

## BLACK CANYON FIRE: FS-2500-8 Burned Area Report Summary



October 24, 2015

Okanogan-Wenatchee National Forest  
215 Melody Lane  
Wenatchee WA 98801



### Fire Background

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The Black Canyon Fire started on August 14, 2015 and burned 32,735 acres of National Forest System lands on the Chelan and Methow Ranger Districts of the Okanogan-Wenatchee National Forest. The lightning-caused fire grew rapidly and exhibited extreme fire behavior during the first several burn periods, attributed to the combined effects of extremely dry conditions, topography, and high winds.



The Black Canyon Fire was included in the Chelan Complex, which was initially four separate fires: Reach, Antoine, McFarland, and Black Canyon. The combined fires burned a total of 88,974 acres on federal, state, and private lands near the communities of Chelan, Methow, and Pateros.

On October 15 the Central Washington Burned Area Emergency Response (BAER) team completed a report of their assessment of the burned area, and requested initial funding of \$163,300 for recommended emergency treatments. The report was submitted to the Pacific Northwest (Region 6) Regional Forester in Portland, Oregon.

### FS-2500-8 Burned Area Report: Analysis

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#### Physical Characteristics of the burned landscape:

**Geology:** Foliated crystalline igneous rocks / gneiss and schist / plutonic igneous formations of granite and granodiorite (Davis et al. 2004).

**Soils:** Volcanic ash cap soils, rock outcrops, and rubble lands.

**Vegetation:** Ponderosa pine, Douglas-fir, Bluebunch wheatgrass.

**Transportation System:** 15.8 miles of trails and 111 miles of road.

## Analysis Overview:

On September 21 the U.S. Forest Service Remote Sensing Application Center (RSAC) in Salt Lake City, Utah, provided the BAER team with an initial Burned Area Reflectance Classification (BARC) map derived from a LANDSAT 8 scene acquisition. The team conducted reconnaissance and field verification surveys to finalize a soil burn severity map for this fire.

The BAER team assessed 32,735 acres burned on National Forest System (NFS) lands and estimated classified 6,338 acres (19% of the burned area) at very low or unburned, 10,579 acres (32%) burned at low burn severity, 11,006 acres (34%) at moderate burn severity, and 4,813 acres (15%) at high severity.

Field assessments of the burned area indicated that about 8,662 acres exhibit a strong water-repellent tendency; these acres were associated with the high soil burn severity areas and about half of the moderate burn severity areas.

The team identified an estimated soil erosion potential of 22 tons per acre from a 25-year/1-hour storm event of 0.73 inches, compared with a pre-fire rate ranging from 0.18 to 0.47 tons per acre. This increased erosion can cause downstream sediment delivery that bulks flows, resulting in increased flooding effects.

The Black Canyon Fire burned across multiple watersheds on NFS lands – the Lower Methow River, Swamp Creek, and the Columbia River. The fire also burned in the Lower Lake Chelan Watershed and negatively affected private, state, and BLM lands. The main drainages are Black Canyon, McFarland, Squaw, Antoine Creek, and Gold Creek.

A portion of the Lower Methow River watershed burned within the 2014 Carlton Complex area. This fire burned 17% of the Gold Creek watershed, 5% of the South Fork of Gold Creek, 33% of McFarland, 49% of Squaw Creek, and 41% of the Black Canyon subwatersheds.

Additional sediment delivery could impair critical habitat for Threatened and Endangered (T&E) species. The loss of soil can negatively affect soil productivity in both the short- and long-term future.

Natural recovery of ground cover through needle cast and native vegetation is expected to occur over the next 3-5 years. Under severely burned forest stands, the full function of the thick litter and duff layer that existed before the fire will not be fully restored until a new forest stand is established. During the 2015 field surveys, the BAER team noted good revegetation in parts of the adjacent 2014 Carlton Complex burn area.

## Identified Values at Risk

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Threats to the values at risk listed below were analyzed by the BAER team for effects of increased water flows, loss of water control, increased sediment delivery and debris flow, establishment of invasive weeds, and habitat degradation for federally threatened species.

### **Threats to Public Safety:**

The team identified increased threats to public safety and property from post-fire conditions. The soil burn severity map shows 15% of the fire area at high severity and 34% at moderate severity. Areas of high and moderate burn severity are at risk of flooding, sedimentation, and debris-laden flows. During the first year after a fire, moderate burn severity areas typically exhibit a response similar to that of high burn severity areas.

Threats to public safety from flooding, falling trees, rocks, and debris-laden flows exist in valley bottoms and in steep burned drainages throughout and downstream of the burned area.

### **Threats to Property:**

Threatened areas include Forest Service roads, bridges and culverts, and recreation sites, along with private homes and other structures in valley bottoms adjacent to or in flood-prone areas or near stream channels. These sites are at increased risk of flooding and debris flows.

### **Threats to Natural Resources:**

Threat to soil productivity is considered low. Sampling of post-fire soil burn severity and effective ground cover along transects indicated the presence and abundance of near-surface intact fine roots. Soil burn severity was usually deemed low in these areas, despite high burn intensity during the fire. Seeds, fungi, rhizomes, and pliable roots just below the surface indicate that the natural recovery of these sites could be relatively rapid, i.e. within one or two growing seasons). Natural recovery of effective ground cover in these areas is therefore the most efficient and cost-effective approach to emergency stabilization; natural recovery also minimizes exposure to safety hazards.

### **T&E Species and Critical Habitat:**

The Methow River supports runs of Upper Columbia River summer steelhead (threatened), Upper Columbia River spring Chinook salmon (endangered), Columbia River bull trout (threatened) and their designated Critical Habitat, as well as Coho salmon, cutthroat, redband/rainbow trout, and Pacific lampreys. The Black Canyon Fire burned in the Lower Methow watershed (HUC 5); in this area the Methow serves primarily as a migration corridor for spring Chinook – they spawn in the middle and upper reaches of the Methow River. Steelhead spawning and rearing does occur in the lower Methow and select tributaries including South Fork Gold and Black Canyon; however, similar to spring Chinook, the steelhead's major spawning aggregation is in the middle and upper reaches of the Methow. Resident rainbow in Rainy and Squaw creeks may also contribute to the lower Methow steelhead population. Gold Creek and tributaries are the primary stronghold for local bull trout populations and provide most of the spawning and rearing habitat for these fish.

The probability of fine sediment or a debris flow from the Black Canyon Fire negatively affecting ESA-listed fish or their habitat in Black Canyon Creek, South Fork Gold Creek, Squaw Creek, or the lower Methow River is a likely (50% to <90%) occurrence within 1-3 years. The expected magnitude of consequences is moderate (damage to critical fisheries resources resulting in considerable or long-term effects) in Black Canyon and South Fork

Gold creeks, and is considered minor (minimal, recoverable, or localized effects) in the lower Methow River. The risk level is deemed high for Black Canyon and South Fork Gold and low in the lower Methow.

### **Threats to Cultural and Heritage Resources:**

There is one unevaluated cultural resources site identified within the fire perimeter, but the threat to the site is assessed as very low.

## **Recommended Emergency Mitigation Treatments**

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### **Objectives:**

- Mitigate negative effects of post-fire watershed response to human life and safety, particularly where Forest roads, bridges, and cross drainages are at risk of damage and where flooding and debris-laden flows present hazards to road users and recreational users.
- Coordinate with state, county and Natural Resources Conservation Service (NRCS) on post-fire effects on downstream values at risk.
- Reduce the potential for road-related surface/mass erosion and accelerated sediment delivery to downstream high-value fisheries habitat, private water supplies, and private dwellings.
- Reduce the potential for roads to act as a conduit for overland flow and increased sediment loading.

### **Land Treatments:**

- No land treatments proposed. Early detection and rapid response for invasive species may be requested later if warranted.

### **Channel Treatments:**

- Install three trash racks: one on FS Road 4010 and two on FS Road 4010-050.

### **Roads and Trails Treatments:**

- Warning/Closure signs for snowmobile trails and Sno-Parks at Echo Ridge, Antilon, Black Canyon, and South Fork Gold Creek.
- Road stabilization on FS Roads 4330, 600, 270, 100, 4010, 4010-050 (drainage dip and armor the downside face).
- Fabricate/purchase and install gates controlling access on FS Roads 4330, 8020, 200, 270, 100, 4010, 8140, 8020, 8010-130, 8010-131, 8200, 8021, 8140, and 8210.
- Temporary closure for trails on FR 8010 (Echo Ridge, 1291 and 1294)
- Install drainage dip at location of melted culvert FR 8020.
- Storm inspection/patrol: Patrol area during and immediately after storm events to unplug or clean/improve road drainage features along FS roads to reduce the risk of catastrophic road drainage failure and high sedimentation yield. As the remaining open access for administration and the public, it is important to monitor roads; two-person teams recommended for patrols.

### **Protection/Safety Treatments:**

- Send coordination letters to Chelan County Manager, Okanogan County Manager, Chelan and Okanogan County Commissioners, and NRCS about potential increased run-off and sediment delivery onto lands under their jurisdictions.
- Install Warning/Closure signs at proposed gate locations.
- Work with the National Weather Service and Washington Department of Ecology to expedite permitting, location, and placement of Automated Local Evaluation in Real Time (ALERT) stations. An ALERT system provides real-time rainfall and flow/stage data to NOAA to evaluate the potential for flooding in specific areas.
- Ongoing interagency and public communications to share information and findings.

### **Monitoring:**

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These efforts and activities will focus on implementation monitoring to ensure that treatments are implemented as planned and prescribed. Some effectiveness monitoring for the area closure is included to determine whether further law enforcement presence or additional public information is needed to achieve compliance and provide for public safety.