



Bear Creek and Quartz Ridge Fires

CO-SJF-000570, CO-SJF-000678

Long Term Implementation Plan

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Preface

This plan, along with the management action point booklets and associated WFDSS decisions, is intended as an aid for the local fire management organization and future incident commanders in management considerations for the Bear Creek and Quartz Ridge fires on the Pagosa Ranger District of the San Juan National Forest. The timelines identified here have been validated with long term analysts, strategic operational planners, and operations section chiefs to produce an actionable plan needed to protect assets and resources at risk within and near the Weminuche Valley and East Fork San Juan River Valley.

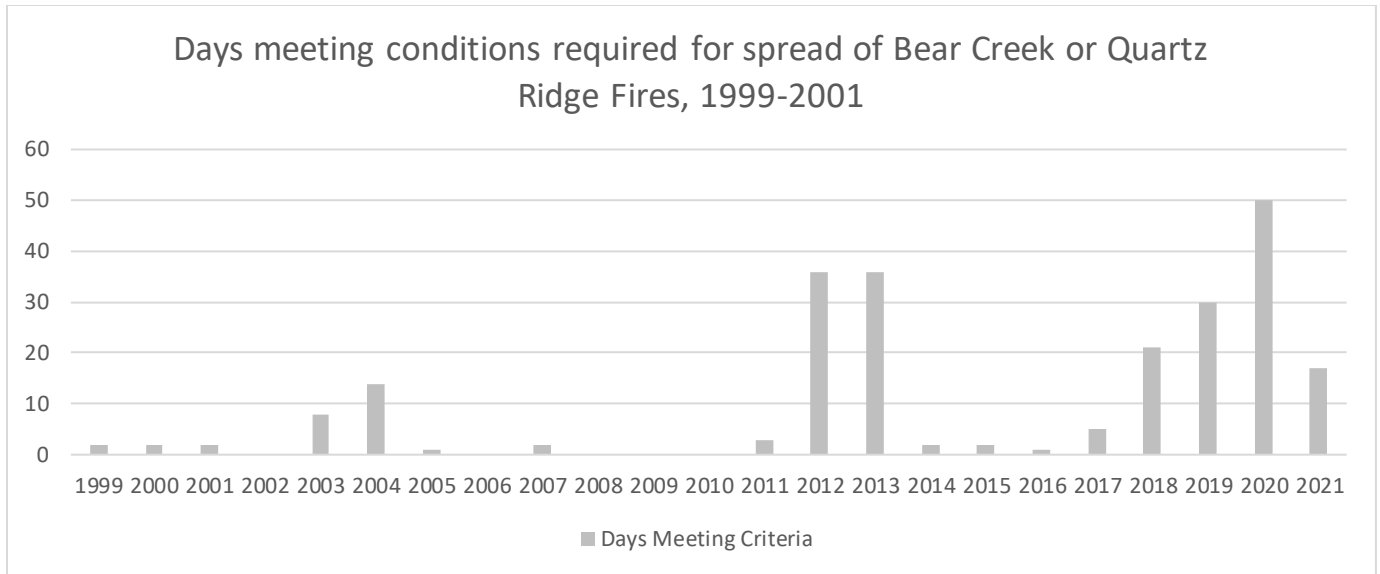
Condition

This plan relies on existing thresholds from the Durango Interagency Dispatch Center Fire Danger Operating Plan to inform future management and organizational considerations. The fire environment conditions required to allow for future spread of the fires are not common but can present themselves in drier than average monsoon conditions which the area finds itself within in 2023. Importantly, in years where fewer than 25 days between August and November have any amount of measurable precipitation, Energy Release Components in the fall season do tend to exceed the 90th percentile later in the fall. Through August 19, the fires have seen five days of measurable precipitation – indicating an average start to the fall precipitation regime. If trends turn drier than average again, the odds of reaching the threshold criteria shown below increase.

Conditions required for either fire to resume movement are:

| Critical Condition Sets for Bear Creek & Quartz Ridge Fires, 1999-2021 Observed Occurrence Rates | | | |
|---|---------------------------------------|--------------------------------|--|
| <i>Index or Value</i> | <i>Criteria</i> | <i>Occurrence (8/20-11/31)</i> | <i>Notes</i> |
| Burning Index, Fuel Model Z | Above 80, 76 th percentile | 10.7% | Combined, these two values represent a local Response Level 4 |
| Energy Release Component, Fuel Model Z | Above 99, 77 th percentile | 15.0% | |
| Daily Maximum Relative Humidity (%) | Less than 50% | 34.1% | RH recovery less than 40% highly correlated with daily growth >500 acres |
| All Conditions Simultaneously | | 8.2% | |

The condition sets above represent single day occurrence of all events. When these events have occurred in the past, they commonly exceed five days in duration, largely due to persistent drought conditions or an abrupt end to an otherwise average monsoon. In an “average” year these conditions occur for about ten days between August 20 and November 31; since 2019 an abrupt uptick has been observed.



All of this information is forecasted out seven days within the DRC Daily Indices mailing, giving ample lead time to staff appropriately. This information is also available in the associated excel workbook that will auto-populate every hour for end users. Close attention to close and mid-range weather forecasts, including the use of a qualified IMET, or using spot weather forecasts, will increase the potential that this plan will be successful. This plan recommends the continued use of an Incident Meteorologist, Long Term Analyst, and Strategic Operational Planner in order to be effectively implemented.

The recommended actions listed below are achievable in a two-day period, including construction of any additional fireline. Therefore, if resources are on scene two days prior to the conditions, there is a high probability of success associated with these tactics. Given the extended duration of this incident as well as the incident priority of maintaining outstanding relationships with our cooperators and the impacted public, this option makes the most strategic sense rather than firing the few existing control lines now and damaging existing relationships.

Action

If Response Level 4 combined with poor RH recovery is forecast in the next 7 days (Appendix A), the day prior to the first onset local fire managers should:

1. Consider ordering the Colorado Multi-Mission Aircraft to provide infrared imaging of both fires to identify sources of heat.
2. With this information, the Rocky Mountain Decision Support Center would be able to produce both near term fire behavior (NTFB) and fire spread probability (FSPro) products to validate or update relative risk assessments and organizational needs assessments within WFSS.
3. While growth should be anticipated if the conditions are reached, the direction of spread and longer-term probabilities of fire spread towards identified critical values at risk must be considered prior to determining organizational needs or relative risk.

Other considerations if the condition sets are forecast or realized include re-evaluating area closures, along with increased coordination with outfitter/guide permittees, potentially including daily check-ins via satellite phone with the IC or Duty Officer. Public Information needs should be expected to increase,

and the forest PAO should be notified when activity is expected to increase. With these considerations, a re-evaluation of the relative risk and organizational assessment within WFDSS should occur to identify management needs (Appendix B). The management organization necessary to continue current strategic actions on both incidents may vary if one or the other fire become active, or both simultaneously (Appendix C). Regardless of management type, continuing current strategies documented in the ISAP AGOL tool (available online through NIFC AGOL as well as hard copy strategy maps and attached Google Earth strategy overview) should be viewed as the first best option to protect values at risk as well as manage risks to responders, especially when considering resource availability in the future.

Resources

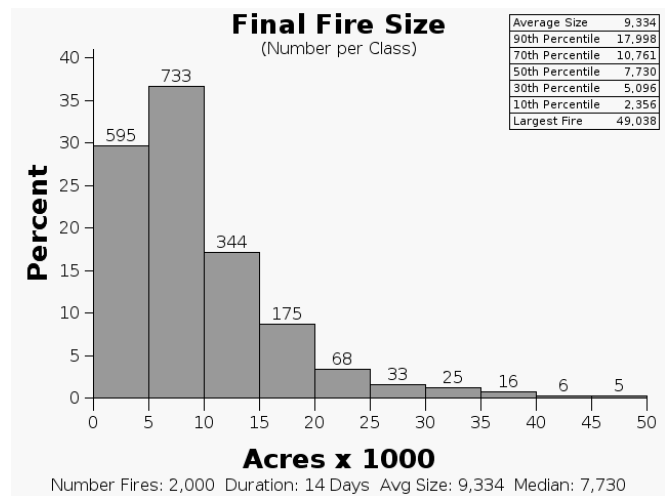
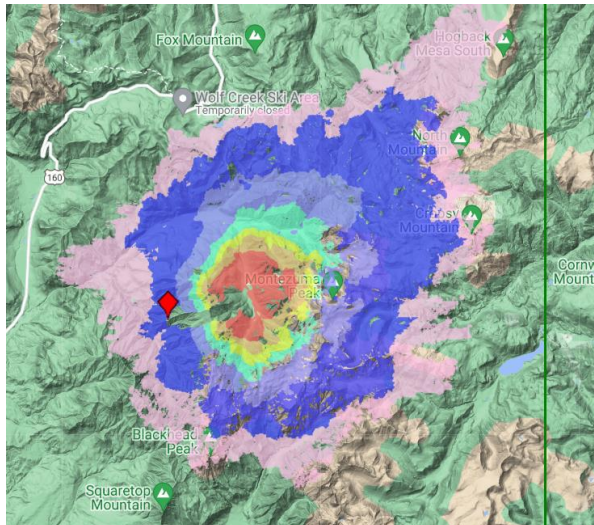
In addition to those resources listed above, most resources are readily available to managers for decision support. While the Fire Business Calculator from Durango Dispatch is critical to plan implementation, the CO MMA, RM DSC, and remote camera observations of smoke activity can also help inform operational resource needs. Continued fuel moisture sampling should occur, and if 1000-hour fuel moistures at Four Mile start to get below 12%, this may be a good indication that some conditions may soon be present for future fire spread.

Fire Spread Probabilities and Perimeter Modeling

In a dry fall ERCs begin to rebound significantly by mid-September. To capture future potential of both incidents, a 14 day FSPro and 4 day Near Term Fire Behavior run were completed for each incident in order to paint a realistic picture of “what if” things dry out as they might in a worst case scenario.

Quartz Ridge Fire Modeling

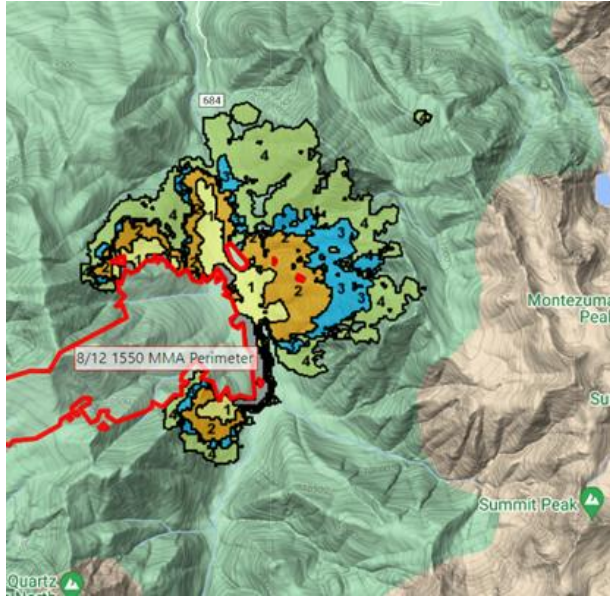
Fire Spread Probability



Hypothetical spread probability over 14 days modeling 2000 fires with an ignition on 9/17/2021. In 2021, after a 2 week drying trend, ERC and BI values in the Durango Zone peaked above the 90th percentile. This analysis is intended to represent spread probability if these conditions were to develop on the Quartz Ridge fire in the future. The analysis uses the Blue Park RAWs for ERC and wind

climatology and draws from climatologic values for both ERC and wind beginning with the first day and continuing throughout the analysis. The analysis assumes no suppression action and that burning conditions similar to those experienced on 9/17/2021 will occur again this year.

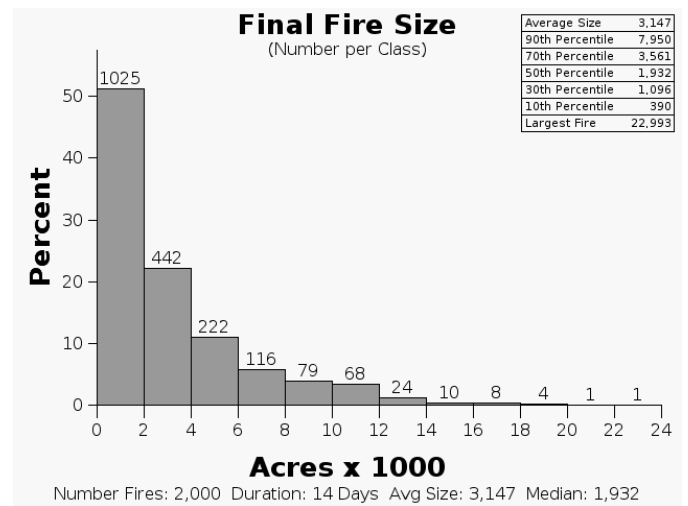
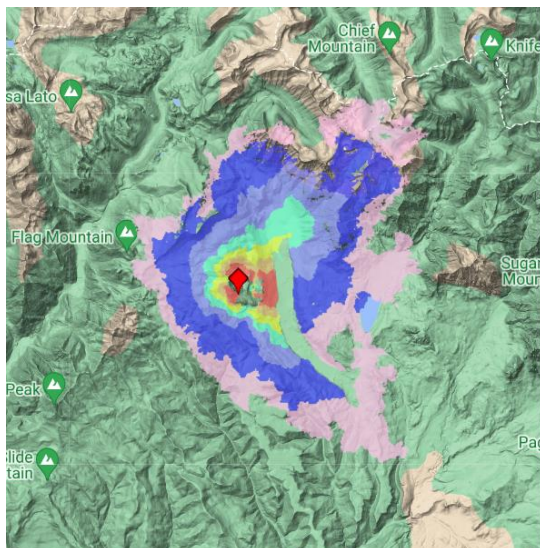
Near Term Fire Behavior



| Date | Start Hour | End Hour | Acres |
|------------|------------|----------|-------|
| 09/17/2021 | 10 | 18 | 234.6 |
| 09/18/2021 | 10 | 16 | 430.3 |
| 09/19/2021 | 10 | 16 | 352.4 |
| 09/20/2021 | 11 | 18 | 913.5 |

Hypothetical spread over 4 days with an ignition on 9/17/2021. In 2021, after a 2 week drying trend, ERC and BI values in the Durango Zone peaked above the 90th percentile. This analysis is intended to represent deterministic spread if these conditions were to develop on the Quartz Ridge fire in the future. The analysis uses weather observations from the Buckles RAWS for burn period length, fuel moistures and winds. The analysis assumes no suppression action and that burning conditions similar to those experienced on 9/17/2021 will occur again this year.

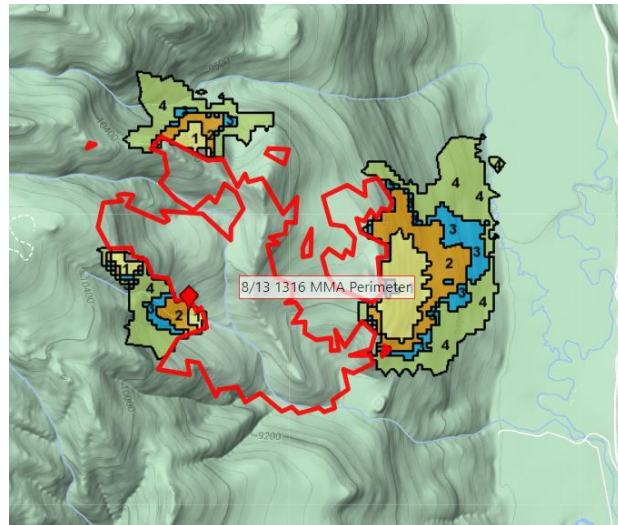
Bear Creek Fire Modeling Fire Spread Probability



Hypothetical spread probability over 14 days modeling 2000 fires with an ignition on 9/17/2021. In 2021, after a 2 week drying trend, ERC and BI values in the Durango Zone peaked above the 90th percentile. This analysis is intended to represent spread probability if these conditions were to develop on the Bear Creek fire in the future. The analysis uses the Blue Park RAWs for ERC and wind climatology and draws from climatologic values for both ERC and wind beginning with the first day and continuing throughout the analysis. The analysis assumes no suppression action and that burning conditions similar to those experienced on 9/17/2021 will occur again this year.


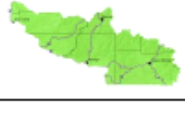
Near Term Fire Behavior

| Date | Start Hour | End Hour | Acres |
|------------|------------|----------|-------|
| 09/17/2021 | 10 | 18 | 56.1 |
| 09/18/2021 | 12 | 17 | 78.2 |
| 09/19/2021 | 12 | 17 | 50.7 |
| 09/20/2021 | 11 | 18 | 182.6 |



Hypothetical spread over 4 days with an ignition on 9/17/2021. In 2021, after a 2 week drying trend, ERC and BI values in the Durango Zone peaked above the 90th percentile. This analysis is intended to represent deterministic spread if these conditions were to develop on the Bear Creek fire in the future. The analysis uses weather observations from the Buckles RAWs for burn period length, fuel moistures and winds. The analysis assumes no suppression action except in the Weminuche Valley and that burning conditions similar to those experienced on 9/17/2021 will occur again this year.

Appendix A: DRC Fire Business Calculator Relevant Outputs for Bear Creek and Quartz Ridge

|  Durango Dispatch Fire Business Calculator - 2023 DRC LOWER Fire Danger Rating Area - Forecast Weather & NFDRS v4 Fire Danger Predicted Indices 8/20/2023 8:19 Stations: Nucla (053805), Chapin (055704), Mockingbird (055710), Mesa Mountain (055805) | | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | August 20 | August 21 | August 22 | August 23 | August 24 | August 25 | August 26 |
| Max Temp (F) | 91 | 91 | 90 | 87 | 85 | 84 | 85 |
| Minimum RH (%) | 16 | 14 | 18 | 24 | 27 | 32 | 30 |
| Max Dewpoint (F) | 41 | 47 | 51 | 49 | 53 | 54 | 53 |
| Min Temp (F) | 63 | 62 | 61 | 61 | 59 | 58 | 58 |
| Max RH (%) | 35 | 50 | 63 | 63 | 77 | 80 | 75 |
| Windspeed (20'-mph) | 24 | 26 | 22 | 13 | 14 | 13 | 13 |
| Wind Direction (deg) | 158 | 171 | 167 | 171 | 176 | 207 | 225 |
| Wind Direction | SSE | SSE | SSE | SSE | S | SSW | SW |
| Lightning Activity Level | 2 | 1 | 3 | 4 | 4 | 4 | 4 |
| 1-hr(%) | 5.73 | 6.64 | 7.90 | 8.37 | 9.68 | 10.17 | 9.62 |
| 10-hr (%) | 7.62 | 8.99 | 10.73 | 10.98 | 12.95 | 13.65 | 12.85 |
| 100-hr (%) | 10.60 | 10.20 | 10.00 | 10.60 | 11.80 | 12.80 | 13.60 |
| 1000-hr(%) | 12.60 | 11.60 | 11.80 | 11.80 | 11.80 | 12.00 | 12.60 |
| ERC-X Percentile | 69 | 58 | 41 | 35 | 25 | 20 | 23 |
| BI-X Percentile | 92 | 90 | 78 | 56 | 46 | 39 | 41 |
| Staffing Level | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| Response Level | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| Adjective Fire Danger | High | Moderate | Moderate | Moderate | Low | Low | Low |
| Recommended Fire Restrictions | Stage I | Stage I | None | None | None | None | None |
| Severe Fire Danger Index | Moderate | Low | Low | Low | Low | Low | Low |
| FWZ 207 Fuels Critical? | Yes | No | No | No | No | No | No |
| FWZ 207 Red Flag Likely? | No | No | No | No | No | No | No |
|  DRC UPPER Fire Danger Rating Area - Forecast Weather & NFDRS v4 Fire Danger Predicted Indices 8/20/2023 8:19 Stations: Salter (055205), Devil Mtn (055904), Sandoval (055902), Log Chute (055808) | | | | | | | |
| | August 20 | August 21 | August 22 | August 23 | August 24 | August 25 | August 26 |
| Max Temp (F) | 88 | 88 | 86 | 82 | 82 | 82 | 83 |
| Minimum RH (%) | 18 | 15 | 22 | 27 | 30 | 35 | 32 |
| Max Dewpoint (F) | 44 | 51 | 56 | 53 | 56 | 57 | 57 |
| Min Temp (F) | 54 | 54 | 54 | 53 | 53 | 52 | 52 |
| Max RH (%) | 48 | 66 | 82 | 80 | 90 | 92 | 90 |
| Windspeed (20'-mph) | 16 | 18 | 16 | 11 | 11 | 12 | 12 |
| Wind Direction (deg) | 158 | 174 | 161 | 187 | 184 | 222 | 228 |
| Wind Direction | SSE | S | SSE | S | S | SW | SW |
| Lightning Activity Level | 1 | 1 | 4 | 4 | 4 | 4 | 4 |
| 1-hr(%) | 7.05 | 8.04 | 9.72 | 9.99 | 11.16 | 11.50 | 11.11 |
| 10-hr (%) | 9.04 | 10.85 | 13.34 | 13.28 | 14.82 | 15.57 | 15.03 |
| 100-hr (%) | 12.13 | 11.28 | 12.43 | 13.29 | 14.29 | 15.29 | 15.71 |
| 1000-hr(%) | 13.70 | 13.13 | 13.13 | 13.28 | 13.28 | 14.28 | 14.57 |
| ERC-Z Percentile | 77 | 72 | 59 | 56 | 48 | 40 | 42 |
| BI-Z Percentile | 91 | 90 | 73 | 61 | 47 | 43 | 43 |
| Staffing Level | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| Response Level | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| Adjective Fire Danger | High | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate |
| Recommended Fire Restrictions | Stage I | Stage I | Stage I | Stage I | Stage I | Stage I | Stage I |
| Industrial Fire Precaution Level | I | I | I | I | I | I | I |
| Severe Fire Danger Index | Moderate | Moderate | Low | Low | Low | Low | Low |
| FWZ 294/295 Fuels Critical? | No | No | No | No | No | No | No |
| FWZ 294/295 Red Flag Likely? | No | No | No | No | No | No | No |

Local Preparedness Level

II

Preparedness and Fire Restrictions Questions

Are resource shortages occurring or is DRC supporting ongoing T1, T2, or T3 incidents?

Yes

If Maximum Relative Humidity (%) is forecast to be less than 50% combined with response level equal to or above 4, re-evaluation of relative risk and organizational assessments within WFDSS should occur along with the other considerations in this plan. August 20th predicted indices are shown as a date where the condition set was met and actions were taken as outlined in this plan.

All DRC NFDRS calculations are displayed as percentiles, not as raw values. A percentile simply shows how frequently a value occurs, which is shown as being between 0 and 100. A 50th percentile value occurs exactly in the midpoint of a range, a 97th percentile value means only 3% of all days have had a higher value.

Appendix B: Considerations by Functional Area

The following bullet points are considerations learned by functional area during the management of the Quartz Ridge and Bear Creek fires. The intent of including these into a long-term implementation plan is to share lessons learned with future incident management organizations if the incidents again increase in complexity or relative risk. A significant amount of specific documentation is available within Teams for each incident and should be referred to in addition to the list below, as necessary.

Command

- Consider ordering a Forest Type 3 Command and General staff when the weather and fuel conditions align with the plan and updated fire modeling aligns with existing predictions and/or anticipated fire spread. Add one Liaison officer to the C&G unless modeling shows impacts to the San Luis Valley—then order two.
- Consider ordering a CIMT if updated fire modeling shows fire spread predictions beyond what was anticipated, and potentially compromises completed work. Add two Liaison Officers under these circumstances.
- Reestablish/continue connections to local sheriffs as affected by expected fire growth.
- Initiate discussion around cost share as needed, informed by updated modelling.

Liaison

- Consider having a scheduled (Sheriff(s)/AA and IC call. Validate the needed frequency of the meeting.
- Ensure local county entities (sheriffs) remain in contact with the AA to help inform need to host cooperator meetings and their frequency.
- More than one liaison may be needed if fire is anticipated to affect values that might require rapid coordination in multiple counties.

Safety

- ISAP process should be continued through this incident revalidating the actions and overall success defending the values taking into consideration the risk level for responders in the incident.
- Hazards have been identified into the work areas, the number of people and the time spent in the area of the hazard (exposure) continues to be an ongoing evaluation for fire management.
- National Incident Within an Incident (IWI) template has been implemented on the incident.
- Extensive ground transport times to higher level of medical care make the use of line Paramedics and EMTs essential.
- One Safety Officer identifying strategic action risks, and one Safety Officer on the fire ground validating hazards and exposures.

Public Information

- Maintain continuity of collaborator engagement. Continue to identify and initiate engagement with stakeholders whose interests and values may be impacted by the fire or smoke.
- Continue and improve Wildfire Smoke (and fire information) support to the San Luis Valley. Alert publics to the dangers of inhaling wildfire smoke and provide detailed instructions on how to minimize exposure to smoke.
 - Contact Rocky Mountain Regional Office Staff Amber Ortega (amber.ortega@usda.gov) or Brian Keating (brian.e.keating@usda.gov) for requesting remote or on site smoke forecasting from an Air Resource Advisor.
- Reference the Communication Strategy for more information on resources available and details to implement fire information plans.

Operations

- Following existing strategies will yield the highest probability of success of protecting values at risk while balancing risks to responders – do not be tempted to hastily alter course.
- Limited aviation use has been necessary to date – except for slowing actions as fire reaches lines, aviation use is not critical to achieve incident objectives.
- Careful validation of strategies should continue with ISAP if incidents resume daily growth, including close collaboration with a long-term fire analyst.
- As with all fires, careful attention must be paid to small scale influences on fire behavior that modelling may not accurately capture – on site validation is critical to any plan.

Planning

- Validation of incident objectives should continue with SAP if incidents resume daily growth. These should be reflected in WFDSS.
- Resource needs and assignments should be tailored to support the objectives and protect High Value Resources (HVR's). Be mindful of mobilization timelines for out of area resources.
- Continue coordination with Resource Advisors (READ's). This may require coordination between Operations, Plans, Agency Administrators, and READS.
- Validate that GISS staffing will meet product requests. As demands increase consider additional GISS.

Finance

- If the number of resources increase to a level that local incident business personnel are not able to maintain the financial package, consider ordering a FSC3 and/or support to provide assistance to assigned personnel.
- If air resources are being used to monitor the fires costs should be included in the eISuite DB, and assessing the WFDSS cost estimate as the support continues.

Logistics

- Keep Camp Cloman in place or at least available, but relocate all resources to operate out of the current ICP. Recommend to consolidate the footprint of ICP to one main room. If total personnel are below 100, move to per-diem and lodging (for non-local personnel). Keep a LSC3, FACL, and GSUL (with driver) on hand to support current operations.
- If personnel numbers are between 100-150, consider a fully functional Logistics section and order a type 3 caterer and shower unit. Coordinate with LSC3 for camp support/functionality.
- If numbers go above 150, consider a CIMT, and a national caterer will be needed. Coordinate with operations for forward operating bases or spike camps as needed.

[Appendix C: Strategy Maps and Google Earth Files \(attached\)](#)