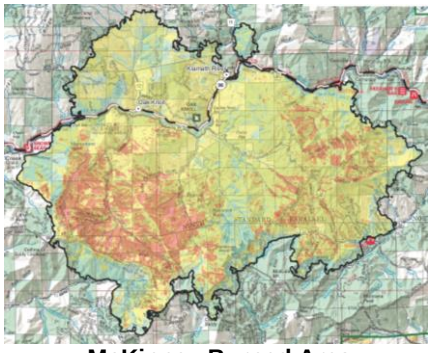
Klamath National Forest

Burned Area Emergency Response (BAER)

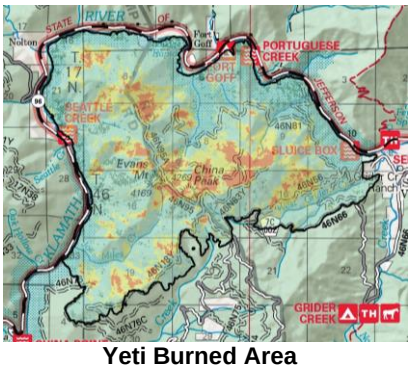
Post-Fire BAER Assessment

August 25, 2022 **BAER Information: (707) 853-4243**

MCKINNEY & YETI POST-FIRE SOIL BURN SEVERITY MAPS RELEASED



McKinney Burned Area



Yeti Burned Area

On August 18, 2022, Forest Service BAER team specialists completed their field data gathering on federal lands burned by the McKinney and Yeti fires. The post-fire maps and data display soil burn severity (SBS) categories of unburned/very low, low, moderate, and high.

For the McKinney Fire, the BAER team analyzed approximately 60,325 acres and its burned watersheds for the different levels of SBS. Approximately 22% of the total acres are either unburned/very low or low SBS, while 63% are moderate SBS and 16% are high SBS.

The BAER team's assessment shows the acreage for land ownership for the 60,325 acres to be:

- 39,316 acres of Klamath National Forest (NF) land, and
- 21,009 acres of private lands.

For the Yeti Fire, the BAER team analyzed approximately 7,879 acres and its burned watersheds for the different levels of SBS. Approximately 71% of the total acres are either unburned/very low or low SBS, while 21% are moderate SBS and 7% are high SBS.

The BAER team's assessment shows the acreage for land ownership for the 7,879 acres to be:

- 7,807 acres of Klamath National Forest (NF) land, and
- 72 acres of private lands.

The BAER assessment team used preliminary remote sensing data based on satellite imagery of the fire perimeter from August 18, 2022, with field-validated data collected over several days to produce the final McKinney and Yeti Post-Fire SBS maps.

The BAER assessment team coordinates with other local and federal agencies such as county and state officials, the State of California Department of Fish and Wildlife (CDFW), California Office of Emergency Services (CALOES), Natural Resources Conservation Service (NRCS), National Weather Service (NWS), and US Geological Survey (USGS) to share information about burned watershed conditions and their predicted response during certain rain events.

The SBS map products are an estimate of fire effects on soils and not a measure of direct effects to vegetation. SBS characterizes the soil surface and below-ground impact, whereas effects on vegetation are estimates of mortality based primarily on changes in vegetation canopy. The Rapid Assessment of Vegetation Condition after Wildfire (RAVG) program produces data describing post-fire vegetation conditions on federal lands. Changes in overhead and understory vegetation canopy are often used as initial indicators of overall vegetation burn severity, but do not necessarily coincide with SBS.

Changes in soil cover, water repellency, and soil physical/biological conditions guide the interpretations to determine the severity burn level of the soil. Water repellency can occur naturally in soil and may change as a result of fire. Fire can increase the strength and thickness (or depth) of water-repellent layers in soil, considerably affecting post-fire water runoff and possibly extending time for recovery of the burned area.

Soil burn severity indicators can be found within the Rocky Mountain Research Station's *General Technical Report 243 – Field Guide for Mapping Post-Fire Soil Burn Severity* https://www.fs.usda.gov/rm/pubs/rmrs_gtr243.pdf and are described below.

Low SBS generally occurs where surface organic layers are not completely consumed and are still recognizable. Structural aggregate stability is not changed from its unburned condition, and roots are generally unchanged because the heat pulse below the soil surface was not great enough to consume or char any underlying organics. The ground surface, including any exposed mineral soil, may appear brown or black (lightly charred), and the canopy and understory vegetation will likely appear "green." Lower risk for accelerated runoff, erosion, flooding, and debris flows is expected within and below these areas compared to moderate and high SBS.

In areas with moderate SBS, up to 80% of the pre-fire ground cover (litter and ground fuels) is consumed. Fine roots may be scorched but are rarely completely consumed over much of the area. The color of the ash on the surface is generally blackened with possible gray patches. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. The prevailing color of the site is often "brown" due to canopy needle and other vegetation scorch. Soil structure is generally unchanged. Where greater amounts of reduced soil cover and increased water repellency occur, increased overland flow of water from precipitation is expected, most notably in locations where the overstory canopy no longer exists.

High SBS occurs where all or nearly all the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) are consumed, and charring may be visible on larger roots. The prevailing color of the site is often "black" due to extensive charring. Bare soil or ash is exposed and susceptible to erosion, and aggregate structure may be less stable. White or gray ash (up to several centimeters in depth) indicates that considerable ground cover or fuels were consumed. Sometimes very large tree roots are entirely burned extending from a charred stump hole. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.

Generally, there is 100% tree mortality in forested areas with high SBS, and tree recovery will take many years without planting. In high SBS, the exposed bare soil is very prone to post-fire impacts. Rain events on damaged soil can cause excessive soil erosion, resulting in higher volumes of sediment delivery to adjacent creeks and rivers. There is increased likelihood for flooding and debris flows. These threats can individually or cumulatively increase the risk to human life and safety, property, infrastructure, and important critical natural and cultural resources.

The BAER team will use the McKinney and Yeti SBS data to analyze and model post-fire hydrologic response for each of the watersheds to determine if there are threats or risks to BAER critical values: human life and safety, property, critical natural resources, and critical cultural resources. The team shares its analysis with cooperating agencies such as CalOES, NRCS, and Siskiyou County who have the authority to work with private property owners downstream from the burned area that potentially may have post-fire threats from increased water and debris flows. The BAER team's analysis and findings will be documented in an assessment report that will be posted to each of the Post-Fire BAER InciWeb pages after the report has been reviewed and approved by Forest Service leadership.

The SBS maps can be downloaded at the "McKinney Post-Fire BAER" InciWeb site (*https://inciweb.nwcg.gov/incident/8345/*) or at the "Yeti Post-Fire BAER" InciWeb site (*https://inciweb.nwcg.gov/incident/8347/*) as a JPEG or PDF format image under the "Maps" tab.

For additional information about understanding SBS, see: Post-Fire Effects--Understanding Soil Burn Severity - InciWeb the Incident Information System (nwcg.gov).

BAER SAFETY MESSAGE: *Everyone near and downstream from the burned areas should remain alert and stay updated on weather conditions that may result in heavy rains and increased water runoff. Flash flooding may occur quickly during heavy rain events – be prepared to act. Current weather and emergency notifications can be found at the* ***National Weather Service*** *websites: www.weather.gov/sto/ and www.weather.gov/eka/.*

McKinney Post-Fire BAER Assessment information is available at: https://inciweb.nwcg.gov/incident/8345/
Yeti Post-Fire BAER Assessment information is available at: https://inciweb.nwcg.gov/incident/8347/