

**Trust, Acceptance, and Citizen-Agency Interactions After Large Fires: Influences on  
Planning Processes**

Suggested running head: Trust is essential to citizen acceptance of postfire management  
strategies

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## **ABSTRACT**

Wildfires have increased in number and size in recent years, making postfire forest management an increasingly important topic. Citizen-agency interactions, citizen trust, and citizen acceptance of management strategies are central to successful planning and decisionmaking in these settings. In this study citizen opinions from the attentive public are evaluated in two locations near recent fires in Oregon: the 2003 Bear and Booth Complex Fires and the 2002 Biscuit Fire. Results suggest an agency's commitment to long-term interactions with citizens influences citizen trust in the agencies and acceptance of postfire management strategies. There is broad acceptance for several postfire management strategies (i.e., erosion control, replanting, reseeding). However, acceptance is highly dependent on trustworthy relations. Further, results suggest it is not enough to simply offer opportunities for public engagement; citizens need to feel that these activities were meaningful opportunities to participate. Although results differed between locations, overall the majority of respondents did not agree with how the local Forest Service and BLM handled forest planning after recent fires. Findings from this research indicate that positive citizen-agency relations need to be developed well before a fire occurs if postfire actions are to be timely and supported by local communities.

## **BRIEF SUMMARY**

Findings from this research support that acceptance of postfire forest management strategies are highly dependent on trustworthy relations. Further, there is evidence this trusting relationship must be fostered long before the fire begins. Citizen assessments of their interactions with agency personnel after wildfire are also examined.

## **INTRODUCTION**

The magnitude and severity of wildfires in the western United States has greatly increased in recent years (National Interagency Fire Center 2007), particularly in the wildland-urban interface (WUI) where steady population growth has resulted in greater risk to people and property. With these trends expected to continue in the future, the process of recovering from large fires (greater than 100,000 acres) will become increasingly important to forest agencies and communities. However, many forest management personnel are challenged with the agency-public interactions that follow such events (Olsen and Shindler 2007). Numerous factors exist that make postfire planning especially problematic.

The decisionmaking environment after most large fires is filled with a high degree of uncertainty, coupled with pressure for prompt action. Agency personnel on postfire planning teams may have little personal experience to draw on in these circumstances, as wildfires at this scale are often a one-time event in the career of a line officer or technical specialist. Additionally, while much is understood about silvicultural systems and harvest operations, there is greater uncertainty about ecological restoration of lands affected by major wildfire (e.g., Donato et al. 2006, Sessions et al. 2004, Thompson et al. 2007). Nevertheless, agency personnel are called on to make technical judgments regarding forest management and restoration, communicate current and reliable information to community members, and include citizens in postfire planning (McCool et al. 2006, Taylor et al. 2005). Not surprisingly, such circumstances can result in considerable conflict over potential actions and the resulting management decisions that play out in the public arena. To be successful, planning efforts will require an informed and supportive constituency (Shindler et al. 2002). Trustworthy relations, developed well before the

fire occurs, are significant to bringing agency personnel and citizens together to agree on a course of action after a fire (Carroll et al. 2000, Liljebblad and Borrie 2006, Olsen and Shindler 2007).

A growing body of research addresses citizen-agency relations in natural resource settings, particularly interactions with citizens regarding fuel reduction activities and defensible space programs. However, research is limited in postfire contexts. The purpose of this study is to improve understanding about citizen-agency relations concerning forest planning and decisionmaking after large wildfires on federal lands, and to examine differences between sites that suggest “one-size-fits-all” policies may not be appropriate. More specifically, the intent was to 1) assess public opinion of citizen-agency interactions, 2) examine citizen trust in the U.S. Forest Service and Bureau of Land Management (BLM) to plan and implement practices, and 3) measure acceptance of postfire management strategies. This was accomplished by examining the experiences of the attentive public in postfire planning using survey data in two locations: southwest and central Oregon where large wildfires recently occurred. The attentive public are often the first to respond to new management initiatives as they are engaged in the issues and are most likely to support or block agency plans (Shindler and Toman 2003). Thus, their opinions can be useful in understanding the success or failure of agency decision processes. Prior to the surveys, these two sites were also examined as part of a qualitative study including interviews of citizens and agency personnel.

## **MANAGEMENT CONTEXT**

Forests in Oregon illustrate the challenges created by the increase in fire magnitude and frequency. Two study sites were selected where large wildfires had recently occurred;

southwestern Oregon in the vicinity of the Biscuit Fire (2002), and central Oregon in the vicinity of the Bear & Booth (B&B) Fires (2003). Lightning was the official cause of both fires. Both burned a variety of land use types (predominantly Forest Service lands) and were eventually extinguished by fall precipitation. Plans for recovery projects were developed at both sites that included a variety of management practices to be applied in different areas. These practices included seeding, measures to control erosion, replanting of conifers, harvest of burned trees (i.e., salvage), actions to protect human safety, and leaving some areas alone. A detailed description of the two sites is provided here so that implications can be drawn about social and environmental similarities and differences between the sites.

### ***2002 Biscuit Fire in southwest Oregon***

The Biscuit Fire encompassed nearly 500,000 acres in the Siskiyou Mountains. Over one-third of fire was in designated wilderness area, and much of the rest of the fire was in roadless or matrix areas on the Rogue River-Siskiyou National Forest and Medford BLM lands. Disparate communities are spread over a large area surrounding the fire, though many of the local communities have a strong history of timber activity as a primary source of local income. Included in the burn area were areas of old-growth forest, a passionate issue for many Oregonians, and several popular recreation sites. Few structures were burned, though thousands of residents were put on evacuation notice. It was one of the largest wildfires in U.S. history and the largest recorded fire in the state of Oregon, which added an additional level of national media attention and controversy as planning and decisionmaking proceeded (Conroy 2007, Durbin 2003, Milstein 1997). Prior to the Biscuit Fire, few other fires had burned in the area in recent years.

Plans for management of the affected Forest Service and BLM lands were developed from 2002-2004. Earlier interviews in the area suggested there was an expectation among both local and national-level agency personnel as well as some local citizens that timber extraction occur in the burned areas. At the same time, there were strong reactions from other local citizens and environmental groups that timber removal be minimized or excluded altogether. Final plans included salvage logging on over 19,000 acres, some of which was in Late Successional Reserves and Inventoried Roadless Areas (Biscuit Fire Recovery Final Environmental Impact Statement 2004).

Local Forest Service and BLM personnel have had mixed success interacting with community members on forest management issues in the past. Agency relations with community members were productive on several previous projects; however, these interactions cooled considerably over time (Shindler 2003). Many individuals attributed this shift partly to policy and budget constraints imposed by the federal government on the ability of local personnel to work cooperatively with citizen groups (Stankey et al. 2003).

During the planning phase of the Biscuit Fire Recovery Project, a broad range of outreach activities were implemented. These included numerous agency-led public meetings in nearby communities, citizen-organized meetings (some with professional facilitators), a workshop-style conference hosted by the agencies, agency presentations with question-and-answer periods, and a limited number of agency-led and invitation-only field trips. Prior interviews suggested the communication focus for the agencies during this planning phase was to keep information flowing and to remain consistent with released messages. Overall, nearly 23,000 written comments were received by the Forest Service and BLM regarding plans for the burned area.

### **2003 B&B Fires in central Oregon**

The B&B Fires encompassed nearly 92,000 acres in the Cascade Mountains of central Oregon, an area where forest use is focused on recreation and amenity benefits. Nearly half of the fire burned in designated wilderness area on the Deschutes and Willamette National Forests. The remainder of the fire burned primarily on other Forest Service lands, though some other ownerships were also affected. Communities near the fire are small with similar amenity interests and have a history of citizen-agency cooperation over the last dozen years. Old-growth forested areas were included in the burn area. Few structures were affected, though many residents were evacuated on two different occasions. It was the largest wildfire in recorded history for the Deschutes National Forest. Residents in this area are also familiar with recent smaller wildfires, some requiring evacuations and destroying a few homes in the immediate area. In addition to the B&B Fires, five other fires burned more than 50,000 acres of ponderosa pine (*Pinus ponderosa*) and mixed-conifer forests in the region since 2002 (Toman et al. 2008a).

Plans for management of the affected lands on the Deschutes National Forest were developed from 2003-2005. As with the Biscuit Fire, earlier interviews suggested an expectation of timber extraction from the burned areas, while others advocated that timber removal be minimized. Final plans included salvage logging on over 6,800 acres, some of which were in Late Successional Reserves (B&B Fire Recovery Project Final Environmental Impact Statement 2005).

As mentioned, local Forest Service personnel have a recent history of positive interactions with community members on forest management issues and projects (Shindler and Toman 2003). During the planning phase of the B&B Fire Recovery Project, numerous outreach

activities were implemented, including several agency-led public field trips conducted within weeks of containment, agency-led public meetings, and one-on-one discussion with and feedback from key local community groups on planning choices. Prior interviews identified that the communication focus during this planning phase was to use “plain English” and humanize concerns and individuals wherever possible. Overall, more than one hundred written comments were received by the Forest Service regarding plans for the burned area.

## **RELATED RESEARCH**

Research on the socio-political aspects of forest and fire management has steadily increased in recent years. Findings from a variety of contexts are relevant to this study. Citizen-agency interactions, trust, and social acceptability are introduced in this section, as each is an influencing factor in successful forest planning and decisionmaking (Shindler et al. 2002, Toman et al. 2006, Winter et al. 2004).

Citizen-agency interactions, especially agency communication efforts, are important during all phases of the fire cycle (pre, during, and postfire), and, decisions made in one phase often influence the options available in other phases (McCool et al. 2006). Hence, public expectations about agency communication and management decisions are often based on prior, pre-fire experiences (Olsen and Shindler 2007). The process of *how* citizens and community groups are engaged is an important factor in determining citizen-agency communication and interaction effectiveness (Toman et al. 2006). More focused messages than those used in large-scale media campaigns are necessary. Considerable research in fire-prone communities indicates two-way, interactive communication activities are more effective at increasing understanding and support than one-way (i.e., brochures, news articles, newsletters) information delivery

(McCaffrey 2004, Parkinson et al. 2003, Toman et al. 2006). Studies in postfire communities emphasize the importance of engaging local social networks and including community leaders and organized groups for building goodwill and the successful implementation of postfire projects (Burns et al. 2008, Toman et al. 2008a). Other fire-related studies support paying credence to location-specific social and environmental factors, including avoidance of “one-size-fits-all” policies (Shindler 2000, Mendez et al. 2003, Brunson and Shindler 2004).

Barriers and obstacles to effective citizen-agency interactions also exist in the postfire planning environment. Olsen and Shindler (2007) identified four that were generalized across many contexts. First, in many settings there is a lack of common language about activities and goals. Use of words like “restoration” when there is no clear definition or understanding among agency personnel and citizens about its meaning can be problematic (Hull and Robertson 2000, Mowrer 2004). Second, there remains a focus on forest aesthetics and returning to natural landscapes, when there is little agreement on what “natural” means (Kay 1997, Shindler et al. 2002). Third, there can be intense pressure for rapid decisionmaking (i.e., over salvage logging) when ecological and social uncertainty may be considerable, and rushing to judgment could deter building of support for solutions (Stankey and Shindler 1997). Fourth, a lack of trust in the citizen-agency relationship can affect how citizens react to and support future agency plans (McCool et al. 2006, Olsen and Shindler 2007).

Citizen trust in forest agencies may be the most essential component to successful implementation of any forest management program (Burns et al. 2008, Carroll et al. 2000, Shindler et al. 2002, Winter et al. 2004). This can be especially crucial in postfire environments where citizens tend to lack personal experience with conditions and practices, but are still

involved emotionally after the event (McCool et al. 2006, Olsen and Shindler 2007).

Community relations built on trust have many positive benefits including conflict reduction, ability to organize, decreased costs, and cooperative behavior (Rousseau et al. 1998), all of which are important in reaching well-supported decisions after fires. Recent wildfire research suggests that trusting relations can be developed when agencies and citizens organize before fires occur, specifically to build fire-safe communities and work together on fuel reduction activities (Knotek and Watson 2006, Liljeblad et al. 2005, Winter et al. 2004). The resulting positive citizen-agency interactions can also carry through during and after a fire event when uncertainty is high (Burns et al. 2008, Ryan and Hamin 2006, Olsen and Shindler 2007, Toman et al. 2008a).

An example of a successful trust-building interaction comes from public bus tours organized by the Sisters Ranger District after the 2003 B&B Complex Fires. Participants responded very positively to the tours, rating them as useful, fair, balanced, and contributing to the credibility and trustworthiness of managers (Toman et al. 2008a). Similar experiences have been reported on other management units as well (e.g., U.S.D.I. National Park Service 2003). However, Toman and colleagues (2008) point out that trust and credibility are too complex to be fostered or repaired exclusively with one activity. Rather, events like these tours, combined with numerous other interactions over an extended period of time, feed the long-term development of the citizen-agency relationship (Shindler et al. 2002). Indeed, research has shown methods for building trust are centered on the frequency, reliability, and predictability of contact over the history of a relationship (Fukuyama 1995, Toman et al. 2006, Winter et al. 2004).

The long-term sustainability and adoption of a forest management practice is influenced by more than just trust; practices must also be socially acceptable (Shindler et al. 2002). While

many researchers and forest management personnel have come to understand the value of working toward public acceptance, it is not something the agency can fully control (Kneeshaw et al. 2004, Mascia et al. 2003, Thornhill 2003). At best, managers can work with citizens to strengthen factors that affect acceptance including trust, knowledge of conditions and practices, and their understanding of management objectives and potential risks (Shindler et al. 2002, Stankey and Shindler 2006).

Of particular relevance to postfire settings, Stankey and Shindler (2006) noted that public acceptability judgments are *contextual*, *conditional*, and *provisional*. They are *contextual* because they are based on familiar, identifiable places that hold meaning for citizens. Community members often care deeply about potential plans for these areas. Judgments are *conditional* because they are often based on whether actions are fair to all stakeholders and if decision processes are inclusive of those who may be impacted. This can be especially important after a fire when effects of the burn are often felt most intensely by specific groups (i.e., those with property damage, loss of businesses, evacuees, etc.). Judgments are also *provisional* because public opinions change; what people find acceptable today may fall out of favor depending on new information or management actions. Numerous authors identify trust as a factor that shapes, sustains, and alters public acceptance of management practices, particularly after wildfires (Burns et al. 2008, Olsen and Shindler 2007, Ryan and Hamin 2006). Citizen-agency interactions are one platform where public understanding of postfire issues and implications can be fostered, creating more responsible, stable, and consistent public opinion (Shindler et al. 2002).

The few postfire studies conducted thus far found high levels of public acceptance for restoration activities such as erosion control and replanting. However, acceptance of salvage harvesting appears highly contextual (Ryan and Hamin 2006, Toman et al. 2008a), with higher rates of approval evident when citizens trust the managing agency to implement strategies (Carroll et al. 2000). Acceptance of salvage is also dependent on the specific location where work will be conducted (Ryan and Hamin 2006), as well as the openness and quality of deliberation in the planning process used to determine sales (Olsen and Shindler 2007).

## **METHODS**

The results presented in this paper represent the second phase of research in these communities. The first phase included interviews with a total of 11 agency personnel and 15 community members from the two study sites. Themes identified during the interviews were used to develop the 8-page mail questionnaire examined in this paper. Survey questions addressed respondents' awareness and opinions of federal agency planning and decisionmaking with regards to general forest management, forest management after fires, and forest management after the Biscuit and B&B Fires specifically. Correlations identified specific factors that influenced key variables in question. To better understand how local context may influence response to questions, comparisons between the two sites were also conducted.

This research employed an attentive public sample, which is characterized by a higher level of citizen participation in government than the general public (Barber 1984, Luch 1987). Use of this sample is appropriate for two reasons: 1) findings from this population are meaningful to agency personnel because the attentive public includes individuals who are likely to pay attention to or participate in agency programs, and 2) opinion surveys often target the

attentive public because these individuals are usually the “first responders” to a new management initiative and, in turn, agencies must account for their input (Shindler and Toman 2003). Samples were drawn from citizen lists maintained by the Forest Service in each region; lists were comprised of individuals who had submitted comments to the local Forest Service or BLM on the Biscuit and B&B (or other recent) fires, participated in fire-related outreach activities, or requested information about recent forest management activities. Only residents within the two study regions were included in the sample. In short, the sample includes local citizens who had interacted with or submitted comments to their local Forest Service office after the fires occurred.

Survey administration began in January 2007 according to a modified “tailored design method” (Dillman 2007). In the Biscuit Fire region, 261 out of 427 surveys were completed and returned for a response rate of 61%. The B&B Fires survey was distributed to 358 individuals, with 250 surveys returned for a response rate of 70%. Given these high response rates and the associated reduction of non-response error (Lehman 1989, Needham and Vaske 2008), no non-response bias check was completed. This level of response is sufficiently high to make inferences to the larger study population of the attentive public in the two study locations (Lehman 1989). Additionally, because fire managers may interpret these results as they relate to similar settings, it is likely these findings will ultimately be useful beyond the current study.

## **FINDINGS**

The survey was completed by members of the attentive, local public at each site. Nearly half of Biscuit respondents lived within 20 miles of the fire boundary, while half of B&B respondents lived within 5 miles of the fire boundary. Respondents considered themselves

moderately or well informed about forest conditions and management after fires. When asked about priority trade-offs between environmental and economic considerations when managing forests, the majority of respondents at both sites tended to prefer actions that protected the environment.

Findings are presented in four sections: 1) acceptance of postfire management strategies, 2) citizen-agency postfire interactions, 3) trust in the agencies, and 4) factors influencing acceptance.

### ***Acceptance of postfire management practices***

Forest agencies have a number of options for managing lands after a fire once emergency crews have finished stabilizing hazardous conditions. These include erosion control measures, replanting trees, seeding with grass or forbs, harvesting burned trees, managing for safety only, and taking no action. These practices were accompanied by short definitions in the questionnaire. Respondents were asked to judge each practice separately. Table 1 displays each management option and respondents' selection from five response choices provided.

**1. Percent acceptance of post-fire management practices.**

<b>Public Acceptance of Post-fire Practices</b>	<b>Erosion Control *</b>		<b>Replanting *</b>		<b>Seeding *</b>		<b>Harvesting burned trees *</b>		<b>Manage for safety only *</b>		<b>No action. Let nature take its course.</b>	
	Biscuit	B&B	Biscuit	B&B	Biscuit	B&B	Biscuit	B&B	Biscuit	B&B	Biscuit	B&B
This practice is a legitimate tool that land managers should be able to use whenever they see fit	<b>70</b>	<b>78</b>	<b>70</b>	<b>85</b>	<b>63</b>	<b>78</b>	<b>46</b>	<b>56</b>	<b>43</b>	<b>33</b>	<b>37</b>	<b>29</b>
This practice should be done only infrequently, in carefully selected areas	<b>24</b>	<b>18</b>	<b>21</b>	<b>11</b>	<b>29</b>	<b>16</b>	<b>28</b>	<b>27</b>	<b>28</b>	<b>35</b>	<b>21</b>	<b>25</b>
This practice should not be considered because it creates too many negative impacts	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>16</b>	<b>7</b>	<b>16</b>	<b>12</b>	<b>19</b>	<b>19</b>
This is an unnecessary practice	<b>3</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>10</b>	<b>9</b>	<b>11</b>	<b>13</b>	<b>21</b>	<b>23</b>
Don't know	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>7</b>	<b>2</b>	<b>5</b>

\* Significant difference between sites at  $p \leq 0.05$ .

Because the second response choice represents the common form of agency implementation for management practices, selection of the first or second choice was interpreted as acceptance of the specific practice. Based on this approach, three practices (erosion control, replanting, and seeding) were acceptable to over 90% of survey respondents from both sites. B&B participants were willing to give managers more discretion for implementation of these three practices as well as for harvesting burned trees. Even this most potentially contentious practice – harvesting burned trees – was acceptable to nearly three-quarters of respondents at both sites (74% on the Biscuit and 83% on the B&B). Overall, relatively few participants indicated any of these six practices should not be used (3<sup>rd</sup> and 4<sup>th</sup> answer choices). On the whole it appears that B&B respondents favored more active management than their Biscuit counterparts. Finally, it is evident that almost everyone had an opinion on these practices as few *don't know* responses were given.

### ***Citizen-agency postfire interactions***

Respondents' opinions of citizen-agency interactions in planning and decision processes after the fires are displayed in Table 2. Response choices for a set of statements were a 4-point scale (*strongly disagree* to *strongly agree*) with a "*don't know*" option. For each statement, the percent of *agree* or *strongly agree* responses are presented. Because *don't know* responses were relatively high in some cases, these are presented in parentheses.

## 2. Citizen-agency interactions for postfire planning and decisionmaking.

Statement	% Agree/strongly agree <sup>A</sup> (% don't know)	
	Biscuit Fire	B&B Fires
Citizens had meaningful opportunities to contribute to decisions *	<b>31</b> (8)	<b>43</b> (20)
Federal managers have used public input to help make decisions *	<b>24</b> (9)	<b>45</b> (16)
Thus far, management decisions after the Biscuit (or B&B) Fire have been made according to a fair process *	<b>11</b> (11)	<b>33</b> (25)
Decisions were based on scientific information *	<b>17</b> (12)	<b>38</b> (29)
Federal forest managers did a good job of explaining management options, activities, and consequences *	<b>32</b> (12)	<b>46</b> (19)
I am skeptical of information from federal forest agencies *	<b>73</b> (5)	<b>57</b> (3)
Federal forest managers have effectively built trust and cooperation with local citizens *	<b>13</b> (6)	<b>40</b> (9)
I agree with how local agency staff have handled forest management after wildfires *	<b>11</b> (8)	<b>31</b> (16)

<sup>A</sup> Response categories range from 1 = *strongly disagree* to 4 = *strongly agree* and *don't know*.

\* Significant difference between sites at  $p \leq 0.05$ .

Overall, respondents at both sites were substantially critical of agency actions. The low-level agreement for the first four statements, dealing primarily with agency decision processes,

suggests citizens are not satisfied with their role in decisionmaking or in the information agencies use to make decisions. Participants also gave agency managers low marks for explaining options and consequences and voiced skepticism about the information they provided. Citizens' overall lack of trust and agreement with how postfire management was handled is revealed by responses about the last two statements. Also striking is that numerous respondents indicated *don't know* for many statements, particularly B&B participants who appear to have had fewer interactions with agency personnel. Even so, it is noteworthy that in every case the B&B participants had more positive opinions than those from the Biscuit site.

### ***Trust in the agencies***

Research has shown citizen trust in forest agencies is important to the success of forest management policies and practices. Respondents' rated their level of trust in the local Forest Service or BLM to make good decisions about forest management using a 4-point scale (*no trust* to *full trust*) and a "*don't know*" category. Subsequently, they were asked if their trust in the forest agencies had changed based on how management activities were handled after the fire. Results are reported in Table 3.

About two-thirds of the B&B participants voiced a moderate or full level of trust in the agencies while scores for Biscuit participants were significantly lower. Few respondents used the *don't know* option. Following this pattern, the majority of B&B respondents said their trust in management activities did not change after the fire. However, the majority of Biscuit respondents indicated a decrease in trust. Still, a substantial number (30%) at the B&B site also noted a decrease. Few respondents at either site indicated an increase in trust.

### 3. Trust in the agencies.

Trust	% Moderate/full trust <sup>A</sup> (% don't know)	
	Biscuit Fire	B&B Fires
My level of trust in local Forest Service or BLM staff to make good decisions about forest management. *	<b>41</b> (1)	<b>66</b> (4)

#### Based on how management activities were handled after the fire, my trust in the forest agencies has... \*

Increased	<b>1</b>	<b>8</b>
Not changed	<b>43</b>	<b>62</b>
Decreased	<b>56</b>	<b>30</b>

<sup>A</sup> Response categories range from 1 = *no trust* to 4 = *full trust* or *don't know*.

\* Significant difference between sites at  $p \leq 0.05$ .

An open-ended follow-up question asked why their trust had changed, and the majority of respondents answered. Of the few who indicated an increase in trust, good public-agency interaction and communication skills was noted. Reasons for a decrease in trust across both sites included: 1) beliefs about political influence (by both national government and interest groups) on local agency personnel at the expense of ecological factors, 2) that management activities were illegally conducted (e.g., activities contrary to land-use goals), and 3) that citizen input, local needs, and forest health (some arguing more harvest was needed, some less) were ignored.

### ***Factors influencing acceptance***

To better understand how factors such as trust and interactions with agency personnel may affect acceptance of postfire management strategies, correlation analysis was conducted. Because trust levels and responses about citizen-agency interactions were significantly different between sites, correlations were run separately for each site. Two column variables are presented: trust and interactions. Trust scores from Table 3 (*no trust to full trust*) were used in the analysis. The citizen-agency interaction variable represents an additive scale calculated from ratings in Table 2. Scores from the statement “I am skeptical of information from federal forest agencies” were reverse-coded to match the attitude direction of the other statements. Factor and reliability analysis confirmed all variables in this scale represent a single latent variable (Cronbach’s  $\alpha = 0.903$ ). Row variables correspond to acceptance of each postfire management strategy from Table 1. *Don’t know* responses were omitted in all cases. Results of the correlation analysis are reported in Table 4.

Both trust and citizen-agency interactions are positively correlated with nearly all active postfire management practices (erosion control, replanting, seeding, and harvest of burned trees) at both sites. Only replanting and seeding (at the B&B site) seem unaffected by these measures. However, with the strongest correlations for all active management options, trust and citizen-agency interactions appear to be major influences on public acceptance of harvesting. Interestingly, the no action alternative was negatively correlated with both measures, suggesting respondents with low levels of trust or negative interaction experiences do not want managers to conduct any active management practices.

**4. Correlation of influences on public acceptance of postfire management practices.**

Acceptance of Postfire Management Practices	Trust in Local Agency <sup>A</sup>		Citizen-Agency Interactions <sup>B</sup>	
	Biscuit	B&B	Biscuit	B&B
Erosion control	.199*	.236*	.207*	.367*
Replanting	.250*	.136*	.308*	.180
Seeding	.194*	.123	.265*	.276*
Harvesting burned trees	.333*	.336*	.467*	.426*
Manage for safety only	-.078	.006	-.272*	.004
No action. Let nature take its course.	-.269*	-.191*	-.373*	-.294*

<sup>A</sup> Response categories range from 1 = *no trust* to 4 = *full trust*.

<sup>B</sup> Scale of responses to statements in Table 2 (Cronbach's  $\alpha = 0.903$ ).

\* Pearson correlation is significant at  $p \leq 0.05$ .

To further test the importance of citizen-agency interactions, participation rates and perceptions about specific interactions with agency personnel were examined. Respondents were first asked if they had participated in four activities that occurred at both sites: 1) providing written comments on forest plans, 2) speaking with agency personnel about forest plans, 3) attending a public meeting with agency personnel, and 4) participating in field trips or on-site

demonstrations with agency personnel. At least one-quarter of respondents at both sites participated in each activity. For many activities a majority indicated participation. Respondents were then asked to rate how worthwhile activities were in which they had participated. Response options included a 4-point scale from *not worthwhile* to *extremely worthwhile*. The questionnaire also explained that “worthwhile” meant that an activity was a good, credible exchange of information and they would participate in it again. Findings are presented in Table 5. Responses in bold represent ratings (*moderately* or *extremely worthwhile*) of respondents who participated in each specific activity (indicated in parentheses).

Results are mixed. For the Biscuit Fire, providing written comments was the most common activity, while B&B respondents spoke with agency personnel more than any other form of interaction. Fewer respondents participated in a field trip, though earlier interviews suggested this activity may have been the least available to local citizens at each site.

Only those who participated in each activity were asked to rate it. Biscuit respondents generally gave low ratings about their experiences. Responses from the B&B site were significantly better; the majority found all activities except providing written comments as *moderately* or *extremely worthwhile*. Field trips fared the best at both sites.

**5. Participation rates and worthwhileness of interactions with agency personnel after fire.**

Activity	% Moderately/extremely worthwhile <sup>A</sup> (% Participated)	
	Biscuit Fire	B&B Fires
Provided written comments on forest plans *	<b>17</b> (72)	<b>34</b> (46)
Spoke with agency personnel about forest plans *	<b>25</b> (59)	<b>56</b> (51)
Attended public meeting with agency personnel *	<b>26</b> (62)	<b>51</b> (47)
Participated in field trips or on-site demonstrations with agency personnel *	<b>37</b> (28)	<b>73</b> (32)

<sup>A</sup> Response categories range from 1 = *not worthwhile* to 4 = *extremely worthwhile*.

\* Significant differences between sites at  $p \leq 0.05$ .

As one additional way to examine influences on public acceptance, respondents were asked how important ten factors were to their judgments of agency actions and decisions. Response options included a 5-point importance scale (*none, slightly, moderately, very, and extremely*). A “*don’t know*” option was not provided. Findings are presented in Table 6, roughly rank-ordered from most important to the least important factor. For each statement, the percent of *very and extremely important* responses are presented.

**6. Influences on public acceptance of agency actions and decisions.**

Statement	% Very/extremely important <sup>A</sup>	
	Biscuit Fire	B&B Fires
Trust in the decision-maker	74	83
The decision is based on environmental consequences	74	82
When I know the objectives of a proposed management action	74	79
Scientists play a role in reviewing alternatives for management decisions	68	80
Actions will help reduce the spread of non-native species	65	76
The decision leads to active management (thinning) to maintain or restore conditions *	60	66
The decision protects wildlife habitat over human use *	56	65
The decision maintains forest access for recreation	52	51
Actions will help support the local economy *	53	34
The decision was based on economic consequences *	46	34

<sup>A</sup> Response categories range from 1 = *not important* to 5 = *extremely important*.

\* Significant differences between sites at  $p \leq 0.05$ .

A number of influences were important at both sites, with about three-fourths or more of the participants giving high marks to trust in the decision-maker, basing the decision on environmental consequences, and knowing the objectives of a proposed management action. Overall, beliefs were somewhat stronger among B&B participants, who also gave high ratings (over 75%) to scientists playing a role in reviewing alternatives and actions helping to reduce non-native species. About two-thirds of Biscuit respondents also felt these factors are important. Actions that support the local economy and basing decisions on economic consequences were among the least important influences on public acceptance.

## **DISCUSSION**

Postfire forest management on federal lands is ecologically and socially complex. This paper explores citizen-agency interactions, trust, and acceptance of postfire management practices in two postfire settings. It must be emphasized that this study did not employ random sampling, and therefore findings cannot be generalized to the general public. Rather, this study examines the attentive public – individuals who by definition are more active in government (Barber 1984, Lunch 1987) and tend to be those most likely to actively support or oppose agency plans. Several findings are noteworthy.

First, there is broad acceptance from respondents for all postfire treatment options. Acceptance is nearly unanimous for the less controversial decisions such as use of erosion control, replanting, and seeding in selected areas. A strong majority of respondents in this study also accepted the use of salvage in carefully selected areas, despite these participants tending to prefer an environmental over economic focus on decision-making, and the fact that the commercial harvest of burned trees has been at the center of postfire controversy in numerous

locations (Duncan 2002, Preusch 2004). Although the acceptance of these four active practices is high, further analysis demonstrated low trust levels may actually reduce this acceptance in both locations. These findings are in line with other studies where people seem to be saying they will withhold their judgment of agency trustworthiness until they see how these treatment options are implemented and whether the agency follows through with what they said they would do (Cvetkovich and Winter 2002 and 2004, Kasperson et al. 1992, Winter and Cvetkovich 2008).

While acceptance for treatment was high, a majority of respondents also supported the no action alternative. As each alternative was measured independently in this survey, this apparent conflict of accepting both heavily intensive (i.e., salvage) and totally passive (i.e., no action) approaches is possible. Such widely supportive judgments of seemingly opposite approaches may result from the expectation that each practice would take place in *different* and carefully selected areas, and that each practice may have an acceptable use somewhere on the affected landscape. These findings are useful to managers in that participants made clear that understanding the purpose and spatial context of proposed actions (“knowing the objectives of a proposed management action”) as one of the most important factors influencing their judgment of agency decisions. Also noteworthy is that 40% of respondents completely rejected the “no action” alternative, suggesting many citizens see a need for some form of management on these lands.

Second, respondents’ assessments of citizen-agency interactions were generally negative. Not only did participants give managers low marks for providing information and opportunities for interaction, they also largely indicated that many interaction activities were not worthwhile. One possible explanation for these low marks surfaced in the open-ended questions in this

survey; citizens were dissatisfied with how the agencies used public input as well as a lack of understanding about the information used to make decisions. Failure to adequately listen and respond to citizens has been cited as a common problem elsewhere (Campbell 2004, Cortner et al. 1998, Kent et al. 2003, McCool et al. 2000, Mendez et al. 2003) and also leads to loss of trust as was noted by respondents in this study. Closer examination of these responses reveals more clues; participants from the B&B site generally responded more positively than participants from the Biscuit site. A likely explanation is that the more developed relationships and history of positive citizen-agency interactions at the B&B site contributed to higher assessments after the fire. Other researchers have suggested this same relationship where pre-fire interactions influence postfire relationships (Burns et al. 2008).

In previous studies (Burns et al. 2008, Shindler and Toman 2003, Toman et al. 2008b), the ability of agency personnel to engage citizens about forest treatment options both before and after a fire appears to be quite important. As this research supported, this frequently means going beyond the traditional agency-public meeting to include more personal, smaller group, and face-to-face opportunities. The traditional meetings do serve a purpose, yet they are often cited as one-way communication that are used simply to comply with the National Environmental Policy Act (NEPA) rather than serving the needs and interests of concerned citizens (Cortner et al. 1998, Shindler et al. 2002). Indeed, interview research in both study sites among citizens and agency personnel reveals the sentiment that the traditional NEPA approach is not sufficient for postfire planning (Toman et al. 2008b). The need to explore new approaches for disseminating, explaining, and discussing information continues to be prominent in forest and social science literature. Field trips, which provide opportunities for face-to-face discussion and on-the-ground

learning, were found most worthwhile in this research. While this is just one of many possible activities that could occur in a postfire environment, it is an obvious place where agencies can build on their strengths and local citizens' interest in their newly-altered postfire landscape.

The notable number of participants who are simply unaware (responded "*don't know*") about how agency personnel interact with local citizens is a third significant finding. This suggests an opportunity for local personnel to make a real difference in their community by reaching out to those who are undecided and possibly influencing attitudes about agency interactions. The number of *don't know* responses amounted to nearly one-third of participants for some survey questions in this study. Given these responses came from the attentive public, it is likely there are a far greater number of "undecideds" in these communities. Certainly many in this group simply are disinterested in the fire issue, but may become more concerned as other natural resource problems arise.

A pathway towards reaching this undecided population is to restructure citizen-agency communication strategies to focus on more personalized forms of public interaction (Cortner et al. 1998). For example, learning about local concerns and specific forest places of importance make the interaction more meaningful to participants and result in more positive public responses (Shindler and Neburka 1997, Shindler and Toman 2003, Winter et al. 2002). In a postfire context where there is likely even greater uncertainty, this may be especially true. Indeed, study respondents indicated attention to local context (i.e., environmental consequences) was very important to them, and they found on-the-ground interaction activities such as field trips as a useful way to engage with personnel. Over time, such activities also are likely to

garner trust in decisionmakers, which this research demonstrated is an important factor influencing public acceptance of agency actions and decisions.

A fourth notable finding is the respondents' decrease in trust in the agencies associated with how they managed after the fires. Prior fire-related research suggests one reason is a failure in having authentic communications and methods to help citizens understand the decisionmaking process (Liljeblad and Borrie 2006, Olsen and Shindler 2007, Toman et al. 2008a, Winter et al. 2004). Responses from the small number of respondents who indicated an increase in trust suggest good public interaction and communications skills were the primary reason for their positive assessment. Although skepticism exists among study participants about influence on local personnel from the national level, many concerns can still best be addressed at the local level. Citizens value the sincere and honest interactions and genuine discussion of both problems and solutions (Burns et al. 2008, Davenport et al. 2007, Shindler and Cheek 1999) that is usually possible only at the local level. With the potential for more trusting relationships as a direct result of open and frank encounters, postfire communities may experience reduced conflict, and an increase in cooperative behavior, during planning processes (Burns et al. 2008, Rousseau et al. 1998).

A fifth noteworthy finding from this research is the considerable variance in opinion between the two study sites. Though some sentiments are similarly shared (e.g., lack of agreement with postfire management, importance of trust in decisionmakers), the significant differences between sites in agreement with most statements about citizen-agency interactions support earlier research in forest communities that a one-size-fits-all planning and management approach isn't likely to be successful (Brunson and Shindler 2004). From the initial descriptions

of these communities, one can see there are differences in the size of the fire, management emphasis for local forests, and the type of interactions among stakeholders. Further, Biscuit respondents were significantly less likely to give managers carte blanche control over active postfire management practices. It is highly likely that initial levels of trust and the decrease in trust overall played an important role in acceptance of management actions. Another key difference is the role the local economy plays in decisionmaking; Biscuit respondents indicated it was significantly more important, due in part to local dependency among some residents on timber-related income. While economic consequences was rated as one of the least important on the list of factors used in this survey, almost half (46%) of Biscuit respondents still feel strongly about its influence. Finally, the difference in ratings of agency actions between sites underscores the importance of acknowledging local-specific social and environmental concerns (Brunson and Shindler 2004, Winter et al. 2004). A valuable resource for managers facing these challenges is available from Shindler and Gordon (2005a and 2005b). Their field guide and accompanying DVD provide many strategies for a step-wise approach to building citizen-agency partnerships for fire and fuel management at the local level.

## **CONCLUSION**

Postfire planning and decisionmaking for federal lands is a highly complex process, one that is affected by citizen trust, citizen-agency relations, and citizen acceptance of management strategies. For most personnel and local citizens an event of the magnitude described in this study will be a first-time experience, making it even more difficult to reach consensus on a course of action. A central conclusion from this analysis is that people are generally willing to accept postfire management practices, but they are much less trusting of the agencies to carry

them out. It is likely that many people are withholding trust until they see if managers can make good on their word, and whether they agree with agency actions that play out on the ground (Shindler and Gordon 2005b). People seem to agree that something needs to be done, but skepticism remains and the need for a well crafted planning process and good leadership are fundamental to success.

Findings from this study also help us to understand more specifically the elements important to citizens. Clearly, respondents were not happy with citizen-agency interactions, and most indicated a loss of trust because of how postfire management planning and decisionmaking was handled. Many who denoted a lost trust in the agencies cited reasons such as disappointment in type of information used in decisions, which was further supported in this correlation analysis. Further, differences between the two study sites in this research suggest positive relationships may be more likely to develop from a long-term investment in engaging citizens in real problem discussion and deliberation, particularly when citizen-agency interactions are more personalized and include opportunities to address the issues face-to-face.

For managers, a first step would be to take the information from this study and engage local citizens and discuss whether this is an accurate picture of their local community. From this initial discussion, managers and citizens can work together towards agreeing on the forest values that are most important in their community, the specific practices and alternatives that may be appropriate, as well as the likely outcomes of each, and how the planning process can best serve all interests.

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