



TECHNICAL GUIDE

Wildfire Risk Reduction Strategies for Historic Buildings, Sites, and Districts

Incorporating wildfire resiliency into the preservation, planning, and protection of historic resources in the wildland-urban interface.

Acknowledgments

The Community Planning Assistance for Wildfire (CPAW) program works with communities to reduce wildfire risks through improved land use planning. CPAW is a program of Headwaters Economics, an independent, nonprofit research group whose mission is to improve community development and land management decisions.

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About CPAW

Community Planning Assistance for Wildfire (CPAW) provides land use planning solutions, communications assistance, and customized research to better understand and manage wildfire-prone areas and reduce risks. CPAW envisions fire-adapted communities that live with the inevitability of wildfires by integrating wildfire risk-reduction measures into design and development to minimize costs, protect structures, and save lives.

All services are provided at no direct cost; participation is voluntary and implementation is at the discretion of the local jurisdiction that has authority over land use decisions. CPAW is a program of Headwaters Economics, an independent, nonpartisan, nonprofit organization. Established in 2015, CPAW is funded by the U.S. Forest Service and private foundations.

Preserving the past while planning for fire

This technical guide was compiled by Community Planning Assistance for Wildfire (CPAW) to help historic preservationists, property owners, nonprofits, planners, and local governments better incorporate wildfire resiliency in historic preservation planning, policies, regulations, and practices.

How to use this guide

This guide provides specific wildfire risk reduction measures for historic buildings, properties, and districts in wildland-urban interface areas. A growing body of research demonstrates that these practices are highly effective at reducing losses. For example, studies have shown that buildings on properties built to wildfire-resistant standards are as much as 40 to 60 percent more likely to survive a wildfire.¹ These practices help protect structures from a variety of wildfire exposure scenarios—including direct flames, radiant heat, and embers—to which historic buildings with wood siding, roofs, or other combustible elements are especially vulnerable.

Wildfire risk-reduction measures for historic assets generally fall into three categories: 1) planning and preparedness, 2) site hardening and 3) structure hardening. Establishing and regularly practicing a comprehensive emergency plan is an essential, foundational component of preparedness. Implementing best practices for site and structure hardening requires a more tailored, context-sensitive approach for historic properties in order to preserve historic character and integrity.

DEFINING THE WUI

According to the International Wildland-Urban Interface Code (IWUIC), the **Wildland-Urban Interface** is defined as that geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.²

01

Planning & preparedness

Build and practice an emergency plan before fire arrives.

02

Site hardening

Reduce fuels and ignition sources in the area around the structure.

03

Structure hardening

Adapt the building itself to resist embers, flame, and radiant heat.

Each community must determine how to balance historic preservation objectives with the increasing risks posed by wildfire. This guide begins by examining the evolving relationship between historic structures and the wildland-urban interface, then presents site and structure hardening recommendations, and closes with a framework for aligning those recommendations with the four treatment approaches in the U.S. Department of the Interior's *Standards for the Treatment of Historic Properties*.

BACKGROUND

When landmarks burn

In July 2025, a wind-driven wildfire rapidly spread across the North Rim of the Grand Canyon, destroying dozens of structures, including the historic Grand Canyon Lodge. Widely regarded as one of the most intact rustic lodges in the national park system, the structure was reduced to its remaining stone masonry elements.

Like many iconic lodges constructed in national parks during the early 20th century by railroad companies, the Grand Canyon Lodge had previously survived fire and reconstruction. Also characteristic of many historic properties across the United States, the lodge incorporated substantial wood construction. The traditional materials and architectural features that contributed to its historic significance—and its listing on the National Register of Historic Places—also increased its vulnerability to wildfire.



Ruins of Grand Canyon Lodge after the July 2025 wildfire. Photo: Matt Jenkins

Recent wildfires have also devastated historic downtowns where many buildings were more than a century old and primarily constructed of wood. Greenville, California, a Gold Rush town with rows of colorful wooden storefronts, was razed by the 2021 Dixie Fire. The 2023 wildfire in Lahaina, Hawaii, destroyed the town's historic commercial core. And a 2024 wildfire complex destroyed nearly three-quarters of the historic town of Jasper, Alberta, in Canada.

24%

of public and private properties listed in the National Register of Historic Places fall within counties with high or very high wildfire risk, according to data maintained by the National Park Service and the U.S. Forest Service.

Many of these counties have high exposure to potential wind-driven urban conflagrations that can consume thousands of structures in hours. In all these counties, historic buildings—whether on the national registry or not—attract visitors, drive economic activity, and serve as cornerstones of local culture.

Unfortunately, reducing the vegetation around buildings—a practice known as improving defensible space—may not be enough to save them. Due to their flammable construction, historic structures are uniquely vulnerable to both wildfire embers and radiant heat.

Windblown embers, which can travel miles ahead of the main flame front, are the leading cause of structure loss. When a single building is set alight by embers, the intense radiant heat can ignite nearby buildings without any flame contact.

Post-fire photographs often show completely destroyed buildings surrounded by mature, living trees—an indication that buildings are frequently at greater risk of burning than the trees around them.

Standards that work against resilience

Methods to reduce wildfire spread between structures are well known and increasingly integrated into building codes. However, guidance for historic structures frequently contradicts wildfire-resistant building standards—often mandating the precise practices that wildfire protection standards discourage or ban. Many wildfire-prone communities have banned or minimized the use of wood on exterior surfaces of new buildings, including roofs, siding, and decks. Yet some of the same communities simultaneously mandate wood material for historic building restoration.

Years of deadly urban conflagrations have driven several states—including Colorado, Oregon, Washington, California, and Utah—to explore building codes that ban combustibile building materials for new construction in high wildfire-risk areas. But even the most recent result of these efforts, the newly passed Colorado Wildfire Resiliency Code,³ exempts historic structures on local, state, and federal registries from its regulations.

Historic preservation is intended to ensure that the buildings anchoring many communities survive for generations. Yet many include significant features made of highly flammable, centuries-old wood, making them costly to insure and difficult for firefighters to save.

To date, historic preservation practices and standards—including the federal standards used by government agencies and private-sector professionals alike—have not significantly adapted to increases in wildfire risk. The Department of the Interior's (DOI) *Standards for the Treatment of Historic Properties* does not provide substantive recommendations to improve the survivability of a historic building in a wildfire. These high-level standards have remained largely unchanged since they were first written in the 1960s, though the federal government has issued updates in the form of guidelines or policy briefs. The most consequential for disaster adaptation, "Guidelines on Flood Adaptation for Rehabilitating Historic Buildings," seeks to correct the decades-old decision to exempt historic structures from flood protection measures.

It is the federal government's intent that communities avoid making the same mistake with buildings exposed to wildfire risk. The standards now suggest that special exceptions or variances may be considered to protect a building from known hazards, although wildfire-related criteria have not yet been provided. The Department of the Interior expects to publish a wildfire-specific policy brief in 2026.

A risk built into our downtowns



Historic downtowns across the country were built before modern building codes and fire safety practices. In the early 19th century, frequent fiery devastation of downtowns inspired building codes, water infrastructure such as fire hydrants, and the first paid fire departments.

By the 1830s, cities including Boston, Philadelphia, and New York had widened streets and transitioned from mostly wood-frame construction to less combustible materials such as brick or steel.

Even with today's codes in place, historic downtowns remain susceptible. The risk is compounded not only by flammable materials—such as the wooden walkways and building facades still in use in many towns in the American West—but also by structural density. Densely built downtowns form a continuous wall, but adjoining buildings with shared wooden roofs and conjoined attics help fire spread more swiftly. Older town centers with narrow streets are also difficult for fire trucks to navigate.

Once wildfire sweeps through a community, damaged historic buildings are difficult and expensive to repair; those destroyed are often irreplaceable. Given that these unique sites cannot be easily or affordably recreated, investing in wildfire-resistant planning and building is a sound strategy.

Practical measures for preservation and resilience

A wide range of measures can help protect historic assets in wildfire-prone areas. Many of these recommendations can be customized and implemented to meet—or at least balance—the objectives of both preservation and wildfire resilience.

01

Understand the wildfire risk

Any community effort to protect historic structures should begin by understanding local wildfire exposure and risk.

- Many local **Community Wildfire Protection Plans (CWPPs)** include detailed maps that help communities understand hazards, identify vulnerable areas, prioritize mitigation projects, and coordinate emergency response.
- Some states have produced wildfire maps that provide useful information for understanding local risks.
- Free community-level risk maps are available at the USDA Forest Service's **Wildfire Risk to Communities** website, with risk data and resources designed for elected officials, community planners, and fire managers.

02

Create and practice a site-specific Wildfire Preparedness Plan

For historic resources in the wildland-urban interface, developing and regularly practicing a site-specific emergency plan is a critical first step. Typical plan elements include, at a minimum:

- Evacuation routes and life safety procedures
- Contact and coordination protocols for owners, fire departments, and emergency contractors
- Site maps identifying access points, fire protection equipment, hazards, and priority protection areas
- Site preparation such as mowing, irrigating, and cutting back flammable landscaping

ELEMENTS — CONTINUED

- Building preparation: utility shutoff for gas, electric, and propane; moving furniture inside; closing windows and doors
- Backup power considerations, if applicable
- Prioritized salvage list for movable historic items
- Post-fire recovery and rehabilitation details

03 Ensure adequate documentation

An essential step is identifying and documenting each historic asset. Inventories that include narratives, drawings, and photographs with details about materials and construction techniques can help determine both risks and solutions—and are essential if a structure is destroyed or damaged.

- Ensure properties and districts already on the National Register of Historic Places have updated inventories.
- Ensure locally significant building and site records are up to date.
- Ensure all records, photographs, and drawings are digitized, redundant, and secure.

Maintaining detailed records carries another benefit: historic designations may provide eligibility for tax incentives or funding to repair, improve, or modernize aspects of buildings such as electrical or fire suppression systems. While some funding sources restrict the types of improvements allowed, there may be allowable adaptations to address natural hazards such as wildfire.

04 Stop exempting historic properties from hazard-safety land use policies

Building codes and regulations should not grant wholesale exemptions for historic properties when it comes to wildfire risk reduction. Land use policies in high-risk WUI areas should discourage untreated wood and other highly combustible materials in all construction, including the restoration of historic buildings and districts. Rather than waiving hazard-safety requirements, local, state, and federal offices can craft policies that focus on desired outcomes that balance risk reduction and historical integrity.

IN PRACTICE · ROUTT COUNTY, COLORADO

Colorado recently adopted a statewide minimum code for wildfire resiliency that included a blanket exemption for historic properties. During the adoption process, Routt County officials adopted more restrictive rules requiring historically significant buildings that undergo significant alterations to include basic structure-hardening elements like Class A roofing, noncombustible gutters and downspouts, and ember-resistant ventilation screens.⁴

05 Integrate wildfire resiliency into existing codes and guidelines

While many communities have a long history of regulating environmental hazards such as floodplains, wetlands, watercourses, and steep slopes, wildfire hazard mitigation is comparatively late to the regulatory world.

Clear **intent statements** establish the underlying purpose, goals, and policy direction of a document—especially valuable where competing priorities such as wildfire resilience and historic preservation must be balanced.

SAMPLE INTENT LANGUAGE

"The intent of these provisions is to reduce wildfire risk to historic resources through compatible mitigation, preparedness, and resiliency measures that preserve historic integrity while improving resistance to wildfire exposure and ember ignition."

Definitions will likely need to be added or amended to include wildfire-specific terminology. Local jurisdictions should coordinate definitions with statewide regulations where they exist.

06 Allow wildfire-resistant materials for existing structures in high-risk areas

Local land use regulations and historic preservation standards should be amended to allow this flexibility, with historic buildings evaluated on a case-by-case basis. Allowing simple elements like metal flashing on roof valleys and deck-to-wall intersections, mesh vent screens with openings not exceeding 1/8-inch, metal gutter guards, and noncombustible gutters and downspouts can improve resiliency without significantly impacting overall historic integrity.

If a historic building in a high-risk area needs a new roof, consider allowing a Class A roof even if it does not match the original material. While a roof is a prominent feature, a Class A roof is one of the most effective building features for reducing wildfire risk. Roofs are highly vulnerable because wind-driven embers accumulate on roof surfaces, in valleys, gutters, and at roof-to-wall intersections.

A What is a Class A roof?

A Class A roof is the most fire-resistant type of roof covering. Examples include:

- Asphalt fiberglass shingles rated Class A
- Metal roofing
- Clay or concrete tiles
- Slate roofing
- Some treated wood-shake products

07 Require wildfire-resistant materials for new construction in WUI areas

Codes and architectural standards should require additions and new construction in WUI areas to meet higher standards for resiliency. Nearby combustible buildings significantly increase risk to historic structures.

While the vast majority of structure ignitions are caused by embers, flame contact and radiation can also be a problem—particularly in historic districts with closely spaced structures. There are many examples of typical historic materials that resist wildfire—brick, stone, stucco, metal, slate, and clay tile—but also many buildings and districts built primarily of wood. In these cases, historic compatibility for new construction should be measured more by form and scale and less by materials. The Secretary of the Interior's standards encourage new construction to be distinguished from the original.

08 Adhere to fire-resistant landscaping practices

All historic buildings can benefit from landscaping that reduces wildfire risk. Research shows that a "noncombustible zone" with no flammable materials within five feet of a structure is highly effective. This guidance applies to potted plants, trees, garden boxes, wood mulch, wood piles, and furniture.

ZONE 1 0–5 feet	ZONE 2 5–30 feet	ZONE 3 30–100 feet
Noncombustible materials only—rock, gravel, cement, stone/concrete pavers. No vegetation, wood mulch, pine straw, or wood fences. Ignition-resistant fencing and decks only.	Spaced mix of mowed grasses and maintained shrubs and trees. Trim dead branches; keep at least 10 feet between canopies, trees, and structures. Prune branches to 10 feet up, or a third of tree height.	Not applicable to small lots. Selected, spaced mix of maintained plantings and trimmed mature trees, clustered with fire breaks between. Density can increase farther from the structure.

Look for mutually beneficial goals. Hardscaping can deter termites and rodents, and keeping trees away from structures protects foundations, roofs, and pipes. Fire-adapted landscaping also tends to be water-wise. Where some vegetation within five feet cannot be avoided, plants should be well-watered, since fire spreads quickly through dry vegetation.

Importantly, while research has demonstrated the benefits of fire-adapted landscaping, the limited research on exterior sprinkler systems has yet to prove effectiveness. If used, exterior sprinkler systems should be connected to an alternate power source, such as a backup generator, as grid electricity may fail during a wildfire.

09**Stay ahead of building and property maintenance**

Owners of historic buildings often modernize electrical systems to minimize the risk of fires that start inside—and should also follow best practices to avoid the spread of fires that start outside. Defensible space requires ongoing maintenance to retain effectiveness.

- Clean behind wooden facades, under decks and porches, and in gutters, removing pine needles and other debris that provide extra fuel.
- Trim vegetation to remove dead branches and maintain at least 10 feet of separation between tree canopies and structures. Prune branches to 10 feet from the ground, or a third of total tree height, to reduce ladder fuels.
- Move wood piles, outdoor storage, and fire pits at least 30 feet away from structures.

Fitting wildfire measures to historic preservation standards

The framework of the Secretary of the Interior's *Standards for the Treatment of Historic Properties* helps determine how to most appropriately incorporate wildfire risk-reduction measures into historic buildings, sites, and districts.

Preservation

The standards prioritize retaining the greatest possible amount of historic fabric while maintaining a building's historic form and character. Properties following this approach may emphasize defensible space, enhanced building and site maintenance, and a comprehensive wildfire preparedness plan as primary risk-reduction strategies.

Restoration

Restoration-focused projects depict a property as it appeared during a specific period of significance. In addition to preservation strategies, restoration may consider allowing concealed or non-character-defining elements to be replaced with wildfire-resistant or noncombustible materials where feasible.

Rehabilitation

Rehabilitation projects recognize the need to alter or expand a historic building to accommodate continuing or new uses while retaining its historic character. Because rehabilitation inherently allows greater flexibility, these projects may provide additional opportunities to incorporate structure-hardening measures and other wildfire-resilient design strategies.

Reconstruction

Reconstruction projects recreate a non-surviving historic building using new materials, typically for interpretive purposes. Because these projects rely on contemporary construction, they may offer the greatest flexibility for incorporating wildfire-resistant materials, assemblies, and techniques while still conveying the property's historic appearance and significance.

Folding recommendations into the SOI Standards

TREATMENT	SUMMARY DEFINITION (DOI)	CURRENT FOCUS	RECOMMENDATION FOR WILDFIRE RESILIENCE
Preservation	<i>"The act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property."</i>	Maintenance and repair of historic materials and features.	Create and practice a Wildfire Preparedness Plan; enhance maintenance of building and site; establish a 5-foot noncombustible zone and defensible space to 100 feet; encourage minor retrofits such as ember-resistant vents, noncombustible gutters, and metal flashing; consider a Class A roof when reroofing; add interpretive signage.
Restoration	<i>"The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period."</i>	Preserving materials, features, finishes, and spaces from a specific period of significance.	<i>In addition to the above:</i> Encourage concealed or non-character-defining elements to be replaced with wildfire-resistant or noncombustible materials where feasible.
Rehabilitation	<i>"The act or process of making possible a compatible use for a property through repair, alternations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."</i>	Allowing alterations for continuing or new uses as long as historical character is maintained.	<i>In addition to the above:</i> Encourage more significant structure hardening, such as replacing wood windows with metal-clad, dual-pane or tempered glass, wildfire-resistant or noncombustible siding, and fire-retardant treated wood; require additions and adjacent new construction to meet stricter standards.
Reconstruction	<i>"The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."</i>	A limited framework for recreating a vanished building with new materials, primarily for interpretive purposes.	In high-risk areas, prohibit the use of combustible materials on the exterior of new buildings.



CONCLUSION

Adapting to fire, preserving history

Historic buildings and districts contribute significantly to local economies, particularly in rural communities, and preserving them is a high priority. As wildfire risk spreads and intensifies, many communities are reexamining how best to achieve this goal. In the effort to balance historical integrity and wildfire preparedness, communities may face difficult decisions about tradeoffs.

But the path forward is becoming clearer, especially as alternative materials continue to improve and offer both increased fire resistance and authentic appearance. Just as cities adapted to the risk of urban fires two centuries ago by updating building practices and installing fire hydrants, many communities today can adapt to wildfire risk and also preserve their cultural and architectural history.



Learn more about Community Planning Assistance for Wildfire

A program of Headwaters Economics · cpaw.headwaterseconomics.org

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