

Retaining Old Trees in Long-Unburned Forests That Historically Burned Frequently

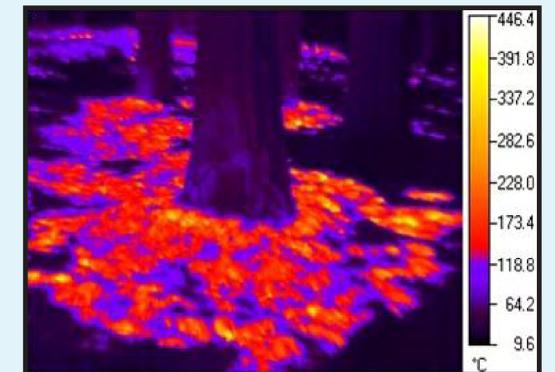
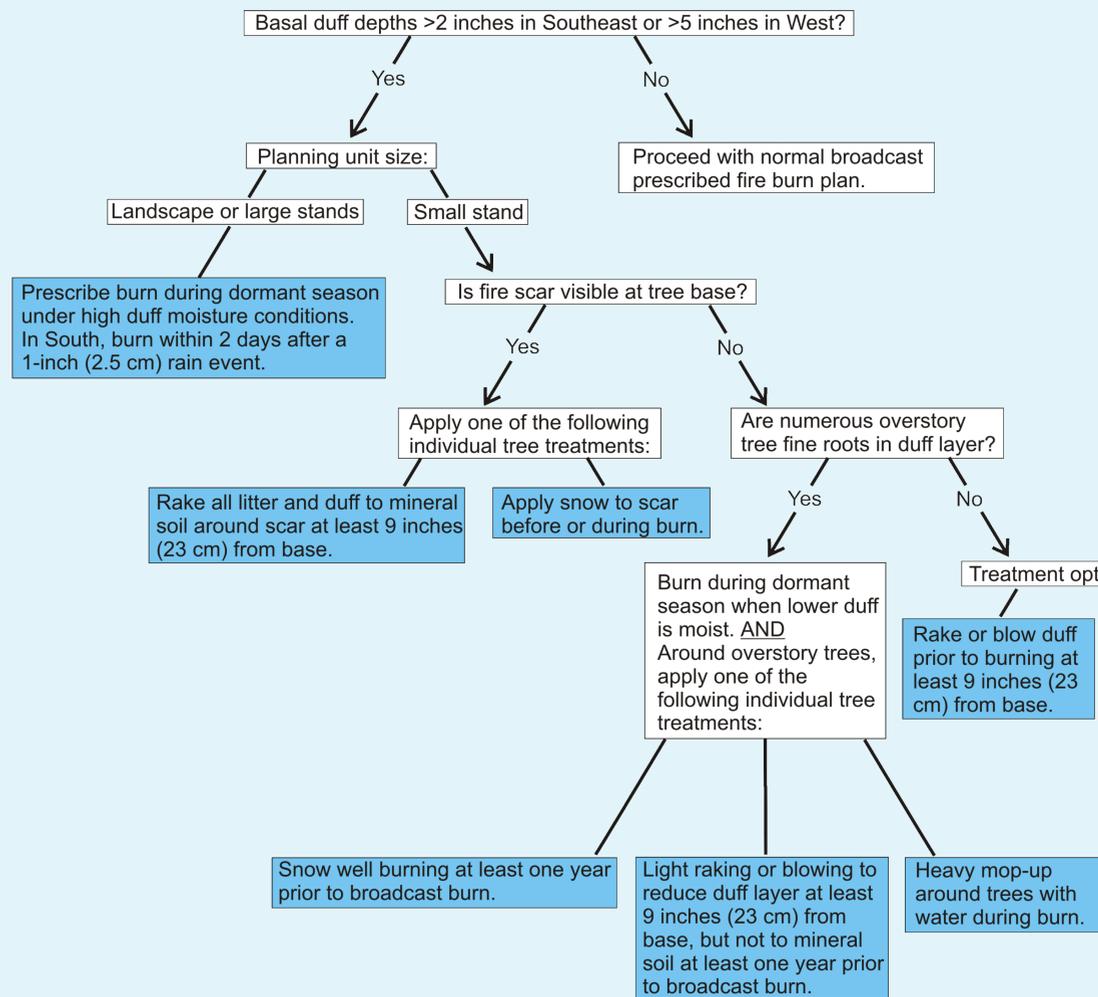
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Background

Many forested ecosystems in the United States have adaptations to survive frequent fire. Decades of fire suppression around the country have led to many unintended consequences in these fire dependent forests, such as increased tree densities and fuel, increased stress on older trees, and greater risk of bark beetle attack. In historically fire-frequent forests, prescribed burning is often used to reintroduce fire as an ecological process in areas unburned for decades as part of larger efforts to restore historical stand conditions and prevent mortality from wildfires. Maintaining the larger diameter and old fire-resistant trees on the landscape is often a primary restoration goal.

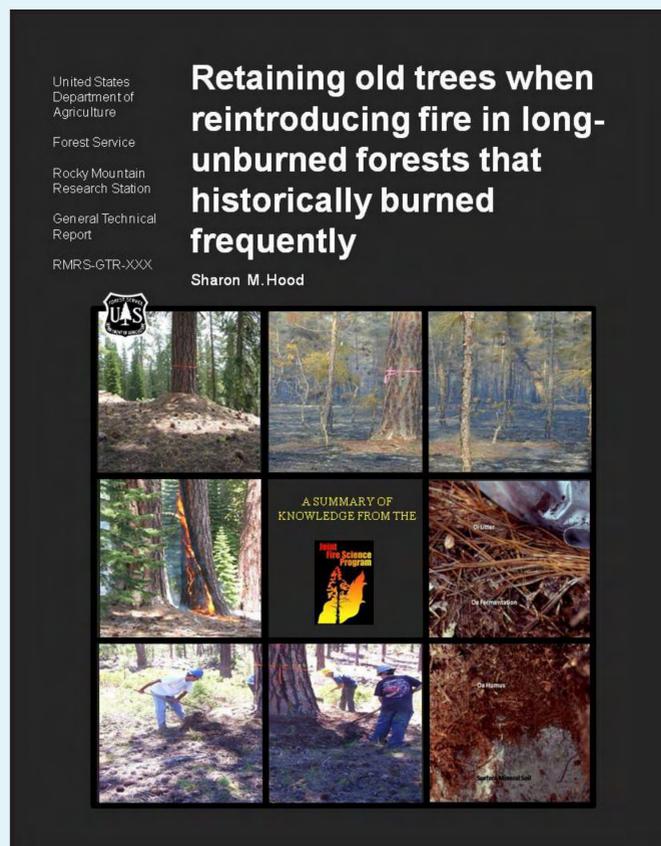
Project

This GTR synthesizes the literature and current state of knowledge pertaining to reintroducing fire in stands where it has been excluded for long periods and the impact of these introductory fires on overstory tree injury and mortality. Only U.S. forested ecosystems adapted to survive frequent fire are included. Treatment options that minimize large diameter and old tree injury and mortality in areas with deep duff and methods to manage and reduce duff accumulations are discussed. Pertinent background information on tree physiology, properties of duff, and historical versus current disturbance regimes are also discussed.

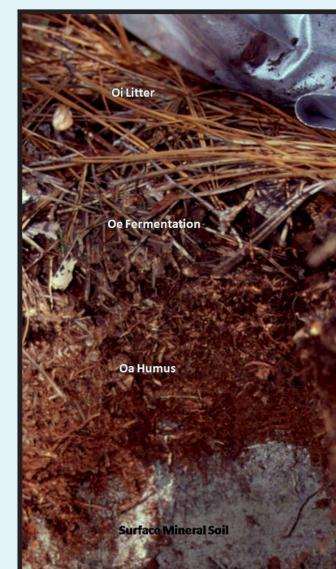


Thermal IR photo showing duff smoldering at the base of a tree. Long-term high temperatures can kill roots and basal cambium.

Decision key of treatment options when reintroducing fire to long-unburned forests to reduce overstory tree mortality. Treatment options apply to forests that historically burned frequently.



Deep duff around the base of an old ponderosa tree in an area that hasn't burned in 100+ years.



Forest floor profile in a long-unburned longleaf pine stand. Frequent fire prevents duff from accumulating to such depths that can cause cambium and root kill.



Fire scarred trees are particularly susceptible to cambium kill during fires.



Crews rake duff around a tree to reduce basal heating prior to burning. Such treatments may reduce post-fire tree mortality.

