks are identified, and communities develop or acquire needed risk assessment and decision support tools.
- d. Communities at risk understand their risk, are actively involved in mitigating that risk, and are prepared for wildfire.
- e. Communities use fire adapted community mitigation tools to reduce risk (Firewise, fuel buffers, local protection capacity, Ready-Set-Go, etc.)
- f. Establishment and maintenance of local, cooperative interagency mutual aid, assistance by hire, or compact agreements is emphasized.
- g. A strong program of rural fire assistance funding to increase local fire response capabilities is supported and used effectively.

2. Strategic reinvestment in wildfire prevention and mitigation programs.

- a. Identification and prioritization of areas in and around communities, which are at high risk from excess fuels and non-native vegetation.
- b. Mitigation and prevention efforts targeted to protect high risk areas:

- **In the WUI area** – this includes fuels treatments to create defensible space and make other needed site modifications and improvements around homes and other structures, and to establish and maintain community safety zones, fuel buffers around communities, and emergency evacuation routes. Other key actions include the hardening of structures against fire intrusion and the provision of necessary related infrastructure such as adequate ingress/egress roads, water sources, dry hydrants, etc.
- **In the middle ground** – This includes treatment of high value middle ground areas necessary for the protection of watersheds, forestlands, wildlife habitat, cultural use areas and sites, utility corridors, evacuation routes, and other high value areas and assets. Appropriate areas for hazardous fuels reduction and the removal of excess or non-native vegetation to create fuel breaks, expand defensible space, and increase landscape resiliency are also treated.
- **In all areas** –Stakeholders are encouraged to organize and/or participate in collaborative efforts to restore and increase the resiliency of the community and the surrounding landscape. State, private, tribal and federal landowners and managers should facilitate compatible management across boundaries, whenever possible. Priority based funding of collaborative fuel treatment projects that support the expansion of local partnerships is emphasized. Landowner cooperation and coordination in invasive species control, wildlife habitat management, fire prevention, and response to insect and disease issues is encouraged and assisted.

3. A coordinated approach to increasing community self-reliance through capacity building.

- a. Conduct public outreach to provide information to community members, to increase public awareness of wildland fire risk and firesafe practices.

- b. Involve the local people in risk assessment determinations and in carrying out, monitoring, and evaluating the effectiveness of fire prevention and mitigation activities.
- c. Work toward recognition and acceptance by community members of responsibility for their property and life safety in the event of a wildfire.
- d. Educate the public, local officials, and the building community of the value of fire hazard zoning, WUI fire codes, defensible space, and the use of non-combustible building and development practices.
- e. Expand the adoption of preparedness/implementation programs such as:
 - Ready-Set-Go Wildfire Action Plan
 - Firewise Communities/USA
 - Fire Safe Councils
 - Firefree
 - Living with Fire, and similar programs.
- f. Implement programs that include homeowner and private landowner incentives, such as financial and technical assistance for both protection of private property and for improving forest and rangeland health.

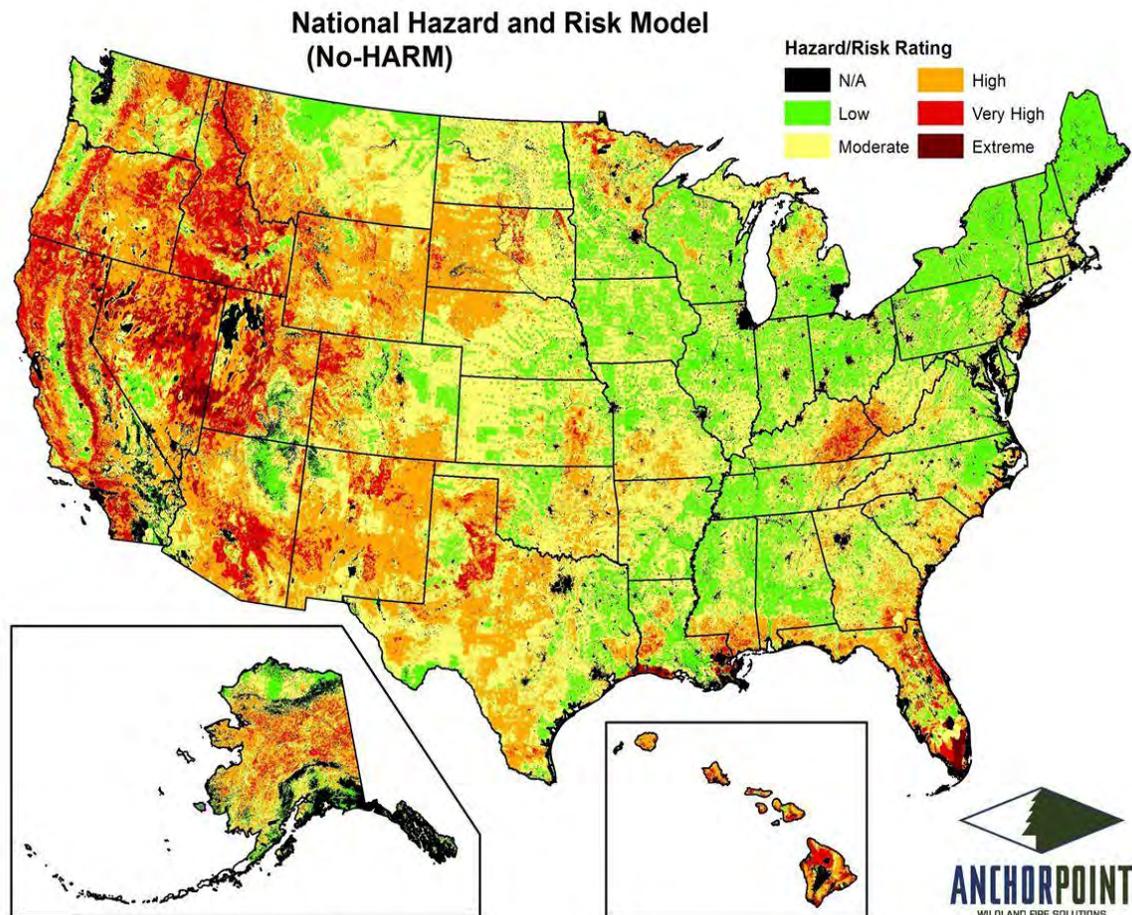
4. Increase community capacity and increase employment and business opportunities in rural communities by implementing landscape resilience and community wildland fire mitigation and protection efforts.

- a. Opportunities are created in fuels reduction and landscape restoration work and through biomass energy projects, green waste reduction, enhanced recreational uses, and related manufacturing and service businesses.
- b. Communities can enhance economic opportunities by offering targeted education including skills training, and other workforce development services.
- c. Federal stewardship end-result contracts, compacts and/or agreements can be entered into by Tribes, communities, states, and for-profit or non-profit organizations to conduct fuels and restoration activities on nearby BLM or Forest Service lands.

Risk to Fire Adapted Communities

When considering wildfire risk and fire adapted communities, we focus on communities at risk -- what can be done to protect them from wildland fire, and what has been done up to this point. Fire has been, and will continue to be, present in the ecosystems of the West. Landscapes near communities, and within the communities themselves, can be modified to reduce the likelihood that damage will occur to communities. In the event of a wildland fire, the community itself becomes fuel for the fire.

Figure 23. National Hazard and Risk of Wildfire



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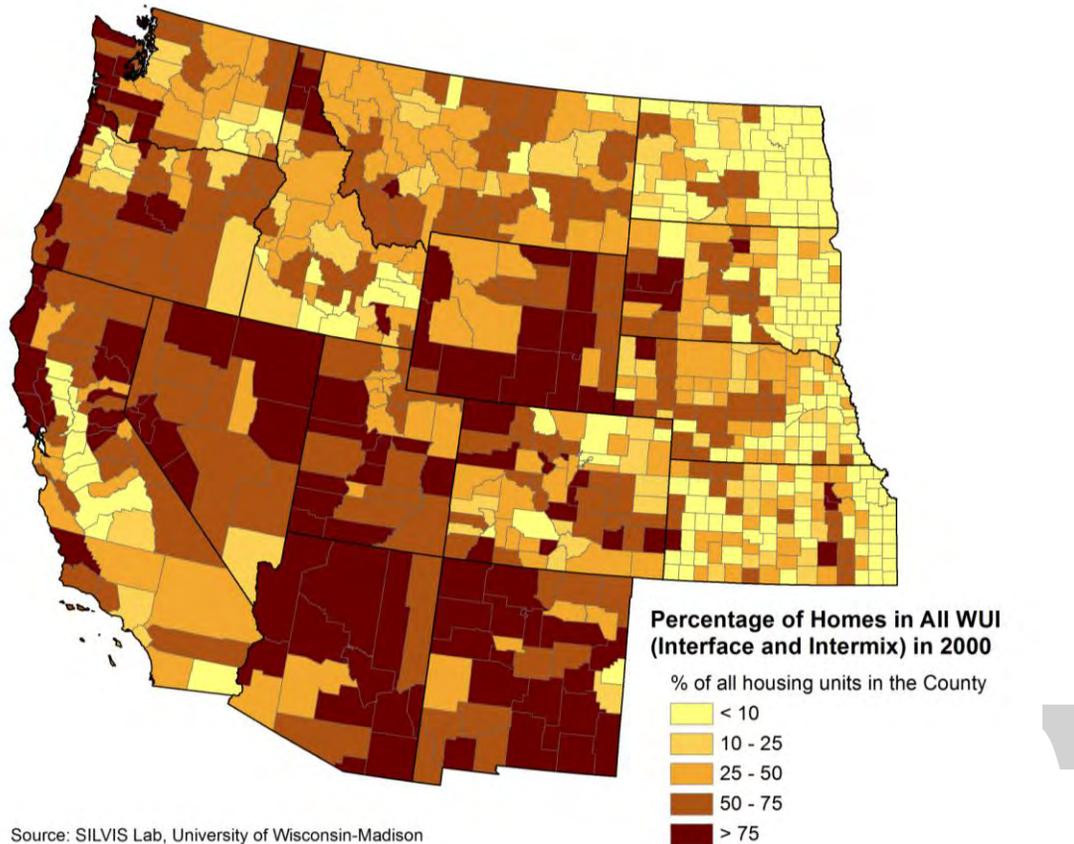
The No-HARM¹, (National Hazard Risk Model) map, figure 23, is based on models of fire behavior and probability, using information about fuels, weather, topography and historic fire occurrence, to show the areas of highest wildfire risk across the country. The largest areas of high risk are in the Western states. This map was created by identifying the levels of risk at the “fired” level of approximately 175 acre units. Communities located in moderate, high, very high and extreme fire risk areas need to become fire adapted.

Fire adapted communities (FACs) are defined as human communities consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire. Fire adaption by communities starts with the ability of the community to prepare their homes and other structures for a wildfire, using known techniques to reduce structural ignitability. Ideally, the structures would be able to withstand a fire without intervention by firefighters, as there are not enough trucks or manpower to protect every structure during a wildfire event. Homeowners need to protect against the threat of fire from both direct flames and burning embers, as most home losses are a result of contact with burning embers, which can often fly miles ahead of a wildfire. People living in fireprone environments need to think about fire safety at all times and prevent ignitions, whenever possible.

Housing Density in the WUI

County summaries of existing home/housing density and high, very high and extreme fire risk show that many communities, and even cities, across the West are in harm’s way due to the relationship of homes to fire-prone areas. WUI within the counties vary from high density to low density, with the highest density areas in southern California and Arizona.

¹ Copyright by AnchorPoint Group, Boulder CO, 2012.



Source: SILVIS Lab, University of Wisconsin-Madison

Figure 24. Counties with moderate or higher burn probability and a large percentage of housing units in the WUI.

Despite the slow down in the housing sector in the past few years, the West is still demonstrating strong pressure for residential growth, particularly in WUI areas. The West has many low density, rural communities scattered across the landscape in fireprone environments. The National Association of State Foresters (NASF) has documented 6,796 communities at risk in the Western region. Communities are not visible on the county level maps, since they are considerably smaller than counties. Local assessments will need to be done at the community level to document vulnerabilities and identify areas for mitigation. However, that is beyond the scope of this report.

Smoke Hazards

Smoke from wildfires poses a risk to communities in terms of respiratory health effects on the elderly, the very young, and those with weakened respiratory and immune systems

(Noonan, et al 2009). An increased concentration of particulate matter in the air is associated with a large number of health problems including: asthma, COPD, and cardiovascular disease in people and animals (Pope, 2011). Smoke also causes traffic accidents with subsequent fatalities and injuries. The smoke negatively affects the tourism industry, discouraging summer visitors to Western communities.



Figure 25. Smoke Plume viewed from space.

This low angle September 2012 International Space Station photograph captures smoke from numerous central Idaho wildfires. It was taken over extreme western Montana with a view toward the west-southwest over the Salmon River Mountains and adjacent ranges. Smoke fills the Salmon River valley at the center of the image and to the north (right) the Selway and Lochsa River valleys that have their headwaters in the Bitterroot range (lower right). [SOURCE: <http://earthobservatory.nasa.gov/IOTD/view.php?id-79303&src=eoaiotd>].

Advantaged and Stressed Communities

Some communities have more resources to be able to prepare their homes for wildfire, and some have less and may need assistance. All stakeholders should work with economically

stressed communities and the tribes to address hardening homes. Creating defensible space for at-risk populations and firesafe living.

Populated areas contribute to the West's wildfire risk, by adding homes, people, infrastructure, and places of cultural significance to the areas that are threatened. An increasing population with home development in the wildland urban interface/intermix, and increasing potential losses characterize risk.

Census data regarding income and education give us broad indications of where people live who may need assistance in addressing the risks and recovery from wildland fire. Counties with higher than the mean income most likely have some capacity to undertake programs to address their risks and recover if fire occurs. The shaded areas in the Demographic Stress Map, figure 26, show the location of Western counties with apparent disadvantages in terms of socio-economic elements that might indicate they may lack the capacity to undertake programs, without economic or technical support, to address their risks and recover if fire occurs.

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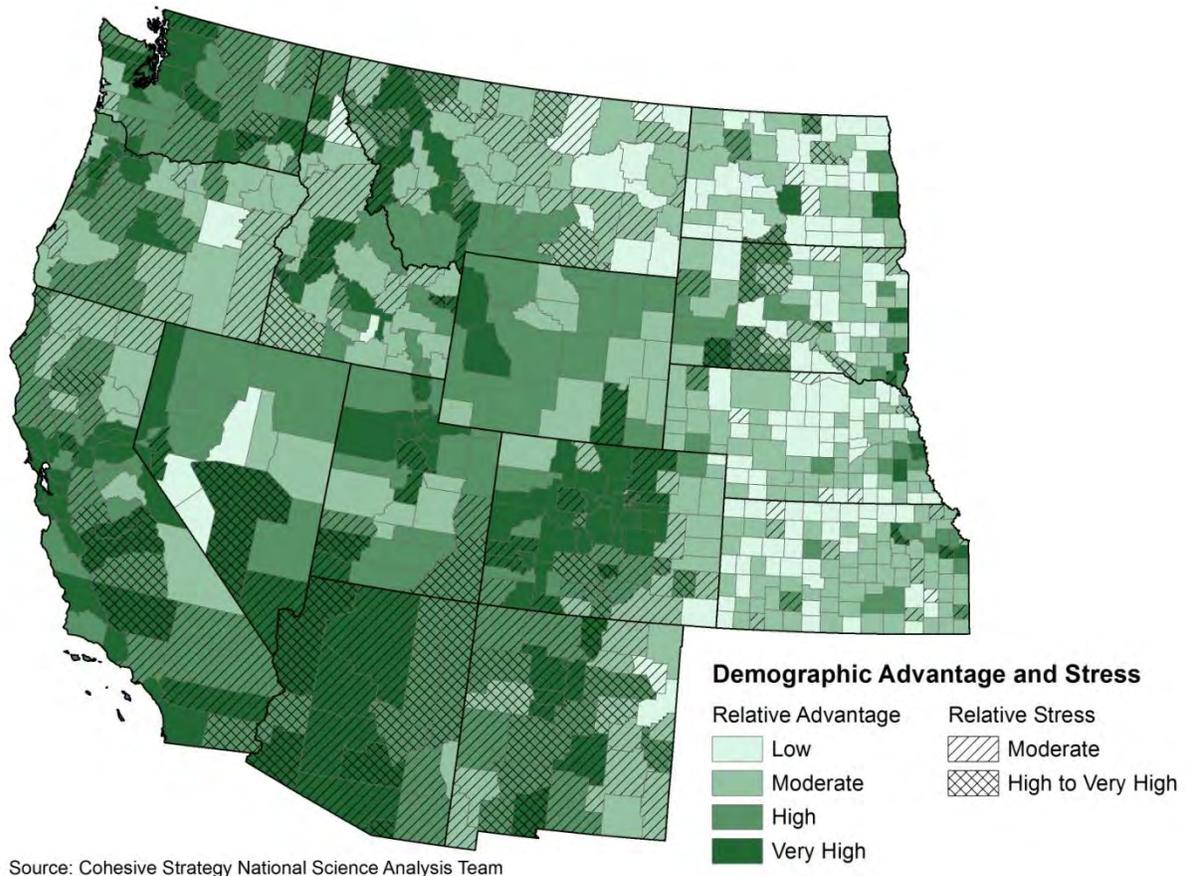


Figure 26. Western counties categorized by socio-economic stress and advantage.

Since the data is shown at the county level, many counties have both people of higher income levels and lower levels. To target stressed communities, we will need to look at a finer scale than at the county level. However, this analysis gives us a general idea of the counties to look at.

Open Space Islands

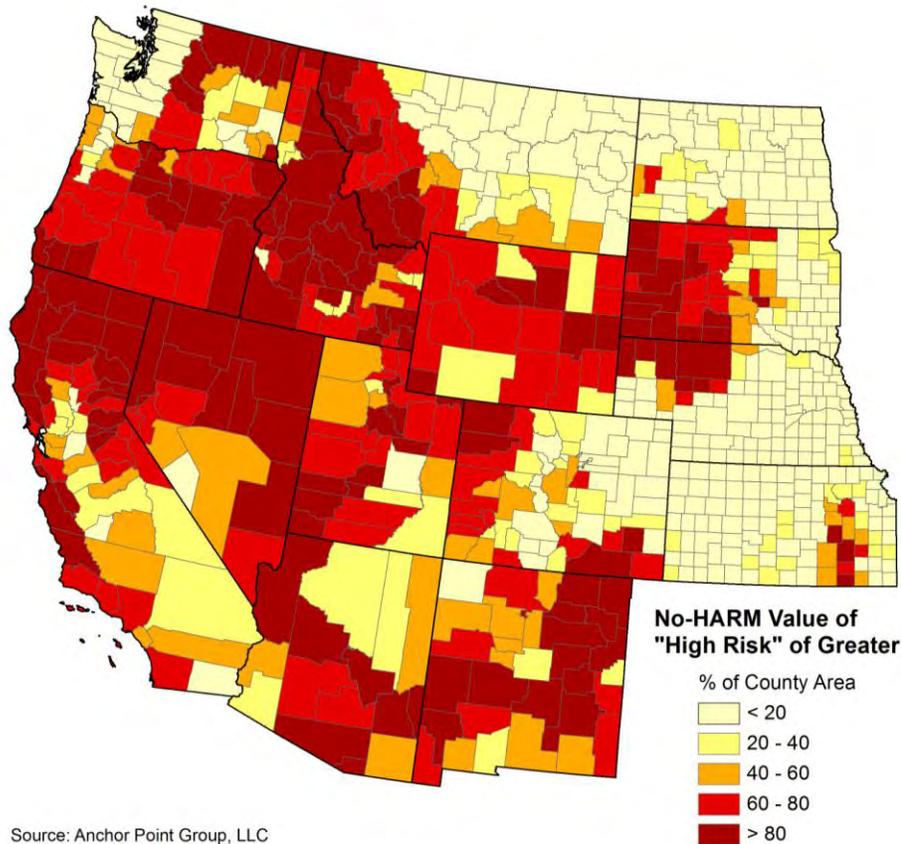
WUI areas are commonly envisioned as a community within the wildland, or at the edge of the wildland. The occluded WUI consists of wildland within a community. The occluded WUI is created as wildlife habitat, park and open space, a watershed, or perhaps a wildland that was not buildable, within the borders of the community. Occluded WUI presents the

same issues of forest resiliency, fire response, and fire adapted community in a smaller, more populated situation. These “open space islands” as they are also called, are native vegetation with all of the management challenges faced in the wildlands, but with the added challenge of being surrounded by homes and development. The resilience of these lands is critical to the local community; the response to these lands expands the requirements of the local fire department and requires them to seek new or expanded assistance agreements. Risks associated with open space islands should be evaluated at the local level. In subdivisions where some lots remain undeveloped, lack of maintenance on the undeveloped lots poses a risk to the nearby homes.

Hazard and Risk at the County Level

The map below is based on the county level No-HARM data. It shows the percentage of land area of each county that is located in areas of high, very high, and extreme wildfire risk. Counties with large percentages of land in the highest risk categories are shown in the darkest shades of red. In this way we show relative risk at the county level. The NO-HARM data is aggregated at the fireshed level, which is significantly finer than the county level information collected for this study. In figure 27 we aggregate the data at the county level to coordinate the No-HARM wildfire risk information with all the other variables in this study. Communities located in counties with a large percentage of high risk lands should be identified for fire adapted community activities.

It should be noted that the county level aggregation, as seen in figure 27, eliminates detail important to the evaluation of hazard and risk at the community level, as presented in the native No-HARM data.



Source: Anchor Point Group, LLC

Figure 27. Counties categorized by the percent of county area rated as high-risk or greater by AnchorPoint's No-HARM wildfire risk model.

Social Science and Fire Adapted Communities

A fire adapted community is a knowledgeable and engaged community in which the awareness and actions of residents regarding siting, construction, and/or modification of infrastructure, buildings, and landscaping and appropriate management of the surrounding ecosystem lessens the need for extensive protection actions and enables the community to safely accept fire as a part of the surrounding landscape. The goal is to reduce risk from wildfire in at-risk communities, reduce damage from wildfire when it does occur, and reduce fire suppression and structural protection costs, while also enhancing firefighter or civilian safety.

Community members work together to prepare for wildland fire through fire adapted

community activities such as: educating residents about wildfire risk and taking action to mitigate those risks, managing fuels on public and private lands in and around the community, developing and maintaining a firebreak around the community, and designating and protecting evacuation routes, and/or establishing safety zones. Preparing and carrying out a CWPP or equivalent document, becoming a Firewise Communities/USA or Firesafe Council/Chapter community, and participating in the Ready-Set-Go program are three important actions that help a community adapt to fire. Individual homeowners and families prepare for wildland fire by reducing fuels around their homes (creating defensible space), building/retrofitting and maintaining their homes with ignition-resistant building materials, and preparing for evacuation or other emergency efforts.

When a community works together and undertakes mitigation and management activities, the community moves toward a more fire adapted state. The more activities the community engages in, the greater the fire resistance of the community. Studies have shown the synergistic effect of multiple activities to protect homes and communities from wildfire (Renner et al. 2010). A community becomes fire adapted as it takes action to reduce risk. Figure 28 shows a list of actions and programs that an existing community can undertake to become fire adapted, or better suited to the fire prone environment in which it exists.



Figure 28. Elements of a fire adapted community.

Source: US Forest Service.

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Community Wildfire Protection Planning

The most important first step in becoming a Fire Adapted Community is the creation of a CWPP. The CWPP brings together a core group of stakeholders within the community to collaboratively craft a plan for reducing the wildland fire risk to the community. Following a risk assessment, which identifies the areas in which the community is vulnerable, they prioritize fuels treatments within and around the community. The stakeholder group educates local homeowners about hardening their homes against fire, and they consider all of the available options, using the best available knowledge, to mitigate the risk the community faces. CWPPs define a WUI boundary for the community, which can include areas of importance to the community, such as watersheds, evacuation routes, recreation areas, wildlife habitat or cultural areas, utility corridors or more. These areas, which lie outside the jurisdictional boundary of a community and have importance to the community, are the middle ground. Since communities have the ability to define their own

WUI boundary, the middle ground can be protected and actively managed within the community's WUI boundary. CWPPs have proven to be an effective tool in moving toward accomplishment of all three goals of the Cohesive Strategy.

A CWPP can be a very powerful tool, however, not every CWPP gets implemented. The level of community involvement in CWPP planning is a good indicator of the power of the individual CWPP. A study of three communities that created CWPPs and implemented some fuels treatments, found that the treatments enabled easier fire suppression and contributed positively to community protection when a wildfire occurred. In addition, the relationships developed during the planning process improved communication and cooperation during the fire. (Jakes and Sturtevant 2012).

The Community Wildfire Protection Plan map shows that most counties in the West have completed a CWPP or its equivalent, and many individual community-level CWPPs have been developed to further refine mitigation planning at the local level.

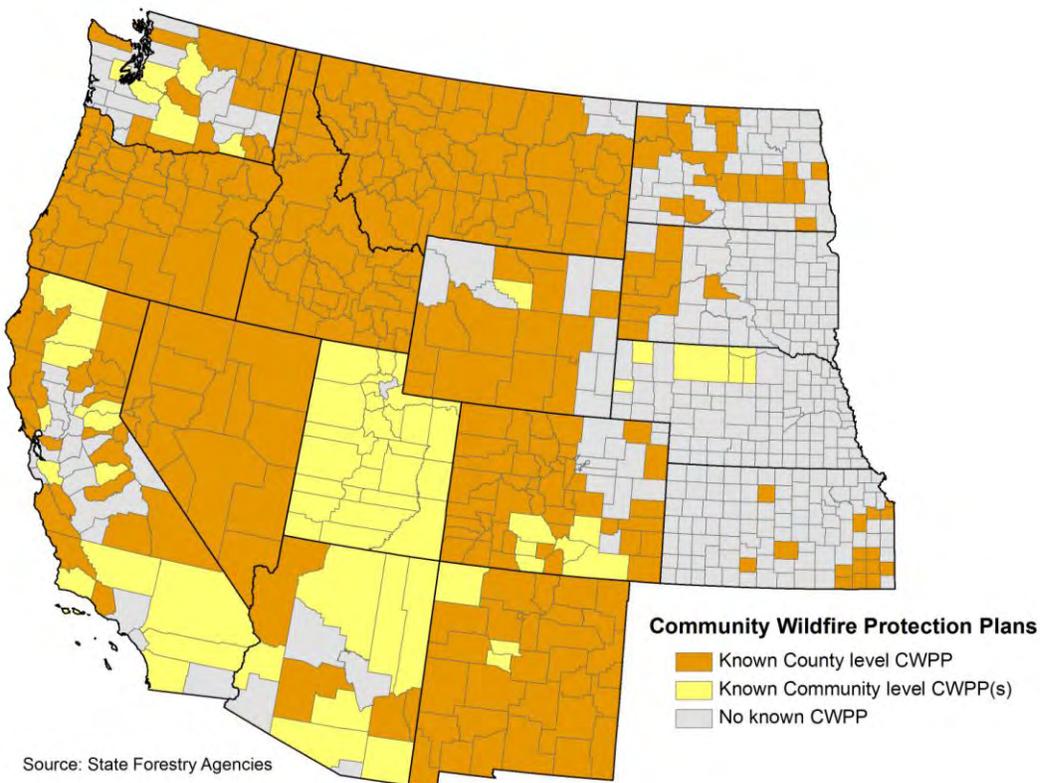


Figure 29. Counties that include communities with CWPPs or with county-wide CWPPs.

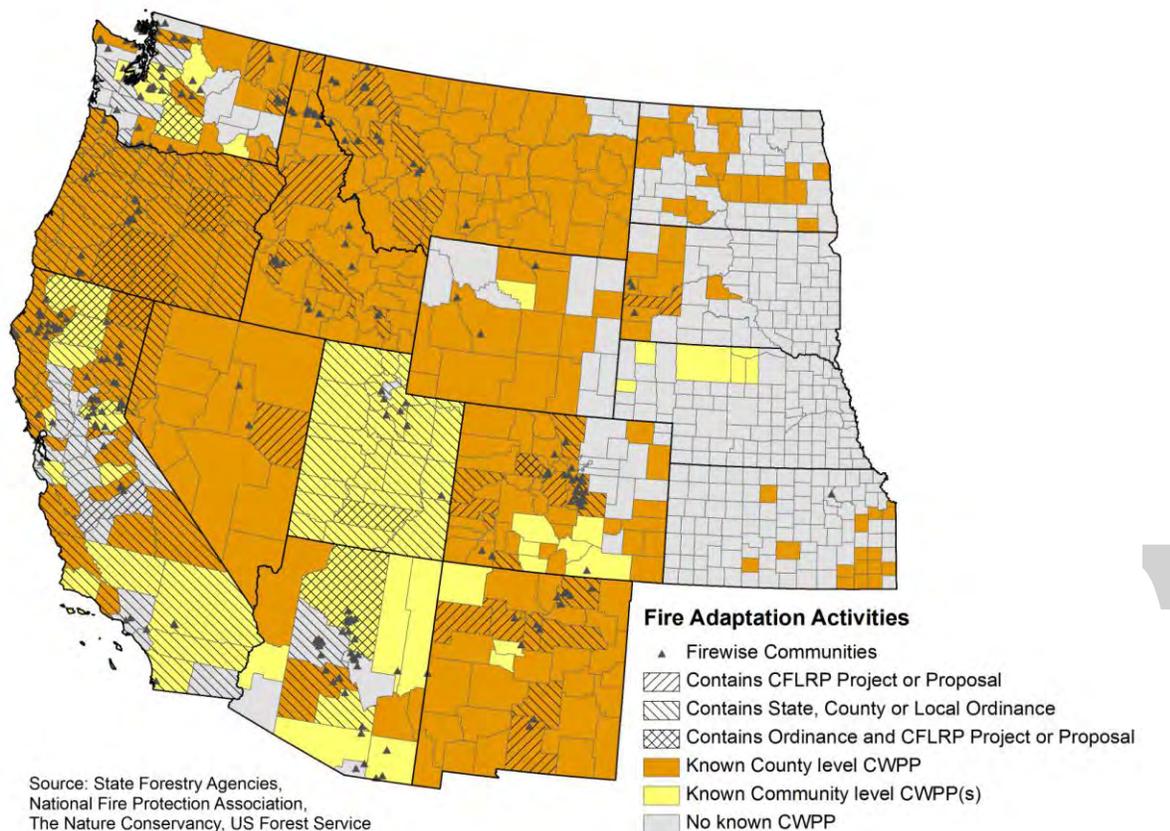


Figure 30. Counties reporting adaptation activities including CWPPs, ordinances, and CFLRP projects.

Source: State Forestry Agencies, National Fire Protection Association (NFPA), The Nature Conservancy (TNC), and USDA Forest Service

Fire Adaptation Activities

The Fire Adaptation Activities map, figure 30, shows the locations of county and community level CWPPs plus other wildfire mitigation programs, including the locations of Firewise communities, and states, counties and municipalities with ordinances requiring defensible space. The two most important actions to protect structures from wildfire are the creation of defensible space and the installation of a Class A roof. Three states - California, Oregon, and Utah have adopted statewide laws relating to defensible space and

other parameters of reducing risk, including Class A roofs and ignition-resistant building materials on houses in high risk zones. The ordinances are different in each state, but the common denominator is the requirement for defensible space.

Model WUI ordinances, such as the International Code Council's Wildland Urban Interface Code, or NFPA's Standards 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire and 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas, contain a network of standards for homes - including defensible space, roof and building component requirements - and neighborhood standards for - site planning and preparation, roads, bridges, water quantity for fire fighting and other requirements. These ordinances can be adopted at the municipal, county, or state levels. Wildfire mitigation requirements can be incorporated into zoning ordinances, subdivision regulations, building and fire codes, nuisance ordinances, or even adopted in neighborhood covenants, codes, and restrictions (CC&Rs). Many jurisdictions believe that ordinances are the most effective means to motivate homeowners to prepare for wildfire. It is important for the ordinance to have requirements for maintenance of defensible space over time and an enforcement clause in the regulation.

The map also shows the locations of Collaborative Forest Landscape Restoration Program (CFLRP) projects. These are large-scale projects to reduce fuels and restore landscapes funded under the Collaborative Forest Landscape Restoration Act. The goals of these projects parallel the goals of the Cohesive Strategy.

This map clearly shows that the West has been mobilizing at the state, county and community levels to reduce wildfire risk. The states have been active for the past 10 years under the National Fire Plan and the 10 Year Implementation Strategy. Programs exist in many states for education, homeowner assistance with prescriptions for fuels reductions around homes, assistance with debris disposal – such as offering free chipping of slash or waste collection, and 252 fire departments across the West that promote the Ready-Set-Go program for fire and evacuation preparedness.

Fire adaptation is a process that requires continual updating and renewal of efforts to be prepared and to keep fuels reduced. Communities need technical and financial support to continue to move closer to a fire adapted status. Efforts by the federal agencies, states, counties, and local governments need to continue to grow to reach more communities and more individuals.

Public Perceptions of Wildland Fire in Social Science

Research from the field of social and behavioral science informs our understanding of fire adapted communities, and how people deal with living in a high risk environment. Recent studies have shown that residents are often well informed about fire and the role of fire in the ecosystem, and generally are supportive of fuel reduction. McCaffrey, *et al* found that “particularly for those in high fire hazard areas, individuals often have a fairly sophisticated understanding of fire’s ecological role”, and further that “overall, results clearly show that prescribed fire and mechanical thinning are, at some level, acceptable management practices for over three-quarters of the public” (McCaffrey, 2012). Several studies have shown that the public thinks fire management planning is primarily the responsibility of (federal or state) agencies, but they want to be informed about management activities and involved in the planning. Another survey found that respondents supported resident involvement in planning focus groups and advisory committees, and believed that education and outreach should be part of a fire hazard reduction program (McCaffrey, 2012).

Research has revealed some key mechanisms that lead to action and how to help a community mobilize. The McCaffrey report conclusively finds that "interactive outreach at the local level" (i.e. people talking to people) is the most effective means of communicating about wildfire issues, and that raising public awareness/education promotes individual action, builds public-agency trust, and builds broad support for fuels management efforts – all key factors in effective fire management. Local action and education are essential. The conditions for local action include:

1. A trusted source of information. Local fire departments and local state and federal fire and land managers are often the sources.
2. A trusted local convener/facilitator for local regular discussions, planning, learning
3. Fire information set in a local context.
4. An experience with risk or high risk awareness.
5. A feeling of “agency”, that what they do will make a difference in fire behavior and effects and that the actions will actually take place.
6. True “agency”: the local capacity to “get work done”
7. A feeling of reciprocity among neighbors and landowners, “shared risk/shared responsibility”.

The model below shows the relationship of key elements of the of fire and fuels management public acceptance model. It shows how people can become accepting of thinning activities including prescribed fire and mechanical treatment. It shows the interactive communication process leading to understanding of the ecological benefits of thinning activities, and building trust in the source of the information, which leads to acceptance of fire and fuels management.

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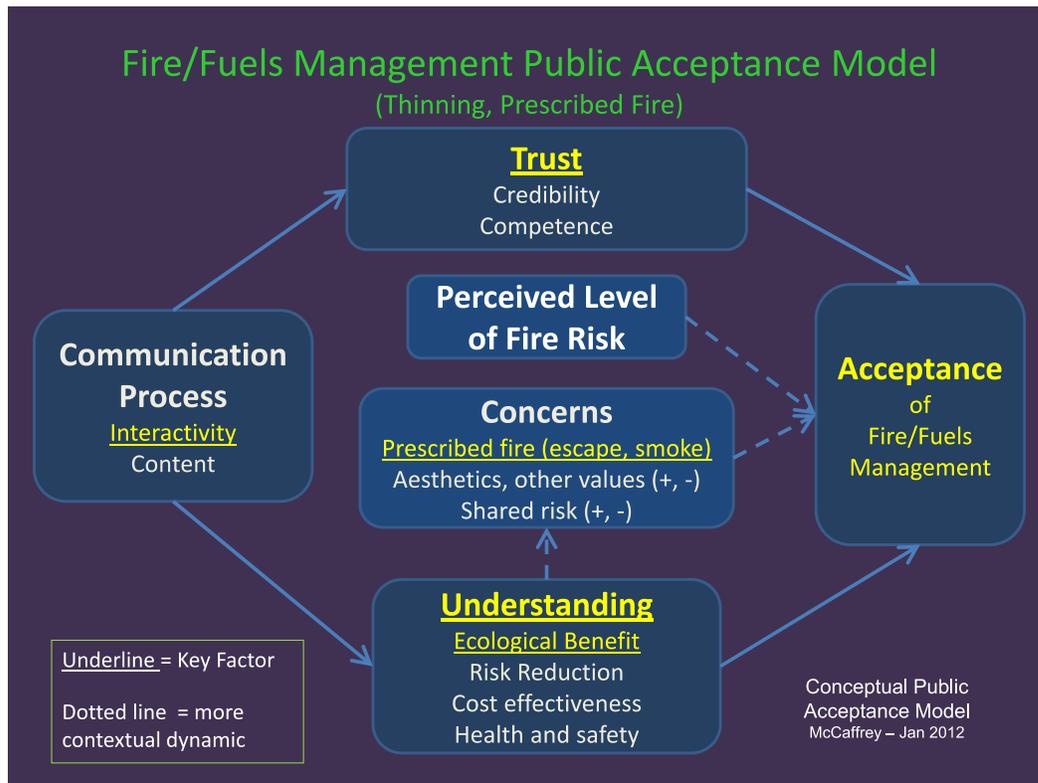


Figure 31. Factors influencing public acceptance of fire and fuels management activities.
Source: Sarah McCaffrey, USDA Forest Service, Northern Research Station.

Attention should be paid to every step of this process. Agencies working with the public should be sure to institute an interactive communication process at the local level.

Regional Models of fire adapted communities in resilient landscapes

There are many model programs for use of FAC tools, techniques, and technical assistance. There are multiple web resources, including CWPP handbooks and examples, the Firewise Communities/USA program, Ready Set Go! And, and numerous federal and state websites offering information on wildfire risk mitigation to homeowners and communities. The fire adapted communities website - fireadapted.org, is designed to assist local leaders through

the many elements of adaptation. However, tools, handbooks, and expertise by themselves, do not lead people to action. Research shows they are effective:

1. In peer-to-peer learning venues (Goulette 2012).
2. When accompanied by federal and state agency and/or NGO technical assistance, (Goulette 2012).
3. When trust is created through experience and personal relationships (McCaffrey, 2012).

The Fire Learning Network (FLN), sponsored by the Nature Conservancy, the US Forest Service, and the land management agencies of the Department of the Interior, is an example of large scale application of the concept of creating fire adapted communities in a resilient landscape. The FLN started in 2002 to provide a social learning network for the people engaged in ecological fire restoration. By 2010, it had 15 regional networks working on 157 landscapes totaling 150 million acres, and 177,000 acres had been treated with prescribed fire. (FLN, 2011). The FLN nurtures expertise in ecological fire restoration and collaborative planning by linking multi-stakeholder collaboratives to regional communities of practice. Additional examples of large-scale projects for landscape resiliency, reducing risk to communities, and improving local economies can be found in the CFLRP in 23 locations across the country.

Potential Outcomes

Fire adapted communities are a good investment. A recent post-fire assessment by FEMA in Colorado Springs, CO found a benefit cost ratio of 517:1. That is, for every dollar FEMA invested in wildfire mitigation projects in Cedar Heights subdivision, there was a savings in suppression cost of \$517.00. (Randall, 2012). Firefighters were able to save 82% of the homes in the three neighborhoods impacted by the Waldo Canyon Fire. Colorado Springs has been working on education homeowners and reducing fuels around homes for ten years. This preparation led to orderly evacuations when needed, and a minimal loss of structures. Similar investments are needed in communities in high wildfire risk areas throughout the West.

Potential Impact of Fire Adapted Communities Actions

If greater investments are made in increasing the fire adaptation of communities, that is, moving communities along the continuum from start-up communities through active communities to innovator communities, the residents of those communities will be empowered to reduce their own wildfire risk. This will result in greater neighborhood safety, reduced stress and general feeling of well-being within the at risk communities. Two examples illustrate the potential impacts of fire adapted communities activities. The Whitefish, MT story is one of preparedness and development of a multi-faceted mitigation program within a community, done in implementing a CWPP. The Hughes Creek, ID example is the story of cooperative effort between the community and the Forest Service in fuels treatments in the middle ground, which protected the community from a recent catastrophic wildfire.

The Whitefish area of Flathead County in northwest Montana has year-round population of about 8,000. Most of the land surrounding Whitefish is forested and managed by federal, state and private industrial landowners. Flathead County did a CWPP in 2005. In 2007, a number of substantial fires in northwest Montana – including one just 20 miles west of Whitefish – motivated the entire community to take action. Over 50 community members participated in the development of a community level Whitefish Area CWPP, and the Whitefish Area Fire Safe Council (WAFSC) was formed to ensure that the community's CWPP would be implemented. WAFSC developed a list of projects to pursue, which together span all three goals of the Cohesive Strategy. Regular monitoring and reporting to the community was also built into the work program

Prevailing winds in the Whitefish area blow out of the southwest, so wildfires starting to the south and west generally present the greatest threat to the community. A major focus of WAFSC's activities has been the creation of continuous shaded fuelbreaks west and southwest of Whitefish. State land managers, several homeowners' associations, and numerous private landowners all have participated in the fuelbreak effort and forest improvement activities. Local non-profit organizations have secured several hazardous

fuels mitigation and forest health improvement grants that provide cost-share funding to local landowners to create defensible space and reduce fuels on their property.

Flathead County's subdivision code requires that the Final Plat for any new subdivision in the WUI have printed on it:

- “This subdivision is located in the Wildland Urban Interface wildfire priority area where wildfires can and do occur.
- Only Class A and Class B fire-rated roofing materials are allowed.
- Firewise defensible space standards shall be incorporated around all primary structures and improvements”.

At least five area subdivisions have achieved certification as Firewise communities. WAFSC has an aggressive wildfire public education effort. The Whitefish Fire Department also actively promotes increased awareness and mitigation efforts.

Another good example of collaboration and preparation for wildfire is the Hughes Creek fuels treatment project. Located in eastern Idaho, near the Montana border, Hughes Creek is surrounded by national forests. In conjunction with Lemhi County's CWPP, the Forest Service conducted the Hughes Creek fuel reduction project from 2009-11 to help protect the community of Gibbonsville. Property owners along Hughes Creek also reduced fuels on their land. In September 2012 the Mustang Fire, which had burned over 290,000 acres of land, burned into the fuels reduction project area, located about 5 miles west of the town. When it encountered the reduced fuel area, the crown fire dropped to the ground and the fire fighting crew was able to contain the fire on that side. The Hughes Creek fuels reduction project not only saved the town, and structures along Hughes Creek, but it also significantly reduced the cost of suppressing the fire in that location.

Strategy for Fostering Fire Adapted Communities

The FAC strategy is designed to speed up the development of fire adapted communities and link them into a sub-regional communication and learning network for continued

development and innovation. Communities should be encouraged to move along a continuum toward fire adaptation.

1) *Start-up Communities* are those that have not yet begun to organize for integrated fire management. They may need assistance to catalyze their social interaction, build trust, and set up the collaborative processes necessary for development and implementation of CWPPs, Firewise, Ready-Set-Go, WUI ordinances, etc. Active or innovative communities may be able to help start-up communities with peer-to-peer counseling, sharing of informational materials, and other assistance that minimizes “wheel reinvention” and enables start-ups to benefit from the lessons already learned by those who are further along the path toward fire adaptation.

2) *Active Communities* are those already in the process of mobilizing to address wildfire risk. They have achieved many of the planning goals of FACs and/or landscape resilience, and are using existing resources (volunteers, grants, etc.) to begin carrying out their plans. Their CWPPs and action plans still might need to add a population protection plan, but they are ready or have begun efforts to reduce fuels in accordance with the CWPP.

3) *Innovative Communities* are community and countywide groups that are working on integrating all three goals of the Cohesive Strategy. They are likely to be key players in supporting and networking “start-up”, “active”, and other “innovative communities” in the region. They may need resources to complete fuels treatments in accordance with their CWPPs and to train residents to mobilize in local fire emergencies.

Alternative #3 – Fire Response

Alternative #3 emphasizes increased stakeholder effectiveness in risk-based wildland fire responses that enhance firefighter and public safety. The alternative includes aggressive, effective initial attack capability where it is deemed appropriate by the local fire management cooperators. The protection of life, property, and resources is the core objective of the alternative. Wildland fire for multiple objectives is encouraged, where

desired, and when risk will not be transferred to a landowner or manager without their knowledge and consent. This alternative illustrates a commitment to fiscal integrity which means wise use of taxpayer funds to include: the integration of local, state, tribal, federal, and private response capability in the areas of protection responsibility; resource mobilization; training; and, qualifications at the regional and national level. Much of the contributing risk in this area is connected to workload as displayed by fire occurrence and measures to reduce that workload. Varying levels of resilient landscape restoration and improvement, hazardous fuel reduction treatment, and fire-adapted community work will all contribute to achieving the three goals of the Cohesive Strategy.

Recommendations:

- I. Improve initial attack success
- II. Prevent wildfires
- III. Improve Public information before, during, and after incidents
- IV. Enhance existing capacity
- V. Improve firefighter and public safety

Focus Areas

Focus Area 1. Public and firefighter health and safety.

- Wildfire response is a shared responsibility. Stakeholders should identify their appropriate contribution to wildfire response and commit to providing it.
- A rigorous fire prevention program will be maintained by all jurisdictions and coordinated at appropriate landscape scales across agencies, tribes, and partner organizations the safest, least expensive, least destructive wildfire is the one that does not start. Planned ignitions are not wildfires and are highly appropriate both for restoration of fire resilient landscapes and the reduction of fire threat to firefighter and public safety, property, ecological services, resources, and other community-values-at-risk through fuels reduction.
- Develop human factors based prevention programs.
- At all levels, risks, hazards, values and fire management approaches will be discussed among stakeholders throughout the year to adapt to changing conditions and apply lessons learned.

- Aggressive, effective initial attack capability to prevent ignitions from growing into large, expensive, damaging, and dangerous wildfires.
- Use efficient and effective combinations of prevention, initial attack, and fuels treatments to manage ignitions in an area to prevent fires from becoming large, expensive, damaging, and dangerous.
- Use efficient and effective combinations of fuels treatments, resilient landscape restoration, and fire adapted communities to improve public and firefighter safety, property and resource protection, and suppression effectiveness resulting in acceptable cost plus net value change, thus achieving the greatest benefit for public expenditures on large fire management.

Focus Area 2. In most settings, an ignition management approach that uses prevention of human-caused wildfire; fuels treatments and hazard mitigation; and aggressive initial attack in a cost-effective combination is the best approach to reduce risk, costs, and losses.

- Enables increased collaborative capacities to facilitate integrated roles in local fire management, decision making, training, and response
- Increased collaborative capacity of stakeholders to facilitate integrated local response to fire threats and ignitions.
- Focus on determination of community-based priorities addressing local issues.
- Encourage greater integration of private sector response capabilities and broader application in the West where private sector resource is more cost-effective. Potential uses of private sector resources in fire prevention education, mitigation, fuels treatments, initial attack, and large fire management should be evaluated for economic efficiencies.

Focus Area 3. Many, but not all, stakeholders recognize that fire is necessary for sustaining fire dependent and resilient landscapes, ensuring flows of ecological services from forests and rangelands to maintain and improve rural and urban economies and lifestyles, and reduce fire risks, costs, and losses.

- Provide for the exchange of fire knowledge and experience among stakeholders and sustained collaborative dialogue leading to more completely shared understandings and goals.
- Educate stakeholders across all agencies and publics about the physical, biological, social and ecological dimensions of wildland fire, fire effects and fire management to enable them to better collaborate on landscape scale coordinated fire response.
- Develop a value among stakeholders to ensure that their decisions about land use and management practices, maintenance, building practices, development, fire response, or activities that might ignite fires do not pass risk or costs to adjoining cooperators or land owners, or constrain their options to use fire in land management and fire protection without their consent.
- Multi-objective fire management activity will require an increased capability to identify multi-scale risks with improved risk assessment and decision support tools.
- In some cases, stakeholders may manage ignitions in ways other than immediate, full suppression, for a variety of objectives, where risk will not be transferred to others without their knowledge and consent.

Focus Area 4. Leverage response capability to make use of public sector funds as effective as possible.

- Integrate local, municipal response capability and non-suppression activities at the regional and national levels especially in the arenas of training, qualifications, and mobilization.
- Although many of the actions in this alternative would require a high degree of social, political, or organizational support, if implemented they could save lives, reduce damage, and be a better investment for the public.
- Facilitate interstate sharing of resources - both the logistical and fiscal components.
- Maintain a national mobilization system for resource sharing and enhance sharing of resources between and across states and regions.
- Integrate fire prevention and education across jurisdictions and among nongovernment organizations to take education and information to settings where it will be most effective for the intended audiences.

- Review all burnable acres for protection responsibility. Where lands are not formally assigned protection responsibility, negotiations will designate appropriate protection responsibility.

Opportunities for Intervention

- Focus on prevention education programs.
- Focus on fuels treatments to reduce risk.
- Focus on preparing communities for wildfire.

Improving the probability of success on initial response should be the highest priority, followed by reducing the cost and damages caused by escaped initial attack fires.

The success can be improved by firefighters arriving on scene sooner, while the fire is in the incipient stages. The options are:

- Faster response by initial attack equipment
- Faster response by initial attack aircraft
- Improved and dispatch functions
- Improved transportation system in remote areas
- Sending the closest response resources.
- Increase response capacity as determined by workload.

Reducing the fire intensity to a level equal to the initial response force arrival in the time specified. Options include:

- Vegetation treatments to reduce the heat generated
- Compartmentalizing vegetation to limit the spread of the fire
- Reducing the vegetation available for an ignition to start

Fire Response

Large expenditures of public funds are made in the West for response preparedness and for response to wildfires. The extent of damage depends on the extent and intensity of the fire and how many homes or acres with other values are affected. In most cases the cost of damage far exceeds the suppression costs. The issue in the West is a matter of local and

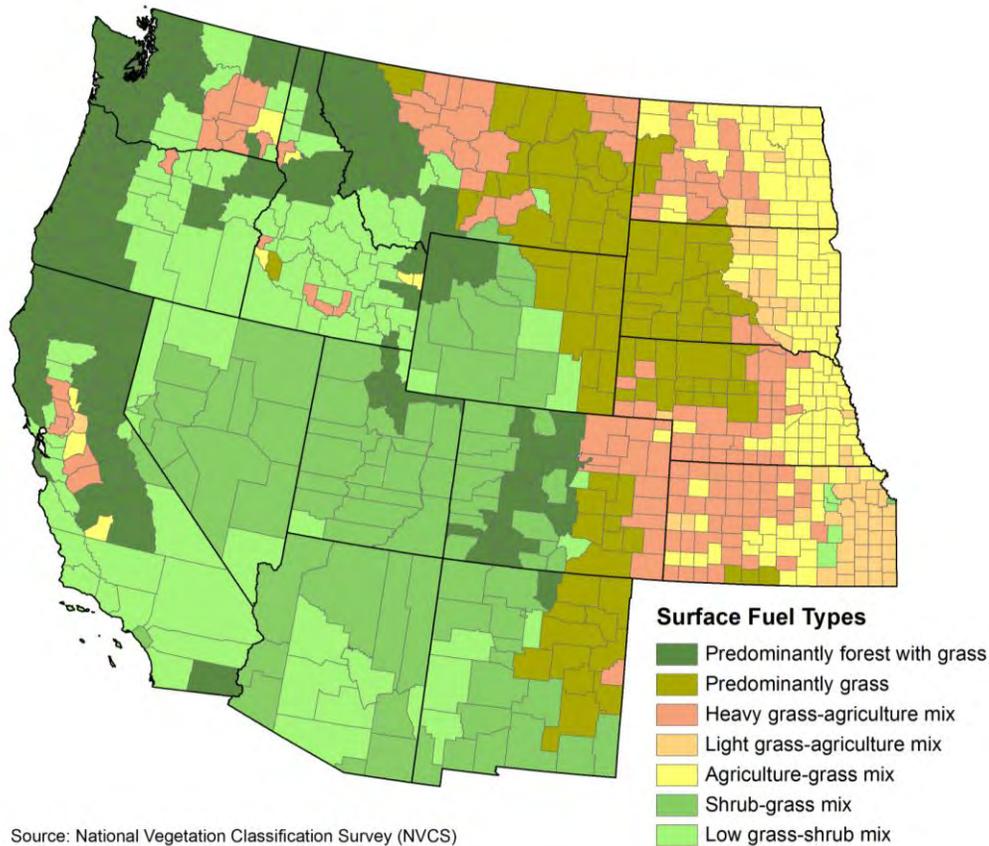
regional social choices and collaborative decision-making. Mitigating and managing regional risk requires collaboration among landowners, land managers, planners, elected officials, and citizens.

Also, consideration needs to be given to the role that fire might play in ecosystem maintenance and restoration. It is possible, in some cases, to achieve conditions under which fire can spread with little or no damage to values and effectively “treat” the landscape. Under such circumstances there may be beneficial aspects of fire on the landscape. Collaborative fire planning and management options can directly affect factors contributing to wildfire risk.

In this section we will briefly describe some of the key factors that contribute to risk in the response to wildfires in the West. To illustrate the contributing factors, we will describe five themes that represent the current situation. The themes below will help us categorize some key contributing factors to organizational risk in fire response.

Vegetation profile as it relates to fuels

The first map shows vegetation portrayed as fuels clusters in the West. This representation is useful for determining potential fire occurrence, workload, where potential impact to acreages exists, and how fuel types contribute to risks in fire response.



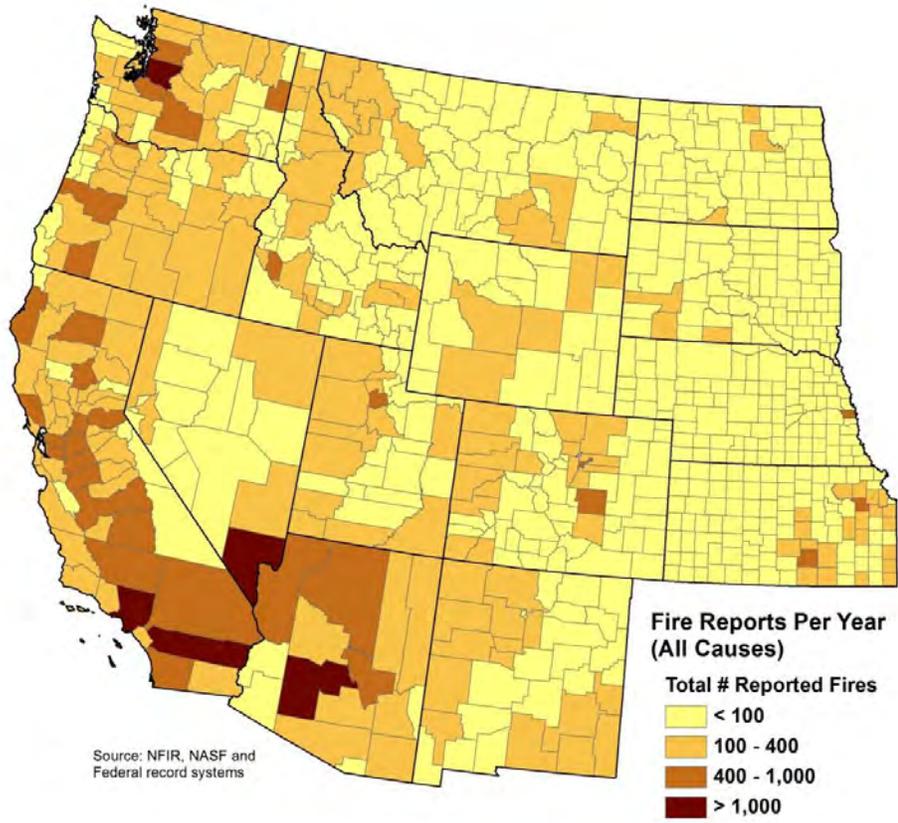
Source: National Vegetation Classification Survey (NVCS)

Figure 32. Western counties categorized in seven broad categories of surface fuel type based on proportion of area in the county.

Source: National Vegetation Classification Survey (NVCS).

The following four maps show the location of hotspots across the West, areas where multiple fires have started, and the locations and percentage of accidental and arson caused fires. The arson fire map shows the percent of human-caused wildfire ignitions that were identified as intentional. Intentional fires are a prevalent problem in the West. As noted earlier in Table 1, approximately two thirds of all Western fires are human caused, and lightning causes one third of the fires. However, lightning caused fires burn considerably more acres each year than human-caused fires.

Figure 33. Mean annual MODIS hotspot detections per 100 square miles, from 2001-2011.



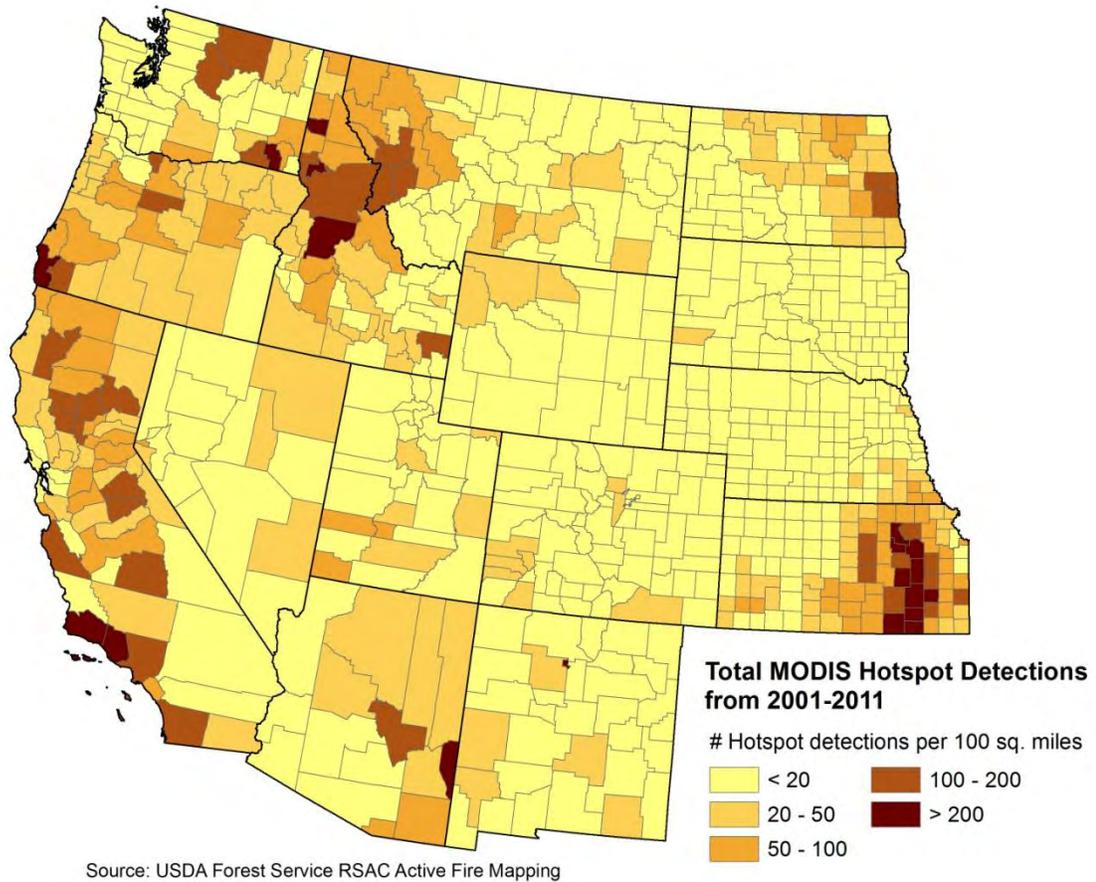


Figure 34. Reported incidents attributed to accidental ignitions using state, federal and local (NFIRS) data of known cause.

Figures 34, 35, and 36 show the reported annual fire incidents from three reporting sectors: federal lands, state datasets, and local fire stations (NFIRS) for all causes (Figure 34), accidental fires (Figure 35), and arson fires (Figure 36).

Figure 35. Reported incidents attributed to accidental ignitions using state, federal and local (NFIRS) data of known cause.

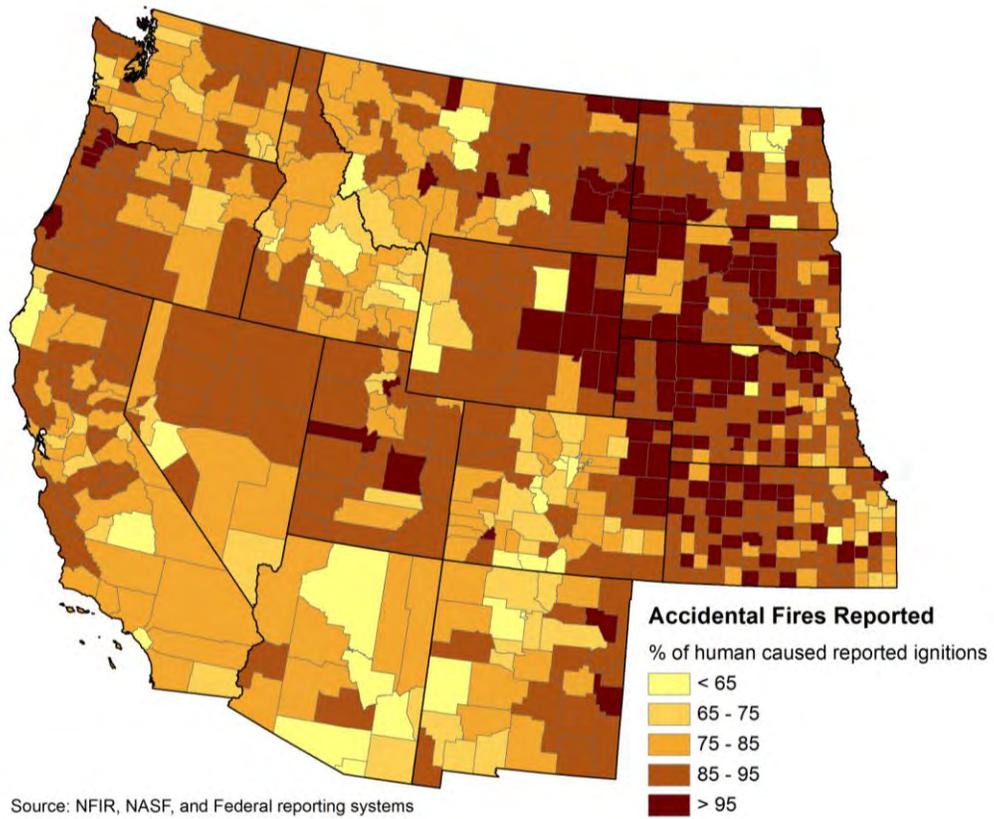
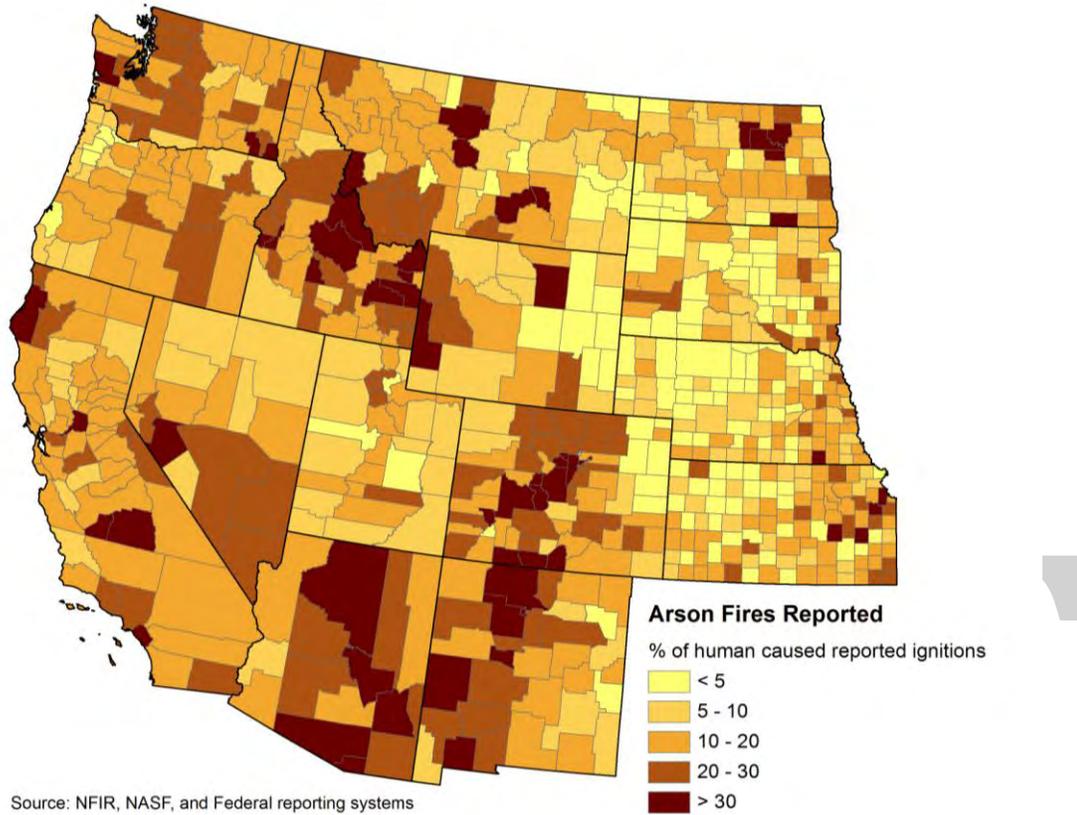


Figure 36. Reported incidents attributed to intentional ignitions using state, federal and local (NFIRS) data of known cause.



The map of large wildfires shows the locations and extent of area burned by fires greater than 100 acres in size, with the highest levels in the Great Basin and Northern Rockies areas.

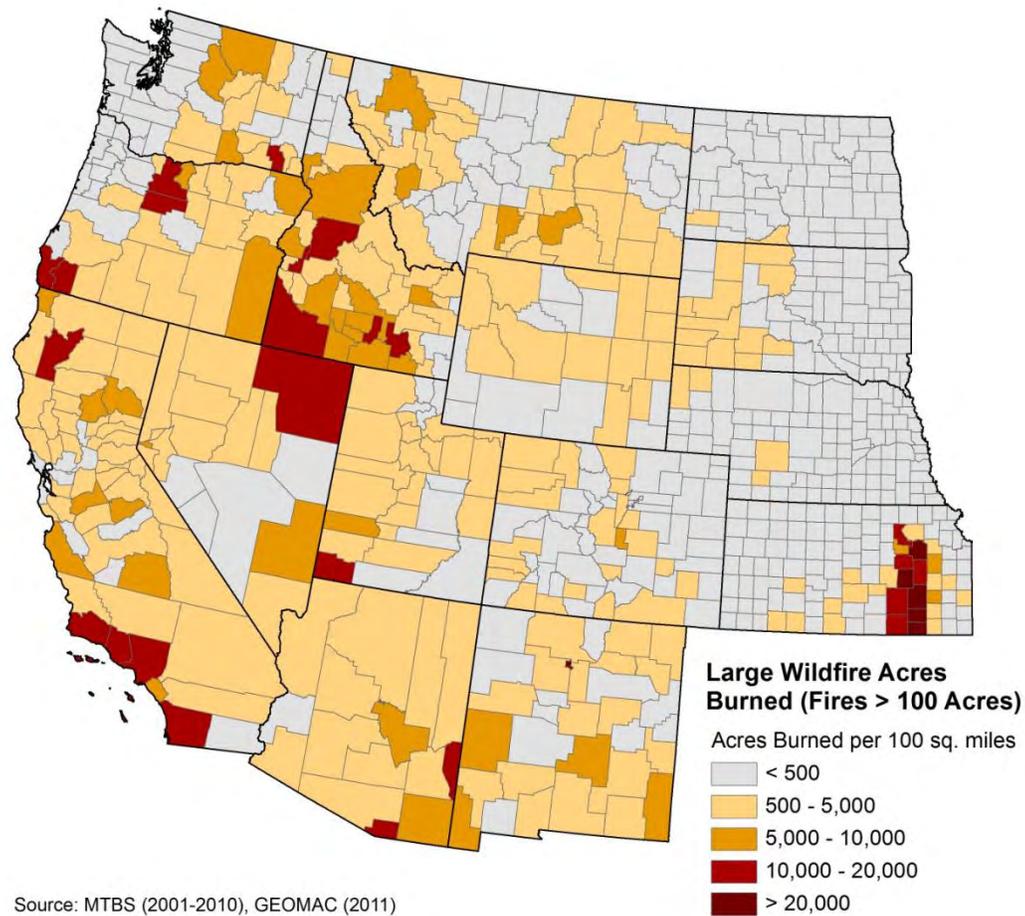


Figure 37. Acres burned per 100 square miles by large fires (300 acres or greater in size) between 2001 and 2011.

Workload

Workload is defined by the number and locations of ignitions, and by the number and locations of annual (and historical average) acres burned. Consideration of the ignitions causes also influences this risk factor. While natural ignitions will not be reduced through prevention activities, they can be influenced by fuels treatment activities in some cases. Human ignition occurrence can be influenced by aggressive fire prevention measures. The risk of ignitions is related to the kinds and distribution of human activities in an area. This

gives us an opportunity to intervene, and set a goal of fewer fires and reduced acres burned, through prevention activities, education, engineering, and law enforcement. The appropriate application of fire for multiple objectives and prescribed fire will impact risk and workload related to fire response in the future.

Land ownership and the dynamics that affect response

- Who has protection responsibility?
- Is the current protection organization reducing risk at the desired extent?

Jurisdictional responsibility and protection responsibility in the West is varied. A unique situation in the West exists in that over 50% of the land base is federally managed, and most of our acreage impacted by fire exists in those areas. This poses both opportunities and barriers in the context of risk. Some challenges include the ability to manage a piece of ground consistent with the needs and values of all stakeholders, and the differences in perception of acceptable risk, damage, and values. The opportunities include landscape level planning, integration of response capability at the level of local, state, federal, tribal, and private response capability before, during, and after incidents. With limited investment capability for response, there is a need to leverage all responder capacity in the most effective manner to leverage capability and overcome differences. Where we are not fully integrated, we see disconnected response efforts, limits in communications and operational interoperability, and safety related incidents. All of these areas can cause increased responder and organizational risk.

Wildfires on federal land have become larger and more resistant to containment on the land of origin. Fires starting in the WUI may trespass onto neighboring jurisdictions; therefore it is important to extinguish all initial attack fires with a combined force.

Response capacity, limitations, challenges

- Where is our capacity in relation to the workload?
- Where is our capacity limited and why?
- What are we currently doing to overcome our limits in capacity?

- Topography, road access, and response arrival time?

The Number of Fire Departments Map shows the number of stations per unit area, summarized at the county level. This shows the variation that exists in the number of fire stations across the West. Some counties have very low density of fire stations while others have a high density, resulting in a highly variable ability to respond to wildfire.

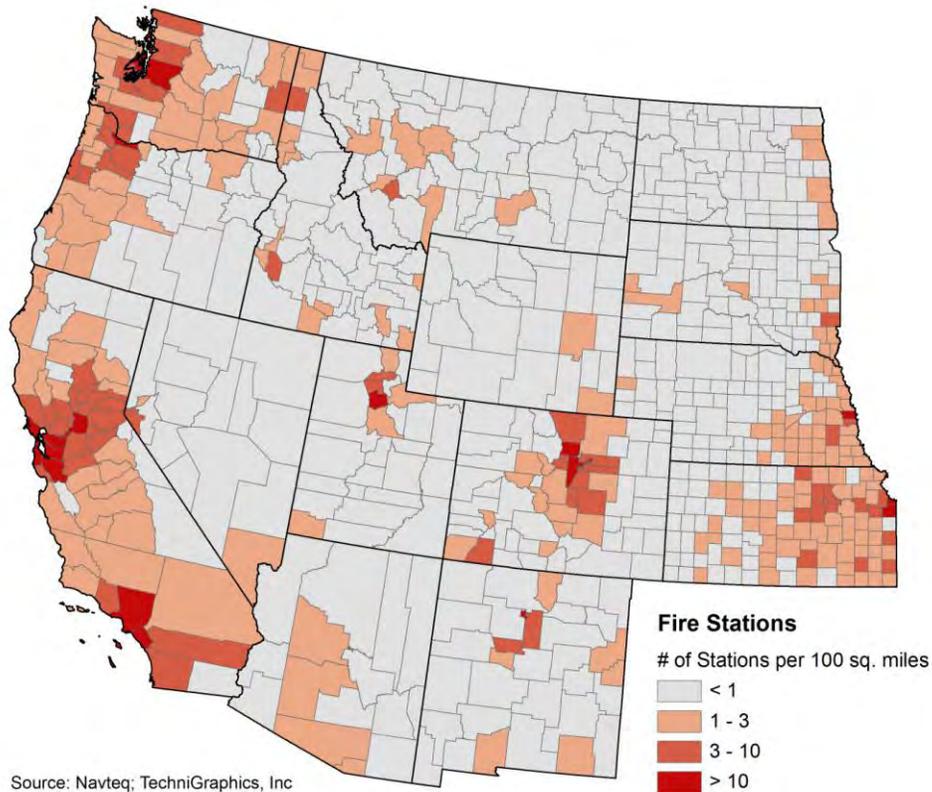


Figure 38. Western counties categorized by the mean number of fire stations per 100 square miles.

The scatter plot chart, figure 39, shows the number of fires per county plotted against the number of fire departments in a county. From the data it appears that workloads are not evenly distributed. California, Arizona and Washington have the highest number of fires per 100 square miles, and California and Washington have the highest number of fire stations. Nevada and Arizona have high numbers of fires, but low numbers of fire stations. Risk is characterized by local response workload in relation to existing and potential response capability.

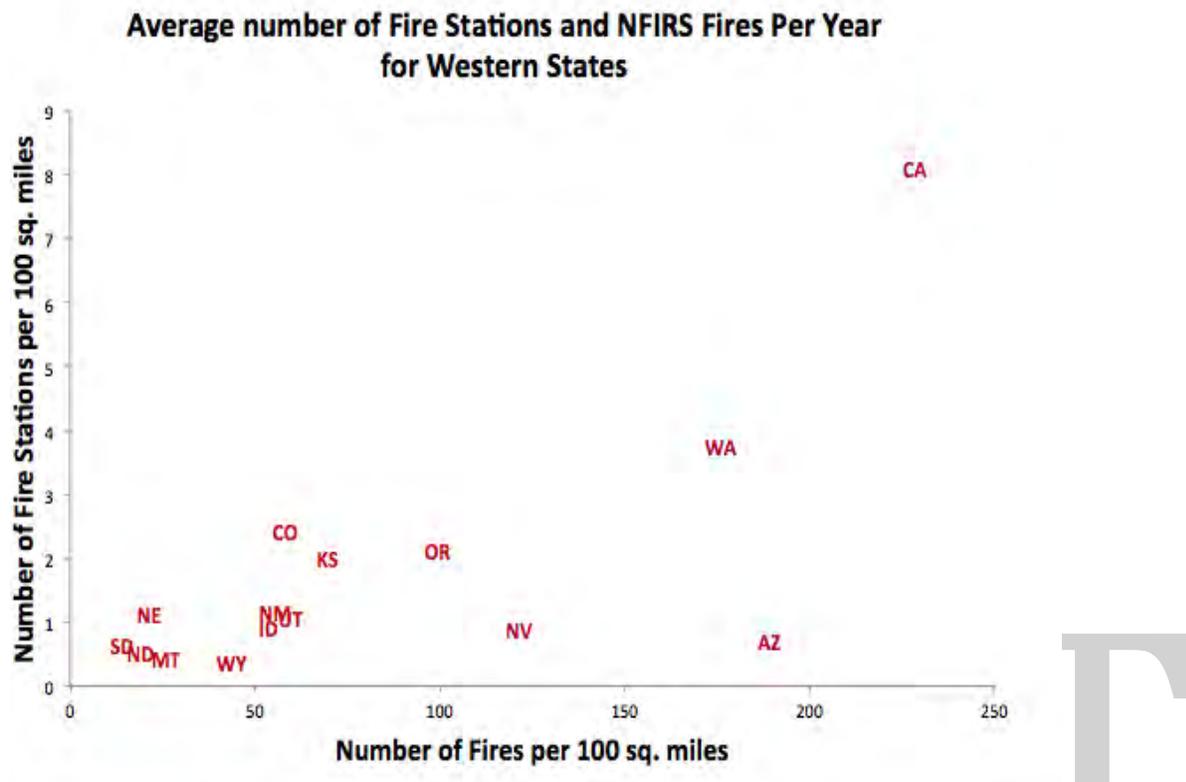


Figure 39. Average number of fire stations and locally reported fires per year for Western states.

Fire data are from the Department of Homeland Security’s National Fire Incident Reporting System (NFIRS), 2006-2010.

On the average, 95% of wildfire ignitions are suppressed at less than 300 acres by a combined force of closest appropriate resources (Report to WFLC, August 2004). This combined force may include federal, state, tribal, local, and private firefighters, working under the incident command system. Interoperability is a challenge that is being addressed. The firefighting response force has largely been preplanned based on the fuel, weather and topography, in consideration of the predetermined initial attack requirements of the primary agency having jurisdiction and the neighboring supporting or assisting agencies. Controlling unwanted fire in the initial attack phase has proven to be the safe and cost effective practice for the firefighters and the public. These forces are made up of ground and air tactical assets as well as supervisory overhead.

The federal response force has been determined by the agencies responsible for wildland fire management, and is funded through Congress. For example, tribal response forces are a part of the federal allocation. Tribes own fee parcels as well, and have rights and jurisdiction over tribal lands, territory, and resources. The nonfederal fire fighting force is either a state or a local resource funded and staffed by their jurisdiction based on the risk or standards that they have adopted. Mutual aid, automatic aid, and assistance for hire agreements may be entered that allow for reciprocal use or temporary use of resources belonging to different jurisdictions. Nonfederal firefighting resources are mostly staffed, equipped, and located based on structural fire response criteria. The categories of station location and staffing are typically commercial/industrial, urban, suburban and rural. The fire stations are denser in a commercial/industrial area, and become incrementally farther apart, with rural areas having the least number of fire stations per square mile.

Fire Prevention and Evacuation Preparedness

The fire triangle is the controlling influence of all fire responders; the triangle consists of fuel, weather and topography with the additional variable of ignitions. The fuel or vegetation can be manipulated to reduce risk, and is part of a resilient landscape; the topography is a fixed variable over which we have no control. The weather is a variable that is predictable but not controllable. There are preventive measures that can reduce most human ignitions, but we cannot prevent all ignitions, and there are natural ignitions (lightning) that are predictable but not preventable.

Whenever the topography, fuel, weather, or number of ignitions exceed the capacity of the firefighting force that can be assembled, fires escape initial attack and move into a larger phase. It is the 5% of all fires that escape initial attack that account for over 90% of suppression funds used.

Firefighting forces include a fire prevention component that provides enforcement, education, and engineering services with a goal to reduce risk or ignitions, and improve public safety in the event of a fire. Examples include: engineering efforts may have a goal to

reduce ignitions from power lines and railroads. The engineering component will assess risk from fire, and work to reduce those risks through vegetation management and weed abatement, to reduce the risk that a fire might spread into the community. Enforcement operations may target an arson problem or other intentionally set fires such as debris burning. The education component could include team teaching children about fire safety, or a community program such as Ready-Set-Go for preparedness in the event of a wildfire.

One area that contributes to risk is the need to develop a more comprehensive evacuation program for the West. Spontaneous evacuations may restrict responders and expose evacuees to accident and injury. Immediate evacuations ordered by the initial responder may pose hazards to responders and evacuees. Planned evacuations generally occur later in an incident, under more controlled circumstances. Repopulation of an area poses logistical and safety concerns involving many entities. The Ready-Set-Go program is intended to increase preparedness and reduce the hazards of evacuations.

Response Capacity and Coordination

The Response system has evolved under the principle that no one agency is capable of managing the entire emergency workload alone. The resource augmentation processes consist of short term free assistance and long term assistance for hire agreements. These resources include: engines, crews and equipment, aircraft, and support assets.

Federal agencies participate in both forms of augmentation, short term free and long term assistance for hire. Wildfires on federal lands can be long in duration and require a larger firefighting force, resulting in the federal firefighting agencies hiring local and state resources to fill overhead and suppression positions.

The mobilization system that coordinates wildland firefighting resources has evolved and expanded to include filling orders for non-fire resources such as caterers, medical staff, logistical functions etc. The system has the ability to process requests and track resources across the country and around the world, and does so on a recurring basis. The response workload moves across the West as the weather changes, and the need moves as depicted in figure 40, showing hotspots by season.

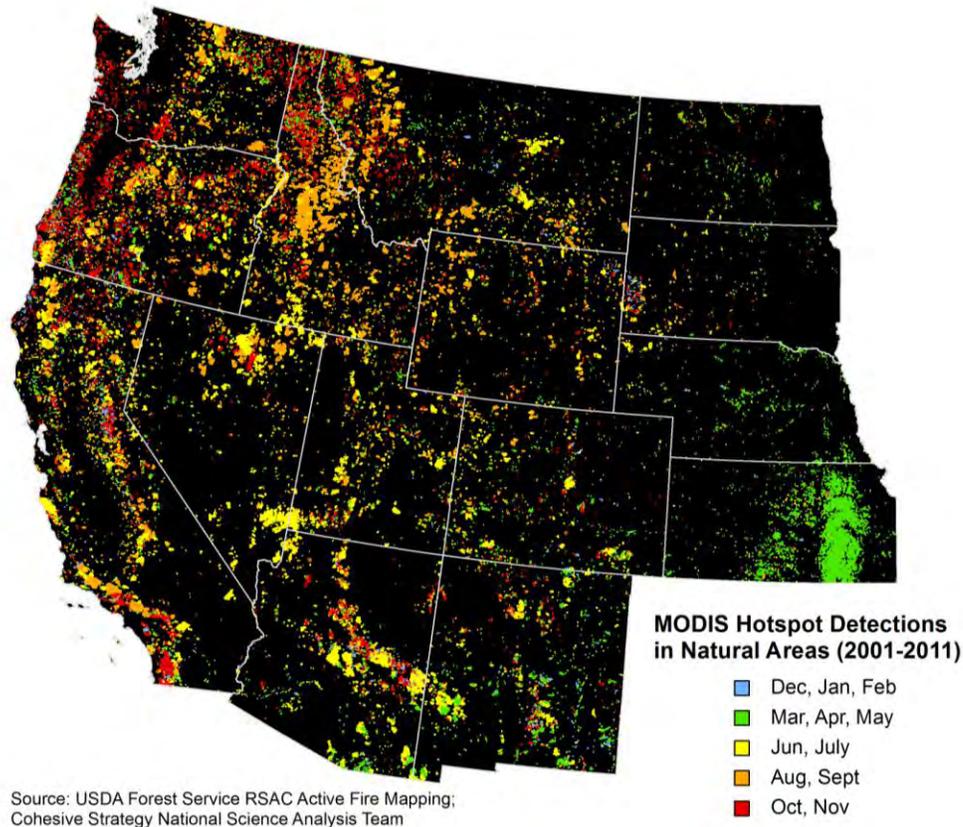


Figure 40. Seasonality of hotspots detected from space by the Terra and Aqua satellites since 2000.

The majority of these hotspots are from wildfire, prescribed fire, and agricultural fires. Source: USDA Forest Service Remote Sensing Applications Center.

If the coordination system did not exist one would be invented. The system that has been developed should not be duplicated nor reduced in its effectiveness.

Static firefighting resources are the fire engines and supporting resources normally assigned to a geographic location. Dynamic firefighting resources are fire engines, crews, aircraft, equipment, and supporting resources that are sent to assist in other geographic locations as necessary in response to an emergency or an anticipated emergency need.

The mobilization system has the capability to move resources, federal and nonfederal, in response to weather predictions such as lightning and high wind events. These short duration events can produce ignitions or fire rates of spread that will overload the static

firefighting forces. Once the static resources are exhausted due to the number or severity of the fires, the coordination system will be used to bring in resources. The fires will grow in size as the augmented resources travel to the incidents, resulting in more damage and increased costs.

Static fire response was developed during different weather and climatic conditions. Today the fire seasons are longer and the fire problem is covering a larger geographic area.

Mobilizing nonfederal resources to a federal incident has fiscal, legal and qualifications challenges. One solution is to rely more heavily on the federal firefighting forces responding to the fire, to the point that all federal management units would have a minimum drawdown level of one fire engine remaining on the unit. The one remaining federal fire engine would be augmented on initial attack by the neighboring mutual aid or assistance by hire resources. This practice would provide more federal resources on federal incidents, reducing the issue of qualifications and cost. This practice would allow local resources to perform their mission and assist as necessary on new fires locally.

The *USDA Forest Service Large Airtankers Modernization Strategy*, Feb 2012 recommends the following:

- USFS and DOI should invest in the next generation of large airtankers;
- Explore flexibility and cost effective airtankers contracting;
- Federal aircraft should be a mix of types and sizes of fixed wing assets.

Findings include: Initial attack on new fires is critical to keep fires small. A 1.5% drop in the success rate of IA could equate to 150 additional fires over 300 acres for an additional \$300-450 million in suppression cost to the USFS. When multiplied by the Western Forestry Leadership Coalition 2010 analysis of the true cost of wildfires, which determined that indirect costs are 2 to 30 times the suppression costs. Therefore the \$300 million in added suppression costs could equate to \$1.2 billion to \$8.7 billion increase added cost to the community of the true cost of wildfire.

Protection Values and Incident Prioritization

Protection values and the complex interagency nature of response capability help us to define a pre-determined response. Typically the incident response is dictated by where it is, what is at risk, the existing fire potential, and available response forces. This works well when very few incidents occur at one time. When we anticipate that we may exceed response capability, the need to prioritize incidents increases. Those priorities are normally protection of life, including responder and public safety, as well as the density of affected populations. The next consideration is initial attack. The next priority for the interagency group is typically protection of residences, followed by high value assets, either natural or infrastructure. In a given similar fire situation, we would prioritize the fire with the highest values at risk.

This system is logical, yet often causes us to have larger remote fires on the rural landscapes because of the lower affected population. This often contributes to large, extended attack fires that eventually require an extended commitment of responders for long durations in large, heavy fuels, for weeks or months at a time.

The risk to fire adapted communities has been characterized at the broad level, using information related to factors that influence risk, with county level information. Integrating the many layers of information through available models allows decision makers to better understand what is likely to influence risk and where opportunities to reduce and manage risk might be effective. Decision makers should use the relationships among the various ecological, social, and fire behavior information to examine options to focus energy toward reducing risk. Windowing down with more detailed analyses, at a community level scale, will prove useful in addressing the specific risks within counties. The broad scale information provides the context within which finer resolution decision making can be most effective. As has been demonstrated, collaborative efforts are most likely to yield positive outcomes for communities at risk.

Measuring Progress Toward the Goals

In Phase I national goals and performance measures were established. The goals are ideals that we hope to approach by taking the specific actions that will be described in the regional and national action plans. It is assumed that if we can restore and maintain landscapes, and create more fire adapted communities and improve fire response, then we will be able to rein in escalating wildfire suppression costs. The national goals and performance measures are broad, and they should be further refined with objectives and actions by the regional strategy committees. As work progresses with the Cohesive Strategy and the development of the Action Plan, the WRSC will address regional performance measures. This is the next step in the Cohesive Strategy process.

National Performance Measures

These are the National Goals and Performance Measures:

Restore and Maintain Landscapes: GOAL: *Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.*

Outcome-based Performance Measure:

- Risk to landscapes is diminished.

National output-based metrics, in support of the national measure, will center on risk to ecosystems at landscape scales.

Fire Adapted Communities: GOAL: *Human populations and infrastructure can withstand a wildfire without loss of life and property.*

Outcome-based Performance Measure:

- Risk of wildfire impacts to communities is diminished.
- Individuals and communities accept and act upon their responsibility to prepare their properties for wildfire.
- Jurisdictions assess level of risk and establish roles and responsibilities for mitigating both the threat and the consequences of wildfire.
- Effectiveness of mitigation activities is monitored, collected and shared.

National output-based metrics will include indicators relevant to communities with mitigation plans and planned or completed treatments.

Wildfire Response: GOAL: *All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.*

Outcome-based Performance Measure:

- Injuries and loss of life to the public and firefighters are diminished.
- Response to shared-jurisdiction wildfire is efficient and effective.
- Pre-fire multi-jurisdictional planning occurs.

National output-based metrics will reflect trends in changing risk to support the national measure. Indicators will include pre-season agreements and annual operating plans, integrated wildfire response scenarios, and shared training. Risk exposure to firefighters will be based on a balanced consideration of values protected and the probability of success.

How Decision-makers Can Use the Alternatives

As the alternatives, actions and activities are presented to local decision makers, particularly at the county level, CWPPs (or their equivalent) should be developed and modified to reflect priorities determined by the local entity. In alignment with local community values and land management objectives, the various actions associated with these alternatives should help to guide practical and sensible decision-making.

Collaborative groups that encompass larger areas, outside of a county geographic boundary, are a valuable tool when discussing priorities at the landscape level.

Collaborative groups have proven to be successful in identifying priority treatment areas and leveraging resources to accomplish hazardous fuels reduction treatments, as well as larger scale forest restoration and management across the landscape. Collaborative groups can also help to develop alternatives and priorities that are acceptable, especially in multi-jurisdictional landscapes, to present to local, tribal and state decision makers.

In the attempt to provide a higher level of wildfire protection for their community, many localities will find reduction of hazardous fuels on both private and public lands to be a

very high priority. To achieve favorable results, it is often most productive to determine the best method of performing such tasks through collaborative efforts. In many cases, the most efficient of these methods could be through active forest management- commercial timber and salvage sales, and/or prescribed fire, which improve forest health and can provide economic opportunities, including biomass utilization. Although this may be simply accomplished on private, tribal, or state lands, it should be recognized that laws applying to federal lands would complicate, delay, or even preclude such activities. Fully implementing all existing federal authorities such as the Healthy Forest Restoration Act and Categorical Exclusions should be considered to accomplish landscape level treatments to restore forest health. Local governments, private forestland owners, interested parties, state agencies and federal agencies are encouraged to participate with collaborative efforts to expeditiously find local solutions that address barriers and reduce risk to communities.

It is anticipated that the Cohesive Strategy and the datasets and maps collected by the NSAT will influence the cascade of decisions that flow from the Western recommendations aimed at achieving the three broad goals. The information, data, and models developed through the Cohesive Strategy can be used to further explore options to address risk at multiple scales. The strength of the information lies primarily in its further use as opposed to any individual report that may be developed.

Federal decision makers from national, regional, and local levels should use the data, models, and recommendations of the Cohesive Strategy to inform their decisions. The expectation also exists that decision makers within the state agencies, tribal organizations, and non-governmental organizations should also use the data, models, and recommendations to inform their decisions. Where collaborative groups are already engaged in discussing solutions to wildfire risks in regional, state, or local areas there is an expectation that the Cohesive Strategy information will inform their discussions. The process for use of the information should be within the context of risk assessment and decision-making. The county-level information that has been assembled in support of the Cohesive Strategy along with the models set the stage for additional analyses that can assist decision-makers with setting context, considering priorities, and examining potential

emphases.

There can be no standard approach that will be the best approach in all areas. The alternatives can and should be used to evaluate procedures and methods to achieve local priorities as outlined and delineated in CWPP's and through collaborative groups. As such, specific actions from the alternatives should inform decision-makers as they develop the most effective approach to accomplish local priorities across the landscape.

Recommendations

The WRSC reviewed the risk analysis in light of the three goals and the three alternatives. They found merit in many different recommendations put forward by the planning groups and analysts. Some recommendations were overarching recommendations that addressed the entirety of wildland fire issues. Some crossed over between focus areas, such as a recommendation for population protection plans in CWPPS for communities at risk, which could be either in the domain of fire adapted communities or fire response. And some recommendations came out of one group, but were appropriate for all aspects of the Cohesive Strategy, such as the recommendation by the landscape resiliency group that collaborative groups be involved in decision making. All of the recommendations are broad-based.

Here are key recommendations put forward by the WRSC. Details on how these recommendations will be carried forward and fully developed in the Regional Action Plan is described in the Next Steps section.

Overarching Recommendations

- Recognize the depth and importance of the communications framework and provide resources to implement communications recommendations, as it establishes the foundation of our collaborative process.
- Ensure the coordinated implementation of the Cohesive Strategy among all stakeholders.

- Enhance collaboration through incentives.
- Emphasize landscape treatments where existing collaborative groups have agreed in principle on management objectives and areas for treatment, and encourage and facilitate the establishment of collaborative groups.
- Expand collaborative land management, community and fire response opportunities across all jurisdictions, and invest in programmatic actions and activities that can be facilitated by Tribes and partners under the Indian Self-Determination and Education Act (as amended), the Tribal Forest Protection Act, and other existing authorities in coordination with the UN Declaration on the Rights of Indigenous Peoples.
- Address identified barriers and promote critical success factors across the region and at all levels.
- Provide resources to support local government officials, such as fire chiefs, in the integration of the Cohesive Strategy into their communities and operations – i.e., support the development of an International Association of Fire Chiefs (IAFC) Leaders' Guide for the Cohesive Strategy.
- Formalize a comparative risk model that includes federal, state, and local costs. Use the model to complete a trade off analysis and establish a risk base point.
- Establish the use of the model, including training and data descriptions for local decision makers, such as counties. Facilitate local updates to the models to enable updates to the national models.
- Identify data gaps and inconsistencies, including describing the purpose of the data in monitoring and evaluating progress to accomplishing the goals of the Cohesive Strategy. Prioritize action toward addressing gaps and inconsistencies.

Landscape Resiliency Recommendations

- Encourage US Forest Service and Department of the Interior/Bureau of Land Management to use existing authorities under Healthy Forest Restoration Act, Healthy Forest Initiative, and other contracting authorities to expedite fuels treatments. Assess what is currently being spent on these tools and increase that

amount. Project criteria to be worked out during action planning may include: Project has to be 5,000 acres or larger, reduces risk to landscapes and/or communities by focusing on areas that have a high burn probability or departure; has to be initiated within 2 years; and is based on collaborative processes.

- Explore data to identify and prioritize landscapes for treatment. This information would be provided to sub-geographical stakeholders, decision makers, as well as state and federal officials for their consideration and use.
- Expedite coordinated identification, prioritization, and restoration of damaged landscapes as a result of natural disturbances including, insect/disease, hurricanes, wildfire, invasives, changing climatic conditions. Identify where investments are not likely to restore areas to assist in prioritization of resources.
- Work with Council on Environmental Quality (CEQ) in developing categorical exclusions for landscape restoration.
- Where appropriate, utilize CEQ alternative arrangements when restoring damaged landscapes as a result of natural disturbances.
- Examine legislative related barriers that are impeding implementation of collaboratively developed landscape health related projects and pursue reform of the existing process to increase our effectiveness in active forest and rangeland management. (e.g., Endangered Species Act, Equal Access to Justice Act, National Environmental Policy Act (NEPA)). Encourage and enlist local, state, tribal, and federal environmental regulatory agency representatives to participate actively in collaborative efforts to restore resilient landscapes.

Fire Adapted Communities Recommendations

- Accelerate achievement of fire adapted communities using existing tools; offer incentives, such as chipping/disposal and incentives for collaboration, etc.
- Enhance campaigns to educate the public about the urgent need for homeowners to take action, including having statewide, Western, and other coordinated campaigns. Use videos such as how to protect homes from fire, the importance of fire in nature, and the need to live with fire.
- Facilitate shared learning among communities for fire adaptation.

- Continue to create and update Community Wildfire Protection Plans (CWPPs) using Secure Rural Schools Community Self-Determination Act and identify new funding sources. Be sure to include offices of emergency management and local response entities, such as the sheriff's office in planning efforts. Update CWPPs in areas that have had a wildfire event.
- Review and modify requirements for technical and financial support of communities through Federal Emergency Management Agency (FEMA), i.e. NEPA administrative processes, and applications for funding.
- Develop and promote local collaborative capacities to implement fuels treatments and respond to fires.

Fire Response Recommendations

- Improve response effectiveness by convening state level groups to identify where fire protection exists for all areas within each state. Eliminate unprotected areas by establishing/extending jurisdictional responsibilities. Response cooperators in each state should identify those voids and negotiate to ensure that every acre within the state has designated protection. Promote realignment of protection responsibilities to the organization that is best suited to provide protection (e.g., block protection areas, offset protection agreements, protection contracts).
- Improve firefighter and public safety. Maintain and/or improve an aggressive human caused ignition prevention program. Involve all stakeholders in the prevention campaign.
- Integrate local, state, federal, and tribal response capacity. Identify where the greatest opportunities exist in communications, training, qualifications, mobilization, and instruments.
- Increase capacity where necessary in order to improve overall local response effectiveness and reduce the need for external (non-local) resources.

Next Steps

As stated previously in the report, the Western Region is tremendously diverse, both physically and socially. As a result the region is not well suited to a monolithic implementation of a detailed list of actions. However, given the similarities the region shares; such as large natural landscapes dominated by federal ownership and the presence of large catastrophic wildfire; it is well suited for implementing actions, decided upon at a local or state level, that are in concert with the goal areas of the Cohesive Strategy.

The challenge is how to enable the local decision making process to be made within the framework of the Strategy. It is clear that directing or attempting to regulate local and state level decision processes is doomed to fail, and is not the most sustainable approach to achieving “cohesive action”. The path forward seems to come from one of the foundational components discovered in the development of the Strategy -- **collaboration**.

In order to sustain the momentum gained while developing the strategy, we must facilitate and expand collaboration in decision making at all levels, and at multiple scales, within the Western Region. Experience has shown us that collaboration does not spontaneously happen. It requires structure, process, focus, and resources. To that end, the next step is to establish a coordination structure that will exist under the umbrella of the Wildland Fire Executive Council (WFEC). This structure will facilitate the broad scale implementation of the recommendations and strategy identified in the Western Regional Report.

It is envisioned that the structure will be a coordinating body, composed of representatives of the decision making and jurisdictional authorities in the West. The coordinating body will be supported by a full time staff lead to assist in the continued engagement of stakeholders throughout the development and implementation of a Western Regional Action Plan. The group will focus on identifying priorities and emphasis areas among the recommendations, identifying solutions to break down barriers, and identifying actions for exploration. They will seek outcomes that are measurable at the regional, state, county, community, and individual property owner levels.

To facilitate implementation, this coordinating body will need resources to provide regional coordination and a communications component. It is recommended that these resources be acquired through new or existing agreements with the Western Governors' Association and/or Western Forestry Leadership Coalition. The objective of the coordinating body will be to facilitate coordinated development and implementation of actions, provide consistent communications with stakeholders, and to foster tools and information to enhance local, state, and regional decision making.

The creation of the Western Regional Action Plan is fundamental to achieving the goals of the National Cohesive Wildland Fire Management Strategy in the West. The WRSC recognizes that the Cohesive Strategy efforts to-date have been very successful. Continued success will rely on a commitment of support, the allocation of assets and resources, and a coordinated, collaborative approach with stakeholders - at all levels. The Action Plan will not restrict or direct local authorities and associated collaboratives in their decision-making.

The FLAME Act requires a five-year update to the Cohesive Strategy. However, the WRSC sees a need for the Action Plan to be more dynamic than that. It will need to change over time, as conditions or other factors (i.e. large fire seasons, economics, insects and disease outbreaks, etc.) warrant such change. Unless otherwise directed, it is the intent of the WRSC to continue operations and move forward with the implementation of our recommendations, action plans, etc. without interruption.

Western Regional Science-Based Risk Analysis Report Appendices

Appendix 1 - Glossary

The National Wildfire Coordinating Group (NWCG) maintains an extensive glossary of fire management terminology and acronyms (found at www.nwcg.gov/pms//pubs/glossary/index.htm). Some terms used in this document that have specific meaning in the context of wildland fire management, but are not found in the NWCG glossary are defined below.

Affected party A person or group of people who are affected by the outcome of a decision or action

Biomass Any organic matter that is available on a renewable or recurring basis. Under the Farm Security and Rural Investment Act of 2002 (Title IX, Sec. 9001), biomass includes agricultural crops, trees grown for energy production, wood waste and wood residues, plants (including aquatic plants and grasses), residues, fibers, animals wastes and other waste materials, and fats, oils, and greases (including recycled fats, oils, and greases), but not recycled paper or unsegregated solid waste. (From Farm Bill Glossary on the National Agricultural Law Center Web site <http://nationalaglawcenter.org/#>.)

Fire-adapted community Human communities consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire.

Fire-adapted ecosystem An ecosystem is “*an interacting, natural system, including all the component organisms, together with the abiotic environment and processes affecting them*” (NWCG Glossary). A fire-adapted ecosystem is one that collectively has the ability to survive or regenerate (including natural successional processes) in an environment in which fire is a natural process.

Fire community Collectively refers to all those who are engaged in any aspect of wildland fire-related activities.

Fire exclusion Land management activity of keeping vegetation or ecosystems from burning in a wildland fire.

Fire management community A subset of the fire community that has a role and responsibility for managing wildland fires and their effects on the environment [according to the Phase I report glossary].

Fire science community Subset of the fire community consisting of those who study, analyze, communicate, or educate others on the components of fire management that can be measured, such as fire behavior, fire effects, fire economics, and other related fire

science disciplines.

Fragmentation Physical process whereby large, uniform areas are progressively divided into smaller fragments that are physically or ecologically dissimilar. Fragmentation can occur through natural disturbances such as wildfire, or more commonly, through land use conversion by humans (e.g., urbanization).

Landscape resilience The ability of a landscape to absorb the effects of fire by regaining or maintaining its characteristic structural, compositional and functional attributes. The amount of resilience a landscape possesses is proportional to the magnitude of fire effects required to fundamentally change the system.

Middle Ground or Middle Lands Those nearby areas that contribute to the identity, structure, culture, organization, and wellbeing of a community, and are often considered essential to its economic, social, and ecological viability.

Parcelization Process of subdividing a large, intact area under single ownership into smaller parcels with multiple owners. The term can also apply to an administrative process of dividing a landscape into multiple management units with different management objectives. Parcelization is often a precursor of fragmentation because of differences in management priorities among property owners.

Silviculture *“The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis”* - definition from John A. Helms, ed., 1998. *The Dictionary of Forestry*. The Society of American Foresters, Bethesda, Maryland.

Stakeholder A person or group of people who has an interest and involvement in the process and outcome of a land management, fire management, or policy decision.

Traditional Ecological Knowledge, also called by other names including Indigenous Knowledge or Native Science, (hereafter, TEK) refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes The relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways, including but not limited to hunting, fishing, trapping, agriculture, and forestry. TEK is an accumulating body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (human and non-human) with one another and with the environment. It encompasses the worldview of indigenous people, which includes ecology, spirituality, human and animal relationships.

Viewshed An area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

Appendix 2 -- Acronyms

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAR	Community at Risk
CRAFT	Comparative Risk Assessment Framework and Tools
CS	Cohesive Strategy
CSSC	Cohesive Strategy Subcommittee
DOI	Department of the Interior
EMDS	Ecosystem Management Decision Support System
EPA	Environmental Protection Agency
FACA	Federal Advisory Committee Act
FEMA	Federal Emergency Management Agency
FFT2	Firefighter 2
FLAME Act	Federal Land Assistance, Management and Enhancement Act of 2009
FLN	Fire Learning Network
FPA	Fire Program Analysis
FPU	Fire Planning Unit
GACC	Geographic Area Coordinating Center
GAO	General Accountability Office
HFI	Healthy Forests Initiative
HFRA	Healthy Forests Restoration Act
HVR	Highly valued resource
IAFC	International Association of Fire Chiefs
ICS	Incident Command System
IQCS	Incident Qualification and Certification System
ITC	Intertribal Timber Council
JFSP	Joint Fire Science Project
LLMPs	Land Management Plans
LRMPs	Land and Resource Management Plans
MOU	Memorandum of Understanding
NACo	National Association of Counties
NASF	National Association of State Foresters
NEMAC	National Environmental Modeling and Analysis Center (UNC Asheville)
NEPA	National Environmental Protection Act
NFPA	National Fire Protection Association
NGO	Non governmental organization (e.g. nonprofit)
NICC	National Interagency Coordination Center
NIFC	National Interagency Fire Center
NLC	National League of Cities
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OMB	Office of Management and Budget
PPE	Personal protective equipment
QFR	Quadrennial Fire Review

RFA	Rural Fire Assistance
RFD	Rural fire department
RSC	Regional Strategy Committee
SFA	State Fire Assistance
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USFS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VFA	Volunteer Fire Assistance
VFD	Volunteer fire department
WFDSS	Wildfire Decision Support System
WFEC	Wildland Fire Executive Council
WFLC	Wildland Fire Leadership Council
WG	Working Group
WGA	Western Governors' Association
WRSC	Western Regional Strategy Committee
WUI	Wildland Urban Interface

Appendix 3 - References and Bibliography

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Appendix 4 -- Useful Links

National Cohesive Wildland Fire Management Strategy Foundational Documents

2009 Quadrennial Fire Review (QFR), http://www.iafc.org/files/wild_QFR2009Report.pdf

National Policy Framework Documents including:

☒☒ *A Call to Action*, 2009, http://forestsandrangelands.gov/strategy/documents/call_to_action_01232009.pdf

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Appendix 5 – Stakeholder Involvement

a) Description of Stakeholder Engagements/Feedback

Representatives of the Western Region Strategy Committee attended local, regional, and national meetings and made presentations about the progress and current status of the Western Cohesive Strategy, as well as upcoming opportunities for comment and feedback. During those engagements, representatives made note of significant discussion topics, questions that “could not be answered”, and potential contacts who may have helpful “success stories” to share. Presenters reported the meeting information using “trip reports”. The trip report summaries are included below.

These engagements took place in the period from February 3, 2012 through August 3, 2012 and included 27 meetings in 9 western states as well as Washington, D.C. Over 935 people attended these meetings representing a broad array of interests and affiliations.

DRAFT

Figure 1. Western Region Cohesive Strategy Engagement Record as of 8/3/2012

Date	Event	Presenters	Location	Attendees
2/3/12	Madison County CWPP update (stakeholder meeting)	Terina Mullen	Ennis, MT	12
2/17/12	Anaconda-Deer Lodge Pre-disaster mitigation plan update (stakeholder meeting)	Terina Mullen	Anaconda, MT	23
2/17/12	Granite County Pre-disaster mitigation plan update (stakeholder meeting)	Terina Mullen	Phillipsburg, MT	20
3/5/12	National Incident Commander and Area Commander Meeting	Joe Stutler, Tom Harbour, Jim Hubbard, Roy Johnson	Denver	50
3/8/12	BIA National Fire and Forestry Management Meeting	Jim Erickson	San Diego	NR
3/13/12	PNWCG Monthly Meeting	Pam Ensley and Joe Stutler	Portland	30
3/20/12	Intermountain Region Fire Management Pre-Season FMO meeting.	Sue Stewart, Joe Freeland	Ogden, UT	40
3/22/12	BLM National Mitigation Education and Fuels Workshop	Joe Freeland, Brad Washa, John Ruhs	Boise	30
3/27/12	IAFC/ Western Governors Assn.	Ann Walker	Reno	100
4/4/12	Great Basin Incident Management Team Meetings	Joe Stutler	Reno	150
4/10/12	BLMs Fire Leadership Team annual pre-fire season meeting.	Joe Freeland	Boise	30
4/11/12	California Nevada Hawaii Fire Council	Caitlyn Pollihan	Hawaii	NR
4/16/12	Madison County CWPP update (stakeholder meeting)	Terina Mullen	Ennis, MT	6
4/18/12	NWCG Monthly Meeting	TBA	Boise	NR
4/25/12	WGA Staff Council	Ann Walker	Phoenix	30
5/1/12	USFS Region 2 Forest Supervisors Meeting	Dana Coelho	virtual	NR
5/8/12	Utah Interagency Fuels Workshop	Joe Freeland, Brad Washa, Erin Darboven	Salt Lake City	30
5/16/12	Western Forestry Leadership Coalition	Corbin Newman, Bob Harrington, Ann Walker, Sam Foster	Salt Lake City	50
5/17/12	National Indian Timber Symposium	Jim Erickson	Warm Springs, OR	NR
5/17/12	BLM Deputy State Directors, Resources & Minerals & WO Division	Joe Freeland, Linda Booty	Washington D.C.	20

	Chiefs			
5/18/12	National Association of Counties - Western Interstate Region	Ann Walker, Bob Cope, Ryan Yates	Santa Fe, NM	35
5/22/12	BLM Field Committee meeting (associate State Directors & Deputy Assistant Directors)	Joe Freeland	Washington, D.C	20
5/24/12	USFS Region 6 Fire and Aviation Leadership Team Meeting	Joe Stutler	Portland, OR	100+
6/7/12	Madison County CWPP update (stakeholder meeting)	Terina Mullen	Virginia City, MT	70
6/22/12	Western Regional Partnership Subcommittee on Disaster Response	Joe Freeland	Albuquerque, NM	30
7/11/12	Jackson and Josephine Counties Fire Board of Directors Meeting.	Joe Freeland	Medford, OR	10
7/17/12	"Revitalizing the National Forest System" Conference	Jim Golden, METI Inc.	Sacramento, CA	50

NR = No Report

Summary of Trip Reports through 8/3/2012

Number of Meetings/Events (reported) 267

Meeting or Event Name (see list above)

Number of Attendees 935+

Locations by State Arizona, California (2), Colorado, Idaho (3), Montana (5), Nevada (2), New Mexico(2), Oregon (4), Utah (3), Washington D.C. (2)

Stakeholder/Affiliations Represented

- Firefighters
- Collaborative Landscape Treatment Groups
- Regional, State, Local Land Managers
- Insurance Industry
- Firewise Communities
- County Commissioners
- Federal Government
- Tribal Government

Unique Discussion Points (beyond the general CS Briefing)

- Using the Deschutes Collaborative Forest Restoration Project to explore the immediate successes of the Cohesive Strategy as an example from Oregon
- What is the crosswalk between the Cohesive Strategy and the new Planning Rule?
- How will things be different in 5 years because of the Cohesive Strategy?
- Concerns were expressed related to the value and meaning of the effort. Comments along these lines related to concerns that this effort has not been clearly outlined and that the expectations for success are still not clear.
- There was a concern expressed that the Western Region is too large to represent only one common strategy.
- There was concern that some of the actions are daunting and could be a very big workload.
- With concepts on local stakeholders and other plans, could there be a collision down the road?
- Still continuing to do CWPPs, etc.; can we take a step further when prioritizing projects on private ground? An “active” community should be one of the priorities – not color schemes on the map.
- Questions ranged from: Do we anticipate significant organizational changes to result from these efforts as well as the current budget climate?
- Why are we not consolidating capability in an interagency manner when it makes sense?
- There were several questions related to expected outcomes, the answers were consistent with reducing our risk trajectory in all three goals by using and leveraging all levels of government and stakeholders in a more effective way than ever before.
- What’s the worst thing that can happen to “us” if this fails, or how do you think the products or implementation actions will be used in the future?” There was some concern that the FS was not strongly represented on the technical or strategic groups during the NSAT interaction, certainly no one stepped up to volunteer, comfortable with information now.
- Several questions and some discussion on how some of the actions in the Western Region are consistent with fire management consolidation and leveraging of capability within the Forest Service Intermountain Region.
- There was discussion relating to how this effort builds on and evolves previous strategic efforts such as FPA, the National Fire Plan etc.
- There were concerns expressed that this was a top down effort e.g. The Flame Act, but we were able to illustrate how the all hands, all lands approach was being use and in fact the assessments in Phase II and again

in Phase III were shaped by comments from all stakeholder that came from the ground and not from the beltway.

- On two occasions, with direct conversations with State Foresters and Regional Foresters, we talked through real life situations each were having in their respective states and gave several example of how the goals of the CS would work for them to resolve issues that directly relate to CS implementation.
- One Regional Forester asked specifically, "If you were me, what you do to help facilitate the CS efforts?" Response was look for those immediate opportunities in your region and personally recognize those efforts particularly when the successes involved multiple stakeholders including the FS.
- The importance of promoting inclusive CWPP efforts to build capacity and to achieve the goals of the CWPP, as well as the CS. Copies of the Community Guide to Preparing and Implementing a CWPP were given to each participant along with a WFLC CS Support document.
- Two participants inquired about how the CS would help them? They live in an area with high conflict between the federal agency and the county and with environmental groups not participating in the collaborative group. The county wants to retain access rights to public lands and the USFS is suing the county. The fact remains there will be litigation and groups that choose to litigate instead of participating in the local collaborative. There are examples of collaborative group members banding together to testify in court, against environmental groups, in support of the projects identified by their collaborative group/CWPP.
- Interest in how science would be included in the phase III process.
- Concepts related to how the strategy relates to collaborative efforts in the southern Oregon.
- What will we in the field see that is different? We hope to see allocation processes local, state, and federal that recognize and reward active vegetation management, broad collaboration, and shared responsibilities.
- Does this have the likelihood for more fuels money, more prevention people, or more firefighting resources? In some areas those things may be the result, but in some cases there will be re-prioritization and subsequent reductions based on limited public sector investment capability.
- How can it be budget neutral? Local, State, and National public sector funds are flat or declining. It appears that that trend will persist for some time. Market based solutions, proponent supported off-site mitigation, and non-public sector investments need to be nurtured and leveraged.

- What are the incentives and dis-incentives for forests to get on board?
There has been extensive non-federal participation in to all three phases thus far. Much of the federal wildland fire management force continues to be skeptical or unaware of the effort. If that sector of the stakeholder group does not participate, then they may not like the outcome.
- How the strategy relates to other collaborative efforts in the Southwest.
There were several questions as to who might be participating in the Southwest.

Questions That Could Not Be Answered

- When will we have conversations about shifting the budgets?

Leads for Immediate Actions/Success Stories

- Deschutes Collaborative Forest Restoration Project - Katie Lighthall
- Quincy Library Group - Frank Stewart
- All 23 CFLRP projects funded in 2010 and 2012
- Paul Summerfelt from Flagstaff Fire Department has taken the 3 goals of CS and applied to his department and area, separate attachment coming.
- Mike Morcom, State FMO for BLM Idaho will use the update of the Master mutual aid agreement and identify existing barriers for implementation, particularly for local government and volunteer fire departments.
- Pam Ensley has some specific PNW lessons learned success stories she wants to post on the Western Portal that can be used for our outreach efforts.
- Sue and Craig Glazier will begin exploration of an Island Park, Idaho collaboration effort with a current, interested county commissioner that is very excited about this topic and has connection bridges between the agencies and the community.
- The PNW will identify a person from Fire and Aviation who will be a specific contact for SORO (State Office/Regional) office and suggest we need to contact regional fire directors and State FMO's looking for similar points of contact
- Policy will be adopted by the governors during their annual meeting on June 11th and posted to the web at www.westgov.org. The final policy will be shared with the WFLC, WFEC, WRSC, and others.
- Presentation by Doyel Shamley, Natural Resources Coordinator for Apache County, AZ, illustrated an aggressive approach to treating the WUI around the community of Greer AZ, utilizing local community resources. The community asserted a "right" to treat the surrounding

federal forest in the name of public safety, and, in a sense, "brought" the USFS along.

- Efforts on the border area regarding state of the art efforts in emergency response communications interoperability.(From Western Regional Partnership)

Appendix 6 – Communications Activities (Communications Team)

Summary of Efforts in Phase III

The Western Region identified the need early in Phase III for a working group focused on communications, outreach, and improving our connectivity to our diverse group of stakeholders. To that end we solicited participation of a variety of stakeholders with a passion for the efforts related to the three goals. The Region, with the support of the WFLC focused a degree of energy on continuing to identify and share success stories that illustrate cohesive strategy behavior and actions. We also spent some energy on the collaboration part of the equation, especially as it relates to communities and what elements lead to successful outcomes. We also spent some energy on expanding the scope and effectiveness of the Community Wildfire Protection Planning (CWPP) process. Through these efforts we were able to gain a common understanding of community capacity, how we might use the success from one area to translate in to potential solutions for other areas, and how we might improve the effectiveness of CWPPs and related efforts. Below, you will find a summary from those three efforts as well as some recommendations for moving forward on the specific topic or for the West in general. To see the complete versions of each of these efforts please refer to the following link and look at the reports section.

Living with Wildfire: The State of Practice in Western Communities - Final Assessment Report

Executive Summary

In order to integrate the experience and insights of community stakeholders working on fire management issues in the west, leaders responsible for the Western Region Cohesive Strategy needed a strong understanding of current trends, needs and opportunities. This assessment was designed to provide that information and is intended to inform strategies, policies and programs emerging through the Cohesive Strategy and in subsequent national fire management investments and priorities going forward. We framed the assessment around the three goals set out in the Cohesive Strategy: response to wildfire, fire adapted communities, and resilient landscapes. The following findings represent a synthesis of the information offered by over 500 individuals reflecting on their experience with fire management:

- A majority of respondents were working across multiple fire management goals in their communities, indicating opportunity for realizing integration and synergy among the three Cohesive Strategy goals.

- Collaboration, cooperation and shared-leadership were highly utilized and highly valued.
- Increased collaboration, communication and sharing of responsibility and authority at the local level can yield improved and sustained partnerships, and improve fire management outcomes.
- Community stakeholder capacity and engagement, supported by flexible programs and partnership arrangements, are important to successfully accomplishing the three Cohesive Strategy goals.
- In both the provision of technical information and assistance, and in learning about new developments in support of fire management, respondents strongly favored various forms of in-person and interactive communications (peer networks, personal contacts, workshops, field tours, etc.) as the most effective tools. However, they also drew on the full array of tools and resources available.
- A diversity of leaders and stakeholders are working through partnerships to plan and implement effective and innovative fire management strategies. However, their successes are constrained by a wide range of social, policy and physical challenges that will require strategic and concentrated actions and investments at multiple levels to overcome.

We hope these findings will guide the Western Region Cohesive Strategy in addressing challenges and supporting at-risk communities as they work to better live with wildfire.

Recommendations

- Focus on fostering integration among the three Cohesive Strategy goals
- Continue investing in collaboration, cooperation and shared-leadership at the local level
- Increase investment in stakeholder capacity and engagement, supported by flexible programs and partnership arrangements, at the local level
- Increase investments in the various forms of in-person and interactive communications (peer networks, personal contacts, workshops, field tours, etc.)
- Continue investing in the full array of outreach and communications tools and resources currently available.

Cohesive Strategy Success Story Framework

Executive Summary

Stakeholder comments provided during Cohesive Strategy (CS) development emphasized the need to streamline the transfer of technology and knowledge from those experiencing success, to those seeking it. Success Stories can serve as one way of building and strengthening the important cultural connection needed between the diverse fire-adapted landscapes and stakeholders who inhabit the West.

Collectively success stories are seen as:

- 1) A tool to provide examples or illustrations how to move toward or achieve the goals, objectives, and actions associated with the CS and
- 2) Demonstrations of immediate actions that could be taken by stakeholders to adapt and live with fire in their communities consistent with the goals, objectives and actions described within the Western Region Strategy and Assessment.

Stakeholder engagement and involvement has been a cornerstone of the CS development effort. Building on and strengthening stakeholder engagement and expanding stakeholder networks provides a foundation for leveraging increasingly scarce resources needed for implementation. Stakeholder networks must be expanded and strengthened. However, an improved delivery method or framework for developing, organizing, and sharing success stories is needed.

The Success Story Framework directly addresses these needs and is designed to:

A. Align and Distribute Success Stories Consistent with CS Objectives and Actions

Making a link between Success Stories and the goals, objectives and actions developed for the Western Region is a key step in implementation. Simply collecting Success Stories from across the West and making them available to stakeholders using web-based search engines, etc. does not accomplish this alignment. It is important to use Success Stories as illustrations of the outcomes envisioned during the collaborative development process and to anchor them to the objectives and actions described in the CS.

This alignment will also address needs communicated by stakeholders to provide concrete examples of how their peers are making progress toward or achieving outcomes described in the CS. Peer-to-peer networks have been identified as one of the most effective methods of providing the transfer of knowledge and experience.

B. Identify Success Stories for the Full Range of CS Objectives and Actions

A preliminary analysis of existing Success Stories posted on Forest and Rangelands.gov, wildlandfireprograms.usda.gov, and others developed during Phase III has identified a “gap” in examples associated with the full range of objectives and actions described in the CS and the diversity of situations faced by stakeholders in different “operating environments”.

C. Provide Stakeholders Relevant and Meaningful Examples of Success Stories Corresponding to their Operational Situation

The Western Region is recognized as ecologically and culturally diverse. The Framework is designed to provide stakeholders a resource to search for Success Stories about objectives and actions accomplished using different collaborative schemes in socio-economic settings similar to their operating environment.

D. Provide a basis for monitoring implementation of the CS

Success Stories can provide empirical evidence over time for monitoring progress in implementing the CS’s guiding principles and collaborative efforts. An evaluation or “snapshot” of the approaches described can provide the basis for monitoring the change in community problem solving methods being employed and the range of CS objectives and actions being addressed.

Delivery of accurate and integrated information to stakeholders consistent with the principles and goals of the CS must be sustained during implementation. Success Stories provide illustrations and examples of stakeholders working toward the goals and

objectives of CS and will provide a durable and expanding stakeholder resource during implementation. An improved web-based delivery mechanism and system for generating Success Stores that incorporates the features of the Success Story Framework is needed to meet these demands.

Recommendations:

Delivery of accurate and integrated information to stakeholders consistent with the principles and goals of the CS must be sustained during implementation. Success Stories provide illustrations and examples of stakeholders working toward the goals and objectives of CS and will provide a durable and expanding stakeholder resource during implementation. An improved web-based delivery mechanism and system for generating Success Stores that incorporates the features of the Success Story Framework is needed to meet these demands.

CWPPs to Protect Landscapes & Communities: CWPPs and the Middle Ground

Executive Summary

Community Wildfire Protection Plans (CWPPs) are planning documents in which communities and counties in the Wildland Urban Interface (WUI) strategize to reduce the threat and potential impact of wildland fire. During the Cohesive Wildland Fire Management Strategy stakeholder input process, many WUI residents made it clear that they value many aspects of the landscape as much as they do their homes. They spoke movingly of the need to protect watersheds, wildlife habitat, cultural use areas and sites, utility corridors, evacuation routes, forested views, and other high value areas and assets. Tribal representatives talked about the need to consider the home and the homeland in unison, and not as two separate entities. The Western Regional Strategy Committee (WRSC) identified the “middle lands” or “middle ground,” areas between the WUI and the backcountry, as an area of concern for fuels treatments, to protect both landscapes and communities. Concern about protecting communities and community values can extend well beyond the community’s boundaries.

This study looks at how the middle ground is being addressed in existing CWPPs, and at the guidance with which CWPP planning groups are working. Setting the WUI boundary is one of the steps in doing a CWPP. The WUI is located near communities at risk. It’s important to consider the relationship of the WUI to the community at risk when determining the WUI boundary. This study examined the CWPP guidance and many CWPPs to determine if CWPPs, as they are currently being done, address the middle ground adequately. This paper discusses the results of the study, and shows a few examples of CWPPs, and how they protect values-at-risk beyond the WUI boundary. The examples also show methods of prioritization of actions for implementation.

A review of many Western CWPPs shows that there are different definitions in use for at-risk communities and the WUI boundary. The definitions of at-risk communities and the WUI have changed in practice since they were first defined in the Healthy Forest

Restoration Act (HFRA) and in the Federal Register. The differences center around whether a community at risk must be near federal land, and if there is a set distance for the WUI boundary. Where there is no CWPP, HFRA sets a maximum distance around the community for the WUI. However, where there is a CWPP, the WUI boundary is defined by the collaborative group, which creates the CWPP. Proximity to federal land is not a requirement if the community is located in an environment that is deemed a high wildfire risk area. The CWPP process gives members of communities and counties with CWPPs the opportunity to provide input into the prioritization process for fuels treatments on public land. The ability to define the WUI boundary in accordance with the unique circumstances of their community and to provide input in the prioritization process are two of the best reasons for communities or counties to create CWPPs.

Across the West, most states did CWPPs at the county level, or at the county level with additional specialized CWPPs focusing on smaller regions within the county. The approaches to defining the WUI and prioritizing projects are varied in CWPPs, with many creative and valid methods employed. The study found that CWPPs done at the county level frequently address the middle ground and consider fuels treatments in the middle ground as part of the prioritization process.

The study finds that there is nothing in the definitions or guidance relating to CWPPs that prevents communities or counties from designating WUI boundaries where they see fit. However, some groups doing CWPPs are not aware of the flexibility of the definition. States, counties and municipalities should educate CWPP groups about the benefits of setting their own CWPP boundary.

As the examples contained in this study show, there are many ways in which CWPPs have successfully incorporated middle ground planning. CWPPs done at the county level often treat the entire county as the area of concern, and may not identify a WUI boundary at all. An example of this method is the Trinity County, California CWPP. Other CWPPs identify a WUI boundary, but plan beyond it by designating areas of concern or areas of special interest (ASIs) such as in the Montrose, Colorado CWPP. Other techniques include identifying a WUI Zone-2, which has prescriptions for fuel treatments that are less stringent than in the more urbanized WUI Zone-1, as in the Mill Creek Canyon, California CWPP. And some CWPPs identify the WUI in relationship to other factors of community importance, not just proximity to structures, as in the Mill Creek Watershed, Oregon/Washington CWPP and the Orleans/Somes Bar, California CWPP.

To best address the middle ground, it is advisable to do a tiered approach to CWPP development, with local, tribal, state and federal entities sharing information on values at risk, whenever possible. Adjoining states, tribes and communities can work together, sharing information across boundaries. In this way, ecological regions, which span multiple counties can have almost seamless CWPP planning. Or, as is done in the Mill Creek Watershed, Oregon CWPP, the entire area of concern can be defined within the WUI boundary. In that case, a valuable watershed, which provides drinking water to the nearby city and covers parts of four counties in two states (Oregon and Washington), is all within the WUI boundary. Additionally, the Orleans/Somes Bar CWPP spans three

counties to include landscapes of community importance, even though each county CWPP breaks the planning area up along county lines. To address the need for planning centered around communities at risk, implementation of the CWPP is coordinated with Tribal planning efforts, and is tiered to tribal and county CWPPs and equivalents. By using a more open definition of WUI, we are taking a holistic approach to the location of communities within the landscape and the interdependence of the community and its surrounding landscape.

Recommendations from this study include:

1. CWPPs or equivalents should be scaled to the county, tribal territory, and/or area of community importance to include middle ground areas as delineated by how communities identify themselves with the landscape concerned.
2. Targeted community CWPPs can be done to supplement the county and/or tribal CWPP or equivalent(s).
3. Adjacent counties, states, tribes, and municipalities should share information and coordinate plans across boundaries for a seamless approach to wildfire planning.
4. Doing small projects first builds community involvement and capacity for larger projects.
5. Weighting systems for hazardous fuels treatments should be sensitive to the differences between the types of places, such as urban, suburban, rural, watershed, evacuation route, etc.
6. In the prioritization analysis, extra weight should be given to fuels treatments in close proximity to communities, to provide protection to both the community and the landscape, and these fuels treatments should be done regularly to keep fuel loads low.

States, counties, tribes and municipalities should give guidance to CWPP planners about the importance of setting the WUI boundaries in coordination with tiered documents to address areas of concern and ecological values at risk.

Information and Resources for Communities, Agencies, and Other Stakeholders

There is a great deal of material (how-to guides, training manuals, collections of success stories etc.) available to help communities, federal and state agencies, and other stakeholders better understand how to initiate and/or become effectively engaged in collaborative processes.

The Forest Service’s Partnership Office website <http://www.fs.usda.gov/main/prc/tools-techniques/collaboration> begins with “The Art of Collaboration” and follows it with sections on partnership development, finding funding for collaborative efforts, and monitoring and joint learning. It also includes a series of training modules on partnerships and collaboration

There is also a great deal of helpful information on the Forest Service's restoration website. Much of it was developed in response to the authorization of stewardship end result contracting (SERC), and that has been augmented with lessons learned from the more recently initiated Collaborative Forest Landscape Restoration Program (CFLRP).

The Forest Service's SERC information (including training materials and success stories) can be found at http://www.fs.fed.us/restoration/Stewardship_Contracting/training.shtml
The CFLRP information begins at <http://www.fs.fed.us/restoration/CFLRP/index.shtml/index.shtml>. The "Results" tab leads to reports on individual projects and success stories, and the "Training" section to recorded peer learning sessions, some of which focus on collaboration.

The Pinchot Institute for Conservation has been conducting yearly programmatic monitoring of SERC projects for the Forest Service (since 1999) and the BLM (since 2005). The resulting annual reports are available at http://www.pinchot.org/gp/Stewardship_Contracting One of the major issues which has been tracked over time is how Forest Service and BLM personnel can increase and improve agency engagement in local collaborative processes. The results are usually worth the effort, but the up-front investment of time that has to be made can be substantial. The regional monitoring teams assessing the information gathered each year have consistently said that (1) collaboration needs to be part of the job -- not an add-on to it -- and (2) there needs to be appropriate recognition of good work in collaboration -- positive performance evaluations, etc.

The Council on Environmental Quality has an excellent handbook on collaboration in the NEPA process that explains how agency personnel can be productively involved in collaborative efforts without running afoul of the Federal Advisory Committee Act (FACA). That document can be downloaded from http://ceq.hss.doe.gov/nepa/nepapubs/Collaboration_in_NEPA_Oct2007.pdf.

The Bureau of Land Management's recently issued *National Natural Resources Policy for Collaborative Stakeholder Engagement and Appropriate Dispute Resolution* focuses on preventing, managing, and resolving conflicts or disputes through collaborative stakeholder involvement. It's at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/adr_conflict_prevention.Par.44228.File.dat/ADR.pdf

The BLM's ADR program website provides a list of available training programs as well as an extensive bibliography "for those interested in learning more about Alternative Dispute Resolution, collaborative engagement, public participation, and related disciplines" at http://www.blm.gov/wo/st/en/prog/more/adr/training_and_resources.html
The National Forest Foundation's *Collaboration Resources* website (<http://www.nationalforests.org/consERVE/resource>) has a "Learning Topics and Tools" section that provides "examples, best practices, and other resources for practitioners working in the field of conservation and collaboration". NFF also offers technical assistance and some grant assistance for qualifying organizations.

The Red Lodge Clearinghouse's *Collaboration Handbook* (<http://rlch.org/content/collaboration-handbook>) provides a step-by-step "how-to" guide for collaborative groups, with chapters on:

- when to collaborate,

- getting started,
- the first meeting,
- subsequent meetings,
- strategic planning,
- gathering resources,
- organization structure,
- dealing with problems, and
- the maturing collaborative.

While not focused on long-term collaborative efforts, the BLM's *Earning Bridges: Strategies for Effective Community Relations Before, During, and After the Fire*, provides practical, common-sense guidance “about building and maintaining relationships” – the core of any collaborative process. As to why that matters, *Earning Bridges* says:

There are pockets of the West where BLM fire programs have developed and maintain positive, productive relationships with special publics, particularly the ranching community. These relationships have multiple benefits that lead to cooperation and a safer environment when fires occur. Where these relationships do not exist, a lack of understanding, communication, and coordination results in unnecessary obstacles and challenges, and safety issues that threaten both firefighters and the public.

The handbook is available at

http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/ib_attachments/2007.Par.23468.File.dat/ib2007-075attach1.pdf

Conclusions and Next Steps

These efforts show the need for continued communication efforts among stakeholders on all topics related to the Strategy. We need to exchange information on successes through a variety of methods and approaches. We have learned that communities and collaborative processes are the cornerstone to success in all three goal areas. Continued efforts to create a broad, common understanding and support among all stakeholders for the underlying principles of the Strategy need to be prioritized. We also have learned that the hub and spoke peer networks between agencies, collaborative efforts, various Non-government organizations, and academia are working very well and those networks will be key in the success of the three goals. We do have four specific recommendations that can be added to the sets above:

1. We recommend the upgrade or design of an improved delivery platform as a vehicle for Cohesive Strategy tools such as success stories. This can be done by modifying existing sites such as forestsandrangelands.gov or choose an existing site that is already configured for continuous updating and modification.

2. We recommend the establishment of a monitoring function to evaluate our success in our efforts related to stakeholder engagement and success towards the three goals.
 3. We recommend continued regional outreach and engagement to increase engagement and participation.
 4. We need to continue to develop collaboration tools, increase communications networks, and strengthen the common adoption and understanding of Cohesive Strategy principles.
-

Monthly Updates

Ongoing communication activities include monthly updates, a brief newsletter format which provides highlights of:

- National Science and Analysis Team Activities,
- Progress and process items from the Western Regional CS effort,
- Items from current events from outside, but relevant to the Cohesive Strategy process,
- And links to the latest “Success Stories” developed by the team.

The update also includes links available for additional information about the CS, as well as to the co-chairs of the WRSC.

“Success Stories” are one of the more effective means of assisting stakeholders in their pursuit of information about techniques and challenges that will facilitate their movement toward achieving the goals of the Cohesive Strategy. Actual situations and events from around the Western US are compiled and made available at the WRCS website, and local contacts are often included for additional help and information.

Monthly Updates and “Success Stories” are posted to the WRSC website beginning in July of 2011 and continuing to the present. These are available at

<http://sites.nemac.org/westcohesivefire/updates/> or
<http://www.forestsandrangelands.gov/strategy/index.shtml>

Presentation Materials

The WRSC members and representatives also maintained a variety of presentation tools and materials, including briefing papers and Power Point Slide Presentations, an example of each follows:

Cohesive Strategy Briefing Paper

The National Cohesive Wildland Fire Strategy was requested by Congress to address the wildfire problems facing communities, such as: loss of life and property, suppression costs, damage to natural and cultural resources, and coordination between fire jurisdictions. The Western Strategy is one of three regional strategy efforts being developed with the participation and assistance of a wide variety of stakeholders and interests across the country.

The three principal goals of the National Cohesive Strategy are:

- Restore and Maintain Resilient Landscapes: reduce the risk to forests and rangelands.
- Create Fire-Adapted Communities: withstanding a wildfire without loss of life, property, and community assets.
- Respond to Wildfires: All jurisdictions participate in safe, effective, efficient wildfire management through improved intergovernmental coordination.

The Western Regional Cohesive Strategy group has:

- adopted those three goals
- contributed ideas to shape the future of wildfire management
- produced the “Western Regional Assessment and Strategy”

In the next phase, the Group will develop:

- a regional wildfire risk assessment
- an evaluation of options and alternative scenarios for the Western Strategy
- performance measures to assure the strategy is effective
- guidance on implementing the strategy

The outcomes from the Western Regional Cohesive Strategy are:

- Improved efficiency for all state, federal, tribal, and local firefighting organizations.
- Forests and rangelands that will better withstand wildfire.
- Communities with reduced risk of loss of life and property when wildfire occurs.
- Communities and agencies positioned to work collaboratively on wildfire management issues.

The three regional strategies will be integrated to produce a National Cohesive Strategy that reflects the unique cultures and environments of the West, the Northeast, and the South. Remain engaged by following the latest information at www.forestsandrangelands.gov/strategy/.

Western Region Cohesive Strategy Overview June 2012



Cohesive Strategy Briefing

The National Cohesive Wildland Fire Strategy was requested by Congress to address the wildfire problems facing communities, such as:



- Loss of life and property
- Suppression costs
- Damage to natural/cultural resources
- Coordination between jurisdictions.

National Cohesive Strategy

Goals

1. Resilient Landscapes
2. Fire-Adapted Communities
3. Wildfire Response



Restore/Maintain Resilient Landscapes

Reduce risk to forests and rangelands



T

Create Fire-Adapted Communities

Withstanding a wildfire without:
Loss of life - Property - Community assets



Wildfire Response

All jurisdictions participate in safe, effective, efficient wildfire management through improved intergovernmental coordination



Regional Cohesive Strategies

Regions: North, South, West

Stakeholder participation around the country



Western Regional Cohesive Strategy Group

- Adopted and developed the 3 national goals
- Contributed ideas to shape the future of wildfire management
- Western Regional Assessment and Strategy



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Western Regional Cohesive Strategy



NEXT PHASE

- Regional wildfire risk assessment
- Evaluation of options and alternative scenarios
- Performance measures
- Guidance on implementation

Western Regional Cohesive Strategy

Results:

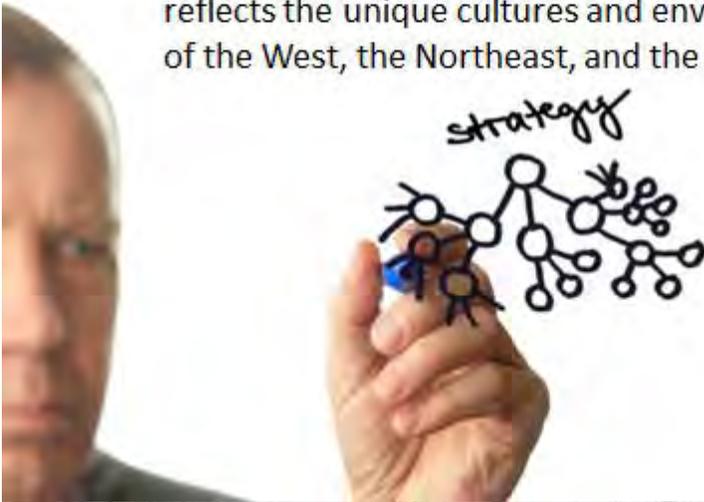
- **Improved efficiency**
... federal, state, tribal, local
- **Better withstand wildfire**
... for forests and rangelands
- **Reduced risk to communities**
... loss of life/property
- **Positioned to collaborate**
... with Communities/agencies



T

National Cohesive Wildland Fire Strategy

The three regional strategies will be integrated to produce a **National Cohesive Strategy** that reflects the unique cultures and environments of the West, the Northeast, and the South



www.forestsandrangelands.gov/strategy/

Communications Plans and Actions - Regional Webpage Information and Content

The Western Regional Strategy Committee maintains a webpage at <http://sites.nemac.org/westcohesivefire> to provide stakeholders with current and useful information and to serve as an outreach site to collect comments about the CS effort at the appropriate times.

The “Welcome Page” provides a brief introduction to the CS effort and describes the three CS regions.

The “About You” page serves as the site where “Success Stories” are found. There are also links to other resources which may be useful to communities and groups of stakeholders who are seeking information about the techniques, processes, tools and challenges of working together to achieve the three goals of the Cohesive Strategy.

The “Reports” page provides stakeholders with the links to the monthly updates as well as links to the Western Regional Strategy and Assessment, Content Analysis from two outreach efforts, and a link to the National Cohesive Strategy home page.

Those web pages are shown on the following pages for illustration. They are available at <http://sites.nemac.org/westcohesivefire>.

Western Region



Welcome

Interested in the Cohesive Strategy? Here's a quick background:

The FLAME Act

Faced with increasing numbers of catastrophic, emergency wildland fires, the U.S. enacted the Federal Land Assistance, Management and Enhancement Act (FLAME) Act in 2008 to establish a new federal fund to cover the growing costs associated with fighting these fires.

Western Region

The FLAME Act also required a cohesive wildland fire management strategy. To achieve this, the U.S. was divided into three zones: west, southeast and northeast. Representatives from agencies, governments and other stakeholders in the 16 western states are working towards a cohesive strategy that will enable them to plan for and respond to wildland fires efficiently and strategically by restoring and maintaining resilient landscapes, creating fire adapted communities and encouraging jurisdictional collaboration.

Similar efforts have been underway for the last decade; however, the Secretaries of Interior and Agriculture directed this to be the most all-inclusive effort ever attempted to develop a national wildfire management cohesive strategy.

Find Success Stories in our
About You section

Search our site

Western Region



About You

Stakeholder Collaboration

This is an all inclusive, wildland fire management stakeholder effort – a long-term, iterative process with ongoing dialogue. We are seeking the most diverse opinion-base possible to help develop the National Wildland Fire Management Cohesive Strategy (Strategy) within the time limitations agreed to by Congress and the Administration.

- The Strategy is to establish national direction for wildland fire management, representing the needs and capabilities of all cooperators, including the public.
- The Strategy is about more than fire suppression. It emphasizes restoring resilient landscapes and promoting fire adapted communities.
- The Strategy is designed to better align national level decision-making with the broad diversity of regional and local interests.

Find Success Stories in our About You section

Search our site

Search



Success Stories from Western Stakeholders

Success Stories are examples of communities, tribes, agencies, organizations, and individuals making progress toward achieving the vision defined by the Cohesive Strategy “...to safely and effectively extinguish fire, when needed; use fire where allowable; and as a nation, to live with wildland fire.” Progress is made toward one or more of Cohesive Strategy’s three goals consistent with the Guiding Principles adopted during Phase I. Click on those stories below that interest you -

- [Structure Protection at Elk Stream Ranch](#) - The First 48 Hours of the Weber Fire and how a small community in western Colorado managed to protect their homes from wildfire.
- [Northern California Prescribed Fire Council](#) - While there are many impediments to the use of prescribed burning, an organization with a participatory professional culture can pave the way for reviving fire use in land.
- [Spring Mountains National Recreation Area Hazardous Fuels Reduction Projects](#) -Less than an hour’s drive west of Las Vegas, Nevada (population 583,756), the Spring Mountains rise high above the desert that completely surrounds them, reaching nearly12,000 feet at the summit of Mount Charleston.
- [Selway-Bitterroot Wilderness Fire Program](#) - Restoring wildland fire to restore fire-adapted ecosystems and reduce longterm management costs.
- [Karuk Tribe – Bringing Fire to the People](#) – Using traditional ecological knowledge to manage resilient ecosystems, create fire-adapted communities, and respond to wildfire.
- [Upper Deschutes River Coalition](#) – Mission: “To protect Upper Deschutes River Communities by restoring and sustaining healthy fire-resistant forests, pure and abundant river flows and wildlife habitat.”
- [Whitefish Area Fire Safe Council](#) – Working together to educate and facilitate the Whitefish Community to reduce wildfire risks and to maintain a Fire Safe environment.
- [Flagstaff Fire Department](#) – Establishing performance metrics to measure progress toward collaborative objectives set for each of the three Cohesive Strategy Goals.
- [Colorado Bark Beetle Collective](#) – Addressing the impacts of the very serious mountain pine beetle outbreak in the area, through intergovernmental cooperation between Federal and State land management agencies, and municipal and county governments.
- [Ashland Forest Resiliency Stewardship Project](#) – Implementing landscape scale treatments of Ashland’s municipal watershed in an effort to restore fire-adapted ecosystem, improve water quality and provide economic and social benefits to the community. Multiparty partnership and monitoring includes municipal, Federal, and NGO collaborators. More at [this project’s website](#).
- [Wallow Fire](#) - When the Wallow Fire tries to burn into the communities of Alpine and Greer, a “triple punch” helps to thwart and stop this high-intensity crown fire before it reaches homes.

Resources for Connecting Nationally

- www.forestsandrangelands.gov
- [Fire Adapted Communities at fireadapted.org](http://FireAdaptedCommunitiesatfireadapted.org)

Topics of interest in followup to the Western Region’s Strategy Assessment

- [Enhancing Collaboration](#)
- [Home and Homeland](#)
- [Community Protection](#)
- [Fully Utilizing Existing Authorities](#)
- [Using Economic Principles to Achieve Ecosystem Objectives](#)

Western Region



Reports

[Preliminary Alternatives and Performance Measures](#)

From **June 11** through **July 10** we collected feedback on the preliminary alternatives and performance measures being developed by the Western Regional Strategy Committee. The comment period is now closed but you may access the material reviewed at the link above.

WRSC General Updates

- [August 2012](#)
- [July 2012](#)
- [June 2012](#)
- [May 2012](#)
- [April 11, 2012](#)
- [December 5, 2011](#)
- [November 4, 2011](#)
- [October 21, 2011](#)
- [October 6, 2011](#)
- [September 15, 2011](#)
- [August 5, 2011](#)
- [July 15, 2011](#)
- [July 5, 2011](#)

Western Regional Strategy and Assessment

- [Full report \[pdf\]](#)
- [Appendix 7: Phase II Outreach and Content Analysis of Comments on Goals, Objectives and Actions \(includes communication plan\) \[pdf\]](#)
- [Appendix 8: Immediate Opportunities \(ideas submitted to the WRSC from METI\) \[pdf\]](#)
- [Content Analysis of Comments on Regional Strategy and Assessment](#)
- [Phase III Content Analysis of Comments on Preliminary Alternatives and Performance Measures](#)

Cohesive Strategy Reports

A National Cohesive Wildland Fire Management Strategy and the Report to Congress: The Federal Land Assistance, Management and Enhancement Act of 2009 – as well as foundational documents for this effort - is available at www.forestsandrangelands.gov.

Find Success Stories in our About You section

Search our site

Appendix 5 Communications Plans and Actions - Phase III Communication and

Outreach Plans

Western Region Phase III Communication and Outreach Plan

The Western Regional Strategy Committee (WRSC) desires to continue an emphasis on stakeholder communication and outreach during Phase III of the National Cohesive Wildland Fire Management Strategy. Communication and outreach objectives identified in the Western Region's Phase II Outreach Communication Plan will persist and be built upon during Phase III, and include:

1. Engaging people affected by this strategy in its development within the timeframes identified by the Wildland Fire Leadership Council (WFLC).
2. Following a collaborative, rigorous, transparent development path.
3. Collecting data representing interests and opinions of stakeholders.
4. Using local, regional, and traditional knowledge and insights, as well as science and technology, to inform the western strategy assessment.
5. Disseminating clear and current information to stakeholders using multiple media on a routine basis.
6. Identifying and sharing on-the-ground success stories, including "key ingredients to success" that could be of immediate help to other communities or organizations.
7. Seeking input from stakeholders to develop Cohesive Strategy implementation plans, and applying their ideas and "key ingredients" associated with successful projects to implementation planning.

Desired Outcomes for Phase III Communication and Outreach

The Western Region Outreach and Communication Plan dovetails with and supports the objectives of the National Communication Framework. This update includes activities leading to and through Strategy Implementation (February 28, 2013).

Outreach and communication efforts during Phase II provided the WRSC/WG with valuable information used to develop the Western Assessment. Efforts by the WRSC/WG to fully engage all stakeholder groups across the West was hampered by a combination of the time of year outreach was conducted and time limitations established by WFLC. As a result, opportunities remain to strengthen and expand stakeholder engagement during Phase III and set the stage for successful implementation of the Cohesive Strategy

The WRSC has identified the following desired communication and collaboration outcomes and activities to be achieved during Phase III:

- Strengthen and expand stakeholder support throughout the West and ensure all affected stakeholder "voices" are heard and engaged.
 - Share the Western Assessment - expand the dialog and stakeholder participation and continue to identify and add good ideas.

- Seek specific input to the Goals, Objectives, Sub-Objectives, Actions and broad policy questions described in the Western Assessment.
- Expand stakeholder support beyond that developed in Phase II by actively reaching out to engage “new voices” in the conversation.
- Continue to identify “Immediate Opportunities for Success” in the West focused on those examples where the three national goals are being met.
 - Identify and describe “key ingredients” including performance measures and metrics that effectively work on the ground.
 - Actively share and expand the application of these techniques with willing stakeholder groups.
- Facilitate agency efforts to streamline processes and increase the pace and effectiveness of implementation by taking full advantage of existing authorities to accomplish goals outlined in the Strategy.
 - Solicit ideas from successful collaborative efforts on ways to cut through process and achieve results.
 - Identify perceived and actual procedural barriers to accomplishment of work and provide guidance or materials that clarify procedural options and/or identify options to improve procedures.
 - Provide tools and materials to assist the WRSC/WG in communicating with stakeholders regarding procedural options available to them.
- Actively engage with the Science Team during the Phase III effort.
 - Keep western stakeholders updated on progress, products, and opportunities to provide input.
 - Clarify what the Phase III trade off analysis is, and provide tangible descriptions of Phase III’s expected outcomes to western stakeholders.
- Continue to keep the CSSC, WFEC and other Regions apprised of Western Region communication and outreach efforts.
 - Coordinate West-wide efforts with the national communication strategy and team.

Western Region Communication Strategy Working Group Goals

The Western Region Communication Strategy Working Group’s goals support the WRSC’s desired outcomes for Phase III communication and outreach:

- 1) Strengthen and expand existing WRSC/WG stakeholder engagement and support.
- 2) Improve elements of the Western Assessment by providing opportunity for stakeholder comment prior to Phase III development work.
- 3) Create opportunities for continuous and expanded stakeholder involvement using multiple media and networks (newsletter/updates, website, social media, etc.).
- 4) Distribute accurate, timely information regarding Phase III objectives, progress, and participation opportunities.
- 5) Emphasize elements and tools for successful National Cohesive Strategy implementation that can be pursued immediately.

Phase III Western Region Outreach and Communication Actions

A detailed action plan for the Western Region will be developed by the Communication Strategy Working Group to support the updated Western Region Outreach Communication Plan. The following actions are not intended to be all-inclusive, but illustrate the range of actions that could be taken during Phase III. In some instances, actions can achieve more than one of the desired outcomes described above:

1. Provide communication support and assistance to the WRSC/WG.
 - Assist WRSC/WG members assigned to maintain and pursue expanded stakeholder engagement by providing communication tools and outreach materials.
 - Maintain a calendar of Western CS engagements and track information from those engagements using a “trip report”. The trip report will be used to record discussion topics, identify additional communication support needs, and note any immediate success story “leads”.
 - Identify key opportunities for the RSC to provide NSAT with information needed to generate program option tradeoffs and performance measures and integrate those opportunities into the Western Region's communication and outreach plan.
 - Develop communication tools/messages to describe NSAT's role and purpose, and how the outcomes from the trade-off analysis may be used in implementation.
2. Provide stakeholders the opportunity to review and comment on the Western Assessment. Analyze comments and provide the WRSC a portrait of comments and stakeholder response.
3. Identify stakeholder groups that were not engaged or were inadequately represented in Phase II, and expand outreach to connect with these groups to ensure that the WRSC/WG hears from these “new voices” and engages them in the process.
 - Identify sub-regions and communities of interest not engaged (e.g., conservation groups and organizations, agency non-fire staff, business and industry, and urban stakeholders)
 - Attract and retain these groups’ attention. Strive for understanding, acceptance and support for the Western Assessment and the Cohesive Strategy.
4. Identify success stories and examples of successful implementation that can be shared with Western stakeholders:
 - Identify groups and individuals that have demonstrated "on the ground" success in achieving the goals of the CS, and encourage them to support the broader application of their successful methods throughout the West.

- Solicit ideas from successful collaborative efforts about their techniques to reduce process barriers and achieve results.
5. Use a variety of media to sustain and expand stakeholder outreach and communication to create the social connection and traction needed for a collaborative foundation for strategy implementation. Use these communication methods to enhance understanding of the Western RSC and the Strategy effort by filling in the picture of who we are, what we are doing and why.
- Develop monthly stakeholder update messages and materials. Develop coordinated messaging that considers: current work of the NSAT, activities of the Western Region Strategy Group and Technical Group, Communication Strategy Working Group, RSC/WG activities, and collaboration and outreach activities. The activities and products of these groups will all feed into the messages developed for internal and external use.
 - Maintain a current mailing list to be used for outreach and updates
 - Maintain information on the Western Region's webpage regarding status, comment opportunities, and who and how to engage in development of the West's strategy.
 - include current updates to reflect the status of the CS Phase III
 - include success stories gleaned from around the West
 - describe immediate actions that can be taken to move communities toward the three goals of the CS
 - promote any opportunities for stakeholders to comment on the development of Phase III

Appendix 7. - Committee and Work Group Members

WEST REGION STRATEGY COMMITTEE – 10/12

Doug MacDonald	Co-Chair/WFEC Liason- IAFC
Corbin Newman	Co-Cair/Regional Forester, FS
Robert Cope	Lemhi County, ID – NACo
Pam Ensley	FWS
Sam Foster	Station Director, FS
Bob Harrington	MT State Forester, NASF
Tony Harwood	Confederated Salish and Kootenai Tribes
Warren Day	USGS
John Philbin	BIA
John Ruhs	BLM
Sarah Craighead	NPS
Ann Walker	WGA

Dick Bahr	NPS
Joe Freeland	BLM
Leon Ben	BIA
Tom Quigley	NSAT/Contractor
Joe Stutler	IAFC (resigned 7/1/12)

WEST REGION WORK GROUP

Joe Freeland	Team Lead/BLM
Carol Daly	Co-Lead/Flathead Policy Center
Alan Quan	FS
Bill Avey	FS
Bill Tripp	Inter-Tribal Council
Travis Medema	Oregon Dept. of Forestry/NASF
Alan Ager	FS
Craig Glazier	Local Government
Eric Knapp	FS
Jesse Duhnkrack	NPS
Joshua Simmons	BIA
Kevin Ryan	FS
Laura McCarthy	TNC
Lynn Jungwirth	Watershed Research and Training Council (WRTC)
Sue Stewart	FS
David Seesholtz	FS PNW Research Station
Joe Stutler	IAFC (resigned 7/12)

WEST REGION TECHNICAL WORK GROUP

Carol Daly	Flathead Policy Center
Joe Freeland	BLM
Tom Quigley	NSAT/Contractor
Alan Quan	FS
Bill Tripp	Inter-Tribal Council
Jesse Duhnkrack	NPS
Kevin Ryan	FS
Laura McCarthy	TNC
Karen Prentice	BLM
Cheryl Renner	WGA/Contractor
Geoff McNaughton	Utah State
Jay O'Laughlin	University of Idaho
Chuck Bushey	IAWF
Brad Washa	BLM
Joe Stutler	IAFC (resigned 7/12)

WEST REGION STRATEGIC WORK GROUP

Carol Daly	Flathead Policy Center
John Ruhs	BLM
Ann Walker	WGA

Joe Freeland	BLM
Tom Quigley	METI/NSAT
Alan Quan	FS
Doug MacDonald	WFEC Liason/IAFC
Laura McCarthy	TNC
Tim Burke	BLM
Caitlyn Pollihan	WFLC/USFS
Danny Lee	USFS/NSAT
Jim Fox	UNC/NSAT
Matt Hutchins	UNC/NSAT
Dick Bahr	NPS
Sarah Craighead	NPS
Joe Stutler	IAFC (resigned 7/12)

WEST REGION COMMUNICATION WORK GROUP

Carol Daly	Flathead Policy Center
Ann Walker	WGA
Joe Freeland	BLM
Bill Tripp	Inter-Tribal Council
Kevin Ryan	FS
Lynn Jungwirth	WRTC
Laura McCarthy	TNC
Steve Solem	METI
Jim Golden	METI
Julie Woldow	METI
Shelley Gregory	BLM-Wyoming
Terina Mullen	BLM-Montana
Judith Downing	FS
Erin Darboven	OWF
Mary Jacobs	National League of Cities
Candace Iskowitz	IBHS
Mark Beighley	METI
Michelle Medley-Daniels	WRTC
Jon Skinner	BLM
Pam Leschak	FS
Jennifer Myslivy	BLM-New Mexico

DRAFT



Proposal

Date: November 2, 2012

Subcommittee: Cohesive Strategy Subcommittee

Description of Issue or Assignment: National Risk Analysis Report and Timeline

Discussion of Proposed Recommendation(s):

At the CSSC meeting, the CSSC reviewed a proposal developed by the NSAT on next steps, namely completion of the national risk analysis. CSSC developed a revised timeline for completing the national risk analysis report based on the approved National Report Template and completing the requirements of the GAO and FLAME Act namely; national threat/risk analysis, national trade-off analysis and cost/investment options.

Identify Considerations:

The CSSC considered the NSAT proposal and discussed associated opportunities, issues, and timeframes. The CSSC explored whether it was possible to do work on both the national risk analysis report (risk, trade-off, and investment) and support the regions in completing regional trade-off analyses. The group, through consultation with the NSAT, determined that concurrent analyses would not be possible, and that the priority order would be to work on the national risk analysis report (June 2013) and then support regional work to be coordinated with the RSCs.

Rationale for Recommendation(s):

A National Risk Analysis report that encompasses the requirements of the GAO and FLAME Act (threat/risk analysis, trade-off analysis and cost/investment options) meets the intent and direction from Congress on the path forward addressing fire at all levels. This direction is also consistent with the previous reports in Phase I and Phase II. Information assessed in the Regional Reports along with participation and representation from the regions on the National Analysis will provide important information and input on the National Risk Analysis Report.

Timelines:

- Complete draft National Risk Analysis Report, including threat/risk analysis, trade-off analysis and cost/investment options; submitted to WFEC June 1, 2013.
- Approval of National Risk Analysis Report and National Action Plan –Fall 2013.

Recommendation(s):

The CSSC concurs with the proposal for completing a national risk trade-off analysis as the priority for next steps (refer to document “Thoughts on Next Steps...” available on



Proposal

the MyFireCommunity). This includes a focused approach from the NSAT as well as a group of dedicated individuals to work with the science team on the National analysis, and a separate group of budget analysts to support the cost/investment options.

Decision Method used:

- Subcommittee Consensus
- Modified Consensus (explain, i.e. majority, super-majority)
- Chair Decision
- Not Applicable

Contact Information:

Dan Smith
CSSC Chair

Prepared by: Henry Bastian, CSSC



Proposal

WFEC Decision:

- WFEC Approves
- WFEC Approves with Modifications (not required to resubmit for WFEC approval)
- Need More Information (required to come back to WFEC for approval)
- WFEC Does Not Approve

Shari Eckhoff, DFO

Date

Notes regarding decision:



Proposal

Date: November 2, 2012

Subcommittee: Cohesive Strategy Subcommittee

Description of Issue or Assignment: Regional Risk Analysis Reports

Discussion of Proposed Recommendation(s):

Each Region submitted their Regional Risk Analysis Report to the CSSC. The CSSC reviewed each report to determine if the reports satisfied the requirements outlined in the regional report template, and if/where edits were needed. At the CSSC meeting last week the CSSC agreed the Regions met the requirements of the regional analysis reports except for tradeoff analysis and investment options. The executive summaries and the full version of each of the reports are available to the WFEC. CSSC developed a proposal and revised timeline for accepting the regional reports as well as completing the national risk analysis report (see second proposal on National Risk Analysis Report and Timelines).

Identify Considerations:

The CSSC considered several options including:

1. Release of the Reports in their current versions, incorporating only the CSSC editorial feedback and inaccurate references. **(CSSC Recommendation)**
2. Add content and incorporate more significant changes to address template components such as the regional trade-off analysis (*note: this would require additional regional analysis to derive the appropriate content*).
3. Develop and release an executive summary document, summarizing the recommendations from each region and refer to the full reports for more detailed information.

Rationale for Recommendation(s):

The Regional Risk Analysis Reports mark a step forward in completing Phase III. It is recognized however that some components initially intended to be part of the reports are not present (e.g. regional trade-off analysis). The CSSC believes that the Regional Risk Analysis Reports as collaboratively written and concurred with within the regions should be released in their current version and form. The priority in our next steps will be to complete the trade-off analysis at the national scale.

Timelines:

- CSSC submit Regional Risk Analysis Reports to WFEC November 2, 2013
- WFEC to define date when the regional reports can be released publically as final by the region. *Note: The current versions are draft until Regions receive WFEC concurrence.*



Proposal

- Regional Action Plans submitted to WFEC by February 15, 2013

Recommendation(s):

Recommend WFEC concur with the proposed timelines, the content of the Regional Risk Analysis Report, and release of the Reports in their current versions, which have incorporated the CSSC editorial feedback and any inaccurate references.

Decision Method used:

- Subcommittee Consensus
- Modified Consensus (explain, i.e. majority, super-majority)
- Chair Decision
- Not Applicable

Contact Information:

Dan Smith
CSSC Chair

Prepared by: Jenna Sloan, CSSC member



Proposal

WFEC Decision:

- WFEC Approves
- WFEC Approves with Modifications (not required to resubmit for WFEC approval)
- Need More Information (required to come back to WFEC for approval)
- WFEC Does Not Approve

Shari Eckhoff, DFO

Date

Notes regarding decision: