Phase I BAER Assessment Team Specialists Evaluate the Hermits Peak-Calf Canyon Fire for Flooding Risks

While many wildfires cause little damage to the land and pose few threats to natural resources and people downstream, some fires create situations that require special efforts to prevent additional damage after wildfires. Loss of vegetation exposes soil to erosion; water runoff may increase and cause flooding, sediments may move downstream and damage houses or fill reservoirs and put endangered species and community water supplies at-risk.

The Forest Service (USFS) Burned Area Emergency Response (BAER) program works on USFS lands with the goal of keeping National Forest (NF) visitors and employees safe while recreating and working. BAER team assessments focus on emergency actions that are necessary to protect human life and safety, property, critical cultural resources, and critical natural resources such as soil productivity, hydrologic function, and water quality. Emergency actions are intended to minimize any further damage during rainstorm events.

Water is one of the most important natural resources flowing from forests. The Forest Service manages the largest single source of water in the U.S. with about 18% originating from 193 million acres of National Forest System (NFS) lands. A network of water and watershed resource specialists support stewardship efforts at all levels of the organization to promote healthy, sustainable watersheds fundamental to ecosystems and people.

A watershed is the drainage area where water from rain or melting snow and ice drains downhill into a body of water such as a river, stream, lake, reservoir, pond, estuary, wetland, aquifer, sea, or ocean.

BAER hydrologists, soil scientists and watershed resource specialists are currently assessing the condition and response of the watersheds within the Hermits Peak-Calf Canyon burned areas. Other BAER specialists evaluate other critical values that could be at risk during major rainstorm events such as NFS roads and trails, campgrounds, and other NFS infrastructures.

Photo 1: BAER specialists overview of the Headwaters of Gallinas Watershed from the top of Johnson Mesa.

At this location, BAER Hydrologists Paul Brown, Edgar Martinez, and Alex Makic were overlooking the burned watershed and its overall drainage system as data in their evaluation of its post-fire condition and response.

Photos 2 & 3: Overview look of Hermits Peak-Calf Canyon burned watersheds.

BAER soil scientists evaluate the burned watersheds to determine whether the soil is hydrophobic – aka repels water. This is important because the amount of hydrophobicity is an important component to determining how much increased water runoff we can expect after a fire. Hydrophobicity is the physical property of a molecule that is seemingly repelled from a mass of water and is considered when mapping watershed response to rainstorms after a wildfire.

Photo 4: BAER soil specialist trainee Susan Roe is assessing soil hydrophobicity (water repellency) and changes to soil structure in a high soil burn severity (SBS) area of the Hermits Peak-Calf Canyon Fire.

Photo 5: BAER team soil scientist Robert Ballard is evaluating SBS near Gallinas Creek and USFS Road 156.

Photo 6: BAER team soil scientist is gathering SBS data to evaluate and map the level of severity within the burned area near USFS Road 156 and USFS Road 18.

Photos 7, 8, 9: BAER team soil scientist Mike Natharius testing for soil hydrophobicity. Mike captures a drop of water placed on the burned soil which was determined to be hydrophobic.

Photos 10 & 11: New Mexico Environment Department for Natural and Working Lands Coordinator Jeremy Klass assists the BAER team with data collection by entering information into the Survey123 database which includes: soil burn severity, soil structure, vegetation burn severity/mortality, and remaining ground cover.

In addition to threats to human life and safety, the USFS BAER program assesses potential threats to USFS property and infrastructure such as roads and trails.

BAER engineering specialists assess the post-fire effects to roads and other infrastructure within the Hermits Peak-Calf Canyon burned areas. They identify potential threats to public users of the roads and infrastructure because of post-fire potential threats from increased water runoff from major rainstorms.

After assessing the roads within the burned areas, BAER engineering specialists may recommend BAER stabilization road treatments to lessen the impacts to USFS roads. These treatments will improve drainage and could include cleaning ditches and culvert inlets and installing culvert risers and trash racks on road crossings that are at-risk of plugging by sediment and woody debris. They may also recommend post-storm inspections to respond to any threats during and after rain events.

Photos 12, 13, 14: BAER Civil Engineer Lisa Archuleta is examining road culverts that may require cleaning and repair to effectively drain post-fire flooding water-flows off of NFS roads.

Photo 15: BAER team soil scientist Robert Ballard is inspecting a culvert along USFS Road 156. Culverts within the burned area on NFS land are evaluated to determine whether to increase its function (replace the culverts with a bigger one) to allow anticipated increased water and sediment flows to continue under roads unobstructed.

Photo 16: BAER trails and recreation specialist Sarah Smith is working with the BAER engineering and hydrology specialists to assess bridges within the Gallinas headwaters watershed.

Photo 17: A burned drainage that flows into Gallinas Creek. Here BAER hydrologists were looking at potential impacts near and around the road that could cause potential damage to the road prism.