COLORADO FOREST RESTORATION INSTITUTE
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USDA

Validating and improving Potential Operational Delineation (POD) boundaries during wildfire:

Linking fire and fuels planning to incident response

Overview

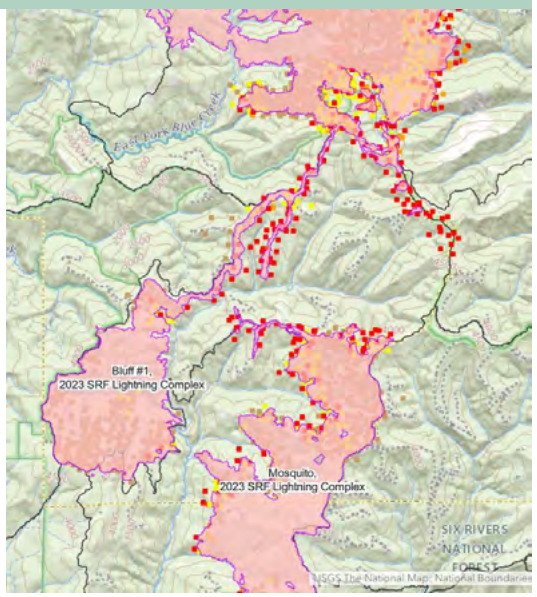
While responding to wildfires, Incident Management Teams (IMTs) often improve existing primary and contingency containment lines. IMTs allocate resources to evaluate whether existing control lines are suitable, determine necessity of increasing control probability under current and expected fire weather, and, if needed, improve lines using hand, mechanical, and burnout operations. This process should be consistent with incident strategy and objectives. Validating and improving lines during wildfires provides a critical opportunity to incorporate Potential Operational Delineations (PODs) into incident strategy, and better link pre-season spatial fire planning, wildfire mitigation, and fire response. PODs are a collaborative, strategic fire planning framework (Stratton 2020) used to pre-identify the most effective control lines to potentially contain a fire. Thus, PODs are useful for identifying where containment lines need improvement, including suitable, strategically-placed fuelbreak locations. Planning to validate and improve lines with PODs can improve response safety and effectiveness and support expansion of proactive fire to reduce future fire risk, promote resilient ecosystems, and protect people and property (Thompson 2023).

Indirect line preparation and improvement. a) roadside brushing and chipping; b) roadside brushing and chipping; c) retardant application; d) burnout (Source: Thompson et al. 2020).

The **Potential Operational Delineations** (PODs) spatial fire planning framework brings together firefighters' local knowledge and analytical products developed and maintained by the USDA Forest Service Fire and Aviation Management Strategic Analytics Branch and Rocky Mountain Research Station (RMRS) to empower pre-planning for future fires. Before smoke is in the air, agency partners and cooperators collaboratively identify and document the most effective potential control lines (PCLs) on the landscape, where there is a high likelihood of containing wildfires (e.g., roads, rivers, ridges, etc.). The development and deployment of PODs is a mutual effort between the Colorado Forest Restoration Institute, Oregon State University and the USDA Forest Service Fire and Aviation Management, Strategic Analytics Branch, the Rocky Mountain Research Station (RMRS), and the Washington Office, Enterprise Program.

Key benefits

- The construction and improvement of primary and contingency containment lines is resource intensive. IMTs have the ability to order a large number of state and national resources normally unavailable to the local unit. It is important that these firefighting containment efforts consider and supplement the current and planned PODs network and fuel treatments.
- Improving POD boundaries can support safe and effective response by facilitating the use of burnout operations and enhance visibility and access.
- PODs are developed in the pre-season and represent fire managers' local knowledge and expertise of local fire behavior, fire effects on values and resources of local concern, and suitable containment features. When PODs are collaboratively developed and socialized, existing POD lines can be improved while IMTs may avoid building line in places that could negatively impact locally-important watersheds, cultural values, sensitive species, or habitat.



Several fires in the 2023 SRF Lightning Complex where managers prepped POD boundaries and initiated burnout operations under moderate conditions (Source: RMA Dashboard).

The process

Before the fire

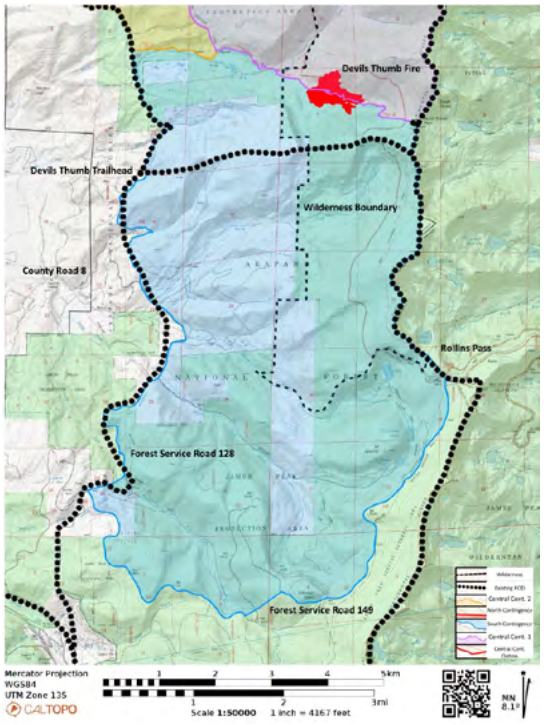
- Forests should collaboratively develop and socialize PODs in the pre-season with fire and fuels staff, forest leadership, resource specialists, partners, and the public. This can build mutual understanding of where fire may be engaged (or where not), and support consideration of community and resource values and risks.
- PODs represent potential opportunities for control. Holding potential varies as a function of the line type (e.g., road, ridge,

trail), condition (e.g., treatment history, treatment depth), location, current and expected fire weather, and resource capacity. Before smoke is in the air, forests should consider ground-truthing and attributing their POD network to document control line type, condition, and other characteristics that help demarcate the amount and type of improvements needed, if any, for the line to be effective (See an example from the Ashley National Forest here - Aldworth and Caggiano 2023). In addition, forests may benefit from including completed (and their age and size), approved, and planned treatments along POD lines and within PODs to support mitigation actions and incident response (Greiner et al. 2023).

- Consistent with the 2009 Guidance for Implementation of Federal Wildland Fire Management Policy and applicable laws, pre-fire mitigation actions and response planning should be tiered to land and resource management and other project-specific planning processes, which require review under the National Environmental Policy Act and require, to varying degrees, public involvement.

During the fire

- During an incident, Agency Administrators may benefit from providing explicit direction in the Delegation of Authority and with the IMT to consider PODs as potential control lines and, if appropriate, incorporate PODs into the overarching response strategy. The Incident Strategic Alignment Process (ISAP) can facilitate these discussions.
- Providing IMTs with updated POD networks and treatment information can help speed up situational awareness, focus and direct IMT actions, and may help cultivate consistency through team transitions on long duration incidents.
- Still, primary and contingency lines will need to be inspected and ground verified by IMTs. While lines can initially be inspected using aerial imagery and other spatial datasets, field validating POD boundaries is essential to ascertain additional valuable information on the status of potential control lines, their viability for fire containment for planning purposes, what improvements would be operationally necessary to help facilitate fire containment, and the resources required to do so.



The Eastern Fraser Valley incident strategic report for the 2023 Devil's Thumb Fire on the Roosevelt National Forest identified POD boundaries and evaluated their utility for fire containment and the work needed to sufficiently improve control lines, as indicated here by this exemplar:

From Forest Trail 1495B to FR 149 (¾ mile): This is an established hiking trail that would cut off a large piece of severely mid slope road. The trail is underslung but with fuels and meadows it will provide easy prep and safety zones. Work required should be snagging and removing dead and down. 2 crews, 1 shift (Credit: Columbine and Pilot Peak Wildland Fire Modules).

After the Fire

- Control line improvements and fuel treatments undertaken in support of fire containment during the incident should be documented and submitted to the appropriate reporting systems (e.g., the Forest Activity Tracking System (FACTS), National Fire Plan Operations and Reporting System (NFPORS), National Interagency Fire Center (NIFC) event lines, or other intra- or inter-agency treatment databases).
- It can be costly to mitigate and rehabilitate impacts from built line. Managers could reduce rehabilitation costs by improving existing POD line networks where the desired condition for the line aligns with incident objectives. If maintained, such features may provide anchor points to facilitate future proactive fire and wildfire containment. Thus, actions during fire can de-risk future fire management response.
- After the fire season, forests may wish to revisit POD boundaries and make adjustments as needed. Recently burned areas, improved contingency lines, and new fuel treatments may all sufficiently change the landscape in a way that affects future suppression opportunities and warrants changes to the POD network.

Conclusion

During incidents, IMTs improve primary and contingency lines. Integrating locally-vetted PODs into line improvement considerations can better link wildfire mitigation and response. IMTs bring resources to help improve PODs, which can support safe and effective response during incidents and promote future proactive fire management while preserving local unit capacity. Before smoke is in the air, local units should collaboratively develop and socialize PODs. Pre-season wildfire mitigation actions and response planning informed by PODs should be tiered and adhere to relevant laws and guidance. During fire, local fire managers should share spatial data with incoming IMTs that includes the type and condition of POD lines, planned and completed treatments, and treatment needs. Agency Administrators can convey clear leadership direction to use or consider PODs in the Delegation of Authority. After the fire, managers should document treatment accomplishments in appropriate reporting systems, and if needed, revisit and refine POD lines to increase readiness to receive future fire.

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