Bonneville Fire Burned Area Summary

Burned Area Report

Fire Background

The Bonneville Fire started on June 20, 2026 in the foothills along the Wasatch Front and was human-caused. The fire reached 572 acres, 319 of which were on National Forest land and 253 were on private land. It reached 100% containment on June 25, 2026.

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. 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 damaging events to meet program objectives.

The Forest Service assembled a BAER team on June 22, 2026 for the Bonneville Fire. This team of experts in various resource disciplines began assessing the post-fire effects to critical values on Forest Service lands. Impacts to the soil are the primary indicator of potential post-fire changes in watershed response, as well as watershed recovery. The team developed soil burn severity (SBS) maps to document the degree to which the fires had changed soil properties. Using the SBS map, physical scientists can predict erosion potential, changes to runoff and flood flows, and increased geologic hazards. Field evaluations and modeling results are used to determine relative increases in post-fire risk to different critical values and inform recommendations to address these increased risks.

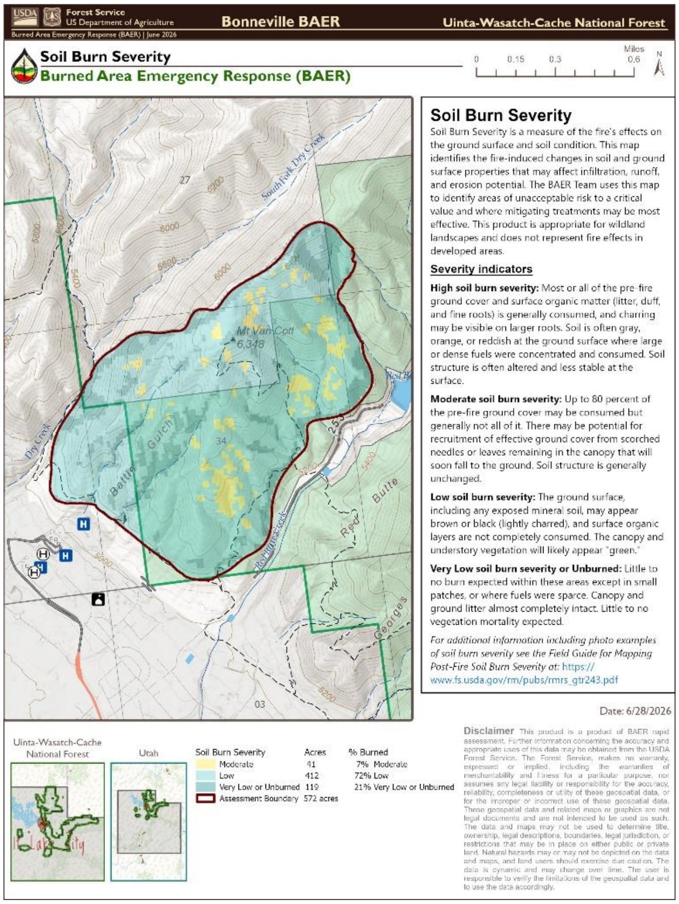

Figure 1. Soil burn severity map for the Bonneville Fire.

Soils

Soil burn severity is not an assessment of vegetation consumption, but rather an integration of vegetation loss, changes in soil structure and infiltration capacity, remaining vegetation, duff, or ash, and soil color, all of which may indicate relative degrees of soil heating.

The final soil burn severity maps were developed with ESRI ArcGIS software using satellite-imagery-derived Burned Area Reflectance Classification (BARC) and field survey data. Field work included assessment of ash characteristics, ground cover, root condition, soil structure, soil water-repellency, and vegetation burn severity as described in the Field Guide for Mapping Post-fire

Soil Burn Severity (Parsons et al. 2010). High burn severity is characterized by a complete consumption of organic material with the surface layers of the soil resulting in a change to single-grain structure. Fine roots are commonly charred or consumed 3-5 cm deep. The highest-severity areas often have a loose, dusty appearance, and no longer have any cohesion or soil strength. Generally, there will be less destruction of soil organic matter, roots, and structure in an area mapped as moderate compared to high. In areas mapped as moderate SBS, soil structure, roots, and litter layer may remain intact beneath a thin ash layer. Low soil burn severity results in very little alteration of soil organic matter and little or no change in soil structural stability.

Mapped and validated SBS for the burned area is High (0%), Moderate (7%), Low (72%), and Very Low/Unburned (21%) (see map on page 1). This encapsulates the entire fire perimeter of which 253 acres were on private and 319 acres were on National Forest land. The more severe a fire's effects are on the soil, the more likely those soils will erode in subsequent rainstorms – especially in locations with steep slopes. Erosion after fires can cause tremendous damage to homes and other structures in the years after a fire.

Geology

The team identified the geologic conditions and processes that have shaped and altered the watersheds and landscapes and assessed the impacts from the fire on those conditions and processes that could affect downstream critical values. Using the understanding of rock types and characteristics, geomorphic processes, and distribution of geologic hazards helps predict how the watersheds will respond to and be impacted by upcoming storms. The Bonneville Fire occurred over Thaynes Limestone formation. Thaynes Limestone formation has light-gray, thin to thick-bedded limestone and brownish-gray siltstone containing beds of light-gray sandstone, pale-red silty limestone, light-gray shaly limestone, and dark-greenish-gray siltstone and shale. Soils are rated moderate for Soil Erosion Hazard in the burned area.

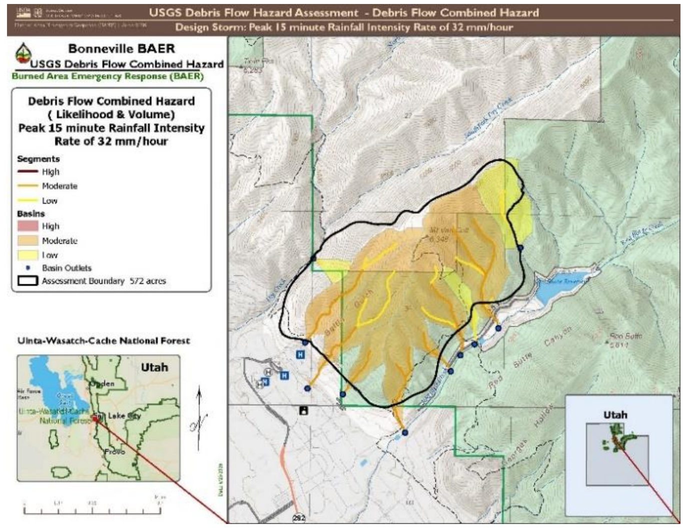

Figure 2. USGS debris flow combined hazard risk of a 2-year storm event for the Bonneville Fire.

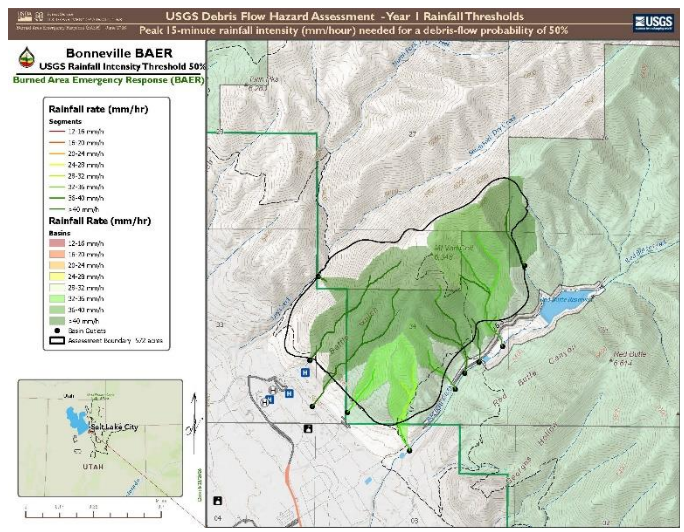

Figure 3. USGS assessment of Year 1 peak 15-minute rainfall intensity thresholds needed for a debris-flow probability of 50%.

The team provided soil burn severity field data to the US Geological Survey Landslide Hazard Program to assist in forecasting the probability, potential volumes, and hazards of debris flows through their developed empirical models. The USGS Post-fire Debris Flow Hazard Model estimates a combined hazard risk of low to moderate across the basins and stream segments, based on likelihood and volume of debris flows (see maps on page 2). This was based on a design storm with a 15-minute rainfall intensity of 32 mm/hr, which is equivalent to a 2-year storm event in this area. The basins and stream segments have a 50% probability of triggering a debris flow in the first-year post-fire in response to a 15-minute rainfall intensity ranging from 32 to over 40 mm/hr. This is equivalent to a 2-year storm intensity to a 5-year storm intensity or greater. The lowest triggering threshold is in the basins on the south end of the fire. In subsequent years, it takes a greater storm intensity to trigger a debris flow due to recovery of vegetation and soils.

Hydrology

Primary watershed response is expected to include an initial flush of ash and burned materials, erosion in drainages and on steep slopes in the burned area, increased peak flows and sediment transport and deposition, and debris flows. Watershed response is dependent on the occurrence of rainstorms and rain-on-snow events and will likely be greatest with initial storm events. Increased watershed response is most likely in areas with moderate soil burn severity. Disturbances will become less evident as vegetation is reestablished, providing ground cover that reduces erosion and increases surface roughness which slows flow accumulation and increases infiltration.

A rapid hydrologic assessment suggests that there will be increased peak flows in response to high-intensity, short-duration storms typical of the Wasatch Front. The storms modelled represent 2-year and 5-year storms. Due to the small size of the watersheds, and the fact that the streams only flow intermittently or ephemerally, peak flows pre-fire were low. Post-fire these peak flows increased up to 13X their pre-fire flows. Although the magnitude of flows are small, they only represent clean peak flows while some degree of flow bulking is likely to occur in the watershed over the next few years, due to burnt wood, rock, and other debris moving through the drainage network. This will likely lead to increased water quality concerns for municipal and domestic drinking water providers within and downstream of the fire.

Critical Values

The first critical value BAER teams assess is always human life and safety on National Forest System lands. During and after heavy rainstorms, Forest Service employees and visitors to National Forest System Lands could be threatened by floodwaters and debris flows.

Recreation

National Forest System recreation infrastructure within the Bonneville Fire includes only trails. Recreation infrastructure could be damaged in post-fire storm events.

Figure 4. Aerial view of the Bonneville Fire scar.

Botany

Invasive plants adversely affect native plant communities through allelopathy (suppression of growth of a native plant by release of a toxin from a nearby invasive plant) and direct competition for water and resources. Over time, native plant diversity decreases as invasive plants expand, reducing habitat for native plant species and wildlife. Shifts from diverse native plant communities to non-native invasive plant dominance could alter future fire behavior, intensity, extent, and season of burning.

Current infestations are located in open meadows in the foothills. However, the burned areas and areas disturbed due to suppression activity creates conditions for invasive species to outcompete native plants and expand their infestation.

Cultural Resources

The most typical post-fire threats to cultural sites are physical threats such as erosion or damage from (now dead) falling trees. In some cases, newly exposed artifacts are threatened by human damaging activities such as looting or vandalism. Cultural resources were evaluated by the team and it was determined that there is no threat to cultural sites within or downstream/downslope of the burned area.

Anticipated Vegetation Recovery

Post-fire recovery varies greatly based on climate, vegetation types and burn severity. It is typical for recovery to take between 3-5 years for reestablishment of ground cover. The persistence of drought in the years following wildfires also delays the recovery time frame.

Figure 5. Bonneville Fire scar from on-the-ground SBS mapping.

Non-Forest Service Values

Since fire effects know no administrative boundaries, additional threats exist for assets not owned or managed by the Forest Service. 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 and local unit BAER Coordinator has engaged with interagency partners to facilitate consideration of off-Forest values covered through other programs with the relevant responsible entities.

Conclusion

There are multiple phases of post-fire actions after a wildfire covering suppression repair through long-term recovery. BAER is the 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 major storms. The BAER team has identified imminent threats to critical values based on a rapid assessment of the area burned by the Bonneville Fire. The assessment was conducted using the best available methods to analyze the potential for damage from post-fire threats, including flooding and debris flows. The findings provide the information needed to prepare and protect National Forest System critical values against post-fire threats. The recommended BAER treatments are not included in this report as they are not yet approved or funded.

BAER treatments cannot prevent all 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. Burned-area watersheds will likely be more responsive to rainfall and prone to erosion and sediment transport due to post-fire conditions. However, vegetation recovery is anticipated to be rapid with ground cover approaching pre-fire conditions within 1-3 years, which will attenuate any post-fire effects on watershed processes. The Forest Service will continue to provide information and participate in interagency efforts to address threats to public and private values resulting from the Bonneville Fire.

The Forest Service will continue to work towards long-term recovery and restoration of the burned area, including both the natural resources and infrastructure affected.

References:

Parson, Annette; Robichaud, Peter R.; Lewis, Sarah A.; Napper, Carolyn; Clark, Jess T. 2010. Field guide for mapping post-fire soil burn severity. Gen. Tech. Rep. RMRS-GTR-243. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p. (https://www.fs.usda.gov/rm/pubs/rmrs_gtr243.pdf