Bushfire as disaster: core principles, challenges and opportunities for planning

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The 2019-2020 bushfire season has already been unusually long and severe. At the time of writing (late January 2020) vast tracts of vegetation, structures, wildlife and human lives have been affected in ways that are challenging to comprehend. A range of policy and regulation at National and State level suggests, and indeed requires in many cases, that urban and regional planning play a key role in building resilience to natural disasters, including bushfires. In this article, I review key principles relating to bushfire and urban planning, highlighting achievements alongside ongoing challenges and opportunities.

Bushfires as disasters – what does this mean?

Bushfires have long been acknowledged as a ‘normal’ phenomenon in Australian landscapes, yet our understanding of normal is being challenged. In the risk literature, a disaster is described as a hazard event that is of a scale with negative impacts overwhelming human systems to the point where they fail, with these systems taking considerable time to recover, if at all.

The recent bushfires overwhelmed our systems in many ways – and in a range of locations there will be ongoing negative consequences. The implication of acknowledging “system overload” is to follow one of two paths: to accept ongoing bushfire disasters as inevitable; or to continue to improve our settlements and systems so that bushfires are events that can be managed and we are not significantly impacted on an ongoing basis. I suggest here that if we are to manage bushfire adequately, risk factors need to be recognized and systematically acted on in new ways.

Aspects of bushfire risk

The intensity and frequency of bushfires appears to be increasing over time in association with weather conditions that facilitate extreme events (Dowdy, 2018). Bushfire risks to humans are generally highest in situations where housing and other structures associated with human activities interact unsuccessfully with flammable vegetation, noting that impacts on natural systems and species are also fundamentally important. In simple terms, risk is generally understood as the likelihood of a negative outcome occurring. High risks are associated with hazards that are reasonably likely, combined with significant consequences such as loss of property, life, impacts on economies, social systems and the environment. The trajectory of higher bushfire frequency and consequences point towards significantly greater risks into the future, and in much larger areas for longer seasons across Australia each year.

Importantly, bushfire risks are highly uneven across landscapes and settlements, and this variability is a key area of action for urban planning. As a useful starting point, risk in a given location can be understood as a function of three interactive elements: the characteristics of the bushfire hazard itself; exposure of humans, structures and other valued elements to that potential bushfire; and, the level and type of vulnerability (or capability) in a given location. Often known as the risk triangle, these aspects are shown in the following diagram (adapted from Crichton, 1999).

While the risk triangle can be used to describe the drivers of bushfire risk in a given location, it also suggests directions for risk avoidance or reduction, including through urban planning. Below I have expanded these to five categories. Those familiar with Building in Bushfire Prone Areas AS3959-2018 and relevant clauses of the Victoria Planning Provisions such as the Bushfire Management Overlay will recognize that we already have provisions addressing many of these aspects. I have resisted detailing these here in favour of providing a summary overview.

1. Avoidance of exposure to bushfire hazard, mainly by avoiding settlements being near to dangerous vegetation, topography, and related factors such as isolation and limited access.
2. Reduction of hazard impacts or exposure in situ, usually by clearing or modification of vegetation near structures, but also potentially the use of earthworks, refuges or shielding mechanisms.
3. Reduce vulnerability or increase resistance in situ. This is primarily achieved by ensuring structures and related systems or infrastructure can withstand the likely effects in a location, of ember attack, heat, and flame contact. Other factors may include strong fire-wind damage and tree strike.
4. Improving Response means that urban planning facilitates and improves the effectiveness of emergency service response, via provision of water, fire truck access, signage, and multiple access points to and around structures and settlements.
5. Improving Recovery refers to the dynamic and dual processes of ensuring that recovery improves the resilience of settlements to a level deemed to be adequate, as well as seeking to establish systems and settlements that more readily “bounce back” to their normal state after a fire event.

Challenges and opportunities

Australian urban planning, including in Victoria, has progressively integrated a range of bushfire risk management mechanisms over time that follow similar themes and approaches. In general, these changes have been positive and are mainly oriented towards statutory regulations. They are primarily based on mapping as a “trigger” to subsequently determine more detailed site-specific responses integrating a combination of subdivision, site, and building controls to manage risks. Overall, these provisions have significantly improved the risk profiles of the structures and subdivisions to which they have been applied, even if there are some areas that could be improved. I will leave these details aside for the moment.

Notwithstanding improvements that have occurred in statutory processes, a wider view suggests a number of areas in which urban planning currently falls short. I list some of these below, acknowledging that some of the shortcomings are inherent to “boilerplate” characteristics of our planning systems – suggesting that we need to find ways to modify these inherent characteristics of our systems.

The Whole Disaster cycle

Disaster has traditionally been understood as a temporal process following an interactive cycle.
Arguably the most powerful aspect of urban planning in disaster is in prevention during the “prepare” phase (eg don’t allow homes near high fire risk vegetation, or make sure houses can resist expected heat and embers from a vegetation). However, we need also to actively consider the powerful role of urban planning in the facilitation of better response processes for emergency managers. Further, urban planning is rarely included meaningfully in recovery – other than to facilitate outcomes desired by other parties such as commissioners or ministers seeking to quickly rebuild – often recreating risks. Rather, planning needs to take a more active role in pre-emptive response and recovery, alongside strategic actions as set out below.

Recovery: people, pre-emption and reaction

Recovery may superficially appear as if it is about buildings and infrastructure – but it is actually about people and the systems they rely on, including the natural world and their relationship with it. Accordingly, it is important to actively take care when making promises, fast-tracking, recreating and apparently “fixing” a community by rebuilding. Experience shows that people recover at a range of different time scales and in different ways. This is also tied into the need to pre-emptively (before the bushfire disaster if possible) identify which settlements or parts of settlements need to be modified or “bought-back” in the event of a bushfire – or prior to one occurring. There are a number of settlements that are high risk and, if assessed under current codes, would be highly questionable as “new builds”. The planning system is generally silent in this respect currently and needs to establish clear principles for proactive risk management.

Strategic planning and scenario testing

The full integration of risk into forward and strategic processes is in a nascent state. While important policy changes to the VPPS have brought about a higher level of concern with the avoidance of creating risk via land release and new subdivision, the greatest proportion of residual risk exists in older structures and settlements that were built prior to current regulatory regimes.

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The planning system must directly deal with this in more proactive ways with a range of other agencies and actors – particularly in settlements that are identified as high risk. This can include a range of mechanisms that planning does not currently use: urban design intervention, realignment of lot boundaries, compulsory acquisition and buy-back, infrastructure and earthworks, vegetation management and agriculture are all relevant to bushfire risks.

Planning needs to go beyond statutory referrals to actively seeking proactive management of risks across a range of sectoral boundaries. This could also include active acquisition, curation and distribution of public funds to ameliorate risks.

Legacy risks and proactive change

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