

# FIRST CREEK FIRE: FS-2500-8 BURNED AREA REPORT SUMMARY



October 22, 2015

Okanogan-Wenatchee National Forest  
215 Melody Lane  
Wenatchee WA 98801



## Fire Background

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Following severe lightning storms that covered much of eastern Washington, a series of wildfires were detected in mid-August 2015.



The First Creek Fire started on August 14 and burned a total of 7,443 acres above the south shore of Lake Chelan, extending from the First Creek drainage to 25 Mile Creek, and encompassing several unnamed intermittent tributaries that drain directly into Lake Chelan. Of the burned acreage, 5,031 acres were on National Forest System lands within the Chelan Ranger District of the Okanogan-Wenatchee National Forest.

On October 15 a Forest Service Burned Area Report, including a summary of the Burned Area Emergency Response (BAER) team's assessment, recommended emergency treatments and requested initial funding of \$41,800 for emergency treatments. It 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:** Sedimentary, metamorphic (i.e. migmatite), and igneous (i.e. basalt, andesite, and rhyolite) intrusive volcanic and high-grade metamorphic rocks heavily modified by glaciers that carved bedrock and deposited sediments in the area now occupied by Lake Chelan.

**Soils:** Ashy loams and sands ranging from mesic to frigid, with some silt loams in mesic environments. Most soils within the fire area are influenced by andic properties.

**Streams:** The area includes 13.7 miles of stream channels that drain to Lake Chelan.

**Vegetation:** Subalpine fir, Engelmann spruce, lodgepole pine, larch, ponderosa pine, Douglas-fir, shrubland, and some transitional sagebrush grasslands.

**Transportation System:** The area includes 31.47 miles of roads (11.35 miles of Forest Service roads and 20.12 miles of non-Forest Service roads). There are no trails within the burned area.

### **Analysis Overview:**

On September 12 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.

BAER team assessment estimated that the 5,031 acres burned on National Forest System (NFS) lands includes 702 acres of high soil burn severity (14% of the burned area), with 1,672 acres of moderate soil burn severity (32%), and 1,556 acres of low soil burn severity/unburned (30%); about 450 acres were classified as rock.

Field assessments of the burned area indicated that approximately 2,670 acres were determined to have strong water-repellent tendency, which was associated with the high soil burn severity areas and half the moderate burn severity areas.

The post-fire area has an estimated soil erosion potential of 26 tons per acre from a 25-year/1-hour storm event of 0.88 inches compared with a pre-fire erosion rate of 0.45 tons per acre. The increased erosion can result in downstream sediment delivery that bulks flows, resulting in increased flooding effects. This additional sediment may impair critical habitat for Threatened and Endangered (T&E) species. The loss of soil can also impair soil productivity in the short- and potentially long-term future.

The burned area requires a recovery period of an estimated 3-5 years to re-establish vegetation. The major concern for vegetative recovery and, in turn, hydrologic recovery is in the high severity burn areas.

## Identified Values at Risk

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**Threats to the values-at-risk below are analyzed by the BAER team for potential impacts from increased water flows, loss of water control, increased sediment delivery, increased debris flow, establishment of invasive weeds, and habitat degradation for federally threatened species.**

The team used a risk matrix (Probability of Damage or Loss and the Magnitude of Consequences) to evaluate the risk level for each value identified during the BAER assessment.

### **Threats to human life and safety:**

Threats to life, safety, and property exist in valley bottom areas and in steep burned drainages throughout and downstream of the burned area. Residents and road users will be exposed to increased risk of flooding and debris flows. Houses and other structures, driveways, other private property, along with county and Forest Service roads in valley bottoms adjacent to or in the floodprone areas or near stream channels are at increased risk of damage caused by flooding and debris flows.

In several locations, structures and roads are sited on alluvial and debris flow fans at the outlets of severely burned gulches; these are at increased risk of debris-laden flows. Post-fire conditions in these areas pose a threat to public safety and property. Maple Creek, Slide Ridge, and a southern tributary to 25 Mile Creek drainages are expected to experience increases in post-fire flows by an order of magnitude. Culverts and other water conveyances may now be undersized; many will likely be unable to pass the flood flows.

### **Threats to Property:**

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Threats to roads and culverts, recreation facilities, private homes, and other structures in valley bottoms adjacent to or in floodprone areas or near stream channels are at increased risk of flooding and debris-laden flows. In several locations, structures and roads are located on alluvial and debris deposits at the outlets of severely burned drainageways.

South Lakeshore Road (Chelan County), along with Forest Service and private roads within or below burned areas are at risk of increased water runoff, sediment delivery, and debris deposits. Resulting impacts include damage to roads and/or loss of access caused by severe erosion of the road surface or deposition of sediment and/or debris. Increased risk exists for temporary loss of access/egress on major thoroughfares and on unpaved roads within and below the burned area. Any damage to or blocking of South Lakeshore Road, Forest Service roads, and/or private roads could compromise access for residents and emergency service providers. Forest Road 125 has inadequate cross-drainage for anticipated post-wildfire flows.

### Threats to Natural Resources:

The risk to natural resources such as soil productivity and hydrologic function is high. Probability is also high that rates of soil erosion and sediment delivery to stream channels will be significantly greater in moderate and high soil burn severity areas. This loss of water control, erosion, and sediment delivery may negatively affect Critical Fish Habitat near the burn area (see Executive Summaries for specifics).

### Values At Risk Evaluation

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The BAER team began assessment of post-fire emergencies on September 14. Since then the team has identified the following values at risk for post-fire threats. Interim reports may be submitted as additional assessments are completed.

The risk matrix below – Exhibit 2 of Interim Directive 2520-2014-1 – was used to evaluate the Risk Level for each value identified during assessment. Only values at risk with a risk of Intermediate or above are discussed.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

Values at risk	Risk and emergency
<p>Human life and safety on NFS roads.</p> <p>FR8410 is the main travel route in the burn area along Slide Ridge. Four culverts on FR 125 (ML2) have been blocked and overtopped. Additional culvert blockage and failure is expected. Portions of road prism could be lost with the culvert failures. FR 119 is an access road to a communication site. FR 234 closed road would remain closed. South Lakeshore Road (County Road) provides access to private homes and business along Lake Chelan.</p>	<p>Probability of damage or loss = Likely  Magnitude of consequence = Major  Risk = High  Emergency treatment needed = Yes  Emergency actions needed = Yes</p>
<p>Human life and safety at the Fields Landing Point recreation site.</p> <p>The threat to Fields Landing Point is intermediate for the southern loop of the parking area. There is a drainage with limited acres of moderate and high severity that flows directly to the parking area and a private residence nearby. The drainage is mostly rock.</p>	<p>Probability of damage or loss = Possible  Magnitude of consequence = Moderate  Risk = Intermediate  Emergency treatment needed = No  Emergency actions needed = Yes</p>
<p>Threats of property damage to NFS roads.</p> <p>All roads in the burned area may be affected in some way from ravel, rock fall, or trees blocking the roadway, culverts blocked and overtopped with and without embankment failure, debris flows depositing on the roadway or removing portions of the road prism. (With the exception of FR 234 which rated out as possible and Minor = L)</p>	<p>Probability of damage or loss = Likely  Magnitude of consequence = Moderate  Risk = High  Emergency treatment needed = Yes  Emergency actions needed = Yes</p>
<p>Threats of property damage to infrastructure at Fields Landing Point.</p> <p>The threat to Fields Landing Point is intermediate for the southern loop of the parking area.</p>	<p>Probability of damage or loss = Unlikely  Magnitude of consequence = Moderate  Risk = Low  Emergency treatment needed = No  Emergency actions needed = No</p>
<p>Threats of property damage to Fields Point Pumphouse.</p> <p>The threat to Fields Landing Point is intermediate for the southern loop of the parking area. The pump house is out of this area.</p>	<p>Probability of damage or loss = Unlikely  Magnitude of consequence = Moderate  Risk = Low  Emergency treatment needed = No  Emergency actions needed = No</p>
<p>Threats of property damage to Snowberry Campground.</p> <p>The threat of flooding and falling trees is unlikely for this recreation site.</p>	<p>Probability of damage or loss = Unlikely  Magnitude of consequence = Moderate  Risk = Low  Emergency treatment needed = No  Emergency actions needed = No</p>

Values at risk	Risk and emergency
<p>Threats of property damage to Pot Peak Trailhead. The threat from flooding and falling trees is unlikely for this recreation site.</p>	<p>Probability of damage or loss = Unlikely Magnitude of consequence = Moderate Risk = Low Emergency treatment needed = No Emergency actions needed = No</p>
<p>Threats to natural resources – hydrologic conditions. The threat (loss of water control) is exacerbated by a high proportion of high and moderate soil burn severity within the watersheds. The risk of flooding and erosion will increase because of the fire, creating hazardous conditions within and downstream of the burned area. These hazardous conditions may be worsened in the case of a rain-on-snow event, where long-duration rainstorms falling on a shallow snowpack can produce very high peak flows.</p>	<p>Probability of damage or loss = Very Likely Magnitude of consequence =  Risk = Major Emergency treatment needed = Yes Emergency actions needed = Yes</p>
<p>Threats to natural resources – soil productivity. Losses caused by erosion in high and moderate soil burn severity areas are likely to affect soil productivity. The extent and degree of changes are unknown. Loss of productivity caused by erosion is considered long-term, but recovery of hill-slope stability is likely within 3-5 years after the fire.</p>	<p>Probability of damage or loss = Likely Magnitude of consequence = Minor Risk = Low Emergency treatment needed = No Emergency actions needed = No</p>
<p>Threats to natural resources – essential fish habitat. Threats to landlocked kokanee salmon in First Creek, 25 Mile Creek, and Lake Chelan. Region 6 Sensitive Species Pygmy whitefish (Lake Chelan) and Westslope cutthroat trout.</p>	<p>Probability of damage or loss = Very Likely Magnitude of consequence = Minor Risk = Low Emergency treatment needed = No Emergency actions needed = No</p>
<p>Threats to natural resources – native or naturalized communities. There are populations of Diffuse Knapweed (Class B noxious weed) along the travel routes in the burn area. Nearby infestations of knapweed are likely to move into the burned area because of the wind-blown dispersal nature of the seed and the inability of the existing native seed bank to offer natural competition.</p>	<p>Probability of damage or loss = Likely Magnitude of consequence = Moderate Risk = High Emergency treatment needed = Yes Emergency actions needed = No</p>

## Recommended Emergency Mitigation Treatments

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### Emergency Treatment Objectives:

- Mitigate effects of changed post-fire watershed response on human life and safety, particularly where Forest roads and cross drainages are at risk of damage and where floods and debris-laden flows present a hazard to Forest Service visitors and road users on private roads and South Lakeshore Road.
- Coordinate with partner agencies to mitigate risk to human life and safety on roads and in downstream communities.
- Mitigate effects of changed post-fire watershed response on Forest Service developed sites such as campgrounds and administrative sites.
- Mitigate potential for loss or damage of road infrastructure within the burn area.

### Land Treatments:

No treatments proposed with this initial request.

### Channel Treatments:

No treatments proposed with this initial request.

### Roads and Trail Treatments:

Forest Road 125: Remove culverts along FR 125 that have the potential to be plugged, to provide uncontrolled overland flow with increasing sediment and debris loading and to prevent local road failure.

The road within the burned area may be affected by slope ravel, rock fall, cross-drain failure, culvert blockage or failure, or debris flows. Four culverts were identified as undersized to pass expected flows. The upper three culverts are currently completely plugged and the lower one is partially plugged.

### Protection/Safety Treatments:

- Send letters to Chelan County Manager/County Engineer, Chelan County Commissioners, City of Chelan, Washington Department of Fish & Wildlife (25 Mile spawning channel), Lake Chelan State Park, and Twenty-Five Mile State Park. Letters to inform recipients of potential increased runoff and sediment delivery onto lands under their jurisdictions.
- Storm patrol and inspection during and immediately after storm events to repair, unplug, or aid in drainage of road features along FS Roads.
- Warning signs will be posted at Fields Point boat loading area about risk of entering a Flash Flood Area. Fire closure signs will be posted at installed gates at the FS 125 intersections with FS 8410 Road that warn of danger trees, fallen rock, and debris/flash flood area.
- Place two temporary closure gates on Road 125 and post warning signs at key access points of the burn area to restrict the public from entering the burned area and prevent exposure to hazards of the burned area until conditions improve.

Work with the National Weather Service and Washington Department of Ecology to facilitate permitting, locating, and placement of two Automated Local Evaluation in Real Time (ALERT) stations for areas affected by the First Creek Fire. An ALERT system provides real-time rainfall and flow/stage data to NOAA to evaluate the potential for flooding in specific areas.

## **Field Monitoring:**

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Use of USGS landslide/debris flow modeling is limited in eastern Washington because of lack of calibration. Planned work with USGS and Washington DNR will allow placement of two recording rain gauges within or immediately adjacent to the burned area. Analysis and results will be managed by USGS and shared with the Forest Service and other coordinating agencies.

### **Post-wildfire rain gauges:**

The USGS Landslide Hazards Program requests permission from the Okanogan-Wenatchee National Forest to install three non-telemetered rain gauges as part of a 2-year research effort to improve predictions of post-wildfire debris-flow hazards. Two gauges would be installed in the 2015 First Creek Fire area. A third would be installed in the area of the 2014 Duncan Fire.