A National Cohesive Wildland Fire Strategy: Northeast Regional Assessment

September 30, 2011

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Executive Summary

The Northeast Regional Strategy Committee (NE RSC) supports three main recommendations that emerged from a collaborative effort to identify, define, and address wildland fire management problems and opportunities in the Northeast Region of the United States: 1) invest in successful partnerships and collaboration; 2) invest in local resources for wildland fire response and 3) invest in joint management planning and implementation that achieves strategic objectives and reduces the effects of fragmentation of fire dependent landscapes.

Collaboration and shared responsibilities are critical for increasing and maintaining landscape resilience, supporting fire adapted human communities, and safely and effectively responding to wildfire in the Northeast Region. Addressing wildfire problems in the region is a multi-jurisdictional effort and there are often policies governing adjacent landscapes that inhibit consistent wildland fire management across the region. Increasing partnerships and increasing opportunities to collaborate among organizations is critical to maximizing opportunities for successful wildland fire management.

Local resources, whether from fire departments or state agencies are largely responsible for initial attack on wildfires in the Northeast. Wildfires tend to be small, however some wildfires can become very large and require incident management teams and resources from outside the region, as has occurred in the Boundary Waters Canoe Area Wilderness over the last decade. Wildfires tend to occur concurrently, and are often contained within a day. Dependence on local interagency resources and incident management leadership works well throughout the region. The model of a largely federal response to wildland fire with nationally available resources is not effective in the Northeast. The Eastern Area Coordinating Group supports an Interagency Type 2 Incident Management Team (IMT) and there are locally supported Type 2 and 3 IMTs in some states. Increased support for local fire departments and state fire agencies is critical to the success of a cohesive wildland fire management strategy.

Wildland fire management in the Northeast is a multi-jurisdictional effort that is complicated by a patchwork of management plans, policies, and ownerships. Historically, fire has performed an important role in shaping landscape structure, composition, and function that contributed to resilient landscapes, but today there are a broad range of potentially unwanted ecosystem responses to wildfire that must be avoided. Modern day wildland fire management will include both the quick suppression of unwanted wildfire and the thoughtful application of prescribed fire where appropriate. Physical fragmentation or discontinuity of ecosystems is more difficult to solve than the apparent fragmentation caused by landowner objectives for their property. In fire dependent landscapes, apparent fragmentation will be addressed through education, land management advice, and through the development of landscape collaborations for restoration.

In this phase of the National Cohesive Wildland Fire Management Strategy the committee developed a hierarchy of objectives and actions to meet the three national goals based on the values, risks and uncertainties shared by stakeholders involved in wildland fire in the Northeast Region. The hierarchy is ranked within each goal from major objective to discrete action, not from high to low importance. We also proposed regional performance measures to ensure that this Strategy remains on a trajectory of meeting the national goals. However, we did not specifically address; "Develop regional strategies, which include the identification of barriers to the efficiency and effectiveness of the activities, used to inform a national trade-off analysis and identify the most effective allocation of funds" from Phase I. Instead, we developed "areas to explore for reducing risk" that would give the National Science and Analysis Team license to explore how bold shifts in investments would alter risk, achieve objectives, and reduce costs. These alternative investment scenarios are suggested as areas deemed important in the Northeast Region for further analysis to determine the impact they would have on reducing risk. In Phase III, NE RSC will work with the National Science and Analysis Team to develop "alternatives" that would be used in a national trade-off analysis.

Background

The National Cohesive Wildland Fire Management Strategy is an effort on behalf of Federal, state, local and Tribal governments and non-governmental organizations (NGOs) to collaboratively address growing wildfire problems in the U.S.

The Cohesive Strategy takes a national, collaborative approach to addressing wildland fire across all lands and jurisdictions. The Cohesive Strategy is being developed with input from wildland fire organizations, land managers and policy-making officials representing all levels of governmental and non-governmental organizations. All stakeholders involved with wildland fire management have come together to develop a truly shared, national strategy. This holistic approach to wildland fire management will encourage further dialogue between local communities and national policymakers.

The strategy will provide clear guidance on roles and responsibilities for all wildland fire protection entities. It also emphasizes how effective partnerships, with shared responsibility among stakeholders in the wildland fire community, will help maintain and restore fire resilient landscapes, promote fire-adapted communities, and improve fire response.

The Cohesive Strategy is defined by three phases, allowing stakeholders to both systematically and thoroughly develop a dynamic approach to planning for, responding to, and recovering from a wildland fire incident.

The three phases include:

1. Phase I: National Cohesive Wildland Fire Management Strategy (completed)
2. Phase II: Development of Regional Strategies and Assessments (in progress)
3. Phase III: National Trade-Off Analysis and Execution (future)

The Cohesive Strategy will address the nation's wildfire problems by focusing on three key areas and goals with actions and outcomes:

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

2. Fire Adapted Communities – Human populations and infrastructure can 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.

3. Response to Fire – All jurisdiction's participate in making and implementing safe, effective, efficient risk-based wildland fire management decisions.

The entire Cohesive Strategy effort builds on the successes of the National Fire Plan and other foundational documents, including the 10-Year Comprehensive Strategy and Implementation Plan, Quadrennial Fire Review 2009, A Call to Action, Wildland Fire Protection and Response in the United States, the Responsibilities, Authorities and Roles of Federal, State, Local and Tribal Government (Missions Report), and Mutual Expectations for Preparedness and Suppression in the Interface. Many of these documents can be accessed at:

http://www.forestsandrangelands.gov/strategy/national.shtml

A core principle of the Cohesive Strategy is to rely on local and regional knowledge and insights throughout each phase and process. Therefore, local and regional assessments, plans, policies, knowledge and insights are basic building blocks for completing Phase II: Regional Strategies and Assessments.

This document, completed regionally in the Northeastern United States, articulates context, values, goals, objectives, actions and performance measures in the region. The Northeast Regional Strategy Committee (NE RSC) and Northeast Working Group (WG) more specifically adopted several roles and responsibilities to guide the development of the assessment. The Northeast Regional Strategy Committee (NE RSC) will:

- Engage with otherwise difficult to reach constituents, stakeholders, and groups (for example, insurance industry).
- Provide information for locally driven changes in policy, procedure and/or practice (for example, county zoning)
- Identify the context and attributes that make the Northeast unique. Integrate this information with conceptual models used in Phase III to illustrate relationships and conduct analysis that will account for this regional uniqueness.
- Empower local organizations to engage in wildland fire management issues and develop local solutions with an emphasis on high-risk counties ensuring community resilience.
- Evaluate and identify alternative methods meeting goals and getting results to ensure efficiency. Acknowledge the uniqueness of suppression capacity and response in the Northeast, which needs to be designed collectively.
- Identify high priority goals and objectives and serve as a conduit for elevating these issues and proposing solutions.
- Interact and conduct outreach with various governance and fire community groups, as well as provide influence to decisions made at the different governance levels (e.g. Wildland Fire Leadership Council (WFLC), Wildland Fire Executive Council (WFEC), Geographic Area Coordination Center (GACC), National Wildfire Coordinating Group (NWCG), State compacts, local government organizations, and fire departments).

Introduction

This document was developed as part of the National Cohesive Wildland Fire Management Strategy. It is Phase II of a three phase process that provides a comprehensive analysis of regional objectives and assessments. Phase III is a quantitative trade-off analysis based on the products of Phase II.. The National Strategy has vested in the use of certain modeling tools that will be used at the regional level.

Phase II was initially identified as "Development of Regional Strategies and Assessments." The Northeast Regional Strategy Committee (NE RSC) has developed this report with the understanding that it will serve primarily to set the foundation for "trade-off analyses" that will inform the development of implementable alternatives for wildland fire management during Phase III of the Cohesive Strategy.

This report does not present alternatives that can be implemented but provides some options that can identify potential investments and how these investments will move the Northeast Region towards the goals of the National Cohesive Strategy. From this analysis, we will be able to combine the most beneficial components into implementable alternatives for the interagency community to advance.

The NE RSC agreed to some underlying principles that are thread throughout this document. Primary amongst them are:

- No single member of this interagency group can redeem their responsibilities without the help of the others.
- Our future is as strong as our collaboration.
- We can leverage our authorities to address barriers to our collective interests.

The regional approach to wildfire management is to "hit fires small." The majority of our fires are small but they can be very intense. Local partnerships and a focus on initial attack have served communities well from a protection standpoint. That approach, however, has resulted in modified vegetation types that have affected the natural environment throughout the region. The region greatly values its connection to the natural environment as part of its quality of life.

This region is characterized by broad scale, multi-partner collaborations around quality of life issues such as air pollution drift from the west, response to natural disasters such as Hurricane Irene, and socio-economic infrastructure sharing between states.

Context

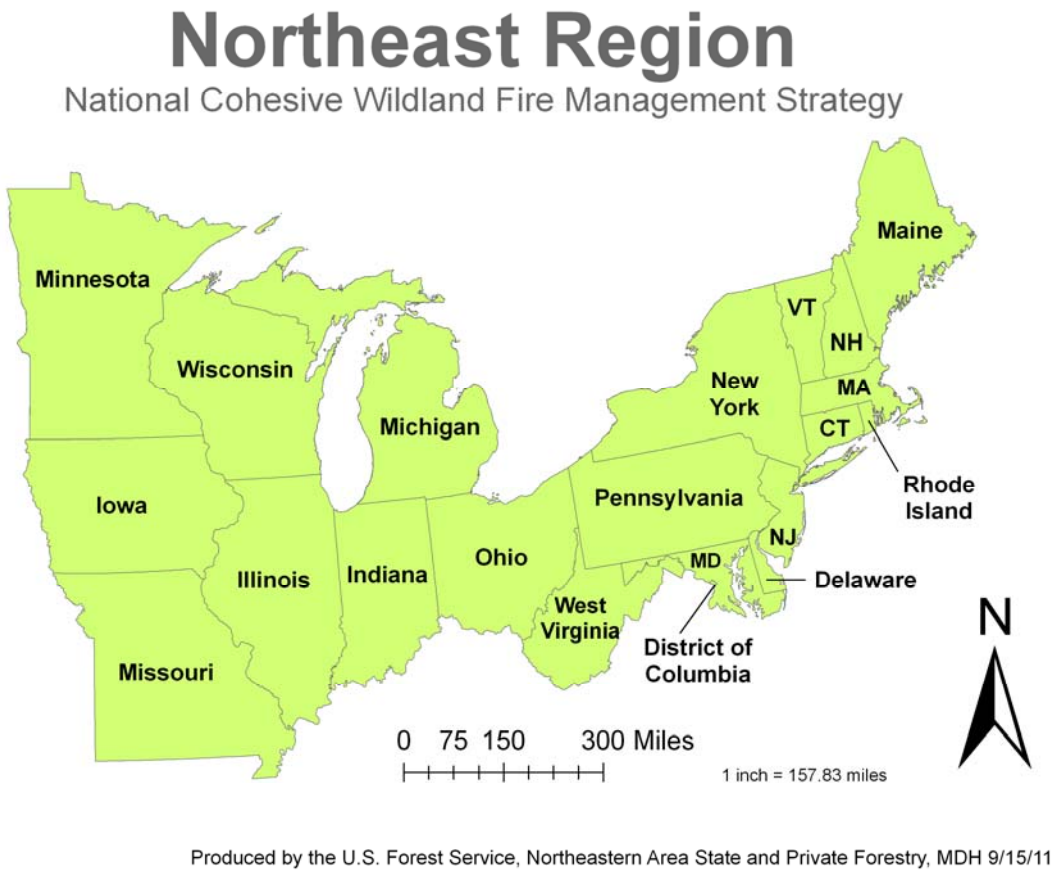


Figure 1 Northeast Region

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. 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. Suppression options, cost share, and policy differences are a few examples of what is considered on each initial attack. 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 Type 2 IMT. Each area of the region defines their respective protocols based on past successes. The fire community in the region could benefit from the development of a "lessons learned" program where both successes and failures are shared for the benefit of all fire managers in the Region.

The Northeast Region encompasses 20 Midwestern and Northeastern states and the District of Columbia (Figure 1). The 20 states comprise the most densely populated region of the nation,

home to more than 41 percent of Americans. Land ownership and management, natural and weather/climate event created fuel loading (surface fuels loading), high wildfire occurrence, and extensive wildland urban interface (WUI) distinguish the Northeast Region from the west, yet the northeast has similarities to the southeast.

Lands are owned and held in stewardship by a diversity of individuals, tribes, industry, organizations, and local, state and federal agencies. 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. Environmental justice needs to be considered at all levels of wildland fire management from strategic planning to wildfire response.

Image 1 House in Wildland Urban Interface, as typically seen in Great Lake States

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 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.

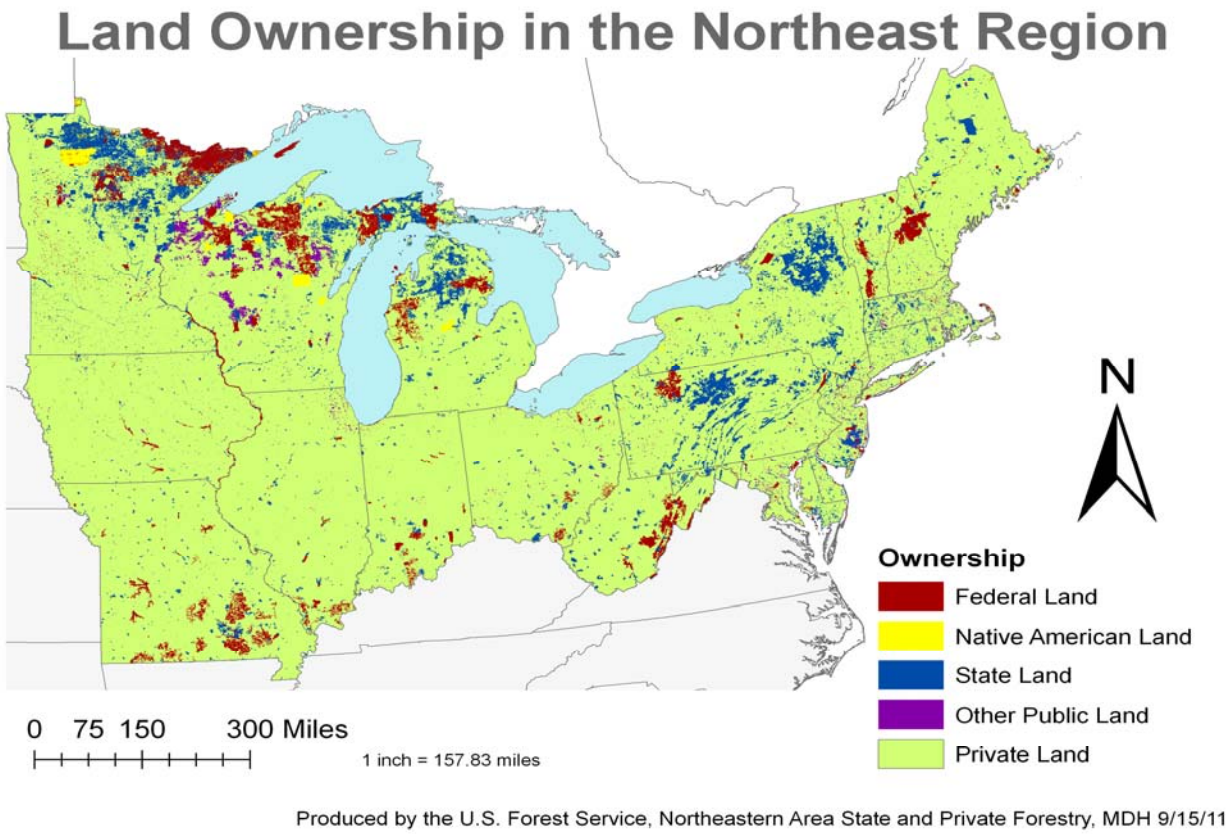


Figure 2 Land Ownership in Northeast Region

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 (Figure 2). 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, and ecosystem services.

Fires occur throughout the year but are concentrated during the spring and fall, and over the summer months on dry soils. 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. Large wildfires can be fast moving and are often contained within a single burning period (one day). Although not all fires are reported, available data shows nearly 184,208 fires burning approximately 611,210 acres during the 10- year period 2000-2009. Most wildfires are human caused. Accidental fires and arson are the primary causes of fires in the Region.

Wildfire response is swift and aggressive with a reliance on equipment and aircraft. Thousands of miles of roads provide vehicle access for emergency response: aircraft are used in those areas where access is limited. 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.

Image 2 2007 Sleeper Fire, Luce County, Michigan. over 18,185 acres burned

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 several states. In 2010 drought conditions developed over many months across the states of Missouri, Illinois, Indiana, and Ohio, creating wildfire risk throughout the fall and winter in some areas which didn't receive wetting rains. Drought ensued over approximately seven years across northern Wisconsin and upper Michigan, which resulted in shallow lakes drying up. Signs of prolonged drought conditions can be masked by seasonal precipitation and green vegetation.

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 an important role in shaping the ecosystems of the Northeast. Soil and climate are determining factors to the distribution of fire adapted ecosystems across the region. Restoration objectives and hazard mitigation objectives can often be achieved through integrated planning. 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.

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.

Shared responsibility between the public and local, state, and federal governments for wildfire protection is a key to success. Land/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.

Image 3 Sprinkler system at private residence in Minnesota

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. 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. 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. Alignment of wildland fire management priorities poses challenges within states as well as across broader agency and organizational jurisdictions.

The many and various scales of wildland fire management occur within and across the States, all with a dependence on local fire departments and other local resources. More than 13,554 local fire departments provide wildland fire protection support on public and private lands in the region (USDA Forest Service, Fire and Aviation Managment). 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.

Image 4 Blowdown prescribed fire, Minnesota

The Northeast can be described in risk management terms as low occurrence but high risk. With longer intervals between large wildfire events, investments in preparedness, at least across some parts of the region, is challenged and questioned, because wildfire management is expensive. Wildfire preparedness at the local fire department level can be overshadowed because of the responsibility for all hazard and medical emergency response.

State forest fire programs 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. 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.

Planning Process

The Northeast Regional Strategy Committee (NE RSC) held two virtual meetings in 2011, on April 18th and 26th, to orient the members to the Cohesive Strategy and the regional tasks. An overview of Phase II process, outcomes and timeframes was provided along with preparation for the NE RSC meeting in May.

The NE RSC convened its first general meeting May 9th-10th, 2011 in St. Paul, Minnesota. The purpose was to discuss the development of the Northeast (NE) Assessment and Strategy and determine the process the NE RSC would follow to deliver the final report by September 30th, 2011.

The NE Working Group Workshop was conducted June 27th-29th, 2011 in Baltimore, Maryland. The purpose of this workshop was to evaluate foundational materials and to develop an initial draft of the Northeast Region's Assessment of regional values, goals, objectives, and actions/activities.

A draft Cohesive Wildland Fire Management Strategy – Northeast Region report was prepared by July 21st, 2011. Formal outreach began on July 22nd and concluded on August 19th, 2011. Members of the NE RSC and the Working Group employed four approaches to collect input and build relationships during the outreach effort:

- direct interpersonal interaction with individuals and organizations, by phone and email,
- a series of virtual discussion forums,
- posting the Draft Regional Assessment and soliciting written comments,
- maintaining a website for distributing information and collecting comments on the draft Regional Assessment.

More than 600 contacts were made by members through email and fax to invite participants to the virtual forums and to comment on the draft report. Presentations about the Northeast Region Assessment and Strategy at meetings or on conference calls reached approximately 500 individuals. In addition, notices of the availability of the report and the opportunity to participate in the virtual forums or comment online were posted on several websites available to the stakeholders throughout the region.

Four virtual forums were held in the region and were facilitated by Management and Engineering Technologies International, Incorporated (METI). The METI Outreach and Content Analysis Team provided content analysis of the comments received during the virtual forums, the web based comment form, written comments and comments on the draft Northeast Assessment and Strategy. In all, 48 people participated in the virtual forums, ten responded to the website questionnaire and six persons/organizations submitted detailed comments on the draft report. This outreach effort is thoroughly summarized in a report: Phase II Outreach and Content Analysis prepared by METI (Appendix 6).

On September 7th-9th, 2011, the NE RSC convened a second general meeting in Milwaukee, Wisconsin. At the work meeting, the NE RSC reviewed the comment analysis from the outreach on the draft report; refined the objectives and strategies; and attempted to develop a list of alternatives.

The draft NE RSC Assessment and Strategy was revised to incorporate comments received from the NE RSC, Working Group, and outreach efforts. All comments and content analysis were considered. Further refinement of the document took place to incorporate comments from a final NE RSC review and was delivered to the Cohesive Strategy Subcommittee (CSSC) prior to September 30th, 2011.

From May through mid-August, the NE RSC held bi-monthly conference calls to work on elements of the assessment and report. Then through September, the conference calls were held weekly.

Values

The societal and environmental values identified in the Northeast Regional Assessment have been characterized under the following themes: Public and Firefighter Safety; Land and Resources; Protection of Private Property and Investment; Willingness to Collaborate and Create Partnerships across Jurisdictions; and Education and Awareness.

<u>Public and Firefighter Safety</u>

Public and firefighter safety was overall the dominant value shared by stakeholders. As stated earlier, most fires in the region are relatively small. 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, herbs, and light brush; unexpected wind shifts; and fire running uphill. Reports show (Mangan, 2007) that the leading causes of wildland firefighter deaths are aircraft accidents and vehicle accidents, closely followed by heart attacks. Volunteer firefighters were the most likely to die from heart attacks. 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. 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).

Image 5 Firewise project in New York

Because extreme fire behavior is less common, loss of situational awareness or complacency on the part of many firefighters is a concern, particularly local fire departments which may have little to no experience with a significant wildland fire in their respective communities. In addition to this challenge, homes, homeowners, and recreationalists are spread throughout the wildlands and also may be unaware of the wildfire risks. 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).

The Northeast has many urban and metro population areas as well as large expanses of urban sprawl and suburbia. Often these areas are located within or next to areas of significant wildland vegetation. The impacts of smoke from wildfires can create health concerns for susceptible populations, and this also impacts the ability to use prescribed fire on the landscape. Depending on location, assessment of wildland fire risk in urban areas needs to be considered.

Cost-effectiveness in 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. Adequate training and equipment programs are important to enhancing firefighter safety on every response.

Other issues which can affect the safety of firefighters and the public are: access issues in rural areas; water supplies for firefighting; predictive capabilities; and communications on the fire line. Radio interoperability is crucial to safe and effective wildfire response by multiple agencies and is not currently available in the Northeast.

Land and Resources

The Northeast contains a large portion of the country's population and wildland urban interface (WUI) areas, and many of the Northeast's residents use the wildlands for recreation such as hunting, fishing, camping, bird watching, mountain-biking, hiking, leaf-peeping, etc. Many of the public parks, forests, and refuges in this area see tremendous visitor use throughout the year. Impacts created by wildfire and wildland fire management activities to trails, campgrounds, wildlife habitat, and temporary closures for public safety, etc., can all negatively impact recreational opportunities.

Aesthetics has been recognized as an important value in the Northeast Region. As one example, people from around the world come to New England each autumn for the show of colors providing a substantial economic boon for several states. Having views obscured by smoke (wildfire or prescribed fire), hillsides with blackened slopes and snags, and other impacts to aesthetics are often not tolerated very well and create challenges for fire managers to balance aesthetic and recreation values with the need to conduct fuels reduction activities.

Tribal heritage and traditional uses of the land are important values in the Northeast Region. Fire has been used for generations and is an integral part of the Region's history. Fire continues to be an important land management and cultural tool on Tribal lands. Timber resources are a valuable trust asset and Tribes accept and generally encourage timber management that in turn results in healthy forests. Being a firefighter is a respected and desired profession that provides an economic benefit in tribal communities.

Forest product markets are important to the local and regional economies of many states in the Northeast. Protection of the forest resource to provide the raw materials is important, and a robust forest products industry provides a cost-effective means for fuels reduction and helping to achieve fire resilience.

In many parts of the Northeast the public water supply is from surface waters and maintaining high water quality standards is paramount. Protection within these watersheds is critical. Impacts to fisheries and coldwater fish habitat are a concern. In some areas fire needs to be excluded to protect sensitive or unique resources, but in many cases the lack of fire has created

a worse situation for unique natural areas. In some areas the natural vegetation is structurally different than in the past due to fire exclusion, thereby altering the natural community and making it more vulnerable to subsequent fires.

People understand that there are great social, natural and economic benefits that are obtained from fire adapted ecosystems. Communities across the region value the fire dependent ecosystems and want them retained in the landscape. Conflicts can arise with human occupancy that might drive management activities to reduce risk in these vegetation types.

Protection of Private Property and Investment

Private landowners are stewards of most of the land in the Northeast. Wildfire response planning is often overlooked by private landowners but fire protection is still a public sector responsibility. Access, type of tactical methods, or objectives for managing a wildfire are a few things that are typically not planned in coordination with the agencies responsible for suppressing wildfires.

Landowners in the Northeast region have diverse interests and objectives for their land including wildlife habitat, recreation, tax interests, and aesthetics. Prescribed fire and fuels reduction are often compatible practices if it helps achieve their primary objectives for the land. Smoke may be the single conflict that could affect the use of fire on private lands as well as public lands.

Image 6 Prescribed fire in oak ecosystem, Mark Twain National Forest, Missouri

Numerous communities and homes are located within the WUI of the Northeast. Some of these areas are located within close proximity to large urban centers, such as pine barrens in southern New Jersey, Cape Cod, Massachusetts, and Long Island, New York. Increased populations using and living in the wildlands increases the number of human-caused ignitions, the probability for property losses, and also additional chances for loss of life and firefighter safety concerns (Cardille, Ventura, & Turner, 2001).

Public access to private property for recreation is a long-standing tradition in many parts of the Northeast. Threat of wildfire, either caused by accident or from arson, can have a detrimental effect on a landowner's willingness to keep their property open.

Willingness to Collaborate and Create Partnerships across Jurisdictions

The Northeast is a patchwork of jurisdictions and ownership, and often more than one agency may be involved in the management of wildland fire. Whether it's the state and a community fire department working together, the state and a federal agency working together, an NGO conducting a prescribed burn, or a homeowner concerned about the safety of their house in the WUI, this strategy will include many stakeholders at various levels and it will need buy-in by many parties in order to be successful.

Coordinated efforts to engage the public in wildfire issues and collaboration with all stakeholders will be important to effective and efficient wildland fire management. Improved organizational effectiveness and collaboration are recognized as important to achieving goals.

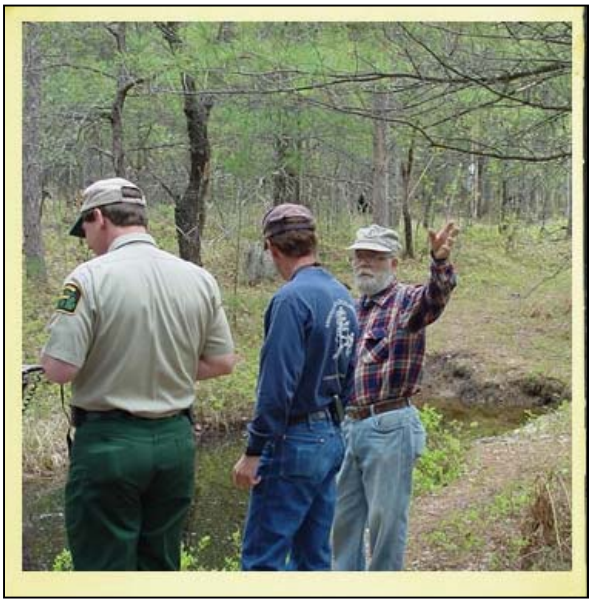


Image 7 Working with private landowner on Firewise property

As important as collaboration and coordination are, partners will be able to maintain their unique missions and values. Flexibility in implementing the strategy is imperative because of the many geographic and cultural divisions of the Northeast.

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

Trends and Uncertainties

An accurate representation of the number of wildfires, their causes, and property damage and loss is missing in the Northeast. Without accurate and consistent reporting it is hard to make a case for determining the most needed actions, both inside and outside the regional fire community. The lack of data creates a perception that there are limited fire issues in the Region. Prescribed burning is accomplished on a small percent of the region. The majority of burning is achieved by state and federal agencies, and the amount of burning is trending

upward. 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.

There is an abundance of fire related science which is pertinent to most areas within the Northeast Region. Research has been conducted in many regional ecosystems and on management issues and concerns, although there is limited science related to the role of wildland fire in New England. 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 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.

Image 8 Prescribed burning

Uncertainties exist related to climate change and the effects on fire return cycles; forest sustainability; the spread of invasive plants; mortality due to forest pathogens and insects; and the number of species which may become threatened, endangered and sensitive. Climate change and seasonal fluctuations affecting fire are not well understood for the Northeast. Some state's historical data show annual and seasonal variations related to fire size and occurrence. Climate change could mean that one wildfire season increases relative to another, that seasons are extended or diminished, or that the summer season becomes more pronounced. Any change will alter the seasonality of wildfire and the ability to put fire on the land, though these changes are not as well understood in the east as in the west because they are more dependent on seasonal precipitation

Modeling projections currently available in northern Wisconsin indicates warmer temperatures and shifting precipitation patterns will influence forest ecosystems. Summer temperatures are

expected to continue rising, leading to reduced water availability and increased drought stress and fire risk, especially in late summer. A longer growing season is likely to create greater water demand, which will cause plant stress if the demand is not synchronized with adequate water supply. Most models project that northern Wisconsin will experience an increase in precipitation in the late winter or early spring, but there is a trend toward reduced precipitation in the late summer and early autumn which can cause drought stress in late summer. 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).

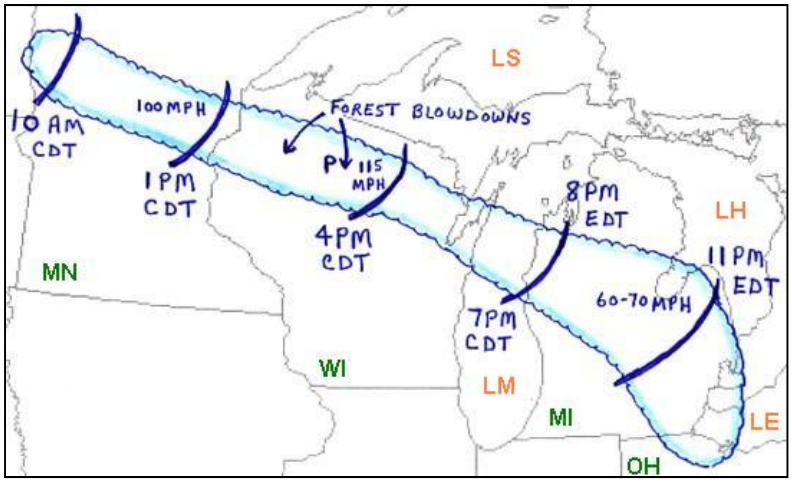


Image 9 1977 Lake States Wind Event

We know that fire dependent ecosystems in the east 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. Shade tolerant forests are not excluded from wind, ice and drought events, nor are they immune to insects and disease such as emerald ash borer, eastern hemlock woolly adelgid or beech bark disease, which all can increase fuel loading that may lead to more extreme fire behavior and greater impact. How fire adapted ecosystems in the Northeast will respond to predicted climate change scenarios are uncertain.

Invasive plant species such as Japanese Stiltgrass, Common reed grass, and multiflora rose 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.

Uncertainties related to federal budgets impact the Region's wildland fire management community, the continuity of well trained and well equipped personnel, and affect fire management program delivery. Fire occurrence in the Northeast is related to regional weather patterns which cause variations in fire frequency and severity. This level of variability makes it difficult to prepare and budget to maintain capacity for suppression and readiness. It also creates challenges to keeping the public and agencies alert to fire risks. The knowledge base and capacity within the wildland fire community is diminishing due to the aging workforce. Loss of skills coupled with reduced budgets will have negative impacts for fire management (for example, hiring, training) in the Northeast, although the degree of impact is uncertain. The capacity of Federal government agencies to provide public services will decline as statutory obligations increase (USDA Forest Service, Northeastern Area, 2007).

Human populations in the Northeast and Midwest continue to grow, and urbanizing communities will expand into the adjacent undeveloped open land. Across the lower 48 states, 9.4 percent of the land is contained within the wildland urban interface (WUI), 38.5 percent of the homes reside in the wildland urban interface (WUI). The highest proportion of land in the wildland urban interface (WUI) is in the east, reaching a maximum of 72 percent of land area 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). 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.

Changes in ownership and land use patterns continue to challenge wildland fire management in many parts of the Northeast. Loss of open space (undeveloped lands) has been recognized as a threat to ecosystem services, and will create greater challenges for restoring and maintaining fire adapted ecosystems. The divestiture of industrial forest land has been seen in the region over the past several decades and continues today in some northern forest areas. This has increased fragmentation of forest land ownership creating challenges and adding complexity to landscape scale management. Any trends away from active forest management can lead to increased fuel loading and the potential for more intense wildfires. Many public lands in the

Northeast are surrounded by private lands. As development increases on those lands effective use of prescribed burning will be impacted and the potential for more smoke related issues will rise.

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. Lack of an abundant supply of wood 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.

Smoke produced from prescribed fires is a concern when considering the use of prescribed fire as a management activity. More expertise with smoke modeling, particularly in the highly dissected landscapes, is needed to avoid putting smoke into communities. Improved ability to identify and work with those households with health concerns is also needed. Burners have also recognized the value of sharing successes and lessons learned with a broader audience.

National Goals Regional Objectives

The Regional Objectives were developed by the Northeast Regional Strategy Committee (NERSC) and Working Group and reflect the perspectives of the members, their affiliation, as well as the feedback received from participants in the virtual forums and comments posted on the UNC Asheville's National Environmental Modeling and Analysis Center (NEMAC) website (http://sites.nemac.org/northeastcohesivefire/). Our outreach efforts highlighted five key considerations when pursuing our goals and objectives:

1. Pursue goals while improving the safety of wildland firefighters through better coordination and cooperation among state, local, tribal, and federal agencies. Improve access to personal protective equipment (PPE) and wildland fire training, and resolve the incompatibility of radio systems. Lastly, participants noted that complacency builds in the long intervals between major fire events in the Northeast.
2. Build capacity in the local fire districts because they are the first responders and often the only defense against wildfire in the rural areas.

3. Improve cooperation among agencies, fire departments, state, tribal, and other entities to facilitate sharing of funds, resources, authorities, and responsibilities that improve efficiencies.
4. Build effective local collaborative partnerships that facilitate reduced risk across multiple ownerships. Involve more communities in wildfire programs and community wildfire protection plans (CWPPs) and interact with the stakeholders at all levels.
5. Adapt educational programs to better address the multiple benefits of prescribed fire, hazard fuel mitigation, and defensible space (space around structures that has been cleared of flammable vegetation to reduce the risk of wildfire). Offer landowner workshops and outreach materials to communicate wildfire prevention and preparedness in fire prone areas not covered by CWPPs or other wildfire protection plans.

Objectives Hierarchy and Measures for Success

The Cohesive Strategy goals have some unique applications in the Northeast. The importance of a healthy functioning natural environment to the future of the Northeast is reflected in the Objectives Hierarchy. Restore and Maintain Landscapes is the goal with the least defined structure and shortest history in management programs. Cooperatives across the region are devoted to addressing large scale conservation issues, one of which is the Cohesive Strategy. Landscape restoration and maintenance is occurring across this region and is a growth arena where great creativity and opportunity is being born.

Community protection and wildfire suppression techniques and tools are well established and need to be improved and refined into the future. Our collaborations must grow and strengthen to better serve and protect.

The goals and objectives in the following hierarchy are not listed in order of priority or importance. They are organized within each of the three goals with broad, inclusive values at the top and narrower, more specific values at lower levels of the hierarchy.

The measures of success which follow each goal represent quantifiable parameters that serve as criteria for determining the effectiveness of the Northeast region strategy for the National Cohesive Wildland Fire Management Strategy.

Restore and Maintain Landscapes

Goal: Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives

This strategy recognizes the current lack of ecosystem health and variability of this issue across the Northeast Region. Landscape conditions and needs vary depending on local weather patterns and fuel conditions (vegetation density, woody debris), among other elements.

Basic premise: In the Northeast, there are numerous challenges to achieving fire resilient landscapes, including: continued, and in some localities, accelerated fragmentation of the landscape, hazardous fuels (vegetation density, woody debris) created by wind/ice storms, and other episodic events, lack of fire or active management in fire-dependent ecosystems, as well as a regional lack of understanding and acceptance of treating land with fire. 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.

Image 10 Aerial view of blowdown in Minnesota, July 1999

This goal seeks to restore landscapes that are resilient to fire, provide habitat to the organisms that depend on them, and present low risk to the human communities that border them and the fire fighters who protect them. Fire resilient landscapes are resilient to other disturbance processes that can degrade ecosystem services (e.g. pollination, carbon sequestration, ground water recharge, harvestable populations of fish, game, plants), food and materials production, recreational value, scenic beauty, and sense of solitude. We 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.

1.1. Restore and maintain structure, composition, and function of fire-dependent communities (e.g., jack pine systems, oak woodlands, prairie and grasslands, barrens and savannas).

Performance measures:

The number of acres treated annually

Proportion of area of fire dependent vegetation communities within natural range of variability in species composition, and density.

1.1.1. Collaborate and coordinate with land agencies, tribes, and private owners to identify, assess and treat priority landscapes.

1.1.1.1. Integrate fire/fuels management in land management plans, initiatives, conservation strategies, and private landowner management plans.

1.1.1.2. Integrate fire and fuels management into plans that aren't necessarily fire related (i.e., the role of fire in watershed restoration).

1.1.1.3. Expand Stewardship program coordination.

1.1.1.4. Manage for the protection of infrastructure values by using habitat objectives, and successional stages to address wildland urban interface (WUI) fire issues.

1.1.2. Use prescribed fire strategically to restore and maintain landscape resilience.

1.1.2.1. All personnel who conduct prescribed burning operations (burners).

1.1.2.2. All burners understand sensitive publics, areas, and tolerance for smoke.

1.1.2.3. Support Prescribed Fire Council development in states that don't have them.

1.1.2.4. Laws pertaining to prescribed (planned) fire are consistent across jurisdictions.

1.1.3. Use mechanical, chemical, or other treatments strategically to meet management objectives.

1.1.3.1. Support the role of forest products industry in meeting cost effective and efficient hazards fuels reduction and landscape restoration that support rural economies.

1.1.4. Suppress unwanted wildfires where risks and costs exceed benefits.

1.1.5. Plan wildfire response to match landscape objectives.

1.1.6. Manage wildfire strategically to restore and maintain landscape resilience.

1.1.6.1. Address state-specific regulations on lightning ignitions.

1.2. Treat (weather/pest/drought-related) event fuels expeditiously in fire – dependent and non fire – dependent landscapes.

Performance measure:

Percentage of weather event related fuels treated annually, and age of fuels treated (how long they remained in the forest)

1.2.1. Collaborate and coordinate with other land agencies and owners to treat weather event or pest related fuels and consider local community's economic sustainability.

1.2.1.1. Design shared treatment objectives across jurisdictions.

1.2.2. Use wildfire as a tool to reduce fuel loading and to meet management objectives.

1.2.3. Use prescribed fire as a tool to reduce fuel loading and to meet management objectives.

1.2.4. Use mechanical treatments to reduce fuel loading and to meet management objectives.

1.2.5. Coordinate wildfire planning and as fire danger warrants deploy suppression resources in untreated high fuel hazard areas (See Wildfire Response).

1.2.6. Provide professional natural resource advice to landowners during and following events (see also 2.2.2.4).

1.3. Protect threatened, endangered and sensitive animal and plant habitat.

Performance measures:

No new species listed as threatened or endangered.

No threatened or endangered species become extinct

1.4. Prevent the spread of invasive plants.

Performance measure:

Acres of invasive plants

1.5. Maintain/increase skills and resource capacity to return fire to fire – dependent landscapes.

Performance measure:

Number and qualifications of fire firefighters conducting prescribed burns and other treatments increases or does not decrease.

1.5.1. Utilize adequate suppression resources for wildfires managed for multiple objectives.

1.5.2. Improve coordination and organization among local fire departments, agencies and Non-Governmental Organizations (NGOs).

1.5.3. Improve leadership development within the fire community.

1.5.4. Expand local level prescribed burner training and experience opportunities.

1.5.4.1. Support burner certification program.

1.5.5. Expand secondary and college education level opportunities for wildland fire management education related to fire ecology, prescribed fire opportunities and experience.

1.6. Improve treatment effectiveness and wildfire planning using the best available science.

Performance Measures:

All wildland fire planning cites current science and monitoring results

Monitor treatment effectiveness, analyze treatment effectiveness variables and incorporate new information in subsequent treatments

1.6.1. Use adaptive process to learn from previous treatments, and share and disseminate science and monitoring results with others.

1.6.2. Create demonstration areas for local awareness and education.

1.6.3. Improve outreach information which addresses fire-resilience, ecosystem resilience.

1.6.4. Monitor landscape attributes to measure progress toward achieving resilience.

1.6.4.1. Use standardized fire effects monitoring and share data.

1.6.4.2. Monitor fuel loading, forest structure, species composition.

1.6.4.3. Monitor wildlife habitat quality for short and long term effects fire and fire surrogates.

1.6.4.4. Monitor for non-native plant invasions.

1.7. Identify and address policy barriers and conflicts that prevent full coordination and collaboration.

Performance measure:

Policy barriers are identified and addressed at appropriate levels

1.8. Foster communication among stakeholders and build partnerships.

Performance measures:

All stakeholders report that they are informed

Number of partnerships increases annually

1.8.1. Invest in education to foster cultural acceptance of fire and fuels treatments on public and private lands.

1.8.2. Develop, distribute, and improve educational resources for schools and public related to unwanted ignitions, fire hazards, fire safe communities, landscape restoration with fire and other treatments.

1.8.3. Utilize, support, and expand The Nature Conservancy's (TNC) Fire Learning Networks (FLNs) for education and fire use.

1.8.4. Utilize the Joint Fire Science Program (JFSP) Fire Science Consortiums for fire-related information.

1.9. Reduce landscape fragmentation by building shared objectives.

Performance measure:

Landscape cooperatives increase in number and share land management objectives.

1.9.1. Identify opportunities and linkages to manage land with more partners at larger scales.

1.9.1.1. Reduce fragmentation with land ownership tools including land trusts, conservation easements, acquisitions, land exchanges, non-traditional partnerships, etc.

1.9.2. Build shared responsibilities.

1.10. Utilize existing Burned Area Emergency Rehabilitation (BAER), Burned Area Rehabilitation (BAR) funding and expertise to identify and treat invasive organisms, water quality issues, and erosion.

Performance measure:

Use of BAER and BAR funding extends to non-federal land issues.

Fire Adapted Communities

Goal: Human populations and infrastructure can withstand a wildfire without loss of life and property.

This strategy offers options and opportunities to engage communities and work with them to become more resilient to wildfire threats.

Basic Premise: Expanding human populations will continue to create complex challenges on all landscapes in the Northeast, where the majority of wildfires are human caused. Research demonstrates that numbers of ignitions tend to increase as humans and access increases. Wind, ice, insects and disease, some land management activities, and vegetation growth in the absence of fire will continue to create fuel hazards to human populations. Large wildfires tend to be surge events that occur during seasonal and sustained droughts. Homes are lost annually in the Northeast from small and large fires.

Image 11 Wildfire along wildland urban interface, Ohio

Community adaptability is the center of coordinated cross jurisdictional wildfire management; creating sustainable communities and 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 the risk for safety and sustainable quality of life.

2.1. Fire authorities, local governments, and community members negotiate/accept risk and the range of actions taken to mitigate risk.

Performance measures:

Greater understanding of wildfire risks among stakeholders and community members
Legal documents describing risk sharing
Number of projects completed that mitigate risk

2.1.1. Collaboratively develop local wildfire plans to include response, structural ignitability, hazard mitigation and treatment priority (i.e. Community Wildfire Protection Plan).

2.1.1.1. Identify shelter in place and safety zones in communities.

2.1.1.2. Identify evacuation routes and hold practical exercises.

2.1.2. Conduct fire risk assessment at the community/county level.

2.1.2.1. Form local multi-jurisdictional assessment teams.

2.1.3. Develop/expand fire risk/fire danger communications.

2.1.3.1. Communicate red-flag warnings.

2.1.3.2. Communicate likely fire behavior (i.e., direction, rate of spread, intensity, etc.) and conditional suppression response.

2.1.3.3. Create and distribute localized information brochures for living in fire prone areas.

2.1.3.4. Widely communicate wildfire and other events while they are happening

2.1.4. Agencies/fire authorities/citizens continually interact to increase awareness, comprehension, conviction, and commitment to manage fire risk.

2.1.4.1. Increase personal contacts between authorities and citizens/groups to promote shared responsibilities.

2.1.4.2. Develop and increase the use of site visits, local demonstration areas, examples of defensible space, fuels treatments, Firewise principles etc.

2.1.4.3. Identify and increase use of opportunities for interaction such as information booths at events, meetings, public forums, field trips etc.

2.1.5. Develop and mobilize prevention teams in areas of high risk.

2.1.6. Share wildfire plans and success stories.

2.2. Reduce Wildfire Hazards

Performance measures:

Acres of treated land on all jurisdictions

Acres of fuels treatments that cross jurisdictions

2.2.1 Reduce wildfire hazards on public lands that border communities to create fuel transition zones.

2.2.1.1. Coordinate and treat event fuels quickly regardless of ownership.

2.2.1.2. Coordinate fuels reduction and maintenance of desired conditions across jurisdictions.

2.2.1.3. Develop complimentary fuel loading/slash treatment guides across ownerships.

2.2.1.4. Coordinate and communicate prescribed fire and surrogate treatments with local fire authorities and citizens.

2.2.1.6 Manage for composition and structure or successional stages that burn less intensely.

2.2.2 Reduce hazardous fuels on private property through a wildland urban interface (WUI) program.

2.2.2.1. Ensure wildfire protection plans identify areas in need of treatment.

2.2.2.2. Coordinate planning and implementation with adjacent owners to ensure fuels reduction efforts are efficient and cost effective.

2.2.2.3. Provide training opportunities for property owners, resource professionals, fire authorities, private land management specialists etc. related to funding and implementation options through local fuels reduction workshops and information sessions, demonstration areas, and tours.

2.2.2.4. Provide access to professional assistance before and immediately following events, including but not limited to forest management advice, economic assistance, and post fire psychological assistance for homeowners.

2. 2.2.5. Establish locally consistent fuels reduction guidelines like best management practices that incorporate defensible space principles and concepts.

2.2.2.6. Create/maintain vegetation disposal for property owners (e.g., chipping, local disposal sites).

2.2.2.7. Promote use of fire-resistant landscaping.

2.2.2.7.1. Provide training workshops/information for designers, landscapers and suppliers related to fire resistant landscaping.

2.3. Reduce unwanted human ignitions in and near communities.

Performance measures:

Number of unwanted ignitions declines

2.3.1. Identify and address causes of unwanted fires and include in prevention outreach.

2.3.2. Provide outreach prevention messages to schools, communities, homeowner associations, etc.

2.3.3. Collaborate with law enforcement investigation, enforcement and prosecution of arson caused fires.

2.3.5. Develop appropriate fire restrictions through the local enforcement authority.

2.3.5. Provide prevention, fire danger, risk information through burning permit programs, and other local homeowner mailings (tax assessments, property tax mailings, township newsletters).

2.4. Identify and address conflicts/barriers to fire-adaptation in local land use planning, building ordinances, and building codes.

Performance measures:

Land use planning includes firewise standards, and other fire planning
New building ordinances and building codes includes fire-resistant materials

2.4.1 Explore zoning laws that require defensible space prior to new development.

2.4.2. Explore building codes for nonflammable materials.

2.4.3. Work with local planners to include fire safe features in new development (e.g., building codes, landscaping, and evacuation routes) and specific restrictions when building in dangerous topography/conditions.

2.4.4. Explore revision of state or local level open burning regulations.

2.4.5. Identify incentives for landowners for fuel treatment activities (investment in high hazard areas).

2.4.6. Engage insurers to educate homeowners and developers for using fire resistant building materials, designing appropriate access roads to homes and developments, and using Firewise principles.

2.5 Develop agreements and memorandum of understanding (MOUs) that ease jurisdictional barriers for efficient and effective treatment and maintenance of fuel treated areas (for example, neighborhood agreements).

Performance measure:

The number of agreements and MOUs.

Wildfire Response

Goal: Ensure all jurisdictions participate in making and implementing safe, effective, efficient risk based wildfire management decisions.

This strategy considers the full spectrum of fire management activities and recognizes the differences in missions among local, state, tribal and Federal agencies. The strategy offers collaboratively developed methodologies to move forward.

Premise:

Throughout the Northeast Region, local fire departments, both professional and volunteer, are key partners and are often the first and sole responders on wildland fires. Due to staffing levels at the federal and state levels, providing financial and technical support which helps to maintain the capacity of local fire departments to respond to wildfires is vital. Because of variations in climate, soil, vegetation and land use patterns, wildfire risk can change quickly across the landscape of the Northeast Region. Wildfires may be small in size but numerous and occur in bursts throughout the fire seasons. Combining the nature of wildfire in the Northeast with the density of people and parcels of land and the diversity of land ownership creates a complex mosaic for wildland fire suppression resources. Life and property loss are at risk on the numerous small fires as well as large incidents. Drought exacerbates risk of wildfire and fire severity.

Image 12 Wind driven Howes Lake Fire, Michigan

A balanced wildfire response requires integrated pre-fire planning with effective, efficient, and coordinated emergency response. Pre-fire planning helps tailor responses to wildfires across jurisdictions and landscape units that have different uses and management objectives. Improved prediction and understanding of fire weather, burning conditions, and various contingencies during wildfire events can improve firefighting effectiveness, thereby reducing losses and minimizing risks to firefighter and public health and safety. Improvements to collecting wildfire occurrence data are critical to effective integrated planning, prevention and response efforts throughout the region.

3.1. Provide for firefighter and public safety.

Performance measure:

Fire fighter and public accidents and fatalities related to wildland fire

3.1.1. Reduce firefighter exposure to hazards on every response.

3.1.1.1. Maintain a ready workforce by being prepared mentally and physically and adhering to training and performance standards.

3.1.1.1.1 Adopt/support fitness programs (e.g. FireFit).

3.1.1.2. Provide adequate personal protective equipment (PPE) and training across jurisdictions.

3.1.1.3. Minimize firefighters' exposure to smoke or other toxic substances.

3.1.1.4. Invest in common communication technologies to address interoperability issues.

3.1.1.5. Support residents and communities to improve defensible space and access (i.e., roads and driveways).

3.1.2. Reduce the public's exposure to hazards.

3.1.2.1. Support private landowner responsibility for risk reduction.

3.1.2.2. Support community awareness of wildfire risks and how to mitigate them.

3.1.2.3. Create community wildfire protection plans (CWPPs).

3.1.2.4. Communicate current fire conditions and fire management response (pre-season notifications, red flag warnings, and fire condition announcements).

3.2. Ensure that wildfire response reflects the broader wildland fire management strategy.

Performance measures:

Planned fire response varies by fuels, weather and topography and incorporates the management objectives of lands being protected

3.2.1. Tactically integrate wildfire use with prescribed fire or mechanical treatments, where appropriate.

3.2.2. Ensure that suppression effectiveness is balanced with long-term objectives and landowner or management priorities.

3.2.2.1. Consider land management objectives when deciding on appropriateness of suppression tactics.

3.2.2.2. Consider private landowner values when responding to fires on private lands or in mixed ownership.

3.2.3. Coordinate the sharing of resources and expertise for suppression, prescribed fire and training among the local, state, tribal and federal entities.

3.3. Maintain the capacity to suppress unwanted fires.

Performance measure:

Number and qualifications of responders matches threats

3.3.1. Sustain a shared capacity for fire suppression.

3.3.1.1. Invest in a sufficient and well-trained fire-response workforce.

3.3.1.1.1. Provide funding opportunities to help staff local fire departments and/or dual positions between federal agencies.

3.3.1.2. Support local fire departments as integral to the suppression of wildfires across the Northeast.

3.3.1.2.1. Improve the local fire departments' abilities and efficiencies in wildland fire suppression.

3.3.1.2.2. Provide funding and/or equipment for local fire departments to build capacity.

3.3.1.2.3. Increase and improve wildland fire suppression training adequate to respond to local conditions.

3.3.1.2.4. Increase local simulation opportunities for cross-training.

3.3.2. Maintain state and federal fire suppression capacity for incident command and extended attack based on local and incident complexities.

3.3.3.1 Federal and state leadership encourage broader engagement of agency personnel for wildland fire management in public land management agencies (militia concept).

3.3.3. Invest in fire succession planning.

3.3.4. Investigate opportunities for shared positions between agencies to reduce duplication.

3.4. Improve organizational efficiencies and wildfire response effectiveness.

Performance measures:

Agencies and departments report increased efficiency yet retain effect response to wildfire.

3.4.1. Address preparedness strategically for greater efficiency and cost effectiveness

3.4.1.1. Develop a flexible and mobile response capacity, given changing fire seasons and fuel events.

3.4.1.2. Coordinate wildfire detection and response (i.e. interagency dispatch).

3.4.1.2.1. Centralize dispatch that mobilizes closest available resources.

3.4.1.2.2. Invest in common communication technologies.

3.4.1.2.3. Develop common standards among agencies/departments

3.4.1.2.4. Encourage citizen involvement in detection.

3.4.1.3. Improve prediction capabilities at the state and local level.

3.4.1.3.1. Coordinate fire danger rating between agencies within a local area.

3.4.1.3.2. Utilize technology and predictive tools to improve fire response.

3.4.1.4. Conduct cost benefit/efficiency analyses to determine best level of protection on smaller or low wildfire occurrence land ownerships.

3.4.1.4.1. Use cooperating or reciprocal agreements/contracting/offsets or other instruments to provide the most cost effective protection.

3.4.2. Strategically align resources (personnel and equipment) across jurisdictions.

3.4.3. Improve cost share and grant programs to leverage resources.

3.4.4. Use/improve fire prevention programs to reduce unwanted wildland fire ignitions.

3.4.5. Strategically manage fuels to reduce the suppression effort needed.

3.4.6. Support local fire response organizations through programs like Ready Reserve, Volunteer Fire Assistance, and excess property programs.

3.4.7. Integrate Department of Defense (DOD) and Federal Emergency Management Agency (FEMA) into incident management.

3.5. Coordinate planning, training, detection and response activities for efficiencies.

Performance measures:

Interdepartmental and interagency sharing of planning, training, detection and response reported

Reduction in redundancies among agencies, departments and fire organizations

3.5.1. Maintain/improve cross-jurisdictional/agency communication.

3.5.2. Maintain preparedness through planning, training and maintaining qualifications.

3.6.2.1. Conduct cost benefit analysis (i.e. when/how do we respond?) for pre-planning based on indices and values at risk.

3.5.3. Increase and maintain fire protection agreements and compacts across jurisdictions.

3.5.4. Cooperatively integrate fire prevention and suppression resources across federal, tribal, state, and local agencies and non-governmental organizations.

3.6.5. Support continued and new regional fire compacts.

3.6. Improve and maintain infrastructure (airports, roads and bridges, etc.) that affect wildfire response.

Performance measure:

Number of infrastructure elements that support wildfire response increases

3.6.1. Identify and coordinate appropriate agencies that have jurisdiction over this infrastructure (remove obstacles, provide letters of support).

3.7. Address capacity issues related to all-hazard response.

Performance measure:

Improved capacity reported in year-end reporting

3.7.1. Improve efficiencies with Multi-Agency Coordination (MAC) group coordination and prioritization between wildfire and all-hazard issues.

3.8. Provide access and reporting standards to all wildfire response agencies and organizations.

Performance measure:

Access and reporting standards are standardizes across agencies and organizations

3.8.1. Provide a standardized wildfire occurrence database.

3.8.2. Improve wildfire reporting at the local, state, tribal and federal levels.

Areas to explore for reducing risk

The following list of investment centers was developed by the Regional Strategy Committee (RSC) to offer the modelers on the National Science and Analysis Team (NSAT) some freedom to explore different ways to achieve the objectives of the Northeast region and reduce risk. The

list below offers investments or levels of investment in four components of the cohesive strategy.

Developing alternatives was part of the Comparative Risk Analysis Framework and Tools (CRAFT) process, and allows the NSAT to model different levels of investment in each of the four components. The purpose of this exercise was to determine which investment combinations reduce risk and meet the greatest portion of the cohesive strategy in the Northeast. The Northeast RSC does not promote these actions, but wishes to explore what impacts these investments would have on risk.

Invest to prevent human caused ignitions

*Investigate different levels of investment into prevention.

1) Double the investment in prevention.
2) Maintain current investment in prevention.
3) Reduce prevention investment to zero.
4) Invest in local ordinances that reduce unwanted ignitions from debris burning, etc. (seasonally, all seasons, etc.).

Invest in fuels treatments

*Investigate different levels of investment into treating hazardous fuels (WUI and non-WUI).

1) Redirect investments to increase investment in fuels treatments.
2) Reduce investments in fuels treatments by 50 percent.
3) Increase investments in fuels treatments by 100 percent.
4) Invest only in treating around communities in fire risk landscapes.
5) Invest only in treating wind/storm/pest/ drought fuels.

Invest to build capacity in wildfire response

*****Investigate different levels of investment into building capacity.

1) Shift all fuels investments to building capacity (increase staffing levels, training, equipment, detection, volunteer assistance programs).
2) Invest in a forest fire warden in each town appointed through the state (50 percent state costs, 50 percent local costs).

3) Integrate wildfire response within a state/compact (deliberate design based on shared priorities).
4) Evaluate integration of all initial attack agencies to determine if it increases capacity or efficiency.
5) Invest in water scooping aircraft assets in states that rely on air support.
6) Eliminate barriers to all cost sharing and cross billing.
7) Train every rural firefighter to Firefighter 2 (FFT2) and provide basic personal protective equipment (PPE).
8) Shift wildfire suppression responsibilities for low-average fire occurrence federal properties to state and local resources, and reinvest federal fire management staff to concentrate on fuels treatments for higher-average fire occurrence federal ownerships.

Invest to protect values exposed to risk

*Invest in protection of ecological functions, not human communities.

1) Treat landscapes with prescribed fire in fire dependent ecosystems.
2) Use funding to address broader landscape issues-landscape protection not structure protection.
3) Invest in influencing developers, code, planning, permitting – modification in role of structure protection.
4) Use fuels treatment investments to invest in fire-proofing homes.
5) Shift cost burden to the home owners in fire prone areas that are benefitting from living in the wildland urban interface (WUI).

Conclusions

Several major factors conspire to make managing wildland fire in the Northeast very complex. The majority of the land in the Northeast is privately owned. Public lands are relatively small and within public lands, various ownerships can be intermingled and are often organized in a random pattern. With relatively little public land in the Northeast, most fires are fought by State, and local responders and often several departments and jurisdictions working together. Lastly, responding to and managing wildfires in a low occurrence, high risk environment demands a level of preparedness that varies across the region, but comes with a considerable cost. Fluctuations in annual wildfire activity both across the region and within states require a level of readiness (skills, training, and equipment) to respond when the conditions warrant.

The Northeast is known for its northern hardwood forests, Great Lakes, mixed agricultural landscapes, and Atlantic sea coast that either have little or no dependence on fire to maintain them. However, the Northeast also contains pine barrens, savannas, prairies and grasslands, and mixed oak forests that have varying degrees of fire dependence. There is a high degree of acceptance that these ecosystems are imperiled because of fragmentation and lack of fire. These islands of fire dependent or fire modified vegetation communities may exist in an agriculturally dominated landscape or fragmented by rural housing units, creating even greater challenges to the land manager.

The Northeast is also a region that receives regular, albeit random weather events like down bursts, sheer winds, ice storms, and drought that can increase fuel loading to dangerous levels on thousands to hundreds of thousands of acres in all forest types. The fuel loading problems from these events cross many property ownerships and thus the response to treat the fuels needs to include cooperation and collaboration with many landowners.

The Northeast Regional Strategy Committee has developed objectives and actions with input from stakeholders that will work toward attaining the three goals of the National Cohesive Wildland Fire Management Strategy. Attaining these goals is a long term investment and requires commitment from the fire community. There is an expectation that coordination and collaboration will expand within the NE fire community and that non-traditional partnerships will be necessary to achieve objectives. (see Figure 3) .

Figure 3 Word map representing wildfire themes from the Northeast

Goal number one can be achieved by collaborating and partnering with all landowners in fire dependent landscapes to develop common landscape objectives and implement them across ownership boundaries. The Strategy prioritizes putting fire back into the fire-dependent ecosystems, but will include other methods of restoration. The timber products industry could be very effective at helping to meet this objective and provide economic stability in rural areas. The Strategy will also prioritize treating weather event fuels swiftly and with cooperation from landowners. Other threats to ecosystem resilience in the Northeast include the spread of invasive species, the loss of threatened and endangered species, and land use and ownership patterns that fragment the landscape into units that no longer have the structure and function they did prior to development. The objectives and actions proposed by the Strategy address all aspects of restoring resilient landscapes.

Goal number two also will be achieved by collaboration, cooperation and communication. All stake holders will need to accept and share risks, and share in the methods to mediate them. Planning is the key to achieving this goal with models like “Firewise” and development of Community Wildfire Protection Plans (CWPP). The strategy addresses the need to reduce the fire hazards in the wildlands surrounding communities but also on private lands. The strategy proposes several ways to minimize unwanted ignitions near communities through prevention and collaborating with law enforcement to investigate and prosecute arsonists.

To achieve goal number three, fire departments and agencies will have to communicate, collaborate and share resources and risk. However, investments are necessary to increase the capacity of local and state fire departments to meet the needs of the region. Investments in training, communications, personal protective equipment (PPE) also are necessary to equip the local fire departments for first response. National resources are rarely an asset to the Northeast because most fires are small and fast moving. Fires are typically out, and the property loss complete before a national campaign can be mobilized. Therefore, the Strategy proposes to maintain a regional force that can surge during periods of multiple ignitions and be mobile to respond to the phenology of fire season in the Northeast Region.

The national goals are challenging to achieve in the Northeast, but with investments in these key areas, the Northeast can continue to respond to wildland fire and reduce risk.

Appendix 1: Acronym List

BAER – Burned Area Emergency Rehabilitation

BAR – Burned Area Rehabilitation

CWPP – community wildfire protection plan

CRAFT – Comparative Risk Analysis Framework and Tools

DOD - Department of Defense

EACG – Eastern Area Coordinating Group

FEMA – Federal Emergency Management Agency

FFT2 – Firefighter 2

FLN – Fire Learning Network

GACC – Geographic Area Coordination Center

IMT -- Incident Management Team

JFSP – Joint Fire Science Program

MAC – Multi-Agency Coordination

MNICS – Minnesota Incident Command System

MOU – Memorandum of Understanding

NEMAC – National Environmental Modeling and Analysis Center (UNC Asheville)

NGO – non-governmental organization

NWCG – National Wildfire Coordinating Group

PPE – personal protective equipment

RSC – Regional Strategy Committee

WG- Working Group

TNC – The Nature Conservancy

VFD – volunteer fire department

WFEC – Wildland Fire Executive Council

WFLC – Wildland Fire Leadership Council

WUI – wildland urban interface

Appendix 2: List of CRAFT Questions

OBJECTIVES

Situation and Context

1. What is the National Wildland Fire Management Cohesive Strategy (Cohesive Strategy)?
2. What are the primary overarching goals of the Cohesive Strategy?
3. What is the specific role of regional efforts in the Cohesive Strategy?
4. What do you hope to accomplish with this specific workshop?

Guidelines

5. What general policies, regulations or laws govern wildland fire management in your area, agency or organization?
6. Which of these, if any, have created conflicts among agencies and across lands? Which of these have helped create effective collaboration across different agencies? Explain briefly.

Values

7. What broad societal and environmental values have been associated with fire in this region?
8. Briefly characterize how each broad value relates to or is affected by fire.
9. What are the dominant common values or perspectives among agencies? What are the dominant conflicts among values or perspectives?
10. Which of these conflicts are exceptionally difficult to address and why?

Uncertainties

11. What challenges in wildland fire management are created or compounded by lack of knowledge or understanding?
12. What societal or environmental changes or trends could affect wildland fire?
13. Briefly describe the uncertainties associated with these changes or trends that make them difficult to predict.

Goals and Objectives

14. What broad management goals or priorities exist for this area that relate to wildland fire?

15. Are there more specific goals which are not explicit to wildland fire but may be related (i.e. an historic site with preservation goals for a particular landscape, or a natural area managed for ecosystem process)?
16. How do your goals as stated above relate to the National goals of the Cohesive Strategy? Are there additional goals that contribute to the broader national goals?
    1. Restoring and maintaining resilient landscapes

        1.1

        1.2

    2. Creating fire adapted communities

        2.1

        2.2

    3. Wildfire Response

17. Which of the above are the highest priorities for completing this assessment and analysis?
18. For each priority goal, identify contributing objectives, and a range of actions and activities that could meet each objective.
19. Now finalize into an objectives hierarchy.

Measures for Success (Endpoints)

20. How do you or can you quantify management success in meeting the goals and objectives? Identify endpoints or performance measures that could be used to illustrate outcomes. For each endpoint, identify the spatial and temporal resolution and units of measure (e.g. dollars, acres, etc).
21. What is the level of acceptability of these endpoints given the range of perspectives and values?

ALTERNATIVES

Actions

22. List the possible broad actions and activities from the objectives section (#).

Alternatives

23. Identify the combination of actions and activities that best reflects the continuation of current policies and practices.
24. Identify other reasonable combinations of actions and activities (alternatives) that collectively could contribute to long and short-term goals. Consider how actions might affect each other with possible cumulative or interactive effects.
25. Are there technical or financial constraints that limit the range of actions and activities that might be pursued? Consider how overcoming these barriers might create opportunities for greater success.
26. Consider how issues vary across the region and where some actions might be more successful than elsewhere. If necessary, refine the alternatives to recognize and incorporate spatial variability.

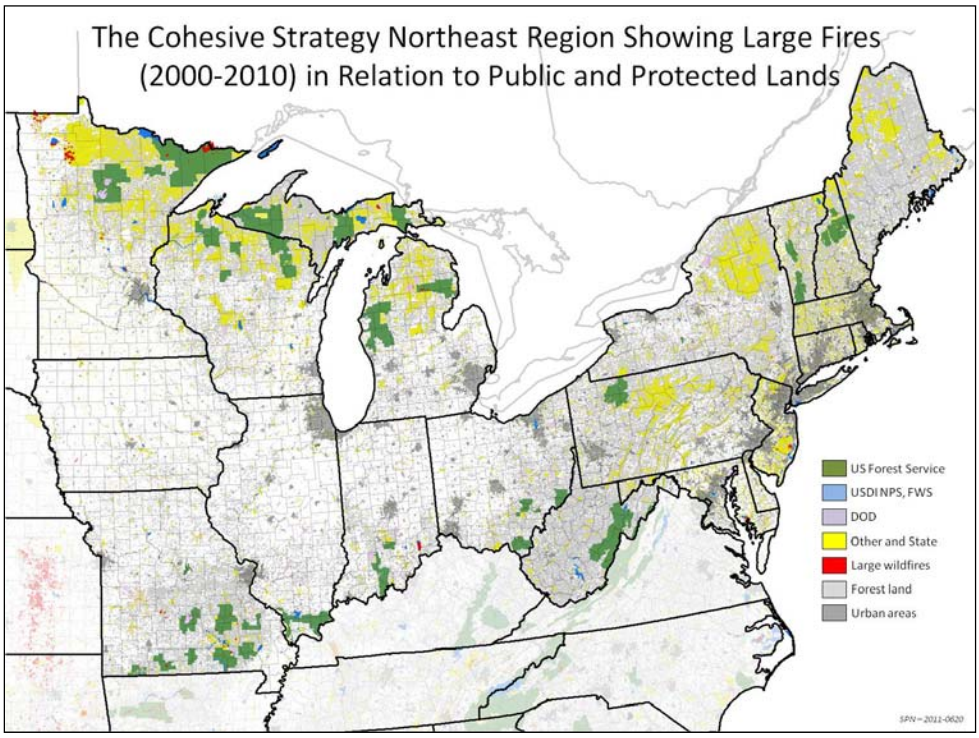
Appendix 3: List of RSC, Working Group and support staff for the region

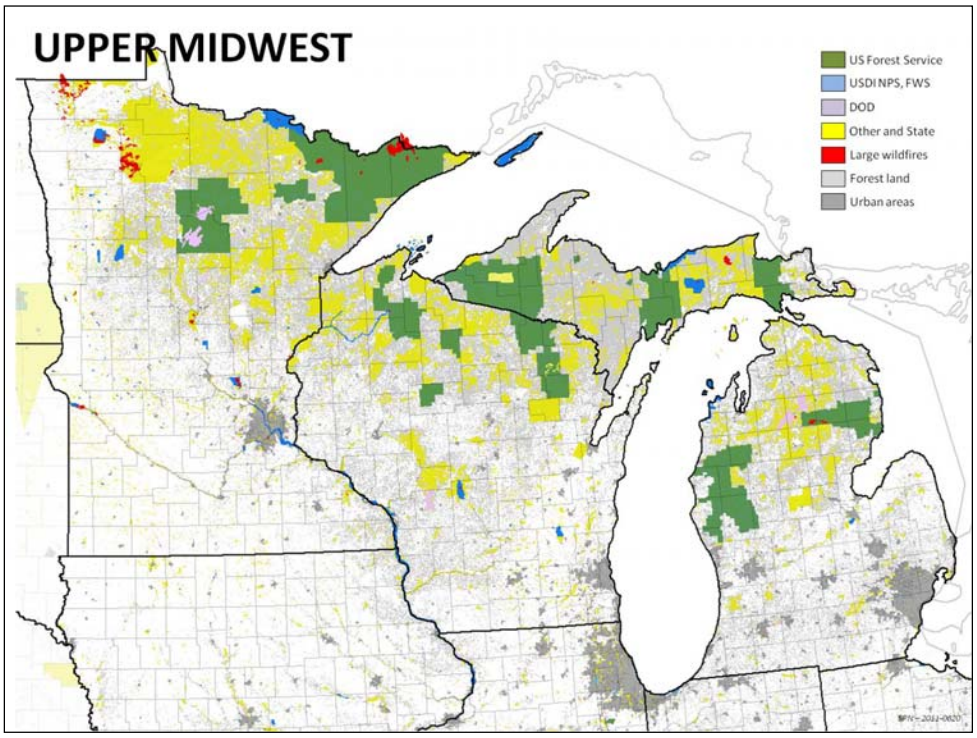
Northeast Regional Strategy Committee (NE RSC)			
Organization	**Name**	**Email**	**Phone**
George Baker	IAFC – NE RSC Co-chair	gbaker@mashpeema.gov	508-539-1454
Doreen Blaker	Keweenaw Bay Indian Community	doreen@kbic-nsn.gov	906-353-4565
Steve Jakala, retired	FWS		
Tim Hepola	FWS	Tim_Hepola@fws.gov	612-713-5479
Jim Johnson	County Commissioner, Cook Co., MN - NACO	sonjohn@boreal.org	218-387-2254
Jim Loach	NPS	James_Loach@nps.gov	402-661-5543
Logan Lee	USFS – R9	llee@fs.fed.us	414-297-3765
Tom Remus	BIA	Tom.Remus@bia.gov	218-327-4793
Matt Rollins	USGS – NE RSC Chair	mrollins@usgs.gov	605.594.2633
Tom Schuler	USFS Research	tschuler@fs.fed.us	304-478-2000, x110
Brad Simpkins	NH State Forester, NASF	bsimpkins@dred.state.nh.us	603-271-2214
Dan Yaussy	USFS Research	dyaussy@fs.fed.us	740-368-0101
Danny Lee	NE NSAT Lead	dclee@fs.fed.us	828-257-4854
Jenna Sloan	Coordination Lead	Jenna_Sloan@ios.doi.gov	202-606-5858
Billy Terry	FS Alternate	bterry@fs.fed.us	610-557-4145
Paul Charland	FWS Alternate	Paul_charland@fws.gov	920-948-4875
Dan Dearborn	FWS	Dan_dearborn@fws.gov	320-273-2247

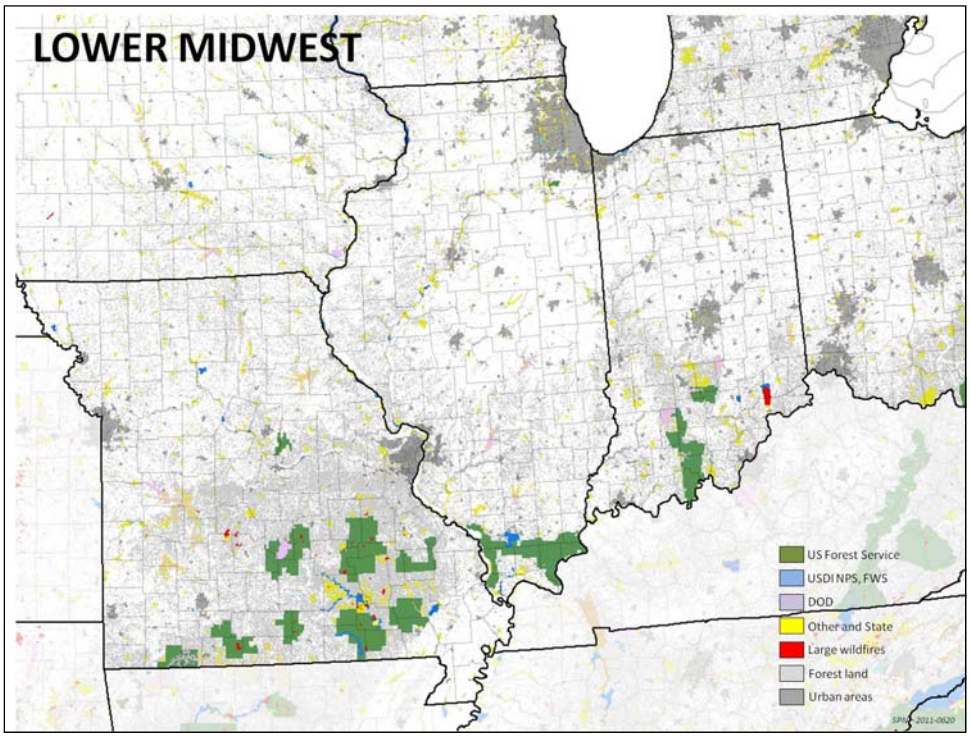
Northeast RSC Working Group (NE WG)			
Organization	**Name**	**Email**	**Phone**
Working Group Lead	Maureen Brooks	mtbrooks@fs.fed.us	610-557-4146
Working Group Lead	Terry Gallagher	tgallagher@fs.fed.us	(414) 297-1812
Fond du Lac	Steve Olsen	stevenolson@fdlrez.com	218 878 7105
The Nature Conservancy	Laura McCarthy	lmccarthy@tnc.org	
The Nature Conservancy	Jack McGowan-Stinski	jmcgowan-st@tnc.org	
The Nature Conservancy	Scott Bearer	sbearer@tnc.org	
Big Rivers Compact	Drew Daily, Indiana State Fire Supervisor	drdaily@dnr.IN.gov	(765) 342-4701
Great Lakes Compact	Ron Stoffel, Minnesota State Fire Supervisor	Ronald.Stoffel@state.mn.us	(218) 327-4587
Mid-Atlantic Compact	Randy White, Pennsylvania State Fire Supervisor	ranwhite@state.pa.us	717-783-7959
Northeast Compact	Tom Parent, Executive Director, Northeast Compact	necompact@fairpoint.net	207-968-3782
BIA	Marty Cassellius	Marty.cassellius@bia.gov	
BIA	Dave Pergolski	Dave.Pergolski@bia.gov	
BIA	Jeremy Bennett	Jeremy.bennett@bia.gov	
NPS	Jeffrey (Zeke) Seabright, National Capital Regional Fire Management Officer	jeffrey_seabright@nps.gov	301-432-6945
NPS	Cody Wienk, Midwest Regional Fire Ecologist	cody_wienk@nps.gov	402-661-1770
FWS	Allen Carter	allen_carter@fws.gov	

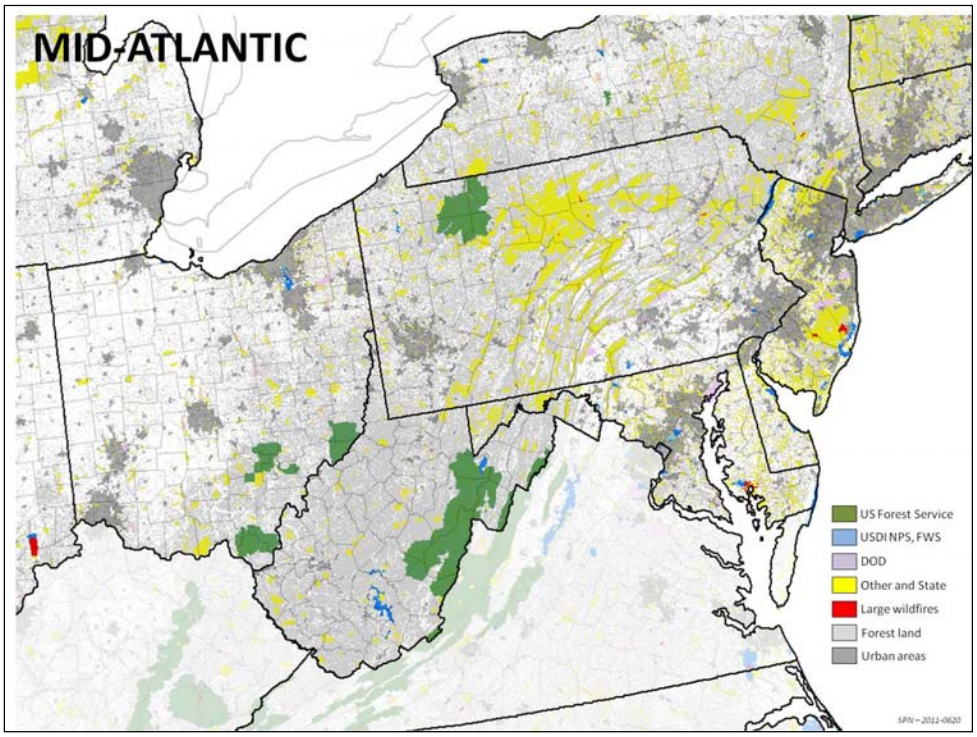
Northeast RSC Support Staff			
Jenna Sloan	Coordination Lead	Jenna_Sloan@ios.doi.gov	202-606-5858
Gus Smith	Coordination Lead	Gus_smith@nps.gov	202-606-5858
Maureen Brooks	Support Staff	mtbrooks@fs.fed.us	610-557-4146
Terry Gallagher	Support Staff	tgallagher@fs.fed.us	414-297-1812

Appendix 4: Maps






LOWER MIDWEST
US Forest Service
USDI NPS, FWS
DOD
Other and State
Large wildfires
Forest land
Urban areas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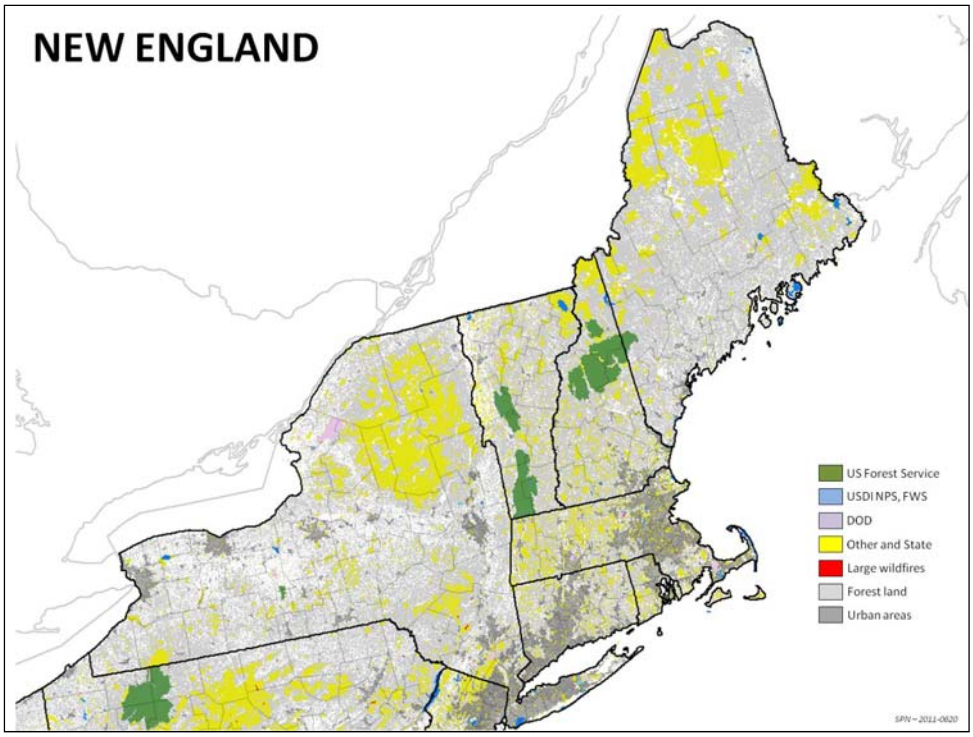
DOD
Other and State
Large wildfires
Forest land
Urban areas


NEW ENGLAND
US Forest Service
USDI NPS, FWS
DOD
Other and State
Large wildfires
Forest land
Urban areas

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Appendix 6- METI Content Analysis

*See separate file NE Content Analysis 091511 Final.pdf