Ecological Restoration Institute

Fact Sheet: *Managing Naturally Ignited Wildland Fire to Meet Fuel Reduction and Restoration Goals in Frequent-Fire Forests*

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Managing Naturally Ignited Wildland Fire to Meet Fuel Reduction and Restoration Goals in Frequent-Fire Forests

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Introduction

Fire is a key process that has played a central role in structuring and regulating the function of forest ecosystems over millennia. There is increasing interest in using fire, particularly naturally ignited wildland fires (Figure 1), to provide a cost-effective alternative, or complement, to mechanical thinning. However, more information about the efficacy of wildfire providing ecological, economic, and social benefits is needed. This fact sheet provides a brief overview of policy guidelines, benefits, costs, and constraints for managing naturally ignited wildland fire in order to meet fuels reduction and restoration objectives.

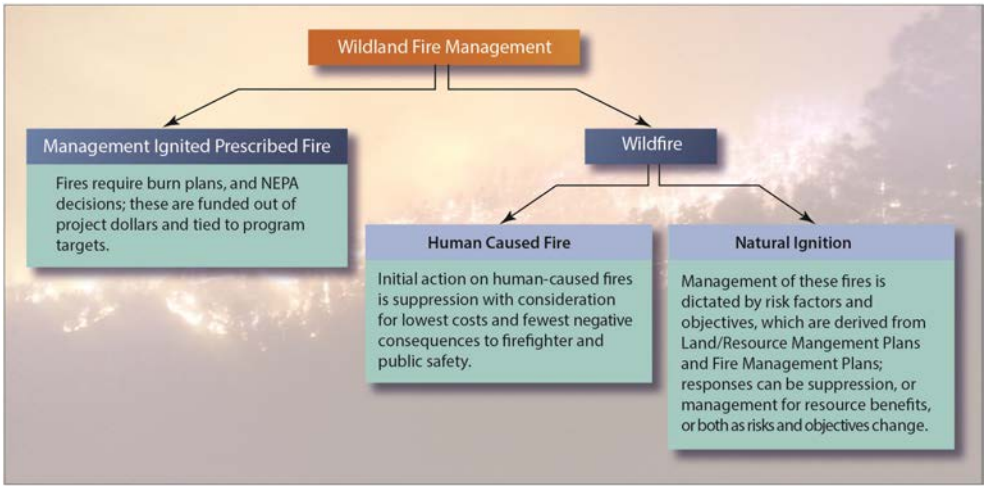

Figure 1. *Decision tree for public land management of wildland fires as based on interagency policies and guidelines.*

Naturally Ignited Wildland Fire Use Planning

Policy guidance allows managers to meet a variety of resource objectives for naturally ignited wildfires (*see* USDA and USDOI 2009).

- Following a natural ignition, fire managers are required to assess the fire and identify an appropriate strategic response. This guidance is in contrast to human-caused wildfires where initial action is restricted to suppression rather than management for resource benefit.
- Appropriate responses to naturally ignited wildfires depend on the Land/Resource Management Plans (LRMPs) and Fire Management Plans (FMPs) for that administrative unit. The web-based Wildland Fire Decision Support System (WFDSS) provides managers with a suite of analysis tools including fire spread probability and spatially explicit analysis of resources at risk (Calkin et al. 2011).
- LRMPs and FMPs must identify areas where using naturally ignited wildland fire is suitable. Key assessment elements include: safety, cost efficiency, a foundation of sound science, objectives or desired outcomes, risk assessment and, where applicable, the involvement of other agencies, cooperators and partners.
- The process associated with managing a wildland fire for resource benefits is more efficient than that of management-ignited prescribed fire because it is not subject to extensive review and appeals at the time of ignition. The planning and environmental analysis for managing a wildland fire is completed upfront when the LRMP or FMP is developed. Thus, planning activities associated with managing a wildland fire are more strategic, whereas management of prescribed fire requires specific analysis and decisions.

- The FMP is not a decision document. It outlines implementation and operational strategies only (i.e., where managed wildfire can occur and what resources need protection).
- Under current guidelines, a wildland fire may be managed to accomplish one or more objectives, and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, and topography; varying social understanding and tolerance; and involvement with other entities.

A firefighter monitors fire activity on the Armstrong Fire, Kaibab National Forest, Tusayan Ranger District. The lightning-caused fire was ignited on August 8, 2011 and burned 2,500 acres. The wildfire was managed for the following resource objectives: returning fire to a fire-adapted ecosystem, enhancing wildlife habitat, and protecting private property, cultural and range resources. Photo courtesy of USFS

BENEFITS, COSTS AND CONSTRAINTS

Benefits, costs, and constraints of managing wildland fires for resource benefit generally revolve around ecological efficacy, risk, economics, predictability, and social acceptance. Although new tools are being developed to predict fire effects and risk (*see* Keane and Karau 2010, and Taber et al. 2013), managers rely on expert judgment and are ultimately responsible for outcomes. A desire to strictly minimize risk can lead to a suppression strategy rather than allowing a fire to burn for resource benefit. Uncertainty about actual benefits versus costs also influences management decisions.

Benefits

Managed wildfires can reduce hazardous fuels and restore more open stand structure in frequent-fire forests that have become dense as a result of decades of fire exclusion (Fulé et al. 2004, Fulé and Laughlin 2007, Hunter et al. 2011, Larson et al. 2013).

- Small patches (<200 acres) of high-severity fire (i.e., where most trees are killed) may contribute to landscape-scale heterogeneity and emulate historical patterns in some dry forests (Iniguez et al. 2009, Margolis and Balmat 2009).
- Use of natural ignitions is often a more acceptable treatment option than mechanical thinning for remote, roadless, and Wilderness areas (Miller 2003).
- Heterogeneous effects of wildland fire that leave standing dead trees, dead and down logs, and patches of early successional plants may provide important habitat for a range of wildlife species (Halofsky et al. 2011).
- Wildfires managed for resource benefit may represent a low-cost option for meeting fuels reduction and restoration goals in comparison to mechanical methods (North et al. 2012). Although data aren't readily available in published literature, costs may be assumed to be similar to prescribed fire, if suppression efforts are minimal. In addition, a decision to allow a wildfire to burn under acceptable fuels, weather, and topographic conditions may save overall costs compared to implementing a suppression strategy, when looking at suppressing a subsequent fire in the same area with more adverse burning conditions.

Costs/Constraints

- Predicting where and when a wildfire will occur, and whether its effects will be beneficial or detrimental to ecosystems or other values is imprecise.
- Variability in fire effects on stand structure may create coarse-grain landscape patterns that do not closely resemble pre-fire exclusion spatial characteristics of many frequent-fire forests (Sánchez Meador et al. 2011, Larson and Churchill 2012, Reynolds et al. 2013).
- Low-intensity fires that consume surface fuels and raise crown base heights without affecting stand structure may reduce potential for crown fire while doing little to restore ecosystem health.
- High costs and resource allocation needed to suppress escaped fires are likely to negate any anticipated economic benefits. In fact, suppression costs are likely to be higher than if mechanical treatments had been done to reduce fuel loading and fire behavior (North et al. 2012).

- Public acceptance is not as strong for letting naturally ignited wildfires burn as it is for suppression or for utilizing intentionally ignited prescribed fires (Kneeshaw et al. 2004).
- Although not a direct cost, there are a lack of incentives for managers to implement management of wildland fire to accomplish resource objectives.

CONCLUSION

Naturally ignited wildland fires have strong potential for complementing prescribed fire and mechanical thinning to meet fuels reduction and restoration goals. However, managers must weigh the risks and benefits in ecological, economic, and social terms. New tools (e.g., WFDSS) to help with this process recently have been developed and continue to be refined. Policy guidelines assist in providing flexibility and accountability for decisions at multiple steps in planning and management processes. With the formidable extent of forest health, fuels accumulation, and uncharacteristic crown fire problems across the western U.S., it is recommended that managers consider greater use of wildland fire to complement other strategies for meeting fuels and restoration goals. In addition to increasing incentives and streamlining policies, more research is needed to better understand strategies that bolster success of wildland fires for meeting ecological objectives across the landscape at all scales.

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