



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

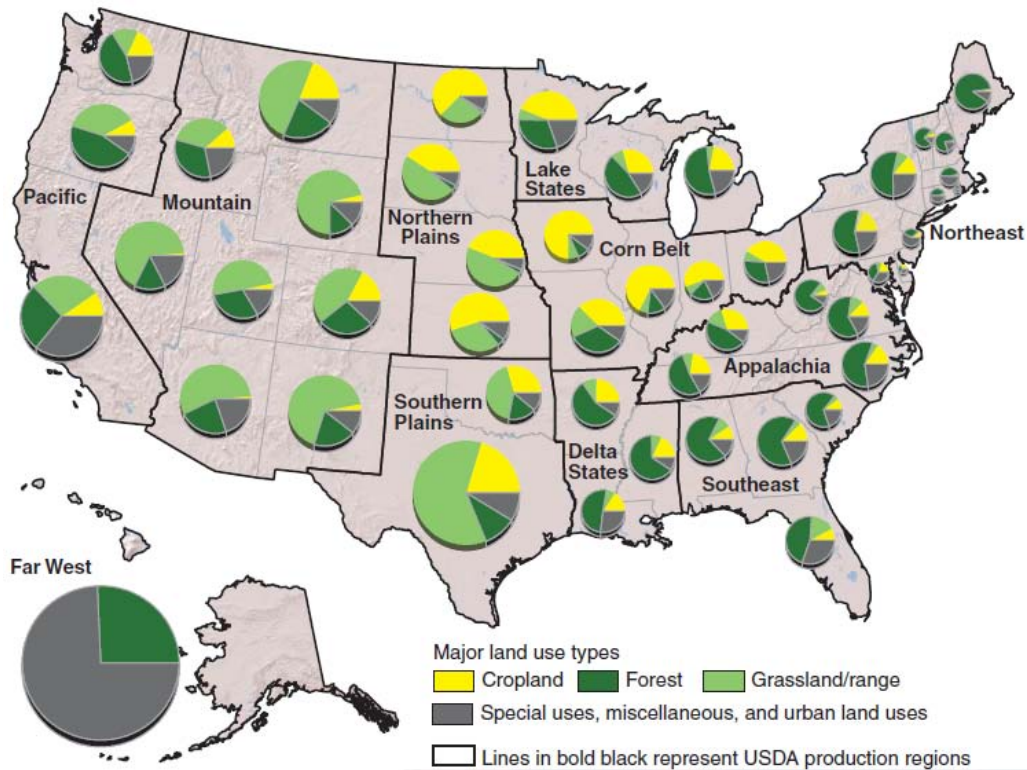


played important roles in shaping the ecosystems of the Northeast. Soil and climate are determining factors to the distribution of fire adapted ecosystems across the region.

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.

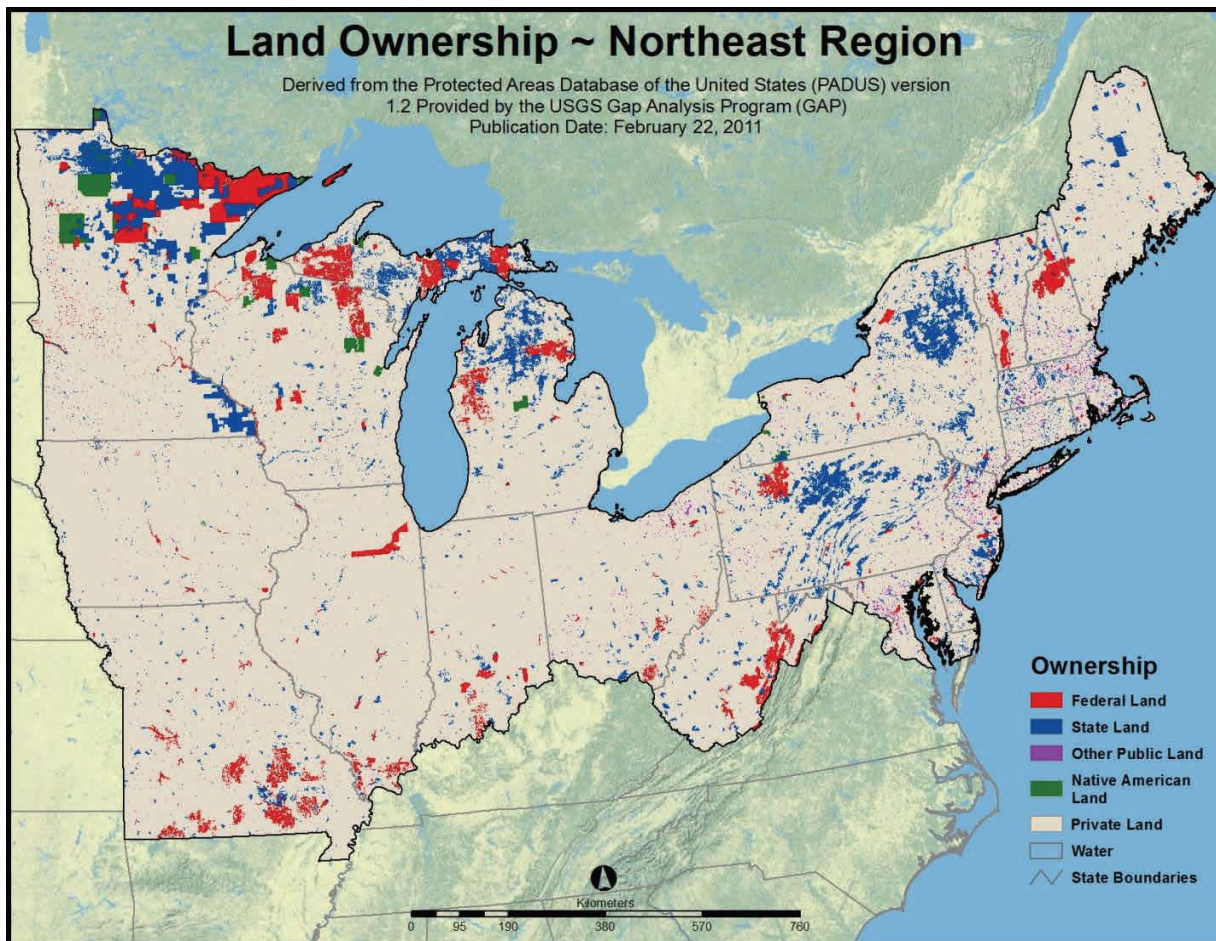
Land-use patterns have greatly affected ecosystems spatial distribution, connectedness and function. Ownership patterns, parcel size and varying management objectives makes ecosystem management in fire dependent landscapes challenging, and for some ecosystems nearly impossible. Census projections show 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

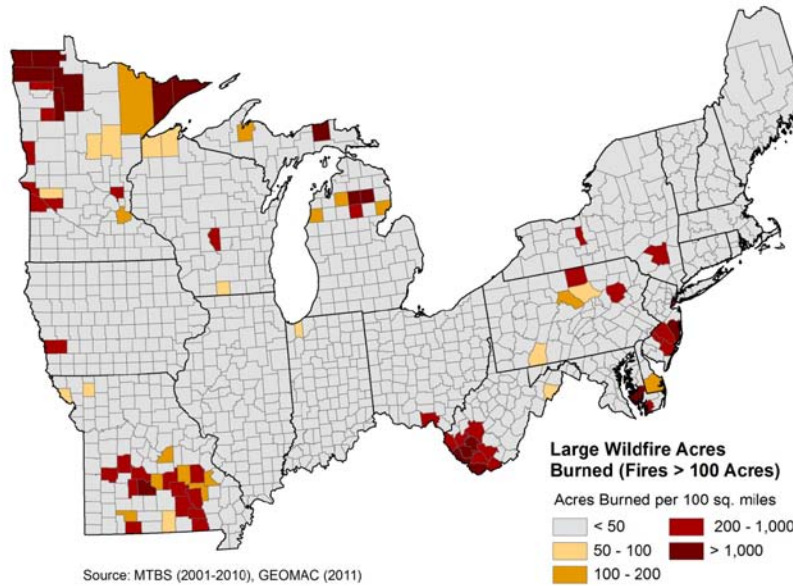
“Decades of study on climatic change and its direct and indirect effects on forest ecosystems provide important insights for forest science, management, and policy. A synthesis of recent research from the northeastern United States and eastern Canada shows that the climate of the region has become warmer 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.

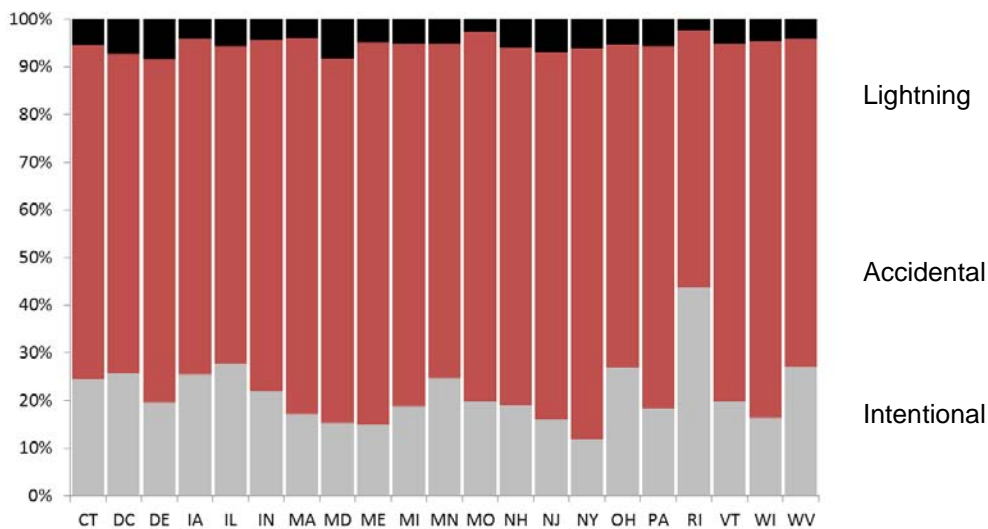
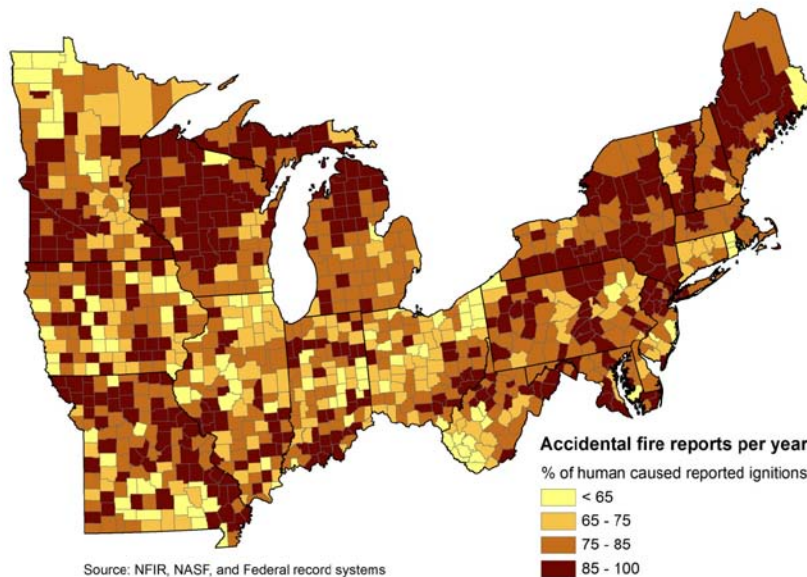


Figure a: Percent of reported lightning, accidental and intentional fires of known cause for states in the Northeast Region based on federal, state, and local data



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

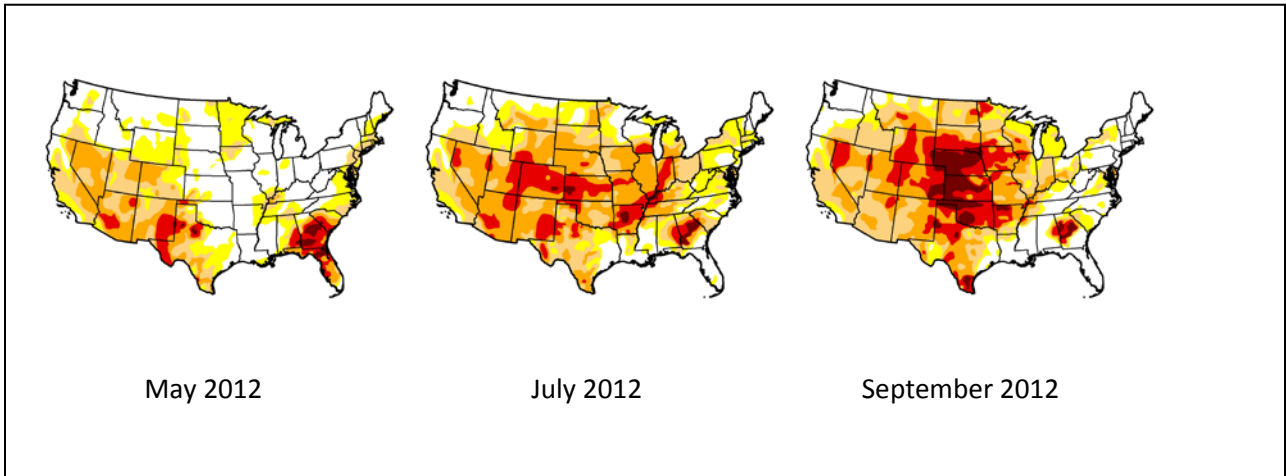


Figure b. **Drought Severity** - Drought Progression in summer of 2012 – dark red represents extreme drought conditions (Source - The U.S. Drought Monitor is produced in partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture,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

GREAT LAKES FOREST FIRE COMPACT
MINNESOTA • WISCONSIN • MICHIGAN • MANITOBA • ONTARIO
PREVENTION • TRAINING • OPERATIONS
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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

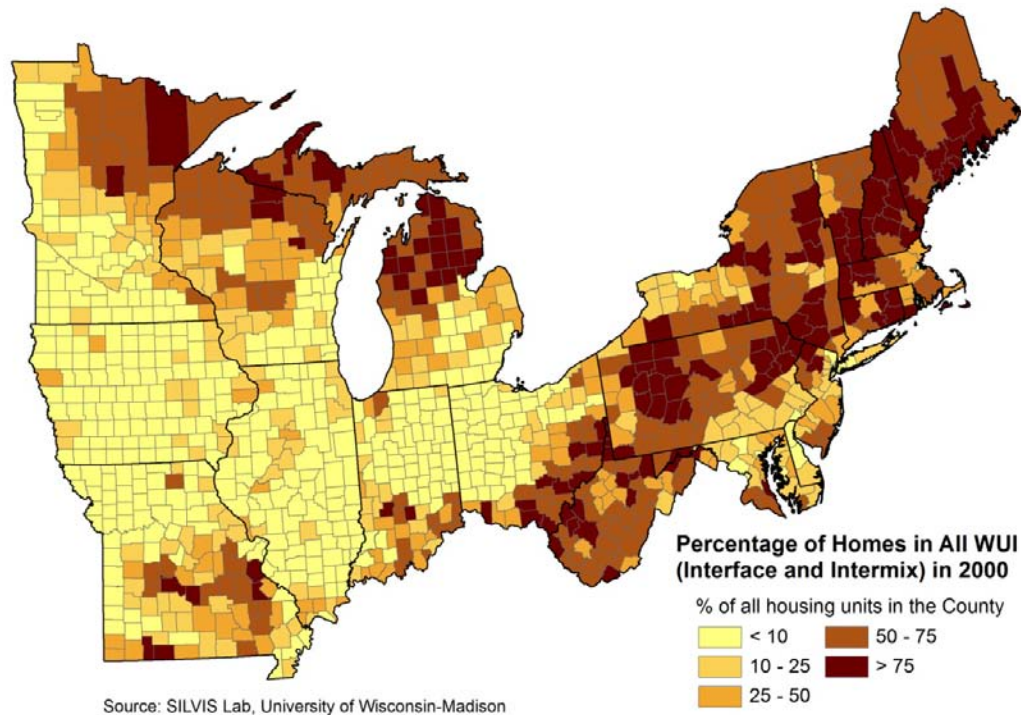
A suite of risks, barriers and critical success factors including expanding human populations, increased human-caused wildfire ignitions, and fuel accumulation (from wind, ice, insect, and disease events, as well as vegetation growth in the absence of fire) continue to create complex challenges for communities 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.

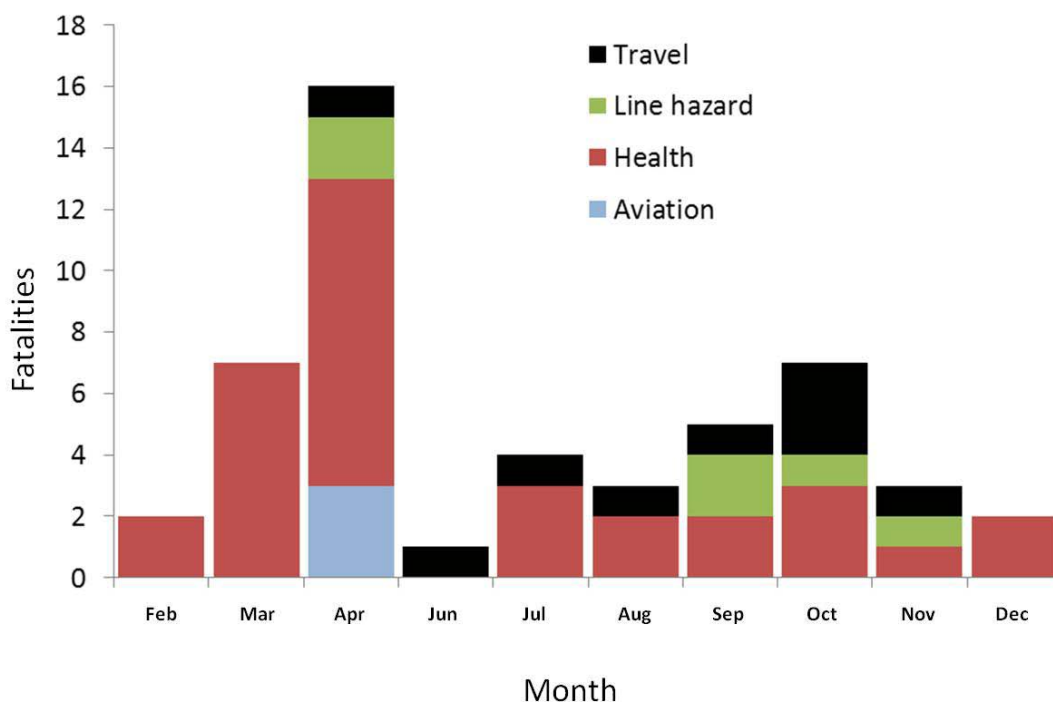


Figure e: Northeast monthly wildland firefighter fatalities by the activity or cause that led to death (1990-2012)

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.

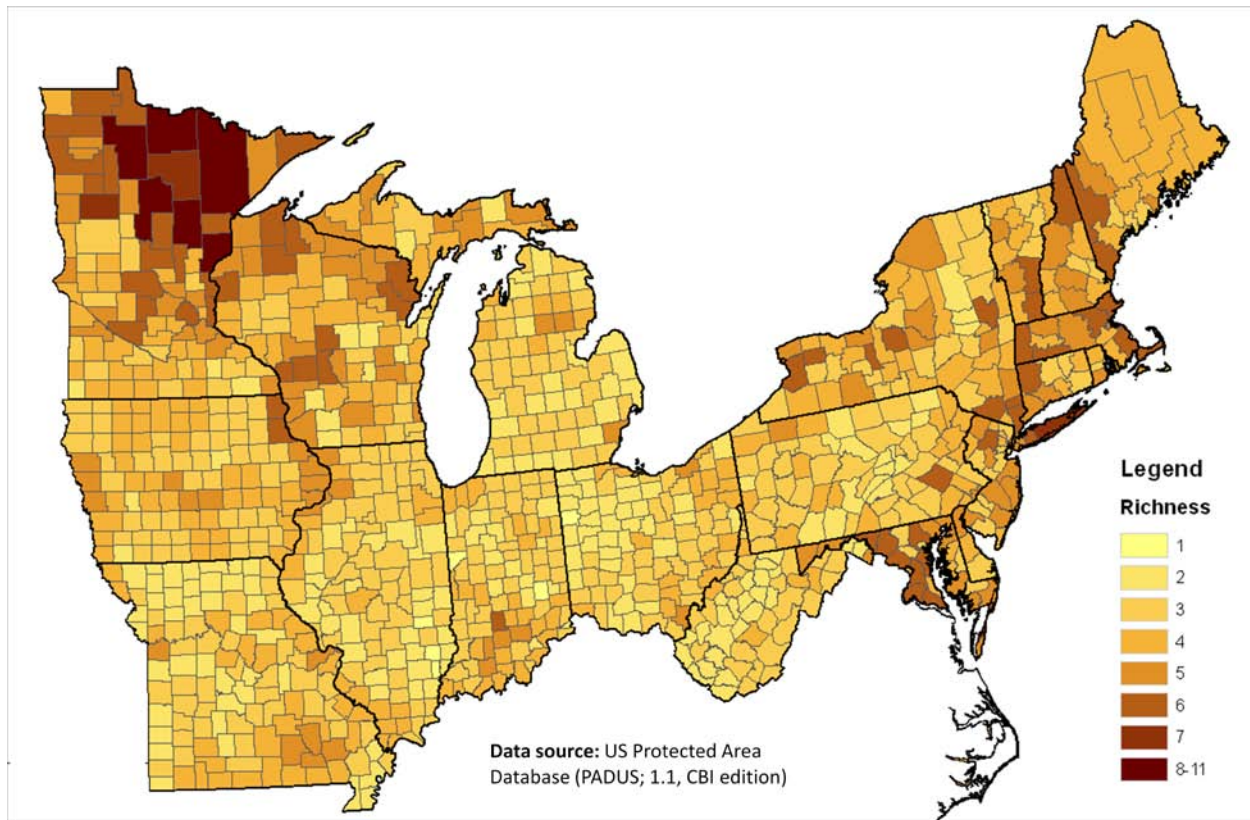
Shared Investment in the Firefighting Workforce

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).

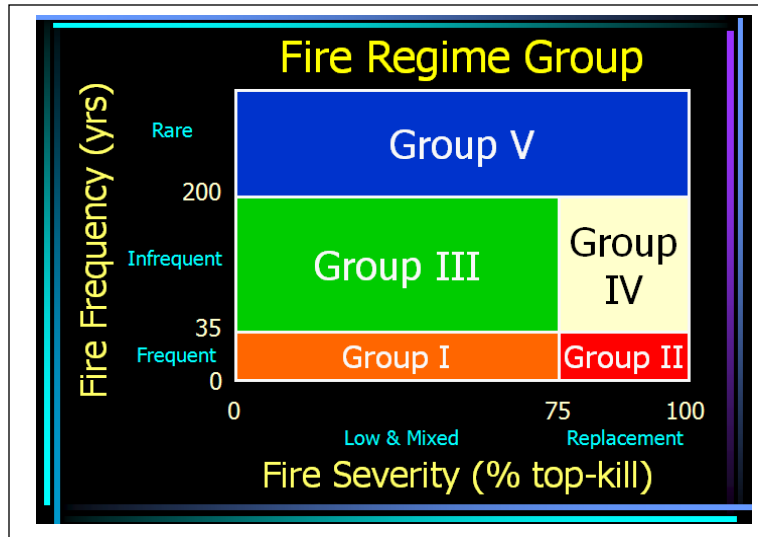


Figure a. Fire Regime Condition Classification Chart

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)

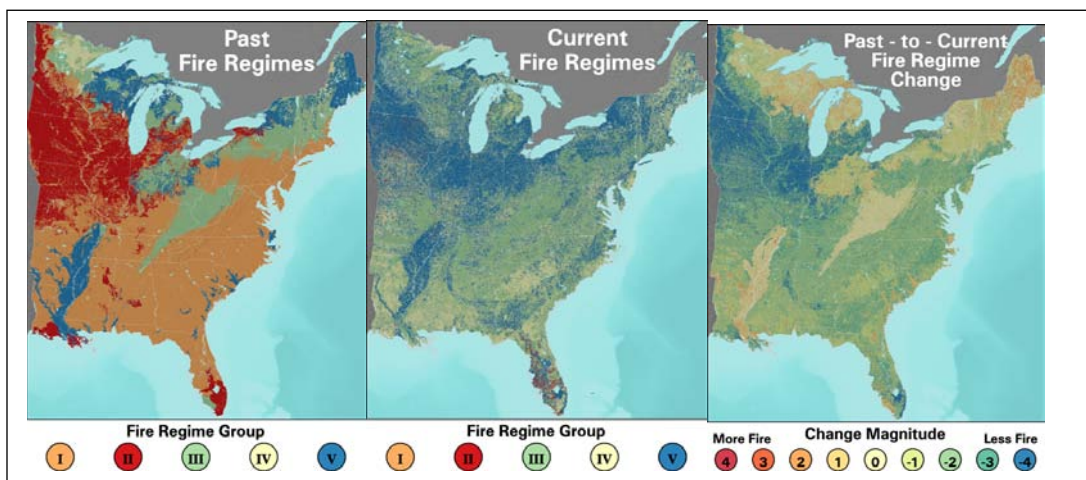


Figure b. Fire Regime Progression Changes in the Eastern US

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.

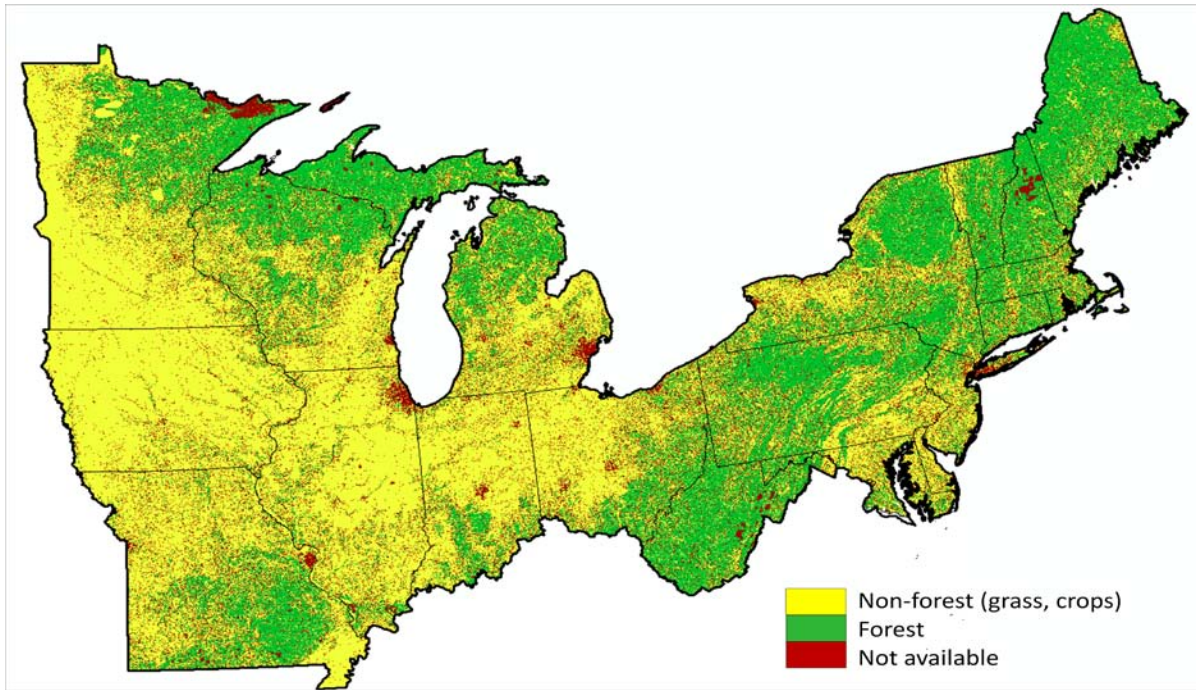
Although all areas are important and have values, the size of area presents varying benefits and challenges. Small land parcels can be more vulnerable to many influences such as invasion from non-native species, or more disturbances such as wildfires, and may take costly conservation measures to maintain. 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.

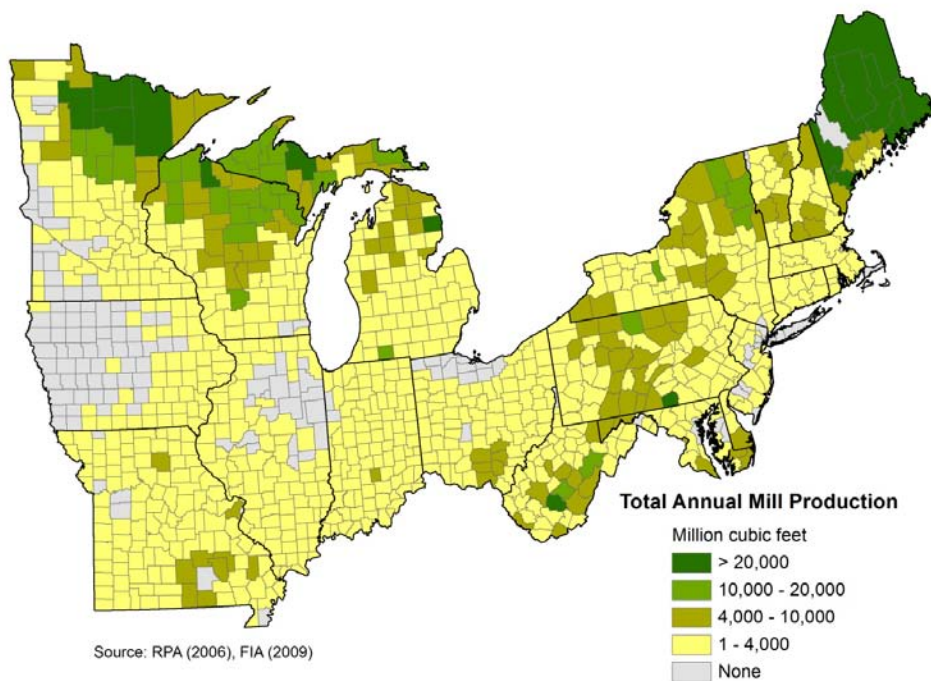
The Buckhorn Wildlife Area in central Wisconsin is managed to promote an oak-pine barrens native community on 934 acres of land by utilizing commercial timber harvests, firewood salvage, piling, and burning.. Due to the lower development and public use and the large fire-break provided by a lake, the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

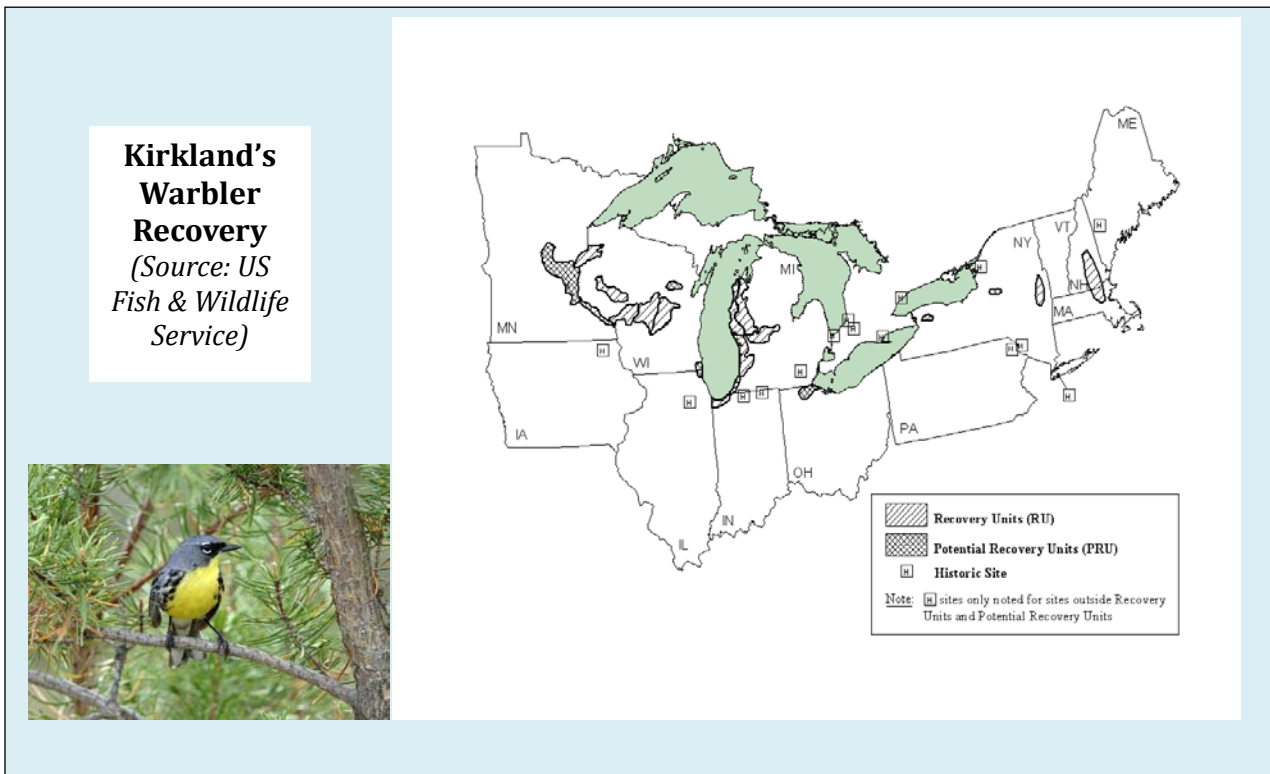


Figure c. Kirkland's Warbler nests on the ground in young dense thickets of jack pine



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).

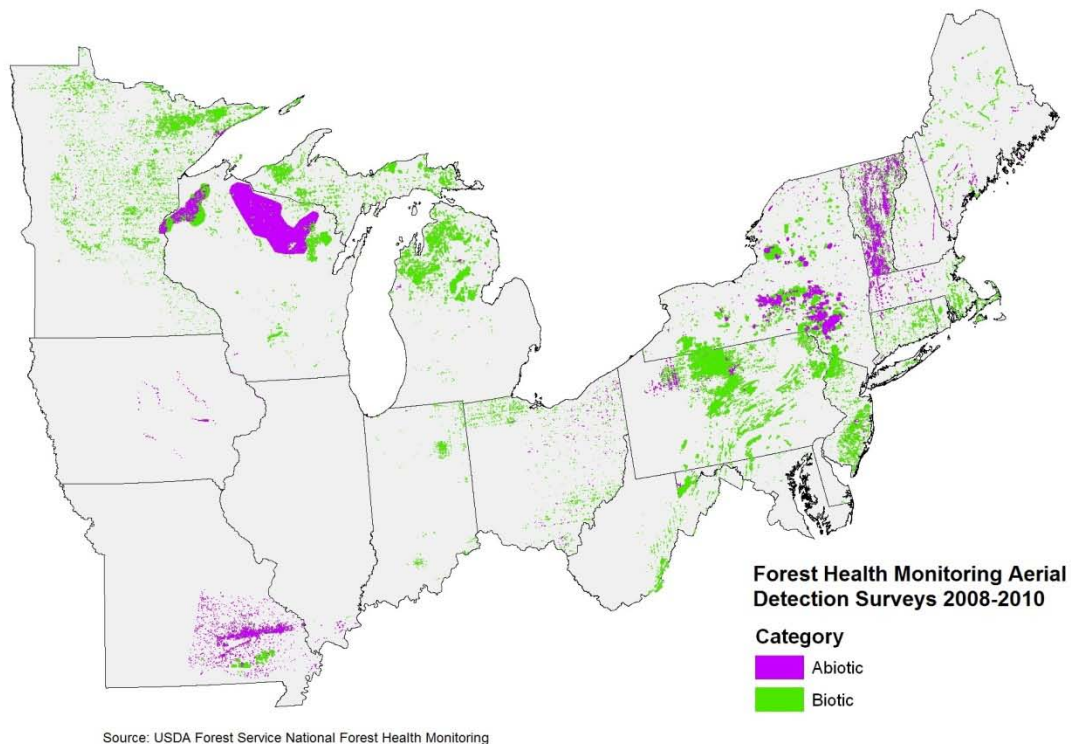


Figure a. Biotic and abiotic forest disturbances across the Northeast Cohesive Strategy Region for the years 2008, 2009, and 2010. Note that inconsistencies exist due to variation in mapping efforts.

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).

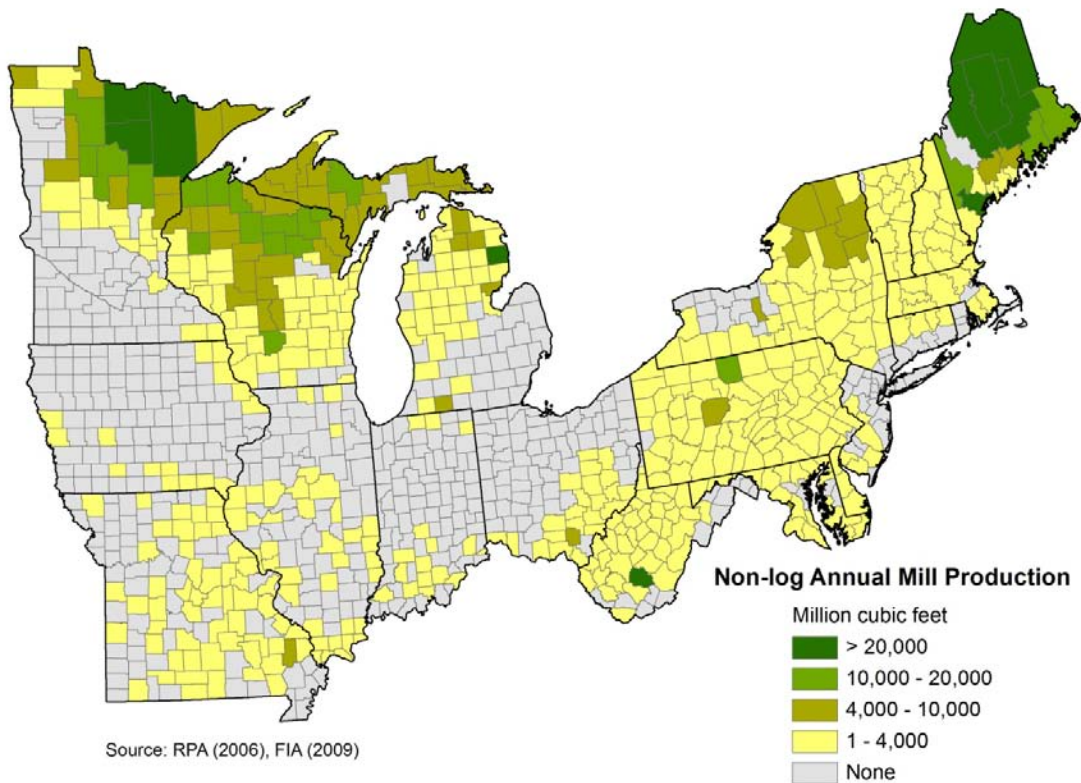


Figure c. Non-log mill production in the Northeast.

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.

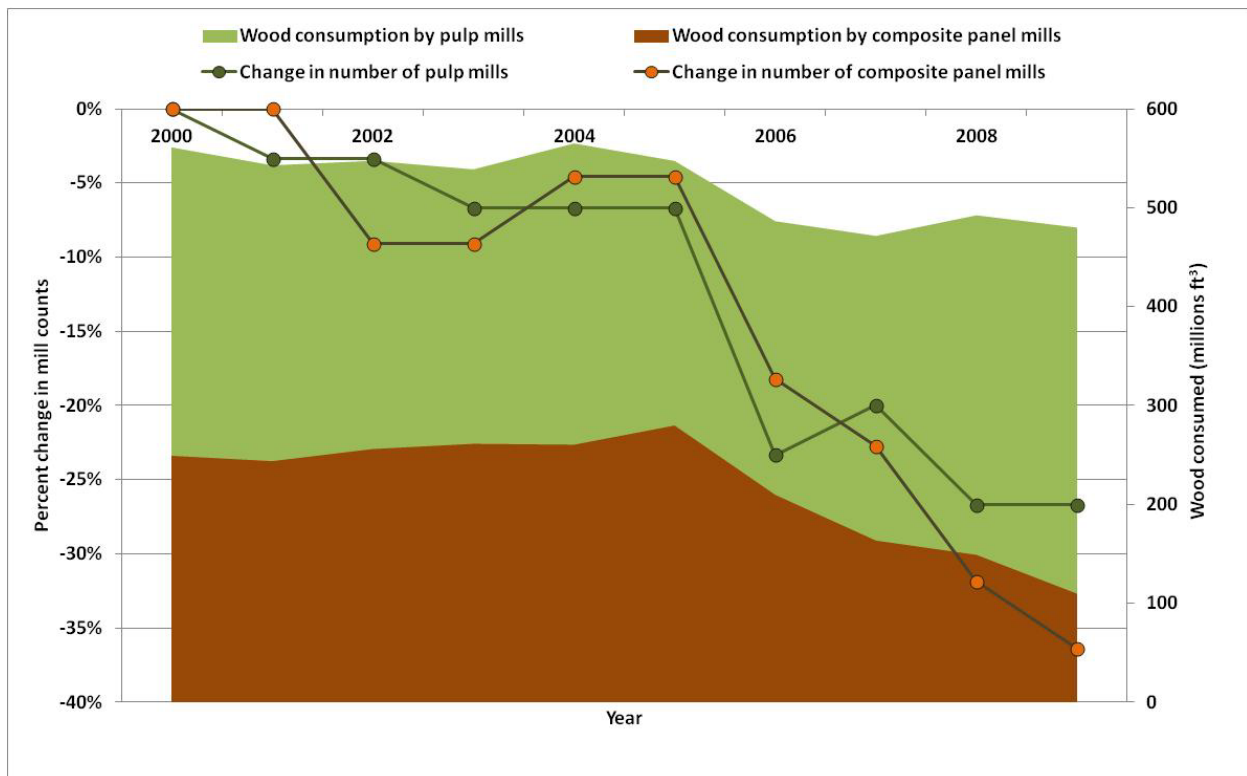


Figure d. Change (percent) in number of pulp and composite wood panel mills since 2000 and wood consumed by pulp and composite panel mills, 2000-2009, North Central states (IL, IN, IA, KS, MI, MN, MO, NE, ND, SD, WI) (Woodall et al. 2011).

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.

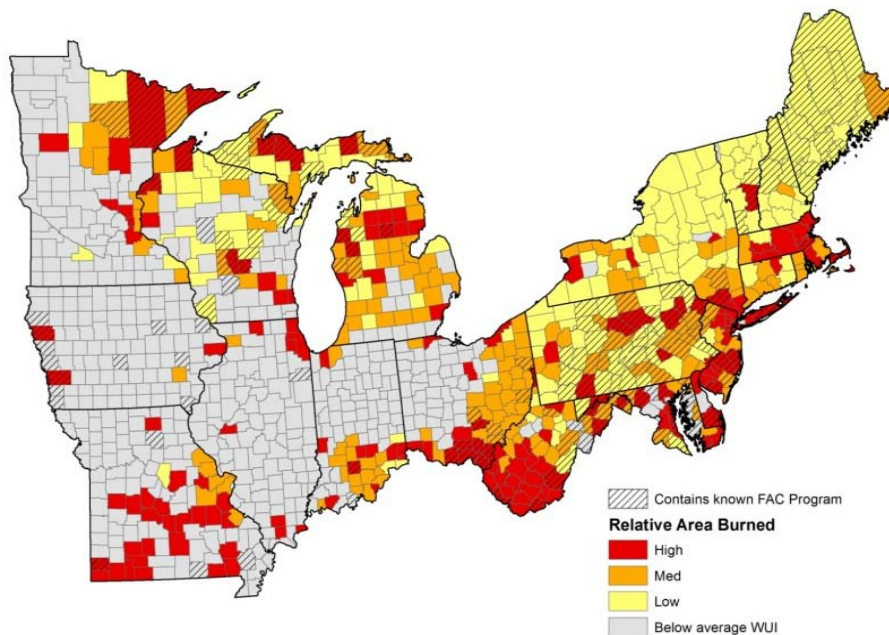


Option 2B - Focus on directing hazardous fuel treatments to the wildland-urban interfaces (WUI). Treatments of WUI lands should provide a broader area of effective protection and reduced risk.

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)



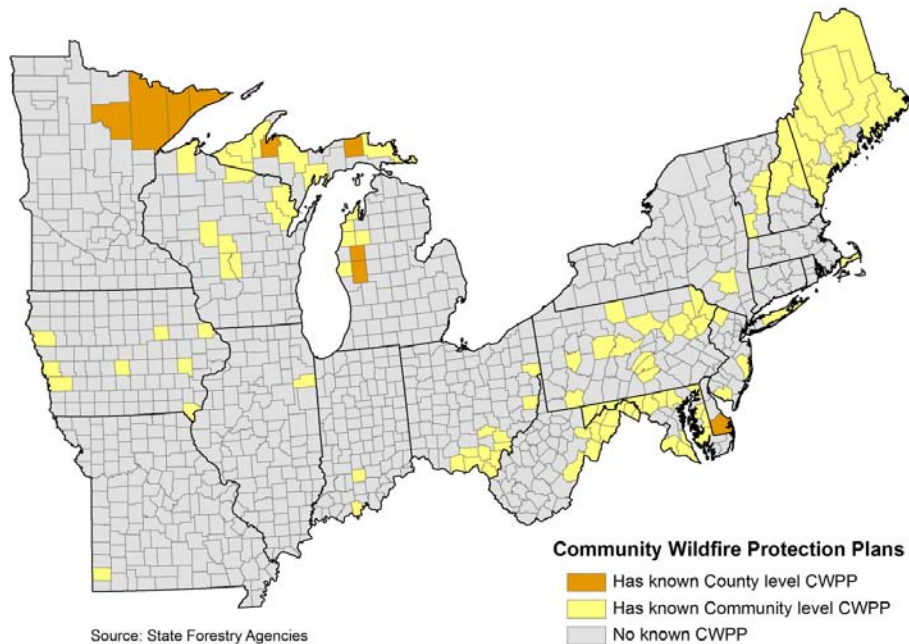
Figure a. Pine barrens vegetation woven in and among residential development in the village of Truro, on Cape Cod. (Fire Science Brief, Issue 13, September 2008)

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.

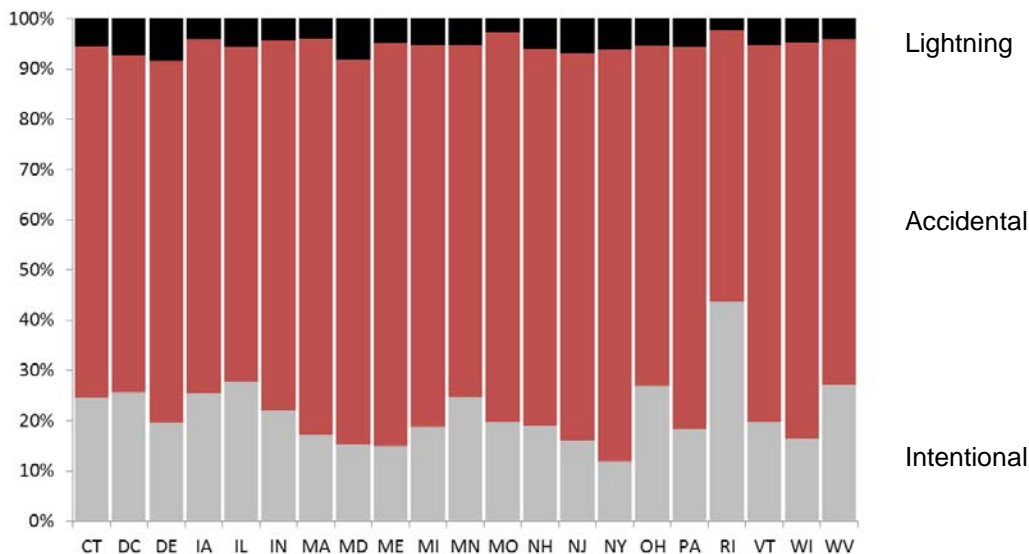
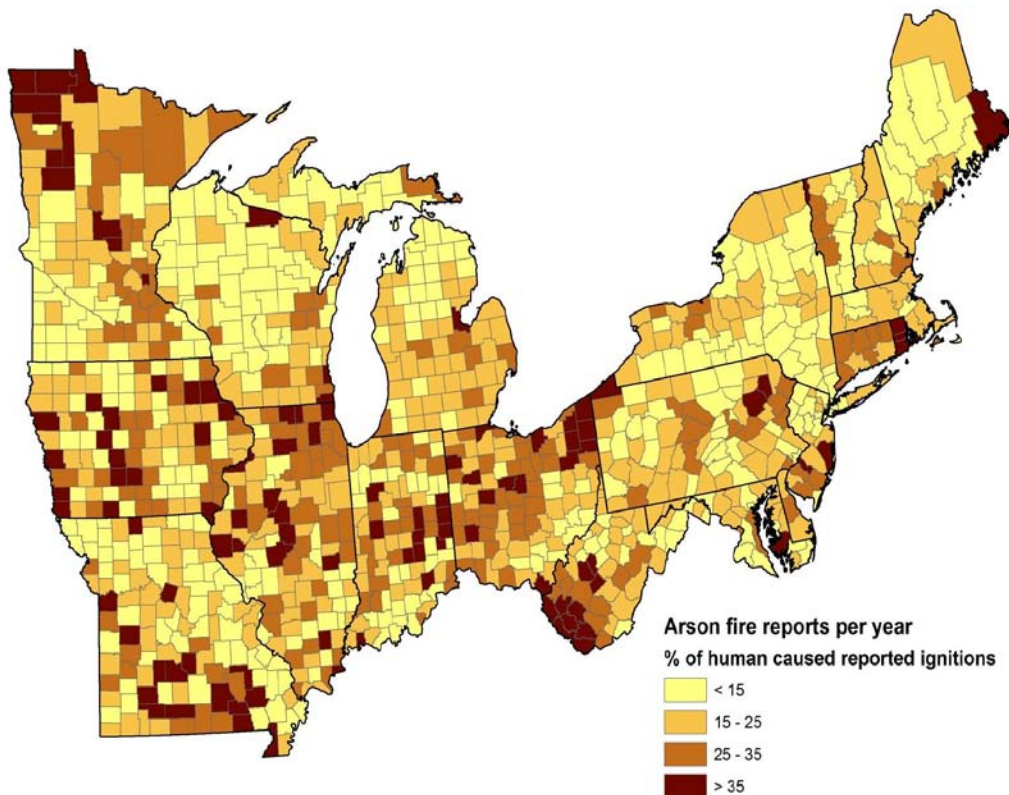


Figure a: Percent of reported lightning, accidental and intentional fires of known cause for states in the Northeast Region based on federal, state, and local data



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.

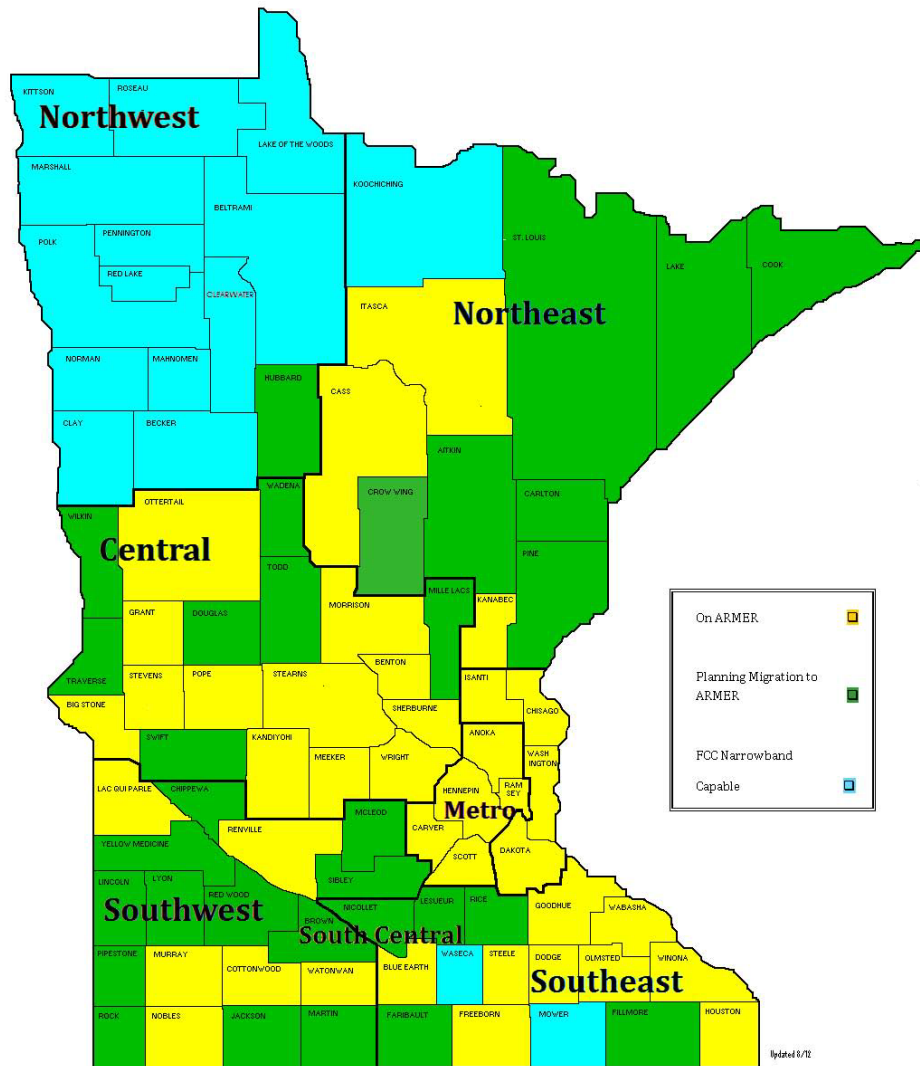
Risks/Barriers/Critical Success Factors #3 – Lack of radio compatibility and interoperability is a local issue occurring nationally. There is a need for radio compatibility between digital, analog, narrowband, 800 mgz, 700 mgz systems. Resolve and simplify frequency use authorization and licensing processes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

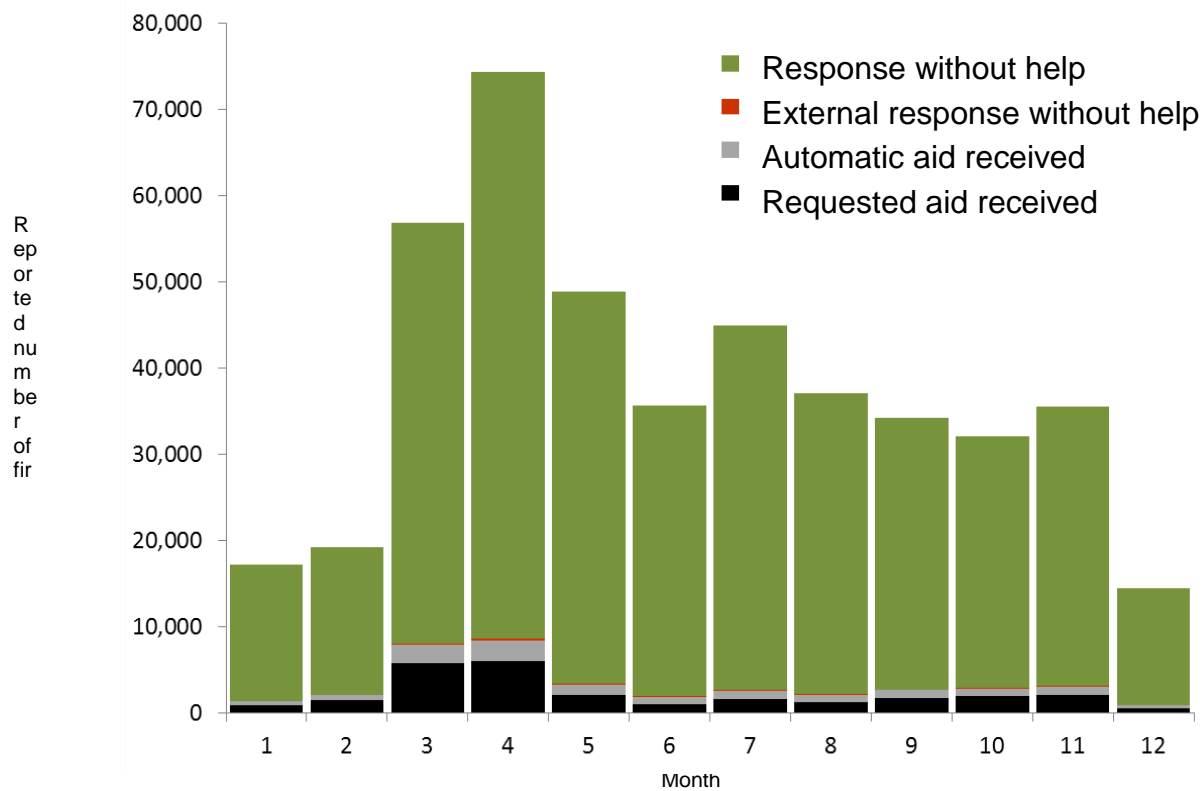


Figure a: *Reported fires in the Northeast region and type of response given or received for suppression-only activities (NFIRS dataset, 2006-2010). This data set shows not only the number and seasonality of fire responses in the region, but also the high number of ignitions that do not require mutual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

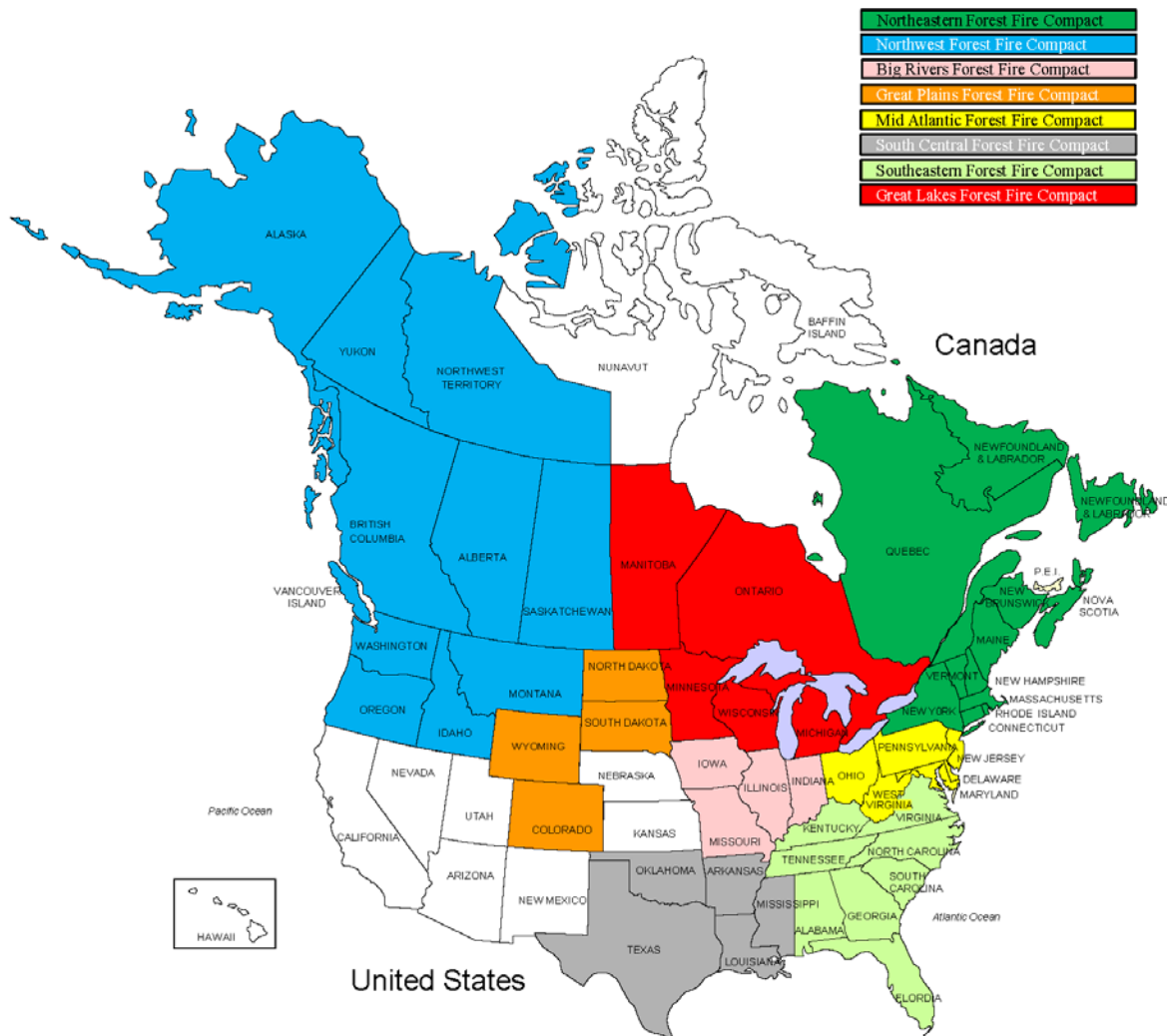


Option 3C - Further develop shared response capacity (extended attack; long duration fire potential). Areas addressed include:

- 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.



Appendix 5 – Stakeholder Outreach and Feedback

Northeast Region



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



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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

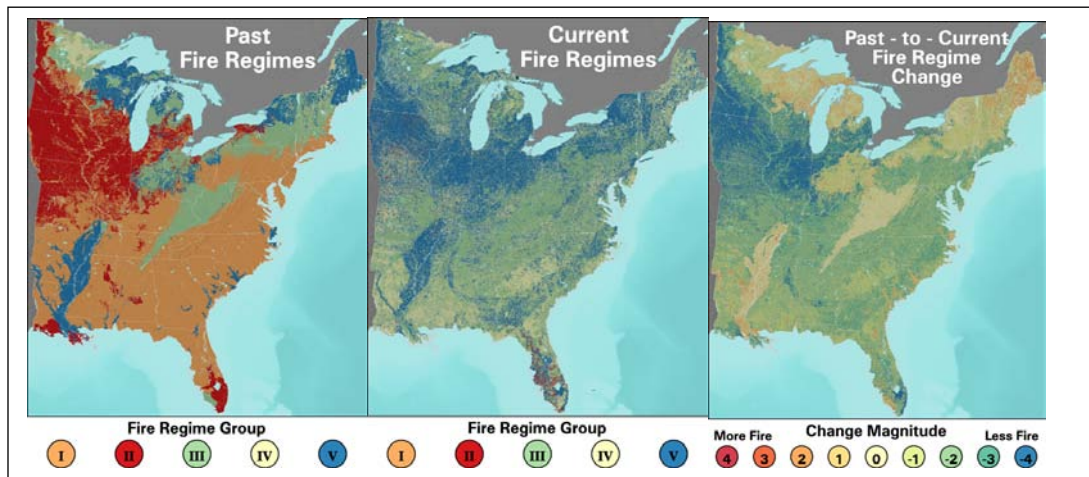
Firewise Communities, www.firewise.org



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.



T

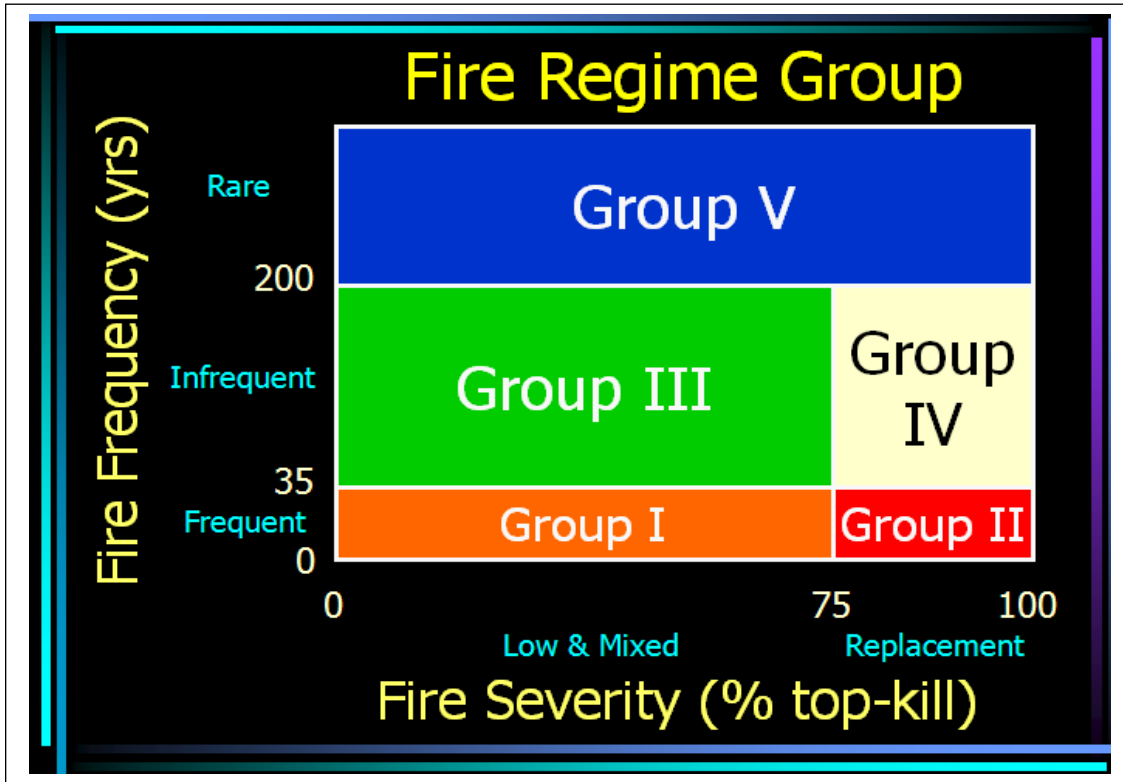
these five regimes include:

- 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.



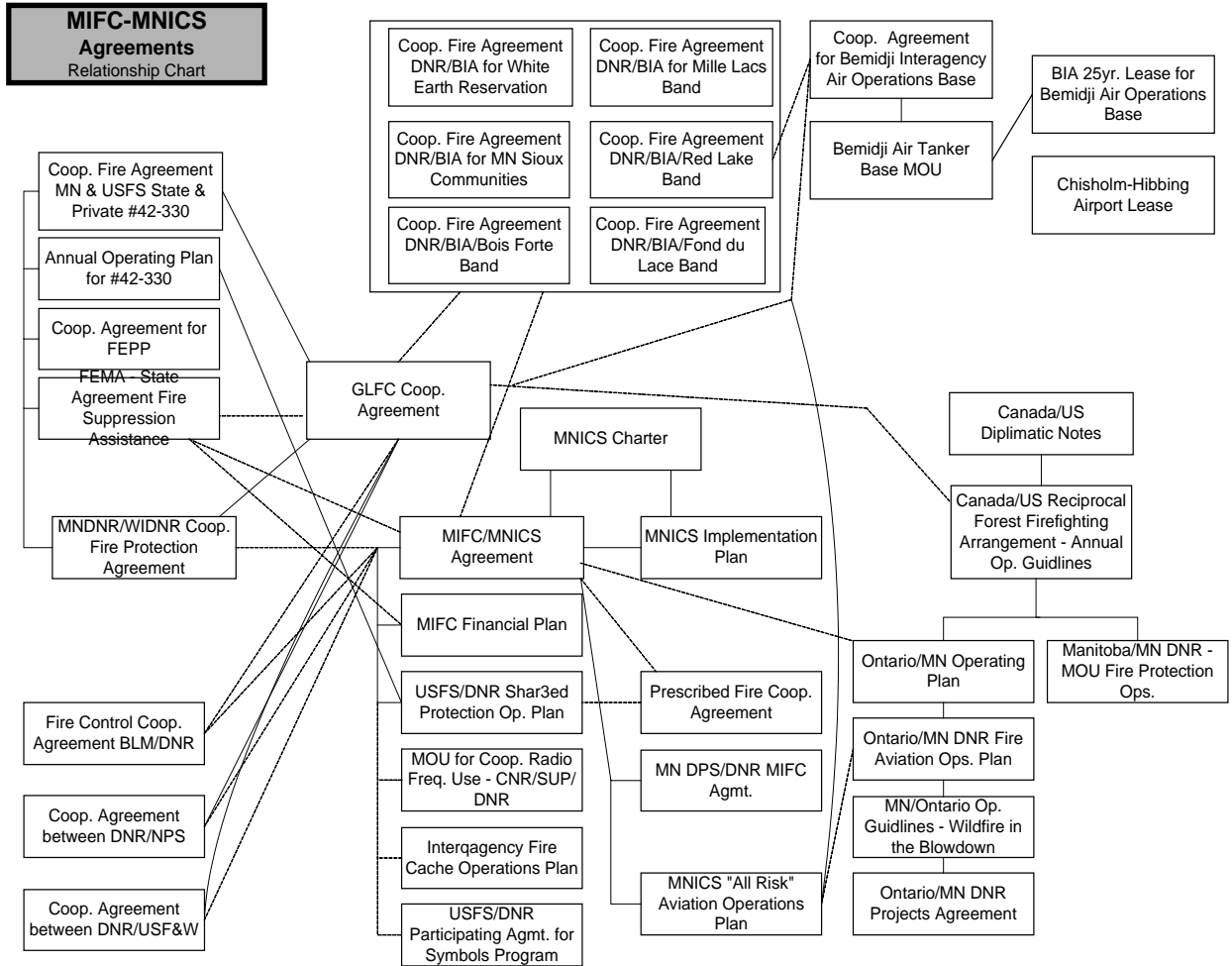
Fire Regime Condition Class (FRCC)

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 that 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

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NPS – Technical – secondary Strategic - Primary	Mark Musitano	mark_musitano@nps.gov	(215) 597-4865 office (215) 900-6050 cell
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International Association of Wildland Fire	Dan Baily	president@iawfonline.org	202.370.1800 x6275



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Terry Gallagher (alternate for Brooks)			
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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)	<ol style="list-style-type: none"> 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.