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May 11, 2026

The Federal Role in Hazardous Wildfire Fuel Treatments

Introduction

Hazardous fuels are combustible vegetation that accumulates on the landscape, presenting a threat of starting and spreading wildfires that resist control. Hazardous fuels and their associated wildfire threats cross land management and ownership boundaries. Federal and nonfederal land managers mitigate hazardous fuels (*hazardous fuel treatments*) for various reasons, including altering fire behavior; protecting desired uses or resources; and promoting overall ecosystem health. Much of the debate surrounding hazardous fuels and wildfire mitigation focuses on how to protect life and property in the *wildland-urban interface* (WUI), where human development abuts undeveloped wildlands.

More than 50 bills introduced during the 119th Congress pertain to treating hazardous fuels. Most prominent among these is the Fix Our Forests Act (H.R. 471/S. 1462), which would affect various aspects of treatment planning, environmental compliance, contracting, implementation, litigation, research, and assistance, among other things.

Federal Role and Statutory Authorities

Hazardous fuels generally are managed by the owner of the underlying land. Five federal land management agencies (FLMAs) across two departments are responsible for the majority of hazardous fuels treatments on federal and tribal lands—the Forest Service (FS), under the U.S. Department of Agriculture (USDA); and the Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs (BIA), under the Department of the Interior (DOI). The federal government also provides assistance to nonfederal groups to address hazardous fuels on nonfederal lands.

No federal law explicitly requires hazardous fuels mitigation from a broad perspective. Instead, various statutes implicitly authorize the FS, BLM, NPS, FWS, and BIA to mitigate hazardous fuels as part of their mandates to manage and protect the lands and resources under their jurisdictions (e.g., 16 U.S.C. §551, 43 U.S.C. §§1701 et seq., 54 U.S.C. §100101, 16 U.S.C. §668dd(a)(4)(B)).

On federal lands, hazardous fuels treatments are planned by the FLMAs, sometimes in collaboration with stakeholders such as states, tribes, wood products industries, conservation and recreation groups, researchers, or firefighters. FLMAs generally lead fuel treatment planning and environmental compliance on the lands they manage. Contractors or state partners implement the treatments.

Congress has, at times, provided specific authorities related to hazardous fuels management on federal lands. Prominent among these is the Healthy Forests Restoration Act, which pertains primarily to lands managed by BLM and the FS (HFRA, 16 U.S.C. §§6501 et seq.). HFRA contains various provisions related to planning, implementation, and administrative processes for specified land management projects on FS and BLM land, including hazardous fuel treatments. HFRA also includes provisions regarding grant programs, cross-boundary collaboration, and other items.

Fuel Types and Fire Behavior

The term *hazardous fuels* has no standardized or broadly applicable statutory definition. Existing statutory definitions pertain to specific areas of federal land or other specific circumstances. Statute defines certain activities on federal lands as "authorized hazardous fuel reduction project[s]" for the purpose of HFRA (16 U.S.C. §6511(2), 16 U.S.C. §6512(a)).

Wildland firefighters classify *fuel types* and other fuel characteristics to predict a fire's heat output (*intensity*) and rate of spread. Examples of surface fuel types include grass, shrub, and *timber understory* (biomass on the forest floor). *Ladder fuels* exist between the surface and canopy (*crown*), creating vertical continuity. In forests, crown characteristics such as canopy cover percentage, base height, and density determine the probability that a fire can move from the surface into the crown of an individual or small group of trees (called *torching*) or, in high winds, move through the crown as a wind-driven, high-intensity *crown fire*. A crown fire can sustain a greater rate of spread in a forest than a surface fire. A grass fire with no trees to slow the wind can spread faster than a forest fire.

A *conflagration* is a rapidly moving, destructive fire. Conflagrations are often spread when burning trees and twigs produce *firebrands*—flaming hot fuel particles carried by wind and convection currents—that cause new ignitions (*spotting*) ahead of the fire's leading edge.

Within each fuel type, fuel moisture, chemistry, and density all determine flammability, with moisture being the most important factor. Dead fuels dry more quickly than live fuels. Fine fuels (called *flash fuels*)—especially grasses—dry out quickly, ignite easily, and spread fire rapidly. Large fuels with less surface area per volume (*heavy fuels*) take longer to absorb moisture, and to lose moisture, than fine fuels. Heavy fuels take longer to ignite than flash fuels, and can burn for a longer amount of time.

Types of Hazardous Fuel Treatments

Fuel treatments can inhibit wildfire ignitions, reduce heat output, and slow wildfire spread. Land managers choose mitigation approaches on the basis of various factors, such as cost, terrain, human safety, wildlife occupancy, public opinion, workforce, and local industries. Options for fuel treatments include the following:

Burning. The use of fire to mitigate hazardous fuels and reduce the chances for future extreme or uncharacteristic

fire behavior is an established, widely used practice. Burning to achieve resource benefits can occur as a *prescribed fire*, where the ignitions are planned, or as an *unplanned ignition* (i.e., lightning) allowed to burn under supervision. Qualified personnel or land owners might ignite prescribed fires in predetermined locations, under predetermined conditions, to meet desired resource objectives. Prescribed burning generally is subject to various legal requirements, such as personnel qualifications, permitting, and liability considerations.

Cultural burning refers to the Indigenous practice of cultivating fire on the landscape, and was a part of life for many Native Americans for millennia. Cultural burning might be applied for wildfire mitigation or other purposes. The reasons for cultural burns will vary among cultural affiliations.

Mechanical Treatments. *Mechanical treatments* involve the manipulation, and may also include the removal, of hazardous fuels with tools and equipment, such as hand tools, chainsaws, and heavy machinery. Mechanical fuel treatments rearrange and resize fuels. The total amount of fuel (*fuel load*) is not decreased unless crews remove the cut biomass after the treatment (**Figure 1**). Crews can haul fuels from the site, redistribute them on the surface, burn them, or use some combination of these approaches.

Figure 1. Fuel Loads

Source: CRS.

Notes: A fuel load is not decreased (left) unless the fuels are removed from the site (middle, right). Fuels can be hauled away, redistributed, burned, or a combination of approaches.

Grazing. *Targeted grazing* is defined by the American Sheep Industry Association as "the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals." Targeted grazing differs from normal livestock grazing because the goal is vegetation management instead of animal production. Concentrated livestock consume and trample fine fuels.

Herbicide. *Herbicide application* is the controlled use of chemicals to kill or suppress unwanted vegetation. Some common uses for herbicides in hazardous fuels control include reducing the presence of specific undesirable species or clearing areas to bare soil. Herbicides can be applied manually, with vehicles, and aerially. Personnel applying certain herbicides require licensing at the jurisdictional level where they make the herbicide applications. The Environmental Protection Agency ensures applicator certification programs meet minimum standards.

Strategic Treatment Configurations. Land managers can configure hazardous fuel treatments of varying intensities across a landscape for purposes such as optimizing limited budgets or facilitating wildland firefighting operations. For example, *fuel breaks* are strips or blocks of land where reduced fuels change wildfire behavior and provide firefighters with places to respond to wildfires. Fuel breaks are often strategically located to protect values at risk. *Shaded fuel breaks* are a type of fuel break that retains enough crown cover to keep the surface cool and moist, in order to resist surface fires. *Firebreaks* are created with the intent of stopping fire spread or to provide a control line for firefighters to work; the fuels are completely removed down to the bare soil or a road. Firebreaks may be created as a precautionary measure before a fire starts or during firefighting operations.

An approach called *Potential Operational Delineations* (PODs) combines local knowledge and spatial analysis to create planning units. PODs are collaboratively developed. Fire managers and other stakeholders identify networks of features such as roads, fuel type changes, or water bodies to outline units. Land managers prioritize treatments appropriate to each of the units, which become strategic zones for fire response.

Issues for Congress

An issue facing Congress is the pace and scale at which hazardous fuels mitigation occurs. Related considerations include determining the appropriate number, size, and location of treatments; the appropriate level of environmental compliance; workforce capacity; and whether and how to assist state, tribal, and private landowners.

A related issue is how to track fuel reduction accomplishments and choose the appropriate performance metrics to determine treatment effectiveness. The FS and DOI annually report hazardous fuels treatments as *acres treated*. The acres treated metric is hard to interpret because (1) multiple treatments on the same part of the landscape—which sometimes are required to maintain or measurably decrease fire hazard—may be counted multiple times, and (2) the metric does not reveal whether the treatments effectively reduce wildfire risk to pertinent resources.

The DOI is consolidating its wildland fire activities, including hazardous fuel treatments, within a new bureau, the U.S. Wildland Fire Service (WFS) (S.O. 3448). Both DOI and FS requested in their budget justifications that FY2027 appropriations for hazardous fuels go to the new WFS instead of the FS. Congress directed the Secretary of Agriculture, in consultation with the Secretary of the Interior, to contract with an independent researcher to study the impacts of the proposed consolidation on several topics, including the hazardous fuels reduction program (P.L. 119-74 and explanatory statement).

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IF13223

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