Measuring Soil Burn Severity for Claims Office Compensation

Release Date: déc 18, 2024

Individuals whose land, including soil, trees, and vegetation, was impacted by the Hermit's Peak/Calf Canyon Fire may be eligible for compensation for resource land restoration.

Background

Soil Burn Severity (burn severity) is a measure of a wildfire's impact on ground surface characteristics, including char depth, organic matter loss, altered color and structure, and reduced water infiltration. Fire scorched landscape can increase the chance of erosion and flooding in the future. When measuring burn severity, the more acutely the soil is damaged, the more time and effort it will take to restore the land.

Individuals whose land was impacted by the Hermit's Peak/Calf Canyon Fire are eligible to apply for compensation through the Claims Office. The USDA Natural Resources Conversation Service (NRCS) works with the Claims Office to determine compensation for long-term restoration.

The U.S. Forest Service and the U.S. Geological Service developed a soil burn severity map for the areas affected by the Hermit's Peak/Calf Canyon fire. The Claims Office uses this map as a tool for **estimating** soil burn severity damages to assist with determining the price of treatments per acre to restore the integrity of the soil from the fire's effects, all while minimizing the administrative burden on claimants. The Claims Office has developed standardized rates to estimate fair compensation for loss of resource lands based on four burn levels. The burn severity map is used to determine the severity of the burn for each claimed property; the level of severity defines the standardized per-acre rate that qualifies for compensation.

Burn severity is categorized as high, moderate, low, or very low. The table below shows the key measurements researchers use to categorize burn severity, based on a USDA field guide. The high, moderate, low and very low/unburned[1] are all eligible for compensation.

Burn Severity	Measurements
High Burn Severity	▪ Soil structure is badly damaged and oxidized, with minerals, nutrients, and other matter burned away. ▪ Burnt soil is unable to absorb water, increasing the chance of erosion and flooding and resulting in the soil not being able to support trees and vegetation growth. ▪ Ground cover, such as plants, duff, twigs, leaves, and fine roots are consumed. ▪ Herbaceous plants and shrubs are almost completely charred or consumed above ground, often with notable branch loss on taller shrubs. ▪ Tree roots are visibly charred. Crown char is typically 100 percent from torching fire, and significant branch loss is present at the highest crown levels. ▪ Tree canopy completely consumed, with few or no needles or leaves left.
Moderate Burn Severity	▪ As much as 90% of the ground cover and underbrush is burned. Many trees are fallen, browned, and dead. Some shrubs have survived. The duff layer has burned evenly across, but not deeply. ▪ Up to 80% of their pre-fire surface litter layers consumed by fire. Black or gray ash may be present on the soil surface. ▪ Soils with moderate severity are more susceptible to erosion in post-fire rain events because they have lost protective surface cover and may have less surface stability because of root mortality. ▪ Fine roots near the surface may be burned. ▪ Tree canopy mostly consumed.

Burn Severity	Measurements
Low Burn Severity	▪ Ground surface, topsoil, appears lightly charred. ▪ Duff, woody debris and newly exposed mineral soil typically exhibit some change. ▪ Intermediate and large overstory trees may exhibit up to 25 percent mortality evidenced by crown char or scorch. ▪ Char height from ground flames is typically less than 3 meters. ▪ In low severity areas, burn may have been patchy, creating islands of green vegetation and intact canopies may be present. ▪ Tree canopy mostly unaltered. Slight scorch may be observed on 5% to 10% of canopy.
Very Low Burn Severity	▪ Low burn on vegetative, canopy, brush and root systems may still adversely impact the area by changing how much runoff is reduced, affect topsoil microbiome, etc. ▪ Soils after wildfire appears to be relatively undisturbed immediately after the fire but it then tends to deteriorate over the next few months. ▪ NOTE: When determining soil burn severity, the Claims Office evaluates unburned to very low burn soil burn severity as damage to the resource area's surface on the organic layer or substrates (as opposed to subsoil) during low burn intensity.

Additional Considerations

Burn severity is a specific measurement which includes GIS imagery, wind speed, fuel load, salt composition, humidity, slope, and soil analysis.

Additional information about burn severity and Claims Office compensation for burn severity, includes the following:

- Burn severity can vary within a property, with one portion of the land graded "highly burned" while another portion is only "moderately burned." These variations are reflected in the burn severity map.
- Fire damage may be less severe than it appears. For instance, the surface vegetation may be charred but the soil and root systems underneath were less

damaged by the fire.

- Soil burn severity considers tree canopy damage, because tree shade affects how well scorched ground will recover. However, it does not measure the number of trees heavily damaged or destroyed. The NRCS measures burn severity when examining fire-damaged properties for its conservation restoration plans, which include recommended treatments and compensation to cover losses and recovery costs.
- The Claims Office uses the burn severity map to review plans by NRCS and other third parties.
- The Claims Office considers the NRCS's restoration plan, including the assessed burn severity and suggested treatments, when determining compensation. A common recommended treatment is weed suppression to prevent invasive plants and unwanted scrub growing in place of trees.
- In general, the more severely soil is burned, the longer it will take to restore the landscape.
- The criteria used to determine burn severity and compensation do not vary between property types. Land owned by individuals, businesses, and government are evaluated by identical criteria when measuring burn severity.

Footnotes

[1] Unburned to very low burn organic soil burn severity is considered by the Claims Office to be damages to the resource area's surface which occurred on the organic layer or substrates (as opposed to subsoil) during low burn intensity.