Bushfire Shelter Options Hierarchy

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This post builds on the 'Bushfire Planning Profile' from my previous post to continue the focus on risk and evidence based fire and emergency management planning using lessons learnt from previous major bushfires that is thought provoking and to generate discussion. It considers what could happen at the property level when first attack has failed and the fire has reached the critical uncontrollable intensity where it can no longer be controlled by conventional (direct/indirect) responses, (refer Bushfire Planning Profile).

Points of Interest:

- Research on environmental circumstances surrounding bushfire fatalities in Australia between 1901 and 2011 by Blanchi et al found the fatalities on Australia's 10 worst bushfire days accounted for 64% of all civilian deaths. Over 50% of all fatalities occurred on days where the Forest Fire Danger Index (FFDI) exceeded 100 at or near the scene of the fatality.
- The dominant location category was open air representing 58% of all fatalities followed by 28% in structures, and 8% in vehicles (6% are unknown). For bushfires occurring under weather conditions with an FFDI value of 100, fatalities within structures represented over 60% of all fatalities. These were associated with people dying while attempting to shelter mainly in their place of residence. Over 78% of all fatalities occurred within 30 metres of the forest. (Blanchi et al, 2013).
- Studies of human actions during bushfire consistently suggest that people sheltering in their house and implementing various protection strategies have a better chance of survival than people who expose themselves to radiant heat when evacuating late (McArthur and Cheney, 1967; Wilson and Ferguson, 1984; Krusel and Petris, 1999).
- The research shows that active defence by residents or brigade members significantly increases the chances of house survival (Wilson and Ferguson, 1986; Leonard, 2003; Blanchi and Leonard, 2008).
- The Bushfire CRC analysis of 1,104 residents who experienced Victoria's Black Saturday found that half of the respondents (51%) who left their homes and properties before or as the fires arrived considered themselves to have left "late" or" very" late. A significant proportion of respondents (47%) left because they felt it was too dangerous to stay and protect their house. A significant proportion of respondents reported experiencing difficulties associated with leaving late, including smoke (44%), poor visibility (26%), traffic (24%), embers (22%) flames (17%) and fallen trees (12%).

Discussion Points

- While the safest option is to leave early, the fact is many people will find themselves in an area threatened by bush or grass fire because of choice, circumstances or most likely because they have simply failed to even consider it could happen to them. As a result, they will be compelled to make critical decisions based on the scenario they face that are largely uninformed in situations of uncertainty and with limited time. If it is not possible to leave the area or be evacuated, seeking shelter will quickly become their only option.
- The final report of the 2009 Victorian Bushfires Royal Commission called upon the State to "strengthen the range of options available in the face of fire, including community fire refuges (CFR), bushfire shelters and evacuation". The Bushfire Shelter Options Hierarchy shows the level of risk each option offers from a fire engineering context. It is important to note a CFR offers a

greater level of risk to life from a defendable house due to the hazards of travelling on the road when there is fire in the landscape, however once there, a CFR provides a higher level of protection.

- The importance of educating the community as to the different potential scenarios, the timing and actions that could be taken in each case and the need to plan for different responses cannot be over stated. Individual and house hold preparedness must reflect the level of hazard and the risks a person, family or neighbours could face and the safety options available, including evacuation, in-home shelter, private or neighbourhood bushfire shelter or places of last resort i.e., CFR, NSP or informal location, i.e. pool, dam etc.

- The degree to which any community will be receptive to or even be capable of understanding the levels of risk and the potential bushfire scenarios they may face will vary enormously. Similarly, the collective and individual understandings about fire in any given local landscape will differ. So too will the capacity of individuals to make effective decisions, especially under stress.

- A key factor during the community emergency response phase in determining what action to take in terms of leave, defend or take shelter could be determined by community information, messaging and warnings. Community messaging and warnings must be accurate and timely based on the actual scenario, i.e. response to a fast running grassfire heading towards a highly populated urban-rural interface with limited road network capacity is very different to a slower moving major bushfire some distance from a town or settlement.

- **The key point for discussion from this Post is around whether existing community engagement and education programs build resilience and prevent complacency setting in as the memory of past disasters subside? The size, severity, timing, location and impacts of grass and bushfires are difficult to predict. If we agree climate change will likely result in an increased frequency and severity of extreme weather events, we must be confident we have done enough to ensure community and agency readiness, response and recovery is up to the challenges we face. This must include shelter options as part of the planning and education process.**

Bushfire Shelter Options Hierarchy

Relative Level of Safety

Leave Early

Bushfire Safer Precinct

Bushfire/Private Shelters (Bunkers)

Community Fire Refuge

Defending a well prepared property

Alternative options to Evacuation

Neighbourhood Safer Place/ Place of Last Resort

Informal Places of Shelter

Defending an ill prepared property

Leaving Late

LOW RISK OPTIONS   MEDIUM RISK OPTIONS   HIGH RISK OPTIONS