Pipeline Fire

Burned Area Emergency Response (BAER)

Executive Summary



USDA Forest Service Southwestern Region Coconino National Forest Flagstaff Ranger District July 21, 2022





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The following is a summary of the Pipeline BAER Team that was ordered to assess the affects from the Pipeline Fire that started 6 miles north of Flagstaff on June 12, 2022 from human causes and grew rapidly under strong winds. This assessment covers the Pipeline Fire, which has burned 26,532 acres and is 90% contained as of July 8, 2022.

Pipeline Fire BAER process-chronology of events

June 20, 2022—Coconino National Forest delegates authority to BAER Team to assess emergency stabilization efforts created by the Pipeline and Haywire Fires.

June 21, 2022-BAER Short team of hydrologists, soil scientists, BAER team leader and BEAR team leader trainee begins soil burn severity assessments. BAER Public Information Officer begins and created InciWeb site for Pipeline BAER <u>https://inciweb.nwcg.gov/incident/8168</u>.

June 21-July 8—ongoing consultation with partners including, but not limited to, the Coconino National Forest, Coconino County, Coconino County Flood Control District, Southwestern Region of US Forest Service and US Forest Service Washington Office.

June 23, 2022-BAER Soil Burn Severity (SBS) Map completed (Please see Appendix A for Pipeline SBS map).

June 23, 2022-Full BAER team (hydrologists, soil scientists, recreation specialists, botanist, archaeologists, engineers assemble for first time.

June 23-29-BAER team resource specialist assess affects from the Pipeline Fire, assess risk to their specific resource value and write specialist reports

June 27-28, 2022- BAER team works though BAER Critical Values table to identified risks critical values and potential resource related emergency stabilization projects

July 1, 2022—Initial Pipeline BAER presentation to Forest Supervisor

July 1-8, 2022—BAER team continue communication with partners and finalizing of BAER report and funding request for proposed treatments.

July 22, 2022—Final approved BAER document (2500-8) with approved emergency stabilization actions.

The following summarizes the findings of the Pipeline BAER Team for the Pipeline Fire.

Post-Fire Watershed Conditions

BAER Team Findings:

- Forty-six percent of the burn scar is a re-burn from the 2010/2011 Schultz, 89 Mesa, and Fly Fires and seventy-five percent of the Schultz burn scar re-burned in the Pipeline Fire.
- Areas with high and moderate burns severities and steep slopes (over 60%) have the greatest risk of post fire flooding and debris flows.

- No basins (please see map of model basins in Appendix B) modeled have an extreme hydrologic-risk for concentrated flows of greater than 2,000 cubic feet second (cfs) per square mile (cfs/mi²) for the oneyear rain event.
- Copeland, Government Tank, Paintbrush-Siesta, Schultz Creek, Thames-Brandis, Upper Campbell-Rope Arabian and Lenox-Wupatki Trail basins all have a high hydrologic risk for hyper-concentrated flows of 1,000-2,000 cfs/mi² for the one-year rain event.
- Bonito, Chimney, Deadman2, FSR258, Inner Basin-Lockett Meadow, O'Leary, Peaceful Way and Siesta-Paintbrush basins all have a moderate hydrologic risk for hyper-concentrated flows of 100-1,000 cfs/mi² for the one-year rain event.
- Government Tank, Schultz Creek, Lenox-Wupatki Trail basins all have an extreme hydrologic risk for hyper-concentrated flows of greater than 2,000 cubic feet second (cfs) per square mile (cfs/mi²) for the two-year rain event.
- Bonito, Copeland, Deadman2, FSR258, Paintbrush-Siesta, Thames-Brandis, Peaceful Way, and Upper Campbell-Rope Arabian basins all have a high hydrologic risk for hyper-concentrated flows of 1,000-2,000 cfs/mi² for the two-year rain event.
- Chimney, Siesta-Paintbrush, Inner Basin-Lockett Meadow, and O'Leary basins all have a moderate hydrologic risk for hyper-concentrated flows of 100-1,000 cfs/mi² for the two-year rain event.
- Bonito, Copeland, Deadman, FSR258, Government Tank, Paintbrush-Siesta, Thames-Brandis, Peaceful Way, Schultz Creek, Siesta-Paintbrush, Upper Campbell-Rope Arabian, Inner Basin-Lockett Meadow, and Lenox-Wupatki Trail basins all have an extreme hydrologic risk for hyper-concentrated flows of greater than 2,000 cubic feet second (cfs) per square mile (cfs/mi²) for the five-year rain event.
- Chimney and O'Leary basins all have a high hydrologic risk for hyper-concentrated flows of 1,000-2,000 cfs/mi² for the five-year rain event.
- All basins all have an extreme hydrologic risk for hyper-concentrated flows of greater than 2,000 cubic feet second (cfs) per square mile (cfs/mi²) for the ten-year rain event.
- Reburned watersheds may experience abnormal recovery because with most of the overstory burned and downed, and then reburned, there is no substantial source of new litter and woody debris for ground cover improvements.

BAER Treatment:

• Human Life and Safety treatments area for area closure to protect against the risk of flooding and debris flows in flood prone areas, as well as safety signage and public messaging related to flood and debris flow hazards.

Post-Fire Soil Conditions

BAER Team Findings:

- Soil burns severity of the fire are 1,310 acres (5% of the fire area) of unburned, 15,004 acres of low soil burn severity (56% of the fire area), 9,141 acres of moderate soil burn severity (34% of the fire area) and 1,315 acres of high soil burn severity (5% pf the fire area).
- Post fire soil productivity and erosion rates are minor¹ on 12,898 acres (48% of the fire area).

¹ Minor erosion hazard – The modeled soil erosion rate is less than the soil loss tolerance value (T factor) for the soil type. Effects to soil productivity will likely be minor and localized.

- Post fire soil productivity and erosion rates are moderate² on 7,086 acres (27% of the fire area).
- Post fire soil productivity and erosion rates are major³ on 6,787 acres (25% of the fire area). The majority of these acres exceed 60% slope.
- Water repellency was confirmed through SBS plots on a majority of the high and moderate burn severity plots. There are approximately 10,456 acres of water repellent soils within the Pipeline Fire.

BAER Treatment:

• No treatments

Post-fire Debris flow potential

BAER Team Findings:

- The USGS debris flow model used a 40mm/hour storm event (or about .40 of rainfall in 15 minutes)
- There are a high probability of debris flows in Copeland, Government Tank, Paintbrush-Siesta, Peaceful Way, Schultz Creek, Siesta-Paintbrush, Upper Campbell-Rope Arabian, and Lenox-Wupatki Trail basins.

BAER Treatment:

• No treatments

Critical Values Assessment

The BAER critical values include human life and safety, property, natural, and cultural resources exist within the Pipeline Fire boundary.

Human Life and Safety

BAER Team Findings:

- Human life and safety of Forest visitors and employees traveling on NFS roads and trails in the burn scar is threatened by the potential for injury or loss of life from hazard tree strikes, falling rocks, stump holes, flooding and debris flows and other burned area hazards. The risk level is high.
- Human life and safety of Forest visitors and employees at USFS developed recreation sites is threatened by the potential for injury or loss of life from hazard tree strikes. These sites include: Little Elden Horse Camp, Elden Springs Trailhead (TH), Bonito Campground, O'Leary TH, Schulz Creek TH, Lockett Meadow TH. The risk level is high
- Human life and safety of Forest visitors and employees at the Bonito Amphitheater and O'Leary trailhead are threatened by the potential for injury or loss of life from flooding and debris flows. The risk level is very high
- Human life and safety of Forest visitors and employees at the Schultz TH, Lockett Meadow, and Lockett Meadow TH are threatened by the potential for injury or loss of life from flooding and debris flows. The risk level is very high.

² Moderate erosion hazard – The modeled soil erosion rate is between the T factor and three times the T factor for the soil type. Negative effects to soil productivity could be considerable and long-term.

³ Major erosion hazard – The modeled soil erosion rate is greater than three times the T factor for the soil type. Negative effects to soil productivity could be irreversible

• Human life and safety of Forest visitors and employees across the burned area are threatened by the potential for injury or loss of life from hazard tree strikes, falling rocks, stump holes, flooding, debris flows and other burned area hazards. The risk level is very high.

BAER Treatments:

- Area closure to reduce risk from fire hazards, including flooding, debris flows, snags, stump holes falling rocks and other hazards and reevaluate post monsoon season.
- Public outreach of hazards
- Removal of hazard trees at developed sites.
- Closure of Bonito Amphitheater and O'Leary Trailhead and reevaluate post monsoon season
- Road and trail hazard signage

Road Infrastructure Assessment

BAER Team Findings:

- The risk to road infrastructure is associated with flooding and debris flows damaging roads and making them impassable by vehicles, as well as the damage to road drainage structures.
- The BAER risk rating to the loss of transportation infrastructure on Forest Service Road (FSR) 552 (Inner Basin Road), FSR 420 (Schultz Pass Road), and FSR 556 (Elden Springs Road) is very high and is very likely to occur.
- The BAER risk rating to the loss of road infrastructure on FSR 146 (waterline road), FSR 553 and 6437 is very high and is very likely to occur as well. These roads are also important to the City of Flagstaff for access to the Inner Basin water pipeline.
- The BAER risk rating to loss of road infrastructure on FSRs 743, 545B, and FR9128F and is very high and is very likely to occur as well. This series of roads are also important for Transwestern gas pipeline access.
- The loss of road infrastructure on FSR 545A and 546 is high and these roads do also provide access to Arizona Public Service (APS) powerline. Loss of road infrastructure and APS access on FSR 418 is intermediate.
- FSR 6064 has a low BAER risk rating while the BEAR risk rating remaining roads within the Pipeline Fire scar is very low.

BAER Treatments:

- Storm inspection and response on FSR 552, 420, 556, 418, 545A, 743, 865, 9128F, and 556A keeps drainage features functional by removing accumulated sediment and debris between or during storm events.
- Removal of existing culverts on FSR 420 at MP 0.53 and 8.91, FSR 556 at MP 4.27, FSR 552 at MP 0.91, and FSR 418 at MP 0.74 are needed to protect the road prism from damage and potential loss during post-fire runoff events.
- Low water crossings (LWC) will need to be inspected and cleaned after each significant storm event. FSR 546 has two LWC at MP 0.16 and 2.12, and FSR 556 has three crossings at MP 3.97, 4.16, and 4.21.
- Storm proofing on FSR 552, 420, 556, 146, 553, 6437 are designed to protect the road from flood events.
- Install Road Hazard signs along FSR 552, 420, 556, 146, 418, 553, 6437

Recreation Trail Infrastructure Assessment

BAER Team Findings:

- There is a high risk to approximately 7.76 miles of trails within the burned area. The post-fire risk to approximately 7.76 miles of trails is flooding and debris flows compromising or destroying water drainage structures on trails, washout and loss of small sections of trails that will make the trails unusable and unsafe.
- The following trails are in areas of high and moderate burn severity where the likelihood of flooding events is very high with a corresponding high-risk rating to the trails: Arizona Trail, Secret, Weatherford, Moto, Inner Basin, Newham, Kachina, Kachina Access, Deer Hill, and Waterline.

BAER Treatments:

• Trail storm proofing is recommended to protect trail infrastructure within the burned area. The work would include rapid trail benching and removing backslope sloughing to keep the trail alignment identifiable

Natural Resource Assessment

Native Plant Communities

BAER Team Findings:

- Within burned areas of the Pipeline Fire, there is an increased risk to native or naturalized plant communities on NFS lands from invasive species and other weeds including Yellow Bluestem, Whitetop, Musk thistle, and Teasel. Eradication is only possible for these species if the plants are documented and treated early and before they are allowed to get established. The risk rating is high.
- Within suppression features such as hand and dozer firelines, camp spots and staging areas, there is an increased risk to native or naturalized plant communities on NFS lands from invasive species and other weeds including existing populations of scotch thistle, diffuse knapweed, dalmatian toadflax as possible weed species that will likely take root in suppression activity disturbed areas within or adjacent the burned area due to their distribution on other areas of the forest. Yellow Bluestem, Whitetop, Musk thistle and Teasel are species that are not found or found in limited distribution on the Coconino National Forest. The risk is high.
- There is an increased risk to native or naturalized plant communities on NFS lands from invasive Diffuse knapweed and Dalmation toadflax populations within the fire perimeter that have had their spread controlled through the use of biocontrol species prior to the Pipeline Fire. The fire has removed the biocontrol creating a corresponding risk rating of high for noxious weed spread.

BAER Treatments:

- Implement Early Detection Rapid Response (EDRR) measures within the general fire area. EDRR measure include monitoring for detection, treatment as soon as populations are found by either pulling and removal or spot herbicide treatments. Seeding with native species to outcompete natives will be accomplished on and around snow events for greater germination rates.
- Implement Early Detection Rapid Response (EDRR) measures within areas that had fire suppression efforts such as hand and dozer firelines, camp spots and staging areas. EDRR measure include

monitoring for detection, treatment as soon as populations are found by either pulling and removal or spot herbicide treatments. Seeding with native species to outcompete natives will be accomplished on and around snow events for greater germination rates.

• Implement biocontrol releases for controlling Dalmatian toad flax and Diffuse knapweed infestations are proposed to be conducted over a total of 2 entries during 2022 or Spring 2023 depending on insect availability.

Critical Terrestrial, & Aquatic Wildlife, & Rare Plants

BAER Team Findings:

- There are 16,340 acres of MSO Critical Habitat within the fire perimeter.
- Fire burned through 4 PACs. The risk that post-fire erosion and flooding could impact the habitats is low.
- No other known Federally listed threatened or endangered species exist within the fire boundary.

BAER Treatment:

No treatments proposed.

Cultural Resources Assessment

BAER Team Findings:

- Eight cultural resource sites eligible for the National Register of Historic Places (NRHP) are threatened by post-fire erosion, flooding, falling hazard trees, and tree uprooting. The risk rating is very high.
- The risk for loss of intact subsurface cultural deposits from erosion, flooding, and uprooted trees on the remaining known 403 sites and San Francisco Peaks Traditional Cultural Property is also very high.
- Due to the rapid response requirements of BAER only 21 of the 411 sites within the Pipeline fire were assessed for emergency treatments.

BAER Treatment:

• Directional felling of dead and standing/fire-killed trees at all eight sites.

For more information concerning the Pipeline Fire BAER efforts, please see the <u>Pipeline BAER InciWeb</u> page and the <u>Coconino National Forest Facebook</u> page.

Appendix A-Soil Burn Severity Map for the Pipeline Fire





Pipeline Fire Soil Burn Severity, Subwatersheds and Modeled Basins