

# Colorado State University Colorado State Forest Service

## Post-Fire Rehabilitation

*Long after the flames are out, land managers and community leaders continue to struggle with the impacts of wildfire on people and ecosystems.*

Since 2000, large wildland fires burned more than 700,000 acres of forests, woodlands and grasslands across the state.

In areas that experience low-severity burns, fire events can serve to eliminate vegetative competition, rejuvenate its growth and improve watershed conditions. But, in landscapes subjected to high or even moderate burn severity, the post-fire threats to public safety and natural resources can be extreme.

Public and private entities invest millions of dollars to implement emergency measures that protect people, communities and critical resources from post-fire events such as flooding, erosion, mudslides, hazard trees and related degradation of water supplies and storage facilities.

### Why Rehabilitation is of Concern

The post-fire condition of a burned landscape directly relates to the type and condition of the forest and the severity of the burn. Fire ecologists use the term burn severity to refer to the effects of fire on soil conditions and hydrologic function. In general, the denser the pre-fire vegetation and the longer the fire burns on a particular site, the more severe the effects on soil and its ability to absorb and process water.

High-severity wildfires remove virtually all forest vegetation from trees, shrubs and grasses to discarded needles, decomposed roots and other elements of ground cover or duff that protect forest soils. A severe wildfire may also cause certain types of soil to become hydrophobic by forming a waxy, water-repellent layer that keeps water from penetrating the soil and dramatically amplifying the rate of runoff.



*Felling of hazard trees is one of several emergency rehabilitation practices intended to protect public safety.*

The loss of critical surface vegetation leaves forested slopes extremely vulnerable to large-scale soil erosion and flooding during subsequent storm events. These risks, in turn, threaten the health, safety and integrity of communities and natural resources that are downstream. The likelihood that such a post-fire event will occur in Colorado is increased by the prevalence of highly erodible soils in several parts of the state and weather patterns that frequently bring heavy rains on the heels of fire season.



*The impacts of high-severity fire on a hillside burned during the Missionary Ridge Fire.*

In the aftermath of the 2002 fire season, the Colorado Department of Health estimated that 26 municipal water storage facilities were shut down due to fire and post-fire impacts.