

TECHNICAL SPECIALIST'S REPORT – BURNED AREA EMERGENCY RESPONSE

Resource: Trails and Recreation Facilities
Fire Name: Waldo Canyon **Month/Year:** 7/2012
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I. Potential Values at Risk

Potential values at risk identified and addressed in this report include: Forest Service system trails and recreation facilities. Risks include threat to life and safety of BAER implementation team and threat to trail and facility infrastructure.

II. Resource Condition Assessment

A. Resource Setting

Note: Trail and recreation site assessment noted that the fire has created numerous hazard trees creating potential threat to life and safety. This risk will be addressed in a separate specialist report.

Trails: There are two system trails impacted by burned area:

- Rampart Reservoir Trail (Trail 700)
- Waldo Canyon Trail (Trail 640)

Rampart Reservoir Trail is a popular multi-use recreation trail on the shoreline of Rampart Reservoir. Total trail length is 11 miles with 2 segments, totaling approximately 1.25 miles, on the south shore impacted by burned area. The 3000 lineal feet of burned slope above the trail will increase runoff and sediment transport across the trail. There are four defined drainage channels that cross the impacted segments of trail that will exhibit increased flows and sediment transport post burn.

The Waldo Canyon trail is a high use trail 6.5 miles in length, starting at Highway 24 north of Manitou Springs. The trail traverses private property for approximately 0.7 miles above Highway 24 then enters USFS property and the Waldo Canyon drainage. At 1.5 miles the trail splits north into Waldo Canyon and east toward Williams Canyon with the two segments connecting at the ridge line between the two drainages, creating a 3.5 mile loop. The first 1.5 miles of trail from Highway 24 has small pockets that are impacted by burned area that will see increased runoff from burned slopes. The east part of the loop, towards Williams Canyon, crosses steep burned slopes that will impact the trail, but is high in the canyon so avoids major drainage crossings. The westerly segment of the loop follows the Waldo Canyon drainage and crosses the active channel numerous times before ascending east to the ridgeline between Waldo Canyon and Williams Canyon. The Waldo Canyon drainage is significantly impacted by the burn with no ground cover or live vegetation remaining. We observed that the channel has already experienced ash and sediment flows that have crossed the trail and caused damage. The entire section of trail in Waldo Canyon will see significantly increased runoff and sediment, with the drainage crossings seeing severe impact from increased runoff and sediment laden flows. We also observed two sections of the trail where wooden stair structures have been burned leaving the trail in a potentially unsafe condition.

Recreation Facilities: Recreation facilities impacted by burned area include:

- South Rampart Shooting Range (temporary closure implemented pre-fire)
- Thunder Ridge Campground
- Meadow Ridge Campground
- Promontory Picnic Area

- Aspen Grove Interpretive Trail

South Rampart Shooting Range is located along Rampart Range Road (Section 20, Township 13S, Range 67W). There are large areas of fired shells on a hillside within a burned drainage. We anticipate increased runoff and sediment flows across this hillside, coupled with the deterioration of the shells caused by the burn, may accelerate transportation of contaminants.

Thunder Ridge Campground, Meadow Ridge Campground and Promontory Picnic Area are developed sites located above the south shore of Rampart Reservoir and are within the burned area. The structures at these sites are not damaged, the prime concern at these facilities are hazard trees resulting from the fire that are a threat to facilities and life/safety and proximity to burned areas.

Aspen Grove Interpretive Site is located in the vicinity of the campground and picnic area on the south side of Rampart Reservoir. The structures within this site are damaged by the burn are unsafe. These should be removed to eliminate safety concerns as closure to this busy area may not be effective.

B. Findings of the On-The-Ground Survey

1. Resource condition resulting from the fire:
 - a. Numerous hazard trees were observed along the impacted trails and at recreation facilities.
 - b. Burned slopes and drainages impact approximately 1.25 miles of Rampart Reservoir trail and approximately 4.0 miles of Waldo Canyon trail. Ash laden sediment flows were observed crossing the trail in the Waldo Canyon segment.
 - c. The larger drainages in Waldo Canyon may also pose a life/safety hazard due to potential for flash flooding off burned areas.
 - d. Burned structures at Aspen Grove Interpretive site are in an unsafe condition.
 - e. Burned areas were observed at the shooting range.
2. Consequences of the fire on values at risk

The Values at Risk for trails and recreation sites subject to increased number of hazard trees and increased runoff and sediment flows are:

- a. Threat to life and safety
- b. Threat to infrastructure

The following conditions describe in detail the consequences of the fire on Values at Risk:

- a. There is an immediate risk of hazard trees adjacent to trails and recreation sites posing life and safety threat to BAER implementation members and other personnel working on or around trails and sites.
- b. Burned slopes above trails pose a risk to trail infrastructure due to potentially high runoff and sediment and ash laden flows. These flows will erode the trail bed and adjacent side slopes.
- c. Burned drainages pose a risk to trail infrastructure due to increased flows and sediment and ash transport. In the larger Waldo Canyon drainages these flows may pose a risk to life and safety due to potential for flash floods, sediment and ash laden flows, at trail crossings. These flows will likely result in failure of trail infrastructure at the drainage crossings and at trail segments adjacent to the drainage channel.
- d. Burned infrastructure has compromised structural integrity posing a threat to safety.
- e. Burned slopes and drainage pose a risk of increased contaminant transport at the shooting range; this is considered a life/safety risk.

III. Emergency Determination

The BAER team has concluded these risks pose an emergency due to:

- Risk to life and safety
- Risk to infrastructure

IV. Treatments to Mitigate the Emergency

A. Treatment Type:

Treatment Objectives: Minimize risk to life and risk of damage to trail and recreation site infrastructure in the burn area through removal of hazards and placement and maintenance of effective erosion and water control measures (stormproofing). These treatments are primarily designed to prevent the uncontrolled channeling and resultant damage to trails, to reduce erosion and further watershed degradation by control of run-off within the trail prism, and to mitigate safety concerns at the recreational sites. Controls are also proposed to mitigate sediment transport at the shooting range to minimize movement of contaminants downgradient.

Trail Treatments Description: An emergency determination was made that the following BAER treatments are required on segments of Rampart Reservoir and Waldo Canyon trails in the Waldo Canyon Fire burned area to protect infrastructure and reduce life/safety hazards:

- Warning Signs
- Temporary trail closure
- Repair of burned trail infrastructure to prevent failure.
- Trail stabilization with Rolling Dips, Lead Out ditches and Rock Waterbars
- Treatment of Hazard Trees
- Erosion controls on long steep side slopes above the trails, log erosion barriers (LEBs) with addition of wattles where there is channelized drainage from the slope onto the trail.
- Stabilization of severely burned drainage channels that cross the trail using rock check dams with native rocks up and down gradient of channel crossings.
- Armored low water crossings.
- Storm Inspection and Response

Recreation Sites Treatment Descriptions: An emergency determination was made that the following BAER treatments are required for recreational site treatments in the Waldo Canyon Fire burned area to protect infrastructure and reduce life/safety hazards:

- Warning Signs
- Removal of burned infrastructure
- Treatment of Hazard Trees
- Containment berm with riser pipe outlet at down-gradient extent of highest contaminant area, blockage of run-off at concentrated shooting areas, in-channel rock check structures and land (slope) treatment using wattles to trap sediment and reduce off site transport of containments.
- Storm Inspection and Response

IV. Discussion/Summary/Recommendations

In summary, the prescribed treatments for trails and recreation sites are designed to help preserve life, safety and infrastructure. Trail treatments are designed to minimize damage caused by hazard trees, increased runoff and sediment transport across steep slopes, and erosion from drainage channels in correlation with burn

areas. Installation of the prescribed trail treatment will mitigate potential risk and further trail damage. Additional controls are proposed at the shooting range to control contaminants. The risk assessment for trails and recreational sites showed a likely probability of damage with moderate consequences resulting in a high risk, with a very high risk for areas with life/safety threats.

References:

Burned Area Emergency Response Treatments Catalog

Chapter 2 – Land Treatments

Chapter 3 – Channel Treatments

Chapter 4 – Road and Trail Treatments

Chapter 5 – Protection and Safety Treatments

Forest Service Handbook

FSH 2309.18 – Trails Management Handbook

FSH 2509.13 – Burned Area Emergency Rehabilitation Handbook

Consulted Forest Service Technical Specialists

David Young, BAER Soil Scientist

V. Appendices

1. File of referenced pictures

WALDO CANYON TRAIL



WALDO CANYON TRAIL- ACROSS BURNED SLOPES



DAMAGED INFRASTRUCTURE REPLACE TO PROTECT TRAIL



IMPACTED DRAINAGE WHICH CROSSES WALDOTRAIL



RECENT SEDIMENT FLOW ACROSS TRAIL



RECENT SEDIMENT FLOW ACROSS TRAIL



WALDO TRAIL FOLLOWS DRAINAGE

RAMPART RESERVOIR TRAIL



SEDIMENT FLOWS ACROSS TRAIL



BURNED AREA IMPACT TO TRAIL



SEDIMENT FLOW ACROSS TRAIL



SEDIMENT FLOW DOWN TRAIL



BURNED AREA IMPACT TO TRAIL



BURNED SLOPES ABOVE TRAIL