energysafe VICTORIA

Creating a safer state with electricity and gas

End of Fire Season Summary

June 2019

VICTORIA State Government

This report has been endorsed by the Director of Energy Safety in Victoria.

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1. Introduction

1.1 Background to the report

ESV prepares weekly reports during the fire season that detail the cumulative and rolling fire incidents on Victoria's electricity networks, and the progress of the network operators in undertaking fire mitigation activities across the networks.

This summary report provides a context for the 2018-2019 fire season (10 September 2018 to 30 April 2019) compared to previous years, and a more detailed and holistic view of the fires that occurred throughout the season.

1.2 Context to the fire danger period

Under Section 80 of the *Electricity Safety Act 1998*, the Country Fire Authority (CFA) is responsible for assigning fire hazard ratings for those areas where the CFA is the responsible fire control authority.

Rural areas are defined as hazardous bushfire risk area (HBRA) by default, unless otherwise defined as low bushfire risk area (LBRA) by the CFA. The CFA periodically reviews and assigns areas a rating based on prevailing environmental conditions and land use.

The fire hazard ratings are used to prescribe LBRA and HBRA for the purpose of the:

- Electricity Safety (Electric Line Clearance) Regulations 2015
- Electricity Safety (Bushfire Mitigation) Regulations 2013.

These regulations place particular obligations on the MECs (and other regulated entities) to ensure they appropriately mitigate safety risks, including the risks of fire from trees within the clearance space around electric lines and poor maintenance of electricity assets.

Management of these risks is particularly important in HBRA, which is more prone to the threat of bushfire: even more so when the CFA has declared a fire danger period for the area.

The CFA declares the fire danger period for each shire or municipality in Victoria in the lead-up to the fire season. The timing of the declaration locally depends on the amount of rain, grassland curing rate and other local conditions.

The fire danger period may be declared as early as October in some municipalities, and typically remains in place until the fire danger lessens, which could be as late as May (see section 2).

The MECs manage their electricity safety risks during a declared fire danger period through their electric line clearance and bushfire mitigation management plans.

Throughout the declared fire danger period, the MECs must meet and maintain specific targets as described in their electric line clearance and bushfire mitigation management plans. ESV requires that the MECs provide data weekly on their progress against these targets; the weekly fire start report is informed by this data.

Note The electric line clearance regulations are currently under review and revised regulations will come into force in June 2020.

2. CFA declarations

Given that the CFA issues fire declarations for municipalities when ground conditions are curing to a level that they can support grassfires and bushfires, we can use the declarations as an indicator of fire risk. This allows us to compare interannual risks and place the 2018-2019 fire season within a historic context.

Figure 1 shows the number of municipalities declared for the current year (bold red line) against last year's declarations (bold orange line) and the Black Saturday fire season of 2008-2009 (bold blue line). Other fires seasons are shown as grey lines.

This year's season started on 10 September 2018. This was earlier than all previous seasons. Declarations continued ahead of the Black Saturday fire season, and full declaration was achieved at the same time as the Black Saturday season.

At the end of the season, full declaration remained in force for longer than previous years. While declarations were initially lifted faster than in 2008-2009, this then plateaued and at 30 April there were still more municipalities under declaration than in previous years.

The indications at the start of the fire season were that 2018-2019 would be a problematic season for fires, and this state of alert persisted across the whole fire season.

Like last year, declarations started early in southeast Victoria, but then stalled for several weeks (Figure 2). Declarations then commenced in the northwest and proceeded down along the Murray River — the normal pattern. Once the north of the state was declared, the southern part of the state was progressively infilled, with the southwest to be the last area declared.

At the end of the fire season, declarations began to be lifted from the northwest spread across the state from there.

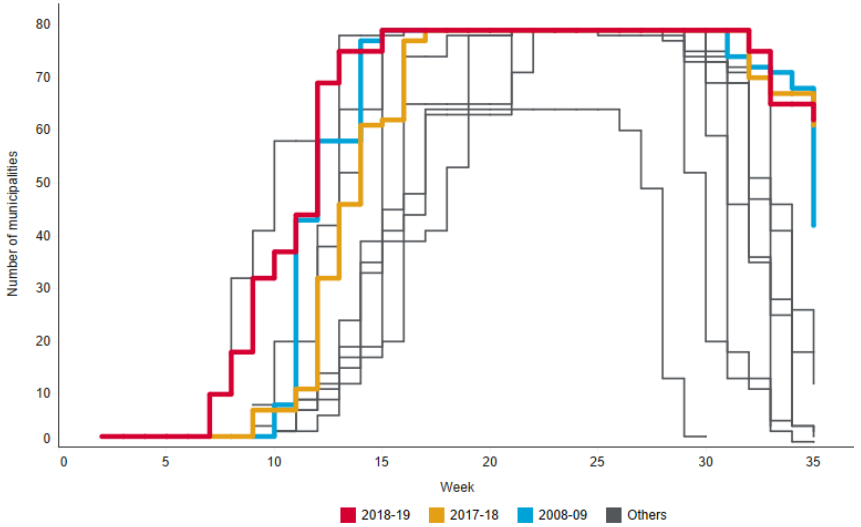

Figure 1 Summary of CFA fire declarations from 2000-2001 to 2018-2019

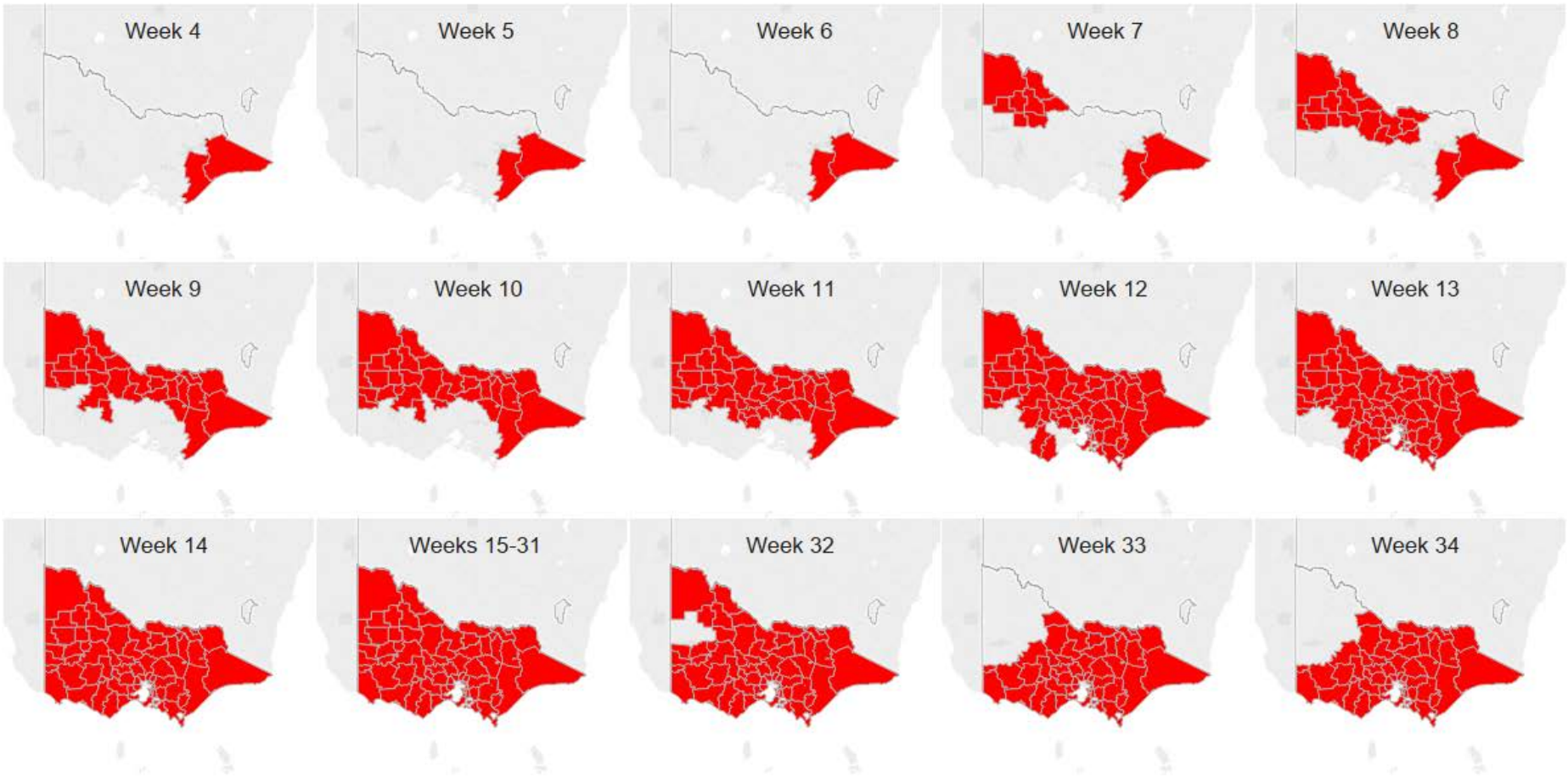

Figure 2 Progressive roll-out of CFA fire declarations for the 2018-2019 fire season

3. Pre-season preparedness

Nine major electricity companies (MECs) operate in Victoria to meet the electricity needs of industry and the community. They are:

- AusNet Services (Distribution)
- AusNet Services (Transmission)
- Basslink
- CitiPower
- Jemena
- Powercor
- Transmission Operations Australia (TOA)
- Transmission Operations Australia 2 (TOA 2)
- United Energy

Failure to operate their electricity networks to acceptably safe standards exposes the community to safety risks such as electrocution, bushfire and loss of electricity supply.

The extreme conditions over the summer fire danger period elevate these risks — they increase the occurrence of electrical incidents and escalate the severity of impacts of such incidents.

In the lead up to and throughout the summer, ESV undertakes a range of activities to test the effectiveness of the systems and measures used by the MECs to manage their networks. This allows ESV to ensure that the MECs are best prepared to operate their networks safely over the fire danger period and not expose the community to unnecessary risk.

The activities that ESV performs include, but are not limited to, system and outcomes audits, asset and electric line clearance inspections, monitoring of MEC asset maintenance and vegetation clearing activities, and review and analysis of incident and performance data.

As part of this, ESV undertakes pre-summer asset and line clearance audits for every business, with locations selected to ensure the audit covers at least three different local areas. Within each location, a statistically representative sample of assets/spans is selected for inspection using the ABS sampling tool. The sample is chosen this way to ensure that the results are representative of the wider network.

Where ESV encounters evidence of a potential issue, ESV then determines whether further investigation and/or enforcement action is warranted. This will involve analysis of risk maps, incident report data, previous work practice audits and other field observations. Stakeholder concerns and feedback from the MEC will also be considered. As part of the investigation, ESV may undertake more detailed sampling to focus on a particular geographical area or expand more broadly across the network. Alternatively, sampling may be designed to ascertain the influence of asset type, environment, weather or other factors on creating a higher risk of another incident occurring.

ESV continues to increase its use of data and analytics to support audit and investigations planning to identify hot-spots or potential failure trends.

4. Analysis of ground fire events

4.1 Fire statistics

4.1.1 Overall performance

There were 215 ground fires between 10 September 2018 and 30 April 2019. This is 60 fewer fires than the same period in the 2017-2018 fire season and 26 fewer than 2015-2016; however, there were 29 more fires this season than in the 2016-2017 season.

Figure 3 shows the cumulative growth in fire numbers across the fire season. While the 2018-2019 curve leads at the start of the season due to some early fires, it soon falls behind the previous four years; it is only in the last week of February (week 25) where the cumulative number of fires exceeds the relatively quiet 2016-2017 season.

Figure 4 shows the distribution of ground fires by month and Figure 5 shows the distribution by day. This season was generally similar to last year, with fires primarily occurring in the mid-late season from January to March (Figure 4). This contrasts with the 2015-2016 season where most of the fires occurred in December and January.

When we look at fires at the daily level (Figure 5), it is apparent that there are single or multiple days were there were large numbers of fires in the 2015-2016 and 2017-2018 seasons. An example is the major peak in 2017-2018 associated with the spate of fires in the southwest over the St Patrick's Day weekend. The peaks on days of multiple fires were suppressed in 2018-2019 and more so in 2016-2017.

Understanding the causes behind these peak fire days is the focus of ongoing work by ESV's Data and Analytics team. Insights on this have been reported previously in last year's *End of fire season summary* and the *Safety performance report on Victorian electricity networks*. Both are available on the ESV website.

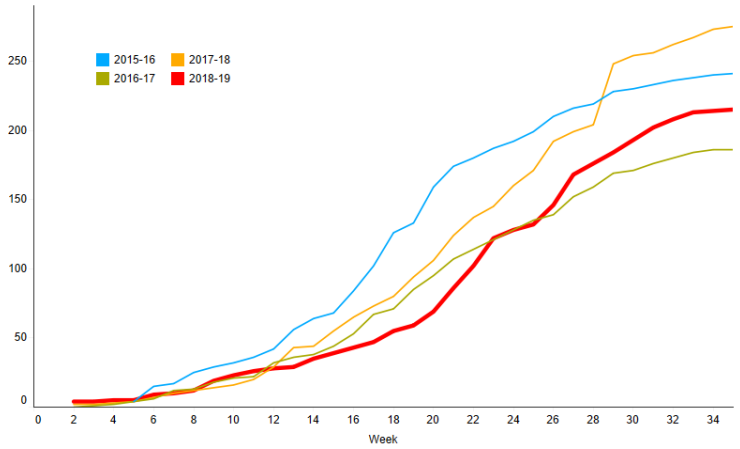

Figure 3 Cumulative ground fires across the fire season

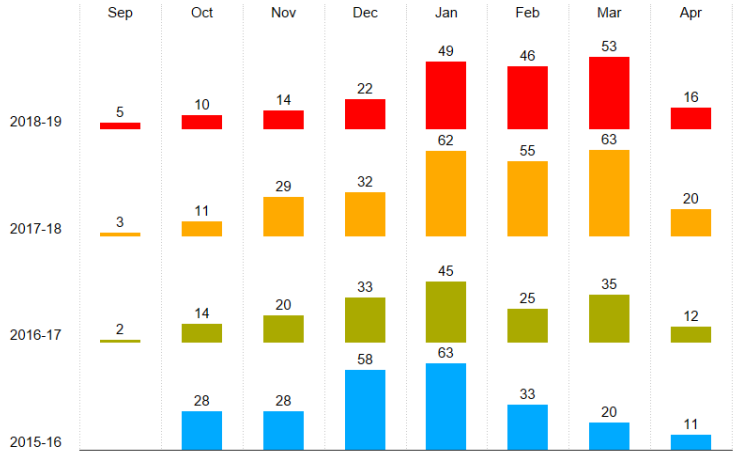

Figure 4 Network-related ground fires per month

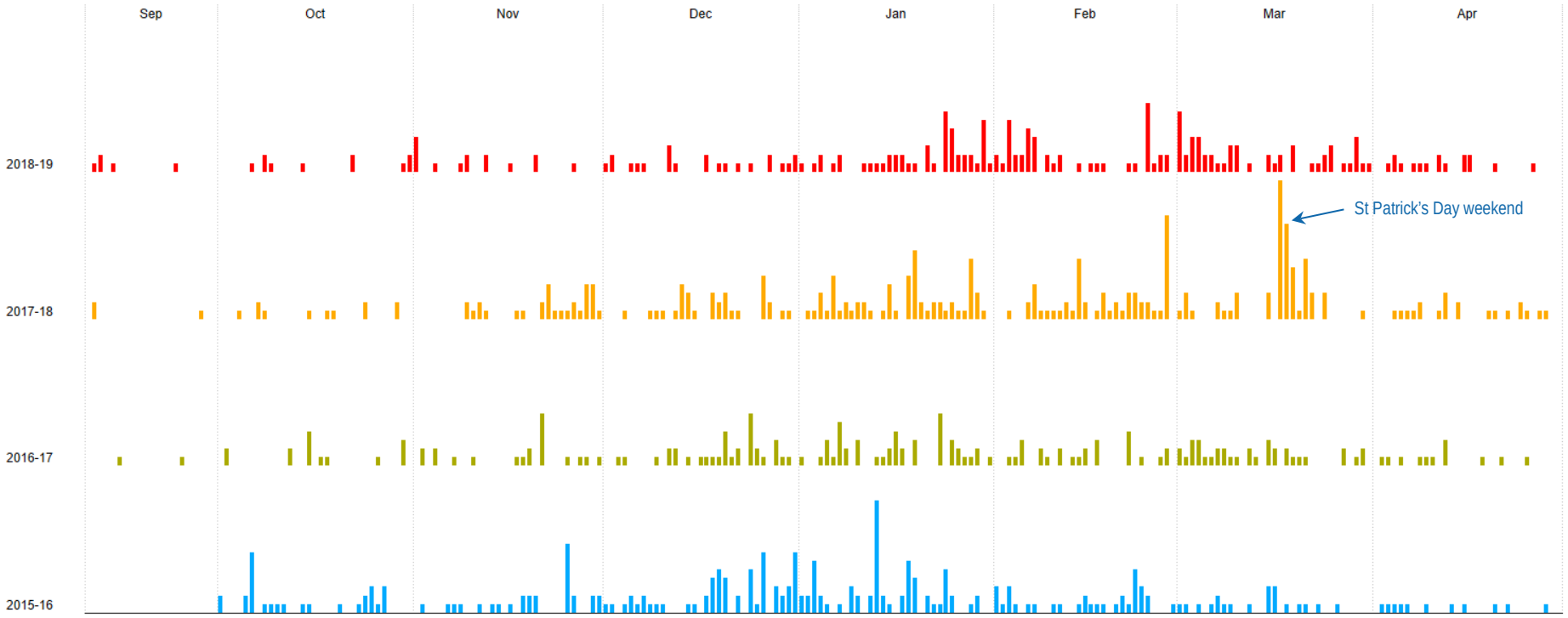

Figure 5 Fire incidents per day

4.1.2 Ground fires by distribution business

Figure 6 provides a breakdown of the ground fires for each of the distribution businesses over the last four fire seasons.

Powercor experienced fewer ground fires this year than in the previous three seasons. This is a positive result.

AusNet Services saw significantly fewer ground fires than last year, but more than the previous two seasons. It was the only business that had more fires this year than in 2015-2016; however, it saw disproportionately fewer fires in 2015-2016 than the other distribution businesses.

The number of ground fires experienced by the other distribution businesses this year was similar to last year and lower than 2015-2016.

Note The size of operating area and number of assets differ significantly between distribution businesses. As such, absolute numbers of incidents are not directly comparable between distribution businesses.

Statistics on the respective sizes of the various networks can be found in the annual *Safety performance report on Victorian electricity networks* available on the ESV website.

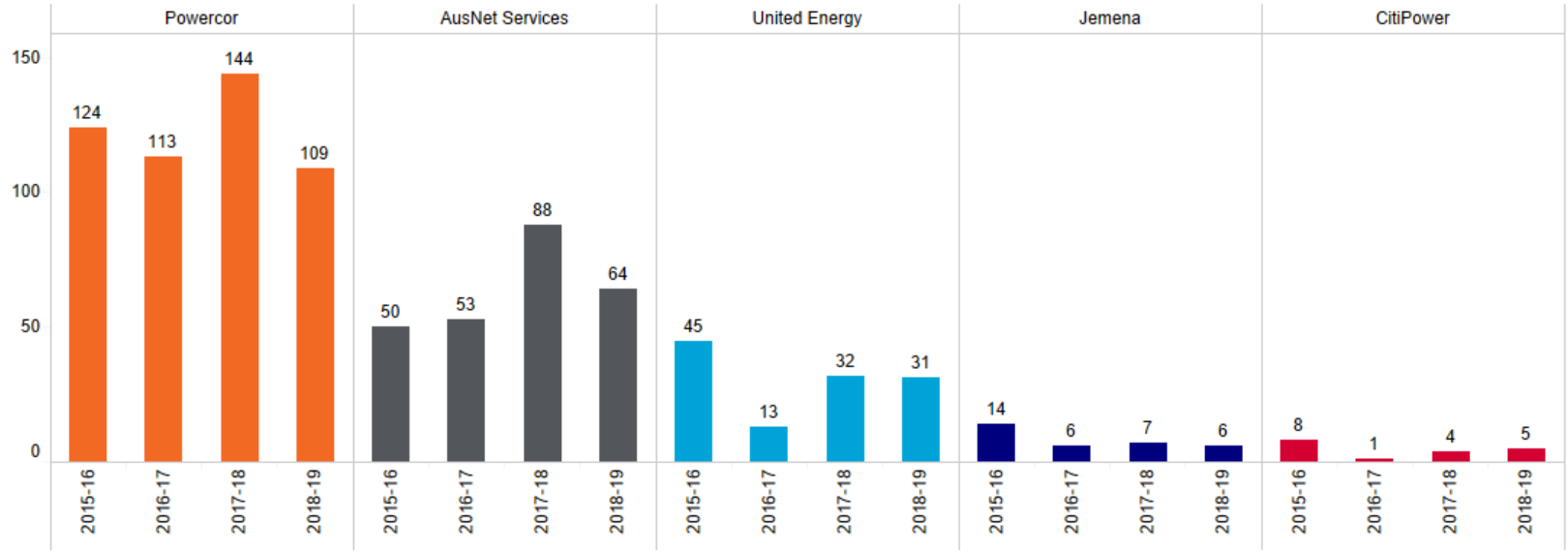

Figure 6 Total fires for each distribution business for the last four fire seasons

4.1.3 Fires by size

When the distribution businesses report fires to ESV through OSIRIS, they are required to classify the size of the ground fire into the following categories:

- Large more than 10 ha
- Medium 1000 m^2 - 10 ha
- Small 10 - 1000 m^2
- Localised less than 10 m^2

Figure 7 shows the total ground fires in each size category for the last four fire seasons and the relative occurrence of fires in each category to the total number of fires. The key findings are:

- the fourteen large fires last year were associated with an isolated extreme weather event and the numbers of large fires has significantly reduced this year
- the number of medium-sized fires is at the lowest level in the last four fire seasons
- small fires continue to fluctuate in absolute numbers but represent an almost constant 34-39 per cent of all fires
- localised fires also fluctuate in absolute numbers but represent a consistent and uniformly constant 48-49 per cent of ground fires across all four seasons
- fires smaller than 1000 m^2 account for 82-87 per cent of all fires.

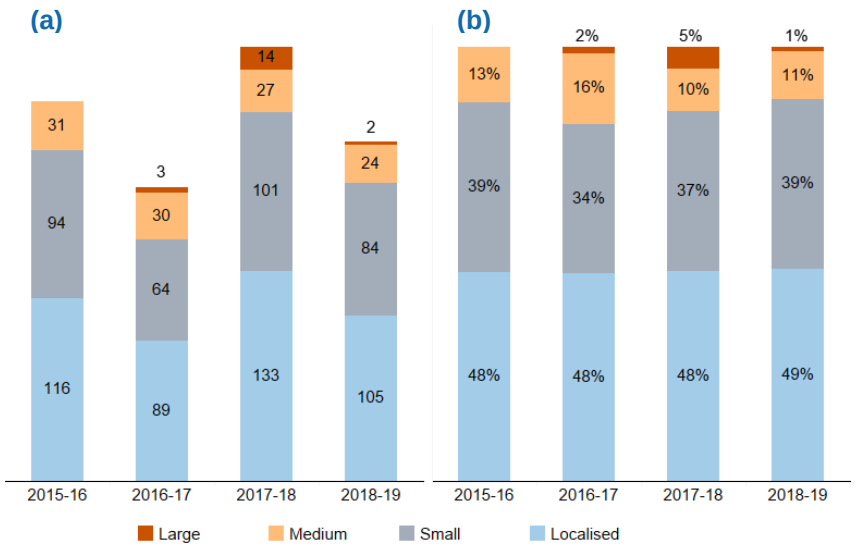

Figure 7 All ground fires by size
(a) absolute numbers; (b) percentage breakdown

4.2 Spatial distribution

Figure 8 shows the locations of all ground fires during the 2018-2019 fire season. While there are no clusters of medium-large fires similar to those observed last year, there is still a cluster of fires in LBRA along the Murray River and around Shepparton. This area will be reviewed by the CFA in 2019 to determine whether it should be classified as HBRA.

Figure 9 presents the aggregated number of ground fires in each Bureau of Meteorology district. This clearly shows that the bulk of ground fires in the state occurred in and around Greater Melbourne, Greater Geelong and Ballarat. This is possibly due to the high network density in those areas. The next tier is associated with the Shepparton area, the corridor from Melbourne through the Latrobe Valley to Sale, and the Otways through to Warrnambool.

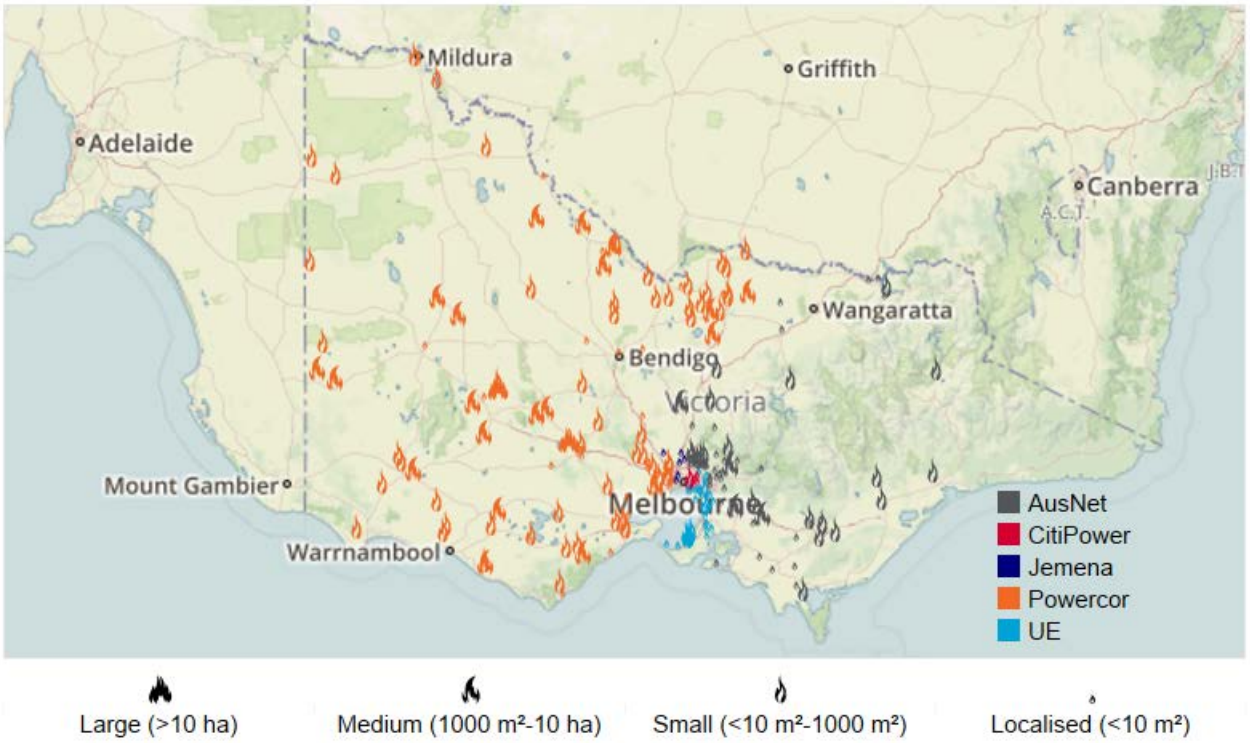

Figure 8 Locations of all ground fires during the 2018-2019 season

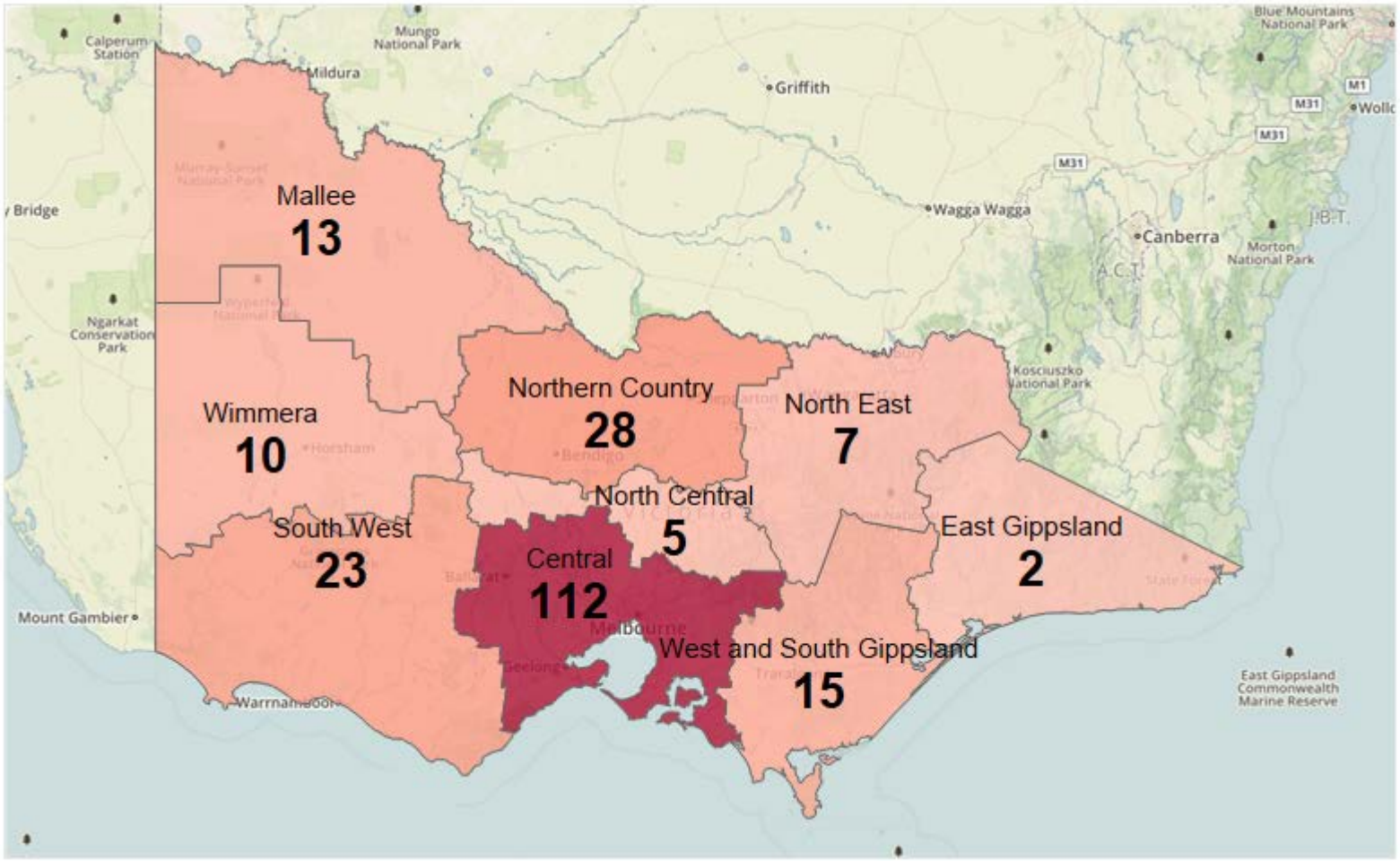

Figure 9 Locations of all ground fires by Bureau of Meteorology district

5. Operational assessment

5.1 Vegetation clearance

5.1.1 Fire season preparedness

In the 2018-2019 fire danger period, ESV completed vegetation inspections for each of the electricity distribution businesses that have tree clearing responsibilities in HBRA. The purpose of the inspections was to test the outcome of each of the businesses pre-summer electric line clearance programmes.

The businesses inspected were AusNet Services, Jemena, Powercor and United Energy.

The Australian Bureau of Statistics sampling methodology was used to set sample sizes sufficient to provide a minimum 95% confidence that the inspection results would be representative of compliance standards across the wider network area. A total of 9847 spans were inspected.

The results of the inspection programme are shown in Figure 10. ESV required that all noncompliant vegetation identified be cleared.

ESV was satisfied with the clearing standards that had been achieved by AusNet Services, Jemena and Powercor. ESV considered that they were, as far as practicable, appropriately managing their electric line clearance risks in HBRA.

The clearing standards achieved by United Energy were not satisfactory; it was not appropriately managing its electric line clearance risks. This matter is the subject of an ongoing ESV investigation.

To address the concerns formally raised by ESV, United Energy engaged an independent consultant to review its vegetation clearance practices and has begun implementing the recommendations of the review. ESV will monitor these works and ensure noncompliance rates are reduced as a result.

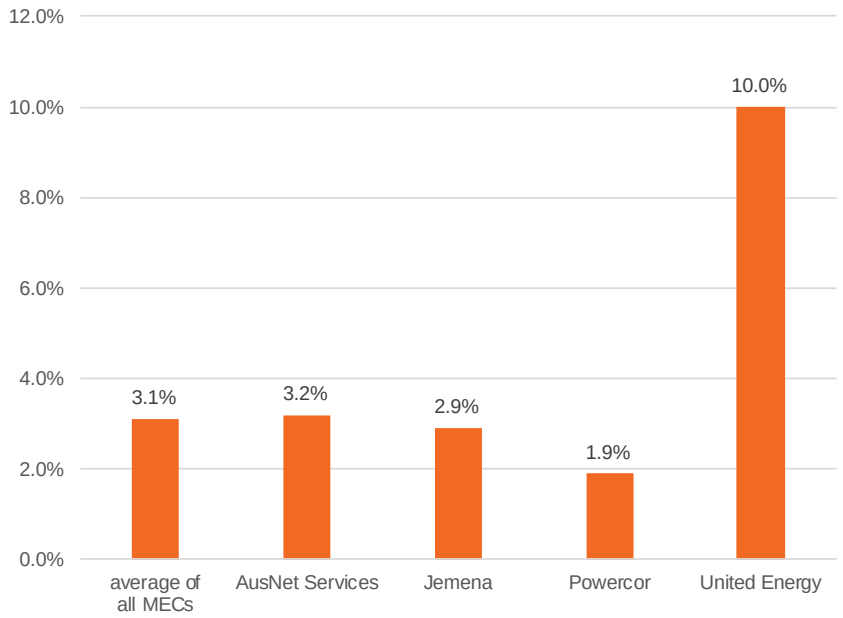

Figure 10 HBRA inspection programme results

5.1.2 Powercor prosecution

In January 2018, three grassfires occurred near the townships of Rochester (6 January 2018), Strathmerton (20 January 2018) and Port Campbell (28 January 2018). The ESV investigation of these three fires concluded that ignition of each fire was most likely caused by tree branches coming into contact with high voltage power lines.

Concerns regarding observations made by ESV when investigating the fires prompted a broader inspection of vegetation clearances throughout northern Victoria, extending from Shepparton through to Mildura. Extensive and particularly unsafe noncompliant vegetation was identified by ESV during this inspection process.

In July 2018, Powercor was charged for each of the three fires and for 189 breaches of the Code of Practice for Electric Line Clearance. The charges for each fire include:

- Breaching key provisions of the Code of Practice for Electric Line Clearance in contravention of section 90 of the *Electricity Safety Act 1998*.
- Failing to minimise the risks to property from a supply network (section 98(b) of the *Electricity Safety Act 1998*).
- Failing to comply with a bushfire mitigation plan (section 113B(2) of the *Electricity Safety Act 1998*).

On 10 April 2019 at the Shepparton Magistrates Court, Powercor pleaded guilty to each of the charges associated with the three fire and a further 51 charges that incorporated the 189 Code breaches. The Magistrate acknowledged the seriousness of the charges but noted that Powercor had pleaded guilty at the earliest opportunity.

The Magistrate imposed on Powercor fines of $374,000; consisting of $200,000 for the line clearance breaches and $58,000 for each of the three fires. The Magistrate also awarded $165,000 in costs to ESV.

Note As indicated by Figure 10, Powercor has shown much improved behaviour and outcomes this season, with the lowest noncompliance rates of all the distribution businesses.

5.1.3 Review of the HBRA and LBRA boundaries

The Electricity Safety (Electric Line Clearance) Regulations seek to mitigate electricity safety risks by excluding vegetation from a predetermined clearance space around electric lines. The required clearance space is prescribed within the Code of Practice for Electric Line Clearance (the code), a schedule to the regulations.

The code makes a distinction between the clearance spaces required in HBRA and LBRA, with the clearances required in HBRA being greater due to the increased bushfire threat in these areas. That said, bushfire risks also exists in certain areas of LBRA throughout Victoria.

The CFA is responsible for assigning LBRA and HBRA where it is the designated fire control authority. Historically, it performed cyclic reviews of these boundaries; however, this program lapsed in 2013. The boundaries have not been reviewed since then. As a result, areas exist where the assigned fire hazard rating no longer represents the prevailing conditions.

Urban development can result in areas currently defined as HBRA being subsequently classified as LBRA by the CFA.

Conversely, in areas where land use has changed, such as irrigated pasture reverting to dry land farming, the LBRA classification no longer represents the fire risks that exist and these areas would be better defined and managed as HBRA.

The former may result in higher levels of management being performed than are warranted. The latter can result in a greater exposure of the public to the risk of bushfire as the management standards used do not align with the risks that prevail.

While the review of fire hazard boundaries is outside of the immediate remit of ESV, we have engaged with the CFA and MECs and reinstated the cyclic reviews by the CFA with the work funded by the distribution businesses. In the future, this will be incorporated into the ESV levy to ensure ongoing funding for this program.

Commencing in July 2019, the first year of the review will target the Powercor distribution network, including the area in northern Victoria discussed in Section 5.1.2.

5.1.4 HBRA clearing by municipal councils

In limited instances across the state, municipal councils are required to manage trees on public land in HBRA to ensure they are clear from electric lines. ESV's increased resources has allowed it to better understand of how these HBRA spans are being managed by councils. An inspection program of these areas was completed in the 2017-2018 fire danger period; this was repeated in the 2018-2019 season.

Where ESV identifies noncompliant vegetation it requires the relevant Council to clear it to make it compliant and safe. It must also notify ESV when the clearing has been completed.

In the 2018-2019 fire danger period, ESV observed distinct improvements in the performance of all councils with HBRA clearing responsibilities; the average noncompliance find rate across councils inspected dropped by more than half (Figure 11).

The drop in noncompliance rates can be attributed to the additional resources employed by ESV that have allowed us to increase our engagement with councils across the state. Many of these councils were not aware of their vegetation clearance obligations under the Electricity Safety Act; most have responded positively to working with ESV once aware of these obligations.

During the year, there were a number of councils where noncompliance rates were significantly higher than their peers. Figure 12 shows the performance of the ten worst performing councils in the 2018-2019 period. ESV will continue to work with these councils to ensure they understand and address their line clearance responsibilities.

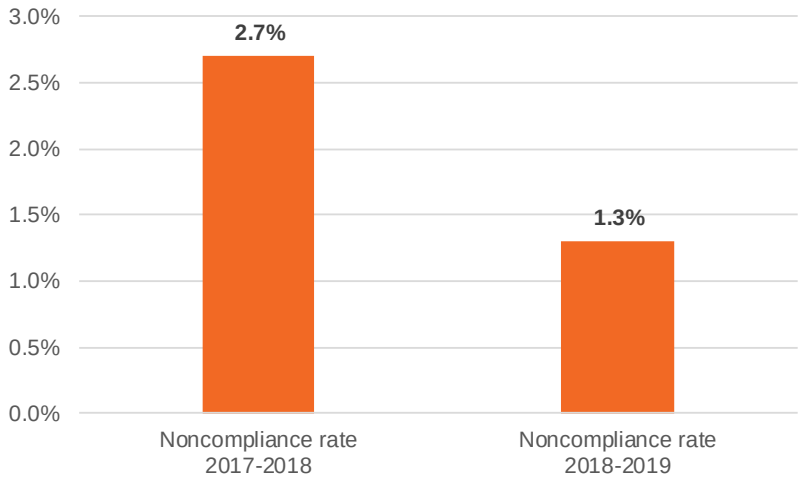

Figure 11 Comparison of noncompliance rates between years

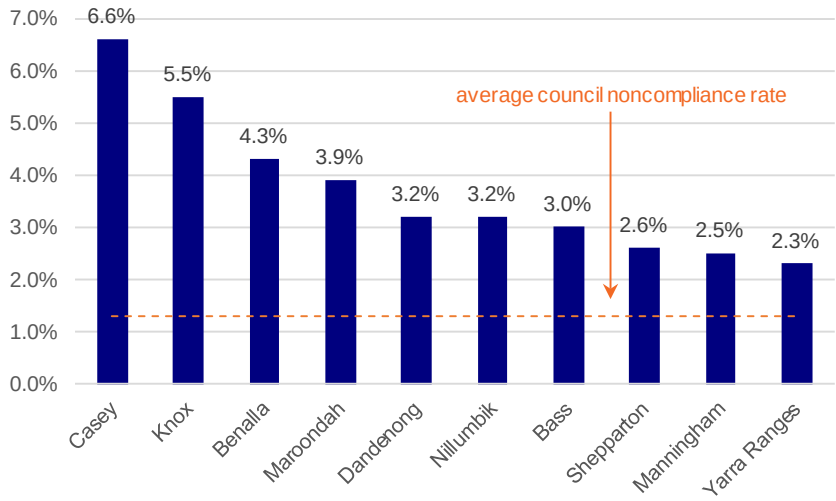

Figure 12 Top 10 worst performing councils in 2018-2019

5.2 Investigation of last season's fires

During the 17-22 March 2018 period, there were 44 network fires across Victoria. Most of the fires occurred on the weekend of 17-18 March when strong winds came through from the west and combined with temperatures close to 40°C. There were further incidents over the subsequent days as the winds reduced but the temperatures remained high.

Of the 44 fires, there were nine large fires (greater than 10 ha), four medium fires (1,000 m^2 to 10 ha), sixteen small fires (10 m^2 to 1,000 m^2) and fifteen localised fires (less than 10 m^2).

5.2.1 The Garvoc (The Sisters) fire investigation

On 17 March 2018, the aforementioned high wind event passed through Victoria's southwest; this caused a fault on the electrical network and a fire in the Terang area. The fire was found to have originated at or close to the location of a failed pole (pole 4) on the Powercor distribution network. The pole was located on the Sparrow Spur line at The Sisters, and the fire was known as the Garvoc fire.

The ESV technical investigation established the following:

- Pole 4 structurally failed at the top of the pole stakes causing the upper section of the pole to fall to the ground
- Powercor's high voltage protection equipment de-energised the line as expected.

ESV has investigated this incident and has concluded from the engineering analysis of the remaining pole sections that the structural failure of Pole 4 was caused by long-term material degradation due to decay and termite infestation. This resulted in the development of a sizeable internal cavity in proximity to the point of failure; this sufficiently reduced the structural strength of the pole such that it could not withstand the prevailing wind conditions.

ESV is now undertaking an investigation to determine the nature and extent of any breaches to the Act or Regulations and the extent of any enforcement action to be taken.

Note Further details on this fire can be found in the ESV technical investigation report *Garvoc Fire (The Sisters) 17 March 2018*.

5.2.2 The Terang fire investigation

On 17 March 2018, the high wind event caused a fault on the electrical network and a fire in the Terang area. The fire was found to have originated at or close to the location of Pole 3 (P3) on the 22 kV Terang 004 feeder (TRG 004) near the intersection of Peterborough Road and High Street, Terang.

The ESV technical investigation established the following:

- there was evidence of arcing damage to the P3 22kV overhead conductors, and four short circuit events occurred on the TRG 004 line between 20:45 and 20:49 AEST
- the electrical clearances (distances) between the upper and lower P3 22kV conductors were not constructed to relevant Australian or Powercor Standards
- the Powercor protection system circuit breaker operated as expected with the Total Fire Ban settings applied.

ESV concluded from its investigations that:

- the most likely source of ignition was molten conductor material falling from clashing and arcing conductors at or around 20:49 AEST, and the damage to the conductors is consistent with this conclusion
- on 17 March 2018, the clearances between the upper and lower P3 22kV conductors were not sufficient to prevent arcing from clashing conductors during the high wind event.

ESV is now undertaking an investigation to determine the nature and extent of any breaches to the Act and regulations and the nature of any consequential enforcement action to be taken.

Note Further details on this fire can be found in the ESV technical investigation report *P3 High Street Terang Electrical Incident 17 March 2018*.