

Umpqua National Forest Burned Area Emergency Response Summary – Archie Creek Fire October 22, 2020

The Archie Creek Fire was detected on September 8, 2020 at approximately 7:30 a.m. in the Steamboat Springs area along Highway 138, east of Glide, Oregon. On September 10th, 2020, it merged with the Star Mountain Fire in the Susan Creek area. The fire burned on the North Umpqua Ranger District of the Umpqua National Forest, the Roseburg District of Bureau of Land Management, private timber land, and through the communities of Rock Creek and Steamboat along both sides of the North Umpqua River and the Rogue-Umpqua Scenic Highway. The fire is currently 131,542 acres and 95% contained (as of 10/22/2020). Approximately 64,622 acres were private property, including private timber land and residences. Forest Service lands accounted for 26,490 acres, and BLM accounted for 40,391 acres.

The Forest Service assembled a Burned Area Emergency Response (BAER) team on September 26, 2020. This team of experts in soils, geology, hydrology, engineering, botany, recreation, archaeology, wildlife, fisheries, and GIS, began assessing the post-fire effects to critical values on Forest Service lands. BAER critical values include Life and Safety, Natural Resource, Cultural Resources, and Property. The team developed a Soil Burn Severity (SBS) map to document the degree to which soil properties had changed within the burned area. Fire damaged soils have low strength, high root mortality, and increased rates of water runoff and erosion. Using the SBS map, BAER team members ran models to estimate changes in soil erosion, stream flows (hydrology) and debris flow (geology) potential. The models compared pre-fire conditions to predicted post-fire conditions to determine relative changes. The BAER team used model outputs to determine the relative risk to critical values and create recommendations to address emergencies. Below is a summary of the findings of each resource area.

SOILS

Soil burn severity was high across 27% of the fire area on USFS lands. Where high severity overlaps with steep terrain, we expect high erosion rates due to topography, lack of ground cover, and erosion modeling results. Slumps and slides, natural to the area, will likely accelerate. While soil loss will likely result in long-term effects to soil productivity, most of the soils are resilient and have good potential for recovery based on decomposition rates and



observed recovery from past fires on the Umpqua National Forest. Where SBS was moderate (45% of fire area on USFS lands), needle casts remain in the trees which, once they drop, will support water infiltration into the soil profile and nutrient replenishment. The BAER team does not recommend any soils treatments because hillslope treatments designed to reduce soil erosion would be ineffective on the very steep hillslope in the fire area.

GEOLOGY

A large portion of the Archie Creek Fire experienced moderate to high burn severity, amplifying the risk of rockfalls, debris flows, and landslides in the next several years. Rockfall activity typically occurs during and immediately after a wildfire. Hazards associated with debris flows, however, may persist for several years. Sediment accumulation in stream channels will not be activated until a high intensity storm event triggers enough stress to initiate debris movement. Likewise, shallow- and deep-seated landslides initially prompted by fire activity may take years to develop.

In general, roads and trails that cut into hillslopes are at risk of rockfalls, especially in areas with steep slopes (>40%) and moderate to high burn severity. Fire activity intensifies the risk of rockfall by removing stabilizing vegetation and exposing loose rocks to falling trees. Values near stream channels (e.g. roads, trails, recreation areas, water infrastructure, and fish habitat) are at risk of experiencing debris flows. Runoff, overland flow, and discrete mass wasting events can prime a channel for a debris flow by delivering material into valleys and streambeds during and immediately after a fire. Fire-related debris added to the channel magnifies the hazard. Moderate and intense rain events can initiate debris movement within the channel. Subsequent transportation of the debris slug can put downstream values at risk.

HYDROLOGY

The hydrologic response resulting from the Archie Creek Fire has the potential to damage values both within and downstream of the fire. Hydrology modeling showed significant peak flow increases throughout the fire



area. Flooding resulting from increased peak flows can affect public safety and infrastructure on roads, trails, and campgrounds in the riparian areas and municipal water supplies.

The high and moderately burned areas have already delivered soil, rock, and burned woody debris to drainage ditches and road surfaces. Even ordinary winter runoff will exceed the capacity of some ditches that become blocked by wildfire debris. Water diverted from stream channels can cause erosion,

road fill failures, and landslides. Within the fire boundary, culverts have the potential to be compromised especially in areas where moderate and high burn severity occurred.

Water quality and aquatic habitat will also likely be impacted by increased sedimentation and elevated peak flows as a result of soil hydrophobicity and groundcover consumption, especially during the first wet season. This impact is expected to be significant at times and will dissipate as vegetation and other groundcover increases. Furthermore, the North Umpqua and its tributaries are on Oregon DEQ's 303(d) list of impaired streams because of excessive water temperatures. Due to the loss of canopy cover from the Archie Creek Fire, we anticipate that stream temperatures will increase. Significant increases in stream temperatures are expected to stress aquatic flora and fauna. Long-term stream temperature monitoring will continue on the North Umpqua and several of the affected tributaries to monitor current and future stream temperatures for the overall health of the watershed.

FISHERIES

Within the Umpqua National Forest, the burned perimeter of the Archie Creek fire includes 465.9 miles of streams (170.6 miles perennial and 295.3 intermittent), of which 45.5 miles are designated as fish-bearing. The burned perimeter contains 16.7 miles of Designated Critical Habitat for Oregon Coast Coho salmon and a total of 18.3 miles of suitable occupied habitat for Coho salmon. Other native species with suitable occupied habitat include Chinook salmon, steelhead trout, cutthroat trout, and Pacific lamprey.

Due to a combination of amplified surface runoff, steep gradients, and fine to coarse textured streams, we expect that widespread streambank instability and channel bed scour will occur in streams within the Archie Creek fire perimeter. Mobilization of woody material within channels is expected especially where large pieces have been burnt, weakened, or broken. Anticipated downstream effects include significantly elevated peak flows in tributaries, periods of very high turbidity, and warmer summer water temperatures within the fish bearing and perennial tributary streams. Impacts to water quality and fisheries are being address by treatments discussed below in the engineering and recreation sections.

ENGINEERING

The fire burned approximately 109 miles of road at various soil burn severities. Approximately 10 miles of Hwy 138 (National Scenic By-way) was also impacted. Hwy 138 (managed by ODOT) serves as a major east-west transportation artery for the local communities surrounding the Umpqua National Forest. The watersheds burned in the Archie Creek Fire will exhibit varying degrees of response through increased runoff rates and erosion rates, increased sediment and debris transport. This creates a future concern for roads, culverts, bridges, and channels along the drainage paths of the burned watersheds in that they may be plugged, overtopped or washed away more frequently than experienced when the watershed was in its pre-fire condition. Debris slides and flooding also present increased danger to structures that remain in the



floodplains.

Treatments include ditch and culvert inlet cleaning, improving road surface and ditch drainage, storm patrol, removal and replacement of undersized stream crossing culverts, and construction of armored grade dips. Further, increasing cross ditching drainage will reduce the risks of fill slope landslides by reducing the volume of water concentrating at any given point. Storm inspection and response during or immediately after significant rain events to check for culvert plugging or other road drainage problems will also help to protect the road infrastructure.

RECREATION

The Archie Creek Fire impacted the most popular recreation area on the North Umpqua Ranger District, including trails, trailheads, campgrounds, and raft launch sites. The fire affected many recreational opportunities and infrastructure, and has created risks to human life and safety. Administrative closures, warning signs, and hazardous tree removal are all safety treatments that we will conduct in the fire area. Crews will install additional drainage structures on trails affected by fire to prevent further loss of trail tread. Hazardous debris removal in the developed recreation areas and removal of burned trail bridges will mitigate impacts to water quality and reduce risk to the public.



BOTANY

Aggressive perennial invasive plants are present within the burned area, primarily on travel routes and powerline corridors. These infestations are within or adjacent to burned areas. Unique habitats identified by the forest and several fungi species populations important for old growth forest structure were also located in areas that burned in the high and moderate severity.

Invasive plants are highly adapted to take advantage of early seral conditions created after fire and will outcompete native plants for resources. While areas away from travel corridors are mostly weed free, dense populations of meadow knapweed and perennial peavine line the primary corridor (Hwy 138) and nearly all auxiliary forest roads used for accessing the fire. Many other infestations of invasive plants are also present in these travel corridors. These invasive plant infestations could have considerable long-term effects with eventual displacement of native plants. Spread of invasive plants into uninfested areas due to conditions created by the fire threaten native plants with direct competition for resources including water, nutrients, above and underground growing space, allelopathy, changes in microhabitat, and direct suppression and



mortality. This could lead to decreases in native plant diversity and shifts from diverse native plant communities to non-native invasive plant dominance. This could also lead to a loss of local plant populations, reduced species viability, and loss of important habitats such as both wet and dry meadows. Preventing invasive plants from establishing in weed-free burned areas is the most effective and least costly management method. This will be accomplished through early detection and eradication by careful monitoring and treatment.

CULTURAL RESOURCES

Nine cultural resource sites were identified as critical values within the Archie Creek Fire (five precontact sites, one historic site, and three multicomponent sites). These sites include lithic scatter sites (precontact) and refuse scatter sites (historic). When there are both precontact and historic refuse scatter sites, they are labeled multicomponent. Over half of the nine total sites experienced a high severity burn, causing irreversible loss of archaeological data due to the effects of the fire. However, components of these sites still remain intact.

Upon evaluating all of the cultural resource critical values the probability of damage or loss was found to be very likely due to the lack of protective cover and the risk of erosion. Treatments are being recommended for five of the nine sites. Treatments are targeted to limit the risks at each site. These treatments include seeding, administrative closure of a road, directional felling of trees to reduce erosion and limit visibility, camera surveillance, and monitoring.

CONCLUSION

The BAER team has identified imminent threats to critical values based on a rapid scientific and engineering assessment of the area burned by the Archie Creek Fire. The team took significant precautions to minimize exposure to COVID-19, and conducted the assessment using the best available methods to analyze the potential for flooding and debris flows. The findings provide the information needed to prepare and protect against post-fire threats. The Forest Service will continue to provide information and participate in inter-agency efforts to address threats to public and private values at risk resulting from the Archie Creek Fire.

