Plumtaw Fire Use of Potential Operational Delineations and Risk Management Assistance Products

The Plumtaw Fire was ignited May 17, 2022 on the San Juan National Forest, Pagosa Ranger District, by suspected human activities. It grew rapidly on its first day to more than 400 acres and continued growing for the next three days.

This was a very undesirable ignition due to: its cause, its location adjacent to a critical watershed and the water supply intake for the town of Pagosa Springs, Colorado, as well as an adjacent subdivision.

In addition, like much of the southwest, this area is in a prolonged drought. Fire danger metrics were nearing all-time highs. There was a very high potential for the Plumtaw Fire to be a long-duration incident.

A heavy Initial Attack (IA) response was assigned, including multiple large air tankers, type one helicopters, and numerous ground resources, including dozers, crews, and engines. The fire ignited within a pre-identified Potential Operational Delineation (POD) developed by staff and cooperators on and adjacent to the San Juan National Forest in 2019. (PODs are fire management and planning units whose boundaries are defined by potential control features—such as roads and natural barriers—within which fire risk to values can be quantified and summarized.)

Both the incoming Type 3 Incident Commander (ICT3) and the Type 3 Operations Section Chief (OPS3) went to the fire on the evening of May 17 to interface with the ICT4 and his Operations Chief. While IA response was heavy, fire activity still outpaced the ability of resources to contain it with direct tactics. When they arrived, work was heavily focused on the fire’s heel, establishing an anchor, and scouting for continued direct attack options.
Through the understanding of the locally developed PODs, incoming overhead developed a plan that was developed to bring fire from the head down to the POD boundary at night to establish a more secure anchor and limit the threat the next day of fire spotting across the Fourmile Creek Road, which forms the eastern boundary of the POD in question.

Those on scene took advantage of the conditions as night fell. With substantially lower winds, they believed that this plan presented the best opportunity for success in the coming days.

Additionally, a roadside fuel break was completed along the POD line in 2021 which greatly aided in firing and increased comfort with the firing operation. A local Long Term Fire Analyst (LTAN) worked to get a new Potential Control Line (PCL) for 2022 posted to enable the IMT3 to begin to plan farther out, if needed.

The LTAN then developed incident-specific fire behavior models which were overlaid with the PCL to identify future containment opportunities.

No good options existed until Highway 160, about 10 miles east in a POD that would result in a long-duration incident with exceptional smoke impacts to the town of Pagosa Springs—until the monsoonal onset which, in that area, would have been at least 45 days distant.

Figure 3 – Active fire behavior during backfiring operations the night of May 17.

Figure 4 – Fire slowing/stopping event file of the area around the Plumtaw Fire, indicative of sustained monsoonal moisture. Odds begin increasing in early-July, which was a little over 50 days from the ignition of the Plumtaw Fire, indicating that if suppression actions failed the likelihood for a long-duration incident was high when viewed side by side with current indices.

Star indicates the Plumtaw Fire ignition date.
Figure 5 – The Risk Management Assistance (RMA) Dashboard was used early in the incident to evaluate POD lines against Potential Control Location Likelihood. While the western portion of the POD is highlighted within a relatively high area of the Potential Control Line (PCL), the northern perimeter was located in a low likelihood area. This information was used to inform tactics on the northern perimeter, including extending with direct lines from the heel (west) to the head (east). Few areas of high potential control exist within the adjacent POD to the east, illustrating the priority placed along the Fourmile Road.

POD lines are in black; PCL legend shown; purple circles are Housing Unit Density.

The completed firing operation provided a solid anchor point to begin working back toward the heel and allow further scouting at the most critical point of the fire. The burnout resulted in a few spot fires which were detected and suppressed the next morning, none of which was larger than one-tenth of an acre. Despite an expressed intent to field resources to continue to use the POD edge as the containment feature, not everyone fully understood what tactics fit with the overall strategy.

On Division D a combination of handline and dozer line was used to complete control features rather than the existing POD edge. There was nothing unsafe about this operation. It met the intent to keep fire within the POD—it just wasn’t in line with the strategic risk management effort of sticking to pre-identified features for control.

This did provide an opportunity to have in-depth conversations with the DIVS (who are typically Task Force Leader [TFLD] on Type 3 incidents) about the value of using pre-existing and pre-identified features to suppress fire. The ICT3 and OPS3 were able to use this example and others as teachable moments to discuss concepts such as opportunity costs, risk management at multiple levels, and the value of analytics in initial and extended response.

The Plumtaw Fire transitioned to a Complex Incident Management Team (CIMT) the morning of May 20. The team was briefed to the local PODs and the difficulty of fire establishing in the adjacent POD. They expanded this POD network at the incident scale to the east, working with Strategic Operations and Strategic Risk Assessment coaches.

The CIMT built upon the work of the IMT3 to improve their odds of protecting critical values at risk adjacent to the POD, including a small subdivision and a critical watershed and water supply intake to the town of Pagosa Springs.
Figure 6 – Plumtaw Fire Progression and Operations Overview through May 19 during IMT3. Many areas of the POD (purple dashed line) were coincident with projected high Potential Control Line (PCL), further improved by the completion of a fuel break along Fourmile Road in 2021 (crosshatched black). The northern boundary of the POD was not viewed as favorable by operations personnel, necessitating construction of control lines to the north off of POD boundaries but along more favorable terrain. Fire progression between May 17-18 on the fire’s far eastern perimeter was the result of burnout operations to anchor the head of the fire to the POD boundary on Fourmile Road. Retardant usage was prioritized on the northern perimeter where few viable control opportunities existed outside of direct tactics.

The PODs concept is still new to some resources, and framing intent around this idea had its challenges, but was well worth the investment spent before the fire as well as during incident management. Speaking to PODs at cooperators’ meetings allowed the ICT3 to rapidly establish strategic direction to a diverse group of stakeholders and rapidly create buy-in to this strategy.

The Public Information Officers were able to develop messages around how resources were suppressing the fire rapidly with little input needed by the IC. In addition, the public can quickly grasp the intent of the suppression response when framed around PODs located at the areas of highest potential control likelihood. On transition to CIMT2, cooperator and public relationships were robust. This is likely a direct outcome of the IMT3’s use of PODs during initial and extended response to the Plumtaw Fire.

This outcome was a combination of preparedness and luck. While we acknowledge the role of luck, we also work to improve the odds of achieving incident objectives by investing in pre-planned tools such as PODs. We have witnessed their value at all levels of incident response.
Lesson

Use PODs to Create an Easily Accessible Common Operating Picture

PODs and tools on the Risk Management Assistance Dashboard can improve response strategies and cooperative relationships by providing a common operating picture at the strategic level that is easily interpretable and shareable.

The Plumtaw Fire can now demonstrate the value of application of these tools and concepts at the incident level so that they can be further adopted by the field.

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