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# Wildland Urban Interface Wildfire Mitigation Desk Reference Guide

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# Preface

The effects of wildland fire on communities have become more intense, frequent, and far-reaching. Increased development in the wildland urban interface means higher wildfire risk and more suppression needs, costing billions every year. A comprehensive approach to preparedness and mitigation is an effective way to address increasing suppression costs and reduce risk to communities.

The *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide* is designed to provide basic background information on relevant programs and terminology for those, whether community members or agency personnel, who are seeking to enhance their community's wildfire mitigation efforts.

Mitigation happens at all levels – local, state, tribal, and federal. A combined approach helps achieve fire adapted communities. Individuals, communities, and organizations working together to share and leverage resources and build partnerships are the keys to success. This guide defines terms and identifies resources that are useful in mitigation planning efforts for all lands.

The four primary objectives of this reference guide are to:

- Provide a reference to assist with integrating wildland urban interface mitigation principles into national wildland fire training;
- Promote common wildfire mitigation language and culture;
- Establish an authoritative source for wildland urban interface mitigation information; and
- Provide consistent definitions for use by all media.



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# Wildland Urban Interface

## What is wildland urban interface?

Generally speaking, wildland urban interface 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 wildlands are at varying degrees of risk from wildfires.

## What is mitigation?

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters.

## Why is mitigation important in the wildland urban interface?

Undertaking wildfire mitigation in the wildland urban interface can reduce or eliminate the risk of wildfire to the human environment (homes, neighborhoods, communities). These actions offer multiple benefits including:

- Creating safer communities by reducing loss of life and property damage.
- Allowing individuals and communities to minimize post disaster disruptions and recover more rapidly.
- Lessening the financial impact on individuals, communities, and society as a whole.
- Contributing to firefighter and public safety by reducing fuels or lessening the risk of structures igniting.

## Mitigation Principles

A comprehensive mitigation approach based on a risk assessment is important for decision making in order to distinguish among various risk management options for accepting, avoiding, reducing, or transferring the risk. Resiliency, or fire adaptation, is a continual process that results in effective risk management.

- **Risk Assessments**

Risk assessment is a systematic process for identifying and assessing the range of elements that could lead to undesirable outcomes for a specific situation.

Quantitative risk assessment requires calculations of the two primary components of risk: the magnitude of the potential loss and the probability that the loss will occur. For the wildland urban interface, a risk assessment is a step in the planning process that identifies the probability that any feature/element of the landscape and structures that will create potential harm to a homeowner or community.

- **Risk Reduction**

The goal of risk reduction is to reduce the potential loss to life and property. This can apply to both existing and future conditions, and pre- and post-disaster environments, through regulations, local ordinances, land use and building practices, and with wildfire mitigation projects.

# Basic Components of Wildland Urban Interface Mitigation

## Fire Adapted Community

The NWCG definition of fire adapted community (FAC) is “A human community consisting of informed and prepared citizens collaboratively planning and taking action to safely co-exist with wildland fire.” More fully, a FAC is a knowledgeable, engaged community where actions of residents and agencies in relation to infrastructure, buildings, landscaping, and the surrounding ecosystem lessen the need for extensive protection actions and enable the community to safely accept fire as part of the surrounding landscape. A successful fire adapted community approach has the potential to save lives, homes and communities, and millions of dollars in suppression costs annually.

The concept of fire adapted communities does not refer to a specific program but a desired end state. A fire adapted community is a dynamic state of being and the community should continually strive to become more fire adapted in order to reduce risk. Becoming a fire adapted community is a continuous process that requires ***maintenance*** and ***adaptation*** to ensure actions are effective. Constant re-assessment will be required to remain fire adapted.

Because wildfire risk is shared by all stakeholders, a fire adapted community strategy stresses that everyone shares responsibility for mitigating the risk. Stakeholders in a fire adapted community include residents, businesses, policy-makers, land managers, and emergency responders, as well as local, state, tribal, and federal governments. Engaging in a fire adapted community approach can be encouraged by all levels of government through:

- Support for outreach programs to engage the public in mitigation efforts;
- Mitigation incentives; and
- Improved application of relevant research findings on structural ignition, fuels reduction, and key social dynamics.

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

- **Community Wildfire Protection Plan (CWPP)** or equivalent plan which help the larger community identify key values at risk and ways to mitigate fire risk.
- **Vegetation management** and **ignition resistant homes** on private lands.
- **Local responder understanding** of the complexities of preparing for and dealing with wildfire.
- **Fuels treatments** on public and private lands in and around communities to reduce hazardous fuels and create fuels buffers.
- **Codes, covenants and ordinances** to foster development in the wildland urban interface that minimizes fire risk.
- **Cooperation** between jurisdictional authorities.

## Community Wildfire Protection Plan

A Community Wildfire Protection Plan (CWPP) is a plan developed by a community in an area at-risk from wildland fire. The CWPP is a collaborative product involving interested parties, local government, local firefighting agencies, the state agency which oversees forest management and, if present in the vicinity, federal land management agencies. While plans do not need to be overly complicated, they should effectively address local forest and range conditions, values-at-risk and priorities for action.

A CWPP, or equivalent plan, is generally developed by local government with assistance from state, tribal, and federal agencies and other interested partners. Plans can take a variety of forms and may be as simple or complex as necessary, based on the specific needs and desires of the local community or county.

The minimum requirements for a CWPP are:

- **Collaboration** – A CWPP must be collaboratively developed. Local and state officials must meaningfully involve federal agencies that manage land in the vicinity of the community and other interested parties, particularly non-governmental stakeholders.
- **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.
- **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 first statutory definition of CWPPs appeared in the Healthy Forests Restoration Act (HFRA) which also specified that communities that had a CWPP in place were to be a

priority for receiving hazardous fuels reduction funding administered by the U.S. Forest Service and the Bureau of Land Management.

For more information on CWPP's visit the Wildland Fire Leadership Council Web site at <http://www.forestsandrangelands.gov/communities/cwpp.shtml>.

## **Homeowner Wildfire Mitigation**

Homeowners can undertake a number of mitigation measures that can decrease the potential destructive effects a wildfire might have on their property. Some measures are designed to modify the forest environment surrounding a structure to decrease potential ignition sources. Others focus on modifying the construction of a structure itself (or changing its location) to make the structure more resistant to ignition. To reduce the risk for the long term, actions need to be maintained over time.

### **Common Practices**

- Actively managing vegetation near the home by reducing, maintaining and/or replacing with ignition-resistant components. Greater efforts are needed within close proximity of the structure and gradually decreasing efforts beyond that. For appropriate distances contact your local state forestry or fire department.
- Maintaining structures free of needles, leaves, and other organic debris from decks, roofs, and near the base of exterior walls.
- Increasing ignition resistance of structures by actions such as using ignition resistant roofing and protecting exterior openings of structures by covering with non-flammable wire mesh screening (attic vents, eaves/soffits, crawl spaces, etc.).
- Removing flammable materials from beneath structures and decks.
- Locating firewood, fuel tanks, and LPG tanks at a safe distance from structures.



# Wildland Urban Interface Mitigation Opportunities

This section provides basic background on a range of larger scale wildfire mitigation opportunities. In addition, numerous programs exist at the state and local level throughout the country.

## Fire Adapted Communities Coalition

The Fire Adapted Communities Coalition is a group of partners committed to helping people and communities in the wildland urban interface adapt to living with wildfire and reduce their risk for damage, without compromising firefighter or civilian safety.

For more information about fire adapted communities visit the FAC Coalition website at [www.fireadapted.org](http://www.fireadapted.org), The Nature Conservancy and The Watershed Center FAC program website and blog at [facnetwork.org/](http://facnetwork.org/), and the IAFC FAC program website at [www.iafc.org/FAC](http://www.iafc.org/FAC).

## Fire Learning Network

The Fire Learning Network (FLN) aims to restore the nation's forests and grasslands and make communities safer from fire, through public-private partnerships that engage in collaborative planning and implementation, conduct experiential training, and supports communication and public outreach about fire and restoration.

For more information visit The Nature Conservancy's Fire Learning Network website at [www.conservationgateway.org/fln](http://www.conservationgateway.org/fln).

## Fire Safe Councils

Fire Safe Councils (FSC) are grassroots community-based organizations which share the objective to protect homes, communities and environments from wildfire. FSCs accomplish this objective through education programs and projects such as shaded fuel breaks to protect area residents against an oncoming wildfire and to provide firefighters with a place to fight the fire. The fire agency and local government representatives may be members of the FSC, or may serve in an advisory capacity, depending on local needs.

All FSCs are independent entities. Some are organized as non-profit 501(c) (3) corporations; others operate under a memorandum of understanding with a county, city,

and/or local fire protection district; some have no formal structure. FSCs vary in size and focus. Some are county-wide, while others involve only the Homeowner's Association in a subdivision. There are also several regional associations of fire safe councils.

For more information on Fire Safe Councils in California visit [www.firesafecouncil.org](http://www.firesafecouncil.org); for Councils in Montana visit <http://firesafemt.org>; and for Councils in Nevada visit [www.nvfsc.org](http://www.nvfsc.org).

## **Firewise Communities**

The Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. The program encourages local solutions for wildfire safety by involving homeowners and others in reducing wildfire risks by fostering defensible space and resilient structures for homes and communities.

Elements of the Firewise Communities program include the Firewise Communities/USA Recognition Program, Home Ignition Zone (HIZ) Workshops, online training courses, an interactive website, public education, and support for fire organizations and community groups.

For more information visit the NFPA's Firewise Communities Web site at <http://www.firewise.org/>.

## **Living with Fire**

The purpose of Living with Fire is to provide homeowners living in fire prone areas with wildfire threat reduction recommendations developed by firefighting experts. This program also provides suggestions about what to do during and after a fire.

The program has many tools available for educators, homeowners, community groups, fire safe councils, and firefighting professionals to help educate and inform others about mitigating Nevada's wildfire threat. The information has been shared with thousands of homeowners living in fire prone areas throughout the country. Materials include pre-fire activities such as creating defensible space, safe evacuation practices, and what to do when returning home after a wildfire threat has passed.

For more information visit the Living with Fire Web site managed by University of Nevada Cooperative Extension at <http://www.livingwithfire.info/>.



## **Ready, Set, Go!**

The Ready, Set, Go! (RSG!) Program seeks to develop and improve the dialogue between fire departments and the residents they serve. The program helps fire departments teach residents in the wildland urban interface how to best prepare themselves and their properties against wildfire threats. The RSG! Program tenets help residents be **Ready** with preparedness understanding, be **Set** with situational awareness when fire threatens, and to **Go**, evacuating early when a fire starts.

For more information visit the International Association of Fire Chiefs Ready, Set Go! Web site at <http://www.wildlandfirersg.org>.



# Background Materials – Policy and Research

## Healthy Forests Restoration Act (HFRA) of 2003

HFRA, signed into law in 2003, authorizes the Secretaries of Agriculture and the Interior to expedite the development and implementation of hazardous fuel reduction projects on federal lands managed by the US Department of Agriculture (USDA) Forest Service and the US Department of Interior (DOI) Bureau of Land Management, when they meet certain conditions (other DOI bureaus are not addressed in the statute, but have generally adopted policies and practices based on HFRA). The wildland urban interface is one of the identified priority areas that qualify for the use of these expedited environmental review authorities.

For more information on HFRA visit the Wildland Fire Leadership Councils Web site at <http://www.forestsandrangelands.gov/>.

## National Cohesive Wildland Fire Management Strategy

Developed in response to requirements of the Federal Land Assistance and Enhancement (FLAME) Act of 2009, the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) is a collaborative effort to examine growing wildfire challenges across all lands regardless of ownership. The process is a collaborative, all-hands, all-lands approach to wildfire management. All members of the wildland fire community, including federal, tribal, state, local, and nongovernmental partners, are active participants.

The Cohesive Strategy focuses on three elements: (1) restore and maintain landscapes, (2) fire adapted communities; and (3) wildfire response.

For outreach opportunities to engage in visit the Cohesive Strategy Web site at <http://www.forestsandrangelands.gov/>.

## Presidential Policy Directive/PPD-8

Presidential Policy Directive-8 (PPD-8) was released in March 2011 with the goal of strengthening the security and resilience of the Nation through systematic preparation within five mission areas: prevention, protection, mitigation, response, and recovery. The directive considers the full spectrum of threats and hazards, including natural, technological/accidental, and adversarial/human-caused. As part of the National Preparedness System required by this directive, a National Mitigation Framework was created which establishes a common platform for coordinating and addressing how the

nation manages risk from all threats and hazards through mitigation capabilities. To implement the National Mitigation Framework, a Federal Interagency Operations Plan was developed and a Mitigation Framework Leadership Group (MitFLG) has been established. The MitFLG serves as the central coordination point for interagency mitigation activities across the federal government by facilitating information exchange, coordinating policy implementation, and overseeing successful implementation of the National Mitigation Framework.

For more information on PPD 8 visit the Homeland Security Web site at <http://www.dhs.gov/presidential-policy-directive-8-national-preparedness>.

## **Quadrennial Fire Review**

The Quadrennial Fire Review (QFR) is a strategic assessment process that is conducted every four years to evaluate current mission strategies and capabilities against best estimates of the future environment for fire management. This integrated review is a joint effort of the five federal natural resource management agencies and their state, local, and tribal partners that constitute the wildland fire community. The objective is to create an integrated strategic vision document for fire management.

For more information on QFR visit the National Interagency Fire Center Web site at [http://www.nifc.gov/policies/pol\\_ref\\_QFR.html](http://www.nifc.gov/policies/pol_ref_QFR.html).

## **Research Efforts**

For the latest findings in social science, fuels treatments and other research efforts, visit the Joint Fire Science Web site at <https://www.firescience.gov> and the US Forest Service Research and Development publication system at <http://www.treesearch.fs.fed.us>.

## **Whole Community**

In 2011, the Federal Emergency Management Agency (FEMA) initiated a national dialogue on a Whole Community approach to emergency management. The Whole Community concept is a lens through which residents, emergency management practitioners, organization leaders, and government officials can understand and assess the needs of local residents and the best ways in which to organize and strengthen their assets, capacities, and interests. The Whole Community approach involves increasing individual preparedness and using communities as force multipliers to enhance the resiliency of our Nation as a whole. The three core principles of Whole Community include:

- 1) Understand and meet the actual needs of the whole community;

- 2) Engage and empower all parts of the community; and
- 3) Strengthen what works well in communities on a daily basis.

These three principles provide a foundation for pursuing a whole community approach to emergency management through which resiliency can be attained.

For more information on Whole Community visit the FEMA Web site at <http://www.fema.gov/whole-community>.



# Common Wildfire Mitigation Language

This section contains terminology currently used in the wildland urban interface arena. For convenience in browsing, terms not found in the *NWCG Glossary of Wildland Fire Terminology* are annotated with an asterisk (\*).

**Awareness** - The continual process of collecting, analyzing, and disseminating intelligence, information, and knowledge to allow organizations and individuals to anticipate requirements and to react effectively and safely.

**Community Wildfire Protection Plan (CWPP)** - A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, local government, local fire department, other stakeholders, and federal land management agencies managing land in the vicinity of the planning area. A Community Wildfire Protection Plan (CWPP) identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends 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 of the above.

**\*Defensible Space** - the area around a structure where flammable vegetation and objects are managed to increase the chance a structure will survive a wildfire with or without active protection. This space is wide enough to prevent direct flame impingement and reduce the amount of radiant heat reaching the structure. The defensible space for each structure varies, depending on the type of vegetation and topography.

**Ecosystem** - An interacting natural system, including all the component organisms together with the abiotic environment and processes affecting them.

**Ecosystem Sustainability** - A concept that promotes the use of natural resources to benefit humans while conserving and wisely managing natural ecosystems for the future.

**Evacuation** - An organized, phased, and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas, and their reception and care in safe areas.

**Fire Adapted Community (FAC)** - A human community consisting of informed and prepared citizens collaboratively planning and taking action to safely co-exist with wildland fire.

**\*Fire Mitigation** - Actions to reduce the potential negative impacts of wildland fires and to improve public and firefighter safety. Includes, but is not limited to, vegetative and structural treatments.

**Fire Prevention** - Activities such as public education, community outreach, law enforcement, engineering, and reduction of fuel hazards that are intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property or resources.

**Fuel Management** - Act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives.

**Hazard Reduction** - Any treatment on living and dead fuels that reduces the potential spread or consequences of fire.

**Home Assessment** - Evaluation of a dwelling and its immediate surrounding(s) to determine its potential to escape damage by an approaching wildland fire. Includes the fuels and vegetation in the yard and adjacent to the structure, roof environment, decking and siding materials, prevailing winds, topography, fire history, etc., with the intent of mitigating fire hazards and risks.

**\*Home Ignition Zone (HIZ)** - The HIZ describes the area where the factors that principally determine home ignition potential during extreme wildfire behavior (high fire intensities and burning embers) are present. The characteristics of a home and the characteristics of its immediate surroundings within 100 feet comprise the HIZ.

**\* Interface Community** - Exists where structures abut wildland fuels. There is a clear line of demarcation between residential, business, and public structures and wildland fuels. Wildland fuels do not generally continue into the developed area. The development density for an interface community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department with the responsibility to protect the structure from both an interior fire and an advancing wildfire. An alternative definition of the interface community emphasizes a population density of 250 or more people per square mile.

**\*Intermix Community** - Exists where structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from



structures very close together to one structure per 40 acres. These areas may or may not have local fire protection district. When present, fire protection districts are often made up of volunteers. An alternative definition of intermix community emphasizes a population density of between 28-250 people per square mile.

**\*Mechanized Fuels Treatment** - Mechanized and hand biomass reduction. Treatment techniques include; thinning, chipping, mastication, mowing, crushing, hand and machine piling, and lop and scatter.

**Mitigation** - Those activities implemented prior to, during, or after an incident which are designed to reduce or eliminate risks to persons or property that lessen the actual or potential effects or consequences of an incident. Mitigation measures can include efforts to educate governments, businesses, and the general public on measures they can take to reduce loss and injury and are often informed by lessons learned from prior incidents.

**\*Occluded Community** - Exists in a situation, often within a city, where structures abut an island of wildland fuels (e.g., park or open space). There is a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in the interface community, but the occluded area is usually less than 1,000 acres in size. Fire protection is normally provided by local government fire departments.

**Preparedness** - 1) Activities that lead to safe, efficient, and cost-effective fire management programs in support of land and resource management objectives through appropriate planning and coordination; 2) Mental readiness to recognize changes in fire danger and act promptly when action is appropriate; 3) The range of deliberate, critical tasks, and activities necessary to build, sustain, and improve the capability to protect against, respond to, and recover from domestic incidents.

**Prescribed Fire** - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act (NEPA) requirements (where applicable) must be met, prior to ignition.

**Prevention** - 1) Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards (fuels management); 2) Actions to avoid an incident, to intervene for the purpose of stopping an incident from occurring, or to mitigate an incident's effect to protect life and property. Includes measures designed to mitigate damage by reducing or eliminating risks to persons or property, lessening the potential effects or consequences of an incident.

**Readiness** - 1) Condition or degree of being completely ready to cope with a potential fire situation; 2) Mental readiness to recognize changes in fire danger and act promptly when action is appropriate.

**Resiliency** - Is used to mean “resilient ecosystems”, which “are those that resist damage and recover quickly from disturbances (such as wildland fires) and other human activities”. (A National Cohesive Wildland Fire Management Strategy, March 17, 2011, Appendix B: Glossary.)

**Risk** - 1) The chance of fire starting as determined by the presence and activity of causative agents; 2) A chance of suffering harm or loss; 3) A causative agent; and 4) A number related to the potential of fire brands to which a given area will be exposed during the rating day - National Fire Danger Rating System (NFDRS).

**\*Risk Assessment** - The determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat.

**Rural** - Any area wherein residences and other developments are scattered and intermingled with forest, range, or farm land and native vegetation or cultivated crops.

**Rural Fire Protection** - Fire protection and firefighting problems that are outside of areas under municipal fire prevention and building regulations and that are usually remote from public water supplies.

**Structural Fire Protection** - The protection of homes or other structures from wildland fire.

**\*Values at Risk** - The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire. These include inhabitants and diverse resources or characteristics that are valuable to the community such as structures, watersheds, power grids, natural and cultural resources, community infrastructure and other economic, environmental, and social values.

**Values to be Protected** - Include property, structures, physical improvements, natural and cultural resources, community infrastructure, and economic, environmental, and social values.

**Volunteer Fire Department (VFD)** - A fire department of which some or all members are unpaid.

**Wildfire** - An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

**Wildfire Suppression** - An appropriate management response to wildfire, escaped wildland fire use or prescribed fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire.

**Wildland** - An area in which development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

**Wildland Fire** - Any non-structure fire that occurs in the wildland. Three distinct types of wildland fire have been defined and include wildfire, wildland fire use, and prescribed fire.

**Wildland Urban Interface (WUI)** - The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

**\*WUI Mitigation Actions** - Activities or projects that address fuels build-up, structure flammability and similar issues to reduce wildfire impacts to lives, structures and communities (e.g., Firewise, defensible space, hardening structures, fuel treatments, etc.)