Hazardous Fuel Reduction in the Blue Mountains: Public Attitudes and Opinions

Eric Toman[1] and Bruce Shindler[1]

Abstract—*Resource managers in the Blue Mountains region of eastern Oregon and Washington are utilizing prescribed fire and mechanized thinning treatments to reduce hazardous fuel loads and restore forest health. This paper uses panel data from a mail survey administered to the same individuals in 1996 and 2000 to measure change in public attitudes and opinions about fire management programs. Respondents are knowledgeable about, and supportive of, prescribed fire and thinning practices; prefer interactive over uni-directional education programs; and desire a role in management decision-making. While findings were generally similar throughout the study period, significant changes suggest a declining relationship between the Forest Service and Blue Mountains residents.*

Introduction

Forests in the Blue Mountains region of Oregon and Washington are threatened by drought, insect outbreaks, and the risk of catastrophic wildfire (Mutch et al. 1993, Tanaka et al. 1995). Resource managers on the National Forests within the region are utilizing multiple strategies to reduce hazardous fuels and restore forest health. Two of the most frequently used methods are prescribed fire and mechanized thinning treatments. Research demonstrates that a large-scale application of these treatments can address the principal causes of declining forest health and increased fire risks and serve to increase biological diversity, improve plant communities, reduce the number of invasive species, and ultimately create more natural forest conditions (Mutch et al. 1993).

The purpose of this study is to improve our understanding of the factors that contribute to public acceptance of prescribed fire and mechanized thinning in the Blue Mountains area. Specific study objectives were to a) compare the current research findings with the 1996 study to describe changes in public attitudes and behaviors, b) identify levels of support for fuel reduction activities, c) identify citizens' information needs, preferred forms of information exchange, and which delivery systems are most effective, and d) assess interactions between the public and the Forest Service.

Management Context

Declining forest health is not unique to the Blue Mountains but is evident throughout forests of the western United States. Poor forest conditions have greatly increased the risk of catastrophic wildfire and the fires of 2000 brought national attention to this situation. Interagency planning efforts have resulted

[1]Department of Forest Resources, Oregon State University, Corvallis, OR.

in a national strategy to reduce wildfire risks while restoring ecosystem health and protecting communities through fuel reduction practices. Citizen support is a basic requirement to project implementation and long-term success. The public has legitimate concerns about these activities following decades of fire suppression activities, fire exclusion education from forest management agencies, and exposure to high-profile escaped prescribed fires such as the Cerro Grand Fire in Los Alamos, New Mexico, during spring 2000. Current agency educational programs nationwide, and within the Blue Mountains region particularly, attempt to address these concerns. Fuel reduction projects and information programs on the Wallowa-Whitman, Umatilla, and Malheur National Forests provide an opportunity to examine citizen perspectives on the legitimacy of these practices and the effectiveness of informational messages.

Although public awareness of prescribed fire is growing, this use of fire still seems contradictory to the practices that many have come to expect from forest agencies (Beebe and Omi 1993, Lee 1987). Public concerns with prescribed fire typically focus on risk (danger of escapes to public safety and private property), aesthetics (potential loss of scenic quality and recreation uses), health issues (the impact of smoke on air quality), ecological effects (impacts to wildlife, vegetation, water quality), and economic impacts (loss of valuable timber).

In spite of these concerns, public attitudes nationwide have been evolving toward a greater acceptance of the use of fire in forest ecosystems, particularly as agencies improve their communication strategies (e.g., Carpenter et al. 1986, Loomis et al. 2001, Stankey 1976). This is the case in the Blue Mountains where our 1996 study identified an association between increased support for prescribed burning activities with increased citizen knowledge about the role and uses of fire. Although other studies have also found associations between factors such as gender, income, age, backcountry experience, and support levels (Carpenter et al. 1986, McCool and Stankey 1986), knowledge and understanding of prescribed fire continue to be the most important contributors to public attitudes about the practice.

Little research has been conducted on public perspectives of mechanized thinning methods to reduce hazardous fuels. Concerns range from aesthetic impacts and potential ecological effects of harvesting practices (Brunson and Reiter 1996) to doubts about whether thinning treatments will result in a sufficient quantity of marketable timber to offset increased operation costs (Shindler and Collson 1998). Another important issue involves public trust in our forest agencies to effectively implement mechanized thinning programs on federal lands; in particular, citizens have reservations about how much license managers will take in thinning forest stands. Overall, timber harvesting is one of the most contentious issues in the highly charged sociopolitical environment in which our natural resource agencies operate. One of the dangers for fire managers is that many citizens believe using thinning treatments to reduce fuel loads is really just another way to continue harvesting or, in other words, conduct “business as usual” (Stankey 1995).

Methods

Methods regularly employed in social science research provide a “snapshot” of a cross-section of the population at one specific point in time; researchers then make inferences about existing conditions and circumstances.

Although careful analysis of cross-sectional data can provide considerable insight, there are limitations in our ability to understand ongoing processes with data collected from a single reference point (Babbie 1995). To overcome these limitations, longitudinal research designs provide for data collection and analysis over time.

A particularly beneficial type of longitudinal research is a panel study that involves evaluations of the same individuals using the same measures at different points in time. Panel data can provide a richer understanding of ongoing processes and be used to identify general trends within the population of interest. Responses from the individual study participants can be "paired," or linked, over the separate data collection points to allow identification of shifts in individual attitudes and beliefs. Paired data typically reduce the variability that could obscure small but significant differences between results (Devore & Peck 1986).

Data Collection

The current study is a panel study (designed to replicate research conducted in 1996 by Shindler and Reed). A new mail-back questionnaire was sent to all 1996 study participants in the summer and fall of 2000. The majority of questions were replicated to allow for comparison of responses between years; additional questions were included to address current concerns, notably specific Forest Service information programs and citizen-agency interactions. When appropriate, data from replicated questions (1996 and 2000) are compared utilizing paired t-tests and significant differences in responses are noted.

In 2000, 455 of the 533 original respondents were located. Of these, 32 were removed from the sample (29 were deceased or unable to complete the survey due to health reasons, and 3 had moved from the Blue Mountains region). From the useable sample of 423 names, 323 respondents completed questionnaires for a 76% adjusted response rate.

Findings

Public Knowledge, Information Sources, and Forest Health Conditions

To help gauge citizen understanding about the use of fire and thinning, a new line of inquiry was introduced in the 2000 questionnaire that engaged respondents in a 15-item true / false quiz. Quiz statements and responses are shown in table 1.

Overall, respondents were generally knowledgeable about both prescribed fire and thinning; the average correct score across all questions was 70%. However, some public misperceptions seem noteworthy. About one-third (35%) of the respondents did not know (answered incorrectly or not sure) about the important role fire has played in shaping natural forests in the Blue Mountains. Almost half were either misinformed or not sure about the effects of prescribed fire on small trees and understory vegetation, in promoting growth of ponderosa pine, and in controlling noxious weeds — all key objectives for the use of prescribed fire. Similarly, almost one-third (30%) did not know that thinning could be used to encourage growth of ponderosa pine as research has demonstrated (e.g., Cochran and Barrett 1993). Overall, participants appeared significantly more knowledgeable about the effects of thinning than about prescribed fire.

Table 1—Citizen knowledge about the effects of fire and thinning in Blue Mountain forests. Answer generally considered correct is in parentheses and percent answering correctly is indicated in bold.

	Generally		Not
Fire	**True**	**False**	**sure**
a. Fires have played a significant role in shaping natural forests in the Blue Mountains. (True)	**66%**	13%	22%
b. Prescribed fires make additional minerals and nutrients available for plants and trees. (True)	**67%**	12%	21%
c. Prescribed fires cause the immediate death of the majority of animals in the burned area. (False)	7%	**80%**	13%
d. Prescribed fires result in the death of the majority of large, established trees in the burned area. (False)	15%	**74%**	11%
e. Prescribed fires promote the growth of plants that serve as food for deer and elk. (True)	**84%**	9%	7%
f. Prescribed fires kill most of the small, young trees and vegetation beneath the forest canopy. (True)	**51%**	30%	19%
g. Prescribed fires encourage tree growth in ponderosa pine forests. (True)	**56%**	10%	34%
h. Prescribed fire is effective in controlling noxious weeds. (True)	**52%**	24%	24%
Thinning			
i. Selective thinning can be effective in controlling outbreaks of insects and disease. (True)	**78%**	7%	15%
j. Selective thinning reduces competition for minerals and nutrients on crowded sites. (True)	**80%**	7%	13%
k. Selective thinning mimics natural conditions by providing openings in the forest canopy. (True)	**74%**	9%	17%
l. Selective thinning causes the immediate death of the majority of animals in the thinned area. (False)	2%	**89%**	9%
m. Selective thinning encourages tree growth in ponderosa pine forests. (True)	**70%**	6%	24%
n. Selective thinning results in decreased habitat for deer and elk. (False)	13%	**77%**	11%
o. Selective thinning results in the death of the majority of the remaining trees on the site. (False)	3%	**90%**	8%

Knowledge and information play an important role in forming support for management practices. In peoples' everyday lives, there are many different places where citizens might obtain information about natural resource issues. Using a 4-point scale (none, slight, moderate, high) respondents were asked to rate the usefulness of nine likely sources of information about forest management in the Blue Mountains (figure 1).

Newspapers / magazines and friends or relatives continued to be the most useful sources and were the only ones to receive a moderate to high rating by a majority of respondents in both 1996 and 2000. Of particular interest are ratings for timber groups and the Forest Service; these are the only sources to receive significantly different ratings during the study period. The usefulness rating of timber groups rose (39% to 50%), while opinions of the Forest Service as a useful information source fell from 60% to 48%. This finding may suggest that the traditional communication formats utilized by the Forest Service (i.e. brochures, public meetings, exhibits) are less effective or that people doubt the credibility of government provided information (Shindler et al. 1996). Overall, the lowest ratings were for radio, environmental groups, and the internet.

To probe this area more thoroughly in 2000, additional questions focused on specific Forest Service information programs. Respondent familiarity as well as program components such as ease of understanding, convenience, and trustworthiness factored into usefulness ratings; however, only the percentage of moderately or highly useful ratings from respondents familiar with the program are displayed in figure 2. For a more complete analysis of the ratings of agency information programs see Shindler and Toman 2002.

Smokey Bear, elementary school educational programs, conversations with agency personnel, interpretive information, and guided field trips received the highest usefulness ratings. Television messages, newsletters, brochures, exhibits at fairs, and public meetings were moderately useful. Alternatively, few people

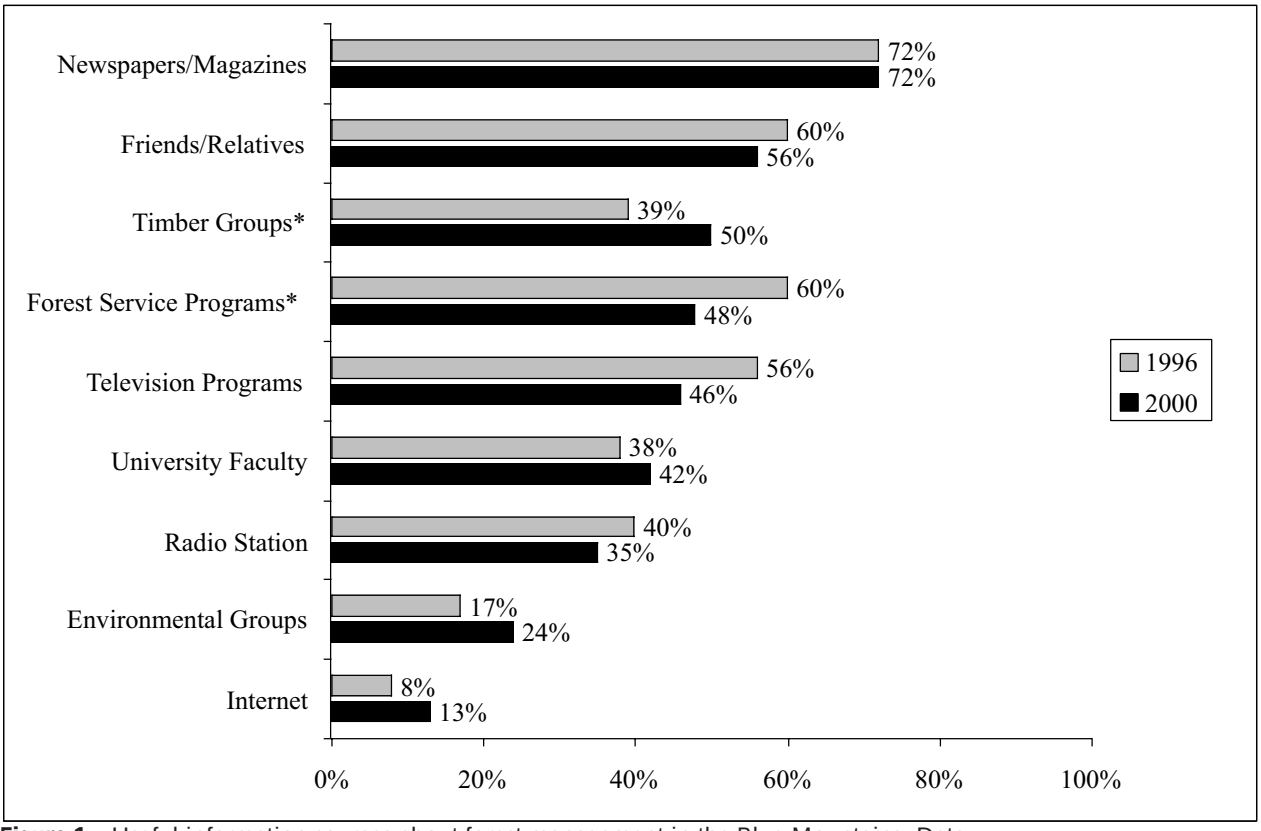

Figure 1—Useful information sources about forest management in the Blue Mountains. Data reflect percentage of citizens who rate usefulness as moderate or high on a 4-point scale (none, slight, moderate, high). *1996 and 2000 responses are significantly different at p £ .01

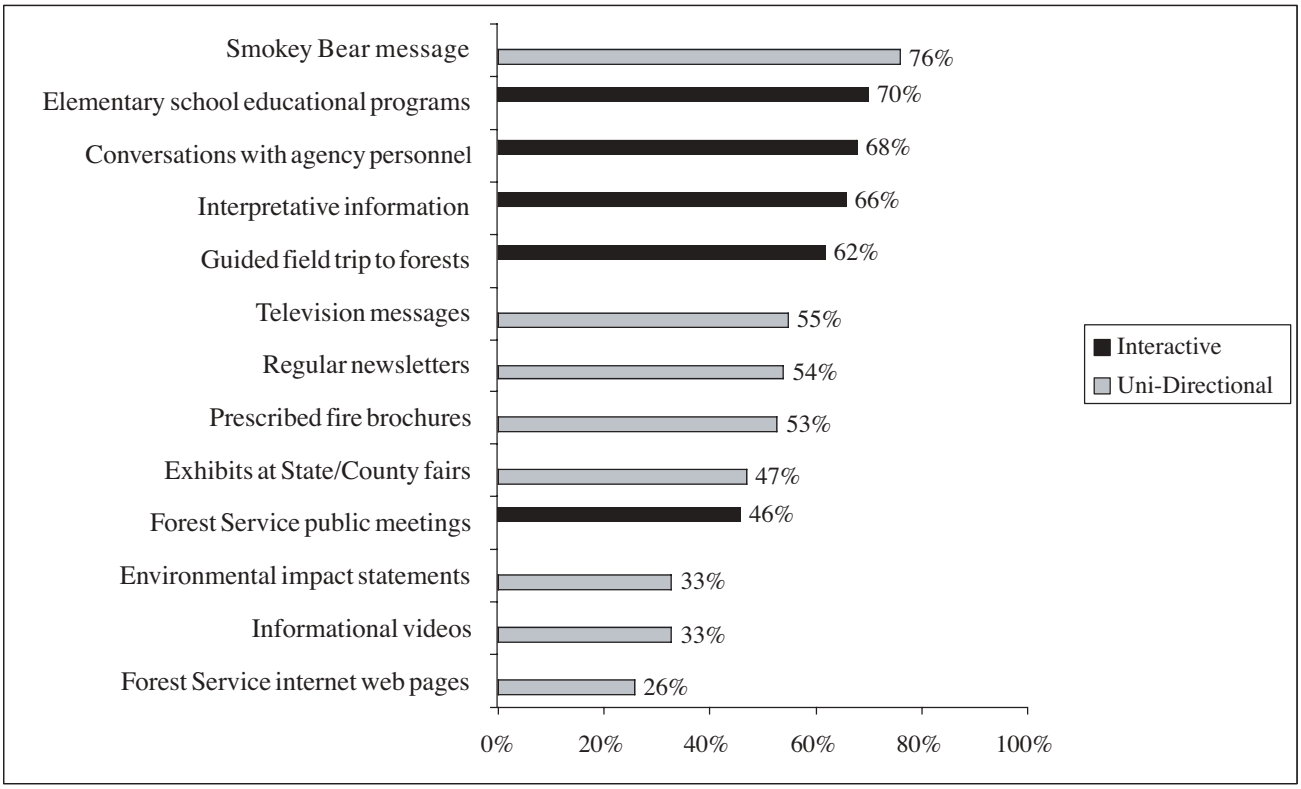

Figure 2—Usefulness of Forest Service information and outreach in the Blue Mountains. Data reflect percentage of citizens who rate usefulness as moderate or high on a 4-point scale (none, slight, moderate, high).

found Environmental Impact Statements, informational videos, and Forest Service internet web pages to be useful.

The outreach programs have been further divided into interactive and uni-directional formats. Interactive programs are those that provide for either personal contact with agency representatives or on-the-ground learning experiences. Uni-directional programs are those that typically involve a one-way flow of communication from the agency to the public. While web pages have the capability to provide a form of virtual interaction, they are included with the one-way messages because none of the Forest Service websites within the Blue Mountains offered an interactive option at the time of this study.

Four of the five most highly rated programs were interactive—elementary school programs, conversations with agency personnel, interpretative centers, and guided field trips—indicating greater dividends may be achieved from this form of outreach. Of the interactive programs, only Forest Service public meetings failed to resonate with a majority of the respondents. Of the uni-directional programs, four—Smokey Bear, television messages, newsletters, and prescribed fire brochures—were useful to a majority of respondents.

Given that one of the stated goals for the use of prescribed fire and mechanized thinning treatments is the restoration of healthy forest conditions, respondents were asked to indicate their perception of the condition of Blue Mountain forests. Opinions about forest health conditions have improved significantly since 1996 (figure 3). While only a few respondents considered conditions to be "very healthy" in either year, responses generally shifted from the lower end (unhealthy) toward the "somewhat healthy" category.

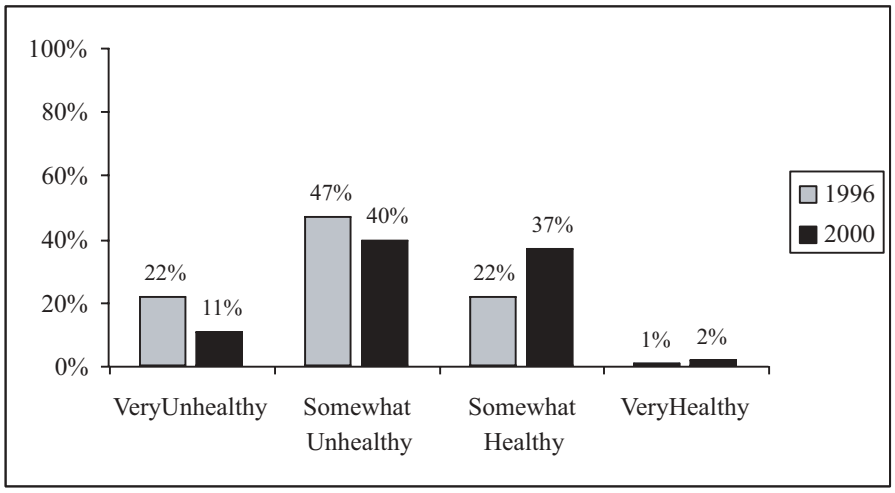

Figure 3—Overall condition of forests in the Blue Mountains. "Don't know" responses omitted. 1996 and 2000 responses significantly different at p £ .01.

Citizen-Agency Interactions

The ability for agencies to interact effectively with local publics is important to successful implementation of management activities (Shindler et al. 2002). Table 2 shows responses about citizens' experiences with the Forest Service from both surveys and responses to four new questions asked only in 2000. Opinions were mixed about these interactions; however, if viewed as a report card, the scores overall were not particularly good.

More specifically, the data show there were several changes since 1996 in respondent assessments of their interactions with the Forest Service. Although agreement was low to begin with, significantly fewer respondents agreed in 2000 that federal agencies use public input to shape management decisions.

Table 2—Experiences and interactions with forest management agencies.[a]

		Agree	Neutral	Disagree	Significance level[b]
Agencies like the Forest Service are open to public input and use it to shape forest management decisions.	**1996**	41%	25%	34%	£ .01
	2000	31%	27%	42%	
Forest managers usually create plans without input from local communities surrounding National Forests.	**1996**	55%	23%	22%	£ .01
	2000	46%	24%	30%	
The Forest Service does a good job of providing information about its management activities.	**1996**	33%	33%	35%	£ .05
	2000	27%	29%	43%	
Our federal forest management systems need major changes, not just minor adjustments.	**1996**	59%	24%	18%	NS
	2000	62%	23%	15%	
The Forest Service should provide a stronger leadership role.	**1996**	54%	32%	14%	NS
	2000	49%	35%	17%	
Federal forest managers build trust and cooperation with citizens so that people will feel that the agency is acting in their best interest.	**2000**	23%	25%	52%	N/A
I trust the local Blue Mountains Forest Service staff, but I don't trust government at the national level to let them do their job.	**2000**	65%	19%	16%	N/A
Local Forest Service staff are prohibited from doing their job because of national restrictions and regulations.	**2000**	68%	24%	8%	N/A
The Forest Service contributes to public knowledge by educating communities about potential benefits and costs of proposed plans.	**2000**	33%	37%	30%	N/A

[a] Responses on a 5-point scale from strongly agree to strongly disagree with a neutral midpoint.
[b] NS = Not Significant, N/A = question not asked in 1996

Given this level of response, it is curious that the number of respondents who agreed that managers usually create plans without input from local communities has decreased, although almost half still believe this to be the case. These two responses seem contradictory but could indicate that while more citizens recognize the Forest Service does solicit public comments, those same citizens do not believe these comments are reflected in management plans. Also, fewer respondents, just 27%, believed the Forest Service does a good job of providing information about its management activities. As in 1996, a majority of respondents agreed that our federal forest management systems need major changes and nearly 50% felt the Forest Service should provide a stronger leadership role.

Responses to new statements added on the 2000 questionnaire provide increased 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 seem to shed light on this finding. Frustration over national level politics and external influences on managing local forests runs high; about two-thirds indicated they trust local Forest Service personnel, but feel government at the national level hinders these individuals from doing their job. Participants were split in their agreement of whether the Forest Service educates communities about the benefits and costs of proposed plans.

A substantial number of people chose the neutral response for most statements. Since no "don't know" category was provided, it may be safe to assume that many of the neutral responses were from people who had no basis for judgment about these issues. This situation usually indicates an opportunity to reach out to a segment of the public and positively influence how these individuals come to view the agency.

Public Attitudes About Prescribed Fire and Mechanized Thinning

Given the many different terms and definitions associated with prescribed fire and thinning activities, care was taken to clearly explain the definition of each practice as used in the questionnaire. The use of the term prescribed fire was limited to management-ignited prescribed fire. Mechanized thinning treatments were defined to include the removal of down logs or standing dead and dying trees less than 15 inches in diameter. Overall support for the use of prescribed fire and mechanized thinning remained similar to 1996 (tables 3 and 4). Most respondents supported some use of prescribed fire in the Blue Mountains; 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—an apt description of current agency fire policy. Support was significantly higher for mechanized thinning; 97% of respondents supported some level of thinning with more than two-thirds giving the agency full discretion for its use.

Table 3—Prescribed fire policies.[a]

The use of prescribed fire in the Blue Mountains...	1996	2000
. . . is a legitimate management tool that the Forest Service should have the discretion to use for improving forest conditions.	44%	39%
. . . should be used sparingly by the Forest Service and only in carefully selected areas.	45%	50%
. . . creates too many impacts and should not be considered as a management alternative.	6%	7%
. . . is unnecessary and should not be utilized.	5%	4%

[a] No significant differences in responses between 1996 and 2000.

Table 4—Mechanized thinning policies.[a]

The use of mechanized selective thinning in the Blue Mountains. . .	1996	2000
. . . is a legitimate management tool that the Forest Service should have the discretion to use for improving forest conditions.	68%	69%
. . . should be used sparingly by the Forest Service and only in carefully selected areas.	28%	28%
. . . creates too many impacts and should not be considered as a management alternative.	2%	2%
. . . is unnecessary and should not be used.	1%	1%

[a] No significant differences in responses between 1996 and 2000.

When asked to indicate their preference for treating the build up of dead trees in the Blue Mountains, respondents clearly preferred a combined thinning and prescribed fire treatment (table 5). It is notable that very few respondents (4%) believed that doing nothing about this problem is a responsible option.

Despite high levels of support, citizen trust in the Forest Service to implement responsible and effective fuel reduction programs appears low (table 6). Regarding the use of prescribed fire, trust levels are not only low but decreased significantly during the study period (52% to 43%). While trust levels

Table 5—Preferred treatment of the existing build up of dead trees in the Blue Mountains.

	Agree
Selective thinning first, then follow with prescribed fire	75%
Use selective thinning only	20%
Use prescribed fire only	1%
Nothing, let nature take its course	4%

Table 6—Citizen trust in the Forest Service to implement fuel reduction programs.[a]

		Agree	Neutral	Disagree	Significance level
I trust the Forest Service to implement a responsible and effective prescribed fire program.	**1996**	52%	21%	25%	£ .05
	2000	43%	21%	34%	
I trust the Forest Service to implement a responsible and effective mechanized thinning program.	**1996**	59%	15%	24%	NS
	2000	52%	21%	26%	

[a] Responses on a 5-point scale from strongly agree to strongly disagree with a neutral midpoint.

were slightly higher for the use of mechanized thinning, only a slim majority (52%) expressed confidence in the agency. A substantial number of people were still neutral regarding both practices, most likely reserving judgment until they see the outcome of agency decisions.

Thus far, the most vocal opposition to the use of fire in the region has been over increased smoke levels. Although temporary in nature, smoke has long been recognized as a public concern associated with the use of prescribed fire, especially because of adverse effects on human health and visibility in communities or along transportation corridors. In 1996 a substantial majority of respondents indicated that smoke levels from prescribed fire were not a problem for their family, nor did they feel that prescribed fire use should be limited because of potential health problems from smoke (table 7). Although the majority of respondents still held similar views in 2000, significantly more people now view smoke as a problem, and, as a consequence, fewer support the use of prescribed fire. When dealing with smoke a simple majority in favor of management practices is probably an insufficient level of public approval. Smoke is a highly contentious issue that provides a rallying point for communities. Those adversely affected by smoke usually vocalize their concerns, a point made by fire managers within the study area.

Table 7—Assessments of smoke.[a]

		Agree	Neutral	Disagree	Significance level
In my area, smoke levels from fire are not a problem for me or my family.	**1996**	76%	10%	14%	£ .01
	2000	61%	15%	24%	
Prescribed fire should not be used because of potential health problems from smoke.	**1996**	12%	17%	71%	£ .01
	2000	14%	26%	61%	

[a] Responses on a 5-point scale from strongly agree to strongly disagree with a neutral midpoint.

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 public debate. Although we have pointed out numerous areas of public support for fuel management practices as well as several specific areas of concern, we recognize these are complex issues. Problems frequently are embedded within larger issues and connected to factors beyond the control of resource managers. Today, the roles that agency personnel are being asked to play are much different than in the past, when citizen participation was minimal and technical expertise was foremost. In this new role, greater public acceptance will be achieved by being aware of, and responsive to, the suite of intertwined ecological factors and community circumstances affecting fuel management. Thus, our concluding comments involve a set of three overarching themes, expressed as basic strategies that emerge from our analysis.

Capitalize on Existing Public Knowledge and Support for Fuel Reduction

Primary results from this study indicate the presence of a knowledgeable general public in the Blue Mountains, solid support for both prescribed fire and mechanized thinning to reduce forest fuels, and an overall stability of public attitudes throughout the study period. Collectively, these findings provide positive news for Forest Service programs. They also suggest that this existing base of well-informed, supportive stakeholders could be a central asset in building future management programs.

Study results also indicate that public understanding and support for treatments is not universal; trouble spots exist. Foremost is the provisional aspect of public support, as evidenced by a drop in the number of people who think the Forest Service can implement a responsible fuel management program. Trust in the agency is central to this issue, but other factors are also likely to apply. In the case of fire management, support is often dependent on the level of uncertainty about outcomes and public understanding of the risks involved. People want to know how serious conditions are, what will happen and when, and who will be affected. Answers to these questions are not simple, nor are they consistent across settings. But to be relevant to the public, fire management policies will need to be placed in a context that is important to them. 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 help citizens understand what the consequences of changes will mean for forest ecosystems and surrounding communities.

Our analysis suggests that citizens in the Blue Mountains are cautiously willing to allow these policies to proceed. As effective treatments are implemented and public awareness of these successes grows, so too will belief that the Forest Service can be trusted to handle the risks associated with fire and fuel management.

Focus on Relations With Citizens

The most troublesome finding from this study is the erosion of relations between citizens and the Forest Service. As elsewhere, many of these feelings

are attributable to the tension between policies set at the national level and the need to create strategies for managing forests at the community level. But it is not likely this circumstance explains all aspects of the declining relationship with the public in the Blue Mountains. Thus, two approaches seem particularly useful. First, to the extent possible, agency personnel will need to filter out the national debate and focus on what can be accomplished in local forests. Programs will need to target local priorities. Second is the necessity to increase opportunities for ordinary citizens and organized groups to have a more meaningful role in planning and implementing fire management strategies. The common thread that runs through all aspects of forest management is the importance of trustworthy relations among stakeholders. It really makes little difference how meritorious a plan may be; nothing will be validated unless the people involved trust one another.

The initial requirement for improving relations and building public trust is an organizational commitment to multi-partner collaboration. This largely depends on whether the leadership on Forests and ranger districts is serious about genuine involvement of stakeholders and how well the actions of personnel reflect this philosophy. Currently, most collaborative efforts and the trust building process remain the job of individuals at the ranger district level where relationships are established and face-to-face interactions can make a difference for residents and their communities. The informal nature of these situations is perhaps the most productive form of relationship building. But this can only occur in a meaningful way when the agency promotes these ideas and supports personnel in their outreach efforts.

Develop a Comprehensive Communication Strategy

Natural resource agencies often think their job is to develop information and deliver it to the public. We still hear frustrated forestry professionals make statements like, “If we could just educate people about the forest and inform them about what we do, then they would understand and support us.” But our tendency to confuse providing information with public understanding and eventual support is a mistake. Although information and knowledge are necessary elements of any public communication strategy, they are rarely sufficient to produce change in the way citizens respond to forest agencies. Public judgments, including judgments of forest conditions and fuel reduction practices, are formed by a suite of factors beyond technical knowledge (Stankey 1996). Thus, the *process* of how people come to understand forest conditions and support policies such as fuel reduction also needs to be an integral component of a communication strategy. A comprehensive public communication strategy will not only focus on the types and content of the information that is disseminated, but also on how and why it is communicated.

Regarding type and content, the data from this project can help organize an approach for communication activities. Two basic levels of communication exist, and each is useful depending on the purpose and intended coverage. One is general information dispersal; this usually involves broad messages that can be conveyed by traditional “bulk” formats such as newspapers, brochures and public service announcements. These are typically for general public consumption and, as such, provide few opportunities to target specific audiences. Because it is difficult to ensure that information is received and understood, their effectiveness as an educational tool is limited. Data in this study seem to reinforce this assessment; most forms of communication in this category are uni-directional formats that received moderate to low level usefulness ratings. Although the agency should continue to use these

informational devices—they are often inexpensive, may be helpful in notifying large audiences about upcoming meetings or proposed projects, and provide some value collectively as a critical mass of information—outreach personnel should not rely on these as primary tools for communicating with local publics.

The second level of communication is more focused in scope and usually includes opportunities for interaction at the community or individual level. In this category are the more highly rated activities such as school programs, visitor centers, and guided field trips. Although these forms generally have widespread acceptance as effective outreach devices, they are also highly dependent on the communication abilities of agency personnel who plan and implement them. For example, public meetings fall into this category but our participants (as elsewhere) did not respond well to this format (Cortner et al. 1998). This seems to be a sign that the more traditional information-sharing or scoping meetings, typically convened to meet NEPA requirements, should be altered in favor of other meeting formats that provide for increased dialogue and two-way communication. But determining the most useful formats is a job to be shared. From a practical standpoint, findings from this study can be used by local personnel to engage communities about which level and forms of information exchange are preferable.

The substantive content of information sources is also a primary consideration. Most content ideas are simple and straightforward—almost intuitive—but neglecting them can be detrimental to communications. Research in forest communities by Shindler and Neburka (1997) as well as Winter et al. (2002) identified specific characteristics of good message content. These include:

- information where terms 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
- fire and thinning plans that provide mitigation measures to reduce impacts on air quality, aesthetics, etc.
- contingency measures for escapes
- cost comparisons of various treatment alternatives
- specific details about who to contact for questions and concerns

Providing the opportunity for people to evaluate the range of information about fuel management and the choices involved brings them much closer to lending support for decisions. Most people like those in our study region are capable of assessing the tradeoffs, including positive and negative consequences, and welcome the chance to do so. When given a set of choices—even choices that are limited or imperfect—citizens will often choose the lesser of the two evils and accept it (Ehrenhalt 1994). The ability of fire management professionals to specify conditions and engage citizens in discussion about the nature of the options is just as essential as providing objective, unbiased information. Of course, this will mean that personnel must be forthcoming about the difficult decisions, including the uncertainty of outcomes associated with the use of fire and thinning treatments.

Useful forums for discussion about forest conditions and fuel management usually involve interactive exchanges, often in places where people can evaluate real-life scenarios prior to policy changes or broad scale implementation of treatments. This study shows that people prefer settings where they can have a more active, legitimate role—settings such as field visits to treatment sites to

review alternatives or planning sessions where stakeholders are given consideration for their points of view and their suggestions are openly discussed and evaluated.

References

Babbie, E. 1995. The practice of social research. 7 ed. Belmont, CA: Wadsworth Publishing Company. 476 p.

Beebe, G.S., and P.N. Omi. 1993. Wildland burning: The perception of risk. Journal of Forestry 91 (9):19-24.

Brunson, M.W., and D.K. Reiter. 1996. Effects of ecological information on judgments about scenic impacts of timber harvest. Journal of Environmental Management 46 (1):31-41.

Carpenter, E.H., J.G. Taylor, H.J. Cortner, P.D. Gardner, M.J. Zwolinski, and T.C. Daniel. 1986. Targeting audiences and content for forest fire information programs. Journal of Environmental Education 17 (3):33-42.

Cochran, P.H., and J.W. Barrett. 1993. Long-term response of planted ponderosa pine to thinning in Oregon's Blue Mountains. Western Journal of Applied Forestry. 8 (4): 126-132

Cortner, H.J., M.G. Wallace, S. Burke, and M.A. Moote. 1998. Institutions matter: The need to address the institutional challenges of ecosystem management. Landscape and Urban Planning 40:159-166.

Devore, J., and R. Peck. 1986. Statistics: The exploration and analysis of data. Los Angeles, CA: West.

Ehrenhalt, A. 1994. Let the people decide between spinach and broccoli. Governing 7 (10):6-7.

Lee, R.G. 1987. Community fragmentation: Implications for future wildfire management. In Proceedings of the symposium on wildland fire 2000, 1987 April 27-30; South Lake Tahoe, CA. J.B. Davis and R.E. Martin, editors. Gen. Tech. Rep. PSW-100. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station.

Loomis, J.B., L.S. Bair, and A. Gonzalez-Caban. 2001. Prescribed fire and public support: Knowledge gained, attitudes changed in Florida. Journal of Forestry 99 (11):18-22.

McCool, S. F., and G. H. Stankey. 1986. Visitor attitudes toward wilderness fire management policy—1971-84. Research Paper INT-357. Odgen, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 7 p.

Mutch, R. W., S. F. Arno, J. K. Brown, C. E. Carlson, R. D. Ottmar, and J. L. Peterson. 1993. Forest health in the Blue Mountains: A management strategy for fire-adapted ecosystems. Gen. Tech. Rep. PNW-GTR-310. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 14 p.

Shindler, B., B. Steel, and P. List. 1996. Public judgments of adaptive management: A response from forest communities. Journal of Forestry 94 (6):4-12.

Shindler, B., and M. Reed. 1996. Forest management in the Blue Mountains: Public perspectives on prescribed fire and mechanical thinning. Corvallis, OR: Department of Forest Resources, Oregon State University. 57 p.

Shindler, B., and J. Neburka. 1997. Public participation in forest planning: Eight attributes of success. Journal of Forestry 95 (1):17-19.

Shindler, B., and P. Collson. 1998. Assessing public preferences for ecosystem management practices. In Ecosystem management: A social science perspective, D. Soden and B. L. Lamb, editors. Commack, NY: Nova Science.

Shindler, B., and E. Toman. 2002. A longitudinal analysis of fuel reduction in the Blue Mountains: Public perspectives on the use of prescribed fire and mechanized thinning. Corvallis, OR: Department of Forest Resources, Oregon State University. 76 p.

Shindler, B., M. Brunson, and G. H. Stankey. 2002. Social acceptability of forest conditions and management practices: A problem analysis. PNW-GTR-537, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 68 p.

Stankey, G. H. 1976. Wilderness fire policy: An investigation of visitor knowledge and beliefs. Research Paper INT-180. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 17 p.

Stankey, G.H. 1995. The pursuit of sustainability: joining science and public choice. The George Wright Forum 12 (3):11-18.

Stankey, G.H. 1996. Defining the social acceptability of forest management practices and conditions: integrating science and social choice. In Defining social acceptability in ecosystem management: a workshop proceedings. M. Brunson, Kruger, L.E., Tyler, C.B., and S.A. Schroeder, editors. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Tanaka, J. A., G. L. Starr, and T. M. Quigley. 1995. Strategies and recommendations for addressing forest health issues in the Blue Mountains of Oregon and Washington. Gen. Tech. Rep. PNW-GTR-350, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 18 p.

Winter, G.J., C. Vogt, and J.S. Fried. 2002. Fuel treatments at the wildland-urban interface: common concerns in diverse regions. Journal of Forestry 100 (1):15-21.