

Sanctuary

MODERN GREEN HOMES

ISSUE
61

UNIVERSAL DESIGN
SPECIAL

PLUS: Three urban renos fit for the future; ecovillage home; upgrading to induction; design for active bushfire defence

DESIGN FOR EVERYONE

Accessible, flexible, sustainable

PUBLISHED BY **renew.**
SUMMER 2022/23 • AU/NZ \$13.95
SANCTUARY.RENEW.ORG.AU

ISSN 1833-1416



9 771833 141017



A Benzina Zero City electric scooter valued at \$5,500!

Offer open to Australian residents. Details page 81

FACING FIRE:

Design for active bushfire defence

WORDS Sarah Lebner



↑

Thinking about the design of your home and how it can support active defence well in advance of a bushfire event is an important complement to more immediate preparations for staying and defending. Here, my toddler takes one last lap in the tractor with Grandpa, creating a firebreak, before I evacuated with him in January 2020 and left my family to defend our family farm.

When a bushfire threatens, the advice from authorities is usually to leave early, and ways to ensure your house has the best chance of surviving on its own are well documented. After personal experience during the Black Summer fires, architect Sarah Lebner advocates taking things one step further and designing for active defence, just in case you do choose to stay or are unable to leave.

The Black Summer broke one of my fundamental beliefs: that in Australia, if there was a bushfire, emergency services would always be able to come and help.

As the unstoppable Green Valley firefront approached in early January 2020, and the Dunns Road fire was chewing into the Snowy Mountains behind us, we and all our neighbours in our border farming community along the Upper Murray, near Corryong, were gathered for advice. We were told that no-one could come. Emergency services were stretched too thin and

the predicted impact was too large and too severe. There was no power. The mobile phone towers were down.

So, a lot of very seriously considered and well-informed decisions were made. My sense is that having learned from previous disasters like 2009's Black Saturday fires, in 2020 Australians were immensely more educated on bushfire survival plans and what's involved in deciding to stay and defend.

With the privilege of time to prepare and plan (something many others did not have during that Black Summer), my mum, dad and husband decided to stay and defend our family farm. It's important to understand that such a decision isn't just about saving expensive farm machinery or a house full of memories; as farmers we are also responsible for hundreds of farm animals, wild animals, and country we've overseen for years, sometimes several generations. There's also a sense of responsibility to neighbours – everyone wants to do their part to help the next person down the line.

I expected this decision from my family, who are fit and well and prepared for firefighting; the house is very defensible. They were joined by my husband's brothers, whose house and farm in the Thowgla valley, 20 kilometres away, had burnt a few days earlier. They all stayed to do what I could not, having made the emotional decision to take our toddler back to safety in Canberra.

These events spurred me to find something to do, anything that would be useful, as so many suffered. As an architect, I know about designing and constructing for bushfire-prone areas so that homes are resilient against bushfire attack when left to fend for themselves: passive design strategies. And now I had this vivid personal experience of what preparing to stay and defend a property actively really looks and feels like: putting into practice the advice from various authorities on what to do.

Aha! There it was. A gap that needed someone just like me to create the bridging piece.

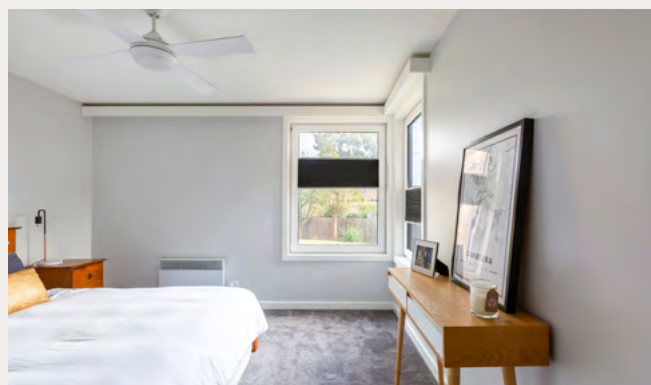
You see, we've made great advances in recent decades on two fronts. Firstly, Australian Standard (AS) 3959 *Construction of Buildings in Bushfire Prone Areas* has ensured that many evacuated homes built to the standard for passive defence have indeed survived bushfire impact. Secondly, since the experience of catastrophic bushfires like Black Saturday with its high death toll, public awareness around bushfire plans, early evacuation and what's involved in the decision to stay and defend has drastically improved, supported by resources like the New South

Wales Rural Fire Service's publication *Staying and Defending*.

The gap I spotted is between these resources that cover design for passive defence and preparing for active defence: namely, the design features that can be included when a house is being built or renovated, that will aid active defence at a later point if a homeowner makes that choice or is thrust into that situation.

Before I go on, it must be stressed that planning to stay and defend a building during a bushfire requires careful preparation, forethought and resources. Most jurisdictions encourage a written and practised bushfire plan, and advice from authorities is usually to leave in the event of a bushfire, and leave early.

However, research such as Dr Joshua Whittaker's 2019 study published by the Australian Institute for Disaster Resilience suggests that even among those who intend to leave, evacuation is often left to the last minute, and indeed is not always possible. And even if a home is evacuated, firefighting professionals may attend later to defend the property. Therefore, designing your house and its surrounding landscape for active defence is a good idea regardless of your intentions in case of fire.



↑

Designating shelter rooms on each side of the house so that you can observe a fire approaching from any direction is important. Shelter rooms should have at least two exits; windows can be exits if they have removable flyscreens and you can easily climb through the opening, such as these bedroom windows at Jacob and Jade's House by Cooe Architecture. Image: Ben King



↑
My father, husband and toddler enjoy a moment of relief during a brief rain shower in the stressful days leading up to the fire that threatened our family farm in January 2020.

Here are some design considerations for active property defence. (If there are items you can think of that are missing from this list, it's likely that they are already captured as part of the passive defence requirements in AS3959.)

- Allow for at least one shelter location (a room to take refuge in while a fire front passes) on each side of the house, so fire activity in any direction can be observed from inside. Provide more than one exit in every room that is to be used as a shelter: windows can be exit points if the flyscreens can be quickly removed and the openable portion can be easily climbed through.
- Design to allow movement from one end of the house to the other through rooms with two or more exits, and to allow for zoning between areas, preferably using hinged solid-core doors. The ability to move furniture away from windows while maintaining safe access between rooms is also desirable.
- Provide sufficient access to monitor the roof space (for example, an access hatch where a ladder can be left set up, with sightlines to the extent of the roof space). Ensure the roof access is close enough to an internal hose fitting to allow spot fires in the roof space to be extinguished.
- Provide designated indoor and outdoor storage locations for protective gear, communications equipment and firefighting equipment. Survival kits should be located on the leeward side of the house, in a well-insulated and sealed location.
- Make provision for loss of electricity, water pressure or telecommunications. A landline or satellite communications connection is a desirable backup in bushfire-prone areas. Backup electricity generation and a pump for water supply is essential. Ensure easy access to switch off mains electricity and gas.
- Install sufficient external taps (with metal fittings) to access all defensible outside areas with hoses, and a tap with a hose fitting (such as an easily accessible washing machine tap) inside for internal defence. Provide somewhere inside to fill buckets easily.
- Design so that it's easy to block downpipes and flood gutters, either by accessing the gutter to block the downpipe from above, or by installing downpipe handle blocks.
- Air conditioning units should be easily accessible so their air intakes can be blocked off; roof mounted evaporative models are not recommended.
- Provide a safe refuge space for pets.



↑ Provide somewhere inside where it's easy to fill buckets, and a readily accessible tap to connect a hose for interior fire defence. This laundry has a washing machine tap in the cupboard under the sink. Image: Ben King

These are all very achievable provisions to include in a new home or renovation; indeed some of them may seem a bit trivial. But don't we plan for all kind of trivial conveniences in our home? I've spent time with clients making sure drawers fit their underwear collection inside, or that devices can be plugged in exactly where they are needed, or that a window is placed just right to capture a delightful view from a special chair. We expect a thoughtful home to accommodate us in so many curious ways, so why wouldn't we also expect our home to support, rather than hinder, our efforts to actively defend in a bushfire scenario?

And what happened at my family farm in that awful January? The fire did turn towards it as predicted. My husband described the roar of it on the other side of the hill as something he will never forget. But, thanks to the decision of other well-prepared and skilled neighbours to stay and defend, the fire was stopped on the neighbouring property.

As we face increasingly extreme bushfire seasons, I hope that the reality of active property defence, whether by informed choice or unfortunate miscalculation, is something we can add to our design considerations when planning our projects, so that we can all give ourselves and our homes the best chance of survival and resilience in this climatically intense world. 5

ABOUT THE AUTHOR

Sarah Lebner is the director of Cooe Architecture, a practice focusing on regional low-carbon homes. She's the author of *101 Things I Didn't Learn in Architecture School*, and was awarded the AIA's 2020 National Emerging Architect Prize. The design information presented in this article first appeared in the Australian Institute of Architects' 2021 Practice Note, *Site Planning and Design for Bushfire*, which Sarah contributed to as an employee at Light House Architecture and Science.

WARNING

Fire authorities' advice is that in a bushfire event, leaving early is the safest option to protect yourself and your family. Architects or designers and their clients should agree in writing that by designing for active defence, they are not encouraging this option but are supporting the ability to defend should the situation ever arise.