

Appendix B—Soil Burn Severity Field Data Sheet and Key

Soil Burn Severity Assessment Field Data Sheet			Fire name:					Observers:		
Date:		Site ID:		GPS coordinates:			BARC classification:			
Observation point	Ground cover (1)	Surface color and ash depth (2)	Soil structure (3)	Roots (4)	Soil water repellency (5)			Observed soil burn severity class (6)	Photo #	Other comments
<i>EXAMPLE</i>	<i>20 to 50%</i>	<i>white, 1 mm</i>	<i>no change</i>	<i>intact</i>	<i>l</i>	<i>3 mL</i>	<i>surf</i>	<i>Mod</i>	<i>23</i>	<i>homogenous</i>
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Average/majority for site (7)										
Site characteristics:		Aspect (deg):		Slope %:						
Slope length (ft or m):		Slope position:		Lower	Middle	Upper	Ridge	Other		
Soil texture class: clay loam, silt loam, loam		Dominant pre-fire vegetation type Chaparral Forest Sagebrush/grassland Other	Pre-fire vegetation density Low High Other	Vegetation comments:	Other notes:					
Surface rock %:										
Soil comments:										

This form is a guide for 10 observation points at a single field stop. It will not always be necessary to record 10 observations if site variability is low; however, if variability is high, more observations may be needed. The purpose is to quickly record information to document observations of soil burn severity and provide support and rationale for post-fire treatments. This form will also provide meta-data to describe site conditions. The data collected here may be used as inputs to hydrologic models.

You will have to use your professional judgment when estimating change from pre-fire conditions. Examine areas of similar soil and vegetation that have not burned and form your opinion as to the degree it has or has not been changed by the fire. An electronic copy of this form is available at <http://forest.moscowfs.l.wsu.edu/BAERTOOLS/>.

Data Form Columns:

(1) **Ground cover:** Record an estimated percentage of cover (greater than 50%; 20 to 50%; or less than 20%). Ground cover means effective organic cover as it pertains to mitigation of runoff and erosion and includes litter, duff, and woody debris.

Example: "20 to 50%"

(2) **Surface color and ash depth:** Include a brief note on color and depth of ash (inches or cm), if any.

Example: gray, 5 cm

(3) **Soil structure:** Has it changed from pre-fire structure? The most common change is from a granular structure in the surface horizon to a loose- or single-grained soil in areas where heat residence time was long and organic matter was consumed.

Example: "changed (loose)" or "no change"

(4) **Roots:** Have they been altered from pre-fire condition?

Example: "scorched," "no change," or "very fine consumed"

(5) **Soil water repellency:** Use the infiltrometer (I) or water drop penetration time method (W) and record volume of infiltration or how long water takes to infiltrate, respectively. If repellency is observed, note the depth tested (inches or cm).

Example: "I/3mL/at surface" or "W/25 sec/ at 1-2 cm"

(6) **Observed Soil Burn Severity Class:** Record the soil burn severity class at the observation point.

Example: "Unburned," "Low," "Moderate," or "High"

(7) **Average/Majority for Site:** Estimate the most frequent or average of the 10 observations.

Appendix E—Summary of Soil Burn Severity Class Factors

Adapted from the BAER Handbook (USDA 1995) by Alex Janicki.

Factor considered	Soil burn severity class		
	Low	Moderate	High
Aerial view of canopy	Tree canopy largely unaltered. Shrub canopy intact and patches of scorched leaves not dominant. Ash is spotty.	Tree canopy is scorched over 50% of area. Shrubs mostly charred but difficult to assess fuels from air. Black ash is visually dominant. Gray or white ash may be spotty.	Tree canopy is largely consumed over > 50% of area. Shrubs completely charred but difficult to assess fuels from air. Gray and white ash is visually dominant.
Vegetation	Nearly all of crown remains “green.” Some scorching in understory trees.	High scorch height. Generally, > 50% of crown is scorched. Mostly “brown” crowns with intact needles.	No needles or leaves remaining. Some or many branches may be consumed. Mostly “black” remaining vegetation.
Trees			
Shrubs	Scorching in canopy but leaves remain mostly green. Limited fire runs with higher scorch. 5 to 30% charred canopy.	30 to 100% charred canopy. Smaller branches < 0.5 inch (1 cm) remain. Shrub density was moderate or high.	90 to 100% charred canopy. Most branches consumed, including fuels < 1 inch (2.5 cm). Skeletons or root crowns remain. Shrub density was moderate or high. Often old growth in character.
Fine fuels (Grassland)	Scorched or partially consumed.	Mostly consumed. Appears black from the air. Small roots and seed bank remain intact and viable.	Not rated as high unless loss of seed bank is suspected or soil structure strongly altered.
Ground cover	Generally, > 50% litter cover remains under trees—less under shrub community or where pre-fire cover is sparse.	Generally, 20 to 50% cover remains or will be contributed by scorched leaf fall from trees. Shrub litter will be mostly consumed.	0 to 20% cover remains as burned litter and woody debris under trees. Shrub litter is consumed.
Water repellency	Soils may be naturally water repellent under unburned chaparral. Other soils will infiltrate water drops in less than 10 sec; greater than 8 mL min ⁻¹ with the MDI.	The surface of the mineral soil below the ash layer may be moderately water repellent but water will infiltrate within 10 to 40 sec; 3 to 8 mL min ⁻¹ with the MDI.	Strongly water repellent soils (repels water drops for > 40 seconds; less than 3 mL min ⁻¹ with the MDI) may be present at surface or deeper.
Soil	Original soil structure—fine roots and pores are unaltered.	Original soil structure—roots and pores slightly altered or unaltered. Soil color darkened or charred at surface or just below surface only.	Soil structure to 1 inch is degraded to powdery, single-grained, or loose. Fine roots are charred. Pores are destroyed. Black charred soil color common below thick ash layer. Compare with unburned.