Perceptions of Wildfire Threat and Mitigation Measures by Residents of Fire-Prone Communities in the Northeast: Survey Results and Wildland Fire Management Implications

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Introduction

Wildland fires are often associated with the arid regions of the Western United States. However, other regions of the country, including the densely populated Northeast, also have a history of wildland fires. In particular, the pitch-pine and scrub oak ecosystem of the region's coastal pine barrens is extremely fire-dependent (Irland 1999). Local land managers want to increase prescribed fire and other forest treatments to reduce fire danger and promote rare and endangered species. However, the barrens' close proximity to urban and suburban areas requires managers to better understand local attitudes and opinions before making widespread changes in forest management.

To help land managers in their efforts, we surveyed local residents living near fire-prone areas of the Central Pine Barrens of Long Island, New York, and the Plymouth Pine Barrens of Massachusetts to learn how they perceive wildland fire risk and management techniques to reduce fire hazard. The study found several valuable lessons for forest managers interested in reducing fire danger and promoting fire-dependent ecosystems. These lessons include the importance of experience and knowledge about wildland fire and fuel hazard reduction treatments in local residents' support for management strategies.

View of firebreak, Myles Standish State Forest, Plymouth, MA

Photo credit: Brian Blanchard

Key Findings

This study, along with a research study we are conducting in the Western United States, gives us confidence the following four recommendations

for managers can be applied in other regions where higher density urban and suburban interface communities abut high fuel-hazard forests.

Public education and outreach efforts about fuel-hazard reduction planning need to be increased well in advance of changing forest management. Because our study found that those who were more familiar with techniques, such as prescribed fire, supported them more strongly, managers need to get the word out early about the benefits and risks associated with each technique. Multiple strategies for reaching the public should be considered, including newspapers, television, and radio. After the initial outreach, demonstration projects, such as a small-scale prescribed burn, can be used to increase the public's experience with new management techniques. Demonstration projects are the perfect setting for teaching the public about the need to manage the forest.

Wildland-urban interface communities are different, even in the same region, so managers need to tailor implementation strategies to the particular area. For example, in higher density, less natural resource-based communities, residents may be less familiar with and more resistant to both prescribed fire and forest thinning. In that case, managed fuelbreaks may be the best strategy until public outreach increases acceptance for more controversial strategies like prescribed fire. More rural communities with longer histories of forest management may be more familiar with and more accepting of forest practices like thinning and burning.

Home located in subdivision adjacent to Myles Standish State Forest, MA

Photo credit: Brian Blanchard

Voluntary defensible space programs will be easier to implement than mandatory regulations. In wildland-urban interface communities that are just beginning fuel- hazard planning, managers should consider promoting voluntary programs that encourage private landowners to create more defensible space around their homes. In the future, with more political support, mandatory programs that regulate buffer zones on new development could be one strategy to create more widespread defensible communities.

The public needs to be involved early in fuel-hazard planning. The controversial nature of fuel-hazard treatments, such as prescribed fire or major forest thinning projects on public land, requires the public to be involved early in the planning

process. Rather than simply having public meetings, it may be more efficient and useful for managers to create an advisory committee of concerned citizens from nearby neighborhoods, local government and fire officials, environmental groups, recreation groups, and business leaders. This advisory committee can help managers reach a wider segment of the community and can be the first step in public education efforts.

Detailed Findings

The following section outlines the specific research findings from our study that inform the above management implications.

Residents perceived the risk of wildfire damage to their homes or property to be between "unlikely" and "somewhat likely."

The study area was identified by local fire officials to be at risk from wildland fire. More than half of the residents had directly experienced a wildland fire in the region. Many said they had seen smoke or fires from their property. Local residents thus appeared to be aware that wildland fires do occur in the nearby pine forests. Nevertheless, the perception that "it won't happen to me" was widespread: our survey found that local residents were not overly concerned about potential damage to their homes or property. Local fire departments also may be hampered by their own positive reputation in the community. We found that local residents, especially in higher density Long Island, were convinced that local fire departments would respond quickly to protect their homes. These perceptions may hinder the ability of fire managers either to convince local residents in the pine barrens to create defensible space around their homes or to support other fuel-hazard reduction strategies on adjacent public forest land.

In general, support for fire-hazard mitigation strategies was moderate, but those who knew more about a particular treatment—such as prescribed fire—also were more supportive of that type of management.

Our study found midlevels of support for fire-hazard reduction strategies, including prescribed fire, mechanical removal of trees and brush, and construction of firebreaks. Mechanical treatments had the strongest support, especially constructed firebreaks, and prescribed fire had somewhat less support. In particular, creating managed fuel zones or firebreaks around public forest land received strong support in both communities. This suggests that land managers need to consider not only the type of treatment, but also the location (see Bright, this volume). There was much less support from local residents for using prescribed fire close to homes, especially in the higher density Long Island study area. Finally, the "no action" alternative received very little support: participants saw a need for land managers to take some action to reduce the wildfire threat in nearby forests.

An important result we found was that local residents who knew more about a particular treatment, such as prescribed fire, also more strongly supported that type of management. But we don't know whether learning more about a treatment led to greater support or whether individuals predisposed to support a treatment sought out information on the method. In either case, the results suggest that land managers should not underestimate the importance of providing specific information on fuels management as an essential part of building support for fuel-hazard reduction work.

Concerns expressed about fuels treatments included the following:

- Worry that prescribed fires would escape and burn out of control was the number one concern.
- There also was concern that prescribed fire and mechanical treatments would harm wildlife and habitats and that mechanical treatment would cause soil erosion.
- There was very little concern about the impact of smoke on nearby residents or driving conditions.

Despite these concerns, many residents agreed that prescribed fire can help reduce the severity of wildfires and improve forest health. The emphasis, though, seems to be foremost on reducing fire risk. Improving wildlife habitat is a slightly less important outcome. Intentionally starting fires in the forest solely to improve habitat may not be reason enough for nearby residents of the wildland-urban interface to support prescribed fire, especially considering their concerns about the escape of controlled burns and burning near homes.

Demonstrating that prescribed fire can be used safely is critical to gaining the support of local residents. Land managers need to have examples of areas where these treatments have improved habitat, and they need to be realistic about the timeframe for forest regeneration after different treatments. In addition, showing examples of the impact of severe wildland fires on different forest types may also be helpful. In talking about mechanical fuels treatments, managers need to demonstrate how forest thinning and brush clearing will be done and demonstrate how soil erosion will be addressed, such as by contour felling, maintaining buffer areas along drainage swales, and minimizing clearing on steep slopes.

There is very little support for implementing local regulations that require homeowners to remove vegetation from their property. Residents are more open to voluntary efforts to create defensible space than to mandatory regulation.

The acceptability of regulation varies widely from community to community. California enforces strict regulations for managing vegetation in a 100-foot zone around structures. Zoning and other regulation is supported by the Firewise program and other wildland-urban interface programs including the National Fire Plan. Neither of our study areas currently has defensible space regulations for private landowners. In fact, the Central Pine Barrens Commission on Long Island requires that new subdivisions

preserve at least a third of the existing forest to protect the local aquifer and native plant habitats. Our findings suggest that land managers and fire officials should consider promoting voluntary programs for clearing vegetation before trying to implement mandatory regulations that could be highly unpopular with local residents. At least initially, fire managers should avoid seeking regulations and restrictions to mitigate fire hazards in communities and rely instead on education and outreach campaigns designed to encourage voluntary adoption of mitigation. Such programs have been successful when based on well-established principles of innovation diffusion and social marketing (see Monroe *et al*. 2005).

Photo credit: Brian Blanchard

Untreated pitch pine forest, Plymouth, MA

There is overwhelming support for involving the public in developing fire-hazard reduction plans, serving on advisory committees, and taking part in focus groups.

One strategy for promoting voluntary defensible space programs is to involve the public in developing these programs as well as other fire-hazard reduction planning. Thus, we were interested in learning how much local residents wanted to be involved in fuel-hazard planning. To our surprise, there was overwhelming support for involving the public in developing fire-hazard reduction plans, serving on advisory committees, and taking part in focus groups. In addition, local residents strongly felt that public education and outreach should be part of any program. In fact, these topics received the most positive ratings of any in our study.

The public strongly desires to be involved in fuel-hazard planning. Land managers interested in changing forest management practices need to find a meaningful way to involve the public more deeply in the planning process—beyond traditional means used in the NEPA planning process. The National Fire Plan and the Healthy Forests Restoration Act both emphasize community collaboration. The collaborative process has been used successfully in fields such as community development and has recently been applied to natural resources and fire management (Sturtevant *et al*. 2005).

The residents of at-risk communities we studied are a likely subset of the public to involve in forest planning because they are directly at risk from the adjacent forests that need thinning. Other important groups would be local government officials, environmental groups, business leaders, and, if applicable,

natural resource industry representatives. Preparing Community Wildfire Protection Plans and other fuels management plans would provide excellent opportunities for community residents to learn on the job.

Fire managers should consider incorporating instruction in fire ecology, fire behavior, and other relevant subjects into collaborative planning projects. The additional educational components of the planning process may draw many local residents who have the relevant education and skills to help in fuels planning. It is not uncommon to find local experts in biology, construction, landscaping, and even GIS. Given the talent pool, resource managers should consider including community and other stakeholders with appropriate skills on the planning team, addressing not only the private lands but also the public lands. They should be included from the beginning in data collection, analysis, report preparation, and public meetings.

Photo credit: Brian Blanchard

Recently control burned pitch pine forest, Plymouth, MA

Study Site

Local land managers in the Northeast are interested in promoting the pine barren ecosystem because it is home to many rare and endangered plant and insect species and has been heavily impacted by development. In addition, the region has many wildland-urban interface communities that are considered at danger from wildland fire, as listed under the National Fire Plan (USDA and USDI 2001). We wanted to learn where the public in the pitch pine barrens of the Northeast stood on different types of management. A written survey was sent to residents of the towns of Brookhaven and Southampton, New York, in the Central Pine Barrens of Long Island and to residents of Plymouth and Carver, Massachusetts, in the Plymouth Pine Barrens. The two study areas are similar in having rapidly growing populations, yet still containing large areas of state-owned forest land. The Central Pine Barrens, twice as large as the Plymouth Pine Barrens, covers approximately 102,500 acres.

Like many areas in the Northeast, there is no USDA national forest land in the study areas, although the Federal government owns significant acreage in New York at the Brookhaven National Laboratory. There is some commercial logging in the Plymouth region on private and State lands, but almost none on Long Island. Fuel-hazard reduction management is increasing in both study areas; State officials are beginning to conduct prescribed burns in conjunction with local environmental groups.

Methods

We worked with local, State, and Federal land managers, as well as environmental groups to develop a survey to learn about local residents' perceptions of wildand fire danger and attitudes toward fuel-hazard reduction techniques that land managers are considering using in these study area. In Massachusetts, 497 surveys were mailed to seasonal and year-round residents and landowners living within a 2-mile radius of Myles Standish State Forest in Plymouth and Carver, Massachusetts. This sample included seasonal residents who leased cottages in the State forest. A total of 153 completed surveys were returned for a response rate of 35 percent.

The Long Island sample included year-round residents of Brookhaven and Southampton, New York, who lived in subdivisions within two blocks of large forested tracts of land. A total of 135 completed surveys were returned from a sample of 503 residents for a 27-percent response rate. Both study areas were identified by local fire officials as being at risk from wildland fire. Thus, a total of 288 local residents of the two Northeast pine barrens participated in this survey. The data from the surveys were entered into a statistical software package and analyzed using several data analysis techniques. The survey results were also compared to those found in other regions of the country.

References

Irland, L.C. 1999. The Northeast's changing forest. Cambridge, MA: Harvard University Press. 432 p.

Monroe, M.C.; Pennisi, L.; McCaffrey, S.; Mileti, D. 2005. Social science to improve fuels management: a synthesis of research related to communicating with the public on fuels management efforts. Gen. Tech. Rep. NC-267. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 42 p.

Sturtevant, V.; Moote, M.A.; Jakes, P.; Cheng, A.S. 2005. Social science to improve fuels management: a synthesis of research on collaboration. Gen. Tech. Rep. NC-257. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 84 p. Also available on line at http://www.treesearch.fs.fed.us/pubs/13123.

USDA and USDI (U.S. Department of Agriculture and U.S. Department of the Interior). 2001. Urban wildland interface communities within the vicinity of Federal lands that are at high risk from wildfire. Federal Register. 66(160): 43384.