

# TECOLOTE FIRE RESEARCH FINDINGS SUMMARY

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## Overview

Effective communication and coordination are important to manage fires in the wildland urban interface (WUI). At present, little empirical work exists to document communication efficacy during a fire event and to identify effective management practices for establishing a coordinated response. In this research, we used surveys, interviews, and social network analysis to better understand communication and coordination processes for fire management. This study was guided by the following questions:

1. How well are Incident Management Teams (IMT), local Forest representatives, and local cooperators communicating with the broader public before and during the fire?
2. How well are IMTs, local Forest representatives, and local cooperators communicating among themselves?
3. What factors contribute to effective communication during wildfire response?

## Methods

Data were collected from four WUI wildfires in NM (Tecolote Fire), AZ (Schultz Fire), CA (Bull Fire), and CO (Four Mile Canyon Fire) during the summer of 2010. The research took place in two phases. The first phase consisted of in-person interviews and social network data collection with IMT command staff and section chiefs, local Forest representatives, and local cooperators. Phase 2 consisted of a survey of residents. In CO we only conducted phase 2. This report describes the findings from the Tecolote Fire, with a brief indication of how the results compare with results from the other study sites.

**Research Site:** The Tecolote Fire started on the Santa Fe National Forest on June 6, 2010, with the Van Bruggen Type 1 Southwest Area IMT assuming command from June 13 until June 21. Values at risk included the watershed for the city of Las Vegas, cultural/historical sites, recreational sites, and structures. The fire covered 812 acres and cost \$5.5 million to suppress. Voluntary evacuations occurred. No structures were lost. National Forest roads were closed for several days. At the peak of the incident, 592 personnel were on site.

Phase 1 interview data were collected from 33 individuals on the Tecolote Fire, representing 87% of the key responder positions among the IMT, Forest, and local cooperators. In Fall 2010, we sent 1,130 surveys to a random sample of San Miguel County residents within ten miles of the Tecolote Fire perimeter to assess communication dynamics during and before the fire.

## Research Findings

### Communication with Residents

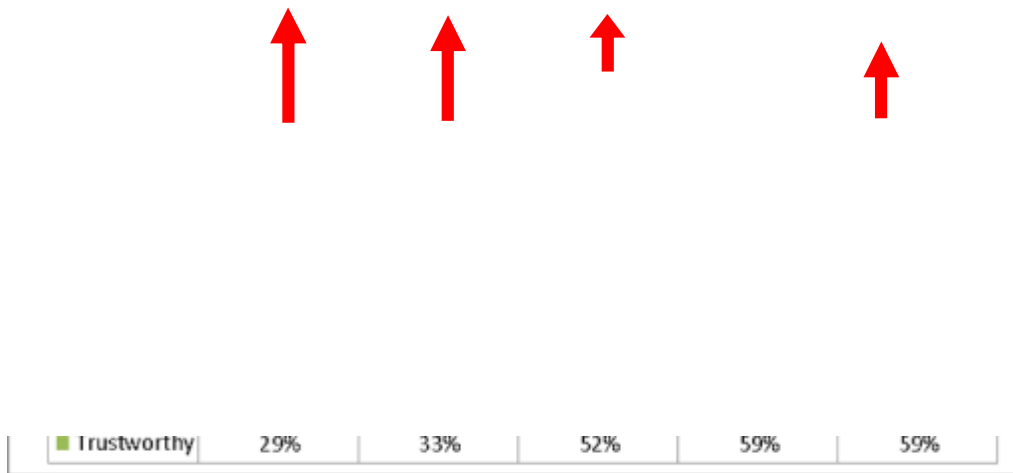
- 1) **During the Tecolote Fire, communication and information satisfaction were moderately high among residents.**
  - 55% of residents surveyed indicated they were “satisfied” or “very satisfied” with information they received during the fire.
  - 65% of residents were “satisfied” or “very satisfied” with how the fire was managed. When asked what factors were most important to them when considering fire management decisions, residents indicated that fire fighter safety (85%), community/resident safety (79%), and ecological needs (58%) were “very important” to them.
  - Among specific types of information they received, residents were most dissatisfied with information about why fire management choices were made.
  - High numbers of “don’t know” responses (22-41%) to survey questions reflect the remote nature of the fire and the fact that the local population was only indirectly affected.
  - Comparing the four fires studied, information satisfaction was the lowest on the Tecolote Fire.

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- 2) Residents surveyed on the Tecolote were equally satisfied with the information they received before the fire as with the information they received during the fire.
- Before the fire, residents indicated an average score of 2.7<sup>1</sup> (between somewhat dissatisfied and somewhat satisfied) in terms of satisfaction with a variety of preparedness information.
  - During the fire, residents indicated an average score of 2.9 in terms of satisfaction with a variety of information types (evacuation, road closure, how fire was fought and managed) and processes (how information was given, how easy it was to get, and who gave it). The differences in the before fire and during fire averages were not statistically significant.
  - Residents wanted more information about the upcoming fire season before the fire occurred. They indicated that they “very much wanted” information about fire hazards and concerns (58%), hazardous fuels reduction (46%), and defensible space (40%). Also, Tecolote residents “very much wanted” information about the ecological conditions of their local Forest (45%), which was higher than residents surveyed on the other fires.
  - More could be done to reach residents before the fire. More than half to three-quarters of residents indicated they were not receiving the information they wanted before the fire, or it was not adequate for their needs. These figures were comparatively higher than on the other fires surveyed.
  - Compared to the other fires studied, fewer Tecolote residents were satisfied (44%) and more were dissatisfied (28%) with evacuation information received before the fire. However, fewer Tecolote residents indicated they “very much wanted” evacuation planning information (37%) compared to residents on the other fires.

3) A significant gap exists between the information sources respondents actually used, and those sources that respondents found most useful and most trustworthy. Residents indicated that they used newspapers (74%), television (71%), radio (69%), and family/friends/neighbors (67%) as their primary sources of information. However, these were not necessarily the most useful or most trusted information sources. Most useful sources included friends/family/neighbors (51%), public meetings (50%), conversations with a local Forest Service representative (49%), and maps (49%). Most trustworthy sources were family/friends/neighbors (59%),

maps (59%), conversations with a local Forest Service representative (59%), and public meetings (53%). The most useful and trustworthy sources tended to be more interactive and “official.” The information sources most used by residents before the fire tended to be the same sources most used during the fire. The disconnect between the most commonly used information sources and the most useful or trustworthy sources was found across all four study sites.



<sup>1</sup> Based on a 4 point scale: 1= very dissatisfied, 2= somewhat dissatisfied, 3= somewhat satisfied, and 4= very satisfied

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### Communication Among “Responders”: IMT, Local Forest, and Cooperators

#### 1) The communication network among responders (IMT, local Forest, and cooperators) showed high levels of cross-agency interaction.

*“I think the way they [the IMT] coordinated their efforts with the USFS was really professional. The way they came into town and they met with everybody and identified what their roles and their responsibilities were going to be, and they addressed everybody and explained the situation...They communicated really well.”*  
– Cooperator

As part of the study, IMT command staff and section chiefs, key Santa Fe National Forest personnel, and local cooperators were asked how often they communicated directly with one another. Page five shows the social network of interaction during the Tecolote Fire. Findings from these data indicate the following characteristics of the communication network:

- The IMT was well integrated with both the Santa Fe National Forest and local cooperators.
- The most central actors in the network were the IMT Incident commander (IC), Public Information Officer (PIO), and Operations Section Chief (OPS), as well as the Santa Fe National Forest Supervisor and the Las Vegas District Ranger.
- Interactions with the IMT were not centralized just through key liaisons like the PIO and Liaison Officer (LOFR). On average, key Forest personnel repeatedly interacted with 6.2 different IMT command staff/sections chiefs during the fire. Cooperators

repeatedly interacted with, on average, 4.8 different IMT members. This was the second highest level of integration of the IMT with local Forest personnel and cooperators of the three fires where we conducted a network analysis.

#### 2) Overall, most responders were satisfied with the information they received.

- 70% of responders reported “little” to “no” room for improvement in the overall quality and timeliness of the information they received from other responders during the fire. The remaining 30% reported “some” room for improvement.
- On average, information received by responders on 1) fire status and behavior, 2) evacuation and road closures, and 3) infrastructure affected by the fire (utilities, communications, etc.) was rated as “quite” or “completely” adequate.
- Findings from across all three fires indicate that communications with and among local government and cooperators have the greatest room for improvement.

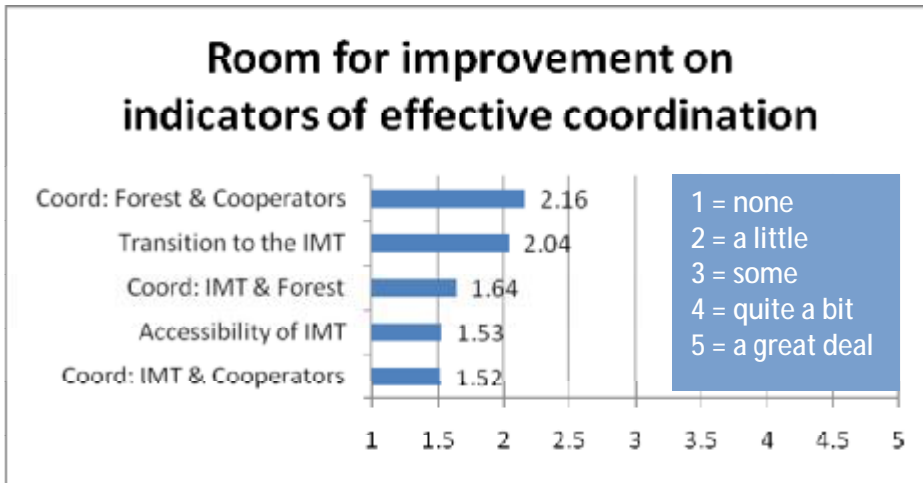
#### 3) The IMT was rated moderately well by other responders at identifying and using local information and resources.

- Over 85% of responders rated the IMT as having “little” to “no” room for improvement in engaging and utilizing local community stakeholders and identifying and protecting cultural and archaeological sites.
- 27% of responders saw some room for improvement in the IMT’s efforts to obtain and utilize information about the local area (e.g., weather, roads, trails) to inform its operations. 20% saw some to quite a bit of room for improvement in identifying and protecting biological species and habitats of concern.
- With the exception of the scores for use of local information, IMT performance ratings were on par with the other two fires investigated.

*“There’s a graciousness and a hospitality in this community that is outstanding...They have such a connection to the land, and they honor that we are land managers as well. We seem to be standing shoulder to shoulder facing the issue rather than sitting on opposite sides of the issue.”* – IMT Command Staff

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- 4) Responders, on average, reported only a little need for improvement in coordination and integration between the IMT, local Forest, and cooperators.



Responders were asked to evaluate 1) coordination between the IMT, Forest, and cooperators, 2) accessibility of the IMT, and 3) the transition from the Forest to the IMT. Once again, responders indicated only modest need for improvement with regard to effective coordination and integration between the IMT, Forest, and cooperators. Similar to the other two fires studied, coordination between the Forest and local cooperators, as well as the transition to the Type I IMT

were viewed, on average, as having the greatest room for improvement.

- 5) While overall performance was rated positively, some areas for improvement were identified.

- **Performance Feedback for the IMT:** Both the Forest and cooperators had high praise for the accessibility and responsiveness of the IMT, and the amount of information that was proactively disseminated. The cooperators' meetings, IMT briefings, and the LOFR were consistently lauded. Several local responders noted the IMT's professionalism, experience, and organization, and appreciated the IMT's efforts to gather information about cultural and biological resources. Areas for improvement included better synchronization of the transition from the Forest to the Type I Team, and earlier coordination with the Office of Emergency Management (OEM). Some responders on the IMT noted that the separation of the Incident Command Post and base camp caused delays in communications and logistical planning.
- **Performance Feedback for the Forest:** The IMT appreciated that the Santa Fe National Forest provided them local assistance in the form of the Resource Advisor, while local cooperators appreciated that the Forest employed the assistance of a well-known local and former Forest Public Affairs Officer (PAO). The IMT noted some room for improvement in the information provided by the Forest, specifically asking for a more thorough in-brief packet, and more accurate and up-to-date maps and information on the cooperators, community, and cultural and biological resources. There also was room for improvement in information dissemination by the Forest PAOs, and coordination between the Forest and local cooperators. Specific areas identified included the need for better coordination and communication on emergency response planning, including establishing road closure and evacuation procedures, and proactively building relationships between the Forest and local cooperators, particularly law enforcement agencies and Volunteer Fire Departments.
- **Performance Feedback for Cooperators:** The OEM served an important role for communicating with and coordinating local emergency responders. Areas for improvement among local cooperators included improving emergency preparedness, such as ensuring cooperators have contact information for other cooperators and developing and educating the public about evacuation plans, enhancing community capacity for managing road closures and evacuations, improving relationships between and among safety and law enforcement agencies, and ensuring adequate communication assets including radios, radio frequencies, cell phone connectivity and the rural 911 system.

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