

*Medio Fire Burned Area Emergency Response (BAER)  
Executive Summary*



*Santa Fe National Forest, Española Ranger District.  
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## Fire Background

The lightning caused Medio Fire started August 17th, 2020 on the Española Ranger District approximately 1.5 miles from the Village of Rio en Medio. This natural ignition was started on the mid third of the slope above a drainage to the Rio Nambe. For several days, north winds pushed the fire to the southeast, until a Type 2 Incident Management Team (IMT) was able to turn it toward the west, using a recent prescribed burn as an anchor. For the next week, the team used indirect tactics to flank the western and northern edges of the fire, backfiring as much as possible to reduce fire intensity. Eventually the fire grew to a total of 4,010 acres. The landscape of the burn area consists of steep canyons that are orientated primarily east to west and drain off the western slopes of the Sangre de Cristo Mountains. The fire was managed with a full suppression strategy.

The fire area is located between 7,200 and 9,546 feet in elevation. The fire includes all aspects, however; the steep drainages running east to west have predominately north and south facing slopes. The south facing slopes are primarily ponderosa pine with some mixed conifer inclusion and the north facing slopes are primarily thick dry mixed conifer. Lower elevations transition into a piñon and juniper woodland.

## BAER Assessment

A BAER team was assembled on September 3<sup>rd</sup>, 2020 to identify critical values on National Forest Systems (NFS) lands and associated risk. BAER is an emergency program for stabilization work that involves time-critical activities that must be completed before the first damaging storm event to meet program objectives. The BAER team uses science-based models to rapidly evaluate and assess the burned area. Due to the COVID-19 pandemic USFS BAER teams were directed to focus initial assessments on human life and safety. A reassessment of the Medio Fire will occur late winter to early spring of 2021 with emphasis on reexamination of the preliminary burn severity, documenting site recovery, evaluating post snowmelt conditions, reviewing and updating the hydrology and soil analysis and a full evaluation of BAER critical values. If the reassessment demonstrates unacceptable risk to BAER critical values on NFS lands and treatments are warranted an interim request for funding will be submitted at that time.

BAER team assessments consist of rapid evaluations of post-fire conditions of the burned landscape to determine the level of risk from potential flooding and debris flow to values on NFS lands. Normally the team identifies 'Critical Values' such as human life and safety, infrastructure, and critical natural and cultural resources. However, as stated above the Medio BAER initial assessment focused efforts on human life and safety. The BAER assessment focuses on determining where post-fire precipitation events could increase runoff, flooding, erosion and sediment delivery. The Medio BAER team analyzed both satellite reflectance images and high-resolution aerial photography to produce a Preliminary Burn Severity map (Figure 1), which categorizes the burned area as High, Moderate, Low, and Unburned severity (Figure 2).

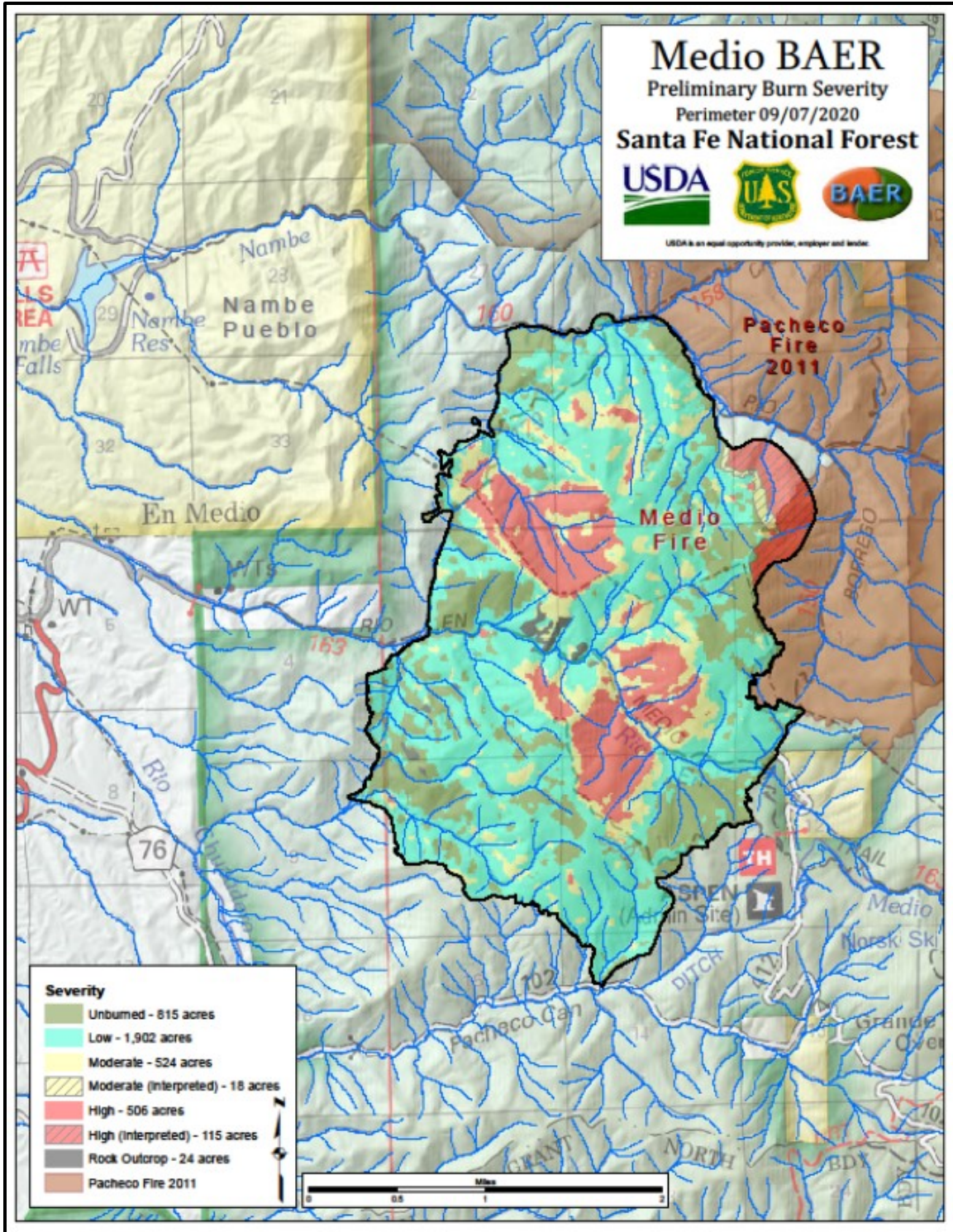


Figure 1. Medio Fire Preliminary Burn Severity.



**Figure 2. Example of a mosaic of high, moderate, and low burn severities.**

Fire-damaged soils are at higher risk for erosion and increased water runoff, and the preliminary burn severity map was used to document the degree to which ecosystem properties changed within the burned area. If unacceptable risks, as identified with the BAER Risk Assessment (Table 1) are determined to exist to critical values, these values become values at risk (VAR) and the team may recommend appropriate and proven effective emergency stabilization measures to reduce the risks to NFS values. Treatment actions must be evaluated based on: (1) the ability to be implemented in a timely manner, (2) effectiveness in reducing risk, (3) practical and technical feasibility, and (4) cost.

**Table 1: BAER Risk Assessment (Forest Service Manual 2520, 2523.1 – Exhibit 02)**

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	<b>RISK</b>		
Very Likely	<b>Very High</b>	<b>Very High</b>	<b>Low</b>
Likely	<b>Very High</b>	<b>High</b>	<b>Low</b>
Possible	<b>High</b>	<b>Intermediate</b>	<b>Low</b>
Unlikely	<b>Intermediate</b>	<b>Low</b>	<b>Very Low</b>

The Medio Fire BAER team consisted of scientists and specialists covering a variety of fields including soil science, hydrology, geographic information systems (GIS), invasive species, and recreation. These specialists worked together to assess the burned area, analyze data and model results, and present findings along with recommended proven, and effective emergency BAER treatments to the Forest Supervisor.

BAER assessment information is also shared with interagency cooperators who work with downstream private home and landowners to prepare for potential post-fire flooding and sediment flow impacts. Cooperators involved in the BAER process include the Bureau of Indian Affairs (BIA), Natural Resource Conservation Service (NRCS), United States Geological Survey (USGS), National Weather Service (NWS), state, local, and county entities. Communication with the Pueblos of Nambe and Tesuque occurred frequently. Information regarding the Medio Fire BAER Assessment can be found on InciWeb at <https://inciweb.nwcg.gov/incident/7133/>.

### **Analysis Overview**

The US Forest Service Geospatial Technology and Applications Center (GTAC) provided the BAER team with an initial burned area reflectance classification (BARC) map derived from satellite imagery that compares pre- and post-fire images. The team analyzed high resolution photography, photos and personal accounts from specialists on the ground to verify BARC data, assess threats to critical values and create a preliminary burn severity map.

### **Hydrology Report Summary**

The Medio Fire was divided into three main tributaries within the Pojoaque 5th code watershed (1302010112) (Figure 3). These three main tributaries (Rio Nambe, Rio en Medio and Rio Chupadero) were then further divided into catchments for the purposes of modeling flow increases (Figure 4). Predicting expected flow increases was accomplished using the Wildcat5 runoff prediction model and the NRCS equation for Estimation of Direct Runoff from Storm Rainfall. Vegetative ground cover, which is critical for maintaining soil stability, has been consumed in many areas where moderate and high severity wildfire has occurred. Burning of vegetation and litter cover, development of water repellent soils, and sealing of the soil surface from raindrop impact combine to result in increased runoff. Areas that exhibit low burn severity have retained most of the effective ground cover, including live vegetation, unburned litter, and partially burned litter. Where low severity wildfire has occurred, organic matter remains intact.

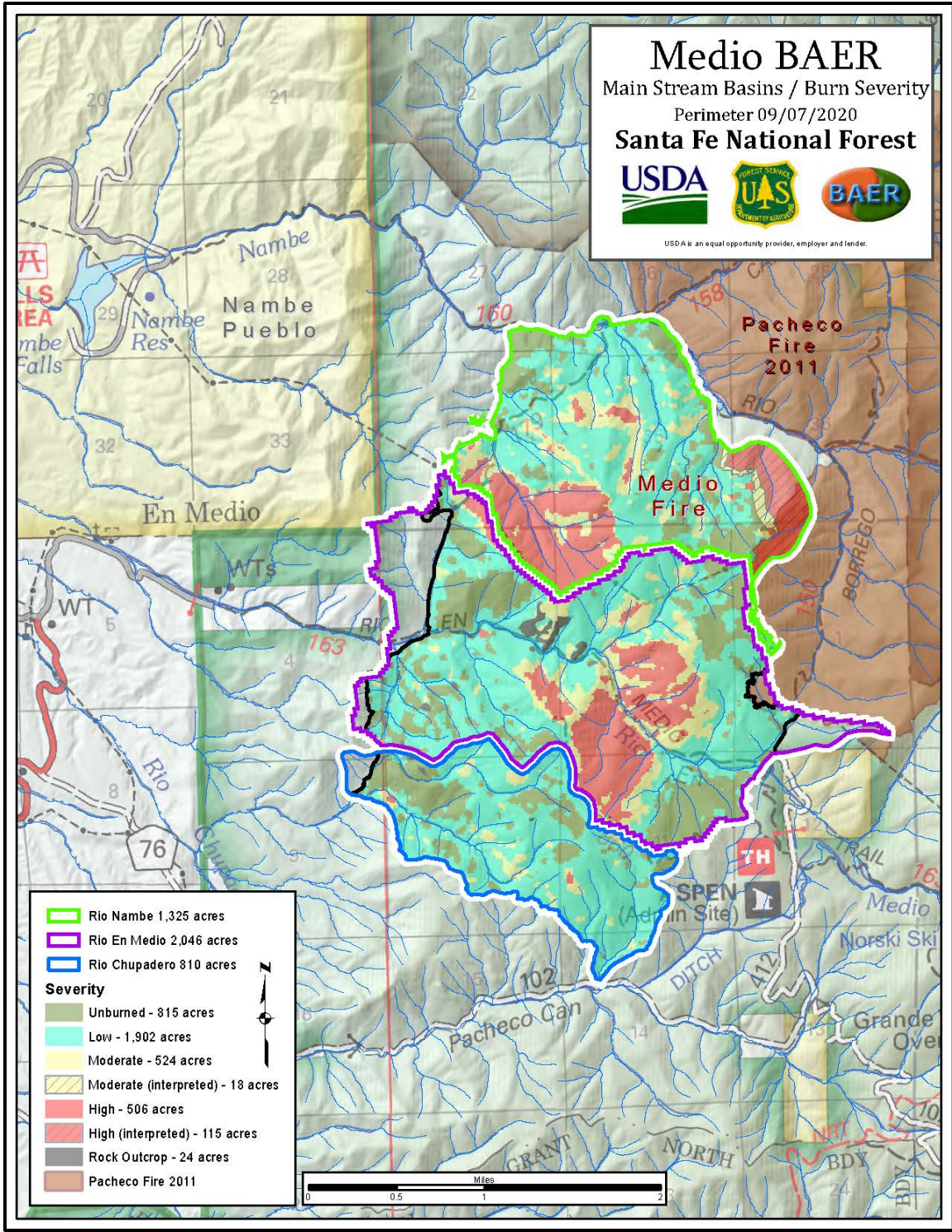


Figure 3. Medio Fire Pojoaque River Tributaries

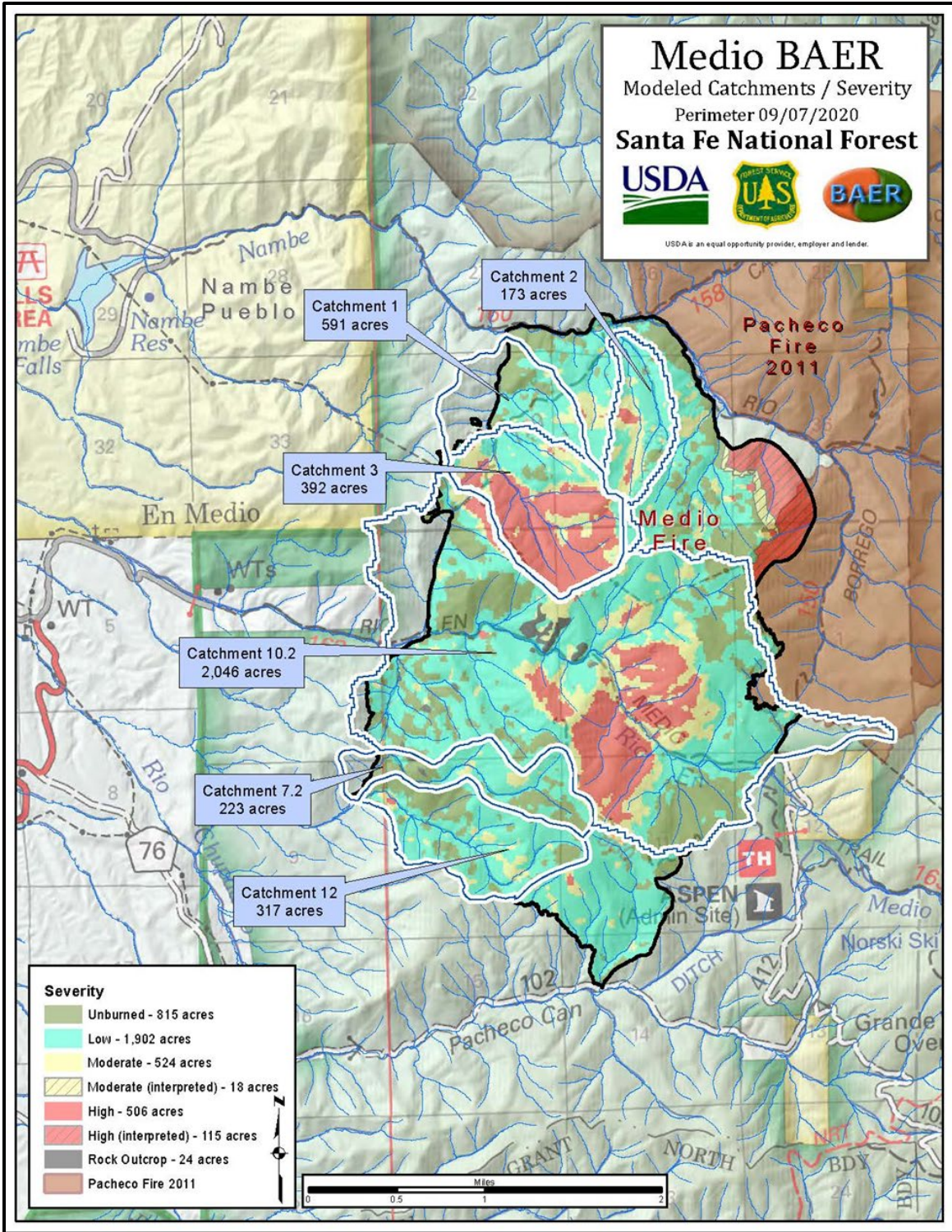


Figure 4. Medio Fire Modeled Catchments<sup>1</sup>

<sup>1</sup> Catchment three is nested in catchment one and represents an area dominated by high runoff potential. That runoff is reflected in the values shown for catchment one in tables 2 and 3.

The following tables summarize selected catchments for the 5-year rainfall of both a 1-hour and 24-hour duration storm event. The 1-hour duration storm event was modeled using Wildcat5 while the 24-hour duration storm event was predicted using the NRCS equation for Estimation of Direct Runoff from Storm Rainfall. It is important to note that runoff volumes reported in the table below are best considered as a relative change from pre-fire to post-fire runoff rather than absolute volumes. These values will more than likely change and be lower by the onset of 2021 monsoonal events due to the likelihood of recovery (increase of litter, vegetation and reduction of hydrophobic soil conditions).

**Table 2. Medio Runoff; Selected Catchments 5-year Rainfall, 1 Hour Duration.<sup>2</sup>**

Catchment (area Sq. Mi.)	Duration (hr)	Precipitation (in)	Pre-Fire Wildcat Peakflow (cfs)	Post-Fire Wildcat Peakflow (cfs)
1 (0.95)	1	1.13	42	310
2 (0.27)	1	1.14	7	37
3 (0.61) <sup>1</sup>	1	1.13	24	324
7.2 (0.35)	1	1.13	18	28
10.2 (3.2)	1	1.14	90	402
12 (0.27)	1	1.13	30	50

**Table 3. Medio Runoff; Selected Catchments 5-year Rainfall, 24 Hour Duration.<sup>3</sup>**

Catchment (area Sq. Mi.)	Duration (hr)	Precipitation (in)	Pre-Fire NRCS Peakflow (cfs)	Post-Fire NRCS Peakflow (cfs)
1 (0.95)	24	1.99	9	30
2 (0.27)	24	2.01	2	5
3 (0.61) <sup>1</sup>	24	2.00	5	18
7.2 (0.35)	24	1.99	3	5
10.2 (3.2)	24	2.01	24	64
12 (0.27)	24	2.00	3	4

Runoff from a 5-year one-hour convective event (~1.13") is projected to be from 1.5 to 13.5<sup>1</sup> times greater than unburned conditions as a function of burn severity and watershed size. Convective storms (e.g. thunderstorms typical of summer monsoons) are not expected to fall on the burned area going into fall and winter. Runoff from a 5-year 24-hour event<sup>4</sup> (~2") is projected to be about 1.5 to 4 times greater than unburned conditions as a function of burn severity and watershed size.

### Soil Report Summary

The geomorphology of the area is dominated by hills and mountains comprised of Proterozoic Granite, Gneiss, Quartz Diorite and Quartz Monzonite. The area is dominated by steep slopes of greater than

<sup>2</sup> Wildcat5 overestimates a 24-hour event due to the default formula in the model, especially on areas >640 acres. The NRCS equation for Estimation of Direct Runoff from Storm Rainfall was used for the 24 hour event.

<sup>3</sup> The "area inches of runoff" input used within the NRCS equation was generated from Wildcat5.

<sup>4</sup> 24- hour events are more typical during fall and winter in the Southwest.

40%. Dominate soils include: Lithic Ustorthents, Typic Ustorthents, Udic Ustorthents, Typic Dystrocrepts, Lithic Dystrocrepts, and Typic Paleboralfs.

The Medio Fire burn area is dominated by a mosaic of low and unburned severity. Soil erosion rates for each Terrestrial Ecological Unit (TEU) with unburned and low severity are expected to be above the natural rates within the burn area, but below the tolerable levels and have a limited impact on soil productivity. Pockets of high and moderate burn severity are located in the northwest portion of the fire and southeast portions of the burn area. These areas burned with higher intensity due to weather related events. A small area of interpreted high and moderate burn severity is located in the northeast portion of the fire. Modeled erosion rates for each TEU with moderate and high burn severity are expected to be well above tolerable levels and have a detrimental impact on soil productivity. Modeled soil erosion rates within the burn area range from near zero to 47 tons/acre.

### United States Geological Survey (USGS) Debris Flow Summary

The Medio Fire BAER team submitted the preliminary burn severity map to the USGS for an emergency assessment of post-fire debris flow hazards. The USGS conducts post-fire debris-flow hazard assessments for select fires in the Western U.S using geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability of debris flows that may occur in response to a design storm.<sup>5</sup> See the following link to the Medio Fire Preliminary Hazard Assessment - [https://landslides.usgs.gov/hazards/postfire\\_debrisflow/detail.php?objectid=315](https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=315). Figures 5, 6, and 7 are products generated by information from the USGS. These figures display the USGS Debris Flow Model Basin Probability from a 12mm/hr (Figure 5), 24mm/hr (Figure 6) and a 40 mm/hr (Figure 7) storm event<sup>6</sup>.

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<sup>5</sup> [https://www.usgs.gov/natural-hazards/landslide-hazards/science/emergency-assessment-post-fire-debris-flow-hazards?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/natural-hazards/landslide-hazards/science/emergency-assessment-post-fire-debris-flow-hazards?qt-science_center_objects=0#qt-science_center_objects)

<sup>6</sup> USGS uses a 15-minute intensity of 24mm/hr for their web site display, which works out to just under 0.24 inches in 15 minutes. In addition to the 24mm/hr intensity; figures within this report display the 15-minute intensity of 12mm/hr (~.12 inches in 15 minutes) and the 15-minute intensity of 40mm/hr (~.39 inches in 15 minutes). The 12mm/hr and 24mm/hr equate to less than a 1-year return storm interval and the 40mm/hr equates to approximately a 1-year return storm interval for convective storms.



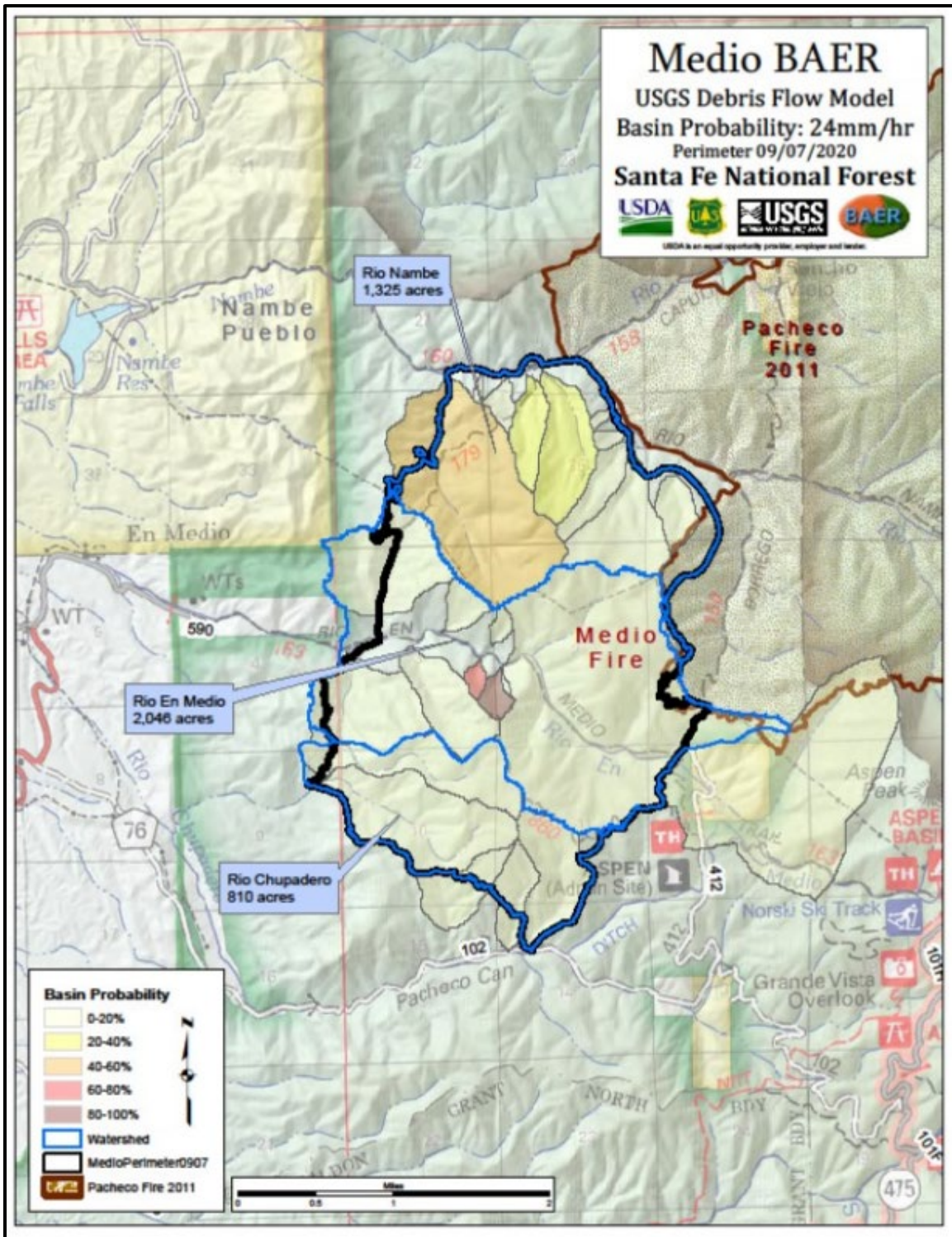


Figure 6. Basin Probability 24mm/hr.

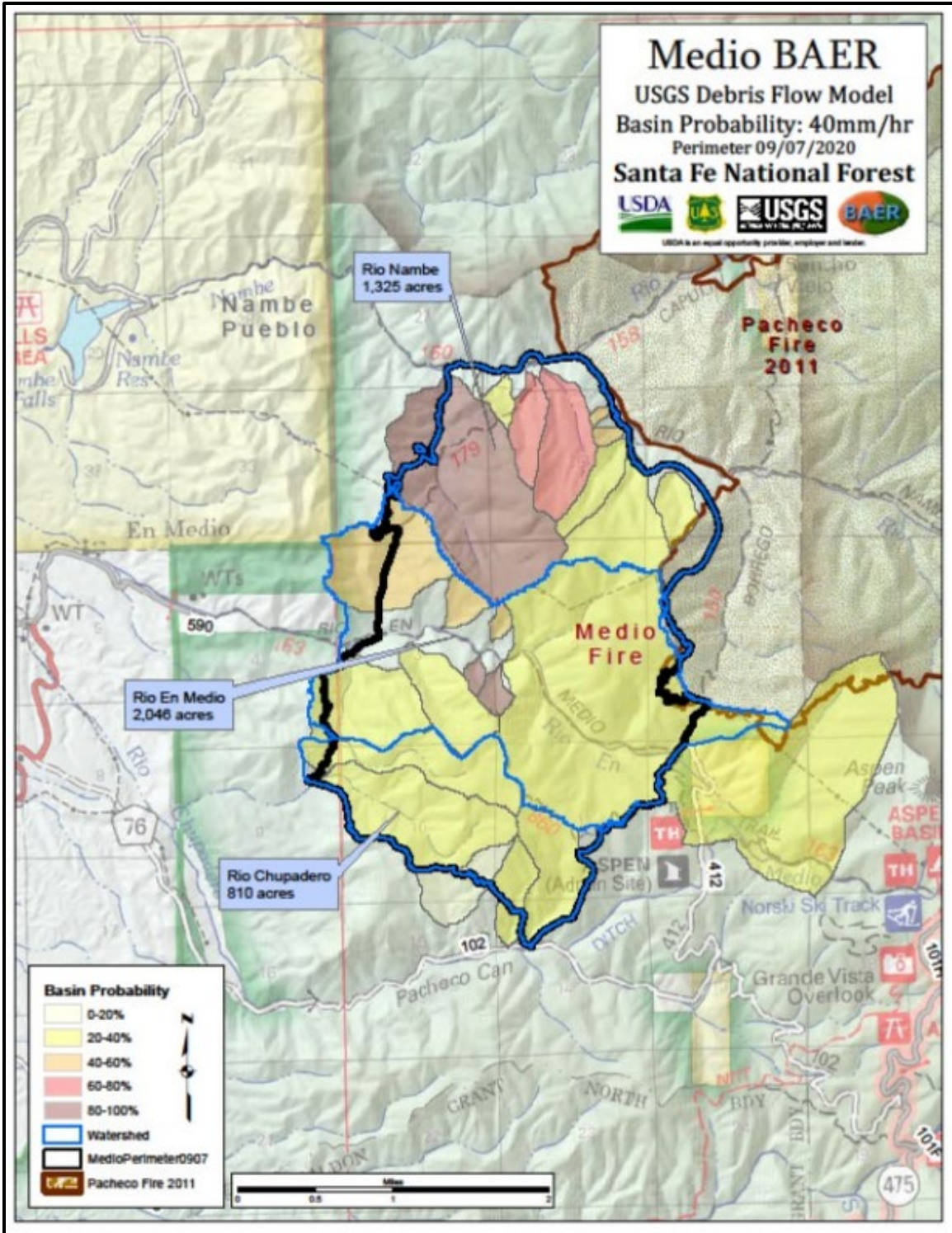


Figure 7. Basin Probability 40mm/hr.

## Identified Values at Risk

The BAER team focused on assessing the human life and safety BAER Critical Values using the BAER Risk Assessment during this initial phase of the assessment. This risk assessment identified human life and safety as critical values at risk from post wildfire effects. Treatment methods were identified and recommended to the Santa Fe National Forest supervisor. Under BAER program direction emergency response strategies should observe the following order in prescribing BAER action strategies:

- Natural recovery. In situations where no burned-area emergency exists or where practical or effective measures are not feasible, rely on natural recovery. Hazard notification to National Forest users may be appropriate in conjunction with this strategy.
- Administrative closures. In situations where a burned-area emergency exists and it is possible to restrict access to protect life and safety, or where valid uses will significantly interfere with emergency stabilization objectives or delay critical recovery, administrative closures should be the first consideration. Other measures should only be considered in these situations where administrative closures are not possible or are not effective.
- Other measures. For other emergency situations, demonstrated effective measures should be applied to manage unacceptable risks to human life, property, and critical natural, cultural and heritage resources on NFS lands.

## Partner Efforts

The Santa Fe National Forest is working with partners, such as the BIA, the Pueblos, the New Mexico Environment Department (NMED), and NRCS to provide support for efforts to protect values downstream off NFS lands.

## Conclusion

The BAER team has identified threats to Values at Risk on NFS lands based on a rapid initial assessment of the area burned by the Medio fire. The BAER team has recommended emergency treatments for reducing post-fire impacts to VARs, but because portions of this fire included steep slopes that burned at moderate and high severity there are likely to be unavoidable impacts. An administrative closure is currently in place for the burn area and NFS lands that may be impacted by post fire effects. Protection and safety treatments include:

- One road closure gate on Forest Road 412 at the intersection with Forest Road 102 to close public vehicle access to the burned area.
- Three road closure/warning signs. One on Forest Road 102 at the Forest Boundary, one at the 102/412 intersection and one on Forest Road 102 east of the intersection with 412.
- Two trail closure gates; at Rio en Medio Trailhead (#163) west of the fire perimeter at the Forest Boundary and Aspen Spur Trail (#417) east of the fire perimeter just below the Aspen Ranch Trailhead.
- Ten trail closure/warning signs. Located to control use of the trail network within and leading to the Medio Fire burned area.
- One trailhead access parking closure barrier utilizing an estimated four jersey barriers as a temporary “wall” located at the Forest Boundary at the end of New Mexico 592 and Santa Fe County Road 78B.

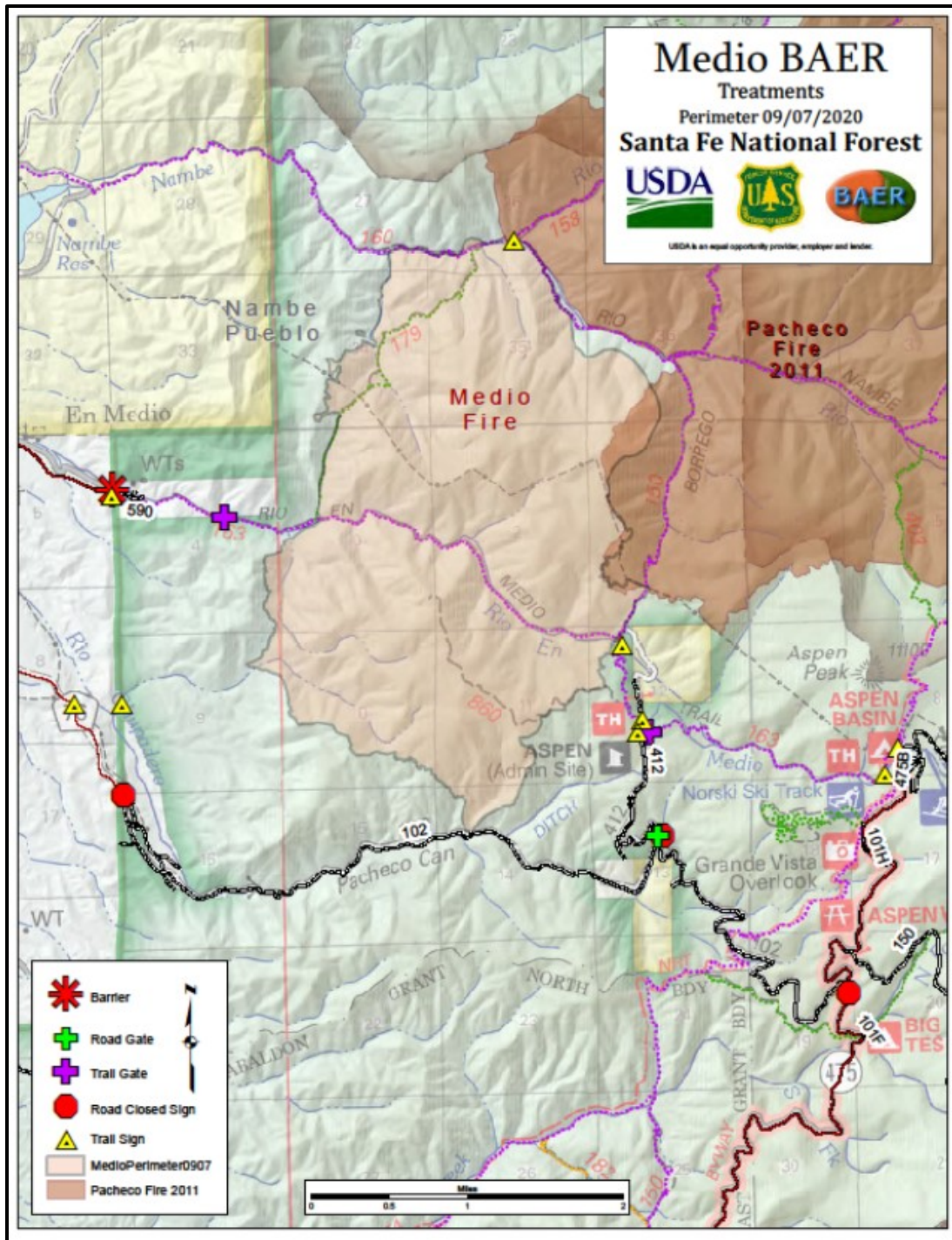


Figure 8. Medio Fire BAER Treatment Map

For further information regarding the BAER program see appendices.

- Appendix A – USFS BAER Program Overview
- Appendix B – BAER Limitations
- Appendix C – BAER Assessment Key Elements
- Appendix D – Three Phases of Recovery

## Post-Fire BAER Assessment

# Burned Area Emergency Response (BAER) Information Brief



## Forest Service BAER Program Overview

The **Burned Area Emergency Response (BAER)** program is designed to identify and manage potential risks to resources on **National Forest System** lands and reduce these threats through appropriate emergency measures to protect human life and safety, property, and critical natural or cultural resources. **BAER** is an emergency program for stabilization work that involves time-critical activities to be completed before the first damaging event to meet program objectives:

### BAER Objectives:

- Determine whether imminent post-wildfire threats to human life and safety, property, and critical natural or cultural resources on **National Forest System** lands exist and take immediate actions, as appropriate, to manage the unacceptable risks.
- If emergency conditions are identified, mitigate significant threats to health, safety, human life, property and critical cultural and natural resources.
- Prescribe emergency response actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to critical values resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources.
- Implement emergency response actions to help stabilize soil; control water, sediment and debris movement and potentially reduce threats to the **BAER** critical values identified above when an analysis shows that planned actions are likely to reduce risks substantially within the first year following containment of the fire.
- Monitor the implementation and effectiveness of emergency treatments that were applied on **National Forest System** lands.

While many wildfires cause minimal damage to the land and pose few threats to the land or people downstream, some fires result in damage that requires special efforts to reduce impacts afterwards. Loss of vegetation exposes soil to erosion; water run-off may increase and cause flooding, soil and rock may move downstream and damage property or fill reservoirs putting community water supplies and endangered species at-risk.

The **BAER** team presents these findings in an assessment report that identifies immediate and emergency actions needed to address post-fire risks to human life and safety, property, cultural and critical natural resources. This includes early detection and rapid response (EDRR) treatments to prevent the spread of noxious weeds into native plant communities. The **BAER** report describes watershed pre- and post-fire watershed response information, areas of concern for life and property, and recommended short-term emergency stabilization measures for **Forest Service** lands that burned.

In most cases, only a portion of the burned area is actually treated. Severely burned areas steep slopes, and places where water run-off will be excessive and may impact important resources, are focus areas and described in the **BAER** assessment report if they affect critical values. Time is critical if the emergency stabilization measures are to be effective.

A **BAER** assessment team conducts field surveys and uses science-based models to rapidly evaluate and assess the burned area and prescribe emergency stabilization measures. The team generates a "**Soil Burn Severity**" map by using satellite imagery which is then validated and adjusted by **BAER** team field surveys to assess watershed conditions and model potential watershed response from the wildfire. The map identifies areas of soil burn severity by categories of very low/unburned, low, moderate, and high which may correspond to a projected increase in watershed response. The higher the burn severity, the less the soil will be able to absorb water when it rains. Without absorption, there will be increased run-off with the potential of flooding.

### BAER Funding:

Special Emergency Wildfire Suppression funds are authorized for **BAER** activities and the amount of these expenses varies with the severity of the fire season. Some years see little **BAER** activity while other years are extremely busy.

Because of the emergency nature of **BAER**, initial requests for funding of proposed **BAER** treatments are supposed to be submitted by the Forest Supervisor to the Regional Office within 7 days of total containment of the fire. The Regional Forester's approval authority for individual **BAER** projects is limited. Approval for **BAER** projects exceeding this limit is forwarded onto the Washington Office.



## Burned Area Emergency Response (BAER) Information Brief



### Burned Area Emergency Response (BAER) Limitations

While many wildfires cause minimal damage to the land and pose few threats to the land or people downstream, some fires result in damage that requires special efforts to reduce impacts afterwards. Loss of vegetation exposes soil to erosion; water run-off may increase and cause flooding, soil and rock may move downstream and damage property or fill reservoirs putting community water supplies and endangered species at-risk.

The **Burned Area Emergency Response (BAER)** program is designed to identify and manage potential risks to resources on **National Forest System** lands and reduce these threats through appropriate emergency measures to protect human life and safety, property, and critical natural or cultural resources. **BAER** is an emergency program for stabilization work that involves time-critical activities to be completed before the first damaging storm event to meet program objectives.

#### BAER Objectives:

- Determine whether imminent post-wildfire threats to human life and safety, property, and critical natural or cultural resources on **National Forest System** lands exist and take immediate actions, as appropriate, to manage the unacceptable risks.
- If emergency conditions are identified, mitigate significant threats to human life and safety, Forest Service property and other critical natural and cultural resource values.
- Prescribe emergency response actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources.
- Implement emergency response actions to help stabilize soil; control water, sediment and debris movement and potentially reduce threats to the **BAER** critical values identified above when an analysis shows that planned actions are likely to reduce risks substantially within the first year following containment of the fire.
- Monitor the implementation and effectiveness of emergency treatments that were applied on **National Forest System** lands.

#### BAER Interagency Coordination:

Post-fire emergency response is a shared responsibility. There are several Federal, State and local agencies that have emergency response responsibilities or authorities in the post-fire environment. The **BAER** team coordinates with these agencies to look at the full scope and scale of the situation to reduce the potential threats to human life and property. It is important that BAER efforts are communicated with all affected and interested cooperating agencies and organizations regarding other post-fire recovery and restoration efforts.

**BAER** treatments cannot prevent all of the potential flooding or soil erosion impacts, especially after a wildfire-changed landscape. It is important for the public to stay informed and prepared for potentially dramatic increased run-off events.

One of the most effective **BAER** strategies is interagency coordination to provide post-fire threat information to local cooperators who can assist affected businesses, homes, and landowners to prepare for rain events. For example, the **Natural Resources Conservation Service (NRCS)** has the Emergency Watershed Protection (EWP) program for post-emergency assistance on private and tribal land, the **National Weather Service (NWS)** has responsibility for flood warning alerts, the **Federal Emergency Management Agency (FEMA)** has flood insurance and other responsibilities if the area is a Presidentially-declared emergency, **Resource Conservation Districts (RCD)** and counties, as well as State and local-highway and emergency services departments, Flood Control authorities, etc. It is important that landowners work directly with **NRCS** and other agencies to determine appropriate actions needed to protect private structures and other assets.

#### **BAER Process:**

**BAER** assessment teams are staffed by specially trained professionals that may include: hydrologists, soil scientists, engineers, biologists, botanists, archeologists, and others who evaluate the burned area and prescribe temporary emergency stabilization actions on **National Forest System** lands to protect the land quickly and effectively. **BAER** assessments usually begin before a wildfire has been fully contained.

A **BAER** assessment team conducts field surveys and uses science-based models to rapidly evaluate and assess the burned area and prescribe emergency stabilization measures. The team generates a “**Soil Burn Severity**” map by using satellite imagery which is then validated and adjusted by **BAER** team field surveys to assess watershed conditions and model potential watershed response from the wildfire. The map identifies areas of soil burn severity by categories of very low/unburned, low, moderate, and high which may correspond to a projected increase in watershed response. The higher the burn severity, the less the soil will be able to absorb water when it rains. Without absorption, there will be increased run-off with the potential of flooding.

The **BAER** team presents these findings in an assessment report that identifies immediate and emergency actions needed to address post-fire risks to human life and safety, property, cultural and critical natural resources. This includes early detection and rapid response (EDRR) treatments to prevent the spread of noxious weeds into native plant communities. The **BAER** report describes watershed pre- and post-fire watershed response information, areas of concern for life and property, and recommended short-term emergency stabilization measures for **Forest Service** lands that burned.

In most cases, only a portion of the burned area is actually treated. Severely burned areas steep slopes, and places where water run-off will be excessive and may impact important

resources, are focus areas and described in the **BAER** assessment report if they affect critical values. Response action timing is essential to ensure the emergency stabilization measures are effective.

There are a variety of emergency stabilization actions that the **BAER** team can recommend for **Forest Service** land such as mulching with agricultural straw or chipped wood to protect soil productivity, increasing road drainage to keep roads and bridges from washing-out during post-fire floods, and early detection rapid response invasive plant treatments to prevent spread of weeds into native plant communities. **BAER** treatments are preventative in nature but cannot prevent all damage, especially debris torrents in areas that are prone to sliding and have lost critical root structure from plants.

**The Cans and CannoTs of BAER:**

What BAER Can Do:	What BAER Cannot Do:
Install water or erosion control devices.	Prevent all flooding and debris flows.
Seed or mulch for erosion control or stability reasons.	Replant commercial forests or grass for forage.
Install erosion control measures at critical cultural sites.	Excavate and interpret cultural sites.
Install temporary barriers to protect treated or recovering areas.	Replace burned pasture fences.
Install warning signs.	Install interpretive signs.
Replace minor safety related facilities, like burned guard rails.	Replace burned buildings, bridges, corrals, etc.
Install appropriate-sized drainage features on roads, trails.	Repair roads damaged by floods after fire.
Remove critical safety hazards.	Remove all hazard trees.
Prevent permanent loss of T&E habitat.	Replace burned habitat.
Monitor BAER treatments.	Monitor fire effects.
Implement EDRR treatments to minimize the spread of noxious weeds into native plant communities.	Treat pre-existing noxious weeds.

**BAER Funding:**

Special Emergency Wildfire Suppression funds are authorized for **BAER** activities and the amount of these expenses varies with the severity of the fire season. Some years see little **BAER** activity while other years are extremely busy.

Because of the emergency nature of **BAER**, initial requests for funding of proposed **BAER** treatments are supposed to be submitted by the Forest Supervisor to the Regional Office within 7 days of total containment of the fire. The Regional Forester’s approval authority for individual **BAER** projects is limited. Approval for **BAER** projects exceeding this limit is forwarded onto the Washington Office.

# Burned Area Emergency Response (BAER) Information Brief



## KEY ELEMENTS OF THE BAER ASSESSMENT

Forest Service **BAER** assessment teams are established by **Forest Supervisors** before wildfires are fully contained. The teams coordinate and work with the **USDA Natural Resources Conservation Service (NRCS)**, **Bureau of Land Management (BLM)**, **Fish & Wildlife Service (FWS)**, **National Weather Service (NWS)**, **local counties**, **State Department of Transportation**, and other federal, state, and local agencies to strategically assess potential post-fire impacts to the watersheds burned from wildland fires.

- The **BAER** assessment teams are evaluating watershed conditions to determine the level of potential risks to human life, safety, property, critical natural and cultural-heritage resources, and determine if there are appropriate and effective emergency stabilization measures that can be implemented on federal lands in a timely manner to reduce unacceptable risks from potential flooding and debris flow threats.
- The **BAER** assessment team conducts field surveys and uses science-based models to rapidly evaluate and assess the burned area.
- **BAER** assessment teams are staffed by specially trained professionals that may include: hydrologists, soil scientists, engineers, geologists, biologists, botanists, archeologists, geographic information system mapping specialists, recreation and trails specialists, and others who evaluate the burned area and prescribe emergency response actions to protect the land quickly and effectively.
- **BAER** assessments usually begin before a wildfire has been fully contained.
- The **BAER** assessment team generates a “**Soil Burn Severity**” map by using satellite imagery which is then validated and adjusted by **BAER** team field surveys to assess watershed conditions and watershed response to the wildfire. The map identifies areas of soil burn severity by categories of low/unburned, moderate, and high which corresponds to a projected increase in watershed response.
- The **BAER** team presents these findings and treatment recommendations to the **Forest Supervisor** in an assessment report that identifies immediate and emergency stabilization actions needed to address potential post-fire risks to human life and safety, property, cultural-heritage and critical natural resources on National Forest System lands.
- The **BAER** report describes watershed pre- and post-fire response information, areas of concern for human life, safety and property, and recommended short-term emergency stabilization actions for federal lands that burned.
- In most cases, only a portion of the burned area is actually treated.
- If the **BAER** assessment team determines there may be potential emergency situations, the short-term goal is to have flood and erosion control protection measures completed before the first large, damaging rain events occur.
- Timely implementation is critical if **BAER** emergency response actions are to be effective.
- The **BAER** assessment team coordinates with other federal and local agencies, and counties that assist private landowners in preparing for increased run-off and potential flooding.
- Federal assistance to private landowners regarding post-fire potential impacts is the primary responsibility of the **NRCS** through the **Emergency Watershed Protection (EWP) program** (<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>).
- **NRCS** in coordination with additional state, local and federal agencies conduct damage survey reports for the private land adjacent to and downstream from the burned areas. **NRCS** uses these reports, along with the **BAER** team’s assessment report, to develop recommended emergency measures for businesses and private home and landowners to reduce the impacts to their property from potential increased water and debris flows.





## THREE PHASES OF WILDFIRE RECOVERY

There are **three phases of recovery** following wildfires on federal lands:

- Fire Suppression Repair
  - Emergency Stabilization-Burned Area Emergency Response (BAER)
  - Long-Term Recovery and Restoration
- **Fire Suppression Repair** is a series of immediate post-fire actions taken to repair damages and minimize potential soil erosion and impacts resulting from fire suppression activities and usually begins before the fire is contained, and before the demobilization of an Incident Management Team. This work repairs the hand and dozer fire lines, roads, trails, staging areas, safety zones, and drop points used during fire suppression efforts.
  - **Emergency Stabilization-Burned Area Emergency Response (BAER)** is a rapid assessment of burned watersheds by a BAER team to identify imminent post-wildfire threats to human life and safety, property, and critical natural or cultural resources on **National Forest System** lands and take immediate actions to implement emergency stabilization measures before the first post-fire damaging events. Fires result in loss of vegetation, exposure of soil to erosion, and increased water runoff that may lead to flooding, increased sediment, debris flows, and damage to critical natural and cultural resources. BAER actions such as: mulching, seeding, installation of erosion and water run-off control structures, temporary barriers to protect recovering areas, and installation of warning signs may be implemented. BAER work may also replace safety related facilities; remove safety hazards; prevent permanent loss of habitat for threatened and endangered species; prevent the spread of noxious weeds, and protect critical cultural resources.
  - **Long-Term Recovery and Restoration** utilizes non-emergency actions to improve fire-damaged lands that are unlikely to recover naturally and to repair or replace facilities damaged by the fire that are not critical to life and safety. This phase may include restoring burned habitat, reforestation, other planting or seeding, monitoring fire effects, replacing burned fences, interpreting cultural sites, treating noxious weed infestations, and installing interpretive signs.

