

***Fuel Reduction Strategies in
Forest Communities: A Longitudinal Analysis***

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Abstract:

This study uses panel data from a mail survey administered to the same individuals in 1996 and 2000 to measure change in public attitudes toward fire management programs on federal lands in eastern Oregon and Washington. Findings were generally similar between 1996 and 2000; however, some noteworthy changes over the study period include: a) lower ratings of Forest Service information programs, b) an increase in citizens who view smoke as a problem, and c) an eroding relationship between the Forest Service and residents in the region. Overall, respondents continued specifically to support prescribed fire and mechanized thinning for fuel reduction purposes in local forests.

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Fuel Reduction Strategies in Forest Communities: A Longitudinal Analysis

Wildfire is a serious threat to forests and surrounding communities throughout the United States. It is well documented that decades of fire suppression have created many dense stands and, more recently, resource professionals have become concerned over declining health in most forest regions. In response, public agencies have undertaken measures to reduce forest fuels and improve conditions; programs that utilize prescribed fire and mechanized thinning are the most common forms of treatment. To be successful these programs require a supportive local constituency—particularly when practices involve igniting fires near residential areas or cutting trees in places that people are familiar with and may care deeply about.

Recent wildfires and fuel reduction programs have led to substantial modification of our forest landscapes, prompting researchers to monitor change and assess contributory factors. While ecological research has a long history of tracking forest conditions over time and evaluating how ecosystems respond to both natural and human influences, the social science complement has been slower to evolve (Beckley and Korber 1995). Currently there is a lack of longitudinal data from which to track how people and communities react to changing conditions. Social science methods usually consist of one-time, cross sectional studies that Babbie (1995, p.95) described as attempting to “determine the speed of a moving object on the basis of a high-speed, still photograph that freezes the movement of the object.” Consequently, we have limited ability to measure change in public opinion about forest conditions or to monitor citizen support for practices used to treat problem areas.

This article describes a longitudinal (panel) study that was designed to help fill this void. The study replicates research conducted in 1996 by Shindler and Reed about the use of

prescribed fire and mechanized thinning on National Forests in the Blue Mountains of eastern Oregon and Washington. This follow up study was conducted in 2000 using the same measures and the original set of participants. Research objectives provided for comparison of findings to examine changes in public attitudes and behaviors, particularly with regard to 1) the usefulness of information sources about forest management, 2) support for fuel reduction activities, 3) factors that influence how citizens respond to fuel reduction programs, and 4) interactions between the Forest Service and local communities.

Management and Research Context

The forests of the Blue Mountains have been cited as an example of the complexity inherent to federal land management in the 21st century (Langston 1995). Historically, these forests were dominated by open, park-like stands of ponderosa pine. However, similar to other western forests, past management practices—particularly fire suppression efforts—have resulted in overstocked stands, declining forest health, and increased risk of wildfire (Tanaka et al. 1995). Resource managers on three National Forests within the study area are attempting to reduce hazardous fuels and restore forest health using a combination of prescribed fire and mechanized thinning.

Although resource professionals have a basic understanding about how to design management prescriptions to reduce wildfire risks and restore healthy forest conditions, community acceptance of large-scale application of these treatments is often less certain. Previously we mentioned the lack of longitudinal research. In the case of prescribed fire, the exception has been three studies on the role information plays in citizen awareness and support for the use of these practices (McCool and Stankey 1986, Bright et al. 1993, Loomis et al. 2001). Collectively, this research substantiated strong associations between educational messages,

increased public knowledge, and a corresponding increase in acceptance of prescribed fire.

Despite these findings, a number of single case studies indicate that citizens still have concerns about the potential risks of management ignited fires including damage to private property, smoke emissions, and impacts on their water supply and wildlife habitat (e.g., Beebe and Omi 1993, Shelby and Speaker 1990).

Comparatively few studies have been conducted on public perceptions of mechanized thinning to reduce hazardous fuels; however, some insight can be gained from the literature assessing attitudes toward alternative harvesting techniques. Not surprisingly most studies found that people preferred stands with little or no modification over highly manipulated forest stands (e.g., McCool et al. 1986, Brunson and Reiter 1996). However, Ribe (1999) documented positive public responses to new ecosystem-based harvests when photographs and detailed descriptions of Forest Service objectives were provided. More often, however, citizens have expressed reservations about how much license managers will take when using thinning treatments to reduce fuel loads. Many are concerned that the agencies will revert to more liberal “business as usual” harvesting techniques (Brunson 1993).

Recent research from forest communities also suggests that the public acceptance problem runs much deeper and is more complex than citizens simply being *for* or *against* a specific treatment. For example, citizens frequently make judgments based on their interactions with forest agencies and the level of trust that exists between themselves and local managers (Shindler et al. 2002). Similarly, Winter et al. (2002) identified that acceptance of fuel treatments hinges on citizen confidence in agencies to effectively manage risk as well as an adequate planning process that includes a role for the public.

Relevance to other Regions

From a contextual standpoint, the question remains as to whether longitudinal data collected from Blue Mountains residents can be generalized to other regions. Opinion research from across forest communities provides some perspective. Several studies have identified a greater level of sophistication among fire-affected communities in both their understanding and acceptance of fire management techniques when compared to the general population (Manfredo et al. 1990, Shindler and Brunson 2001). Additional work in fire-prone areas indicates a number of similar factors influence public support for fuel treatments despite geographic and economic differences (Winter et al. 2002). All this suggests that findings from the Blue Mountains may be particularly relevant for other western communities where fire professionals are attempting to implement similar practices to combat similar problems.

Research Design

Our original 1996 study utilized a mail-back questionnaire to survey a stratified random sample of residents from communities adjacent to the Malheur, Umatilla, and Wallow-Whitman National Forests. The 533 respondents came from a nine county area in eastern Oregon and Washington that make up the Blue Mountains region. This group was treated as a panel for purposes of the follow up study. Panel research involves evaluations of the same individuals using the same measures at different points in time. Responses from individual study participants can be “paired,” or linked, over the separate data collection points to identify shifts in individual attitudes and beliefs.

We based the follow up survey design on the 1996 questionnaire and added new questions to address current agency concerns. To provide a common reference for the treatments we asked about, prescribed fire was described in the survey: “Management ignited prescribed

fire is used to accomplish an objective—to control forest diseases, insects, and excessive build up of trees—and managers schedule these burns around the weather, fuel loads, season, and their ability to maintain control of the fire.” We also described the thinning program that managers were attempting to implement in the region: “Mechanized thinning involves a range of mechanized harvesting methods to control disease, insects, and excessive build up of trees. Currently, managers use ground-based harvesters and skyline (above ground) yarding systems to remove standing dead and dying trees less than 15” in diameter from selected forest sites.”

In the summer and fall of 2000 we were successful in locating 455 of the original 533 study participants. Of these, 32 were removed from the sample (29 were deceased or incapacitated for health reasons and 3 had moved from the area). From the useable sample of 423 respondents, 323 completed questionnaires for a 76% adjusted response rate. In the following tables, data from replicated questions (1996 and 2000) are compared utilizing paired t-tests and significant differences in responses are noted.

The original 1996 study (Shindler and Reed) reported that Blue Mountains respondents were attentive to National Forest issues and largely supportive of both prescribed fire and thinning treatments. However, citizen trust in the Forest Service to implement effective treatment programs was mixed with roughly half of the respondents giving the agency a vote of confidence to proceed. Given these findings, as well as related literature about more knowledgeable publics accepting fuel reduction strategies, we expected to find higher levels of support for treatment implementation in the 2000 study. We also anticipated that this support would be associated with knowledge about treatment effects and be influenced by the relationship between citizens and the Forest Service.

Findings

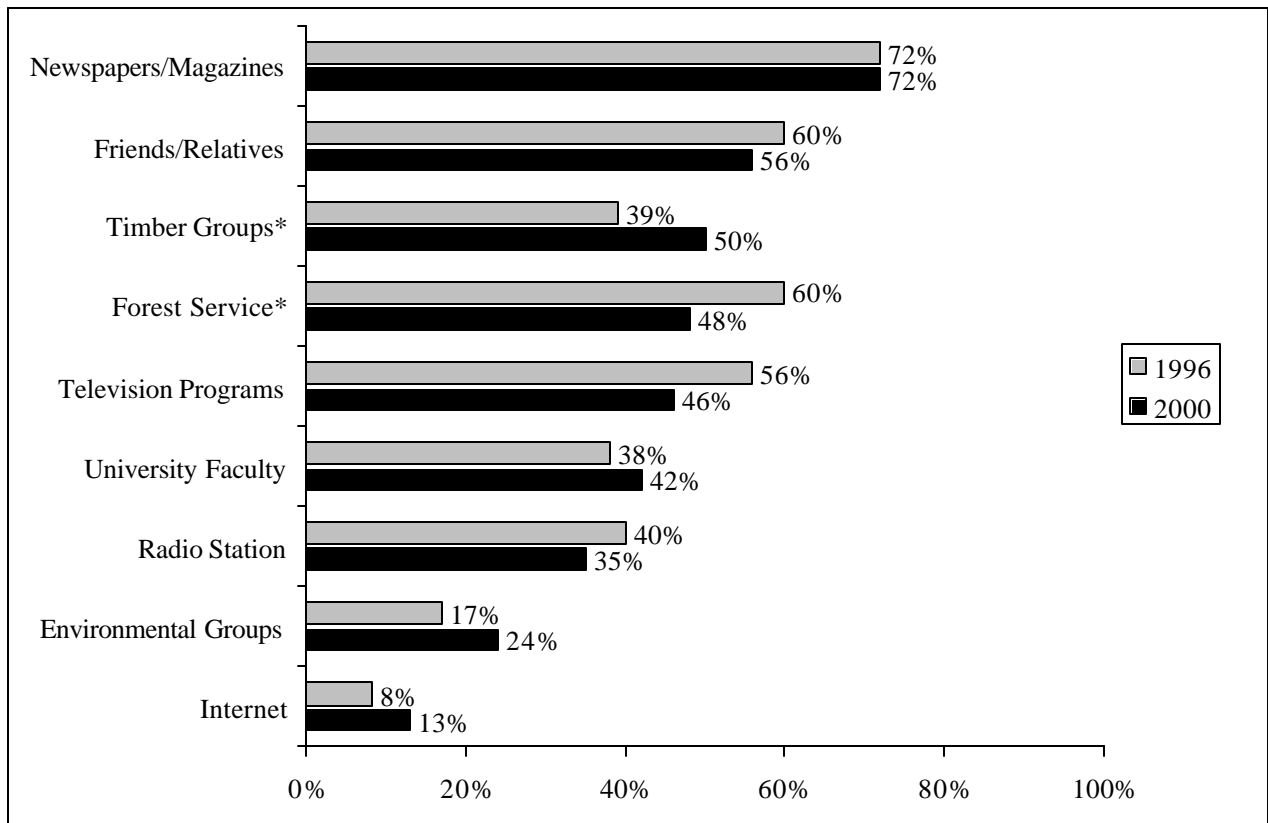
Communities within the Blue Mountains are rural in nature with a long history of economic reliance upon natural resource industries. Study participants had lived in the Blue Mountains area for an average of 41 years, providing considerable time for residents to develop long-term connections to the National Forests surrounding their communities. Not surprisingly, responses from both the 1996 and 2000 surveys indicate an attentive and knowledgeable public; in both studies, 90% of respondents said they pay a moderate to great deal of attention to National Forest issues and over 80% believe they are moderately or well informed about forest conditions.

Information Sources

Earlier we identified the important role that knowledge and information play in forming support for management practices. In the course of citizens' everyday lives, there are many places where someone might obtain information about forestry issues. In both surveys respondents rated the usefulness of nine likely sources of information on forest management. Findings are displayed in Figure 1.

Newspapers/magazines and friends or relatives were the most useful information sources and were the only ones to receive a moderate to high rating by a majority of respondents in both 1996 and 2000. Overall, the lowest ratings were for environmental groups and the internet. Of particular interest are scores for timber groups and the Forest Service because these are the only ones that changed significantly during the study period. The usefulness rating of timber groups rose from 39% to 50%, while opinions of the Forest Service fell from 60% to 48%, signaling a shift in the role that each might play in local communities.

Figure 1: Usefulness of information sources about forest management



Data reflect percentage of citizens who rated usefulness level as moderate or high on a 4-point scale (none, slight, moderate, high).

*1996 and 2000 responses significantly different at p # .01

Attitudes about Prescribed Fire and Mechanized Thinning

Responses in Table 1 show that overall support for the use of prescribed fire and mechanized thinning remained similar to 1996. In selecting from one of four choice categories, most citizens supported some use of prescribed fire in the Blue Mountains. In 2000, 39% believed the Forest Service should have full discretion for its use, while an additional 50% felt the agency should use prescribed fire only in carefully selected areas—taken together, public opinion seems congruent with current agency fire policy. Support was even higher for mechanized thinning; overall, 97% of respondents supported some level of thinning with more than two-thirds giving the agency full discretion for its use.

However, the last item in Table 1 raises a cautionary point. In both study years, citizens voiced relatively low levels of trust in the Forest Service to implement a responsible and effective program for either treatment. This was especially the case for prescribed fire where trust in the agency decreased significantly from 52% to 43% over the four-year study period. Although trust levels were slightly higher for mechanized thinning (and responses for this treatment did not significantly change), only a slim majority (52%) expressed confidence in the agency in 2000.

Table 1. Public opinion about legitimacy and implementation of fuel reduction practices

The use of fuel treatments in the Blue Mountains...	Prescribed Fire		Mechanized Thinning	
	1996	2000	1996	2000
. . . is a legitimate management tool that the Forest Service should have the discretion to use for improving forest conditions.	44%	39%	68%	69%
. . . should be used sparingly by the Forest Service and only in carefully selected areas.	45%	50%	28%	28%
. . . creates too many impacts and should not be considered as a management alternative.	6%	7%	2%	2%
. . . is unnecessary and should not be utilized.	5%	4%	1%	1%
Citizen trust in the Forest Service	Prescribed Fire*		Mechanized Thinning	
I trust the Forest Service to implement a responsible and effective program.	52%	43%	59%	52%

*1996 and 2000 responses significantly different at p # .05

Anecdotal reports from ranger districts in the region indicate some of the most vocal opposition to the use of prescribed fire has been over associated smoke emissions. Table 2 provides evidence that these concerns are on the rise. In 1996 a substantial majority of respondents indicated that smoke levels from fire were not a problem in their area, particularly if treatments result in a healthier forest. Although the majority of respondents still held similar

views in 2000, significantly more people now view smoke as a problem regardless of its beneficial effects on forest health. It is difficult to tell if these data stem from the presence of increased smoke because the agency has been more active in its burning program or if they reflect a lower tolerance among citizens for smoke overall. But for managers, one point is evident. Just as with the marginal trust scores reported above, a simple majority in favor of smoke management practices is probably an insufficient level of public approval. Smoke is a highly contentious issue that provides a rallying point for communities; residents adversely affected by diminished air quality are quick to vocalize their concerns.

Table 2. Citizen evaluations of smoke from prescribed fire

	Agreement	
	1996	2000
In my area, smoke levels from fire are not a problem for me or my family.*	76%	61%
Smoke levels are acceptable if it results in a healthier forest.*	68%	58%

*1996 and 2000 responses significantly different at p # .05

Citizen-Agency Interactions

Throughout the West, a preference for greater citizen participation in forest planning is strong (Steel et al. 1997). We posed the efficacy of this strategy to respondents in both surveys and results were the same. Nearly two-thirds (65%) believed that citizen participation is highly valued even if it increases the cost of government, while very few (11%) felt it was of little or no value. Given the importance of citizen-agency interactions, we probed deeper into this relationship. Table 3 demonstrates that opinions about these interactions were mixed; however, if viewed as a citizen report card on agency effectiveness, the scores indicate areas of concern.

Specifically, comparative data for the first three statements show several changes in citizens’ experiences with the Forest Service. Significantly fewer respondents—just 27% in 2000—agreed the Forest Service does a good job of providing information about its management activities. On the other hand, there was greater recognition of managers’ efforts to collect input from local communities during the planning process. Given this response, it is curious that there was a decrease (41% to 31%) in the number who agreed that the Forest Service is open to and uses public input to shape management decisions. While these two shifts seem contradictory, they coincide with recent findings from forest communities where citizens recognize the Forest Service now solicits more public comments, but do not believe the agency uses this input in forming management plans (Shindler et al. 2002).

Table 3. Experiences and interactions with the Forest Service^a

	Agree		Disagree	
	1996	2000	1996	2000
The Forest Service does a good job of providing information about its management activities.*	33%	27%	35%	43%
Forest managers usually create plans without input from local communities.**	55%	46%	22%	30%
The Forest Service is open to public input and uses it to shape management decisions.**	41%	31%	34%	42%
New statements from 2000 survey	Agree		Disagree	
Federal forest managers build trust and cooperation with citizens so that people feel the agency is acting in their best interest.	23%		52%	
I trust the local Forest Service staff, but I don’t trust government at the national level to let them do their job.	65%		16%	
Local Forest Service staff are prohibited from doing their job because of national restrictions and regulations.	68%		8%	

^aResponses on a 5-point scale from strongly agree to strongly disagree with a neutral midpoint; neutral responses omitted.

1996 and 2000 responses significantly different at *p# .05 and **p# .01

Responses to new statements added on the 2000 questionnaire provide additional cause for concern. Few people viewed Forest Service actions as building trust and cooperation with citizens; in fact, a majority disagreed with this statement. The next two items shed some light on this finding. About two-thirds indicated they trust local Forest Service personnel, but distrust government at the national level and feel regulations hinder individuals on ranger districts from doing their job. These sentiments are representative of a growing set of frustrations in the western U.S. over national politics and external influences on management of localized problems (Shindler et al. 2002).

We should also point out that in responding to these statements a substantial number of participants—roughly one-fourth overall—selected the neutral midpoint (omitted from this table). Since a “don’t know” response was not provided, one assumption is that many of these individuals have had little personal experience with the Forest Service. As more people become interested and involved in fire management activities, the agency will have an opportunity to (positively) influence this segment of their public.

Sociodemographic Characteristics as Influences on Attitudes

Numerous studies indicate that public attitudes about natural resource issues are often associated with identifiable sociodemographic characteristics (e.g., Steel et al. 1997). Attributes such as gender, income, education, and participant knowledge are common correlation measures. In our 2000 study, we gauged citizen knowledge specific to the use of prescribed fire and thinning by asking respondents to complete a 15-item true/false quiz about treatment objectives and potential effects.

Although quiz scores were slightly higher for the thinning questions, overall results suggest that study participants are generally knowledgeable about both treatments. For example,

three quarters of all respondents understood that thinning encourages tree growth in ponderosa pine forests and is effective in controlling outbreaks of insects and disease. About the same number also knew that fires historically have played a significant role in shaping natural forests in the region and that prescribed fire promotes the growth of plants that serve as food for deer and elk. However, several misperceptions still exist about the use of prescribed fire—about half the respondents did not know about the role of fire in reducing understory vegetation and noxious weeds or its use in promoting the growth of ponderosa pine. Individual scores for the 15 items are not reported here; however, composite scores were calculated and used as one of the variables (along with other characteristics) for the correlation analysis reported in Table 4.

Table 4: Bivariate correlations between respondent characteristics and support for prescribed fire and mechanized thinning, 2000 survey

Characteristics	Support for Prescribed Fire	Support for Mechanized Thinning
Gender (1 = male, 2 = female)	-.060	-.105
Income	.083	.057
Education	.113	-.066
Treatment specific knowledge	.424*	.316*
Trusts the Forest Service to implement a responsible and effective fire/thinning program.	.490*	.260*
Agrees Forest Service provides good information.	.274*	.059
Economic dependence on the timber industry.	-.031	.186*

* Significant at p # .01

Although other researchers (e.g., Carpenter et al. 1986) have reported relationships between support for prescribed fire and gender, income, and education, we found no such evidence among our respondents. However, several other significant associations did emerge; two are shared by both practices. There was a strong direct relationship between support for

both prescribed fire and mechanized thinning with knowledge level. The more knowledgeable individuals are about the specific practice, the more likely they are to support its use. Similarly, as trust in the Forest Service to implement responsible and effective treatments increased, so did support for their use. It is notable that the strongest association was reflected in peoples' trust in the agency and their support for prescribed fire.

Two other significant relationships emerged. Support for prescribed fire increased with agreement that the Forest Service provided good information. And as might be predicted in natural resource dependent communities, respondents who rely upon the timber industry for their livelihoods were more likely to support the use of mechanized thinning.

Discussion

This study utilized citizen responses to the same measures in 1996 and 2000 to provide a framework for tracking public attitudes and behaviors over time. The nature of the data allowed for unique comparisons not possible with single case studies and can help management personnel more directly respond to citizen concerns. Several important points emerged.

First, there was a significant shift in citizen ratings of the Forest Service as an information provider. In the past, the public frequently has turned to agency professionals for specific information about fuel conditions and fire management (Shelby and Speaker 1990). That fewer people now view the Forest Service as a useful source compared to other information providers, particularly the timber industry, should be a red flag to agency personnel hoping to deliver important messages about fire management. Several explanations exist including the notion that people are less trusting of the agency these days and that the information provided—or the formats used to disseminate it—may not resonate with the needs and experiences of local citizens. Other studies have suggested the need to retool agency outreach programs to

communicate more effectively with citizens (Cortner et al. 1998). For example, more interactive forms of outreach that focus on citizen concerns and specific forest places are important components of communication strategies. (See ending sidebar for several recent experiments.)

The ability of fire management professionals to specify conditions and engage citizens about treatment options is as essential as providing objective information. For example, recent studies show that citizens do not respond well to traditional meeting formats such as those commonly used to satisfy agency NEPA requirements (Cortner et al. 1998, Shindler et al. 2002). These approaches provide for little real participation by citizens, and thus little commitment either, in the plan itself or the process by which it was developed. On the other hand, providing opportunities for people to evaluate the range of information about fuel management and the choices involved brings them much closer to lending support for decisions.

Second, citizens in the Blue Mountains strongly support fuel reduction programs. On balance, people are more supportive of thinning treatments and are willing to give the agency more discretion in implementing these projects, but almost 90% of respondents also believe that prescribed fire could at least be used sparingly and in carefully selected areas. However, it is unlikely this support comes *carte blanche*. In particular, data presented here show there are growing concerns over smoke and the nature of the planning process. These shifts suggest that people will be more watchful about the presence of smoke in their community and will make judgments based on how well fire managers communicate objectives and control treatment effects. While smoke often invokes predictable reactions from citizen groups and politicians, agency attention to discussing smoke management in local communities (e.g., specific location of planned treatments, time of day, geographic features, weather and road considerations) may quell overreactions to a perceived “problem.” Local examples can be used to provide real,

observable evidence where management objectives have been achieved, thus reducing fears over treatment risks as well as skepticism that the Forest Service can produce on its fire management plans.

The relationship between respondent characteristics and support for practices is also noteworthy. Several areas that agency personnel have the ability to influence are directly associated with support for management practices. For example, managers can contribute to the public's knowledge of specific treatments and help build a literacy about alternatives among stakeholders. If citizens are to have a real ability to participate in fire planning, and eventually support management actions, they must possess a capacity for participation (Shindler et al. 2002). A second area involves the trust building process. Although public trust is in short supply these days, in this study we see that a substantial amount of the distrust is aimed at big government and national politics. Although local managers still will bear the brunt of such reactions, there is some indication that forest communities are places where trust building can occur. Many recent reports of positive citizen-agency interactions involve situations that are small and local (e.g., Shindler and Neburka 1997), most often at the ranger district level.

Third, the most critical finding of this study involves an erosion of the Forest Service's relationship with local citizens. This is a primary concern given that research throughout the past decade overwhelmingly indicates that feelings of distrust and disenfranchisement in communities can trump agency attempts to initiate programs like fuel reduction activities, regardless of their scientific merit (Shindler et al. 2002). Although support for prescribed fire and thinning is quite strong in the Blue Mountains, it is public skepticism about management intentions—here and elsewhere—that limit agency effectiveness. Given the controversy surrounding most federal resource management decisions, agency personnel can feel that there is little public support for

or recognition of management actions. But understanding the context of decreasing levels of trust can be helpful. As mentioned, responses here suggest that much of citizens' negative feelings are frustration with the federal bureaucracy in general and not necessarily with Forest Service personnel in the Blue Mountains. Findings from this study suggest a remedy to this situation. The region has a knowledgeable public who also have positive attitudes about treatment alternatives and appear ready to lend support to fuel reduction programs. The key in places like the Blue Mountains is likely to be how well projects target site-specific problems and whether they incorporate the personal concerns of residents (Winter et al. 2002), including the degree to which citizens feel they were represented in the planning process (Lawrence et al. 1997).

Trust is central to an agency's relationship with citizens, but there are a number of related and contributory factors. In the case of fire management, acceptance of practices often depends on the level of uncertainty about outcomes and public understanding of the risks involved. For the most part, it is the uncertainty of actions that gets people excited. People want to know how serious conditions are, what will happen and when, and who will be affected. One certainty is that answers to these questions are not simple, nor are they consistent across settings. But to be relevant to the public, fire management policies need to be placed in a context that is important to them (Loomis et al. 2001). To the extent possible, managers will need to provide scenarios that depict what changes in forest conditions will look like, how soon they could occur, and allow citizens to discuss what the consequences of changes will mean for forest ecosystems and surrounding communities. Most people like those in our study region are capable of assessing the tradeoffs, including positive and negative choices, and welcome the chance to do so. When given a set of choices—even ones that are limited or imperfect—citizens will often choose the

lesser of the two evils and accept it (Ehrenhalt 1994). As effective treatments continue to be implemented and public awareness grows, so too will belief that the Forest Service can be trusted to handle the risks associated with fire and fuel management.

Conclusions

Public acceptance is an essential element in virtually every resource management decision facing public agencies today. Problems such as fire management and forest health, given the attendant risk and uncertainties surrounding these issues, are particularly subject to scrutiny. This study has helped reveal that public acceptance of fire and fuel management is a product of the interactions between citizens and resource managers over time and reflects the beliefs, trust, and confidence that citizens hold about those responsible for federal forests.

A central conclusion from this longitudinal analysis is that public judgments are provisional. As citizens become more aware of the factors involved in fuel management—the choices and consequences, the costs involved, how and why decisions are made, and so on—what seemed reasonable in the past may be deemed less appropriate today (Shindler et al. 2002). By its nature then, public acceptance of fire policies and resulting forest conditions is a continuing process rather than an end product. The job of reaching agreement among stakeholders is long-term and rarely final or absolute (Cortner et al. 1998). This situation underscores the importance of effective, inclusive communication strategies that not only provide information but also focus on the process of how people come to understand forest conditions and support policies for fuel reduction.

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Communication Strategies for Fire Management (Sidebar)

Across public lands a number of innovative outreach efforts are underway that offer citizens an opportunity to evaluate the range of information about fuel management and the tradeoffs of different treatment options. Two examples from the Sisters Ranger District on the Deschutes National Forest in central Oregon are the Heritage Forest Demonstration Area and a partnership with the Black Butte Resort Homeowners Association.

The Heritage Demonstration Project is a collaboration between the Sisters R.D. and a local citizen group, Friends of the Metolius, that consists of 13 treatment plots designed to showcase multiple fuel reduction treatments near high-use recreation areas and residential property. Along with agency personnel, the Friends group has played a key role from the outset. They have been engaged in each planning phase and carried the message to local property owners. Once work was initiated, they erected interpretive signs to accompany the treatments and led public tours to demonstration sites. The project has been instrumental in providing citizens with an opportunity to discuss forest conditions and fuel management and evaluate real-life scenarios prior to a planned broad-scale application of treatments in the area. On Black Butte Ranch the homeowners association is working cooperatively with Forest Service personnel to thin the forest interface between public and private lands—once trained, property owners do much of the work themselves.

Although cooperative programs require greater initiative on the part of citizens and land managers, experiences like those described here suggest that projects can be made more convenient and more effective by organizing them around other local activities such as property owner meetings, watershed council activities, and specific interest group projects. In forest communities, these are the groups that are greatly concerned about conditions and have a real stake in the outcomes. Lessons from management experience show that public understanding and support are more likely to develop in the context of local problems that are relevant to citizens' daily lives.

The ability of fire management professionals to specify conditions and engage citizens in discussion about the nature of the options is essential. Agency personnel can choose the type of participatory experiences that best suit the local situation. Research from forest communities by Shindler and Neburka (1997) and Winter et al. (2002) indicate public responses are more positive when these communications include:

- legitimate opportunities for citizen participation
- language and terms that are defined for common use
- current, accurate, and understandable information that comes from a reliable source
- prescribed fire plans that specifically account for conditions such as weather, proximity to homes, and timing of events
- mitigation measures to reduce treatment impacts on air quality, aesthetics, etc.
- contingency measures for escapes
- cost comparisons of various treatment alternatives
- opportunities to see the result of treatments on-the-ground (preferably at different time scales)
- specific details about who to contact for questions and concerns