

## Wildfire Communication—Before and During an Event

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As more people move into areas where wildfire is a significant risk there is a greater need for managers to interact with those affected by a wildfire event. Consequently, effective communication before and during a wildfire event is increasingly an important part of sound land and fire management. This research project sought to understand residents' use and trust in different communication modes before and during a wildland fire event, as well as their understanding of wildfire management strategies.

To explore these issues we developed a survey of individuals affected by four fires. One of these fires took place in 2009. Three more will be investigated in 2010. The survey sought to verify or refute information patterns identified in qualitative interviews on three fires in 2008. Key questions posed in this research, and suggested by the 2008 research, included: 1) What communication took place *during* the fire? 2) What communication took place *before* the fire? and 3) What did participants understand about the fire management choices on their fire? Below we report on the results on the first of the four fires. There are inherent limitations in drawing conclusions from a single fire as a number of local factors may influence communication. We believe that some of the findings will be of interest to fire managers and communities where fire is a threat, particularly as the results reported here reinforce the findings from our 2008 study. The additional work in 2010 will help us identify how the findings compare to these results from 2009 and 2008. A more extensive discussion of this research exists in a PowerPoint presentation and other publications. A short summary and PowerPoint presentation of the qualitative interviews from 2008 also exists. Please contact Toddi Steelman (information above) for copies.

### RESEARCH SITE and METHODS

In the summer 2009, our research team investigated the Hat Creek Complex in northern California. Approximately 130 structures were threatened and 400 people were affected by three fires that burnt a total of 11,269 acres and cost \$7.7 million to suppress. Evacuations took place over a four day period in an area with significant communication issues due to main highway closures, burned over and downed power and phone lines, and poor cell phone coverage. We surveyed 1,000 residents within 10 miles of the fires' perimeter. The survey was pilot tested in late Spring 2009 and administered on October 2, 2009, approximately eight weeks after the end of the fires. A three-wave, Dillman-type methodology was used. We received 133 responses for a response rate of 13%. Non-response error is the biggest potential bias in this research. Compared to the general population of Shasta County, our respondents are more male, older, better educated, retired, have been residents longer, and are more rural.

### RESEARCH FINDINGS

#### *During the Fire*

While significant portions of our survey respondents were satisfied with the information they received, sizable portions were dissatisfied. In response to the question, "How satisfied were you **overall** with information you received?" Respondents were most satisfied (66%) with "overall information" received during the Hat Creek Complex and least satisfied (35%) with information about "why management choices were made".

Respondents wanted some general types of information more than others. For instance, the top three general areas of information respondents wanted "very much" were "status of the fire" (94%), "where the fire is" (81%), and "fire hazards/concerns" (78%). Sizable portions found the information to be inadequate or had never received it. Twenty five percent of respondents indicated that the information they received about "status of the fire" was not adequate, while another 22% did not receive this information. This meant that a total of 47% of respondents either did not receive fire status information or found it not adequate for their needs. Additionally, respondents identified some specific pieces of information as more important to them. Large majorities of respondents indicated that answers to the following questions—"Where is the fire likely to go?" (88%) "Where is the fire going?" (88%) and "What should I be doing?" (73%) were "very important" to them. Since this information was important to respondents, we asked if they actually received this information and how timely the information was for them. Over two-thirds of respondents

indicated that they received information about “Where is the fire likely to go” (68%) and “Where is the fire going” (72%), but fewer received information about “What should I be doing” (49%). Less than 50% of respondents indicated that they received information about these questions in a timely manner. This suggests the need to deliver this “very important” information in a more timely manner. Some types of information may be over-delivered relative to its importance to respondents. For instance, information about “Who is responsible for the fire?” and “How much does the fire cost?” was rated as “very important” by 45% and 23% of respondents respectively, but was received by 55% and 47% respectively.

The three most used information sources during the wildfire were “unofficial” sources—family/friends/neighbors (88%), local or regional newspapers (84%), and local or regional television (83%)—followed by two “official” sources, maps (69%) and information billboards/kiosks (53%). A gap exists between the perceived usefulness and trustworthiness of the “unofficial” sources and their use during a fire. While 88% of respondents used family/friends/neighbors, only 59% indicated this was a very useful source and 52% indicated this was a very trustworthy source. The same trends existed for local or regional newspapers (41% useful, 42% trustworthy) and local and regional television (32% useful, 28% trustworthy). In comparison the five most trustworthy sources as identified by respondents tended to be more “official”: local Forest Service representatives (69%), scanners (64%), maps (60%), Incident Management Team representatives (56%) and family/friends/neighbors (52%).

Most respondents see getting information about the fire as their responsibility or a joint endeavor with agencies. Nearly three quarters indicated that it was “mostly my responsibility” or an equal portion their responsibility with agencies to get information about the fire to them. Additionally, most respondents were actively searching for information. Eighty six percent of respondents indicated that they “did a lot” or “did a little” to search for information about the fire, in contrast to 15% who “did not search for information” or “did not do very much.”

### ***Before the Fire***

Prior to the fire, respondents were more satisfied with information they were getting on how to protect their property than on other aspects of fire preparedness. In response to the question “How satisfied were you with information about how to protect your house/property prior to the fire?” 79% indicated they were very satisfied or satisfied (13% very dissatisfied/dissatisfied). In contrast, only 48% were very satisfied or satisfied with “overall information on fire management” received prior to the fire (33% very dissatisfied/dissatisfied).

The types of information respondents “wanted very much” before the fire included information about hazardous fuel reduction (62%), defensible space/FIREWISE (59%), evacuation planning (58%) and fire hazards/concerns (57%). Significant portions of respondents indicated that they are not receiving this information or it is not adequate for their needs. 71% of respondents indicated that they did not receive information about evacuation planning or it was not adequate. These percentages were lower, but still very high, for fire hazards/concerns (60%) and hazardous fuel reduction (58%) and quite a bit lower for defensible space information (36%).

The information sources respondents were most aware of before the fire tended to be “unofficial” sources such as television (79%), family/friends/neighbors (79%), newspapers (78%), local or regional television (83%), and radio (40%) followed by “official” sources such as conversations with local Forest Service representatives (40%) and information billboards/kiosks (38%). As with information sources during a fire, significant gaps exist between the main sources used and their usefulness and trustworthiness for respondents. Family/friends/neighbors, television and newspapers were identified as “very trustworthy” by 59%, 27% and 36% respectively, and “very useful” by 47%, 33% and 32% respectively. Agency sources tended to be more trustworthy and useful. Of the five most trustworthy sources identified by respondents—conversations with local Forest Service representatives (63%), brochures (54%), information billboards/kiosks (51%), family/friends/neighbors (47%) and visitor centers (42%)—four also had high proportions who found them very useful, with only visitors centers seen as less useful (57%, 44%, 48%, 59%, 29% respectively).

### ***Fire Management Strategies***

Respondents were most dissatisfied with information they received about how the fire was managed compared to other types of information received during the fire. Only 47% were very satisfied/satisfied with the information they received about how the fire was managed and 35% were very dissatisfied/dissatisfied. However, fire management information is not as high priority as other types of information such as fire status: Fewer respondents indicated they wanted fire management information “very much” or rated fire management information as “very important” compared to other types of information during the fire, such as fire status. Questions about fire management including “What fire management choices are being made?”, “Why are these fire management options the best?” and “Why are the fire management choices being made?” were identified by 47%, 44% and 41% of respondents as “very important. Small portions of respondents indicated that they actually received this information with 26% receiving information about “What fire management choices are being made?”, 16% receiving “Why are these fire management options the best ones?” and 19% receiving “Why are the fire management choices being made?”

There is a large gap between what respondents think they know about fire management strategy and what they actually know. When asked “to what extent do you feel you understood the fire management strategy?” 63% indicated the somewhat understood or fully understood what was done. When asked what kind of fire strategy was actually used on the Hat Creek Complex, thirty five percent correctly identified that a direct suppression strategy was used, while 65% either misidentified the strategy or didn’t know what kind of strategy was used.

Several factors are more important than others respondents when making judgments about fire management actions and decision. Fire fighter safety, community and resident life and safety and protecting private property were identified by 90%, 89% and 79% of respondents respectively as “very important” to them. This compared to other factors such as protecting cultural resources (39%), protecting endangered species (35%), ecological needs (35%) and firefighting costs (27%). Only 51% received information about firefighter safety, while 60% received information about community and resident life and safety and 62% received information about protecting private property. Once again, some of this information may be over-delivered compared to its importance to respondents. Only 27% identified firefighting costs as “very important”, but 51% indicated they received this information.

Respondents appear to have some understanding of the conditions on their forests and how these relate to fire management. Respondents were asked to characterize several conditions that affected their forest prior to the fire. Large percentages accurately identified drought (72%), steep terrain (76%) and too many tree/density of trees (61%) as severe or moderate factors affecting their forest. More than 50% of respondents felt that steep terrain (65%) and drought (52%) affected how the fire was managed.

### **Factors Associated with Overall Information Satisfaction**

Inferential statistics were used to identify significant relationships about information satisfaction. Satisfaction with overall information during the fire was positively correlated with understanding fire management strategy. This suggests that even though fire management strategy information may be less time sensitive, it is still important to overall information satisfaction.

The US Forest Service was the most important communicator with respect to satisfaction with overall information and satisfaction with information about the way fire is fought. Communication by the Forest Service during the fire was the most highly correlated factor with overall information satisfaction. The second highest correlated factor was communication by the Forest Service before the fire. ***This suggests that communication by the Forest Service during the fire and before the fire is most important to overall information satisfaction during the fire.***

## KEY TAKE AWAY POINTS

### During the Fire

**Give residents information about the status of the fire NOW!** Some information needs are more immediate than others. PIOs need to focus on providing information about fire status, where the fire is, and fire hazards/concerns, while also answering “Where is the fire going?” “What is the fire doing?” and “What should I be doing?” most immediately during the fire. Other types of information are less important to residents and less dependent on timely delivery.

**Leverage agency credibility!** Residents most trust and find most useful the information that comes from “official” sources during the fire. The top types of information used by residents (TV, newspapers, family/friends/neighbors) are less trustworthy and useful to them than the information provided by “official sources” such as local Forest Service and the IMT.

**Focus on what is important to residents.** Some types of information are less important to residents and more important to the agency. Residents are not as interested in information about the cost of the fire and who is responsible for the fire. These types of information reflect agency priorities.

**The public is your partner.** The public has a partnership mentality when it comes to responsibility for getting information about the fire. They are making an effort to look for information but it needs to be available. Efforts to provide timely information on topics of most concern to the public are a good way to meet public needs while increasing understanding of the fire management process.

### Before the Fire

**Change communication patterns before the fire starts.** Residents leverage the same information sources during the fire that they access before the fire. Unless communication patterns are changed before the fire, they most likely will default to the same sources during the fire.

**Leverage agency credibility!** Residents do not trust or find useful the information sources that they typically default to compared to “official” sources of information. The challenge is to change these communication patterns before the fire even starts.

**Provide information important to residents.** Several types of information that residents want are not received or provided adequately. Information about hazardous fuels reduction, evacuation planning, and fire hazards are clearly wanted by residents but are either not received or not adequate for their needs.

### Fire management strategies

**Wait to deliver the information about how the fire is being managed.** If the agency wants to change the way fire is managed on the ground, then it is important to communicate these changing expectations to the public before and during the fire. Respondents appear to want fire status information most immediately during a fire. They are interested in information about how the fire is being managed, but it is not as time sensitive as fire status information. Information about overall strategies and tactics may best be delivered after fire status information needs have been satisfied. It also may be useful to discuss likely firefighting strategies before there is any fire event.

**Information about how a fire is being managed is important!** Although respondents rated this information as less important we also found that increased understanding about fire management strategy is significantly tied to increased satisfaction with overall information on the fire. If the goal is to change how wildfires are managed, then agencies need to do a better job of communicating the reasons for different strategies. This could lead to greater overall satisfaction with information delivered during the fire.

**Explain fire management strategy.** Respondents understand conditions on the forest and how these conditions relate to firefighting strategies. Forest conditions can be talking points to reinforce why certain strategies are chosen. For instance, “Steep terrain in the forest means we need to look out for our fire fighters and not put them at risk. Therefore we will take a limited suppression response in this area and avoid direct attack” or “We are taking a direct suppression approach because this will best protect residents and their property”.