Wilderness Fire Management in a Changing World

BY CAROL MILLER

Several strategies are available for reducing accumulated forest fuels and their associated risks, including naturally or accidentally ignited wildland fires, management ignited prescribed fires, and a variety of mechanical and chemical methods (Omi 1996). However, a combination of policy, law, philosophy, and logistics suggest there is a more limited set of fuels management activities that are appropriate in wilderness (Bryan 1997; Parsons and Landres 1998; Nickas 1998). Naturally ignited wildland fires is the commonly preferred fuels management strategy in wilderness (Miller 2003), with management-ignited prescribed fire being considered in some cases (Landres et al. 2000). Restoring the ecological role of fire to wilderness has proven difficult, as the majority of lightning-caused ignitions in wilderness are suppressed for myriad biophysical and social reasons (Morton et al. this issue; Miller and Landres 2004; Parsons and Landres 1998). This article discusses fire management options currently available to managers of wilderness in the United States and speculates how these might change with nationally and globally important influences.

Carol Miller.

Wildland Fire Use in U.S. Wilderness

Wilderness fire managers in the United States have a range of options for responding to unplanned (naturally or accidentally caused) ignitions, and the appropriate response should be based on ecological, social, and legal consequences of the fire (USDA and USDI 2001). U.S. federal fire policy currently distinguishes two types of wildland fire that can result from unplanned ignitions: wildfire and Wildland Fire Use (WFU). Wildfire is unwanted fire that results from either human or natural causes, and the management objective is to stop the spread of the fire and extinguish it at the least cost (USDA and USDI 2001). In some cases, concerns about firefighter safety and suppression costs will result in a less aggressive suppression response to a wildfire, with features of the landscape being used to allow fire to burn within a designated area. WFU is the management of naturally ignited wildland fires to protect, maintain, and enhance resources in predefined areas outlined in fire management plans (USDA and USDI 2001). The management objective is to allow fire, as nearly as possible, to function in its natural ecological role. In some cases, certain suppression tactics might be used with WFU to protect life, property, or specific values of concern. Recently, there has been discussion about effectively dissolving the distinction between wildfire and WFU, and managing all wildland fires with an appropriate management response (AMR) (USDA and USDI 2005c).

The use of naturally ignited wildland fires to achieve resource objectives on federal lands began in the 1960s (Aplet, this issue). At that time, these fires were called Prescribed Natural Fires (PNFs); a policy change in 1995 introduced the new terminology of Wildland Fire Use (WFU). Since the early 1970s, when policies were first implemented to use natural ignitions, well over 1 million acres (404,858 ha) have been allowed to burn by either PNF or WFU in national parks and national forests, with the vast majority of PNF or WFU occurring within designated wilderness. Over the past 35 years, WFU has been implemented with varying degrees of success in wilderness. In recent years there has been increased application, and the expectation by managers is that it will continue to increase (Miller and Landres 2004). There is also increasing application of WFU outside wilderness, and a significant portion of the total area burned by WFU during the fire season of 2005 occurred outside designated wilderness.

Information collected through telephone and email interviews in 2003 indicate that at least 29% of wilderness units in the United States have the necessary authorization for WFU in approved land and resource management plans (LRMPs) and fire management plans (FMPs) (unpub. data) (see figure 1). The percentage of areas with authorization for WFU has likely increased in the past two years as the FMP process has continued (e.g., USDA and USDI 2005b). Furthermore, all federal lands in Alaska have strategies equivalent to WFU, but the terminology of WFU is not necessarily used. More than half of the wilderness units in Alaska have a written FMP that explicitly allows WFU, but those that don't are not included in the 29% figure.

Not surprisingly, there is a tendency for managers of larger wilderness areas to have the WFU option (see figure 2). Because fires are more likely to escape from a smaller wilderness area, local and regional staff may consider WFU an infeasible strategy in those smaller areas, and WFU is less likely to be authorized in the plans. Oftentimes, the considerable effort involved with revising and updating a plan is not seen as worthwhile if there is little opportunity for WFU.

However, even in many wildernesses where the fire management plan allows for WFU, the majority of lightning ignitions are suppressed (Morton et al., this issue). Where the potential for fire to escape the wilderness boundary is high and when fire behavior can be expected to be erratic or of high intensity, managers may feel less comfortable making the WFU decision (Miller and Landres 2004; Doane et al. 2005). Furthermore, there is an inherent difference in the longevity of a typical suppression fire versus a WFU event. Suppression fires typically have a lifetime of days or a couple of weeks, whereas the WFU decision requires commitment by a manager to living with that fire—along with any changes in resources or weather—for the remainder of the fire season.

Forces of Change

To anticipate the future of WFU in U.S. wilderness, one needs to consider the dynamic human and ecological environments within which any wilderness area resides. Many factors can be expected to restrict or expand the range of options available to fire managers, but two of the strongest influences will likely be human development patterns and climate.

Rural areas, particularly in the western United States, have seen dramatic increases in human populations during the past few decades. Much of this increase has resulted in the creation and expansion of the wildland-urban interface (WUI), where wildland vegetation and houses intermingle (Radeloff et al. 2005). As housing densities increase and the WUI continues to expand, the potential threats to life and property from wildland fire increase (Hammer et al. 2004). Where WFU is not yet an option, the continued expansion of the WUI casts serious doubt on whether revisions of management plans will ever authorize the strategy. Where WFU is already an option, wilderness fire managers will find it increasingly difficult and costly to mitigate the risks posed by WFU. The result could be fewer decisions to exercise the WFU option.

The impact of encroaching human development will be felt most intensely

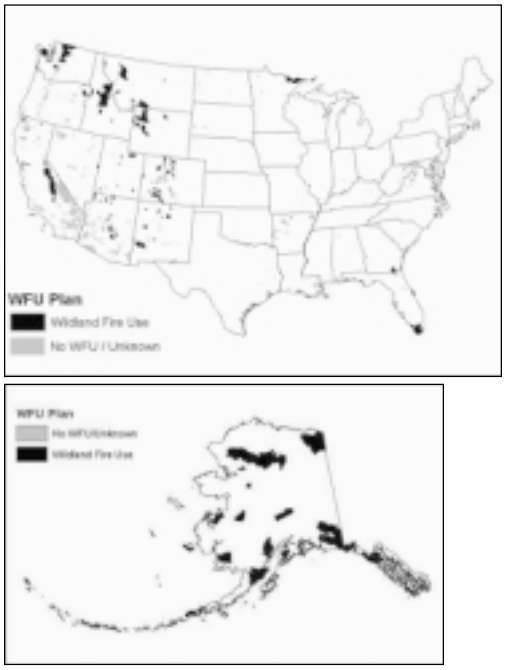

Figure 1—Status of authorization for WFU in US wilderness areas.

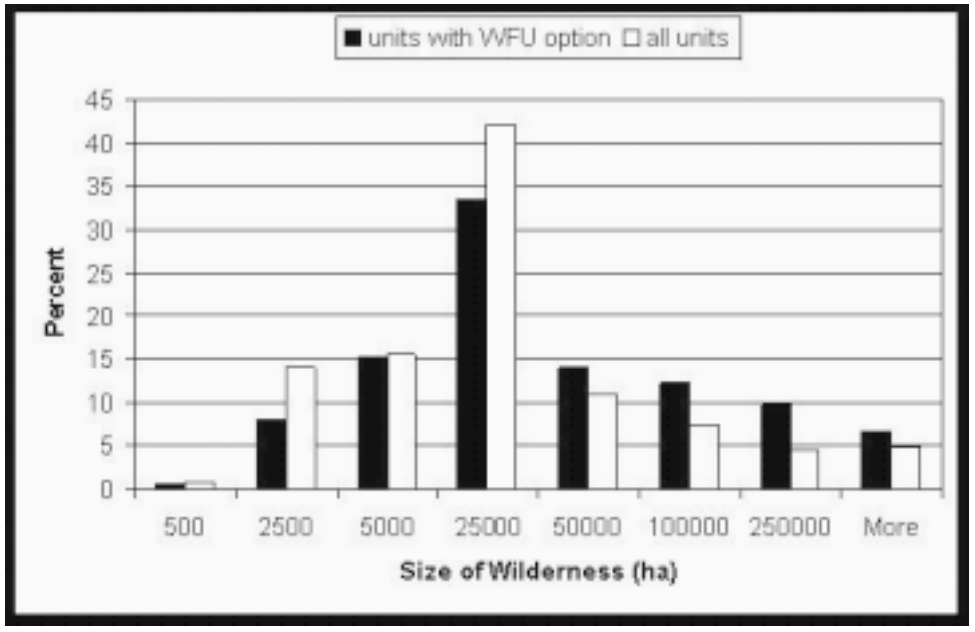

Figure 2—Size distribution of wilderness units with the necessary authorization for WFU in approved LRMPs and FMPs compared to size distribution of all wilderness areas.

Figure 3—Because of the risks involved, WFU may not be feasible in all wildernesses, and in such cases, management-ignited prescribed fire may be a viable option. Photo by U.S. Forest Service.

by managers of smaller wilderness areas, where there is a higher likelihood of fires escaping. Managers of wilderness with certain shapes and geographic orientations will also face additional challenges. For example, wilderness areas situated along mountain ranges in the western United States are typically oriented north-south, as are the adjacent populated valleys. This orientation is problematic for the fire manager because the prevailing wind direction—which influences direction of fire spread—is west-east. In these kinds of settings, the decision to implement WFU may be especially difficult.

Forecasts about future climate include warmer temperatures in winter and summer, with an unprecedented rate of warming (IPCC 2001). This is likely to lead to increased drought, longer fire seasons, and more area burned (McKenzie et al. 2004). Snowmelt will occur earlier at high elevations, bringing more area within a wilderness into the fire season for a longer period of time. All of these forecasted changes will compound the challenges currently faced by wilderness managers. Wilderness managers may find it more difficult to handle the increased load of fire activity that can be expected under a future climate. Longer fire seasons will require longer-term commitments to managing a WFU, potentially stretching the comfort level of many managers. Fire intensities and spread rates increase with dry conditions (Catchpole et al. 1998). If WFU decisions are limited now by concern over expected behavior and risk of escape, managers may become even more reluctant to make the WFU decision in a warmer and drier climate. Finally, under drier conditions, we can expect individual fires to be larger, and perhaps more often spread out of a wilderness.

Figure 4—The impact of encroaching human development will be felt most intensely by managers of smaller wilderness areas, where there is a higher likelihood of fires escaping. Photo by U.S. Forest Service.

The Prescribed Fire Option

Because of the risks involved, WFU may not be feasible in all wildernesses (Parsons 2000), and in such cases, management-ignited prescribed fire may be a viable option (see figure 3). Changes in housing development patterns and climate that present increased challenges for the application of WFU may make prescribed fire an attractive option to wilderness managers (see figure 4). However, for philosophical, ecological, and practical reasons, the use of prescribed fire in wilderness will likely be limited. Philosophically, prescribed fire represents a manipulation that is inconsistent with the "untrammeled" intent of wilderness described in the 1964 Wilderness Act (Nickas 1998). Ecologically, prescribed fires may not be an adequate substitute for natural fire (Baker 1994). Finally, prescribed fire will not be a practical option for many wilderness areas that are typically difficult and costly to access.

The implementation of prescribed fire in wilderness is fundamentally different from WFU implementation. To meet the requirements of the 1969 National Environmental Policy Act, prescribed fires must undergo some form of public review, but this review can be done on a case-by-case basis and so prescribed fire use does not have to be approved in the LRMP or FMP. Even so, as of 2003, 42% of wilderness units had the authorization for prescribed fire explicit in their management plans. This is probably because many wilderness fire managers do not feel

comfortable conducting prescribed burns in wilderness unless the fire management plan explicitly prescribes it.

Conclusion

How we steward wilderness fire in a changing environment requires that we recognize our management options may be changing. The combination of increasing development and a warmer climate is likely to make the decision to implement WFU more difficult in the future. It is more important than ever for the wilderness management community to fully exploit available options now. Management actions taken today will influence the range of options that will be possible in the future, widening or narrowing the future decision space for WFU.

The option of WFU needs to be made available in many areas where it doesn't currently exist. In many cases, this requires not only the revision and update of FMPs, but also revision of LRMP. The recent trend in fire management planning efforts of extending the WFU option to lands outside wilderness, especially in the western United States, will improve the ability of managers to more fully realize WFU objectives. In many cases, improved cooperation across agencies will also be necessary. The management flexibility of allowing a WFU fire to cross political boundaries essentially increases the effective size of wilderness and makes it easier for a wilderness manager to make the WFU decision.

Where WFU is already an option, managers need support and incentives for implementation (Aplet, this issue). Fire management decisions made today have great potential to keep future management options open because today's fires can serve as tomorrow's strategic firebreaks on the landscape. Increasing the implementation of WFU will mean helping managers overcome some of the barriers and disincentives for WFU (Doane et al. 2005).

WFU is the management of naturally ignited wildland fires to protect, maintain, and enhance resources in predefined areas outlined in fire management plans.

WFU is arguably one of the most effective fuels management strategies we have, but it needs to be integrated with other fuels management strategies on surrounding lands, and in some cases, in wilderness. As WFU becomes more difficult to implement, wilderness managers will need to identify if, when, and where WFU needs to be supplemented with prescribed fire or other fuel manipulations. As such, we can expect the debate about when and where prescribed fire is appropriate in wilderness to intensify in the future. Although this debate may not be easily resolved, it will play a key role in shaping future stewardship of wilderness. **IJW**

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research will help address the uncertainties and resulting fears that currently prevent managers and the public from taking full advantage of WFU.

Policies should also support public education about the benefits of fire to wilderness ecosystems and to people. Smokey Bear and other fire prevention programs have proven the effectiveness of public education. Similar efforts aimed at increasing public knowledge about fire, particularly efforts aimed at changing sensationalist media coverage, could also mitigate public fear and produce a society supportive of wilderness fire. A better understanding of fire ecology will be necessary among the public, but especially among air quality regulators, before policies can be developed that simultaneously address human health effects of smoke and sustain healthy wildland ecosystems.

Finally, perhaps the most important policy step that can be taken is to address public fear through necessary fuel treatment work in and around communities to lower fire danger. Only when people begin to feel safe in their homes will they warm to the idea of expanded wilderness fire. Resources are urgently needed to support planning and implementation of fuel treatment on private lands where the community protection challenge is most acute. **IJW**

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GREGORY H. APLET is senior forest scientist in The Wilderness Society's Denver office, at 1660 Wynkoop Street, Suite 850, Denver, CO 80202, USA. greg_aplet@tws.org.

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CAROL MILLER is a research ecologist, studying how to steward fire as a process in wilderness, at the Aldo Leopold Wilderness Research Institute in Missoula, Montana. She can be reached at cmiller@fs.fed.us.