

SCHULTZ 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 responses?

Methods

Complete data were collected from three WUI wildfires in NM (Tecolote Fire), AZ (Schultz Fire), and CA (Bull Fire), as well as resident survey data only in CO (Four Mile Canyon Fire) during the summer of 2010. This 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. The first section of this report describes the findings from the Schultz Fire with a brief indication of how the results compare with results from other study sites.

Research Site: The Schultz Fire started on the Coconino National Forest on June 18, 2010, with the Hughes Type 1 Southwest Area IMT assuming command from June 21 until July 1. Values at risk included residences, recreational sites, roads, power lines, threatened and endangered species, cultural resources, communication sites, the Flagstaff municipal watershed, and gas and water lines. The fire covered 15,000 acres and cost \$8.6 million to suppress. Two-thousand structures were threatened. No structures were lost. Highway 89 was closed for several days. At the peak of the incident, 967 personnel were on site.

Phase 1 interview data were collected from 42 individuals on the Schultz fire, representing 92% of the key responder positions among the IMT, Forest, and local cooperators. In Fall 2010, we sent 1,000 surveys to a random sample of Flagstaff residents within five miles of the Schultz Fire perimeter to assess communication dynamics during and before the fire. We also surveyed an additional 496 residents who were within the evacuation zone of the fire.

Research Findings

Communication with Residents

- 1) **During the Schultz Fire, communication and information satisfaction were high among residents.**
 - 71% of residents surveyed indicated they were “satisfied” or “very satisfied” with information they received during the fire.
 - More than 75% 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 (94%), community/resident safety (93%), and protecting private property (82%) were “very important” to them.
 - Residents were most dissatisfied with information about why fire management choices were made and information about road closures.
 - When looking at all four fires studied, communication and information satisfaction on the Schultz Fire compared favorably to the other fires.

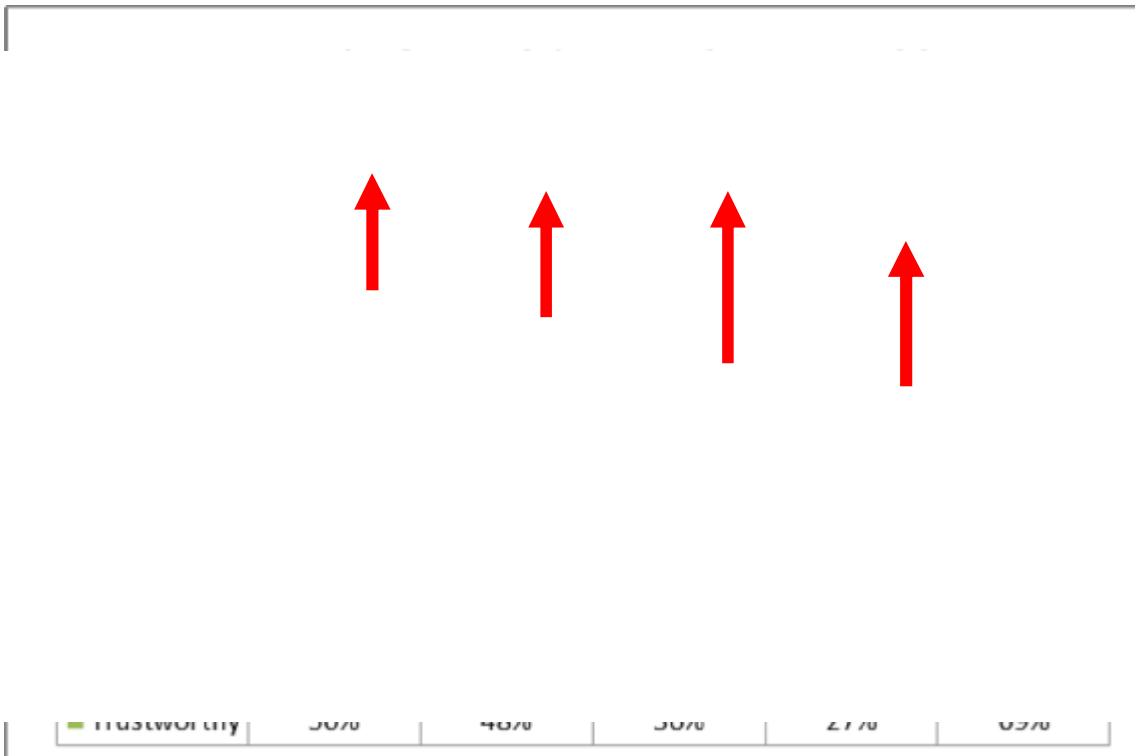
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2) Resident satisfaction with preparedness information received before the Schultz Fire was lower than satisfaction with information received during the fire.

- Before the fire, residents of the general population indicated an average score of 2.8¹ (between somewhat dissatisfied and somewhat satisfied) and the evacuation subgroup indicated an average score of 2.4 in terms of satisfaction with a variety of types of preparedness information.
- During the fire, residents of the general population indicated an average score of 2.9 and the evacuation subgroup indicated an average score of 2.7 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).
- 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 (62%), defensible space/FIREWISE (50%), and hazardous fuel reduction (47%). A third to more than a half indicated that they were not receiving this information or it was not adequate for their purposes.
- The evacuation subgroup scored lower on satisfaction (15% “very satisfied”) and much higher on dissatisfaction (25% “very dissatisfied”) with respect the quality and availability of preparedness information before the fire.
- When looking at all four fires, the results from the evacuation subgroup highlight how close experience with a fire may lead to stronger feelings, both positive and negative, about a fire’s management.

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 family/friends/neighbors (84%), radio (81%), newspapers (78%), television (66%) and maps (65%) as their primary sources of information during the fire. However, these did not tend to be the most useful or trusted information sources, which were more interactive and came from “official” sources. Sources deemed most useful sources included the local fire department (68%), maps (62%), and conversations with the IMT or local law enforcement (57%). Sources identified as most trustworthy were the local fire department (78%), maps (69%), conversations with IMT (68%) and Inciweb (63%).



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 not being the most useful or trustworthy was found at all four of our study sites.

¹ 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 showed high levels of cross-agency interaction.

“Their [IMT] tie-ins with us almost on an hourly basis was outstanding. From their incident commanders to their operations to their information to...I mean, their logistics and the impact that it was having upon our immediate area...it was top notch.” – Local Cooperator

As part of the study, IMT command and general staff, key Coconino Forest personnel, and cooperators were asked how often they communicated directly with one another. The social network of interaction during the Schultz fire is displayed on page five. Findings from these data indicate the following characteristics of the communication network:

- The IMT was well-integrated with both the Coconino National Forest and local cooperators.
 - The IMT Incident Commander (IC), Public Information Officer (PIO), Liaison Officer (LOFR), and the Deputy IC communicated most frequently within the network. The Coconino Forest Supervisor and the Chief of Summit Fire District were also prominent in the communication network.
- On average, key Forest personnel repeatedly interacted with 6.5 different IMT command staff/sections chiefs during the fire. Cooperators repeatedly interacted with, on average, 5.3 different IMT members. This was the highest level of integration of the IMT with local Forest personnel and cooperators of any of the three fires where we did a network analysis.

2) Overall, most responders (IMT, local Forest, and cooperators) were satisfied with the information they received.

- 74% of responders reported “little” or “no” room for improvement in the overall quality and timeliness of the information they received from other responders during the fire. No responder reported more than “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 indicated that communications with and among local government and cooperators have the greatest room for improvement.

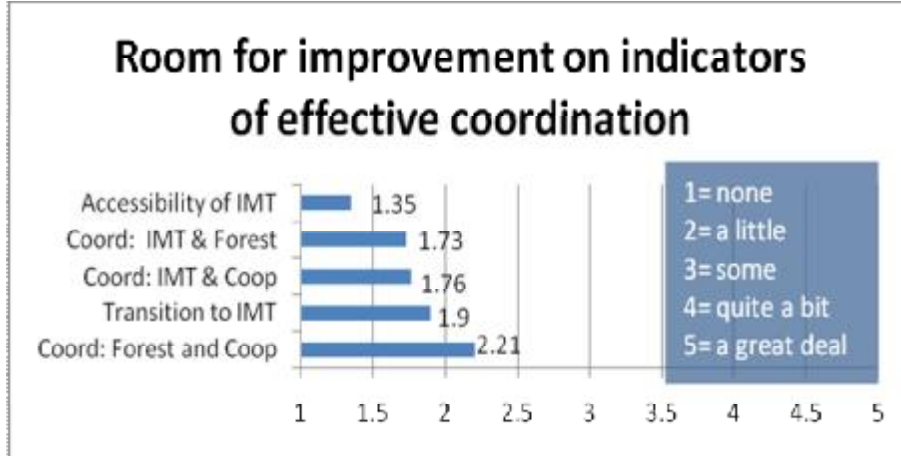
3) The IMT was rated highly by other responders at identifying and using local information and resources.

- Over 90% of responders rated the IMT as having “little” to “no” room for improvement in 1) obtaining and utilizing information about the local area (weather, roads, trails); 2) being sensitive to social and political issues; 3) engaging and utilizing local community stakeholders; and 4) identifying and protecting cultural and archaeological sites.
- 15% of responders saw “some” room for improvement in the IMT’s efforts to identify and protect biological species and habitats of concern.

“We have the Ponderosa Fire Advisory Council (PFAC) that is really key...we meet monthly and have an annual drill, we train a lot together...Not only have we drilled and discussed this [evacuations] with all the agencies that are involved locally, for several years, we’ve also had several fires that we were required to do this...I knew that all I had to do was say let’s start evacuations and it was a done deal.” – Local Cooperator

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



Responders were also asked to evaluate the coordination between the IMT, Forest, and cooperators, the accessibility of the IMT, and the process of 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. Coordination between the Forest and local cooperators was viewed 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 expressed appreciation for the availability of the IMT and the amount of information that was pro-actively disseminated. The cooperators' meetings, IMT briefings, and LOFRs received strong praise. Several local responders commented on the accessibility of the IMT and appreciated the IMT's efforts to be sensitive to the cultural significance of the San Francisco Peaks – particularly to the tribal nations. Areas for improvement included better communication and coordination with the Emergency Operations Center (EOC) and providing more frequent updates between IMT briefings. Respondents noted that more information on trigger points associated with future management actions would be helpful. Respondents also noted the need to balance habitat modifications (i.e., the removal of snags) with firefighter safety, so as to minimize the number of snags removed without compromising firefighter safety.
- **Performance Feedback for the Forest:** Both cooperators and the IMT were complimentary of the in-brief provided by the Coconino National Forest. A "little" to "some" room for improvement was identified in the coordination between the local Forest and the cooperators. Specific areas identified included: need for better coordination and communication on road closures, lack of inter-operability of the radios, need to update maps including locations of cultural sites, need for developing a more coordinated communication strategy concerning social media, and requests for greater Forest involvement in communicating road closures to recreationists.
- **General Feedback (Forest and Cooperators):** Ponderosa Fire Advisory Council (PFAC) efforts repeatedly received high praise for preparing cooperators and the Forest to coordinate effectively. Strong praise was given to the level of engagement of cooperators in preparedness efforts. Areas for improvement included general preparedness such as ensuring key personnel have cell phone numbers of other cooperators. There were also areas for improvement noted in communicating and coordinating around the de-mobilization (e.g., releasing law enforcement from assisting with road closures as soon as possible so as to minimize long term strain on resources) and communicating about the post-fire consequences such as the transition to the Burned Area Emergency Response team.

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