How Potential fire Operational Delineations (PODs) might increase wildfire use for resource benefit in your watershed

Ben Gannon
Spatial Analyst, Colorado Forest Restoration Institute
PhD Candidate, Department of Forest and Rangeland Stewardship

COLORADO FOREST
RESTORATION INSTITUTE

WARNER COLLEGE
OF NATURAL RESOURCES
COLORADO STATE UNIVERSITY

Spatial fire planning

Most fire management decisions are made under intense time constraints with imperfect understanding of potential fire behavior, effects, and control opportunities.

Spatial fire planning focuses on pre-fire analysis to develop response strategies that are appropriate for the location and fire conditions considering:

- Land and resource management objectives
- Potential fire control locations and their probability of containment success and firefighting hazards
- Potential fire behavior and effects

Scott *et al.* 2013; O'Connor *et al.* 2016; Thompson *et al.* 2016; Dunn *et al.* 2017

Default response strategy:

- aggressive suppression

Variable response strategies:

- Exclude
- Protect
- Maintain
- Restore

PODs

Potential fire Operational Delineations (PODs) is an emerging spatial fire planning framework that focuses on assigning variable response strategies to “operationally relevant” fire management units.

PODs are:

- Operationally relevant because fire managers delineate them with existing fire control features
- An approximation of “box and burn” tactics widely used to contain wildfires
- Informed by models of suppression difficulty (Rodríguez y Silva *et al.* 2014) and containment likelihood (O’Connor *et al.* 2017)

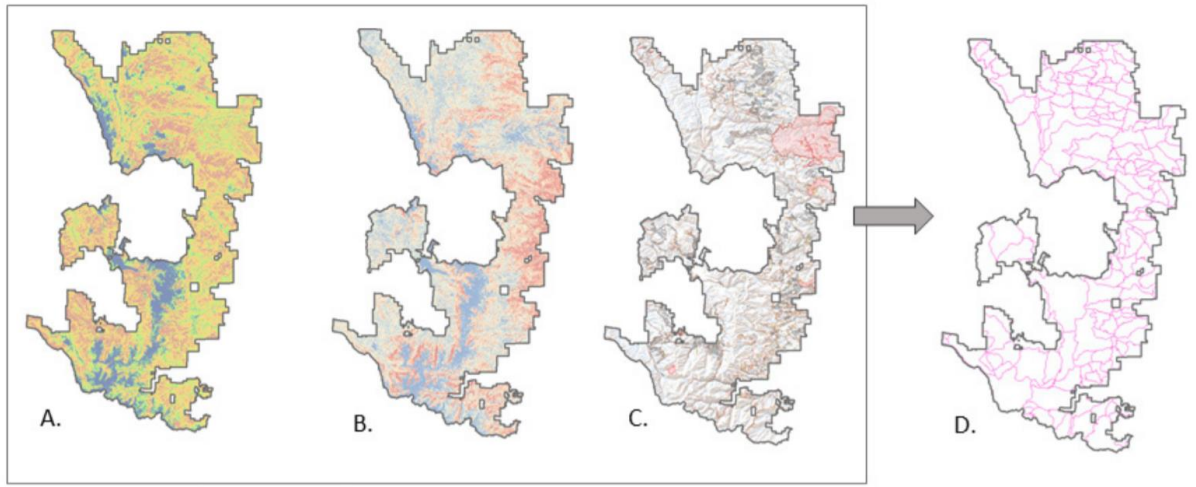


Figure 4. Workshop participants use maps with Suppression Difficulty Index (A), Potential Control Locations (B), and reference layers (C) to hand draw lines (Figure 3) identifying effective control lines across the landscape. Hand drawn POD boundary lines are then digitized into an electronic format using Geographic Information Systems (D).

Caggiano 2019

PODs facilitate pre-fire analysis and strategy development

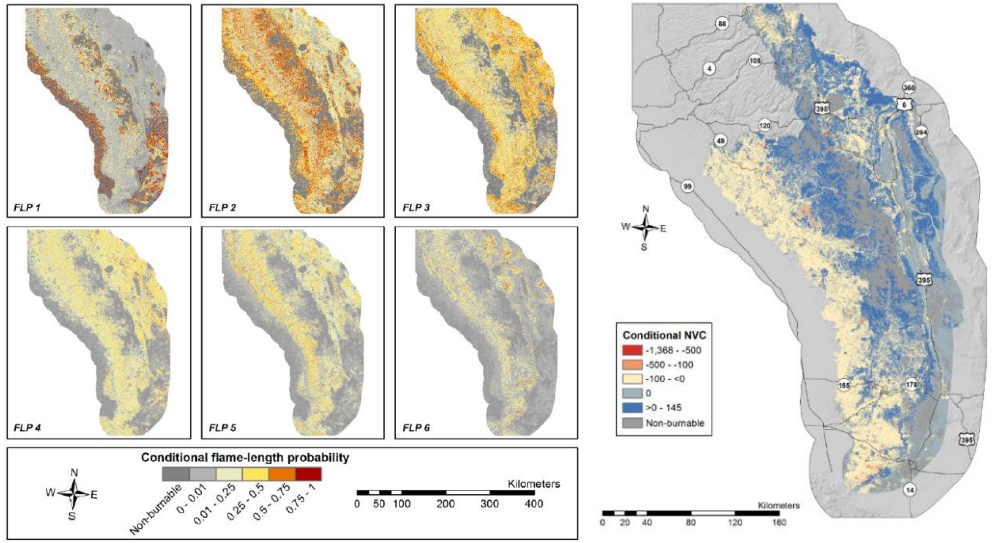
Delineating PODs before a fire allows time for analysis of potential fire behavior and effects to understand where and under what weather conditions fire can achieve land and resource management objectives.

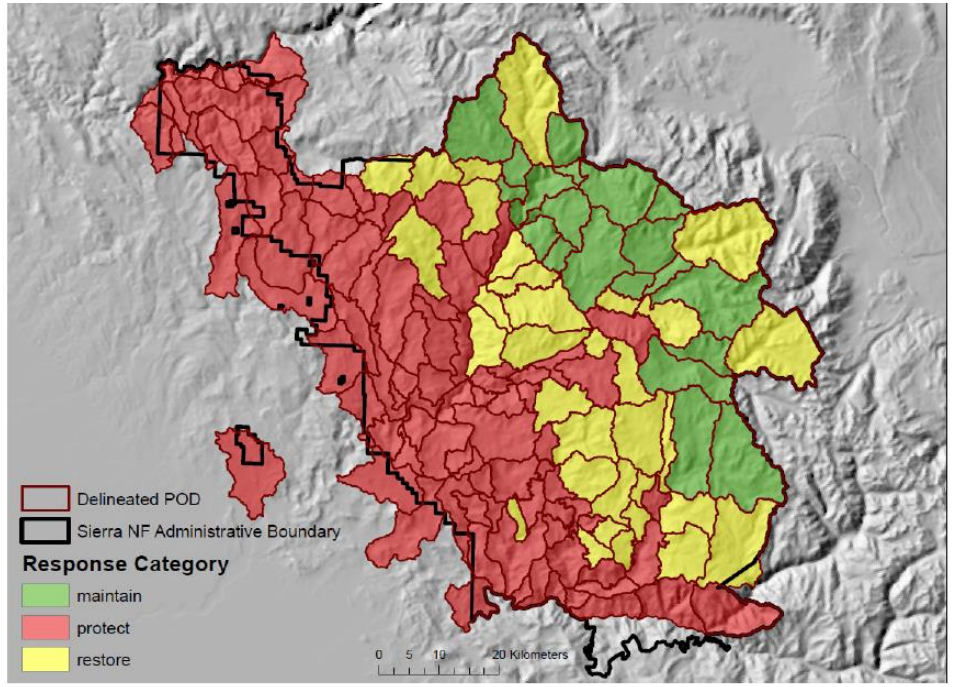
This may include:

- Fire behavior modeling
- Fire exposure analysis
- Fire effects assessment

Strategic responses:

- Focus on land and resource management objectives
- Are not tactical prescriptions (e.g. direct attack, perimeter control, point protection)

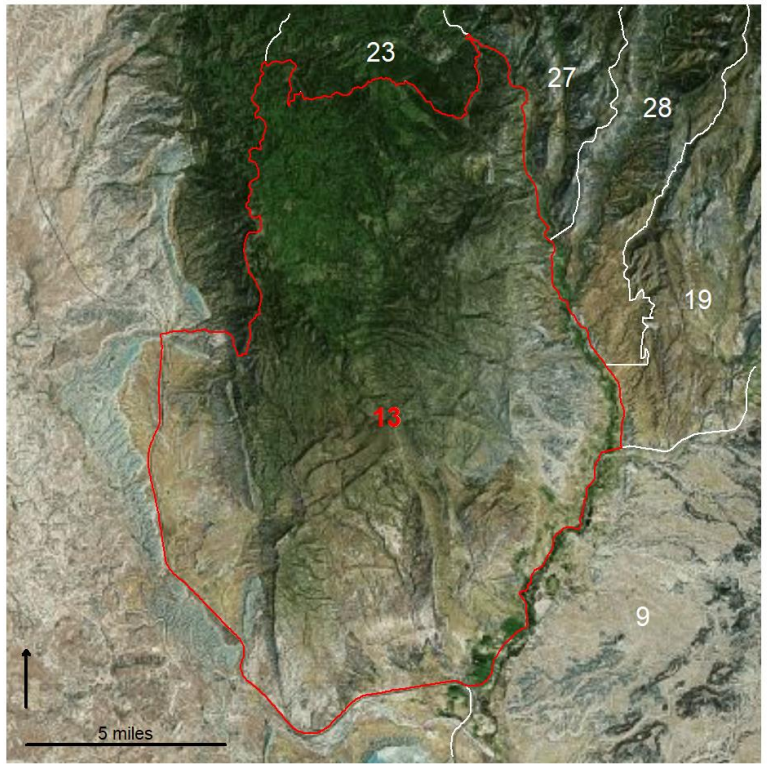




Thompson *et al.* 2016

PODs facilitate pre-fire analysis and strategy development

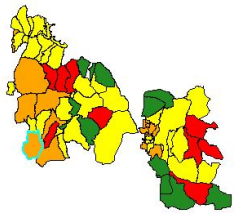
POD 13



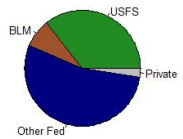
Strategic response:

High complexity

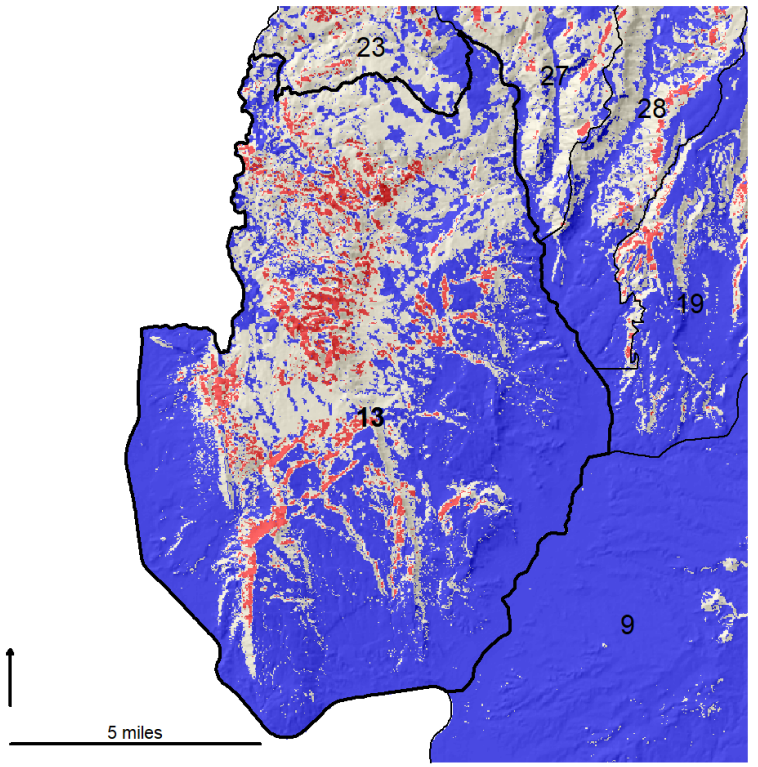
- Protect
- Restore
- Maintain
- High complexity

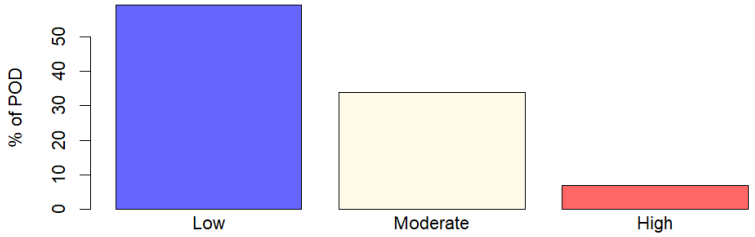


Land ownership:

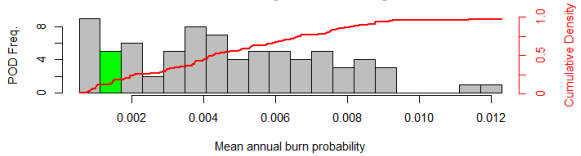


POD 13 Suppression Difficulty Index



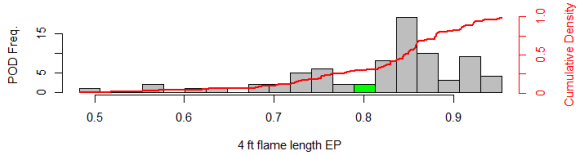


Mean annual burn probability = 0.0015



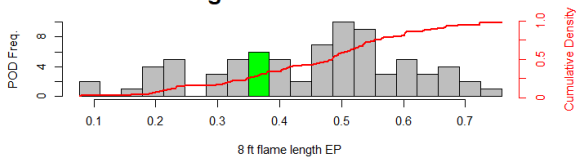
18 Percentile

4 ft flame length EP = 0.803



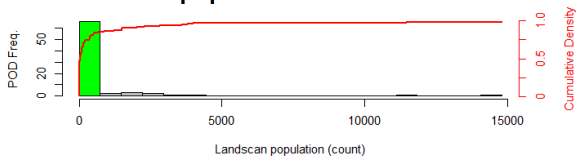
31 Percentile

8 ft flame length EP = 0.370



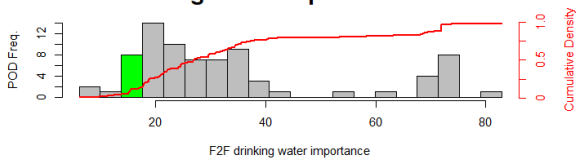
31 Percentile

Landscan population = 193



72 Percentile

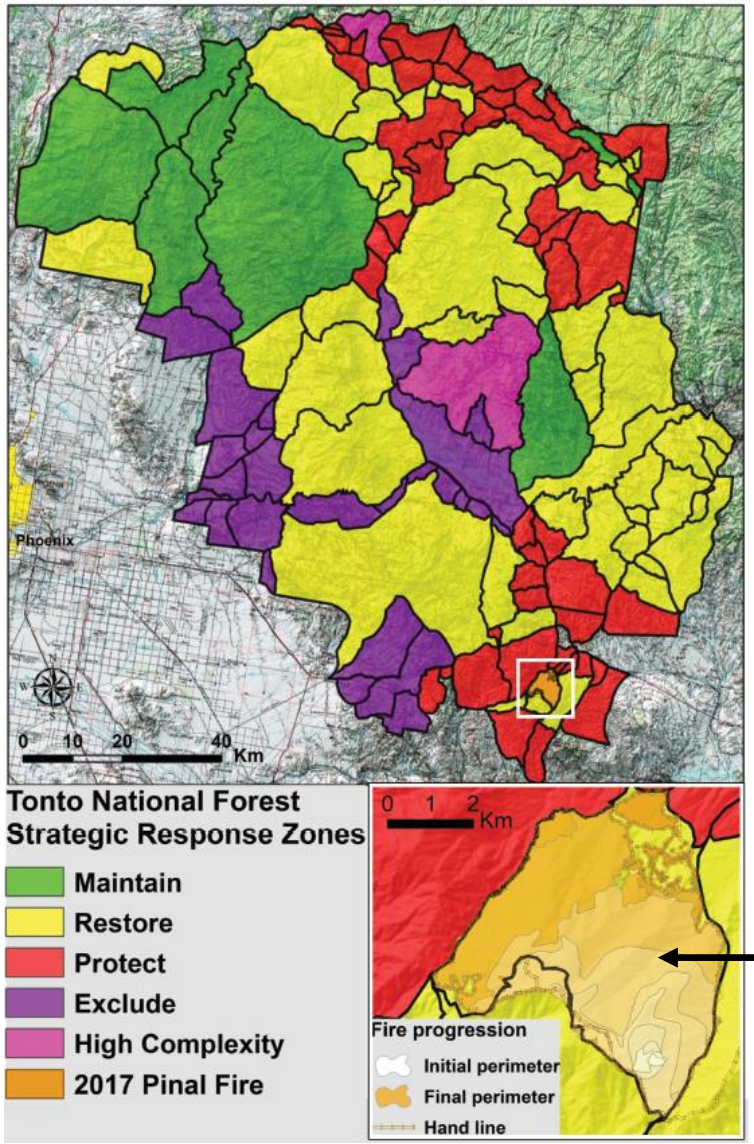
F2F drinking water importance = 16.9



13 Percentile

PODs in use

Tonto National Forest

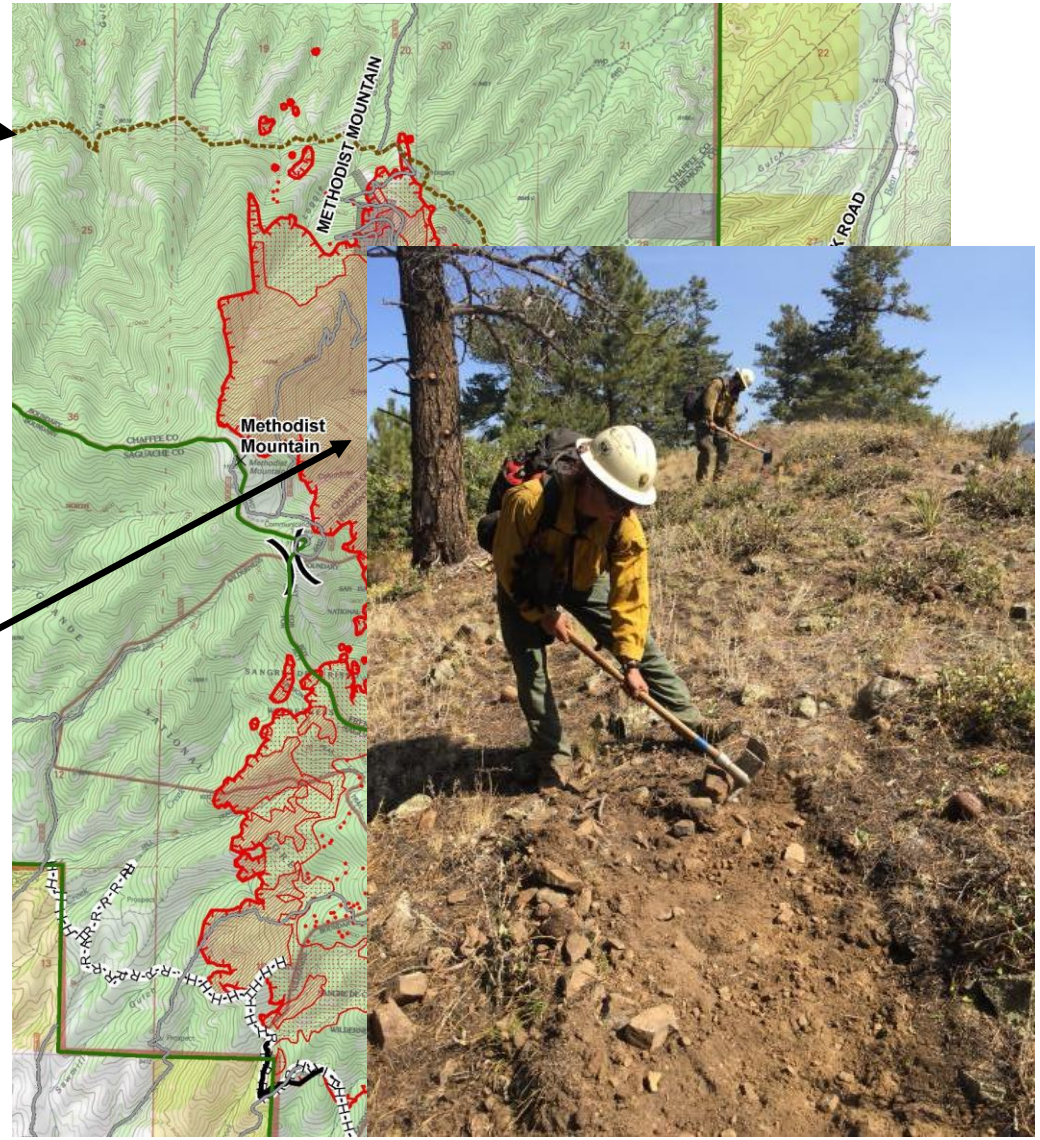


Pinal Fire
2017

Thompson *et al.* 2018

Pike and San Isabel National Forests

Rainbow Trail
is POD edge



Decker Fire
October 1st

Inciweb 2019

Watershed implications

We expect more small-to-medium fires burning during moderate weather.

Arapaho-Roosevelt NF POD sizes:
Median: 7,400 acres
Mean: 10,000 acres

Managing wildfire at this scale could greatly accelerate the pace of forest restoration.

How much short-term risk should be accepted in pursuit of this goal?

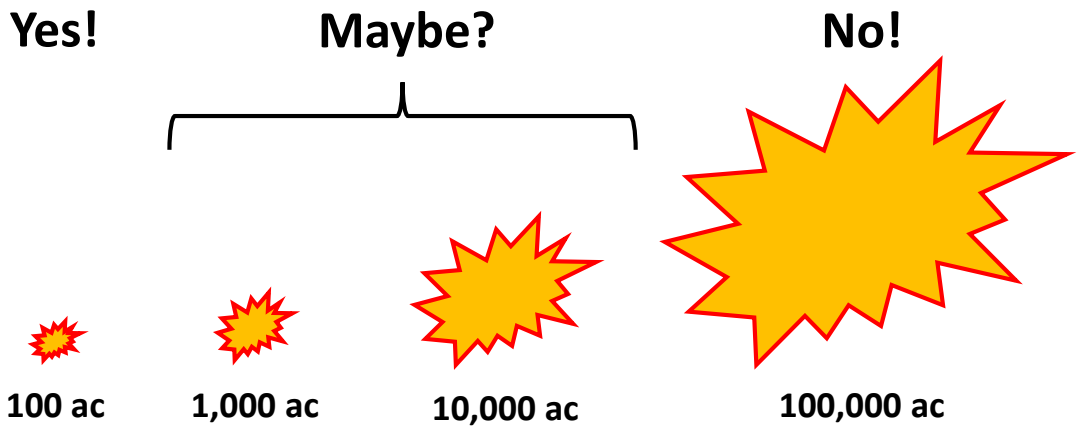
Short-term risk from fire

Long-term risk reduction from future fires

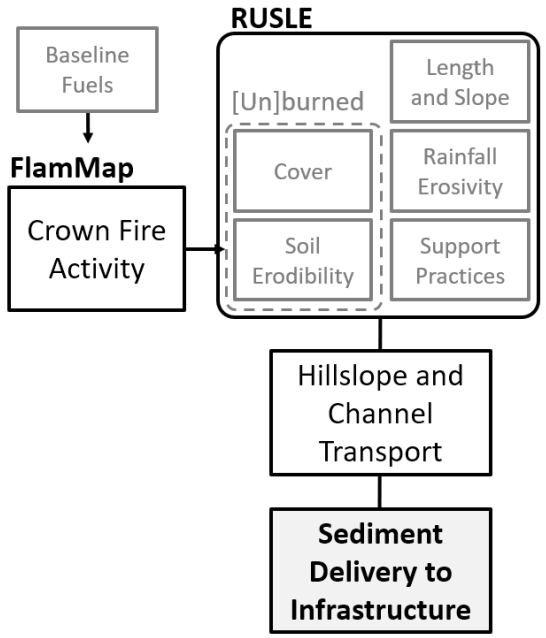
Strontia Springs, 2011
(Denver Water)

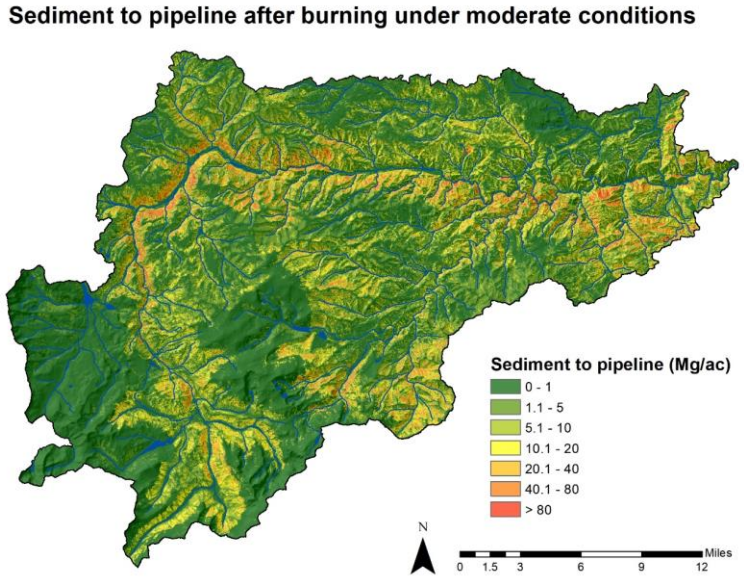
Pine Valley Pipeline, 2012
(Colorado Springs Independent)

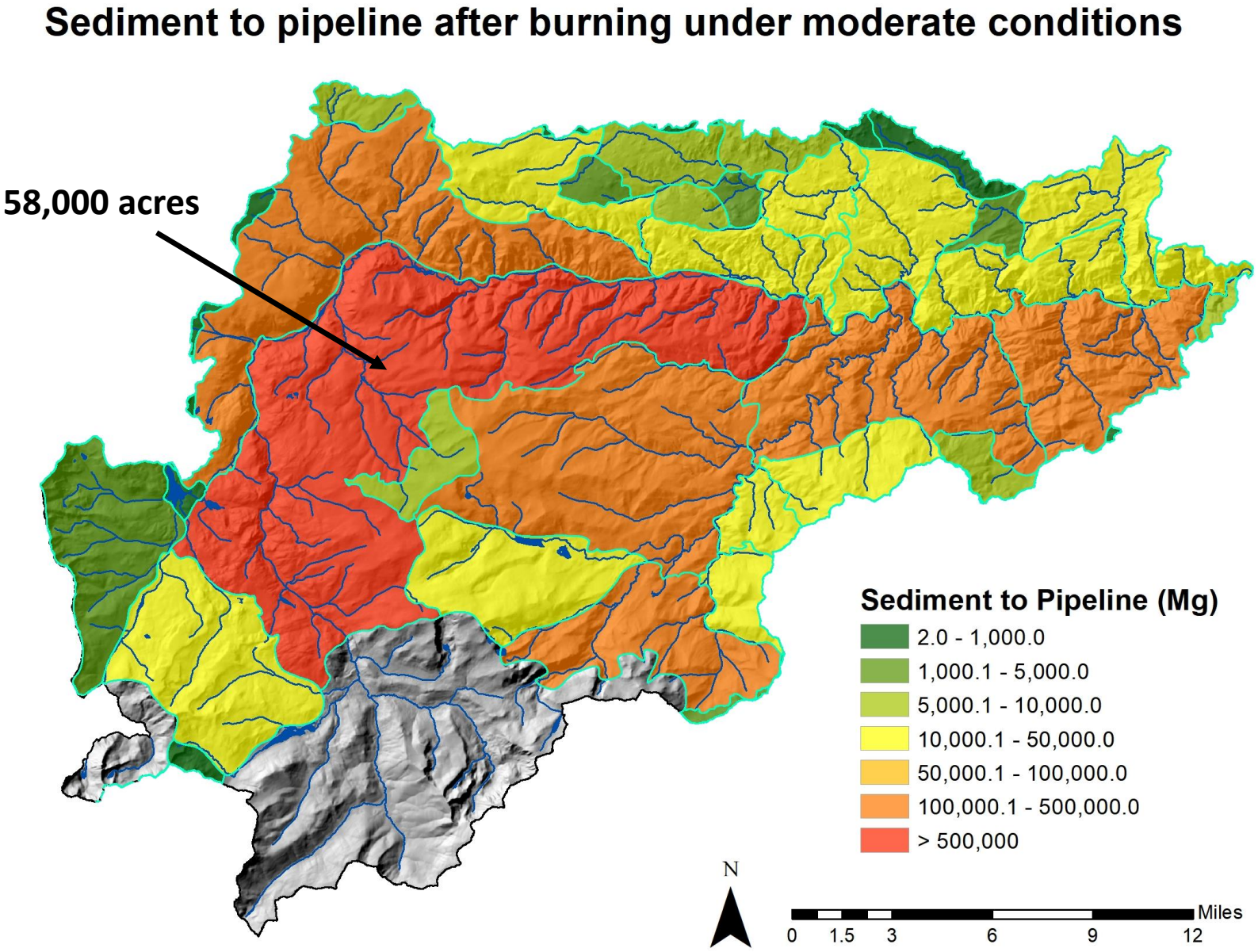
Cache la Poudre River, 2012
(Oropeza and Heath 2013)



Watershed implications

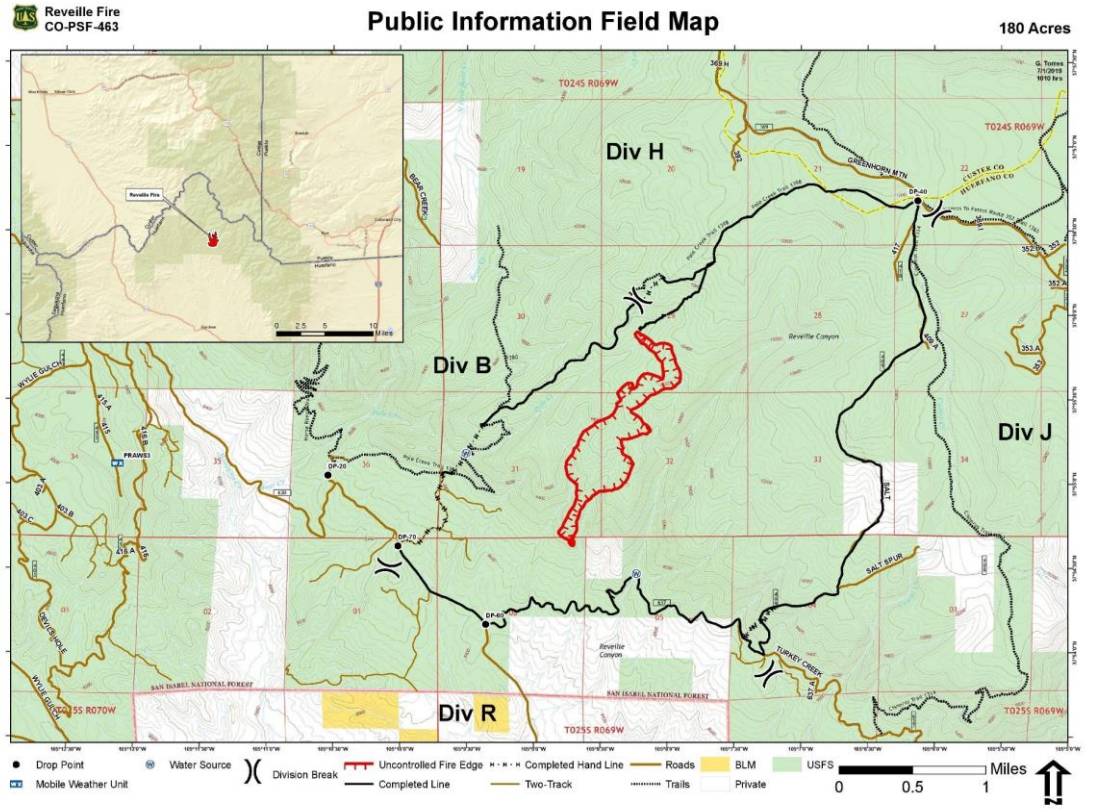






Summary

- The PODs spatial fire planning framework has been rolled out on several national forests in Colorado and adjacent states.
- It may accelerate the pace and scale of forest restoration with managed wildfire.
- PODs are a meaningful spatial unit to analyze wildfire impacts to watershed resources.
- Pre-fire POD analyses can increase fire manager awareness of fire effects to a range of resources including watersheds to make better informed decisions.



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Ben Gannon
Colorado Forest Restoration Institute
Benjamin.Gannon@colostate.edu
https://cfri.colostate.edu/