2014

# IMPROVING COMMUNITY RESPONSE TO WILDFIRE:

# 2013 FIRE SEASON FINDINGS REPORT

# LOLO CREEK COMPLEX

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 Lolo Creek Complex 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

# Lolo Creek Complex: Incident Report

## Study Background

This report summarizes findings on incident response outcomes for the Lolo Creek Fire that occurred in 2013. The report presents outcomes of the Lolo Creek 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 26 surveys were completed for the Lolo Creek Complex (62 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 is 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 Lolo Creek Complex**

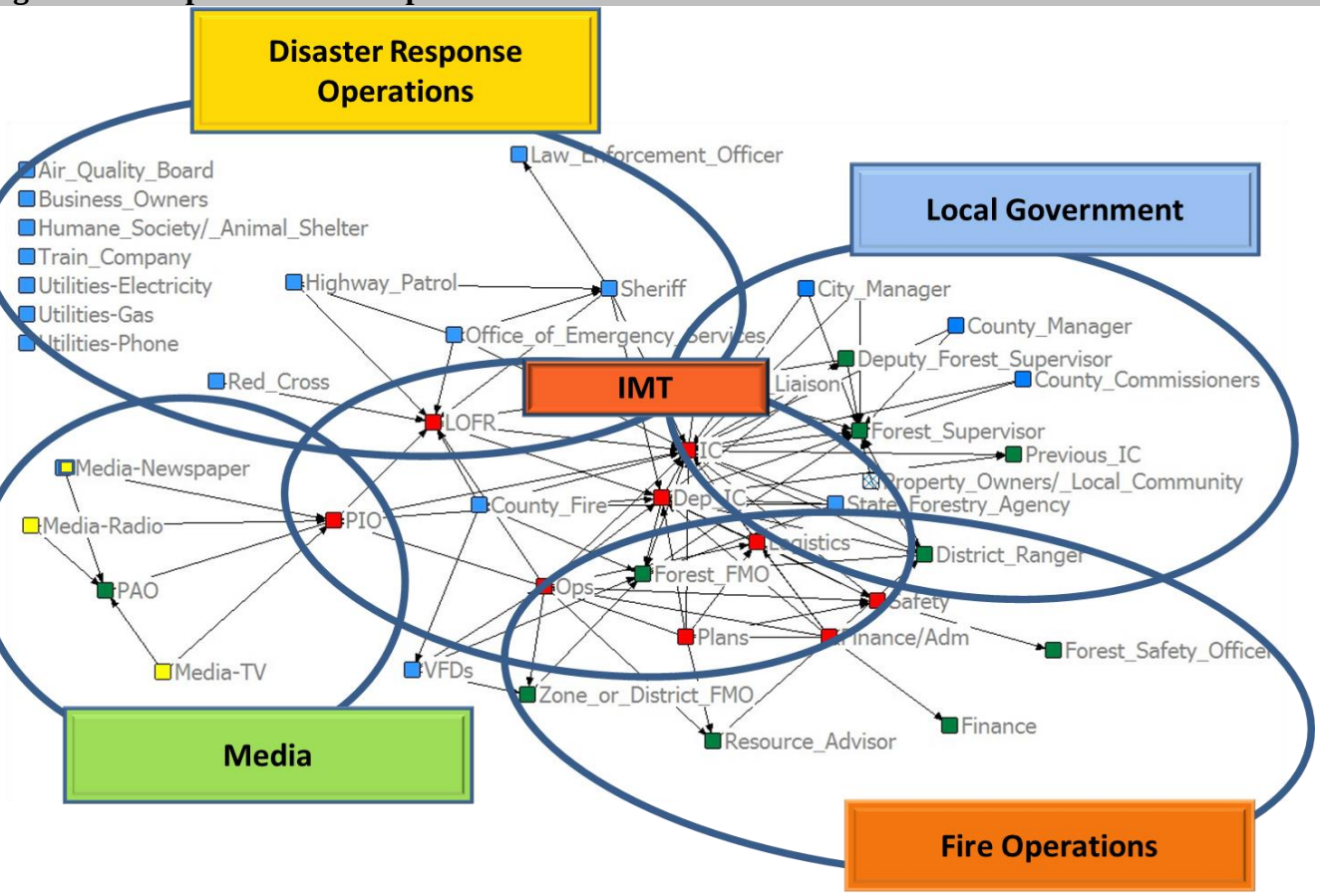
On August 18, 2013, lightning ignited the Lolo Creek Complex eight miles west of Lolo, MT, on Montana Department of Natural Resources and Conservation (DNRC) land. On August 20th, Poncin's Type I Incident Management Team (IMT) arrived on the Complex under unified command, with the Lolo National Forest and the Montana DNRC serving as host units. According to ICS-209 Incident Reports, mandatory evacuations along the Highway 12 corridor were put in place on August 20th and were lowered to notices on the 28th. At its peak, 1,200 residences and 10 commercial properties were threatened; 5 homes and 4 outbuildings were destroyed in the fire. Cooperators on the incident included Missoula County Sheriff's Office, Missoula County Disaster and Emergency Services, Missoula Rural Fire District, Montana Highway Patrol, the Montana Department of Transportation, and others. The final Inciweb update dates for the Lolo Creek Complex from September 3rd report that the fire burned a total of 10,902 acres.

## Incident Response Network Performance: Lolo Creek Complex

### 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 & 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 (average = 4.44) and public information (4.34). On average, lower performance was reported for cost share (3.87), evacuation (3.99), and sheltering/mass care (4.0). See Appendix A for specific questions asked in each category and average level of agreement for each.

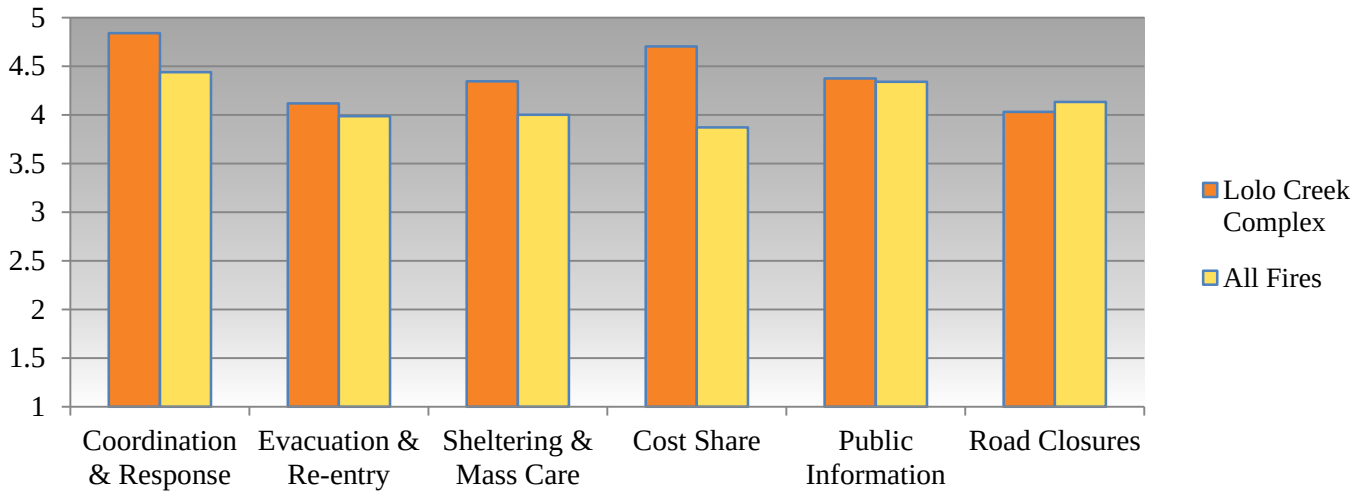
**Network Performance: How did things go on the Lolo Creek Complex?**

Figure 1 shows network performance ratings for the Lolo Creek Complex in comparison with the average across all twenty-two fires in our sample. In all but one area, Lolo Creek Complex network performance was slightly higher than the averages across all fires. Lolo Creek Complex network performance was higher than average for coordination and response, sheltering and mass care, and cost share. Network performance was slightly higher for evacuation and reentry, and public information. Notably, those surveyed provided overwhelming positive feedback about performance in the area of coordination and response. Lolo Creek Complex network performance was just slightly lower than the all-incident average in the area of road closures. In particular, respondents saw room for improvement in the extent to which a consistent message was provided to the public about the status of road closures (See Appendix A for more detail).

**KEY FINDINGS**

- Network performance on the Lolo Creek Complex was rated higher than the 22 incident average in all but one category
- Coordination and response and cost share were identified as areas of particular strength
- Consistency in messaging to the public about status of road closures was identified as an area with more room for improvement

**Figure 1. Average Network Performance by Activity: Lolo Creek Complex**



**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 Lolo Creek Complex 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 Poncin's Type I IMT on the Lolo Creek Complex ranged from 0.3 to 1.1, indicating little room for improvement. The team was rated more positively than the regional average in all 19 areas of evaluation during the Lolo Creek Complex.

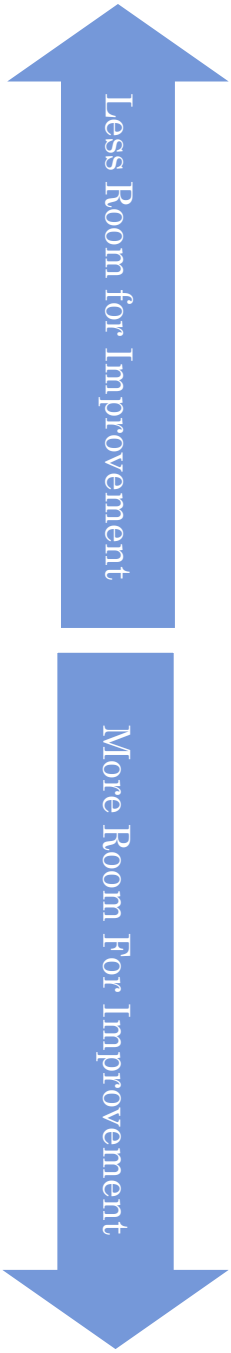
**KEY FINDINGS**

- On average, Poncin's Type I IMT was rated more positively than the regional average in all 19 areas during the Rough Creek Fire
- IMT strengths:
  - positive interactions with the local community
  - providing training opportunities for local capacity
  - being accessible
  - being flexible in adapting their fire management strategy
- Areas the IMT may want to prioritize for further improvement included:
  - obtaining local context to inform operations
  - increasing efforts to proactively engage stakeholders in information dissemination

On average, Poncin's Type I IMT had less room for improvement than the overall average, with the most notable differences in interacting with the local community, using the incident as a training opportunity to build local capacity, being accessible to other agencies, and accounting for local preference in adapting their fire management strategy. Greatest strengths and areas for improvement for the incident management team on the Lolo Creek Complex are highlighted in the IMT Key Findings box.

**TABLE 1. Lolo Creek Complex Incident Management Team Room for Improvement**

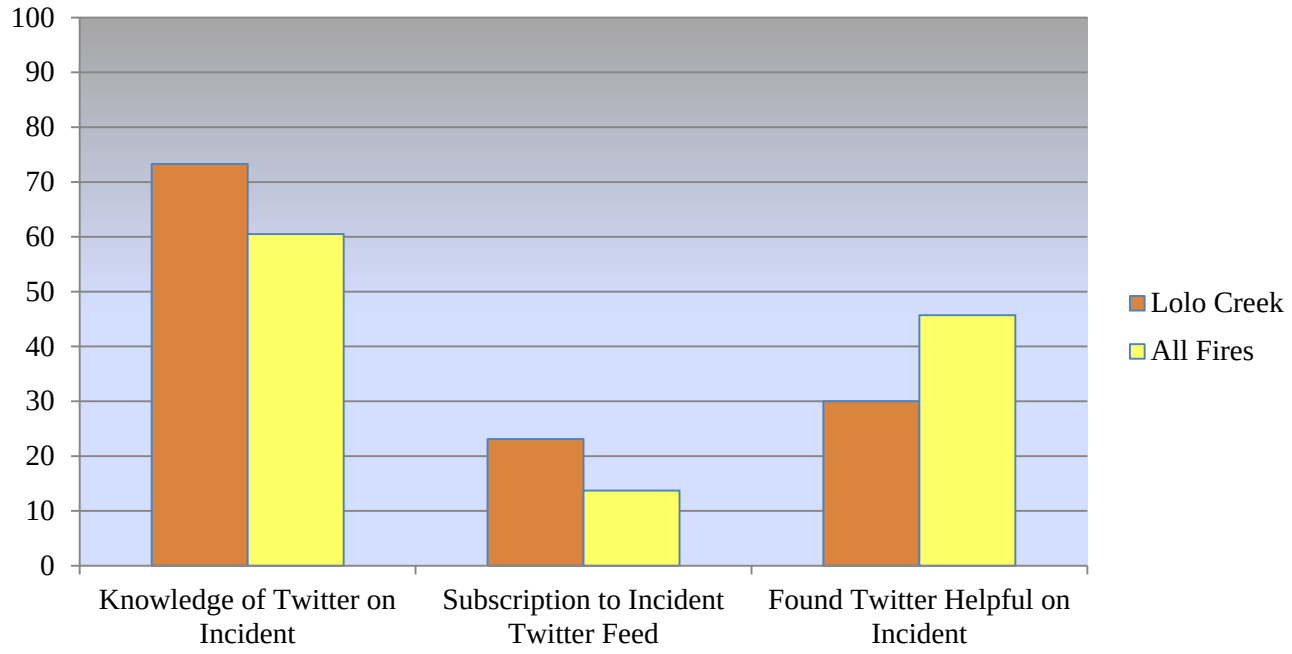
| Area for improvement in working with Host Unit(s) and local cooperators | 22 Incident Average Room for Improvement (0-4) | Lolo Creek Complex Average Room for Improvement (0-4) |
|---|---|---|
| Serving as a positive ambassador in interactions with the local community | 1 | 0.3 |
| Using the incident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



## 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 Lolo Creek Complex 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 Lolo Creek Complex**




Inciweb, the US Forest Service Northern Region, the Lolo Creek National Forest, and the National Weather Service all tweeted information about the Lolo Creek Complex Fire, often retweeting Inciweb updates. Additionally, the Bitterroot National Forest tweeted a fire update on August 20, 2013, and a handful of Twitter users—likely concerned citizens—actively spread information throughout the incident. On the Lolo Creek Complex, more respondents had knowledge of Twitter than respondents on other incidents, a higher percentage of subscribers to Twitter, but were less likely to find Twitter helpful relative to the average rate across all fires in our sample.

**KEY FINDINGS**

- Lolo Creek Complex respondents were more aware of Twitter information resources than respondents across other incidents
- Lolo Creek Complex respondents subscribed to Twitter information feeds with greater frequency than respondents across other incidents
- Lolo Creek Complex respondents did not find Twitter information sources as helpful as did respondents across other incidents

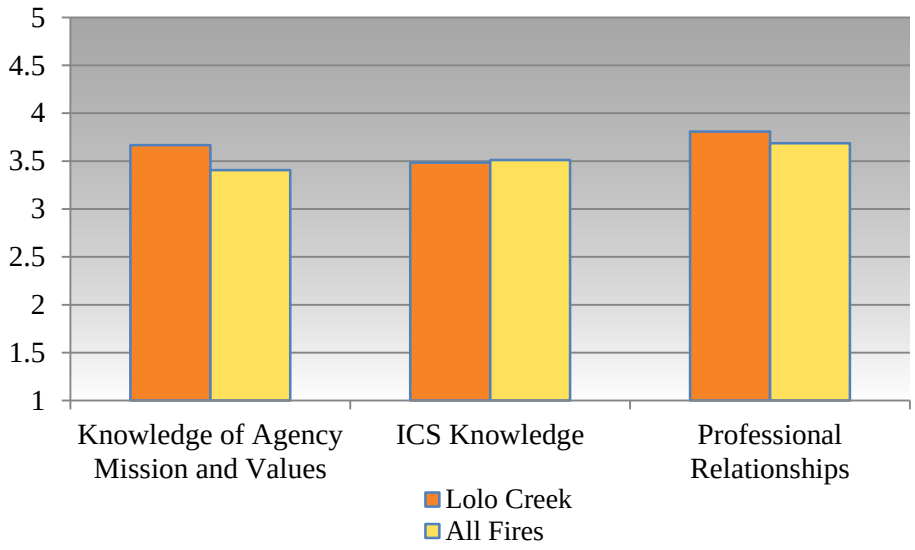
## Moving Forward: Incident learning and capacity building

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.

**KEY FINDINGS**

- Over all the wildfire incidents we studied, evidence suggests that knowledge of agency missions and values, ICS knowledge, and professional relationships were perceived to have improved
- Lolo Creek Complex respondents reported slightly higher scores than regional averages in knowledge of agency missions and values and professional relationships
- For the Lolo Creek Complex, the greatest impact was on professional relationships

**Figure 3. Incident Learning and Capacity Building from the Lolo Creek Complex**




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 capacities and constraints 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 Lolo Creek Complex, responses varied between "no change" and "somewhat better" for knowledge of agency missions and values, ICS knowledge, and professional relationships. Improvements in knowledge of agency missions and values and in professional relationships were more pronounced on Lolo Creek Complex than the average improvement across all fires. While improvements in ICS knowledge was slightly lower for Lolo Creek than across all fires, respondents did generally agree that this area was improved.

## APPENDIX A. Network Performance: Lolo Creek Complex

| Areas of Network Performance | 22 Incident Average Level of Agreement (1-5) | Lolo Creek Complex Average Level of Agreement (1-5) |
|---|---|---|
| **Coordination & Response** | | |
| A coordinated set of fire management objectives were agreed upon among all affected jurisdictions | 4.29 | 4.90 |
| All concerned jurisdictions prioritized maintaining good communication across agencies | 4.21 | 4.70 |
| Credit for success and effort was shared among agencies during public meetings and media events | 4.37 | 4.65 |
| There was a general willingness across agencies to offer assistance to other agencies or jurisdictions | 4.48 | 4.85 |
| "Borrowed resources" were released in a timely fashion to minimize burden on the lending agency | 4.38 | 4.72 |
| Community values at risk from wildfire were readily identified | 4.64 | 4.95 |
| Efforts to protect community values were appropriate given available resources and risks to firefighter safety | 4.59 | 4.85 |
| The overall strategy taken in managing this fire was appropriate | 4.40 | 4.86 |
| Local resources were incorporated into the incident management operations | 4.50 | 4.95 |
| **Evacuation Performance** | | |
| Cooperating agencies were able to use existing evacuation plans to quickly establish a coordinated evacuation strategy | 3.82 | 3.65 |
| Residents received timely notification of evacuation status using clear, pre-established language to distinguish between an evacuation warning and an evacuation notice | 4.03 | 3.83 |
| Evacuations were executed in a timely and orderly fashion | 4.15 | 3.95 |
| Cooperating agencies had a prepared plan for how re-entry into evacuated areas would be coordinated | 4.05 | 4.35 |
| Trigger points for when evacuated areas would be opened for re-entry were clearly communicated to the public | 3.88 | 4.26 |
| Re-entry was carried out in an organized and orderly fashion | 4.15 | 4.65 |
| **Sheltering & Mass Care** | | |
| Adequate sheltering options were prepared to house evacuees | 4.16 | 4.50 |
| Sheltering options were clearly communicated to evacuees | 4.01 | 4.38 |
| Donations for evacuees were well-coordinated | 3.74 | 4.00 |
| Auxiliary care needs of evacuees (e.g., food, water, clothing, transportation, spiritual or mental health assistance) were adequately provided for | 4.05 | 4.82 |
| Adequate sheltering options were made available to evacuate pets and livestock | 3.88 | 4.00 |
| **Cost Share Performance** | | |
| We used pre-agreed frameworks/principles to expedite cost share agreements | 3.80 | 4.10 |
| The process through which cost share was decided upon was fair | 3.86 | 4.56 |
| The resulting cost share agreement was fair | 3.96 | 4.89 |

| APPENDIX A. Network Performance: Lolo Creek Complex (continued) | | |
|---|---|---|
| **Areas of Network Performance** | **22 Incident Average Level of Agreement (1-5)** | **Lolo Creek Complex Average Level of Agreement (1-5)** |
| **Public Information Performance** | | |
| Public information was coordinated among cooperating agencies to ensure continuity of the message | 4.35 | 4.33 |
| Local resources were leveraged to ensure timely dissemination of public information | 4.32 | 4.37 |
| Social media was used effectively to provide timely public updates concerning the status of the fire | 4.16 | 4.25 |
| A system for communication with the media was put in place to ensure timely dissemination of public information | 4.42 | 4.50 |
| **Road Closure Performance** | | |
| All cooperating and fire management agencies maintained a timely awareness of the status of road closures | 4.25 | 4.14 |
| Trigger points for making decisions about road closures were proactively communicated to the local community | 4.05 | 4.10 |
| A consistent message was provided to the public about the status of road closures | 4.11 | 3.85 |

## APPENDIX B. Incident Learning and Capacity Building: Lolo Creek Complex

| Areas of Incident Learning and Capacity Building | 22 Incident Average Reported Impact (1-5) | Lolo Creek Complex 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 | 3.63 |
| 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 | 3.67 |
| **Knowledge of ICS** | | |
| Your understanding of what an Incident Management Team can and cannot do to assist your county during an incident | 3.44 | 3.38 |
| Your familiarity with Incident Command Systems | 3.48 | 3.44 |
| Your knowledge of how to work effectively with an Incident Management Team | 3.67 | 3.59 |
| Opportunities for you to gain additional training in an area of incident response | 3.45 | 3.53 |
| **Professional Relationships and Networks** | | |
| The strength of working relationships within your county | 3.76 | 3.92 |
| The strength of working relationships between your county the local National Forest District | 3.60 | 3.85 |
| The strength of working relationships with National Forest Headquarters | 3.42 | 3.33 |
| Your knowledge of the capabilities and constraints of cooperating agencies in your area | 3.73 | 3.81 |
| Your knowledge of the capabilities and constraints of the local National Forest | 3.58 | 3.58 |
| Your professional networks with leaders of cooperating agencies in your area | 3.89 | 4.06 |
| Your knowledge of your local community | 3.72 | 3.88 |

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