What Is Limiting More Flexible Fire Management—Public or Agency Pressure?

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ABSTRACT

Conventional wisdom within American federal fire management agencies suggests that external influence such as community or political pressure for aggressive suppression are key factors circumscribing the ability to execute less aggressive fire management strategies. Thus, a better understanding of external constraints on fire management options is essential. This entails validating or refuting the perceptions of fire managers about the relative constraints that external pressures place on their ability to implement more flexible fire management options. In the summer of 2008, our research team traveled to two fires—the Gap in California and Gunbarrel in Wyoming—each of which used a different strategy for managing the fire. At each site, we interviewed key agency individuals and asked them about internal and external factors that influenced their fire management decisions. We also interviewed community members to understand whether they sought to influence fire management. Internal factors included procedural requirements and agency beliefs and attitudes. External factors included political and community pressures from the public who are often perceived to demand an aggressive suppression response. This article details how these internal and external factors influence flexibility in fire management. Our findings did not wholly support conventional wisdom and suggest that internal pressures are as important as external pressure in shaping fire management strategy.

Keywords: fire management, political pressure, community pressure, wildfire costs, fire suppression, wildfire policy

In recent years, wildfires have had growing societal impacts as more acres are burned, more people are affected, and cost of fighting wildfires has risen (National Academy of Public Administration [NAPA] 2004, Wildland Fire Leadership Council [WFLC] 2004). Several factors contribute to the problem including accumulation of fuels from decades of fire suppression, the growing number of houses being built in fire-prone areas, and global climate change leading to increased incidence of drought and disease outbreak (Dombeck et al. 2004, Gorte 2004, Stewart et al. 2005, Westerling et al. 2006, Quadrennial Fire Review [QFR] 2009). Federal fire officials believe that to face these challenges, fire management agencies need a more flexible approach to fighting fires than the historic, singular emphasis on total suppression (QFR 2009). The traditional suppression focus is seen as more likely to put firefighters at risk and misuse resources while losing opportunities to reintroduce fire. The use of a wider range of strategies beyond full suppression is seen as leading to more cost-effective fire management over time and longer-term land-management benefits. However, shifting from the long-established dynamic of suppression is not simple, because both policy and practice must adapt. One of the perceived challenges to implementing greater flexibility in fire management is political and community pressure to engage in the traditional practice of suppression. Conventional wisdom suggests that communities want to see fires suppressed and clamor to ensure that this happens. This is an empirical question worthy of investigation, because as perceptions shape action it is important to understand how real such perceived constraints actually are. In this article, we seek to identify the relative influence of external factors in comparison with internal agency processes and practices in shaping fire management decisions. In the following sections we provide an overview of relevant wildfire policies that relate to understanding fire management decisions on the ground and how various internal and external variables factor into fire management decisions. We crafted a framework based on a literature review and analyzed two case studies from the 2008 wildfire season to better understand the relative in-

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fluence of internal or external factors in driving wildfire management.

Background

Fire Management Policy

We contextualize our work in the following policy history to illustrate the challenges faced in moving toward more flexible management. There are many constraints, both internal and external, that inhibit implementing policy to its fullest extent. The history of wildfire policy is replete with exhortations to broaden management beyond suppression, but the full implementation of these policies has been slow to follow. Consequently, a review of policy in light of its effect on fire management is helpful to convey the general policy context in which on-the-ground decisions are made.

The dominant wildfire policy for more than 100 years can be characterized in one word—suppression. Other policies have competed but none have been as effectively implemented as the suppression policy, which defines the wildfire problem and goal narrowly—fire poses a threat to timber resources and human communities so all fires must be extinguished (Saveland et al. 1988, Pyne 1997 [1982]).

Since the 1960s, a number of incremental steps have been taken to alter the dominance of the suppression focus. In spite of these policy modifications, actual practices in the field have been slow to change. Initially, the National Park Service (in 1967–1968) and the US Forest Service (in 1978) revised their policies to allow for less aggressive strategies. Fire control (i.e., suppression) was renamed fire management and both agencies encouraged managers to allow natural fire to burn in wilderness areas. A policy review after 34 firefighters perished in 1994 led to the 1995 Federal Wildland Fire Management Policy, which emphasized safety above all else (US Forest Service and US Department of the Interior [USDI] 1995) and encouraged all federal agencies to allow naturally ignited fires that fell within specific parameters to burn ("wildland fire use" [WFU]) and reintroduce fire through management-ignited fires ("prescribed fire"). All other fires were called wildfires, defined as unwanted fires, whether ignited by humans or nature. The 1995 document also introduced the concept of appropriate management response (AMR), defined as actions that are appropriate given the laws, policy, sociopolitical situation, and environmental conditions that are in effect at a given point of time (US Forest Service 2006). This allowed for use of a broader spectrum of firefighting options than full suppression, including encircling the fire completely to contain it (full suppression or perimeter control), focusing protection on specific high-value resources or targets such as houses or endangered species (point protection), using prescribed fire to burn large areas to help control an unwanted fire (large-scale burnout), tracking wildfire and then intervening when necessary (monitor, confine, and contain), creating strategic areas where wildfire would be difficult to cross (fuelbreaks), and allowing wildfire to burn in areas that could reap ecological benefits without having to aggressively put out the fire (WFU) (US Forest Service 2006). The dramatic wildfire season of 2000, which included an escaped prescribed fire that threatened Los Alamos National Laboratory saw 861 structures burn and more than $1.3 billion spent on suppression, spurred revision of the 1995 policy (US Forrest Service and USDI 2001, Fleeger 2008). The resultant 2001 Federal Wildland Fire Management Policy committed all federal agencies with fire management–related programs and activities to managing fire as an ecosystem component where the natural role of fire would be incorporated into management.

Despite these policy shifts, evidence shows a continued emphasis on suppression. Although the full range of AMR strategies has been part of national policy since 1995, strategies and tactics have continued to primarily consist of variants on full suppression. Kauffman (2004, p. 880) identified that from 1995 to 1997 only 0.2% of US Forest Service wilderness areas and 0.1% of National Park Service wilderness areas were allowed to burn as a result of natural fires. Additionally, from 1998 to 2002, an average of only 296 of more than 85,000 fires/year were managed under the policy of WFU (Kauffman 2004, p. 880). Since that time, these percentages have increased slightly, although the following calculations track a wider array of federal agencies than Kauffman's data. Data from 2000 to 2008 across all federal and state agencies (Bureau of Indian Affairs, Bureau of Land Management, US Forest Service, US Fish and Wildlife Service, National Park Service, and the States) indicate that on average, 316 of 78,522 fires/year were managed under WFU for a total yearly average of 0.4%. Acres burned under WFU out of total acres burned on a yearly basis ranged from 0.08% to a high of 7.7% in 2003, with an average of 3% (National Interagency Fire Center [NIFC] 2010).

Evidently, other factors beyond national policy directives shape actual on-the-ground practices. A survey of US Forest Service wilderness fire managers concluded that barriers to WFU included organizational culture, organizational capacity, policy directives, and public perceptions (Doane et al. 2006). Pyne (2004, p. 875) has suggested that the discrepancy between words and actions is a consequence of "… [L]ack of public understanding, waffling administrators, and a gut-wrenching scarcity of funds." This suggests that the use of approaches other than suppression requires understanding not just how national policy supports decisions but how various internal and external factors at the local level may influence decisions to use or not use less aggressive responses to wildfire.

Local Internal and External Factors that Could Influence Fire Management Decisions

Internally, agencies need to contend with formal and informal practices that institutionally have favored more aggressive strategies, such as suppression, over less aggressive strategies, such as WFU. At the time our research was conducted, a number of aspects of national policy hindered the use of more flexible responses. One key element was that US Forest Service implementation guidelines/requirements, as written in 2007, stated that, for any unplanned wildfire start, only one management objective or strategy could be used. This restricted fire managers from applying both WFU and suppression strategies for different portions of a wildfire or at different points in the management of a wildfire. In addition, managing a wildfire to benefit the broader ecosystem, as an objective of a WFU, requires National Environmental Policy Act (NEPA) approval through the Land and Resource Management Plan (LMP) and a Fire Management Plan (FMP). Furthermore, the decision to manage for WFU had to be made at the time of ignition with the NEPA process complete.

Externally, community and political pressure are argued to be key drivers in the continued focus on suppression: that in effect the public demands a suppression response (NAPA 2004, Canton-Thompson et al. 2008). Agency administrators and fire managers may believe that their options are

limited to suppression-only strategies and tactics due to perceptions that the public wants to see an overwhelming response, planes in the air, and large fire camps on "their fires." Political interest is another external factor that may influence how fires are managed, as powerful political figures may push for use of specific strategies. Under these conditions, agency administrators and fire managers may perceive that WFU strategies are politically risky. Incident Management Team (IMT) members interviewed by Canton-Thompson et al. (2008) discussed "political smokes," a phrase used by some team members to describe cases where external politics pressured them to use resources, strategies, or tactics they would not normally have used and which in many cases they knew would be ineffective. For more flexible management to be practiced as intended, validating or refuting these various perceptions of agency administrators and fire managers about the external constraints is essential.

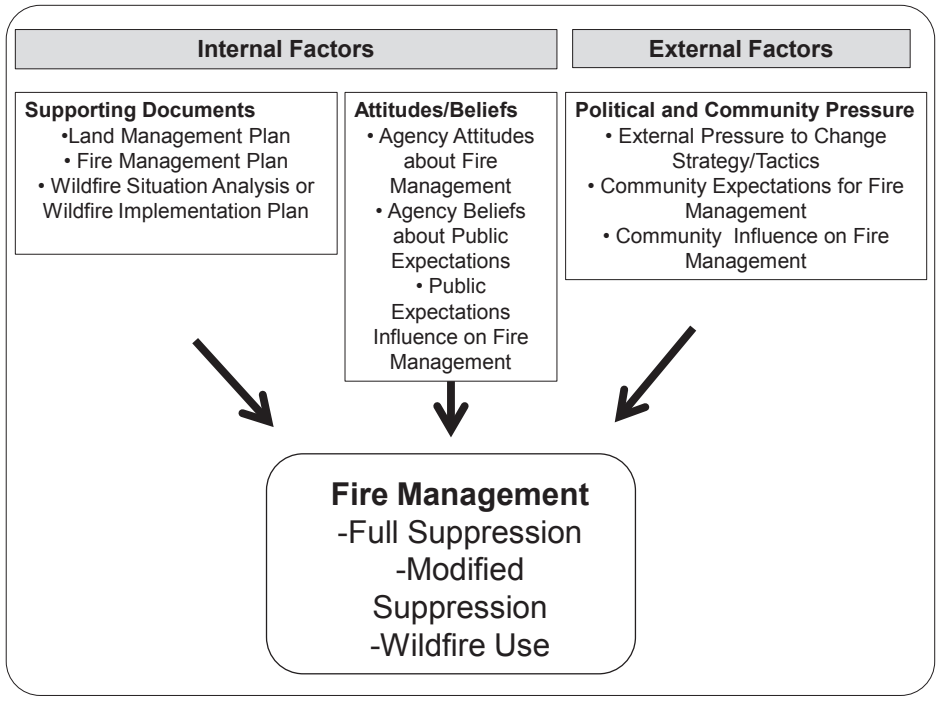

Figure 1. Conceptual framework for understanding internal and external factors in fire management.

Methods and Conceptual Framework

This research sought to understand how these internal and external factors influenced wildfire management. The main hypothesis was that external factors were the main driver of wildfire management decisions. We devised an interview protocol that focused on internal and external factors (see Appendix A), based on the conceptual framework in Figure 1, to try to get a sense for the relative contribution of different factors to the strategy. We conducted research on two fires in 2008: the Gap Fire, which used a full suppression strategy, and the Gunbarrel Fire, which used a wildfire use strategy that was eventually transitioned to a monitor, confine, and contain strategy.

The Gap Fire on the Los Padres National Forest burned nearly 9,500 ac in Santa Barbara County near the town of Goleta in California. This fire took place in a dense urban interface (180,000 people) in 30- to 50-year old chaparral. Nearly 3,000 homes were threatened and more than $2 billion in real estate values were at risk. Fire suppression cost approximately $16 million. No homes were lost. Before the Gap Fire, primary contact with the public about fire management was through the county fire department with a focus on creation of defensible space.

The Gunbarrel Fire on the Shoshone National Forest burned more than 68,000 ac near Yellowstone National Park in Park County, Wyoming. This fire took place in heavy dead and down spruce and fir with 50–80% insect-caused mortality. More than 9,000 people in Cody, Wyoming, were affected by smoke and 245 residences were threatened. Fire suppression cost a little over $9 million. Seven outbuildings were lost. Before the Gunbarrel Fire, local US Forest Service officials had been conducting outreach with the local public and engaging in hazardous fuel reduction projects to create defensible space and opportunities for point protection tactics.

Once a large fire has started, a federal IMT is invited in by the local National Forest Service. The IMT is designed and trained to have the skill set and managerial capacity to manage large wildfires, but ultimately reports to a designated local National Forest Service representative responsible for the fire (Agency Administrator). The IMT and local National Forest Service will work with local cooperators—such as the sheriff; emergency managers; and local, county, or municipal fire managers—to deal with the fire.

We interviewed 11 federal agency representatives (IMT staff and local US Forest Service personnel) and 12 community members for the Gap Fire and 7 agency representatives and 9 community members for the Gunbarrel Fire. Community interviewees were divided into two groups. Those who had formal roles in the fire (e.g., sheriff, emergency management, and more) and those who had informal roles (e.g., key community members). Key community members were identified through their participation in public events (e.g., city council meeting and IMT meeting) or referred to us as a key community informant by others in the process. We transcribed interviews and these were sent back and verified by interviewees. The qualitative data were systematically coded and analyzed by the research team using Atlas.ti software that enables the cataloging, coding, and analysis of large quantities of qualitative data. As part of the informed consent process associated with research involving human subjects, interviewees agreed to allow their positions to be associated with their quotes to enable the reader to contextualize the significance of the data. Confidentiality was not guaranteed.

We also reviewed the LMP, FMP, and Wildfire Situation Analysis/Wildfire Implementation Plan (WFSA/WFIP) documents to triangulate on what we were hearing in the interview data. LMPs and FMPs are the primary policy documents that guide management decisions at the forest level. LMPs are the primary guiding document for a national forest and provide operational and project level direction for specific actions.

FMPs are usually part of the broader LMP and specifically detail how a wildfire will be managed on a given landscape and take into account the vegetation, fire history, population densities, overall landscape, areas at risk, and other factors. The WFSA is the primary document for guiding the management of the wildfire and the flexibility therein for managing the fire. In the case of WFU, a WFIP is used to establish a longer-term management strategy.

Gap Fire Findings

Supporting Documents: LMP, FMP, and WFSA

Supporting documents were a clear constraint on the strategy that was chosen on the Gap Fire. The LMP and FMP allowed only a full suppression response: no other strategy could be considered. One of the Los Padres Fire Management Officers clarified how the LMP factored into their decision-making, "… we are basically bound by law because we wrote a policy that we will suppress every fire…. We fully suppress in the wilderness too. We're not even allowed to let that burn." This was confirmed by the Deputy Forest Supervisor, "… it was pretty much full suppression for us…. Every acre on the forest has a full suppression mode." Likewise, the FMP dictates a specific type of response. As explained by a Los Padres District Ranger, "… this is a full suppression forest, because of it being extensively in the Wildland Urban Interface, we don't have Wildland Fire Use in our Fire Management Plan." The WFSA needed to abide by the LMP and FMP but did allow for tactical flexibility within the broader strategy of suppression. As described by the IMT Commander, "… We had flexibility in how we applied the tactics … a combination of direct and indirect containment lines … indirect lines were based on firefighter safety…."

Agency Attitudes and Beliefs

When asked to characterize their own attitudes toward fire management, the agency participants in the Gap Fire revealed that they did not have attitudes that predisposed them toward a suppression-only response. According to the IMT Incident Commander, "I've had exposure to a broad range of selecting the appropriate management for a particular incident, all the way from full perimeter control, full suppression to actually monitoring—one end of the spectrum to the other." This was confirmed by the Los Padres Deputy Forest Supervisor, "[t]here's probably an uneducated/unexperienced perception that firefighting is more of a science than an art, but it's really more of an art than a science … there's a lot ways to go about it."

In contrast, when asked what they thought the public expected from them in terms of fire management, agency officials felt that the public expected them to put the fire out. There was little variation in response to this question. "The public expects us to put this fire out. There's no doubt in my mind," asserted one of the Los Padres District Fire Management Officers.

When asked if they thought their own beliefs about the public expectations influenced the strategy or tactics taken on the fire, agency respondents were divided. Some thought that they were influenced by their beliefs about the public's expectations. "Oh, I know my beliefs were influenced by what the public wants. There's no mistake about that. We had a gorilla on our hands and they expected us to tame it. There's no doubt about that," recalled one of the Los Padres District Fire Management Officer. Others conceded that they were aware of public expectations but tempered these expectations with professional judgment. "I don't know if it was the public that influenced the decision or more of knowing it was the right thing to do," (IMT Incident Commander). "We live in this community and we see these people…. So yeah, sure, we do feel the pressure to fight the fire in an aggressive manner, yet on the other hand of this, we can only do what is safe" (Santa Barbara County Fire Chief).

Agency interviewees were asked if they received pressure from individuals external to the agency to change the strategy or tactics on the fire. Respondents were divided. Some did not feel external pressure while others indicated they had felt pressure: most of which centered on local government wanting additional resources ordered for the fire, particularly large aircraft.

When agency officials were asked directly whether internal or external factors most influenced the way the fire was managed, responses were mixed. Some felt external forces played the most influential role with some resources being used on the fire primarily to meet external political demands and not necessarily those of effectively fighting the fire. Others felt the internal factors were the primary driver. Yet others felt that both factors figured in. One of the Los Padres District Fire Management Officers reflected that, "Those three documents [LMP, FMP, WFSA] alone, they do influence it because there are certain things you can't do . . . [but] there's a lot of pressure being exerted by the public." The Los Padres District Ranger on the fire felt that the external forces worked in concert with the internal forces. "I think it's mixed because when I think WFSA, I really think the WFSA reflects the local geographic fuel and weather conditions, so to me those were a huge factor in how we managed the fire. Politics entered in … actually, they were complimentary because politics allowed us to get the resources we needed when we needed them. We had, what 2,000 people all of a sudden and heavy air support, number one priority in the state. You want to do something and politics sways you. In our case, I think politics reinforced and helped our cause."

Local Agency and Community Members' Beliefs

To more completely understand the dynamics between the agency and the community, we also interviewed community members and how they sought to influence management of the fire. Community members revealed varied responses when asked what they expected in terms of fire management on the Gap Fire. Some expected the fire to be put out. "My expectation was that you don't let little fires grow to big fires. You hit them as quickly as you can with everything that you've got" (Gap Fire Community Resident I). Others were less clear about what should be done. "I honestly don't know" (Gap Fire Community Resident B). Others suggested less aggressive approaches than all out suppression. A wildfire use option was mentioned by Gap Fire Community Resident C, "What I expected was that they were going to get on it and put it out. Always in the back of my head it's like, 'let it burn'—its my quiet little secret." Local Agency Representative G indicated a point protection strategy might be appropriate, "My expectation was that they would put a lot of energy and effort into protecting the front country here and the people who live here."

Likewise, community members gave varied responses when asked if they exerted any influence over how the fire was managed. Some did not try to do anything. "I don't have experience with fire to be telling fire folks how to fight fire" (Gap Fire Local Agency Representative E). Others did try to

Table 1. What drives fire management on the Gap Fire?

Internal factors—Supporting docs	
LMP	Yes—LMP mandates suppression
FMP	Yes—FMP mandates suppression
WFSA	Yes—WFSA takes suppression approach with tactical flexibility for direct/indirect containment
Internal factors—Attitudes/beliefs	
Attitudes	No—Showed variation in attitudes
Public expectations	Yes—Agency believes public wants suppression
Your beliefs about public expectations	Mixed—Some definitely influenced, some using professional judgment to temper what public wants
External factors	
External pressure	No–Strategy not altered Yes—Tactics/resources altered
Community expectation	Mixed—Community expectations not monolithic
Community influence	Mixed—Some deferential, others seeking influence

bring in additional resources or heard that others had done so. Gap Fire Local Agency Representative D recalled, "… we got some of the structure protection resources that we did receive because there was none to be had. It was personal phone call that caused that to happen, so I was told." Others directly intervened in procuring more resources, "… we've talked to [Senator] Boxer and her staff. I've talked to Senator Feinstein's staff. And they're calling us. 'Are you getting everything you need out of the Forest Service? Are they helping you?" "And the Governor is very unhappy about this and, you know, fully intends on talking to the White House," (Gap Fire Local Agency Representative F).

When looking at the data on how the internal and external factors influenced fire management on the Gap Fire, it is clear that both the internal and the external factors played a role, as detailed in Table 1. The LMP, FMP, and WFSA dictated that, given the proximity to a large, urban wildland interface, full suppression was the most appropriate strategy. Agency interviewees indicated flexibility in their attitudes toward fire management, so this did not appear to be a constraining factor in choosing a strategy. Agency interviewees believed that the public wanted suppression. Some agency interviewees believed that their beliefs about public expectations influenced their strategy and tactical choices. These beliefs were not upheld in the interviews we conducted with selected community members who expressed less monolithic and more varied expectations for fire management. Community members expressed a range of preferences that included the full spectrum of approaches from full suppression to point protection to WFU. Finally, there was mixed evidence in terms of external influence on the fire. Some community members clearly sought to influence the resources brought to bear on fire. In some cases, they were successful. This influence rested less on the overall strategy taken than on the tactics and resources used in support of the overall strategy.

Gunbarrel Fire Findings

Supporting Documents: LMP, FMP, and WFSA

Supporting documents clearly facilitated the strategy that was chosen on the Gunbarrel Fire. The LMP and FMP allowed WFU and had been recently amended to allow for more flexibility in fire management should the opportunity arise. The Shoshone Forest Fire Management Officer clarified how the LMP factored into their decision-making, "The Land Management Plan that we had in there prior had allowed Fire Use only in wilderness areas, and each individual wilderness had its own management plan…. By amending the plan, we were able to open up all the areas that could potentially benefit from Wild Fire Use, and at the same time, identify the areas that we just needed to protect." Likewise, the FMP was tied to the LMP and permitted flexibility in response. As explained by the Shoshone Forest Supervisor, "The maps in the Fire Management Plan show you what types of responses are appropriate in certain areas, and if there is infrastructure, that's immediate suppression, but apart from that, across the forest we have a lot of latitude to do different kinds of things. So it's very consistent, and again that was an update that we do annually." Finally, the WFIP, the guiding document used on a wildfire use fire, supported fire use as well as a range of other options as appropriate for meeting land management objectives. The Shoshone District Ranger elaborated, "The WFIP, if you go that route, allows you the opportunity to manage it with much greater flexibility than a WFSA as far as I'm concerned. A WFIP gives you all options from watching a fire to full suppression where you need to."

Agency Attitudes and Beliefs

When asked to characterize their own attitudes toward fire management, the agency interviewees from the Gunbarrel Fire revealed that their attitudes toward fire management had changed over time to appreciate the need for greater latitude in response. The IMT Incident Commander recollected, "Oh yeah, it's changed hugely, it has, and I think that's an evolution that takes place with suppression people all the time. You know, my attitude early in my career was fire was a bad thing and it destroyed things, and then I realized over time that it's a natural process that has a lot of value. It's also a lot of times safer. It allows us to accomplish fuels work that we won't be able to accomplish any other way, and it's cheaper." The Shoshone Forest Fire Management Officer revealed that it really wasn't about which specific strategy was taken but its probability of effectiveness, "… what's changed as I get to understand this more, I would say I can discern better between what's the appropriate response to a given fire. I think the thing I really keyed in on is this idea of, 'Well, what's your probability of success?'" and listening to that and saying, "well, its low or its high and really staying away from things that have a low probability of success. It just costs money and puts people at risk."

When asked what they thought the public expected from them in terms of fire management, one set of agency respondents indicated that they thought that the public expected the agency to protect values at risk. The Shoshone Public Affairs Officer thought that the public, "expected us to protect property and protect safety, like the highway, and I think they expected us to keep the highway open so there would be no economic effect to local businesses." Others commented on their ability to affect the public's expectations about what could be done. The Shoshone District Ranger elaborated on what they have done to shape expectations, "I have the ability to shape or create what the public's expectations are in the sense that the public expects us to protect [structures, businesses, roads]. If I can assure them that that's going to happen, then I can

feel comfortable to go whatever route that I want to go … we worked hard to create the expectations of the public, and in return they let us know what those are. We educate is what we do, and in return we get back a different message, so it works both ways." The Shoshone Public Affairs Officer reinforced this perspective of working with the public and creating a situation where the public was comfortable with the choices that were being made: "Both the Forest and the local county Fire Marshall have done an amazing job with outreach out here, and so they had already told people, 'Don't expect full suppression any more. It doesn't make sense for a whole lot of reasons. They've done a lot of fuels work so that a lot of people were more calm about accepting that because they had a lower perceived risk now.'"

When asked if their beliefs about the public's expectations influenced the strategies and tactics they took on the fire the agency response was mixed. Some thought their beliefs about the public did influence the approach taken: "I think it can play a role, in fact I do believe it plays a role. I'm a public servant. I'm supposed to listen to what the public has to say and factor that into decisionmaking" (Shoshone Forest Supervisor). Others did not think they had played a role: "You know, I can honestly say that I didn't really care on this particular fire. I think I have allowed that in the past" (Shoshone District Fire Management Officer). In terms of whether agency interviewees felt they were pressured from individuals external to the agency to change the strategy or tactics on the fire respondents were uniform in their belief that no one tried to influence them.

When asked directly whether internal or external factors most influenced the way the fire was managed, agency responses were mixed. One group clearly felt internal factors drove the response. According to the Shoshone Forest Fire Management Officer, "I think it was the internal factors. The change in the Land Management Plan is the key internally to open things up for us…." The District Ranger seconded this opinion, "I think both were taken into account, but probably internal had more influence because if you didn't have the Fire Use Plan done, you couldn't let it burn outside of wilderness no matter what you felt the resource benefits or the public opinion was. If you didn't have the ability through the Forest Service granted to you to make that decision, it would be a moot point." Others felt that both sets of factors were important, but that wildfire use was a nonstarter without the internal factors in place. The Shoshone Forest Supervisor stated, "I think both of the factors really led to the same conclusion. I don't think they were conflicting. I think we got really good external support or at least reasonable external support, and I think it lined up with the right resource decision, and we had the items that we needed to have in place to enable us to make that decision…all of the factors internally and externally lines up to enable us to make the right decision." This perspective was reinforced by the IMT Incident Commander, "… it's always a combination of both to a degree, because if the internal and external don't line up, somebody internally is not doing a very good job. However, for the most part, the decisions on these kinds of fire management responses are pretty much internally driven."

Local Agency and Community Members' Beliefs

When community members were asked how they expected the fire to be managed, answers varied, just as they had with the Gap Fire. Some clearly wanted the fire to be put out. Community Residents H and I were very clear in what they wanted, "Put that [fire] out now!" Others were content with the wildfire use approach: "I would say it is what I expected. You know, anybody who has spent a lot of time up there is under the same opinion.… I would rather see them go ahead and let these burn in small areas and manage them rather than one big California firestorm which you see, because that valley is ripe for it" (Local Agency Representative D). Others saw both sides: "I think anyone with some common horse sense knows it needs to be cleaned out. Now, is there a community out there that doesn't like it? Yeah. And yet some of that same community says it's natural" (Local Agency Representative A).

Community members also gave varied responses when asked if they exerted any influence over how the fire was managed. Some did not try to do anything: "I tried to stay out of how it was being fought" (Community Member A). Others did try to influence what was being done, but this was mostly at the margins. Economic interests often drove these actions. For Community Member A, keeping the road open was key to economic survival in this tourist-dependent area. "From day one our goal was, whatever you do, keep that … road open!" Community Member G exerted the most clearcut influence when he found out that the Hot Shot crew detailed near his lodge was going to be called back even though the fire continued to burn into his property. "So that really got me started, and to find out that I'm losing my night crew, I got pretty excited. So they came up, and we had a talk for a couple of hours. It was cut and dry. The conversation was early on you can have your night crew back. We won't stop. Yeah, I have tried to influence, and it worked."

Community members also corroborated the efforts the local National Forest Service personnel had taken to prepare the community for less aggressive response to a large fire when it occurred. Local Agency Representative B recalled, "They have completed a lot of hazard fuel reduction projects. They … have taken somewhere in the neighborhood of 8 to 10 million board feet of lumber off the North Fork in the last three to four years, primarily around the summer home groups and the lodge sites…. Of course, they have had all the necessary public meetings and talked to all of the lodge owners and all the cabin owners and explained what they are trying to accomplish." Community Member E corroborated how the local National Forest Service sought to influence their expectations of what could happen: "I think they laid out a picture of the future that is going to happen sooner or later because the conditions are all here, and that's one word you hear is the conditions. When the conditions are right, it is going to happen. . . . When you get winds over twenty five miles an hour, that's when things burn heavy and they move. That's a moving fire that sets crowning and all kinds of other things, and we learned about all these terms from the Forest Service too."

The data (Table 2) on how the internal and external factors influenced fire management on the Gunbarrel Fire show that both internal and external factors played a role. The LMP, FMP, and WFIP supported the opportunity to take a fire use strategy. Agency interviewees indicated flexibility in their attitudes toward fire management and how they had changed over time to be more accommodating of less aggressive responses. Agency interviewees also believed that public expectations about fire management were not set in stone but could be influenced. They worked with the public and created fuelbreaks and defensible space to enable the public to feel safe with the strategy that was

taken. Some agency interviewees thought their beliefs about public expectations did and should influence their strategy and tactical choices because they were public servants and were supposed to be responsive to their public. Similar to the Gap Fire, community expectations about fire management were not monolithic: some wanted the fire out while others were ready for fire use. There also was mixed evidence in terms of external influence on the fire. Some community members clearly sought to influence the resources brought to bear on the fire, sometimes successfully. As with the Gap Fire, this influence rested less on the overall strategy taken than on the tactics and resources used in support of the overall strategy.

Table 2. What drives fire management on the Gunbarrel Fire?

Internal factors—Supporting docs	
LMP	Yes—LMP supports WFU
FMP	Yes—FMP supportive WFU
WFIP	Yes—WFIP supports WFU as well as range of other options
Internal factors—Attitudes/beliefs	
Attitudes	Yes—Attitudes predisposed to WFU
Public expectations	Yes—Public expected protection of values at risk, agency can shape expectations
Your beliefs about public expectations	Mixed—Some definitely influenced, others it does not play a role
External factors	
External pressure	Mixed–Strategy not altered, suggestions were offered
Community expectation	Mixed–Community expectations not monolithic
Community influence	Mixed—Some deferential, others seeking influence

Conclusions and Implications

The desired policy direction for fire management as stated in various agency documents is for greater flexibility in strategies and tactics used during a wildfire (US Forest Service and USDI 1995, 2001, Dalton 2009, NIFC 2009, QFR 2009). However, policy changes in and of themselves are rarely sufficient to reach the desired end goal because existing beliefs and practices also shape willingness to use different strategies. The results from this research provide insight into the factors that facilitate and/or impinge on the implementation of more flexible fire response on federal agency lands. Our guiding hypothesis for this research was that external factors were the dominant constraints. Evidence from the Gap and Gunbarrel Fires fail to support this hypothesis as it shows that *both* internal and external factors influenced wildfire management and that many constraints can be minimized if appropriate effort is applied. We identify four main lessons that flow from this research.

First, internal guiding documents, including the LMP and FMP, have to be predisposed to flexible response. Unless the LMP and FMP provide some degree of flexibility in the potential for the fire management approach, fire managers will have no decision space to consider more flexible options. Suppression was the only option available in the Gap Fire. WFU could be considered in the Gunbarrel Fire because it had been written into the LMP. Managers have greater tactical flexibility inside the strategy that is considered when writing the WFSA or WFIP. However, the broader strategy outlined in the WFSA or WFIP will be determined in part by what the LMP and FMP allow. In short, less than full suppression is unlikely to happen without the supporting guiding documents in place. These documents—the LMP and FMP—are necessary, but not sufficient conditions to enable a more flexible response.

Second, one reason that external constraints appear to be less influential than many believe is that public views are not monolithic and can be changed. Communities did not uniformly believe suppression was the only approach. In both locations we found community members who advocated suppression, ones who preferred point protection, and ones who favored fire use. Public views also are not set in stone: agencies can inform expectations. The Gunbarrel Fire managers had laid the groundwork with the public for WFU and this effort was recognized by the residents with whom we spoke. This suggests that agencies may have more flexibility than is conventionally believed if they are willing to expend resources to explain reasons for use of less aggressive strategies.

Third, internal attitudes also are malleable. Agency attitudes about fire management options are changing. Our interviewees recognized that there were multiple options available for managing a fire. How these attitudes are put into practice are shaped by other factors, including agency beliefs about public expectations for fire management. Managers may fail to appreciate the diverse viewpoints that exist among the public with respect to fire management. Gap Fire managers uniformly believed suppression was the only option favored by the community; however, we found more diverse perspectives. Recognizing this diversity in viewpoint may be important for agency managers who want to operationalize more flexible approaches in fire management.

Finally, what might be most important in terms of internal and external factors is the congruence between them. In some cases, such as areas in close proximity to a large population as with the Gap Fire, suppression may be the best response. In other cases, WFU may be most appropriate. In these cases, aligning internal agency documents, attitudes, and beliefs with political and community external factors is essential. The Gunbarrel Fire example illustrates that laying the foundation for managing political and community expectations is a long-term process. To create greater congruency among internal and external factors, agency managers need to consider their options and engage with their public well ahead of any event.

Since the time our research was conducted in 2008, new policies have been promulgated to influence fire management. They are worthy of mentioning here because they may influence how fire is managed in the future. In 2009, the US Forest Service reclassified its terminology for wildfire and WFU. These terms were replaced with planned and unplanned ignitions and were intended to give fire managers greater flexibility in how they could manage fire (NIFC 2009, QFR 2009). "Planned ignitions" include prescribed burns and intentional backfires whereas "unplanned ignitions" include wildfires caused by lightning and human causes, such as arson. New fire management tools accompanied these changes, which include the ability to have multiple objectives on one fire and to transition from different strategies over the course of a fire, including from active suppression to monitoring. In addition, WFSA, which provided guidance on wildfires, and WFIP, which provided WFU guidance, have both been replaced with the Wildland Fire Decision Support System, which can guide the management of both planned and unplanned ig-

nitions. These changes suggest that some of the internal processes for managing wildfire are changing. This is important, but without flexibility built into the LMPs and FMPs, change will continue to be a challenge.

In addition, the 2009 Federal Land Assistance Management and Enhancement Act requires federal fire agencies to develop a Cohesive Wildfire Management Strategy that will, among other things, address issues of cost-effectiveness and fire-adapted communities. This last item, in particular, highlights the importance of managers moving beyond simplistic assumptions about automatic negative public views of less aggressive fire management strategies to the richer and more accurate understanding of public perceptions that our study suggests is the reality.

Ultimately, the ability to respond more flexibly in fire management rests within a nested structure of influences. At the highest level, national policy needs to support less than full suppression approaches. Recent changes to policy are facilitating moves in this direction (cf. NIFC 2009). At the next level, guiding documents on the forest—LMPs and FMPs—need to provide opportunity to foster, or at least not hinder, a more flexible response. If these supporting rule structures do not facilitate the option for more flexible response, then no amount of external influence will change that. If these policies and the guiding documents are in place, then the attitudes and behaviors of the agency personnel and the external influence of community members can shift the direction of management.

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Appendix A: Interview Questions

Internal Factor Questions

Internal Supporting Documents

- LMP—How does the LMP address fire management and did it influence your decision in the management of this fire? (Agency)
- FMP—How does the FMP factor into decisionmaking on this fire? (Agency)
- WFSA/WFIP—Did the WFSA/WFIP influence your ability to manage the fire with greater or lesser flexibility? (Agency)

Attitudes about Fire Management

- Agency Attitudes—How would you characterize your own attitude toward fire management? Has your attitude changed over time? (Agency)
- What do you think the public expected from you in terms of managing this fire? (Agency)
- Do you think your beliefs about the public's expectations influenced the strategies and tactics you chose on this fire? (Agency)

External Factor Questions

Political and Community Pressure

- Did you receive pressure from individuals external to the agency to change your strategy or tactics on the fire? (Agency)
- How did you expect this fire to be managed? (Community)
- Do you think public expectations for how the fire should be managed are influencing the management of this fire? (Community)