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NWCG Standards for Mitigation in the Wildland Urban Interface

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The *NWCG Standards for Mitigation in the Wildland Urban Interface* establishes the standards for understanding and implementation of concepts, issues, and best practices to increase community fire adaptation. This publication is designed to:

- Support common understanding.
- Encourage use of consistent and proven local risk reduction efforts.
- Increase awareness and implementation of mitigation best practices, techniques, tactics, and strategies.
- Improve community and structure survivability as the result of pre-wildfire mitigation actions.

The National Wildfire Coordinating Group (NWCG) provides national leadership to enable interoperable wildland fire operations among federal, state, tribal, territorial, and local partners. NWCG operations standards are interagency by design; they are developed with the intent of universal adoption by the member agencies. However, the decision to adopt and utilize them is made independently by the individual member agencies and communicated through their respective directives systems.

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History and Background

Wildfire knows no boundaries. Mitigation must involve cross-boundary partners; local, state, tribal, federal, and private land authorities working together to share and leverage resources and build partnerships focused on mitigation actions on the ground. Mitigation actions in wildfire prone communities are a critical piece of the National Cohesive Wildfire Management Strategy.

Historically developing a national wildfire response that provides consistent training and qualifications, funding, and leadership structure has been the focus. Increasing the focus to include reducing community wildfire risk will help develop sustainable national mitigation efforts and a consistent national strategy.

Local mitigation efforts can be challenging due to lack of resources, investments, training, workforce, and funding sources. The impact of wildland fire on communities grows each year. Increased development in the wildland urban interface (WUI) heightens the risk of wildfire. A comprehensive approach to mitigation is an effective way to address increasing risk.

The *NWCG Standards for Mitigation in the Wildland Urban Interface*, PMS 052 is grounded in the following concepts.

National Cohesive Wildland Fire Management Strategy

The National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is the result of the Federal Land Assistance and Enhancement (FLAME) Act of 2009. It was a collaborative cross-boundary effort to examine growing wildfire challenges across all lands regardless of ownership. The Cohesive Strategy is an all-hands, all-lands approach to wildfire management. The Cohesive Strategy focuses on three goals: (1) restore and maintain landscapes, (2) create fire adapted communities and (3) safe and effective wildfire response.

For more information, visit the Cohesive Strategy website at <https://www.forestsandrangelands.gov/>.

Community Fire Adaptation

As defined in the *NWCG Glossary of Wildland Fire Terminology*, PMS 205, a Fire Adapted Community (FAC) is “a community that recognizes its risk and takes action before, during, and after a fire in order for their community to be more resilient to wildfire. FAC members are informed and prepared, collaboratively planning, and taking action to better live with wildland fire.” More fully, community fire adaptation enables communities to live safely with fire as part of the surrounding landscape.

A successful FAC approach has the potential to save lives, homes, and communities as well as billions of dollars in suppression, damage, and recovery costs annually. A successful approach also allows for the beneficial ecological processes of fire to take place.

Community fire adaptation does not refer to a specific program or endpoint but rather a dynamic state in which the community continually strives to reduce wildfire risk. Adapting to wildfire is a continuous process that requires maintenance and adaptation and regular risk reassessment.

Community fire adaptation involves all stakeholders who live, work, and play in the community. This includes residents, businesses, policymakers, land managers, and emergency responders and local, state, tribal, and federal governments.

There is a range of actions that communities can undertake to become more fire adapted. In general, the more elements that a community has addressed, the more fire adapted it is. As every community is unique, not all elements listed below will be emphasized to the same degree in each community.

Major elements of a FAC may include:

- An implemented Community Wildfire Protection Plan or an equivalent plan that specifically identifies wildfire risk, projects to reduce that risk and jurisdictional authority responsible for reducing risk.
- Ignition-resistant structures, building materials, and landscapes.
- Local fire departments engaged in best practices for effective on the ground mitigation and prepared for local wildfire response.
- Fuels treatments on public and private lands in and around communities to reduce hazardous fuels and create fuel breaks.
- Science and research to help inform decision making.
- Codes, covenants, and ordinances to foster development in the WUI that minimizes fire risk.
- Cooperation and collaboration between jurisdictional authorities.
- Evacuation planning.
- Wildfire prevention and preparedness education.

Mitigation 101

What is the Wildland Urban Interface?

The wildland urban interface, or the WUI, refers to the zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Communities adjacent to and surrounded by wildland are at varying degrees of risk from wildfires.

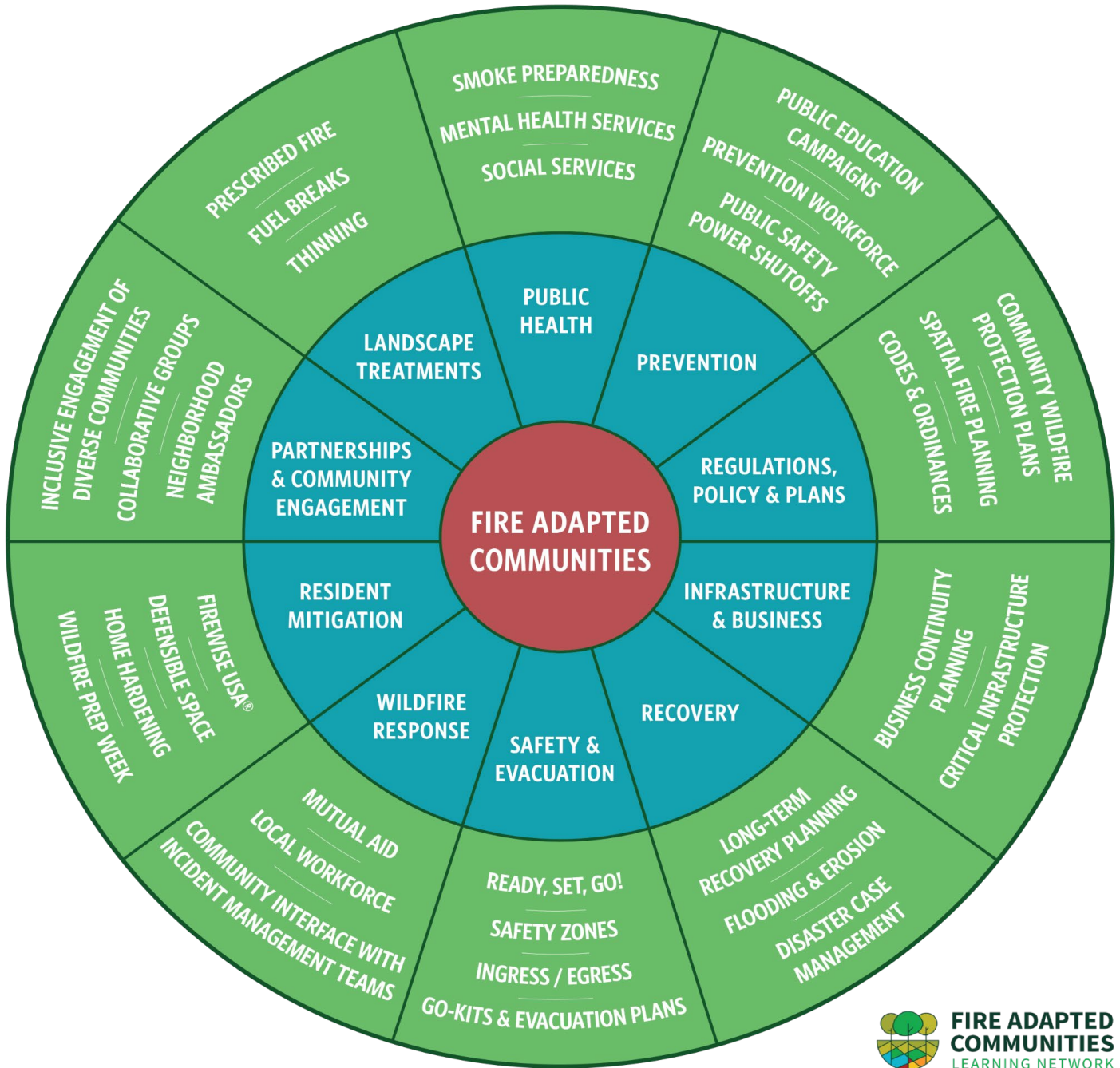


Figure 1: The Fire Adapted Communities graphic, created by the Fire Adapted Communities Learning Network, communicates the FAC framework. It depicts a set of components, which might make up community wildfire adaptation and provides examples of specific programs and actions that a community could undertake to advance their work. FAC is not a one-size-fits-all approach, and this graphic is not comprehensive. Community context matters and communities should undertake those actions which are most effective in, and appropriate for, their place.

What is Mitigation?

Mitigation, in this document, focuses on pre-incident actions that reduce community risk of wildfire. It is an effort to reduce the loss of firefighter and civilian life and to lessen the impact on the economy and environment.

Mitigation can be supported through:

- Consistent and sustainable funding of wildfire mitigation efforts on the ground.
- Participation in wildfire mitigation coalitions or collaboratives that get work done on the ground.
- Funding, requiring, and enforcing codes, ordinances, and policies that reduce wildfire risk to communities.
- Cross-boundary fuels reductions on a landscape scale.
- Outreach programs to engage the public in mitigation efforts.
- Incentives that elicit community engagement and action.
- Improved application of relevant research findings on structural ignition, fuels reduction, and key social dynamics.

The Importance of Mitigation

Undertaking wildfire mitigation in the WUI can reduce or eliminate the risk of damages caused by wildfire to the human environment like homes, neighborhoods, and communities. Mitigation can also reduce risk to the natural environment such as wildlife, watersheds, and ecosystems.

Mitigation actions offer multiple benefits, including:

- Contributing to firefighter and public safety.
- Creating communities that are more resilient.
- Allowing individuals and communities to minimize post disaster disruptions and recover more quickly.
- Lessening the financial impact on individuals, communities, business, and the natural environment.
- Enhancing other important values such as ecological benefits and aesthetics.

Mitigation Guiding Principles

Applying a set of guiding principles to mitigation work can contribute to its success. The following is an abbreviated list of these ideals.

- Learn about the audience and their barriers to mitigation.
- Understand the community's hazards, areas of risk, and available options to reduce exposure.
- Build trust-based relationships through in-person engagement during all phases of mitigation.
- Develop on the ground actions that are strategic, selective, and focused to reduce vulnerability and increase resiliency.
- Build partnerships to work collaboratively across boundaries and jurisdictions.

- Make mitigation support inclusive and equitable to everyone.
- Support vulnerable populations.
- Leverage resources with other partners and ask for help.
- Track program investments, progress, and partner contributions. Share success stories.
- One size does not fit all. Be flexible and adjust mitigation strategies according to community demographics, local values, and wildfire hazards.

Risk Assessments

Wildfire risk assessments are a systematic process using available knowledge to comprehend the nature, expression, and evaluation of risk. Assessments provide information on wildfire likelihood, intensity, and susceptibility of valued resources and assets. They are critical for a focused wildfire mitigation effort.

Risk assessments can be quantitative or qualitative and applied at multiple scales from a single property, to community, to landscape. A good risk assessment should geographically and specifically identify areas at risk from wildfire by ownership, location, and level of risk. Assessments should be collaboratively developed and shared with the community, landowners, and jurisdictional authorities. They are important for decision making and help to distinguish among various risk management options for accepting, avoiding, reducing, or transferring the risk.

Risk assessments are vastly different across the nation. The available options must be evaluated to determine the best fit for the local community. In many cases, multiple assessments can be adopted, modified, or developed to accommodate the local community and demographics based upon capacity and usage. Wildfire practitioners should be familiar with the risk assessments utilized in their community, how those assessments were constructed, and the methods used for community outreach and engagement.

WUI Mitigation Standards

Community Engagement and Partnerships

Effective community engagement is the result of interactive communication, a two-way process that values the input of all. It follows a whole community approach that is inclusive and equitable, and builds trust by engaging in face-to-face, give and take conversations.

Local capacity or the ability of the local community to provide funding, as well as resident and partner engagement to enable work on the ground is key to community mitigation. Capacity is the “infrastructure” that supports and shapes organizations into sustainable, efficient, and effective change agents. Capacity building enables organizations, leaders, and residents to develop competencies and skills in the delivery of a service.

When developing and delivering mitigation programs, strive to develop and recruit confident, competent, and skilled local resources who focus on wildfire risk reduction. This may include a local government authority, tribe, non-profit organization, contractor, and residents. Develop programs that share ownership and accountability directly with community members.

Inclusive Communications

Make Mitigation Support Accessible to All Populations

- Know the audience and determine the best way to communicate with them. Communities are composed of diverse residents, which include those who have different languages, socio-economic backgrounds, access, and functional needs, cultural backgrounds, and more. Successful mitigation is shared by all; work to be inclusive in your process from planning to implementation.
- Include translation and interpretation services in your mitigation planning, budget, and activities.
- Knowing the audience and communicating effectively in-person over time builds trusting relationships. Passive communication, like brochures, Public Service Announcements (PSAs), and handouts are not as effective in moving residents to take mitigation action.
- Make support accessible. At-risk community members need to know who to contact for help and they need to be confident that someone is available to help them.
- Use terminology that resonates the most with the community. Don't use jargon.
- Follow up with residents; a one-time visit is not enough. Mitigation is a continuum.

Ignition-Resistant Structures and Surrounding Landscape

Mitigation programs must include recommendations related to creating ignition-resistant structures and vegetation management to be effective. Research studies show that a lack of ignition-resistant structures and managed vegetation is the leading cause of structure loss during wildfires.

Many things can be done to reduce the wildfire risk of a property and several key terms have been defined in this standard. Practitioners should use the terminology that resonates the most with their community.

Structure Ignition Zone

The structure ignition zone is the area most critical to survivability of homes and structures. The structure ignition zone is the characteristics of a structure and its immediate surroundings within 100 feet. The structure ignition zone may be extended (e.g., to 150 or 200 feet) in areas of steep terrain or dense, highly flammable vegetation. The structure ignition zone is the key determinant for structure ignition potential during wildfire.

Management of the structure ignition zone includes ignition-resistant plants, managed vegetation, and ignition-resistant features of the structure.

There are several terms historically used to describe this area, including home ignition zone and defensible space. To be inclusive of the wide range of structures that are built in the wildland urban interface environment, the WUI Mitigation Standard uses the term structure ignition zone.

Ignition-Resistant Structures

Creating ignition-resistant structures is essential to wildfire risk mitigation. Structure enhancements and modifications can vary in terms of effectiveness and cost. When completed comprehensively, an ignition-resistant structure will reduce exposure greatly. Incremental adjustments will also have a complimentary impact.

The interconnectedness of structures and the landscape cannot be understated. Both where a structure is located on the landscape (i.e., adjacency to fuels and other structures, topography, and aspect) and the materials that the structure is constructed out of are critically important when considering the factors for ignition potential and structure survivability.

The design of a structure, the construction materials used, and how the structure is maintained are all critical to improving the chances of that structure’s survival. The importance of examining the interrelated component of the effects of the surrounding landscape is a significant piece of structure maintenance.

Ignition-Resistant Structure Standards

Table 1: Standards and recommendations for modifications to elements and components that will create a more ignition-resistant structure. All elements and individual components described herein must be within the designated operational lifespan, well-maintained, and inspected on an annual basis. For instance, screens must be inspected to ensure they have not corroded and are otherwise compromised while decks and siding must be in good condition with no rot and or compromised areas.

Element	General Design, Location, and Construction Considerations	
Introduction	Can increase or reduce exposure.	
Components	Standard	
Architectural designs that add numerous overhangs, corners, jut-outs, etc.	Vertical and horizontal joining on the roof (arch/aesthetics) may be better. Constructed of fire resistant or noncombustible materials and well-maintained.	
Proximity of vegetation	Clear all combustible materials, such as dead vegetative material like leaves and pine needles, from Zone 1, including anything that overhangs the roof. Branches overhanging the roof should be cut back at least 10 feet.	
Post and beam style foundations	Enclose open areas with noncombustible skirting. Adhere to landscape management guidance closely.	

Element	Roof Assembly	
Introduction	Roofs are highly vulnerable to wildfire ignition. The roofing assembly of interacting roof components, which also needs to include the way they are installed, includes the final layer exposed to the elements (e.g., shingle, metal, clay, or cement tiles, etc.), the roof deck, vapor retarder, if needed, flashing, and insulation.	
	Components	Standard
	Roof Materials	Class A fire-rated roof assembly.
	Roof Design	Complex roof assemblies where roof coverings meet vertical walls are susceptible to accumulation of materials. Pay close attention to keeping areas clear on complex roof assemblies. Install metal step flashing a minimum of 6 inches where combustible vertical walls meet the roof.
	Roof Slope	Less slope means more debris accumulation. Pay special attention to roofs with less slope and clean these frequently.
	Covering (shingles, tile, metal roofing)	Repair damaged shingles and seal any gaps.
	Edging	Install metal flashing or "drip edge" to protect roof decking from direct exposure.
		Fill any gaps that exist where the roof covering and roof deck meet. For example, gaps can occur at the roof edge when clay tiles or metal roofing materials are used.
	Skylights/Solar panels	Replace plastic skylights with tempered glass.
		Replace dome type with flat, tempered glass skylight.
	Roof Vents	Use vents designed to resist ember entry. This includes assessing the turbine style air circulation vents from the interior of the structure.

Element	Gutters	
Introduction	Gutters can often act as debris traps and require significant maintenance.	
	Components	Standard
	Gutters.	Use noncombustible gutters, spouts, or connectors. It is important that they are kept clear of debris.
		Keep gutters clear of debris.

Element	Eaves and Vents	
Introduction	Vents are used in several areas on structures such as on or near the roof, attic and soffit vents, dryer, and/or heating vents and on vertical walls. Vents located on the exterior of the structure, especially attic vents, perform an important function by allowing excess moisture to leave the inside of the home preventing mold growth. These openings, however, can also allow embers generated during a wildfire to enter the building in a warm, dry place like the attic and cause the structure to ignite and burn.	
	Components	Standard
	Vents	Use vents designed to resist ember entry (e.g., 1/8 inch non-corrosive metal mesh).
	Vertical wall vents (gable end, dormer face)	
	Foundation Vents	
	Dryer vents	Install vents that remain closed when the dryer is not running.
	Overhangs/eave construction	Box in overhangs and soffits. Use vents designed to resist ember entry (e.g., 1/8 inch non-corrosive metal mesh).

Element	Siding	
Introduction	The type of siding and how it is installed are important to structure survival.	
	Components	Standard
	Siding materials	Use noncombustible siding, such as cement board or metal.
		Remove all human-made and vegetative combustibles from Zone 1.
	Openings	Seal openings. This applies to logs/chinking or gaps around windows and doors.
	Foundation to siding clearance	There should be at least 6 inches of distance from the bottom edge of the siding to ground. The exposed surface should be noncombustible (e.g., concrete foundation, or rock).
Introduction	Pay special attention to the interior corners of structures as debris often accumulates in these areas.	
	Components	Standard
	Corners of the structure and vegetation	Ensure vegetation is clear from Zone 1 and 2 near corners of the structure, as ignited vegetation could impact the structure siding.
	Re-entrant corners	Keep clear of combustible materials and debris.

Element	Doors and Windows	
Introduction	It is important to consider what materials windows and doors are made of and how well they seal.	
	Components	Standard
	Windowpanes	Remove all human-made and vegetative combustibles from areas around or near doors and windows.
		Replace single-pane windows with dual or multi-pane.
	Screening	Install metal screening in all windows and doors.
	Pet doors	Seal pet doors when not in use.
	Gaps	Ensure weather stripping is in good condition and replaced as needed.

Element	Decks and Attachments (including overhanging projections such as porches, balconies, and attached structures like pergolas)	
Introduction	Reducing the deck's vulnerability requires an approach that focuses on the materials and design features used to build the deck and creating a noncombustible zone around and under the deck. Most wood-plastic composites, along with higher density tropical hardwood and fire-retardant treated decking products are less vulnerable to embers.	
	Components	Standard
	Storage	Do not store combustible materials under decks. If this is not an option install noncombustible siding around the deck.
		Clear/remove all combustible materials (e.g., welcome mats, firewood, construction material) and vegetation.
	Deck debris	Clear deck gaps and the intersection between deck and house. Regularly sweep or wash off decks to prevent flammable material from accumulating in the gaps.
	Flashing	Install step flashing that extends a minimum of 6 inches from the deck to siding.
	Attachments and overhanging projections, including supporting structural elements	Overhanging projections shall be constructed of heavy timber, noncombustible material, exterior fire-retardant treated wood, or ignition-resistant materials.

Element	Fencing	
Introduction	Fences can provide security and privacy to people and their pets. Fences made of combustible materials are susceptible to ignition and carry fire to the structure.	
	Components	Standard
	Section adjacent to the structure	Install a noncombustible section (3-5 feet) that attaches to siding.
	Fence design	Minimize air flow and debris accumulation as well as the vegetation that grows near the fencing.

Element	Garages and Outbuildings	
Introduction		
	Components	Standard
	Garage door	Install a garage door if one does not exist. If one does exist, install a garage door weather seal.
	Location of outbuildings	The same standards and maintenance for structures apply to any outbuilding within 30 feet of the main structure.
	Seal	Weather seal around the perimeter so that there are no gaps.

Element	Propane Tanks	
Introduction		
	Components	Standard
	Location of propane tanks	Should be moved at least 30 feet from structures.
	Vegetation and material surrounding the tank	All vegetation should be removed from around the tank. It is preferable to have rock mulch or concrete blocks underneath. Do not build a flammable screen around the tank.

Sources:

National Institute of Standards and Technology WUI research: <https://www.nist.gov/el/fire-research-division-73300/wildland-urban-interface-fire-73305>

USDA Forest Service Rocky Mountain Research Lab: <https://www.fs.usda.gov/rmrs/publications/examining-influence-biophysical-conditions-wildland-urban-interface-homeowners-wildfire>

National Fire Protection Association and Insurance Institute for Business & Home Safety Fact Sheets: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series>

National Fire Protection Association 1144 - Standard for Reducing Structure Ignition Hazards from Wildland Fire: <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1144>

Landscape Surrounding the Structure

Check state and local resources, as several factors such as codes, standards, and regulations as well as topography, vegetation type, and condition as well as surrounding development can influence necessary actions. The WUI Mitigation Standard refers to the structure ignition zone, but an approach approved by a specific region or fuel type will suffice.

Research has shown that the characteristics of structures and their surroundings determine the risk of ignition. The structure ignition zone is the characteristics of a structure and its immediate surroundings within 100 feet. The structure ignition zone is further broken down into three subsets: Zone 1 (0-5 feet), Zone 2 (5-30 feet) and Zone 3 (30-100 feet).

Structure Ignition Zone: Landscape Surrounding the Structure

Table 2: Fuel management recommendations and standards for each zone focus on breaking up the continuity of fuels. Routine maintenance of vegetation and debris in these zones is crucial to slowing, or even stopping, fire spread as well as reducing wildfire intensity as it approaches structures.

Zone 1	0-5 feet from the structure	
Introduction	The area 0-5 feet around a structure and its attachments is the noncombustible immediate zone. Research shows this is the most important zone to take immediate action on as it is the most vulnerable to embers. The zone should be extended to 7 feet in cases of complex building design and areas with re-entrant corners. The goal of this zone is to prevent embers from becoming flames and to stop creeping fire from reaching the structure by having only noncombustible materials near the structure. Having plants, shrubs, man-made objects, or vehicles in this area will decrease the effectiveness of this zone and increase the structure’s risk of ignition. Ongoing maintenance to remove combustible debris is necessary.	
	Components	Standard
	Noncombustible immediate zone	<ul style="list-style-type: none"> • The area 0-5 feet around structures should be designed and maintained to keep fire or embers from igniting materials and spreading fire to the structure. This includes spaces under steps, decks, and other attachments, such as fences, decks, or extensions. • Keep this area free of combustible material, such as mulch, plants, firewood stacks, patio furniture, vehicles, gasoline cans, piled construction materials, and other man-made objects. • Remove anything stored underneath decks or porches. • Remove anything stored underneath decks or porches. • Remove anything stored underneath decks or porches. • Replace combustible mulch with a hardscape material like rock, gravel, pavers, or concrete; bare ground is also acceptable. • While it’s best to not have any vegetation here, having mowed grass, or a few scattered fire resistant plants can be acceptable if they are maintained. • Leaf litter, pine needles, and other windblown debris should be routinely removed from this zone.

Zone 2	5-30 feet from structure
Introduction	The zone 5-30 feet around structures (and their attachments) is the immediate landscaped area. The goal of this zone is to remove the fuels that support large flames so that only short, low-intensity, slow-moving flames could burn in this area. Short flames should run out of fuel when they meet the noncombustible immediate Zone 1. Other structures and vehicles that reside in this zone can burn for long periods of time, increasing a home's fire risk. Trees, shrubs, plants, and grasses in this zone will deposit vegetative debris that will need to be routinely removed.
Components	Standard
Immediate landscaped area	<ul style="list-style-type: none"> • This area should be kept clean by keeping grass mowed and vegetative debris raked away. • Vegetation should be watered/irrigated as needed during times of drought. • All dead vegetation should be removed. • Plantings should be limited to carefully spaced, low-growing, low-combustibility species, grasses, and lawns. • Lawns should be mowed regularly. • Trees and shrubs should be well-spaced and not highly combustible (such as evergreens). • If highly combustible trees or shrubs are in this zone, they should be limited in number and well-spaced from one another, have their lower limbs pruned up and away from the ground to prevent fire from moving into the crown and they should not be aligned with the corner line of structures. • Boats, RV's, and other vehicles should not be parked in this zone. • According to the Insurance Institute for Business & Home Safety, "There is not enough scientific understanding to prescribe exact distance recommendations for spacing of accessory structures." Even with this information, it's generally accepted that structures should not be within 30 feet of one another and if they are, each should have a managed structure ignition zone. • Propane tanks should not be in this zone. If they are, a 10-foot managed area should be maintained around them.

Zone 3	30-100 feet from structure	
Introduction	Zone 3 includes the remaining 30-100 feet around structures (and their attachments) and is the extent of the structure ignition zone. This zone may need to be extended to 200 feet in areas with steep slopes or heavy fuels. The goal of this zone is to reduce the continuity of fuels in such a way that large flames (crown fire) cannot persist. Tall flames should be converted to short, low-intensity flames as they enter Zone 2.	
	Components	Standard
	Immediate landscaped area	<ul style="list-style-type: none"> • Low flammability vegetation should be chosen for this area with adequate vertical and horizontal spacing between the vegetation to limit the potential of fire spread. • Trees should be spaced from one another to minimize the transfer of crown fire. Tree groupings should be well-spaced from one another as well. • Structures in this zone should also have a managed structure ignition zone. • Dead and downed fuels should be removed as much as possible.

Beyond Zone 3	Larger Landscape	
Introduction	The landscape beyond Zone 3 should be considered for management when possible. Fuels in this area could be managed in such a way to lessen the volume of ember production, decrease fire intensity, and create opportunities for fire suppression equipment and personnel while being in line with other forest management goals. Fuel breaks can be created by lowering the density of forest vegetation, removing the higher flammability species. Fuel breaks should be strategically located with prevailing weather patterns in mind. Fuel breaks should be created to protect human development, timber stands, and other values at risk. Fuel breaks can be made even more effective if they are tied in with existing firebreaks, such as bodies of water, roads, trails, landings, rights of way, cultivated fields, golf course, etc. Accessibility to the breaks is key if they are to be able to be utilized by firefighters.	

Sources:

Insurance Institute for Business & Home Safety’s Wildfire Research: Near-Building Noncombustible Zone: https://ibhs.org/wp-content/uploads/wpmembers/files/Near-Building_Noncombustible_Zone_Report_IBHS.pdf

Behm AL, Long AJ, Monroe MC, Randall CK, Zipperer WC, Hermansen-Baez LA (2004b) Fire in the wildland–urban interface: preparing a firewise plant list for WUI residents. University of Florida, Institute of Food and Agricultural Services, Florida Cooperative Extension Service Circular 1453. (Gainesville, FL). <https://edis.ifas.ufl.edu/publication/FR151>.

Landscape-Level Treatment

Landscape-level treatment, also called vegetation management or fuel treatments, can restore forest health, and reduce wildfire risk to communities and infrastructure.

Landscape treatments may include thinning, mastication, grazing, vegetation management, prescribed fire, or other activities designed to modify the condition of the landscape. These activities occur on a significantly larger scale (e.g., watershed) than treatments occurring in the landscape surrounding a structure.

Effective landscape-level treatments require engaging with property owners and residents from the start to maximize the benefits of creating cross-boundary projects. This will also help to prioritize areas that impact identified community values such as structures, critical ecosystems, infrastructure, landscape health, cultural values, etc. Follow all historical, state, and federal ecological guidelines before completing healthy landscape work.

Safety

There are a range of safety considerations that mitigation professionals must consider. Equipment use, interacting with residents, home visits, and driving, among others, should all be considered. Check for specific protocols, policies, and procedures from local jurisdictions or organizations.

The National Wildfire Coordinating Group 6 Minutes for Safety Subcommittee provides comprehensive safety information available online, <https://www.nwcg.gov/committee/6mfs/my-safety>.

Regulations, Policy & Plans

Be familiar with the codes, ordinances, and plans adopted by local jurisdictions that may apply in an area.

Codes and Ordinances

Codes and ordinances can play an important role in community risk reduction. The most effective codes and ordinances are specifically designed and embraced by the local community to meet specific needs. They also have an enforcement mechanism. Without buy-in from residents or an understanding of the intent, code requirements are often viewed as additional costs or burdens.

The following codes often act as a model for local standards:

NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire. The 1144 Standard provides a methodology for assessing wildland fire ignition hazards around existing structures and provides requirements for new construction to reduce the potential of structure ignition from wildland fires.

ICC 2018: International Wildland Urban Interface Code. This comprehensive WUI code establishes minimum regulations for land use and the built environment in designated WUI areas using prescriptive and performance-related provisions.

NFPA 1141: Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas. The 1141 Standard provides requirements for the development of fire protection and emergency services infrastructure to make sure that wildland, rural, and suburban areas undergoing land use changes or land development have the resources and strategies in place to protect people and property from fire dangers and allow firefighters to do their jobs safely and effectively.

Plans

Communities may have several different plans in place that guide wildfire mitigation efforts. Practitioners should be familiar with the various plans and determine what may best work for a community.

Community Wildfire Protection Plans

According to the *NWCG Glossary of Wildland Fire Terminology*, PMS 205, a Community Wildfire Protection Plan (CWPP) is defined as:

“A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, and local government, local fire department, other stakeholders, and federal land management agencies managing land in the vicinity of the planning area.”

A CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on federal and non-federally administered land that will protect one or more at-risk communities and essential infrastructure. The plan includes recommendations and measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection -or all the above.”

The minimum requirements for a CWPP include:

1. **Collaboration.** A CWPP must be developed collaboratively. Local and state officials must meaningfully involve federal agencies that manage land in the vicinity of the community and other interested parties, particularly nongovernmental stakeholders.
2. **Prioritized Fuel Reduction.** A CWPP must identify and prioritize areas for hazardous fuel reduction treatments on both federal and non-federal land and recommend the types and methods of treatment that, if completed, would reduce the risk to the community.
3. **Treatment of Structural Ignitability.** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

The three required signatories for a CWPP include:

1. The authority having jurisdiction (city or county),
2. Local fire department(s), and
3. State forestry agency.

For more information on CWPPs, visit the Wildland Fire Leadership Council website at <https://www.forestsandrangelands.gov/resources/communities/index.shtml>.

State/Tribal/Local Hazard Mitigation Plan

The Federal Emergency Management Agency’s (FEMA) Federal Insurance and Mitigation Administration (FIMA) administers the National Hazard Mitigation Planning Program and provides guidance and technical assistance for developing hazard mitigation plans, <https://www.fema.gov/hazard-mitigation-planning-resources>.

FEMA requires state, tribal and local governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects.

Many communities at risk for wildfire take an integrated planning approach and incorporate the jurisdiction's CWPP into their multi-hazard mitigation plan.

Other Plans

Other plans, at a variety of scales, may need to be considered for a community. These plans may provide more specific guidance for wildfire mitigation action in these community. Examples at a variety of scales include, but are not limited to, National Forest System Action Plans, Integrated Resource Management Plans, State Forest Action Plans, Hazard Mitigation Plans, local comprehensive or land-use plans and Firewise USA® Action Plans.

The *NWCG Standards for Mitigation in the Wildland Urban Interface* is developed and maintained by the Wildland Urban Interface Mitigation Committee (WUIMC), an entity of the National Wildfire Coordinating Group (NWCG).

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