



Climate change adaptation in the Midlands

Bushfire, what are we in for and how we can prepare as individuals and a community

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Photo: Graham Green

Bushfires by their very nature are very unpredictable in terms of where they start, the track they take and their consequences. In some cases no amount of preparation is enough as bushfire is gradually going to 'next level' in terms of size, pace, ferocity and destructiveness. We've had plenty of reminders of this recently. The reality that conditions suitable for bushfire are worsening due to climate change also puts into question whether future fires are something we will be able to prepare for and adapt to at all.

Unprecedented dryness, high temperatures, early starts and late finishes to bushfire seasons are an emerging trend driven by the warming, drying climate. The numbers don't lie, and the

science is clear, what we are experiencing is not just a part of a normal cycle. I was shocked to see reported in 'State of the Climate 2020' the surge in extreme heat events last year in Australia. Days on which the national average maximum was 40°C or above totalled just 24 from 1960 to 2018, most of these were in recent years. But last year alone, 33 days reached that milestone – that's more extreme heat days in one year than in the previous 58 years combined! We saw for ourselves how this outbreak of unprecedented heat translated into the worst bushfire carnage ever witnessed in this country.

We should also be mindful of the concerning feedback loop that bushfires create. That is, incineration of forests and their humus rich soils releases a massive amount of greenhouse gases into the atmosphere in what may be referred to as a 'carbon bomb'. Right now we need our forests like never before to do the job of drawing carbon dioxide from the atmosphere and storing it long term. Unprecedented bushfire frequency and reach means that we are losing this battle. In 2019 it is estimated that Australia's bushfires emitted 250 million tonnes of CO₂ to the atmosphere which is equivalent to about half of Australia's annual greenhouse gas emissions.

In this article I provide a synopsis of some of the major bushfires Tasmania has experienced, including ones in and around our municipal area. I also look at bushfire likelihood modelling for the near future to see what we may expect.

The last thing I want to do is generate alarm but it's important to be real about what smart minds in the field of climate change science are communicating to us and what the implications are for our community.

Historical Context

In the summer of 1897-98, devastating fires burned around Hobart and across the Mount Wellington ranges. It is estimated that six people died, 43 properties were destroyed, and extensive damage to farming areas and infrastructure was sustained.

In the summer of 1933–34, strong winds and high temperatures contributed to significant fires in the Derwent and Huon Valleys. It is estimated that the Forest Fire Danger Index rating reached 92, placing it in today's 'Extreme' range.

On February 7th 1967, Tasmania experienced the worst bushfire event in its history. It reached 39 degrees in the south and the Forest Fire Danger Index rating was 128, placing it in today's 'Catastrophic' range. The bushfires burned 264 270 hectares, destroyed 1400 homes, killed 62 people (injuring a further 900), and caused stock losses of 62 000 head. The fire also destroyed: 80 timber bridges; 5400 km of fencing; and 1500 vehicles.

In January 2013, strong winds combined with the hottest temperatures ever recorded in Tasmania fuelled a savage wildfire that devastated the southeast region around Dunalley and the Tasman Peninsula. The 2012/13 bushfires wiped out 119 300 hectares in Tasmania. The Southern Midlands had a pre-cursor to this big event with a major fire burning at Rhyndaston Road which took weeks to control.

Other significant fires in our area include: a 5000 hectare fire in February 1982 at Kempton and Broadmarsh that killed one person and destroyed: eight buildings, 38 outbuildings, substantial farming equipment, fences, and 3000 livestock.

In January 2003, a deliberately lit fire extended through the Broadmarsh, Mount Dromedary and Brighton areas for two weeks and threatened rural properties throughout.

2016 brought to bear the realisation that we can now expect bushfires to burn in places and at intensities never before experienced – including formerly wet forests, rainforests and sensitive alpine vegetation. There was considerable damage to fire sensitive areas in the Central Highlands, West Coast and South West.

In 2018/19, 210 000 hectares of the State was burned, the largest amount since 1967. The Great Pine Tier fire on the central plateau was very disturbing for many Southern Midlands residents. The fire was right on our doorstep and residents had to endure weeks plagued by bushfire smoke.

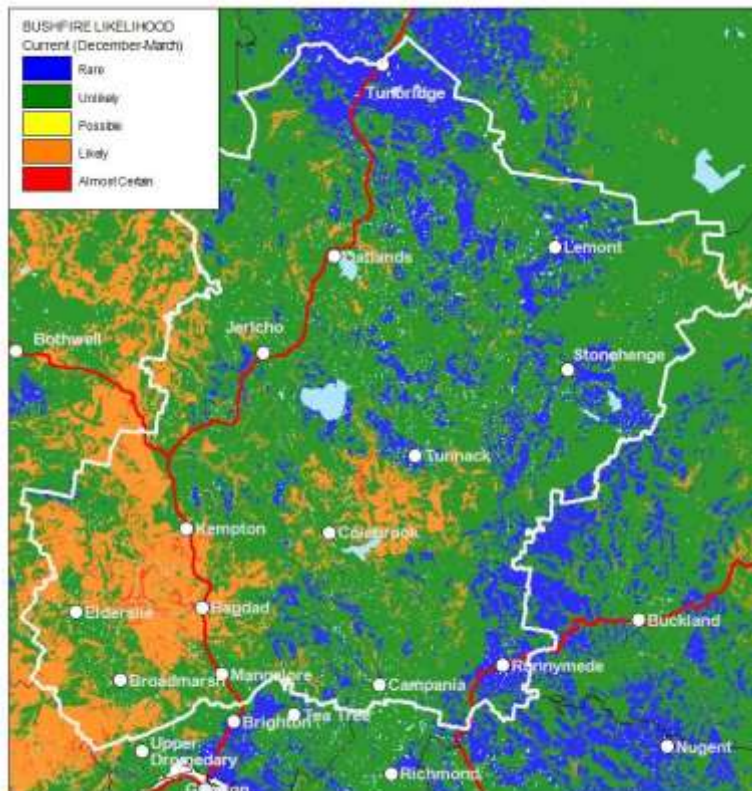
In 2019/20 firefighters had to contend with a series of bushfires burning across Tasmania including in our local area at Pelham and Elderslie that burned 1600 hectares, and destroyed property and fences. This local fire event was concurrent with the Gosper's Mountain mega-fire in New South Wales which started on 26 October 2019. This unprecedented fire became Australia's largest bushfire on record, raging for nearly 80 days, and burning over one million hectares of land.

What does the future hold for the Southern Midlands?

i) Bushfire modelling

Bushfire risk in the Southern Midlands in relation to climate change was assessed using the Tasmanian Bushfire Risk Assessment Model, developed by the Tasmanian Parks and Wildlife Service in 2010. Data from the Climate Futures for Tasmania Project was entered into the model.

Bushfire likelihood depends on a number of factors, including: vegetation flammability, fire history, slope, ignition potential, and suppression capability (fire detection and potential for ground and air attack). The modelled near future (2010-2039) 'bushfire likelihood' output for our area is shown in the following image:



The model suggests that the areas of greatest likelihood and risk of bushfire is the southwestern corner of our municipal area, inclusive of Bagdad and Kempton. Bushfire modeling is an interesting academic exercise and determines relative risk and vulnerability, however, there will be times when all conditions, seasonal and local, conspire to essentially paint the entire map red. On these days modeling becomes irrelevant because everything is vulnerable.

ii) McArthur Forest Fire Danger Index (FFDI)

The McArthur Forest Fire Danger Index (FFDI) was developed in the 1960s to measure the degree of danger of fire in Australian forests. The index combines a record of dryness (based on rainfall and evaporation) with meteorological variables for wind speed, temperature and humidity.

Fire danger rating		
Category	Fire Danger Index	
	Forest	Grassland
Catastrophic (code red)	100 +	150 +
Extreme	75–99	100–149
Severe	50–74	50–99
Very High	25–49	25–49
High	12–24	12–24
Low–Moderate	0–11	0–11

Fire danger ratings are determined by the responsible fire agency in each jurisdiction. The Black Friday fires of 1939 were used as the example of a 100 index.

How the FFDI is likely to change in the Southern Midlands

In the recent update of the Climate Futures for Tasmania data we were provided with a figure for the 'Average Annual Cumulative Forest Fire Danger Index'. This index is the sum total fire danger rating for each day of the year. For the period 1960-1990 this figure was averaged out at 1774 per year. Alarmingly, this measure of fire danger is modelled to increase by 44% in our municipal area towards the end of this century.

Time period	Average Annual Cumulative FFDI
1960-1990	1774
2080-2100	2547

This is significant enough to mean that previous fire ratings will jump at least one category, for example, 'Severe' rated fires will become 'Extreme' and previously rated 'Extreme' will become 'Catastrophic'.

What should we do?

The best we can do in regard to bushfire is be armed with knowledge of the likelihood and localised risks, stay abreast of fire weather conditions and alerts, and have a clear plan. We can't afford to be complacent about bushfire because the risk is real and increasing.

Resources for preparing your property are available at: www.fire.tas.gov.au

There needs to be 100% confidence in a bushfire survival plan for those who plan to protect their property. If there is any doubt, the best policy is to leave early and prioritise survival over protection of assets.

Aside from planning for our own personal circumstances we are also reliant upon fire management agencies for rapid response and suppression of fires when they ignite. This is sometimes an incredibly difficult task and things don't always go as quickly as we'd like.

Assessment of fuel loads and responding accordingly with hazard reduction burns should reduce fire risk. However, the window of opportunity for conducting safe burns is becoming shorter due to hotter and drier conditions starting earlier and finishing later than in the past. It is likely that the window of opportunity for prescribed burning will continue to shrink. As bushfire weather worsens, the effectiveness of hazard reduction burning will also diminish. No amount of hazard reduction will protect human lives, animals and properties from catastrophic fires.

Another important adaptation consideration is vulnerability to smoke. We are well aware now that bushfire smoke from both Tasmania and the mainland can blanket us for weeks at a time - it can become insufferable, or even life threatening for those with asthma or allergies. A domestic air purifier could be a worthwhile investment. Most air purifiers will

handle particles far smaller than bushfire smoke. A house needs to be well sealed for an air purifier to work effectively.

It's exceedingly likely that the current decade will be the coolest of the 21st century. What's ahead is uncharted territory in terms of extreme weather events and associated bushfire risk. We have a job to do to make things better. We can't afford to fail on emissions reduction - the future will be scary if we don't do enough.

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