



# Additional building measures

**Spray Systems**

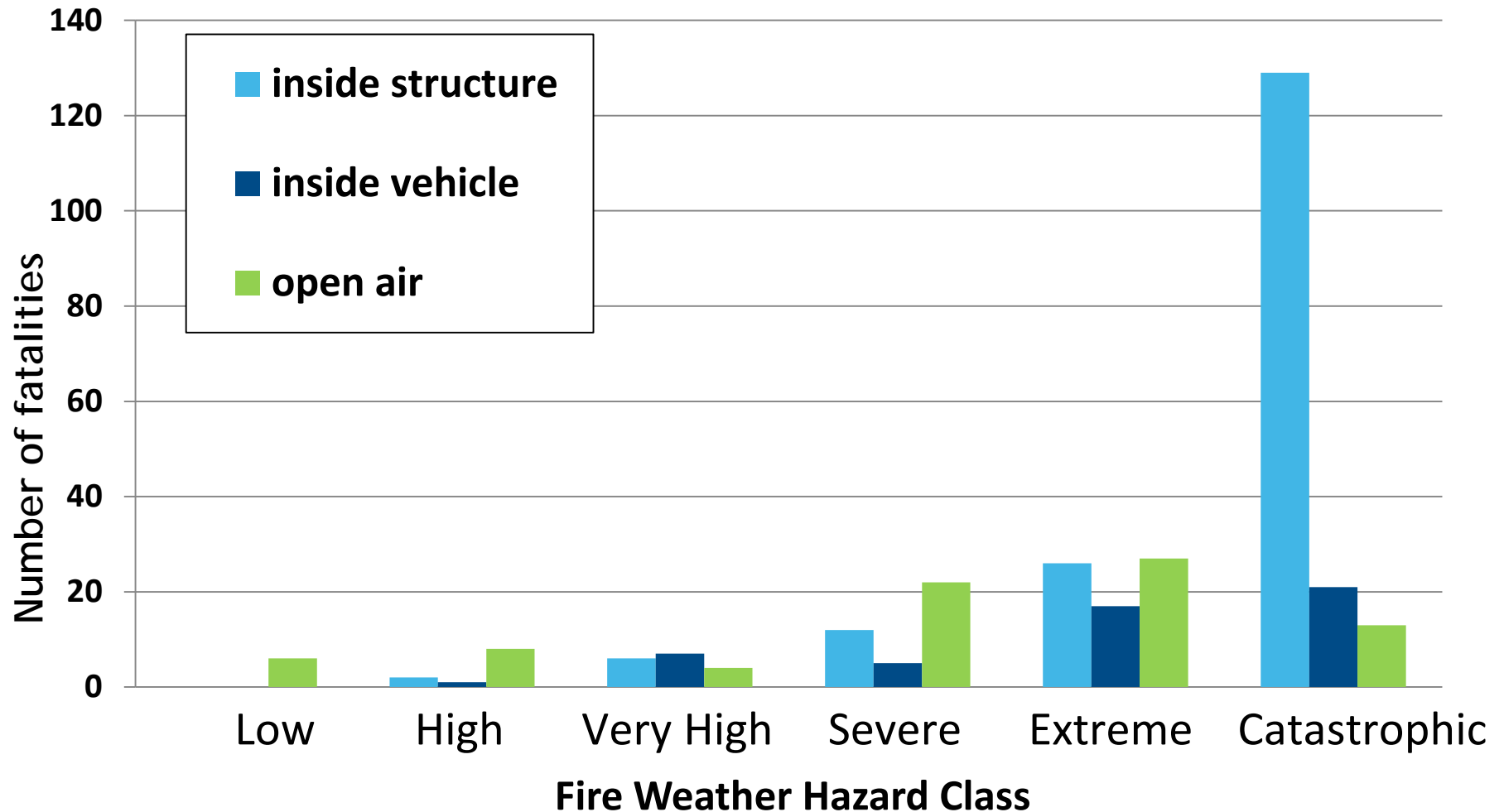
**Personal fire shelters**

**Egress**

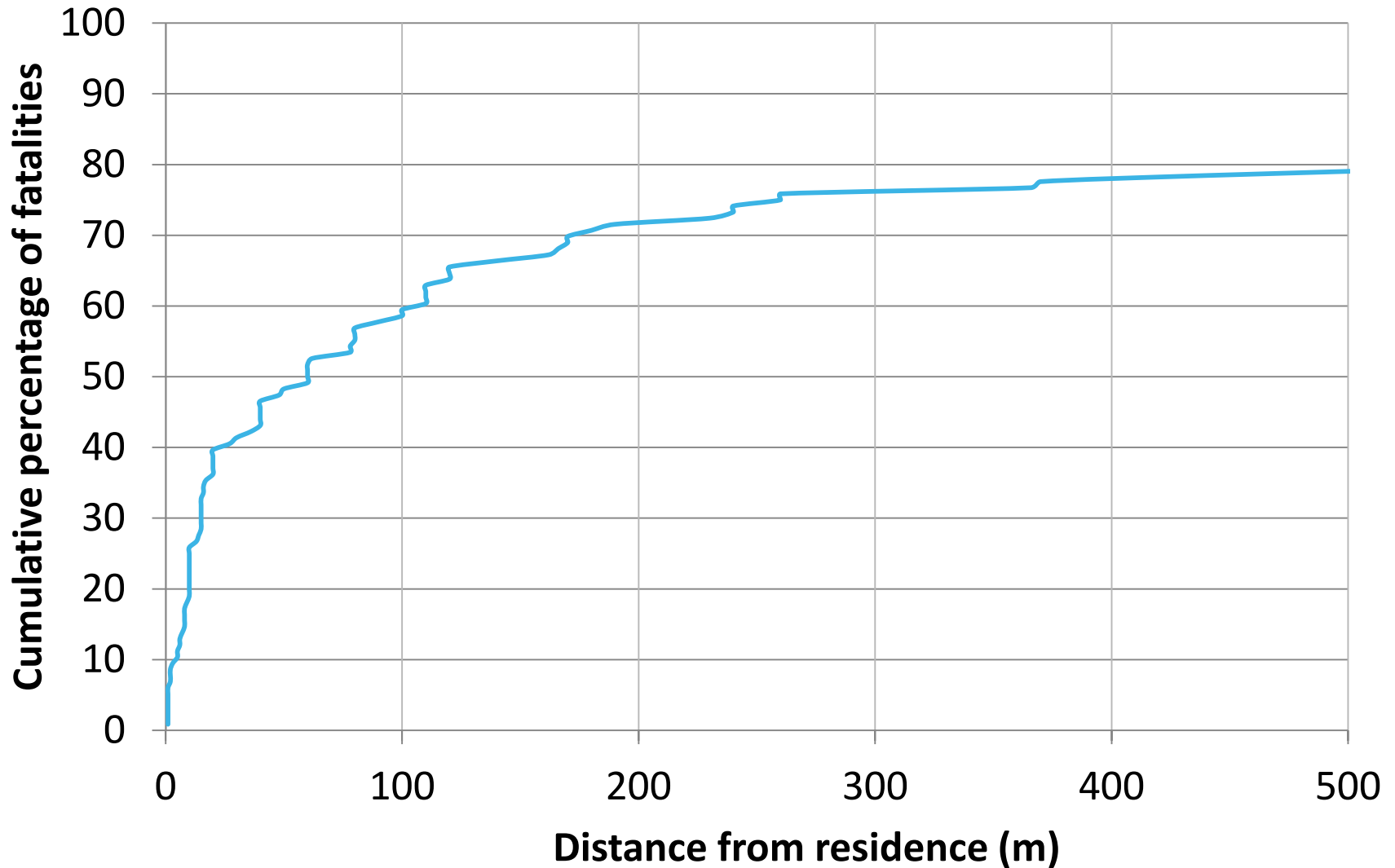
**Paul Hardisty and Justin Leonard**

**18 September 2015**

# National Fire Danger Ratings Research – Life Loss & Weather



# Distance from Fatality to Residential address



# Location of Fatality within Structures

| Location              | Number of fatalities | Percentage of known |
|-----------------------|----------------------|---------------------|
| Bathroom              | 36                   | 29%                 |
| Kitchen               | 26                   | 21%                 |
| Bedroom               | 17                   | 14%                 |
| Study                 | 10                   | 8%                  |
| Under house enclosure | 9                    | 7%                  |
| Entrance              | 5                    | 4%                  |
| Lounge                | 4                    | 3%                  |
| Cool-room             | 3                    | 2%                  |
| Laundry               | 3                    | 2%                  |
| Outdoor spa           | 3                    | 2%                  |
| Toilet block          | 3                    | 2%                  |
| Bunker                | 2                    | 2%                  |
| Shed                  | 2                    | 2%                  |
| Independent garage    | 1                    | 1%                  |
| Shack                 | 1                    | 1%                  |
| <b>Total</b>          | <b>125</b>           | <b>100%</b>         |

# Location of Fatality within Homes

| Location              | Number of fatalities | Percentage of known |
|-----------------------|----------------------|---------------------|
| Bathroom              | 36                   | 33%                 |
| Kitchen               | 26                   | 24%                 |
| Bedroom               | 17                   | 15%                 |
| Study                 | 10                   | 9%                  |
| Under house enclosure | 9                    | 8%                  |
| Entrance              | 5                    | 4%                  |
| Lounge                | 4                    | 4%                  |
| Laundry               | 3                    | 3%                  |
| <b>Total</b>          | <b>110</b>           | <b>100%</b>         |

# Location of Fatality within Homes

| Location              | Number of fatalities | Percentage of known |
|-----------------------|----------------------|---------------------|
| Bathroom              | 36                   | 33%                 |
| Kitchen               | 26                   | 24%                 |
| Bedroom               | 17                   | 15%                 |
| Study                 | 10                   | 9%                  |
| Under house enclosure | 9                    | 8%                  |
| Entrance              | 5                    | 4%                  |
| Lounge                | 4                    | 4%                  |
| Laundry               | 3                    | 3%                  |

93% in a location with no direct exit

**Total**

**110**

**100%**











# Building design for egress

- Combustible door?
- Combustible facade?
- Combustible hidden cavities?
- Exits:
  - Which direction?
  - How many options?
  - To where?













































## Water tank behaviour in bushfires

Understanding the behaviour of combustible and non combustible water storage devices for the purpose of maintaining a suitable fire fighting water supply during a bushfire. This was achieved through large scale exposure of common tank systems.







# Location of Fatality - Shelters

| Location              | Number of fatalities | Percentage of known |
|-----------------------|----------------------|---------------------|
| Bathroom              | 36                   | 29%                 |
| Kitchen               | 26                   | 21%                 |
| Bedroom               | 17                   | 14%                 |
| Study                 | 10                   | 8%                  |
| Under house enclosure | 9                    | 7%                  |
| Entrance              | 5                    | 4%                  |
| Lounge                | 4                    | 3%                  |
| Cool-room             | 3                    | 2%                  |
| Laundry               | 3                    | 2%                  |
| Outdoor spa           | 3                    | 2%                  |
| Toilet block          | 3                    | 2%                  |
| Bunker                | 2                    | 2%                  |
| Shed                  | 2                    | 2%                  |
| Independent garage    | 1                    | 1%                  |
| Shack                 | 1                    | 1%                  |
| <b>Total</b>          | <b>125</b>           | <b>100%</b>         |

# 2009 Black Saturday Observations

- Six fatalities in under house enclosure considered by the resident as a safe “fire protection” area by fatalities (in cellar and in workshop)- fatalities were considered to be well prepared.
- Two fatalities inside self built bunkers
  - Two different properties;
    - One of the bunker was dug into the side of the hill, had a thick door, the walls were lined with either sleepers or corrugated iron and were supported by star pickets, the roof was a concrete slab covered with a layer of soil.
    - One bunker off the side of a house as fire bunkers with metal shutters - fatalities considered well prepared,
- Three fatalities trying to retreat to their bunker (It consisted of a shipping container buried in the north-west face of the spur 10m from the house, under about a metre of soil) – Bunker remained intact.



# Bunker Regulation Principles – Separation Distance


- Minimum of 6m from other fuels including structures
- No greater than 20m from the House.

# Bunker Regulation Principles – Tenability

- Able to be sealed to an air tight state during the fire passage
- Have provision for air ventilation
- Have sufficient air volume for occupants for one hour
- Maintain a temperature below 45°C with a mean duration over the hour of below 39°C
- No interior surface to exceed 70°C
- Be constructed from non-combustible materials that will not emit toxic gases to the inside of the bunker during an exposure.



# Bunker Regulations



## Community Information Sheet Private Bushfire Shelters (Bushfire bunkers)

On 11 November 2009 the Victorian Government introduced the Building Amendment (Private Bushfire Shelter Construction) Interim Regulations 2009.

These regulations mean that a building permit must be obtained for private bushfire shelters (bushfire bunkers) prior to construction. Bushfire shelters have to comply with the performance requirements in the regulations including accessing and exiting the shelter.

These Regulations were subsequently replaced by the Building Amendment (Private Bushfire Shelter Construction) Interim Regulations 2010. These Regulations adopted the national Performance Standard for Private Bushfire Shelters 2010 Part 1 which provides guidance on the design of a private bushfire shelter.

The purpose of this Community Information Sheet is to explain the regulations and give further information to anyone considering installing a private bushfire shelter.

In summary:

- New regulations are now in place and they require all private bushfire shelters to have a building permit.
- It is not compulsory to build a private bushfire shelter but if you do build one, it is compulsory to obtain a building permit for it.
- Private bushfire shelters may not be a safe option in all cases and are a last resort as part of a bushfire survival plan. The best way for people to ensure their safety during a bushfire is to leave their properties early when it is recommended under the new bushfire warning system and heed the CFA Prepare Act Survive messages.


**What is a private bushfire shelter (bunker)?**

A private bushfire shelter (commonly referred to as a bushfire bunker) is an option of last resort where individuals can take refuge during a bushfire while the fire front passes. This may be a pre-fabricated commercial product or a structure built on site.


You should continue to heed the new warning systems and leave early. You should also continue the preparation of your property before each fire season utilising the information in the CFA's Prepare-Act-Survive publication available at [www.cfa.vic.gov.au](http://www.cfa.vic.gov.au)

**Is it compulsory to build a private bushfire shelter?**

No. New houses in Victoria are required to undergo a Bushfire Attack Level assessment, which may give rise to construction requirements under Australian Standard AS 3959-2009 'Construction of buildings in Bushfire Prone Areas'. However, there is no legal requirement to build a private bushfire shelter and they are not regulated under AS 3959-2009. It is a matter of personal choice as to whether people want to construct a private bushfire shelter as part of their bushfire survival plan.



## Performance Standard for Private Bushfire Shelters



2010

PART 1









## Brush-wood fence impact on houses











