2014

IMPROVING COMMUNITY RESPONSE TO WILDFIRE:
2013 FIRE SEASON FINDINGS REPORT

MOOSE MEADOW FIRE

In 2013, the Fire Chasers Research Team at North Carolina State University developed a series of incident performance measures in collaboration with incident response and land management professionals. The goal of this effort was to provide metrics that can help improve interagency coordination and communication during complex, large scale wildfires. In the summer of 2013, data on these incident response outcomes were collected from 22 Type I and Type II wildland-urban interface fires in Idaho, Montana, Oregon, and Washington. This report summarizes the findings from the Moose Meadow Fire in the areas of interagency network performance, incident management team performance, use of social media and incident learning and capacity building.

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FIRE CHASERS PROJECT
Advancing the science of adaptive capacity toward more disaster resilient communities

Moose Meadow Fire: Incident Report

Study Background

This report summarizes findings on incident response outcomes for the Moose Meadow Fire that occurred in 2013. The report presents outcomes of the Moose Meadow Fire compared to twenty-one other Type I and Type II incidents that occurred in Idaho, Montana, Oregon, Washington, and one pilot incident in Colorado, during the 2013 wildfire season. The goal of this report is to provide disaster, fire response, and land management agencies with feedback on the incident. This feedback is designed to help identify areas of strength, as well as prioritize areas for capacity building to improve incident response in the upcoming fire season. This report summarizes findings on the following areas: 1) interagency network performance; 2) incident management team performance; 3) use of social media; and 4) incident learning and capacity building.   All findings are based on surveys completed by key personnel associated with the incident management team, host agency, and cooperating disaster response agencies on each incident. County and municipal elected officials in the affected area were also surveyed. Surveys were generally collected from Type 1/Type 2 incident management team members immediately before they transitioned off the incident. Surveys with host agencies and county disaster response agencies were collected in October/ November of 2013. A total of 15 surveys were completed for the Moose Meadow Fire (43 percent response rate).

How Should I Interpret the Data in This Report?

Incidents differ in their complexity and more complex incidents can create more challenges. The information contained in this report are based solely on the survey data and indicators *do not* account for differences between incidents.   This should be kept in mind when interpreting findings from a single incident in relation to the regional incident averages. Findings with lower response rates should also be interpreted with greater caution as there may be key perspectives that are missing.

Recommended questions for reflection in interpreting the findings from this report include:

In what areas did we excel during this incident? What strategies and actions did we take that may have contributed to this success? What actions can we take to make sure these practices and lessons are retained for future incidents?

In what areas were our ratings comparatively less positive? How do we make sense of those? Were there missed opportunities either *before* or *during* the incident that might have improved our outcomes in this area? Are there actions we can take *now* to help ensure future success in this area?

## Overview: A brief summary of the Moose Meadow Fire

On July 25, 2013, at approximately 4pm, lightning struck the Beaverhead-Deerlodge National Forest 18 miles southwest of Philipsburg, MT. Within hours, 24-hour evacuation notices were issued for Moose Lake, Frog Pond Basin, Copper Creek Campground, and Moose Lake Cabin. On July 27th, Pearson's Type II Incident Management Team (IMT) was called onto the fire and by the 28th, officials issued several mandatory evacuations that remained in place until August 2nd. Per Inciweb, cooperating agencies included the Philipsburg Volunteer Fire Department, Montana Department of Natural Resources and Conservation, the American Red Cross, Granite County Sheriff, and Department of Emergency Services. Despite rainfall, the fire continued to burn through mid-August, threatening 60 residences and 60 outbuildings, critical fish habitat, and cultural sites in the area, and burning over 3,500 acres.

Incident Response Network Performance: Moose Meadow Fire

What Is an Incident Response Network?

Effective incident response to a complex wildfire event involves the coordination of multiple organizations and agencies with formal response responsibilities during the incident. This group of organizations and agencies can be referred to as the *incident response network*. This network typically includes the incident management team, fire management operations, disaster management operations, county and municipal government, and the media. Diagram 1 shows what this network might look like.

Diagram 1. Sample Incident Response Network
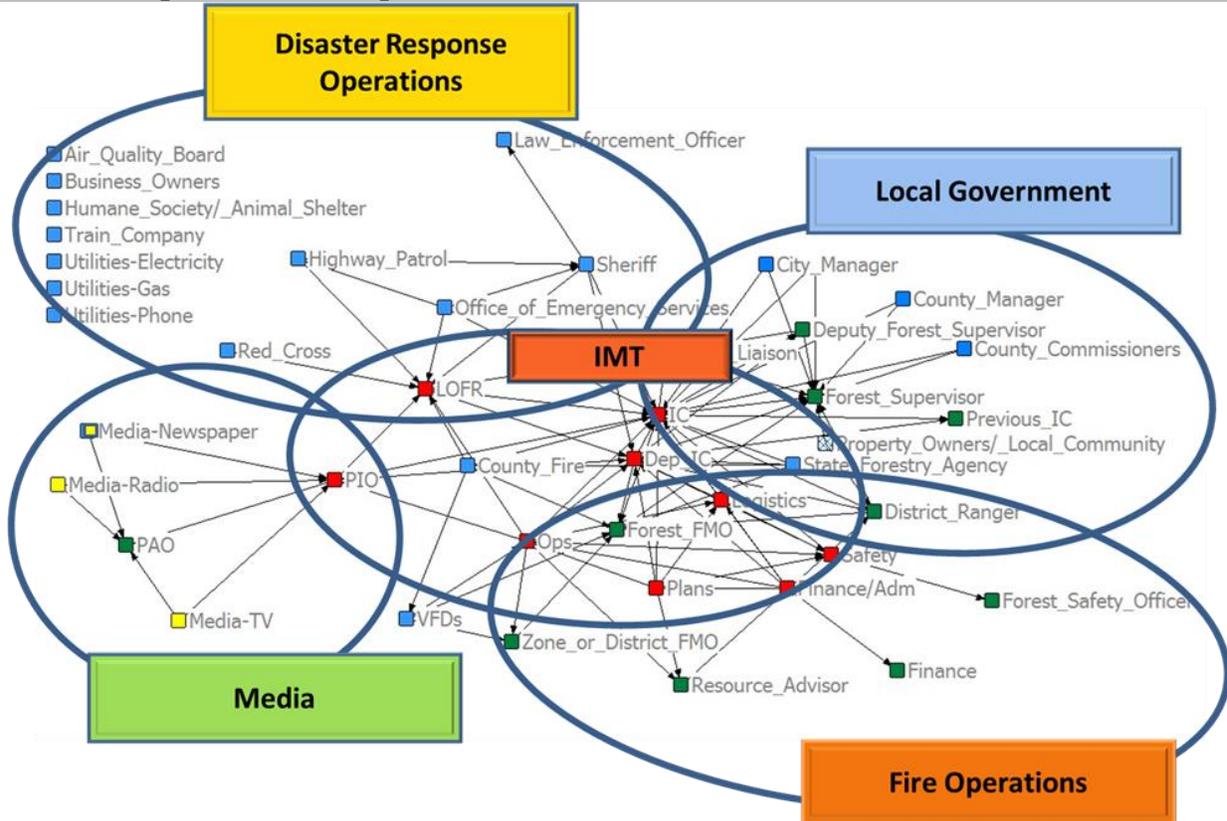
What is network performance?

When working as part of an inter-connected network like the one shown in Diagram 1, the actions of any one agency within the network can affect others in the network. Consequently, incident outcomes are often the result of the *combined* management actions of the entire network, and the level of communication and coordination within it. Not all agencies are involved in all areas of incident response. However, problems in one area of the network can lead to problems in other areas. As a result, effective incident response is not about the performance of any single organization or agency, but is related to the performance of the *network as a whole* in the following areas:

- ❖ Interagency coordination & fire response
- ❖ Public information
- ❖ Road closures

- ❖ Evacuation and re-entry
- ❖ Sheltering & mass care
- ❖ Cost share

To learn more about network performance, we asked all agency and organizational leaders in the incident response network to rate how things went in each of these six areas. Respondents were asked their level of agreement with a set of statements. Options ranged from (1) "strongly disagree" to (5) "strongly agree." Overall, network performance scores were high. Some areas are also worthy of additional attention prior to fire season 2014. For the twenty-two fires in our sample, overall network performance was the highest for interagency coordination and fire response (average = 4.44) and public information (4.34). Cost share (3.87), evacuation (3.99), and sheltering/mass care (4.0) on average, lower performance was reported. See Appendix A for specific questions asked in each category and average level of agreement for each.

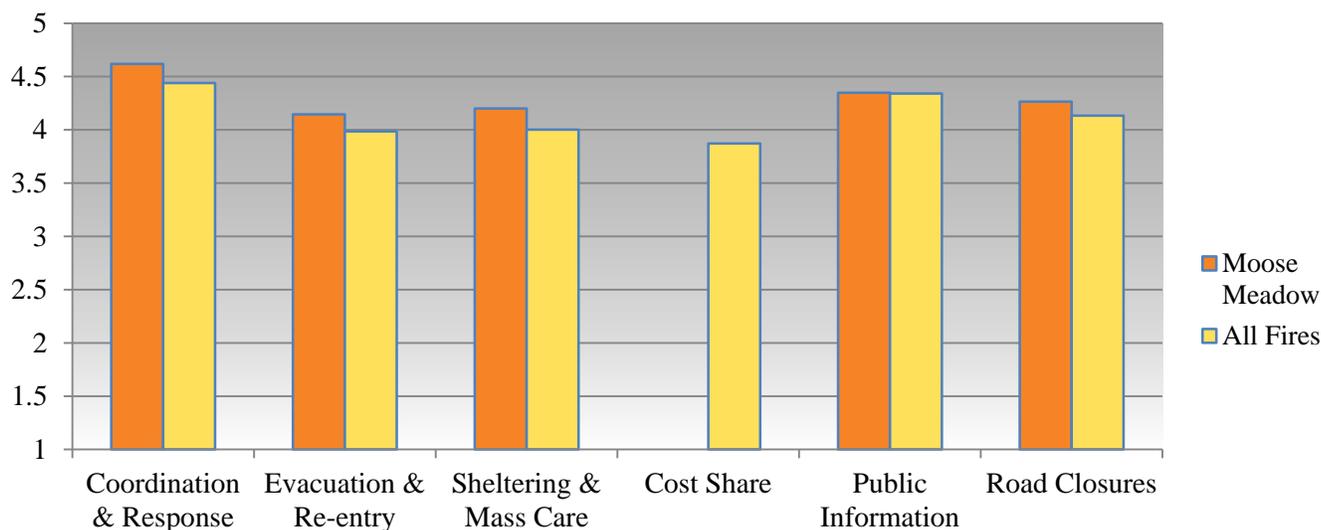**Network Performance: How did things go on the Moose Meadow Fire?**

Figure 1 shows network performance ratings for the Moose Meadow Fire in comparison with the average across all twenty-two fires in our sample. Overall, Moose Meadow Fire network performance was relatively consistent with the averages across all fires. Moose Meadow Fire network performance was higher than average for coordination and fire response, evacuation and reentry, sheltering and mass care, and road closures. Network performance was approximately average for public information. Across all activities, no respondents reported negative perceptions

KEY FINDINGS

- In all areas rated, Moose Meadow Fire network performance was greater than or equal to the 22 incident average
- Interagency coordination and fire response was an area of particular success on the Moose Meadow Fire
- One area identified as having some room for improvement was public communication of trigger points for when evacuated areas would be open for re-entry

of how well different aspects of incident management were carried out by all parties involved. According to respondents, there were no cost share agreements on the Moose Meadow Fire, so we do not have data on this network performance factor for this incident. While evacuation and re-entry were rated higher than the all fire averages, one area that was rated relatively lower was in public communication of trigger points for when evacuated areas would be open for re-entry (see Appedix A for details).

Figure 1. Average Network Performance by Activity: Moose Meadow Fire

Legend: Moose Meadow, All Fires

Categories: Coordination & Response, Evacuation & Re-entry, Sheltering & Mass Care, Cost Share, Public Information, Road Closures

Incident Management Team Performance: Perspectives from host agencies and local cooperators

On each incident, we asked representatives of local cooperating agencies, the Forest Service, and other host agencies to reflect on how well the incident management team communicated and coordinated with local host agencies and cooperators. Incident management teams (IMTs) were assessed across 19 areas outlined in Table 1 on the following page. The response options ranged from "No room for improvement" to "A lot of room for improvement", and included "Don't Know" and "Not Applicable" choices.

Across all twenty-two incidents, incident management teams were reported to perform the best in: 1) being accessible; 2) acknowledging cooperation; 3) sharing credit; and 4) serving as positive ambassadors in interactions with the local community. On average, scores were quite positive across all areas. However, host communities reported the greatest room for improvement for IMTs in the areas of: 1) obtaining local context information to inform fire operations; 2) incorporating information about local values at risk into fire management plans; and 3) engaging affected jurisdictions in planning and decision making from the beginning. The first column of Table 1 lists the average room for improvement for incident management teams across all fires. The second column displays average room for improvement for the Moose Meadow Fire incident management team. For each item in Table 1, *lower numbers indicate less room for improvement*. The scale includes (0) indicating "no" room for improvement, (1) "a little," (2) "some," (3) "quite a bit," and (4) "a lot." Average responses for

KEY FINDINGS

- On average, Pearson's Type II IMT was rated more positively than the regional average in 18 out of 19 areas during the Moose Meadow Fire

- IMT strengths:
    - understanding organizational culture, values, and capacities of local agencies
    - clarifying roles and responsibilities
    - acknowledging cooperation

- Areas the IMT may want to continue to focus on for improvement include:
    - serving as a positive ambassador to the local community
    - rapidly identifying key local players to be communicating with during the incident
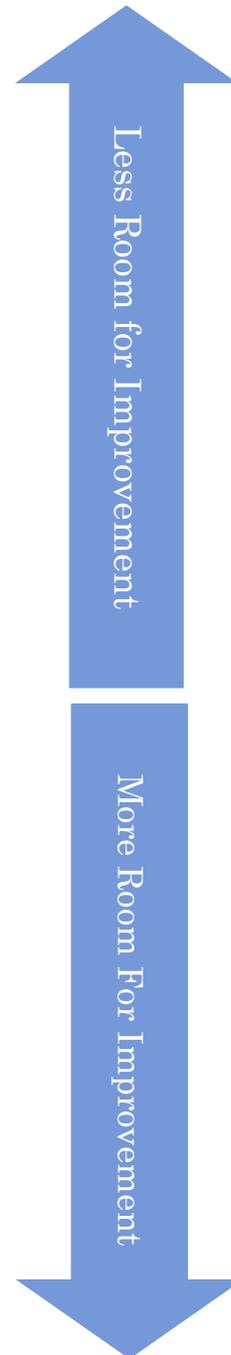   - being sensitive to local community culture and political climate

Pearson's Type II IMT on the Moose Meadow Fire ranged from 0.3 to 1.0, indicating "a little" room for improvement. The team was rated more positively than the regional average in 18 of 19 areas during the Moose Meadow Fire. The team was rated equal to average in serving as a positive ambassador in interactions with the local community. Greatest strengths and areas for improvement for the incident management team on the Moose Meadow Fire are highlighted in the IMT Key Findings box above.

Area for improvement in working with Host Unit(s) and local cooperators	22 Incident Average Room for Improvement (0-4)	Moose Meadow Average Room for Improvement (0-4)
Seeking to understand organizational culture, values, and capacities of your agency	1.2	0.3
Clarifying roles and responsibilities	1.2	0.3
Acknowledging cooperation	1	0.3
Valuing local knowledge and local input	1.2	0.4
Engaging affected jurisdictions in planning and decision making from the beginning	1.3	0.5
Incorporating information about local values at risk (e.g., biological, archeological, cultural, recreational) into the management of the fire	1.3	0.6
Being accessible to you	1	0.6
Including your agency in the dissemination of vital information during the incident	1.2	0.6
Valuing your agency's input	1.2	0.6
Being flexible in adapting their fire management strategy to account for local preferences	1.2	0.6
Sharing credit with your agency	1	0.6
Getting your agency information you needed to be effective	1.2	0.7
Being helpful to cooperating agencies	1.1	0.7
Obtaining local context (e.g., burn scars, trail systems, local weather patterns) to inform their operations	1.3	0.8
Using the incident as a training opportunity to build local capacity	1.2	0.8
Being sensitive to local community culture and political climate	1.25	0.9
Staying in their lane and not over-stepping their delegation of authority	1	0.9
Rapidly identifying key local players they needed to be communicating with during the incident	1.2	1
Serving as a positive ambassador in interactions with the local community	1	1

TABLE 1.   Moose Meadow Incident Management Team Room for Improvement

Less Room for Improvement

More Room For Improvement

Twitter Use

Social networking sites, such as Twitter, have become important tools for sharing information during various emergencies. Researchers are only beginning to study the implications of social media for risk communication and practitioners are often interested in best practices for using social media. As part of our survey, we asked local cooperators and Forest Service personnel whether they knew of an "official" Twitter feed associated with the wildfire incident, whether they subscribed to this feed, and whether or not they found the information on Twitter helpful. Figure 2 shows percentage of Twitter use for Moose Meadow Fire compared to the average rate across twenty-one fires in our sample that reported on social media.

Figure 2. Percent Social Media Use and Utility on the Moose Meadow Fire
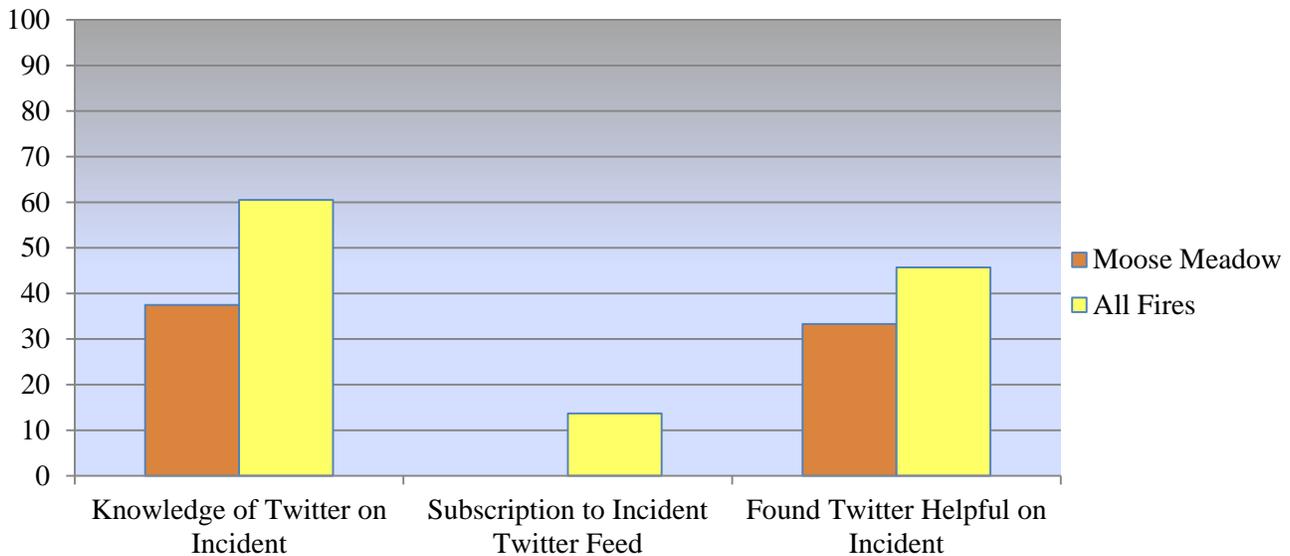
Inciweb and the US Forest Service both tweeted information about the Moose Meadow Fire. Much of the incident-related Twitter activity was comprised of Inciweb retweets. On Moose Meadow, respondents had a lower frequency of knowledge of Twitter, no subscribers to Twitter, and were less likely to find Twitter helpful relative to respondents across all fires in our sample. While Twitter knowledge, subscription, and helpfulness ranks lower on this incident, the conclusiveness of our findings is impacted by a significant amount of missing data for this section on this incident.

KEY FINDINGS

- Moose Meadow Fire respondents were less aware of Twitter information resources than respondents across other incidents

- No Moose Meadow respondents subscribed to Twitter

- Moose Meadow Fire respondents did not find Twitter information sources as helpful as did respondents across other incidents

Moving Forward: Incident learning and capacity building

The field of incident response prioritizes using every incident as an opportunity for learning and relationship building to improve capacity for responding to future events. To assess incident learning and capacity building, respondents were asked to report how personal outcomes were influenced by the incident in the areas of: 1) increased knowledge of other agencies' missions and values; 2) enhanced knowledge of the Incident Command System (ICS); and 3) increased familiarity and strengthened professional relationships within the local network. Respondents were asked to rate how each factor was affected by the incident, on a scale ranging from (1) "much worse" to (5) "much better", with (3) indicating "no change." See Appendix B for specific questions asked in each category and average level of agreement for each.

Figure 3. Incident Learning and Capacity Building from the Moose Meadow Fire
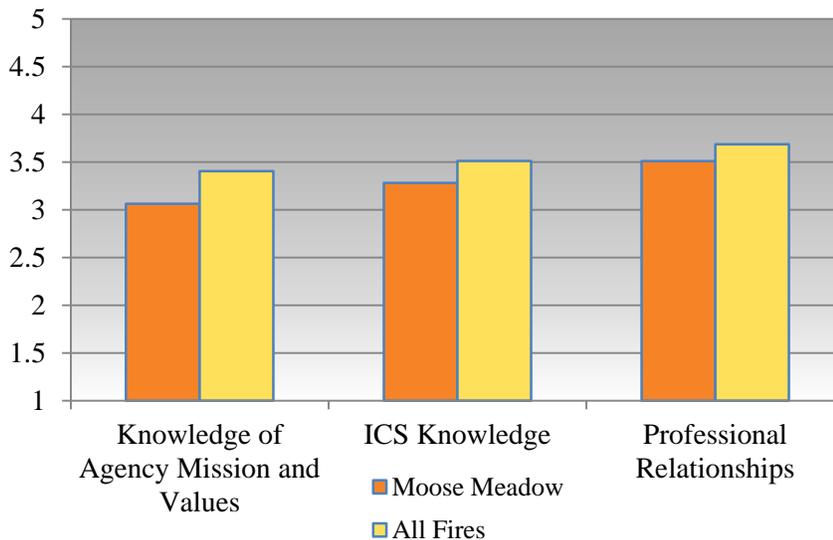
Across all the wildfire incidents we studied, evidence suggests that knowledge of other agency missions and values, ICS knowledge, and professional relationships were perceived to have improved. Across all incidents, local cooperators and host agencies reported the greatest improvements in the area of professional relationships, which included respondents reporting strengthened professional relationships with leaders of cooperating agencies, stronger relationships within counties, and better knowledge of the missions and values of cooperating agencies. The least improvement was shown in local cooperator and host agency knowledge of agency missions and values, which included knowledge of the mission and values of state land management agencies and the National Forest. In the middle range is knowledge of the Incident Command System, which includes familiarity with ICS, opportunities to gain additional training in an area of incident response, and understanding how to work with an IMT, including what the IMT can and cannot do to assist your county during an incident.

On the Moose Meadow Fire, all responses varied between "no change" and "somewhat better" for knowledge of agency missions and values, ICS knowledge, and professional relationships. While improvements in these areas were slightly lower for the Moose Meadow Fire than across all fires, there were no negative impacts reported in any area. Modest improvements were reported in increasing respondents' knowledge of the county and strengthening the working relationships between your county and the local National Forest District. Respondents on average reported little to no improvements in their understanding of the mission and values of state and federal land agencies.

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APPENDIX A. Network Performance: Moose Meadow Fire

Areas of Network Performance	22 Incident Average Level of Agreement (1-5)	Moose Meadow Fire Average Level of Agreement (1-5)
Coordination & Fire Response		
A coordinated set of fire management objectives were agreed upon among all affected jurisdictions	4.29	4.70
All concerned jurisdictions prioritized maintaining good communication across agencies	4.21	4.46
Credit for success and effort was shared among agencies during public meetings and media events	4.37	4.45
There was a general willingness across agencies to offer assistance to other agencies or jurisdictions	4.48	4.69
"Borrowed resources" were released in a timely fashion to minimize burden on the lending agency	4.38	4.67
Community values at risk from wildfire were readily identified	4.64	4.93
Efforts to protect community values were appropriate given available resources and risks to firefighter safety	4.59	4.79
The overall strategy taken in managing this fire was appropriate	4.40	4.43
Local resources were incorporated into the incident management operations	4.50	4.69
Evacuation Performance		
Cooperating agencies were able to use existing evacuation plans to quickly establish a coordinated evacuation strategy	3.82	3.70
Residents received timely notification of evacuation status using clear, pre-established language to distinguish between an evacuation warning and an evacuation notice	4.03	4.31
Evacuations were executed in a timely and orderly fashion	4.15	4.54
Cooperating agencies had a prepared plan for how re-entry into evacuated areas would be coordinated	4.05	4.09
Trigger points for when evacuated areas would be opened for re-entry were clearly communicated to the public	3.88	3.67
Re-entry was carried out in an organized and orderly fashion	4.15	4.25
Sheltering & Mass Care		
Adequate sheltering options were prepared to house evacuees	4.16	4.62
Sheltering options were clearly communicated to evacuees	4.01	4.36
Donations for evacuees were well-coordinated	3.74	3.50
Auxiliary care needs of evacuees (e.g., food, water, clothing, transportation, spiritual or mental health assistance) were adequately provided for	4.05	4.13
Adequate sheltering options were made available to evacuate pets and livestock	3.88	4.14
Cost Share Performance		
We used pre-agreed frameworks/principles to expedite cost share agreements	3.80	NA
The process through which cost share was decided upon was fair	3.86	NA
The resulting cost share agreement was fair	3.96	NA

Areas of Network Performance	22 Incident Average Level of Agreement (1-5)	Moose Meadow Fire Average Level of Agreement (1-5)
APPENDIX A. Network Performance: Moose Meadow Fire (continued)		
Public Information Performance		
Public information was coordinated among cooperating agencies to ensure continuity of the message	4.35	4.62
Local resources were leveraged to ensure timely dissemination of public information	4.32	4.25
Social media was used effectively to provide timely public updates concerning the status of the fire	4.16	4.10
A system for communication with the media was put in place to ensure timely dissemination of public information	4.42	4.67
Road Closure Performance		
All cooperating and fire management agencies maintained a timely awareness of the status of road closures	4.25	4.46
Trigger points for making decisions about road closures were proactively communicated to the local community	4.05	4.33
A consistent message was provided to the public about the status of road closures	4.11	4.08

APPENDIX B. Incident Learning and Capacity Building: Moose Meadow Fire

Areas of Incident Learning and Capacity Building	22 Incident Average Reported Impact (1-5)	Moose Meadow Fire Reported Impact (1-5)
Knowledge of Agency Mission & Values		
Your understanding of the mission and values of state land management agencies (e.g., Oregon State Forestry, DNR/DNRC, Idaho Department of Lands, Fire/Timber Protective Associations, etc.) in your area	3.43	3.13
Your understanding of the mission and values of federal land management agencies (e.g., BLM, National Park Service, USFS, etc.) in your area	3.38	3.00
Knowledge of ICS		
Your understanding of what an Incident Management Team can and cannot do to assist your county during an incident	3.44	3.25
Your familiarity with Incident Command Systems	3.48	3.13
Your knowledge of how to work effectively with an Incident Management Team	3.67	3.50
Opportunities for you to gain additional training in an area of incident response	3.45	3.29
Professional Relationships and Networks		
The strength of working relationships within your county	3.76	NA
The strength of working relationships between your county the local National Forest District	3.60	3.60
The strength of working relationships with National Forest Headquarters	3.42	3.57
Your knowledge of the capabilities and constraints of cooperating agencies in your area	3.73	3.25
Your knowledge of the capabilities and constraints of the local National Forest	3.58	NA
Your professional networks with leaders of cooperating agencies in your area	3.89	3.50
Your knowledge of your local community	3.72	3.57

Fire Chasers: Improving Community Response to Wildfire Project

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