



Fuel Management Activities in Western Australia

Summary of 2019-2020

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DFES
Department of Fire &
Emergency Services

FOR A SAFER STATE



Message from the Executive Director Rural Fire Division



I am pleased to present this latest annual summary of fuel management activities undertaken to manage bushfire risk across Western Australia. It is heartening to see that so many organisations managed to overcome the restrictions forced upon us by Covid-19 to continue the important task of managing bushfire risk. Some organisations were forced to change their usual approach, particularly during autumn (or the early dry season in the north), and I acknowledge the good work, innovation and personal sacrifices made by those whom contributed to this.

The 2019-2020 Fuel Management Activities report shows a continuation of the trend of more organisations from across Western Australia recognising they have an important role to play in managing bushfire risk. The report again shows that a spirit of collaboration continues to drive positive outcomes for the entire Western Australian community. This year, we have included some case studies in the report that show examples of State Government, local governments and private residents working together to manage fuels. These are only a small sample of the many great stories that we have heard while compiling the report and I hope you find them as inspiring as I have.

Thank you to the organisations that have contributed information to this report and congratulations on your commitment to managing bushfire risk. The great work that is being done throughout the State is crucial to enhancing our community's resilience to bushfire.

Murray Carter

Executive Director Rural Fire Division
Department of Fire and Emergency Services



Quick Stats

104 organisations reported on their fuel management programs in 2019-2020. Together, they completed:

- 829 planned burns totaling 4.96 million hectares and
- 71 thousand hectares and 23 thousand kilometres of other fuel management activities.

Introduction

Bushfires had a tremendous impact on Australia in 2019-2020. The extensive fires that occurred throughout Queensland, New South Wales, Victoria and South Australia took a huge toll on people, communities and the natural environment. Here in Western Australia, we were lucky to be less severely affected, though we still experienced several large and disruptive bushfires.

The large size and varied climate of Western Australia means some part of the State can be threatened by bushfire at almost any time of year. Addressing the hazard of bushfire is a responsibility that is shared by the entire community and requires a coordinated approach spanning the spectrum of prevention, preparedness, response and recovery. Managing the fuel that powers bushfires is crucial to reducing the harm that they cause.

Each year, the Department of Fire and Emergency Services (DFES) surveys land managers across Western Australia to ask about the steps they have taken to manage bushfire fuel, factors that helped or hindered their fuel management program, collaboration that occurred and lessons that were learned. This report summarises the responses received for the 2019-2020 financial year.

Why manage fuel?

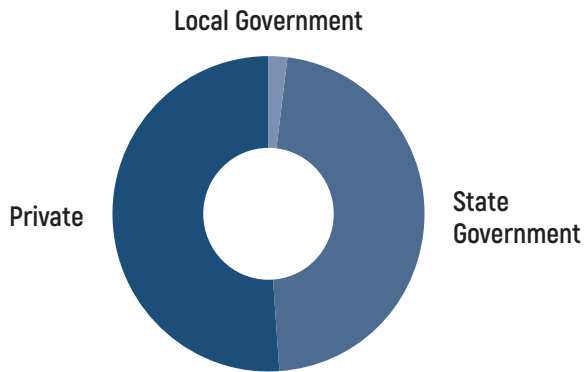
There are three things that determine how severe a bushfire will be: the weather, terrain and fuel that is available to burn. Of these three things, people can only influence the fuel. Fuel management is the practice of removing or modifying vegetation and leaf litter so that it is not available to be burnt if a bushfire occurs.

Where there is little fuel available to burn, bushfires are less likely to become established and fires that do occur will burn less intensely. This makes them easier and safer for fire fighters to contain and extinguish. An effective regime of fuel management, therefore, makes it less likely that bushfires will cause harm to people, communities, economic and cultural assets or the natural environment.



**IN 2019-2020, 55 ORGANISATIONS
COMPLETED A PLANNED BURN**

Who manages fuel in Western Australia?



The proportion of the state managed by each sector for fire prevention.

In Western Australia, the land owner or occupier is responsible for managing bushfire fuels on their land. Private residents and companies must manage fuel on the land that they own or lease according to the requirements set by local governments. These requirements are published in the local governments' annual fire management notice, often called a fire break notice.

State Government agencies that manage land are not legally required to comply with local government fire management notices. They do, however, still have a legal and moral obligation to take reasonable steps to prevent bushfires on their lands, including by managing fuels. Local governments are similarly responsible for fuel management on all lands vested in them, such as shire reserves.

State Government

- National parks, nature reserves, State forest and other conservation reserves
- Unallocated Crown land and unmanaged reserves
- Schools, hospitals, correctional facilities and similar facilities with bushland.

Local Government

- Shire parks, reserves and other local government managed land.

Private land managers

- Aboriginal lands
- Pastoral and mining leases
- Farms and private plantations
- Private properties with bushland.

Compiling the report

In August 2020, DFES sent a survey to all of Western Australia's local governments, 14 State Government agencies and 18 private companies with significant land or fire management responsibilities. The survey contained 20 questions about the respondent's fuel management activities in 2019-2020.

126 Responses were received from 104* different organisations representing:

- 85 local governments
- 11 State Government agencies
- 8 private sector companies.

A full list of the responding organisations is provided in Table 6 and a map showing the responding local governments in Figure 1.

* Some State Government agencies provided a response for each region or property they manage.





A mild planned burn is lit in Canna Reserve.



A plant that was thought to be extinct growing in a recently burnt area of Canna Reserve.

CASE STUDY

Back from the Brink at Canna Reserve

Canna reserve is about 2100 hectares of York gum woodland, Acacia shrubland and granite rock outcrops in the shire of Morawa. It is a special environment, supporting a large population of mallee fowl, threatened plant communities and several Aboriginal cultural heritage sites.

This large area of vegetation also adjoins the Canna townsite and farmland, and so contributes to bushfire risk in the area. Management of this risk has traditionally been difficult, as the reserve includes sections of unallocated Crown land, unmanaged reserve, local government reserve, nature reserve and freehold land.

To address this, the Community Emergency Services Manager for the Shire of Morawa developed a coordinated plan to manage bushfire fuel in Canna Reserve. Working with DBCA and local environmental groups, he has planned and implemented a rolling program of small, mild planned

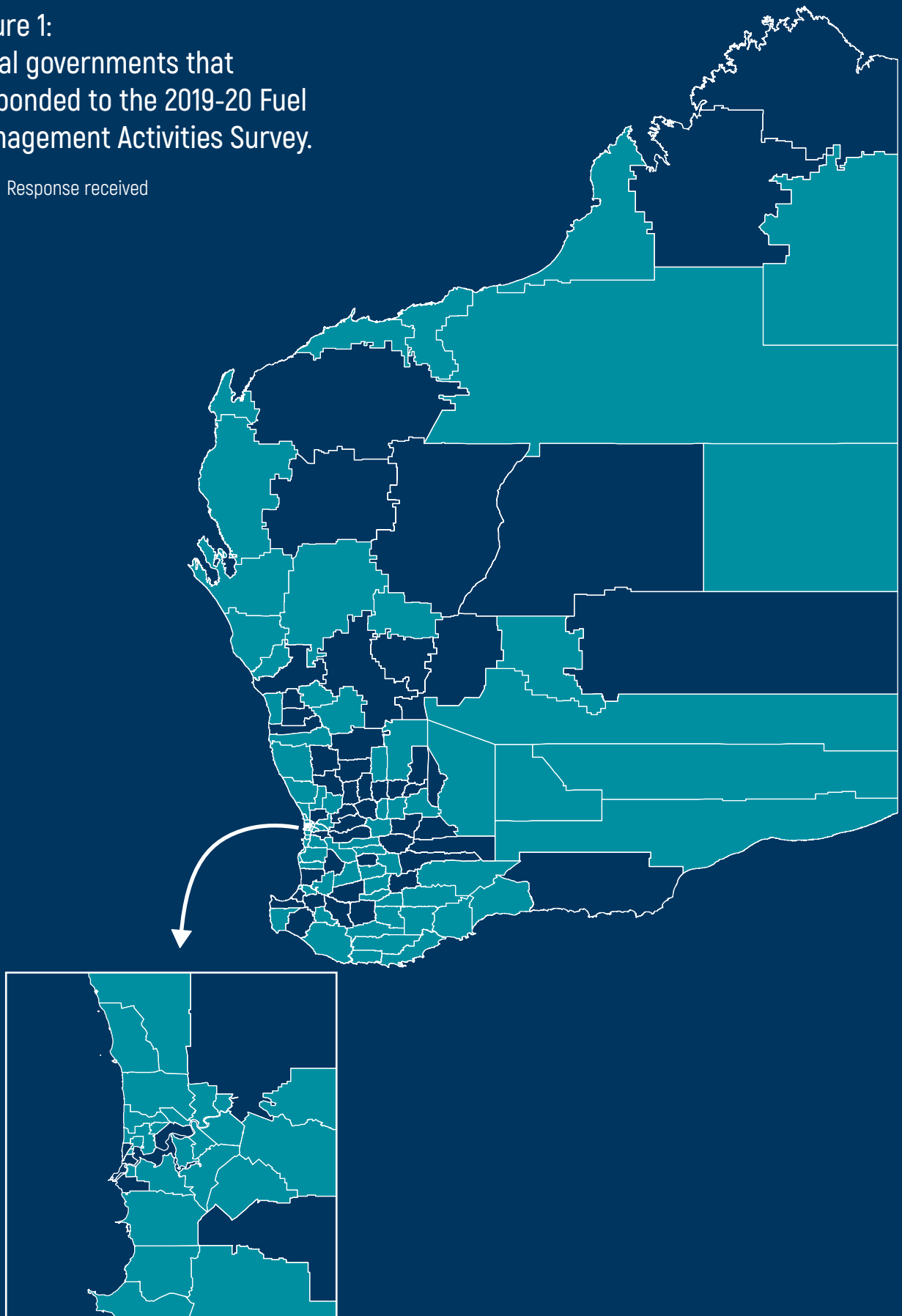
burns over several years. A small part of the reserve is burnt each year, progressively developing a mosaic of fuel ages and protecting the area's natural and economic assets from bushfire.

To the delight of all involved, recent burning has also resulted in the germination of two rare plant species. One of these was thought to be extinct, having last been recorded some ten years ago, while only two small populations remained of the other. Both plants are fire opportunists and the reintroduction of burning to the reserve caused seeds in the soil to germinate. Canna now boasts healthy populations of both species within the recently burnt areas, with thousands of plants recorded in a recent survey.

Canna Reserve is a great demonstration that carefully planned and well-executed burning can simultaneously achieve positive outcomes for community safety and the environment.

Figure 1:
Local governments that
responded to the 2019-20 Fuel
Management Activities Survey.

 Response received





CASE STUDY

Managing fuel and weeds in Broome

Siratro is a creeping vine that was introduced to Australia as a fodder plant. It is fast growing, very invasive and has become a significant weed in the Kimberley. Left unchecked, it will smother native species and take over.

When workers from the Shire of Broome identified an infestation of siratro in a reserve they were planning to burn, they recognised an opportunity to use fire to control the weed. The grasses of northern Australia are well adapted to periodic burning, but the introduced siratro can be killed by a fire that is hot enough to burn down to the root zone. A decision was made to ensure that the planned burn was hot enough to kill the weeds, destroy their seeds and encourage native grasses to re-establish.

To achieve this, the Shire sprayed infested areas with weed killer and waited for them to die and completely cure. They then engaged the Broome Bush Fire Brigade to undertake a burn on a warm August day with fresh winds. Burning on a westerly wind ensured the smoke was carried away from the neighbouring residential area, while a road to the east contained the burn. Herbicide was applied again post-burn to any areas where siratro was resprouting. A follow-up burn is planned for 2021 to maintain low fuel loads and continue to suppress weeds.

Planned burning

Planned burning is the most efficient way to reduce bushfire fuel over large areas. When done in a considered way, it is also safe and environmentally sustainable. In fact, as many of Western Australia's ecosystems have evolved with fire, planned burning can make a vital contribution to maintaining ecological function.

In 2019-2020, 55 organisations reported undertaking planned burning, collectively completing 829 planned burns totalling 4.96 million hectares. This represents an increase of almost half a million hectares compared to 2018-19, with 5 more organisations conducting burns and 86 more burns completed.

The largest contributors to the area of planned burning achieved were:

- DBCA completed 134 burns totalling about 3,553,000 hectares
- Australian Wildlife Conservancy completed 50 burns totalling about 495,000 hectares
- Kimberley Land Council completed 118 burns totalling about 486,000 hectares
- DFES completed 94 burns totalling about 410,000 hectares.

These four organisations all conduct extensive aerial planned burning programs in the Kimberley. In that region, large, patchy, low intensity burns are undertaken in the early dry season, to reduce the impact of damaging late dry season bushfires.

33 local governments reported completing some planned burning, with the most active being the Shire of Mundaring, who completed 154 burns totalling almost 1,500 hectares.

Together, State Government agencies completed about 4 million hectares of planned burning, private organisations almost 1 million hectares and local government about 3,300 hectares.

Planned burn escapes

Despite the many things put in place to make planned burning as safe as possible, burns do occasionally escape from their intended area. In 2019-2020, 11 planned burns escaped, affecting a combined area of about 6,400 hectares. This means about 1% of all planned burns conducted in 2019-2020 resulted in a burn escape, and the area burnt by escapes was about 0.1% of the total area of burning. The number of burn escapes has trended downward for the last three years.

Mechanical and chemical fuel management

Mechanical fuel management involves removing or modifying fuel by hand or using machines. The most common forms of mechanical fuel management are slashing or mowing vegetation and clearing fire breaks. More than three quarters of survey respondents reported that they had undertaken each of these activities in 2019-2020. Spraying herbicides to eradicate weeds was also a common method of reducing bushfire risk, with about half of survey respondents having undertaken chemical fuel management.

Table 1 shows the amount of mechanical and chemical fuel management activities completed by responding organisations. In total 94 different organisations reported completing over 71,000 hectares and 23,000 km of mechanical and chemical fuel management.

Table 1: The amount of mechanical and chemical fuel management completed by respondents.

Treatment	# of organisations	Area (ha)	Length (km)
Parkland clearing	30	424	20
Chemical spraying	51	6,759	10,306
Slashing or mowing	80	26,020	4,020
Weed management	29	17,356	257
Fire breaks or access	80	18,352	6,670
Scrub rolling	3	1	504
Mulching	23	1,680	147
Other	8	555	1,256
Total	94	71,147	23,180

Despite the impact of Covid-19, most survey respondents reported similar activity completion rates to the previous survey. Maintaining firebreaks and slashing or mowing were the activities most completed, with 84% of respondents reporting they completed most or all of their planned program. The completion rate of planned burning was significantly lower in 2019-2020 than in the previous survey period, with only 35% of respondents completing most or all of their program, compared to 49% of respondents in 2018-2019.

Table 2: Proportion of respondents that reported completing at least 75% of their programmed fuel management activities. Percentages are based only on those that intended to undertake the activity and had a set program.

Fuel management method	% of respondents completing >75% of planned works	
	2018/19	2019/20
Fire breaks or strategic access	89	84
Slashing	88	84
Chemical spraying	81	81
Mulching	77	63
Parkland clearing	75	77
Planned burning	49	35

Enabling fuel management

Survey respondents were asked how they funded their fuel management program. About 53% funded their entire program internally with a further 13% self-funding at least half of their program. About 32% of respondents accessed some State Government grants funding, with 10% of respondents entirely reliant on State Government grants to implement their fuel management program. The increased use of State Government grants compared to the previous survey reflects more local governments having completed a Bushfire Risk Management Plan, making them eligible to apply for the Mitigation Activity Fund.

The degree of reliance on an organisation's own staff to complete fuel management activities increased since the previous survey. In 2019-2020, 74% of organisations responded that their own staff were essential to completing their fuel management program, with the other 26% responding their staff were involved to some extent.

As per the previous survey, contractors, volunteer brigades and State Government fire agency staff were the next most important contributors, with each of these also showing a greater degree of involvement in 2019-2020 compared to 2018-2019.

Table 3: Summary of responses to the question 'How reliant is your organisation on the following sources of labour and expertise in completing your fuel management program?' Some categories have been amalgamated and non-responses removed from the data.

	Essential to outcomes (%)	Participated in activities (%)	Not involved
Organisational staff	74	26	0
Contractors	59	23	18
Volunteer Brigades	30	41	29
State Government agencies	20	62	18
Bushfire consultants	8	18	75
Other volunteers	5	20	75

Indicators of collaboration also showed significant improvement in 2019-2020, compared to the previous survey. Over half of respondents reported collaborative endeavours between State Government agencies, local governments and private organisations in planning or implementing fuel management programs. A further third of organisations reported consulting on their program between sectors or communicating it to these stakeholders. This represents an increase of about 20% in the extent of cross-sector engagement reported compared to the previous survey. There was also good inclusion of the broader community, with three quarters of organisations engaging nearby residents in the planning process for fuel management activities.

This year, for the first time, we asked about engagement with Traditional Owners. Almost half of respondents reported having engaged with Traditional Owners in some way, which is encouraging but remains an area where we hope to see further improvement.

Table 4: Summary of responses to the question 'How much did you engage with the following stakeholders when planning or implementing your organisation's annual bushfire risk management program?' Non-responses were omitted from the dataset.

	Worked collaboratively (%)	Communicated or consulted (%)	Not involved (%)
State government agencies	51	35	13
Local governments	47	29	24
Volunteer Brigades	41	27	32
Traditional Owners	14	31	55
Residents	7	68	24



Restrictions on fuel management activities

The factors that prevented organisations from completing their fuel management program in 2019-2020 were similar to those identified in the previous survey. About two thirds of respondents reported that weather or seasonal conditions limited their ability to get work done, up about 12% from the previous year. The second most commonly reported limitation was a lack of capacity or expertise in the organisation, with over half of respondents identifying this factor. This was a significant increase from the previous year, suggesting there is a growing need to encourage the development of organisational capacity to plan and implement fuel management in local government.

Planned burning was identified as the activity most impacted by the factors above, with over half of respondents saying that they were restricted in their ability to complete burning. Installing fire breaks and fire access, slashing or mowing and chemical spraying were the activities next most commonly reported as having been affected, with about one third of respondents indicating each of these activities were restricted.

Table 5: Issues identified as limiting respondents' ability to complete planned fuel management activities. The figure shown is the sum of those who reported the factor limited their works program somewhat, limited their works program significantly or prevented most works from occurring.

Limiting factor	% of respondents who identified as an issue	
	2019/20	2018/19
Weather or seasonal conditions	68	56
Lack of in-house capacity or expertise	55	37
Availability of funding	49	42
Volunteer brigade availability	42	36
Environmental approvals	39	33
Community concerns	37	32
Contractor availability	31	30
Grant application process	30	26
Cultural or archaeological approvals	18	21
Access to information for planning	18	21

Other ways of managing bushfire risk

Aside from managing fuels, many organisations reported undertaking communication, education and engagement with the community or other stakeholders as an important part of their approach to managing bushfire risk. A significant number of respondents also described developing some form of bushfire risk management plan as being central to their approach. The use of local government fire break notices to enforce fuel management on private properties was identified as important by many local governments.

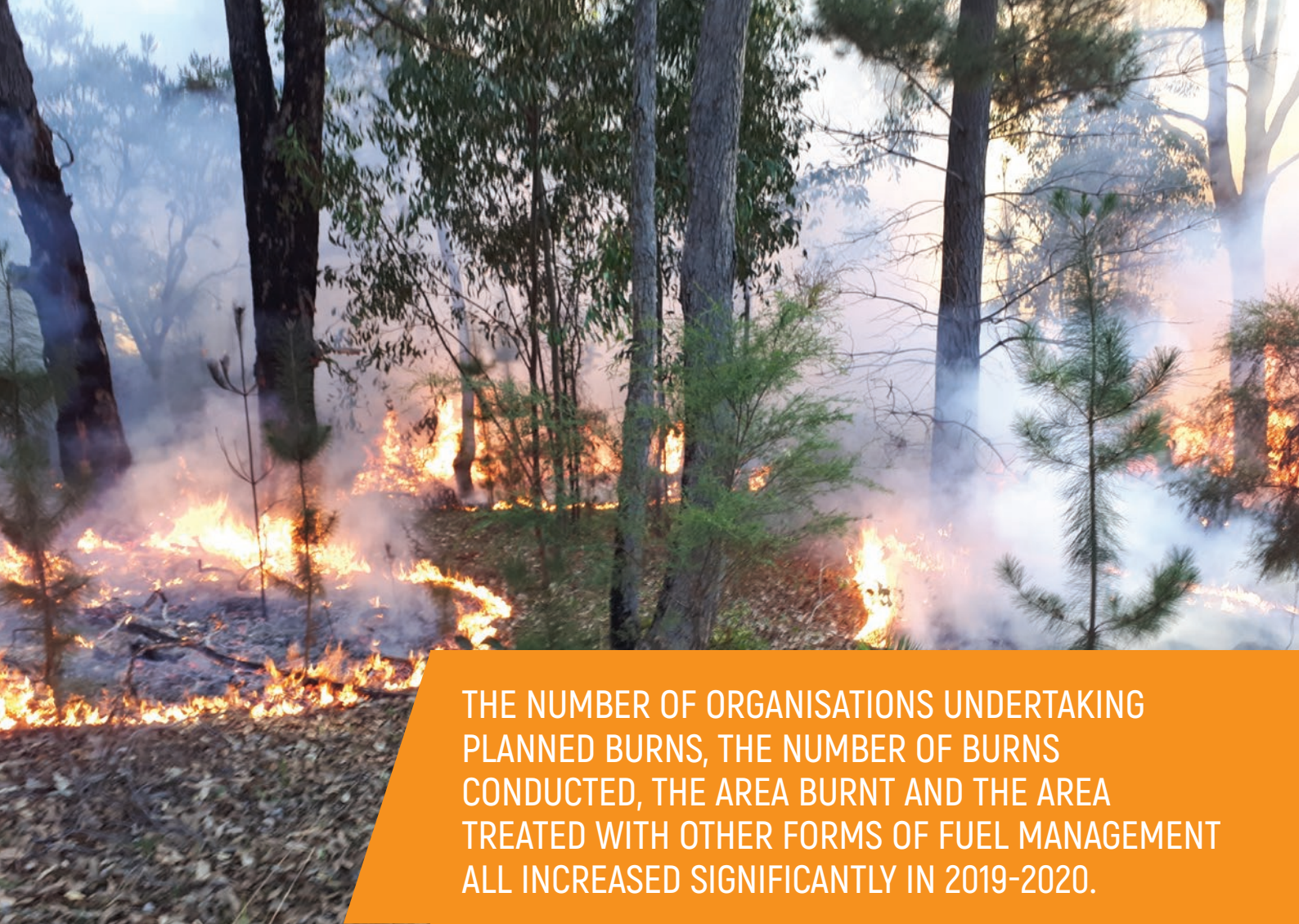
Lessons learned

Diverse responses were given when organisations were asked about what they feel they are doing well and where they could improve their approach to fuel management. When quizzed on their organisation's strengths, responses relating to stakeholder engagement, communication and education were most common, followed by references to cooperation, collaboration and coordination of activities. Planning, prioritising and funding activities were also nominated frequently.

When asked about opportunities to improve their approach to fuel management, the most common response from organisations related to increasing their staffing or funding for activities. Better planning for bushfire risk management was next most commonly nominated, followed by better communication with the community.

Access to more funding for fuel management and better support for planning dominated responses when organisations were asked what the sector as a whole could do better. The next most common response was for better coordination to occur with State Government agencies in planning and implementing fuel management.





THE NUMBER OF ORGANISATIONS UNDERTAKING PLANNED BURNS, THE NUMBER OF BURNS CONDUCTED, THE AREA BURNT AND THE AREA TREATED WITH OTHER FORMS OF FUEL MANAGEMENT ALL INCREASED SIGNIFICANTLY IN 2019-2020.

Conclusion

The 2019-2020 fuel management activities report shows ongoing growth in the amount of fuel management completed. The number of responses to the survey was down a little compared to last year, with many organisations relating that disruption caused by Covid-19 made it more difficult to access or compile data. Despite this, the report shows managing the fuels that power bushfires continued to be undertaken very effectively in a coordinated and collaborative manner across the State. This resulted in a huge amount of good work being achieved, with the number of organisations undertaking planned burns, the number of burns conducted and the area burnt all significantly increasing in 2019-2020. It is very pleasing that, despite this increase in activity, the number of burn escapes decreased. The area treated with other forms of fuel management also doubled in 2019-2020 compared to the previous year.

The qualitative measures reported in 2019-2020 showed similar patterns to the previous survey period. The bushfire sector in Western Australia continues to be characterised by a growing sense of collaboration, resulting in better coordination between State Government, local government, corporations and private land holders.

As always, there remain opportunities for improvement, many of which are already being pursued by the sector. Access to funding continues to increase as more local governments complete their Bushfire Risk Management Plans and become eligible for the Mitigation Activity Fund. As of November 2020, 44 local governments have an endorsed plan and 19 others are in the process of developing plans. DFES is also working to facilitate greater access to bushfire risk management planning support and enhance systems and processes to simplify the planning process. One example of this is an ongoing project to reform the designation of bushfire prone areas and contemporise the policy response to planning and development proposals in these areas. Finally, the Bushfire Centre of Excellence continues to progress programs to drive further improvement in collaboration, training and community education. The Centre's Traditional Fire Program is also growing connections with Traditional Owners and supporting greater Aboriginal involvement in fuel management and bushfire prevention. Taken together these, and many other initiatives in both Government and private enterprise, continue to give Western Australia a place at the forefront of bushfire risk management practice.

CASE STUDY

Bornholm Bush Fire Brigade gets the community involved

Torbay Hill sits just to the north of West Cape Howe National Park in the City of Albany. The area features several dozen houses and tourist accommodation among a mixture of farmland, lifestyle blocks and reserves. Much of the area is densely vegetated, with shrubland and heath in lower lying areas and jarrah and marri woodland and forest higher on the slopes. Ignitions are fairly common in the area, due to a relatively high frequency of lightning strikes and illegally lit camp fires at nearby campsites. These fires can spread quickly and burn with great intensity, fanned by often strong winds and fuelled by plentiful vegetation. As you might expect from this description, Torbay Hill has been identified as one of the areas of greatest bushfire risk around Albany.

The diverse terrain, land tenure, land use and vegetation around Torbay Hill makes it challenging to manage this risk. The Department of Biodiversity, Conservation and Attractions and the City Of Albany each have a fuel management program on their reserves, but a strategically important portion of the hill is divided into numerous privately owned, and mostly vegetated, blocks. Implementing a coordinated fuel management program across these private properties was a challenge that was accepted by fire fighters of the Bornholm Volunteer Bush Fire Brigade.

The brigade succeeded in getting a belt of private properties spanning the exposed north eastern aspect of Torbay Hill to sign on to a joint fuel management plan. With support from the City Of Albany, these properties have been divided into about 14 cells, by a system of fire breaks. These cells will be burnt in rotation, at a frequency agreed with the property owner, as a joint undertaking by local Bush Fire Brigades, the City of Albany and residents. The result will be a fuel reduced buffer, which will help to limit the spread of bushfires and protect people and assets in the area.

Although all the burns will be designed to be mild, their timing and season will be varied to maximise the resultant diversity of vegetation structure and habitat. Negotiations are also underway to have researchers monitor the effects of this burning on the local environment, to increase understanding of the local ecology and design the best possible burning regime for the area. Torbay Hill is a great demonstration of a community-led initiative to address a complex bushfire risk management issue.



Table 6: Organisations that responded to the annual fuel management activities survey in 2019-20.

Local Governments		
City of Albany	Shire of Collie	Shire of Murray
City of Bayswater	Shire of Coolgardie	Shire of Narrogin
City of Belmont	Shire of Coorow	Shire of Ngaanyatjaraku
City of Bunbury	Shire of Cranbrook	Shire of Northampton
City of Canning	Shire of Cue	Shire of Peppermint Grove
City of Cockburn	Shire of Dandaragan	Shire of Perenjori
City of Gosnells	Shire of Dardanup	Shire of Pingelly
City of Joondalup	Shire of Denmark	Shire of Plantagenet
City of Kalamunda	Shire of Dundas	Shire of Quairading
City of Kalgoorlie-Boulder	Shire of East Pilbara	Shire of Ravensthorpe
City of Karratha	Shire of Exmouth	Shire of Serpentine-Jarrahdale
City of Kwinana	Shire of Gingin	Shire of Shark Bay
City of Mandurah	Shire of Gnowangerup	Shire of Tammin
City of Melville	Shire of Halls Creek	Shire of Toodyay
City of Nedlands	Shire of Irwin	Shire of Wagin
City of Rockingham	Shire of Jerramungup	Shire of Wandering
City of South Perth	Shire of Katanning	Shire of Waroona
City of Stirling	Shire of Kellerberrin	Shire of Wickepin
City of Subiaco	Shire of Kent	Shire of Williams
City of Vincent	Shire of Koorda	Shire of Woodanilling
City of Wanneroo	Shire of Lake Grace	Shire of Yilgarn
Shire of Augusta-Margaret River	Shire of Leonora	Town of Bassendean
Shire of Bridgetown-Greenbushes	Shire of Manjimup	Town of Cambridge
Shire of Brookton	Shire of Menzies	Town of Claremont
Shire of Broome	Shire of Merredin	Town of East Fremantle
Shire of Broomehill-Tambellup	Shire of Morawa	Town of Port Hedland
Shire of Carnarvon	Shire of Mount Marshall	Town of Victoria Park
Shire of Chapman Valley	Shire of Mundaring	
Shire of Chittering	Shire of Murchison	
State Government Agencies		Private Organisations
Central Regional TAFE		ARC Infrastructure
Department of Biodiversity, Conservation and Attractions		Australian Wildlife Conservancy
Department of Communities		Fortescue Metals Group
Department of Education		Horizon Power
Department of Fire and Emergency Services		Kanyirninpa Jukurrpa
Department of Health		Kimberley Land Council
Department of Justice		Yinhawangka Aboriginal Corp.
Department Planning, Lands and Heritage		Yinhawangka Aboriginal Corporation
Forest Product Commission		
Main Roads WA		
Water Corporation		

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