Forest Stewards Guild

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Effective Wildfire Mitigation in the Wildland-Urban Interface: A Research Summary

SUMMARY

THE WILDFIRE THREAT

Wildfire threatens people and homes across the U.S. When homes are built in and around forests they become part of the wildland-urban interface (WUI). There are about 190 million acres of WUI in the U.S., 44 million houses in the WUI, and 99 million WUI residents or 32 percent of the U.S. population.* And the WUI continues to grow. In the lower 48 states, the WUI grew by nearly 20 percent during the 1990s. Much of the WUI occurs in fire-adapted forests, which need fire to be healthy. For much of the 20th Century, an aggressive and successful effort suppressed most forest fires. However, fire cannot be excluded from fire-adapted forests forever. Now dense, unhealthy forests have created a hazard for people in the WUI. The number of large fires, acreage burned, and fire severity have all increased in recent decades. Large, high-severity wildfires have a devastating impact on lives, property, and forests. For example, California's 2013 Rim Fire destroyed 11 homes, cost $127 million to suppress, ruined as much as $265 million in private property, and caused a loss of environmental benefits that could be as large as $736 million. Disastrous wildfires like this are likely to become more common as the climate gets warmer and drier.

2013 Jaroso Fire via InciWeb (above)

Hundreds of millions of dollars have been spent on planning, education, and fuel reduction treatments in the WUI, yet there is little information on the effectiveness of these efforts. To address this need, we conducted an assessment of the mitigation activities in communities across New Mexico. We examined how fuel treatments change modeled wildfire behavior in 12 WUI areas, analyzed over 2,000 assessments of home wildfire hazard, studied the community hazard reduction program called Firewise, and finally integrated these different pieces of WUI mitigation efforts by studying the implementation of nine Community Wildfire Protection Plans (CWPPs). CWPPs are a key focal point because they facilitate the public's participation in wildfire threat reduction, set priorities for fuel treatments, and are required to access certain funding sources. Over 17,000 CWPPs have been written to guide wildfire mitigation in the WUI. Each CWPP can be very different because of local decisions about scale, approach, areas of emphasis, and depth. This summary presents lessons learned and strategies for success for creating CWPPs and mitigating wildfire in the WUI.

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*For references please see the full report *Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland-Urban Interface* available at www.foreststewardsguild.org

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Our analysis indicated successful CWPPs usually include active community participation, engaged federal agency staff, clear prioritization, planning at an effective scale, and avoid formulaic CWPPs written just to access funding.

LESSONS LEARNED: EFFECTIVE WILDFIRE MITIGATION IN THE WUI

People are the key

If there is one element that seems to make the difference between a living CWPP that helps drive real wildfire mitigations and an unused CWPP, it is an actively-engaged planning team (often called a CWPP Core Team) that meets regularly and has strong personal relationships. In one case we examined, the paper version of the CWPP is brief and unimpressive, but the Core Team has achieved impressive results. The Core Team met before, during, and after the development of the CWPP and was able to implement a range of treatments and drive a reduction in home hazard throughout the community. Interviews from CWPPs also point to a paid WUI coordinator as one way to promote an engaged Core Team.

CWPP planning processes that are inclusive and build trust are linked to successful outcomes. In contrast, CWPPs developed through processes that omit affected parties and disregard local relationships do little good. Consultants with little connection to local community often use boilerplate CWPPs and undervalue public involvement. Engaging agency support during the CWPP process is important because agency staff can bring resources and expertise, as well as instill confidence that the plan will drive treatment on public land.

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Prioritizing treatments

Clear prioritization of implementable projects makes a CWPP useful for managers and can speed implementation. The importance of prioritization is clear: it focuses resources and attention on the most at-risk areas and the most important projects.

Joe Stehling

Reina Fernandez

Prioritization facilitates implementation by streamlining planning and helping to match funding to projects.

Planning scales

While county plans fit well with many administrative boundaries and provide a synoptic view of the wildfire hazard, the community scale is better suited to identify individual projects. Managers and residents can develop new plans at the community scale that build off of the many existing county CWPPs and avoid duplicating time-consuming efforts such as mapping wildfire risk. Vulnerable populations, such as the poor, the elderly, and people with disabilities, are at particularly high risk from wildfire; future plans should consider their needs, which may be best accomplished at the community rather than the county scale.

Ensuring that plans work

Effective WUI mitigation work requires avoiding a plan that will just sit on the shelf. One way to avoid paying for plans that are never used is for funding agencies to require concrete evidence of engagement such as regular Core Team meetings. A related issue is the lack of integration between CWPPs and other plans, which contributes to duplication and wasted effort. However, all-hazard, zoning, and other planning efforts are likely to involve many of the same agency staff and engaged residents as CWPPs, so relationships built within CWPP Core Teams could be advantageous to other planning efforts.

Fuel reduction treatments

Our fire behavior modeling for CWPPs in New Mexico demonstrates that where communities and land managers have made a concerted effort, treatments can change wildfire behavior enough to give firefighters the opportunity to protect lives and properties. Modeling showed a reduction in active crown fire and some reductions in flame length. This modeling fits well with the growing body of research that shows fuel treatments can change fire behavior, particularly when thinning is combined with removal of surface fuels. Prescribed fire is often the most efficient way to remove surface fuel over large areas. However, fuel reduction treatments are not occurring fast enough or across enough of the landscape to stop all wildfires.

Home hazard mitigation

Even with effective fuel reduction in the forest, wildfires are part of fire-adapted ecosystems, so residents need to reduce home ignitibility as a complement to forest fuel reduction. Our analysis of home hazard assessments indicates that two-thirds of homes lack key elements of defensible space. However, nearly 20 percent of the average home hazard could be reduced by undertaking the easiest mitigation steps. The community hazard reduction program, Firewise, is one tool that can build on the power of neighbors encouraging neighbors to undertake mitigation efforts. Our interviews indicate residents like the Firewise program and feel it has made a difference in their communities.

Documenting success and weathering transitions

Where mitigation efforts like Firewise have been successful, it is important to document and trumpet successes. The spread of Firewise to nearby communities underscores the positive impact that sharing successes can have. The same is true for fuel treatments. Mapping where treatments have occurred can build momentum and communication across land management agencies. The sharing of information allows managers from different agencies to talk, and be able see the spatial connections between their efforts on a map. Data tracking and sharing can also help protect against the negative impact of staff transition. Keeping an accessible record of projects and successes reduces the risk that the departure of an individual will mean loss of important information and momentum.

Meredith Flannery (above)

Maintaining treatments and momentum

One of the biggest challenges facing WUI communities is the maintenance of treatments and home mitigation efforts. Wildfire hazard reduction is not a one-time task. Forest fuel reduction treatments only affect fire behavior until trees and vegetation grow back, often in 10 years or less. Similarly, campaigns to promote home mitigation can lose momentum, particularly because of the importance of individuals as community catalysts. Future wildfires may reinvigorate mitigation programs just as wildfires helped motivate some communities begin mitigation programs. Communities and managers should be ready to channel the concern and attention nearby wildfires generate into productive mitigation efforts.

Planning for post-fire

Even the most effective wildfire mitigation cannot eliminate wildfire from fire-adapted ecosystems, so communities need to plan for their post-wildfire response and recovery even as they reduce wildfire hazard. Some CWPPs already include recommendations to develop post-fire Burned Area Emergency Rehabilitation protocols for each local watershed. Preplanning can significantly reduce the impact of wildfires on communities and enhance their recovery after wildfire.

Conclusion

The challenge of wildfires in the WUI will continue to grow. More houses will be built and wildfires will likely grow in size and severity. Our review of past studies and an in-depth look at WUI mitigation in New Mexico shows there is no perfect solution, no silver bullet, to protect lives and properties within fire-adapted ecosystems. Creating fire-adapted communities requires a combination of fuel treatments and home hazard mitigations. Effective treatments are guided by a strategic CWPP and include both thinning and surface fuel reduction. Neighbors and community catalysts are crucial for expanding and deepening the adoption of home mitigation measures. While fire can never be completely eliminated from fire-adapted ecosystems, building fire-adapted communities links the wide range of WUI mitigation approaches in a way that can significantly reduce the impacts of wildfires on communities.

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The Forest Stewards Guild practices and promotes ecologically, economically, and socially responsible forestry as a means of sustaining the integrity of forest ecosystems and the human communities dependent upon them. Our members are foresters, conservationists, resource managers, scientists, students, forestland owners, policy makers, and land stewards working in forests throughout the United States and Canada. Our research program synthesizes existing knowledge and conducts novel scientific studies as a complement to Guild member's place-based experience.

This summary is based on a larger research report entitled, *Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland-Urban Interface* available at www.foreststewardsguild.org. This project was supported by Joint Fire Science Program grant #11-1-3-10.

The large cover photo is from the 2013 Doce Fire and the small photo is from the 2015 Rough Fire. Both are from InciWeb.nwcg.gov.