



## Wildfire Prevention Manual – Chapter 2

### Understanding the Risk

To enable the shared preventative activities that this document aspires to it is important to have both a common understanding of the problem (the risk or threat to the UK) and also terminology relevant to the UK market. Agreed terminology is therefore important and the wrong terminology could undermine preventative efforts and, in the worst case scenario, cause the issue at hand to not even be recognised.

For example, using the term 'Wildland Urban Interface' or 'WUI' in the UK could, despite the term being widely accepted and understood overseas (and referenced in the FRS Wildfire Operational Guidance manual), generate a certain amount of scepticism amongst some users and undermine the intent of the manual – the term 'Wildland' not being applicable to the vast majority of the UK.

The use of the term 'Rural Urban Interface' ('RUI') however, explained in this document and likely to be more relevant to stakeholders, together with a clear explanation of the threat posed to it by Wildfires, should enable both the required common understanding and the prevention agenda.

The following chapter therefore looks to ensure that the risk posed to communities and Fire and Rescue Services is fully understood, whether this is on open land or in the RUI, via direct flame, the threat from embers or even the threat posed by terrorism. There are also a number of key terms associated with wildfire and the widely accepted definitions of them are included to enhance the common understanding necessary.



[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### Wildfire

It is important to clarify what is meant by a wildfire, the topic being the subject of much debate. Depending on the part of the Country / World you come from these fires might be referred to as heath fires, forest fires, brush fires, something else or, worst case scenario, not even be recognised as such. It can be debated when an outdoor fire becomes a wildfire (in terms of size, number of appliances or firefighters attending etc.), but for the purposes of this document it will be defined as follows:

**A wildfire is any uncontrolled vegetation fire which requires a decision, or action, regarding suppression.** (Source: Scottish Wildfire Operational Guidance)

The rate of spread of wildfire can vary depending upon the type of vegetation (flammable material or fuel) and the topography, particularly its vertical arrangement. For example, any fuel uphill from a fire is more readily dried and warmed by the fire than vegetation downhill, and hence is more likely to be affected by wildfire. It is possible therefore to categorize wildfires by the fuels involved, as follows:

**Ground fires** are fed by subterranean roots, duff and other buried organic matter. This fuel type is especially susceptible to ignition due to spotting. Ground fires typically burn by smoldering, and can burn slowly for days to months.

**Surface fires** are fueled by low-lying vegetation such as leaf and timber litter, debris, grass, and low-lying shrubbery.

**Near Surface / Elevated (Ladder fires)** consume material between low-level vegetation and tree canopies, such as small trees, downed logs, and vines.

**Aerial fires (aka crown or canopy)** burn suspended material at the canopy level, such as tall trees, vines, and mosses. The spread of a crown fire, referred to as crowning, is dependent on the density of canopy, its height, continuity, and sufficient surface and ladder fires in order to reach the tree crowns.

The link between the above, and hence the spread of a wildfire from ground to the canopy, provides a focus for land management and prevention efforts, discussed in this manual in the later chapters.

[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### Rural Urban Interface

The population of the UK continues to expand and there is immense pressure to build additional housing in the countryside, often in areas where there has been no development at all. In addition, people also want to move to the countryside to take advantage of the privacy, natural beauty and recreational opportunities that it brings. Developers are building new housing and indeed whole new communities to accommodate the influx.

As a result, there is an increased risk of wildfires impacting severely on areas where these homes are built near or among lands prone to this type of incident. For the purposes of this document this interface is defined as follows:

The area of transition between unoccupied land and human development, where there is an identified risk of wildfire, can be referred to as the **Rural-urban interface or RUI**.

Much of the information found in this manual will assist develop preventive solutions for areas where urban environments, villages, towns & cities are in close proximity to high risk wildfire areas. However, when planning prevention initiatives, it is important to understand that the RUI can be found in two distinctly different scenarios:

**Interface:** Where a distinct boundary line exists between the wildfire risk and the urban habitats (fig 1)

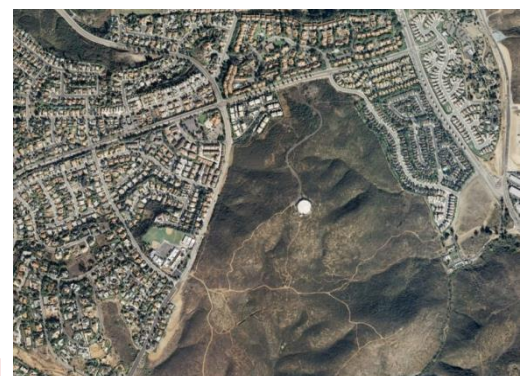


Fig 1

[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### Rural Urban Interface

**Intermix:** Where structures are scattered throughout the risk area with no clear demarcation (fig 2)

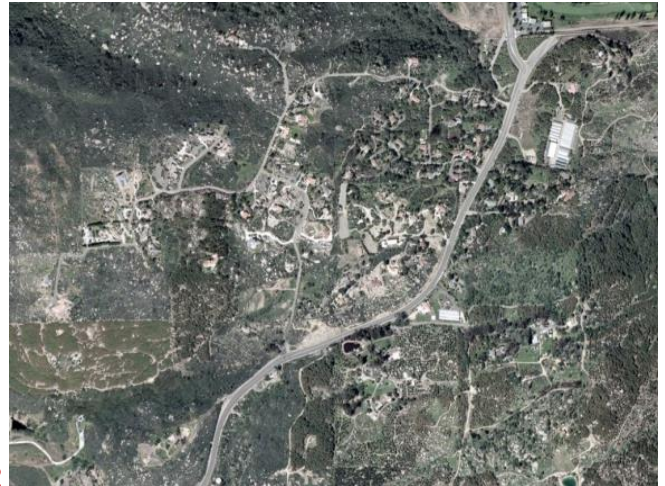


Fig 2

For the purposes of this document both will be referred to as the RUI

The RUI, however, is not a place as such but a set of conditions that can exist in nearly every community in the UK. It can be found in anything from a large town or village to a few homes on a common.

According to the National Fire Protection Association (NFPA), these conditions include (but are not limited to):

The amount, type, and distribution of vegetation; the flammability of the structures (homes, businesses, outbuildings, decks, fences) in the area, and their proximity to fire-prone vegetation and to other combustible structures; weather patterns and general climate conditions; topography; hydrology; average plot size; and road construction.

What is clear is that **the RUI exists in every county** in the UK and that fires in the RUI, although not currently widely recognised in the UK, are an increasing threat with the ability to stretch FRS resources to the extreme in the same – or perhaps even more extreme ways - as a wildfire on open ground.

[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### The Risk

The risk exists in the UK in two main forms – from ignition by **direct flame** and ignition from **embers**. In the UK currently, the greatest threat is from fires started by direct flame but for wildfires overseas, in the USA for example, wind-blown embers are a major cause of concern in both the Rural Urban Interface and Intermix. Most structures overseas within the RUI are **not** destroyed from direct flame impingement, but rather from embers and this is a problem that the UK has to be aware of when planning response and preventative initiatives, both now and in the future.

#### Direct Flame

The devastating effects of direct flames in a wildfire are seen often on open spaces and forestry, but more and more in the UK this is a major problem in the RUI. This problem is discussed in the following pages with examples to highlight the risk.



#### Ember Threat

Embers may precede the flaming fire front, carried by the winds that distribute burning brands or embers over long distances. These embers fall, or are wind-driven, into receptive fuels within structures, often going undetected for some time. As the fire front passes, these small embers may ignite small fires that, unchecked, spread to structures. Without any intervention these fires can then pass from structure to structure right across a community.



[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### The Risk

One of the most common, yet often overlooked, (**direct flame**) risks in the UK is that posed by crop fires, typically those including hay, corn and timber. With regards to hay and corn the risk is at its height when the crop is 'cured' and able to sustain burning and, in the case of hay, this may only be after cutting and baling when the crop is lying in the field. Often it can be the process of harvesting that starts the fire, particularly with corn crops as these are ready to burn at this time.

This in itself adds to the risk, both material and life, that FRS should consider with the presence of very expensive farm machinery and farmers who may try to save this equipment should a wildfire occur. Further, these fires can be very intense, 'flashy', fires that will move with great speed and react quickly to any weather or topographical changes. They should not be underestimated and can easily become very dangerous.

In Essex in 2010 two residential properties were destroyed by a wildfire when the fire moved from crops into the roof of a terrace of 1970's designed buildings, causing a loss of over £700,000. This is shown in the attached image, that not only shows the existence of the RUI in the UK clearly but also the dangers of not correctly planning for wildfire incidents within these areas. This fire started as a rubbish fire, yet was able to cross two public roads and the fields shown before destroying the properties, a car and surrounding sheds, fences etc. The fire used ladder fuels (unmown field borders, bushes and trees) to transfer to the property shown.



[Contents](#)



## Wildfire Prevention Manual – Chapter 2

### The Risk

Timber crops pose a completely different type of hazard (including ‘spotting’ / the **Ember Threat**) to FRS as well as land managers, owners and the public. At the current time, most (deciduous) timber crops do not pose a hazard in normal UK conditions, with the possible exception of Eucalyptus plantations which are currently uncommon. These woodlands however should not be dismissed from FRS long term planning – it is to be noted that with the current predictions for the effects of global warming, there could be a significant risk posed by deciduous timber plantations within the next 20 years.

As witnessed at the Swinley Forest fire (2011), it is currently the commercial, coniferous plantations that pose the greatest risk. These plantations contain a mixture of fuel types (light, coarse and heavy



depending on age and management) with young plantations posing the greatest risk and displaying extreme fire behaviour, particularly at thicket stage before the first thinning. Whilst mature plantations generally pose a lesser threat, the presence of ladder fuels along with high wildfire conditions can see canopy (or crown) fires develop and prove extremely difficult to extinguish.

Good forestry practice (as discussed in detail later with the section covering the Forestry Commission’s Practice Guide ‘Building Wildfire Resilience into Forest Management Planning’) will help to mitigate the risk posed by timber fires. Simple steps such as maintaining rides and fuel breaks between stands of timber will help to break up the fuels and provide control lines to extinguish the fires. Particular care needs to be taken when considering prevention measures, in the Rural Urban Interface.

[Contents](#)