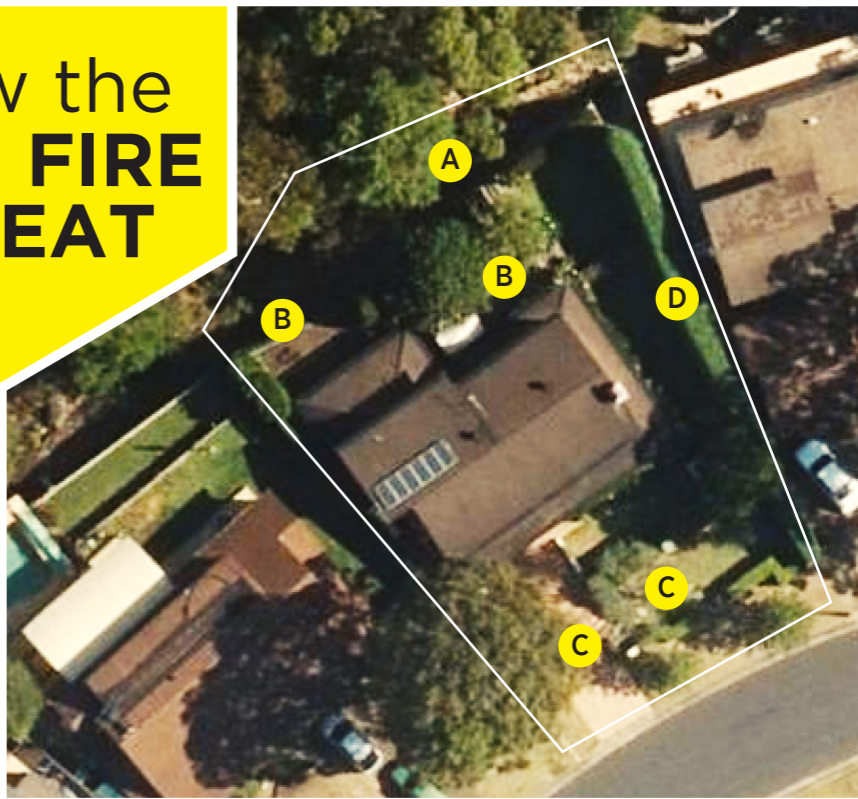




# Know the BUSH FIRE THREAT



## Types of bush fire threat

- A Direct Flame**  
Close exposure to bushland means flames from north-west could directly attack this home
- B Radiated Heat**  
High temperatures caused by the radiant heat of a nearby bush fire can crack windows or cause gardens to dry out sufficiently to combust
- C Ember Attack**  
A vortex in the gully to the north-west can lift embers over the top of the house and land in front gardens or nearby property
- D Hedge - The 'Wick' affect**  
A hedge the length of the property could act as a 'wick' transferring the fire from bush to the streets behind

Ridge which may create localised winds vortices

Increase in slope near home may increase fire intensity as it nears the home

Houses subject to ember attack where a wind vortex lifts embers up and over the houses adjacent to bush

Typically wetter vegetation, except during long term drought

NSW RFS Westleigh Brigade Station

Typical fire path

Winds swing to this south-west direction after an afternoon 'change'

Extensive Dry Sclerophyll Forest surrounds the suburb with some concentrations of volatile Eucalypts

Case Study:  
Westleigh Home

Topography

The property in Westleigh is located in a typical ridge top development surrounded by extensive bushland areas with varying aspect, exposures and slopes.

Vegetation

While the forested area is typical Dry Sclerophyll Hawkesbury Sandstone there are extensive concentrated patches of species in some locations that will have an impact on some properties but not on others. These concentrated patches include high volatile Eucalypts, extensive groves of Casuarinas or Banksia, Scribbly and Angophora gums plus a wide variety of intermediate fuel species and grasses.

Fire History - duration since last fire

The last serious fire to impact the area was in 1976 in which three houses were destroyed in Westleigh. Major high threat fires are indicated when it has been more than seven years since the last major fire.

Typical fire paths

The typical fire path in this area is from the west and north-west.

Time since last fire (fuel loads)

Fuel loads may be influenced by recent wild fire or hazard reduction burning. Recent hazard reductions include the entire bush interface from Westleigh Drive around to and including Duneba Drive, bushland to the North of the Water Reservoir adjacent to Koorinal Ave, Thornleigh. Fuel loads are estimated to be 15-25 tonnes per hectare.

Fuel types and structure

Fuel types are a combination of Eucalypt, Apple Gum, Casuarina groves and intermediate Banksia, Teatree species with various fern species. Together these provide a variety of embers.

Aspect

The house faces west to north-west and is adjacent to extensive bushland.

Slope - Topography

The house is on a ridge with a general 26 deg slope for about 105 metres running down toward a creek to the north-west. About 45 metres from the home, the slope increases to a 34deg slope. A fire moving across this landscape would move quickly up the slope and increase in intensity on the steeper slope as it neared the home.

Wind patterns

Prevailing winds are from the north-west but typically swing to the south-west during an afternoon or late evening 'change'. Winds around this property are also influenced by the local topography. A south-east/north west ridge just to the north of the property may cause winds to swirl in the gully adjacent to the house, this may cause a vortex over the roof of the house, delivering embers to the far side of the house and neighbouring properties.

Drought conditions

Long or short term drought conditions will have an impact on fire behaviour or direction. In this example, lengthy dry or drought conditions may alter typical fire patterns. The areas east and south-east of Westleigh typically receive less sun than the area north-west of the suburb so remain wetter and less likely to burn. In a long-term drought this may not be the case therefore the threat of fires coming from the south-east may be higher.

Bush Fire Danger Rating

The prevailing Bush Fire Danger Rating has a significant impact on the intensity of fire threat to be expected. For example radiant heat may be less of a threat on a day of low Fire Danger Rating.

Types of fire threat determined at the Westleigh home

As a result of this analysis, it is determined that the home has a high chance of bush fire impact from all three threats. An overall risk rating for this home would be determined after a personal property inspection is completed, which we will explore in the next Liftout.

**A** Direct Flame

A high intensity fire impacting on this residence is possible.

Due to the nature of the fuel types and structure in the area, the buildings could be exposed to the threat of direct flame carried by the continued intermediate fuels and tree canopy.

**B** Radiated Heat

Windows could be cracked due to sudden heat transfer from direct exposure to radiated heat. Garden shrubs and hedges around the property could reach a combustible level if sufficiently dried out by high temperature winds.

**C** Ember Attack

Before a fire occurs, wind effect from the local topographical features combined with the structural design of the house may cause a vortex or turbulence effect that enables a build-up of leaf litter around the building away from the expected approach direction of fire. During a fire the same wind influences may carry embers into those fuel litter built up locations.

Embers would likely be large pieces of strip bark (candle bark) that have a lengthy burning period and long travel distance. This was evidenced during a fire in 2013 in Quarry Rd, Dural which saw embers impacting on Westleigh. Leaf, twig and smaller bark particles would be prevalent. Fine soot and ash ember attack could cause build up of hot material in cracks or corners of windows and doors and under roof tiles or loose roof edges.

PROPERTY INSPECTIONS: STEP BY STEP

Property inspections are a key part of the protection of the community and many brigades are actively and regularly visiting homes to help them determine the risk at their home and develop a relevant bush fire survival plan.

This Bush Fire Bulletin Liftout is the first in a series about Property Inspections designed for NSW RFS members.

STEP 1

BUSH FIRE THREAT

What is the threat from a bush or grass fire for the area and the particular property?

STEP 2

FIRE HAZARDS AND RISK

Assisting residents to identify and manage fire hazards to reduce their risk.

STEP 3

PREPARING A BUSH FIRE SURVIVAL PLAN

How you can assist people to prepare their Bush Fire Survival Plan specific to their family and property risk.

BUSH FIRE THREAT STEP 1 OF THREE STEPS

STEP 1

DETERMINING BUSH FIRE THREAT

In this *Bush Fire Bulletin* Liftout we will provide information on determining bush fire threat for a property. Identifying the fire threat is based on three aspects of bush fire behaviour however, the type of bush or grass fire that may impact a given property is wide and varied and cannot be easily generalised across all houses at threat. The three bush fire threats are:

- A** **Direct Flame** impact is caused by:
  - Flames from the approaching bush fire
  - Flames from hazardous material catching fire near to or against the property
  - Flames from an adjoining structure fire
- B** **Radiated Heat** is excessively high temperatures caused by:
  - The approaching bush fire

- Burning hazards that emit very high temperature
- Very hot winds coming from the bush fire
- C** **Ember Attack** is a variation of burning or smouldering material from a fire driven by winds. These are the main categories of ember attack:
  - Large strip type bark material that may be distributed over lengthy distances
  - Smaller bark, leaf and twig material that impact over shorter distances
  - Powdery ash or soot that causes short distance smouldering impact

Ku-Ring-Gai District had determined the level of risk in Westleigh was Extreme.

The level of risk can change from property to property due to a wide variation of factors, some beyond our control. To assist people with determining their individual level of risk we need to work with them at their own properties. We have identified the bush fire threat for the property in Westleigh on the following pages, however, the same principles can apply to any property regardless of location.

Considerations in determining bush fire threat include:

- Fire History
- Fuel types and structure
- Bush Fire Danger Rating
- Aspect
- Time since last fire
- Drought conditions
- Slope- topography
- Typical fire paths
- Wind patterns

Case Study

Members from Westleigh Brigade in Sydney's north-west attended a property inspection in June 2015 at a house in Western Crescent, Wth the permission of the residents, we have taken this property as a case study.

A Bush Fire Risk Management Plan identifies a level of risk (threat) for wide areas within the scope of the plan. In this case the BFRMP for the Hornsby/

COMING UP

In an upcoming Bush Fire Bulletin Liftout we will look at Step 2 on identifying and managing hazards around the home in order to reduce the level of fire risk.