My submission is primarily related to bushfire risk mitigation at the scale of individual allotments of residential and rural-residential land under private tenure. My views are framed through my engagement with a number of individuals and communities affected by major Australian bushfire events including Black Saturday (2009), Springwood NSW (2013), Wye River/Separation Creek (2015) and lesser events such as Point Henry WA 2002 and Bremer Bay WA 2012. My experience in this field is as follows:

- 20 years experience as a Research Architect (now with QUT) specializing in building in Bushfire Prone Areas in Australia – registered in WA, QLD and Tas.
- Current member of Standards Australia FP-20 technical committee on AS3959 Construction of Building in Bushfire Prone Areas
- Founding/current member of the Bushfire Building Council of Australia
- Land-owner of 4ha of remnant indigenous vegetation in a rural-residential Subdivision at Point Henry, Shire of Jerramungup
- Member of Volunteer Fire Fighters, Bremer Bay

**Effectiveness of Prescribed Burning and Other Mitigation strategies**

Prescribed burning cannot be seen as a panacea to all sites and situations where bushfire risk is deemed unacceptably high because burning – no matter how ‘surgical’ --- does not guarantee a reduction in that risk. Why:

1. It is not a universal rule that all Australian vegetation responds to fire with a reduction in fuel or flammability. In the Proteaceae-dominated shrubland around Bremer Bay, fuel load is actually *increased* with fire because fire responsive species such as wattles and agonis (Peppermint) come to dominate
the vegetation communities. Research by Nathan McQuoid Landscape Ecologist commissioned by the Shire of Jerramungup, and my own detailed studies of historical aerial photography of the region, show that regardless of the fire regime (frequency + intensity), actual bushfire risk is increased through burning (therefore mechanical or other means of fuel reduction are more effective).

Prescribed burning can increase the risk of unmanaged fire causing injury to others and their assets (including their vegetation). Not only does climate change contribute to the shortening of seasonal ‘windows’ for effective fire management but some landscapes are (now) so fuel-laden and flammable that regardless of how favourable the weather conditions are, fire can become unmanageable. A case in point is a recent (2015) winter burn off by a private landowner at Bremer Bay, that escaped onto neighbouring property.

Prescribed burning may well be the cheapest form of fuel reduction but it is far from the safest. Mechanical fuel reduction is a growth industry experiencing innovation driven by cost affordability. We should therefore expect that in the foreseeable future we will see more ‘hybrid’ approaches to fuel reduction and fire ground management, especially with the advancement of robotic technology.

**A more complete taxonomy of risk reduction elements**

Prescribed Burning and Mechanical management are simply just means of reducing fuel loads, and reducing fuel is only one way of reducing risk. If the ‘primacy of life’ is the rule, then timely warnings and early escape may well be more effective than fuel reduction. It is frustrating that a recent ‘Bushfire Strategy’ adopted by the Shire of Jerramungup – which involved substantial community comment – ignored the community’s practical suggestions for early warning and community asset registers and instead took a purely land planning-based approach using the blunt instrument of the bushfire’s act to mandate clearing.

This so called strategy has come into force at the very same time that DFES roadside fire warning signs have been removed from the Bremer Bay townsit, signs that would otherwise alert its many summer visitors. Another worrying trend is the prescribed burning of toxic sites close to the Bremer Bay town site and mechanical slashing in classified die back areas in the Bremer Bay townsite. These examples signal a very one dimensional and ‘at any cost’ approach to bushfire risk mitigation that is not in any way site or landscape specific.

I present these examples from one of the OBRM pilot local government areas to highlight to The WA Office of Emergency Management that bushfire risk mitigation needs a much more holistic approach, one that should take into account: private landowners capabilities and assets; efficacy of early warning systems; a practical assessment of ‘safer places’ (eg beach areas); enhanced fire ground asset registers for fire fighting crews; and better communication of FFDI information (not just roadside warning signs).
**LG responsibilities and capacity**

The single greatest challenge to achieving effective bushfire risk mitigation in residentially zones (including rural-residential) is the ability for local governments to inspect and administer lot/tenure specific bushfire risk management plans. Landowners with existing houses in the Shire of Jerramungup (just one example), are being issued generic bushfire notices (see below) that comprise of 20 metre minimum asset protection zones, driveway clearance specifications, water storage volume requirements and fire appliance couplings.

Said firebreak notices make note that 'variations' to these specifications might be considered - but to date such applications have been rejected on the principle of 'uniformity'.

This 'uniformity' principle has become dogma amongst local government legislators and fire agencies. This is highly problematic because uniformity is simply an impossibly in existing subdivisions, but more concerning is that authoritarian mandates for uniformity flies-in-the-face of the first principle of 'shared responsibility'. Landowners who earnestly seek to implement bushfire management plans that can be practically managed in perpetuity - while balancing their site constraints with the requirements of fire fighters should be able to be accommodated in a more sophisticated fire risk strategy. They are after all assuming a high level of responsibility. Instead, by aiming for the lowest common denominator - with inflexible generic rules – we put such earnest individuals offside, thereby undermining the ‘shared responsibility’ aim.

A sophisticated 2020 (year) approach would accommodate a range of management objectives - in short 'life is not all about bushfire!'

Local government thereby needs human resources and/or appropriate technology to inspect and administer individual lots management plans - or alternatively enable landowners to utilise the emerging capabilities of the bushfire assessment profession to accredit and (annually) assess the implementation/ongoing management of bushfire plans. In the latter scenario the landowner seeking variations to the rule takes on the added cost of professional fees/certification. Either way the principle is not unlike the annual termite inspection and might well utilise the ‘meter box’ sticker method of tracking compliance.

**How to better utilize fire ground experience**

No comment
**Bushfire mitigation resourcing**

As discussed below, there is a mounting financial impost on private landowners to undertake fuel reduction and engineering works (access ways & tanks) on their townsite and semi rural properties. In accepting the responsibility for bushfire risk, the financial cost can be significant and we see the impact of this with stalled property sales in the bushland subdivisions across the Great Southern. I implore the OEM to conduct a review of the real cost borne by these landowners and then devise a means of financial support to help them manage their sites in perpetuity. The legacy of preexisting subdivisions and housing stock is all to conveniently forgotten when we introduce entirely new conditions upon land ownership.

**Personal responsibility and landowners understanding of site-specific risk**

The decree “If you own the fuel, you own the risk” implies that private individuals (along with other tenure holders) have a responsibility to others (neighbours, the community, fire agencies etc) to manage fuel loads on their property. This precept belies an extremely simplistic understanding of actual tenure specific and site-specific constraints, it places undue liability on those least equipped to manage such risk, and it ignores the fact that much of this ‘fuel’ is actually an asset performing important biophysical, social, economic and human health functions.

For example many landowners in the Great Southern own rural-residential allotments (subdivided for a single dwelling) that are 90-100% remnant indigenous vegetation – and yes, many of these lots have high to extreme fuel loads. Goode Beach near Albany and Point Henry near Bremer Bay are two such examples; where the planning conditions established at the time of rezoning/subdivision where such that the remnant vegetation was to be protected with minimum clearing for future residential development. The purpose of the clearing constraints was to protect the vegetation communities and the landscape ‘quality’ as well as to minimize visual impact between landowners and for visitors and tourists. Those subdivisions have subsequently attracted so called ‘tree change’ residents but by and large (especially in the case of Point Henry) many of these single dwelling lots – ranging from 3-10 ha in area --- remain undeveloped.

Enforcing lot scale fuel management runs contrary to the initial LG subdivision policies in these areas, and importantly, landowners rarely have the facilities, finances and/or skillset to manage ‘their’ fuel levels.

The original planning constraints placed on vegetation clearing at the lot scale aimed to keep the larger scale landscape systems intact. Now landowners are being told that those constraints are no longer valid, that the highest priority is bushfire mitigation and they will be held personally liable for it. This is not only difficult to instrument in practice – attempting to retrofit opposing land planning policies over one another -- it is ethically quite questionable.
(Mis) appropriation of the Bushfire Act

The appropriation by local governments (eg Jerramungup and Swan) of the 1954 Bushfires Act to enforce bushfire risk mitigation upon residential landowners is a case in point. This act was initially devised to address the containment of fires on pastures and cropping areas in rural agricultural landholdings, vis à vis the construction of ploughed firebreaks around paddock perimeters. It is now being applied by local governments to enforce – under the threat to substantial financial penalties – clearing of Asset Protection Zones around houses, firebreaks around residential lots, driveway clearing, and fire fighting water supply. In some cases (eg the townsite of Bremer Bay) the bushfires act – via – the so-called ‘fire break notice’ – is being used to enforce the wholesale clearing of lots.

Regardless of the negative landscape and amenity impacts, there is substantial financial impact to these landowners because, in contradistinction to the farmers for whom the 1954 act was intended, these land-holders do not have mechanical means such as tractors and ploughs etc on hand, now the skillset to conduct the works.

Cost is an important issue, and I remind the OEM that other legislation related to building design and bushfire risk, such as the National Construction Code and AS3959 (Bushfire Standard) have both been parsed through a rigorous cost-benefit-analysis process to ensure that their measures are acceptable to the community. So I ask why then have the mitigation specifications in Local Government fire break notices been excluded from equivalent cost-benefit analysis processes?

I contend that this misuse of this 1954 Act – and its associated ‘fire break notice’ (which seems to be written at will by local governments) should be investigated immediately and a thorough assessment of the costs and environmental impacts be made, and that this should be done before any new Legislation is adopted, and before any additional funding and support for LG bushfire risk mitigation is granted.

The outcomes from the Ferguson Report and other major bushfire reviews

The Yarloop fire (Waroona) presents a case whereby much of the housing stock was ignited by ember attack rather than an actual fire front. The most vulnerable buildings where timber structures, with extremely low moisture indexes.

In my discussions with Justin Leonard, the chief bushfire building scientist at CSIRO (who investigated the fire), he agreed that perhaps the most effective means of signally the ignitability of housing stock is not the Forest Fire Danger Index but rather a Timber Moisture Index. Such a meter/forecasting method does not yet exist, which highlights that the OEM could play a (greater) role in encouraging innovation in bushfire risk management.

Most bushfires in Australia have impacted on housing stock that was built before the introduction of AS3959, and which preceded planning policies such as WA’s SPP3.7.
It is difficult, if not impossible, to retrofit one planning policy over another because planning policies operate at a scale that is far too broad for existing development in bushfire prone areas -- which by their nature are characterized by variable topography and building design, difficult access and vegetation clearing constraints such as covenants and corridors.

Therefore, greater emphasis needs to be placed on the risk assessment and retrofitting of individual houses. The CSIRO (Justin Leonard) points out that the aim in retrofitting existing housing stock should not be compliance with AS3959. Instead each house should be assessed individually and fit-for-purpose changes made (which might be removal of elements rather than just adding elements). With this aim, the Bushfire Building Council of Australia (headed by Black Saturday survivor Kate Cotter) proposes a ‘5 star’ rating methodology to help home-owners understand their level of vulnerability to bushfire. The 5 star registers might be updated annually and submitted as part of the Bushfire Risk Management plan for that tenure.

This ‘vulnerability register’ would then be accessible to fire ground crews as an ‘in cab’ data set to best tailor fire fighting resources. While DFES seems to favour a ‘uniformity’ approach the NSWRFS applies a much more nuanced and site-specific approach to community consultation, and fire ground response, wherein there is
very good knowledge of individual assets and vulnerability. The 5 star register might offer another opportunity for OEM to show leadership through innovation in bushfire risk mitigation.

**AS3959: misreporting on cost**

As an architect specializing in building in Bushfire Prone Areas, and a member of the AS3959 technical committee, I am dismayed at misleading cost projections of building to the various Bushfire Attack Levels set out in the standard. I advise the OEM to be cautious of any generic percentage-based cost forecasts for construction costs. I have found in practice that building to BAL-40, in particular, adds a significantly lower premium than those reported by national housing and building organisations. Of more value is a case study approach where the costs of completed houses are assessed. By way of example -- in our project the *Karri Fire House*, built for a professional DFES firefighter in the Great Southern, we found that BAL-40 compliance contributed just 3% to the construction costs.

**The ‘defendability’ argument.**

We find after every bushfire review that housing stock was not suitable for bushfire and that fire crews could not attend all house fires. We use these examples to forewarn residents to not expect the emergency services to attend their house, yet at the same time we mandate, via such blunt instruments as the bushfire act, that *every* property must have bushfire risk mitigation measures in place. When landowners challenge the need for such measures the ‘fall back’ position is always: ‘well fire fighters need clearing around houses and we can’t risk their safety’.

‘Don’t expect fire fighters to come, but you must prepare for them to come in case they do’ – is a paradox that landowners find hard to reconcile.

We should work towards a strategy where landowners who assume total responsibility might be rewarded with the flexibility to undergo best-fit mitigation rather than our present stance, which aims for the lowest common denominator with a one-size-fits-all approach. This present approach seems quite out of touch with even our current technology and capabilities, let alone what we might advance into the future.

It seems timely that we might then consider a National Bushfire Risk Mitigation Research Centre – a collaborative research cluster that addresses some of the significant gaps in knowledge I have addressed above.

Yours sincerely,

Dr Ian Weir

9th July 2017