

# Lime Belt Fire: BAER Briefing



November 15, 2015

Okanogan-Wenatchee National Forest  
215 Melody Lane  
Wenatchee WA 98801



## Fire Background

The Lime Belt Fire started on August 14, 2015 and burned 133,438 acres of the Okanogan watershed in central Washington. Of the total fire area, 11,483 acres were National Forest System lands and 61,595 acres were privately owned lands. Approximately 25 percent of the burned area in the South Fork Salmon Creek subwatershed was classified at moderate or high burn severity.

The Central Washington Burned Area Emergency Response (BAER) team on October 15 submitted a request for \$40,900 for risk-mitigation projects to improve road drainage, install Automated Local Evaluation in Real Time (ALERT) storm warning systems, initiate storm patrols, and install burned area hazard signs and gates.

Surface erosion and mass wasting are inherent hillslope processes accelerated by disturbance – principally wildfire or intense precipitation and high runoff. Erosion is accelerated when effective ground cover and protective forest canopy have been removed, or when runoff is locally concentrated.

Risks of debris-laden flows are higher on steep slopes, and those with shallow soils in first- and second-order headwater drainages (such as the tributaries of South Fork Salmon Creek) are most prone to these hazards. Elevated risk is also possible in drainages with heavier deposits of unconsolidated ash and pumice-derived soils. The probability of debris flows is relative to hillslope steepness and landform morphology, the extent of upslope burned area, and notable precipitation. Debris flow likelihood and severity can be exacerbated by the removal of protective forest canopy and fire-diminished root strength.

Heavy precipitation and runoff are associated with seasonal storms; however, rapid snowmelt can also contribute excessive water to susceptible slopes. Debris-laden flows



are usually associated with steep drainageways and channels where sediment is routed downslope.

Locations of particular concern in the Lime Belt area include the upper basin of South Fork Salmon Creek, along with smaller east-facing drainages in the Schalow Mountain area where the steep headwaters were severely burned. As gradient decreases in both the valley bottom near Fish Lake and in the main valley bottom of the South Fork Salmon Creek, likelihood of debris-laden flows is reduced but could lead to the development of sediment-laden flood surges and/or hyperconcentrated flows. Structures on alluvial fans, or along streambanks and/or floodplains are at increased risk of damage from flooding and flood-mobilized debris; area reservoirs could also receive large volumes of sediment.

Contiguous patches of the fire area experienced moderate to high soil burn severity; notable patches include the upper slopes of Salmon Creek. The potential is very high for accelerated erosion-transported sediment reaching these streams. Cumulative bulking of eroded materials from these slopes – combined with deposits that now exist in the channel – will probably increase runoff and flooding to the stream channel by an order of magnitude. Property and infrastructure such as roads below these drainageways are at risk if runoff of sufficient magnitude occurs, particularly along the upper reaches of Salmon Creek.

Of the basins on NFS lands in the Lime Belt Fire, the headwaters area of South Fork Salmon River below Buck Mountain is most affected by the fire. Smaller tributary headwaters in the Schalow Mountain area also experienced high burn severity. Based on Burned Area Reflectance Classification (BARC) mapping and field reconnaissance, the upper basin of South Fork Salmon Creek and northeast-facing drainages off Funk Mountain experienced high severity burns. Areas of concern include a few private residences above Conconully Reservoir and the Sugarloaf Campground in the Schalow Mountain area.

Increased threats to human life and safety were identified during a survey conducted by the BAER team; they found that the fire burned around the perimeter of Sugarloaf Campground and its access road. One cement toilet building at Sugarloaf should be pumped to reduce health risks.

Increased threat of damage to trail systems and other USFS property exists from soil erosion and flooding. The hiking trail (#356) to Beaver Lake experienced 0.38 miles of moderate severity burns. Schalow Trail #361 shows 0.36 miles of moderate severity burn. Not all trails were surveyed because of time constraints, and further assessment by the District will help determine which trails should be closed for public safety. These trails are not only valued by recreational users but are also important to the economy of neighboring communities.

Along with these trails, 6.85 miles of groomed snowmobile routes exist within or near the perimeter of the fire. Of the 6.85 miles, 2.7 miles were burned at moderate to high severity. Hazard trees along the burned trails, and near Sugarloaf Campground and the snowmobile routes, pose threats to public and employee safety.

All roads in the burned area are at risk of falling rocks or trees on roadways, along with blocked culverts and debris-laden flows that could block roadways or result in loss of road sections.

Water quality in the area will be negatively affected by ash, sediment, and debris; sediment is likely to flow through burned area streams into the Okanogan River and beyond. Post-fire effects to the Okanogan watershed could include increased water

temperatures, peak flows, and channel scour, along with localized landslides and debris flows.

Two cultural resource sites lie within the Lime Belt Fire perimeter. Mountain Lookout, which sustained minimal fire damage to the wooden tower supporting the cab, is owned by the Department of Natural Resources (DNR) but is under a Forest Service permit. The second is a lithic scatter in an area of low to no burn severity adjacent to the road accessing Funk Lookout. The two sites within the fire perimeter will be monitored by a cultural resource specialist. No BAER treatment is needed for cultural resources located within the Lime Belt Fire perimeter.

Soil loss caused by post-wildfire erosion in some areas will result in a long-term loss of soil productivity. Natural recovery of ground cover vegetation is likely over the next 3-5 years, but in areas that were severely burned, pre-fire conditions may not be restored until a new forest stand is established.

Planned Forest Service emergency treatment projects within the Lime Belt Fire area focus on the safety of travel on roadways, within recreation sites, and along trails within and downstream of the burn area.

Rather than focus on slope treatments, the team concluded that higher priority treatments would best focus on protecting roads and infrastructure. These treatments are believed to have greater potential for success than hillslope treatments.

The Forest Service will coordinate with county governments, the Natural Resources Conservation Service, and the National Weather Service to provide information about the increase in flood risk to those below the fire area, with information about the safety of traveling on county and forest roads within and downstream of the burn area. Post-fire work will also include signage, temporary area closures, fire closure signs, and installation of precipitation monitoring stations and ALERT stations.

Other planned projects will ensure safe access within the drainages and reduce road-related hazards. Some road work, such as pulling culverts on Forest Road 42 and installing drain dips, will reduce the risk of runoff downstream of the fire and address safety issues where debris flows meet drainage structures.

### **Questions?**

Check for updates on the BAER team website at [CentralWashingtonFireRecovery.info](http://CentralWashingtonFireRecovery.info) or call the Okanogan-Wenatchee National Forest office at 509-664-9200.