NSW GOVERNMENT

NSW RURAL FIRE SERVICE

September 2022

Fire Season Outlook 2022-23

Contents

About this Statement

The 2022-23 NSW Bush Fire Season Outlook Statement has been prepared by the NSW Rural Fire Service (RFS).

The statement provides a summary of available information relating to the bush fire risk across the state, including weather and climatic conditions, agency firefighting capability and resources, risk management and mitigation works, and research relating to community preparedness.

The report provides a summary of this information as of August 2022, recognising that this information will change as the bush fire season advances.

The statement is an outcome of the NSW Bushfire Inquiry into the 2019-20 fire season, commissioned by the NSW Government and led by Independent Planning Commission Chair and former Chief Scientist and Engineer Professor, Mary O'Kane AC and former NSW Police Force Deputy Commissioner, Dave Owens APM.

The RFS is the lead agency for bush and grass fires in NSW. Under the *Rural Fires Act 1997*, the RFS has responsibility:

(a) for the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts,

(b) for the co-ordination of bush firefighting and bush fire prevention throughout the State,

(c) for the protection of persons from injury or death, and property from damage, arising from fires, and

(c1) for the protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires, and

(d) for the protection of the environment by requiring certain activities referred to in paragraphs (a)–(c1) to be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the *Protection of the Environment Administration Act 1991*.

Letter to the Minister

Hon Steph Cooke MP
Minister for Emergency Services and Resilience
Minister for Flood Recovery
Parliament House
Macquarie Street
SYDNEY NSW 2000

Dear Minister

I am pleased to submit to you the NSW Bush Fire Season Outlook Statement for the 2022-23 fire season. The NSW Rural Fire Service (RFS) produces the Outlook Statement each year in response to recommendations 2, 30 and 8(e) of the NSW Bushfire Inquiry and to assist the NSW community and relevant agencies to prepare for the approaching bush fire season.

The risk profile across NSW has continued to shift since the devastating bush fire season of 2019-20, during which large and destructive forest fires impacted communities across the state. This shift is due to continued rainfall and an increase in grass and crop loads in many areas.

While the spring outlook for 2022 favours the increased chance of above median rainfall, meaning this grass growth will continue, typically drier and warmer conditions across spring and summer would create the possibility of very high to extreme grass fuel loads in most of the state. Grass fires pose a significant risk to the community. They start easily and spread quickly, impacting people, property, infrastructure and local economies.

While more than five million hectares were burnt in the 2019-20 season, large pockets of unburnt forested areas remain at a normal level of risk. The seasonal fire risk usually starts in the state's north, moving south as the season develops. The outlook for the entire NSW fire season is illustrated on Page 5 and takes into account the expected increase in grass and crop fuel loads across spring and the drying effects of warmer weather. It shows an above normal fire potential for grassland areas across central and north-western NSW. The risk will shift more towards the central and southern areas of the state later in the season.

The climate drivers and fuel load growth contributing to this outlook are described in more detail throughout this statement.

Prolonged rainfall and major floods across large areas of NSW over the past 18 months have significantly restricted opportunities for completing hazard reduction activities. Despite these challenges, over the past financial year, fire agencies and land managers treated more than 40,796 hectares of bush, protecting over 47,941 properties directly on the urban and bush interface. The record-breaking rain has added impetus to the Service's work to identify and trial alternative hazard reduction methods that are less weather-dependent than burning, such as its goat grazing program. Ten sites have been completed to date under this trial, with another four still under way and scoping work continuing to identify further locations.

The NSW Government's record emergency services budget for 2022-23 has enabled the RFS to extend its work to assist and protect the community from the threat of bush fire through the expansion of its mitigation crew program to more than 300 permanent positions. These crew members are available to assist volunteer brigades in reducing the bush fire risk across NSW, enhancing our service delivery to the community.

The new Australian Fire Danger Rating (AFDRS) came into effect on 1 September 2022. The most significant change to the way fire danger ratings are determined and communicated in more than 50 years, the AFDRS will ensure national consistency in safety messaging and providing greater clarity for the community, particularly in cross-border regions.

The RFS continues to focus on moving towards a pro-active approach to managing bush fire risks in local communities. Work is under way to expand the Service's capabilities to deal with Bush Fire Hazard Complaints relating to both public and private lands. In 2021, the RFS began the Interface Program to holistically manage Asset Protection Zones around communities. A total of 3,551 sites have been identified to date under this program, which identifies, maps and mitigates sites of bush and grassland on urban interfaces throughout NSW.

Other important initiatives to enhance bush fire risk management include the development of the new Ignition Management Zone (IMZ) in the new generation Bush Fire Risk Management Plans. The IMZ will add another layer of preparedness by managing fuel loads in areas prone to fire ignition from lightning strikes, particularly on ridge tops, which are difficult for fire crews to access. This was identified as a major cause of fires throughout the 2019-20 season. In a pleasing outcome following protracted consultation and negotiations, the Bush Fire Co-ordinating Committee has now endorsed the new IMZ. In the coming year, as the Chair of this Committee, I will be looking to our network of Bush Fire Management Committees across the state to expand the scope of their treatment programs with a strong focus on enhancing the preparedness and resilience of their communities.

The RFS is continuing to work with our partner fire agencies, land managers and the community to prepare for the 2022-23 fire season.

Rob Rogers AFSM

Commissioner
Chair, Bush Fire Coordinating Committee

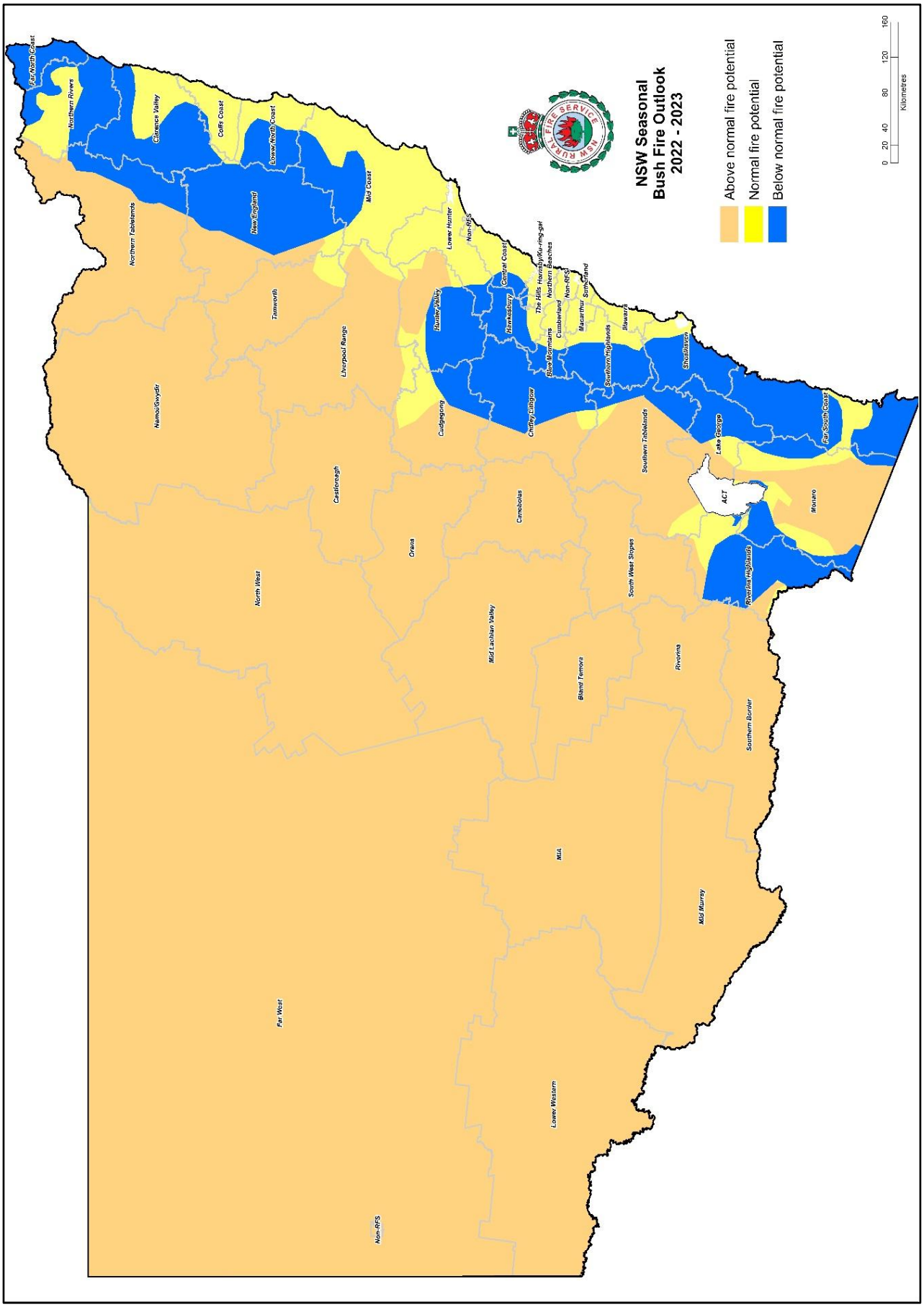


Figure 1 – NSW Seasonal Fire Season Outlook 2022-23

Conditions leading into the 2022-23 Fire Season

Rainfall was above average across many parts of NSW during the summer of 2021-22 (Figure 2), resulting in above average crop yields and increased grass fuel loads through many areas west of the ranges.

Bursts of fire weather and operational activity were seen in the south-west of the state, including three days of severe fire danger.

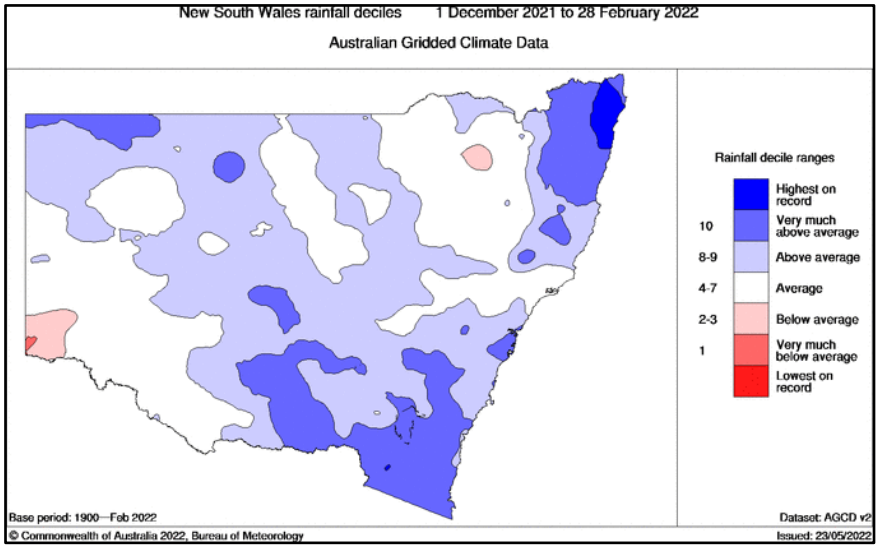


Figure 2 - Bureau of Meteorology rainfall observations for the period 1 December 2021 to 28 February 2022

Figure 3 demonstrates that rainfall leading into this year's fire season has been above average in eastern, central and western NSW.

Above average rainfall is providing wet soils which is suggesting the potential for good spring growing conditions for crop and grassland areas.

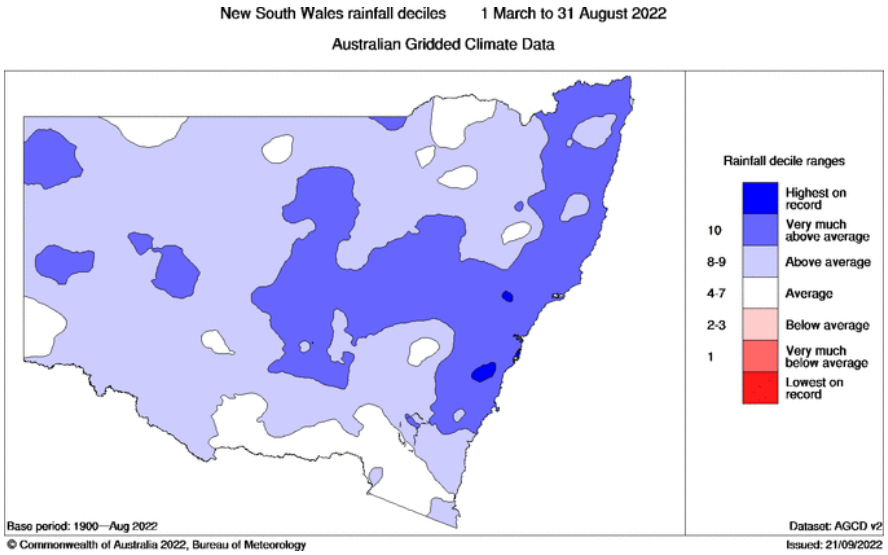


Figure 3 - NSW Rainfall Deciles 1 March to 31 August 2022 (Source: BoM)

Forest Fuel Loads

Predicted forest fuel loads ahead of the 2022-23 fire season are shown in Figure 4. This fuel load mapping is derived from modelling using time since fire and fuel accumulation curves. It uses the average re-accumulation rate of fuels post-fire. Higher fuel loads are marked in red and lower loads in dark green on the map.

The burn scar from the 2019-20 fire season is still evident along the coast and ranges on this year's map.

While the fuels that burnt in 2019-20 are still recovering, high loads still remain in some areas of the coast and ranges, particularly around Sydney, Wollongong and the Hunter.

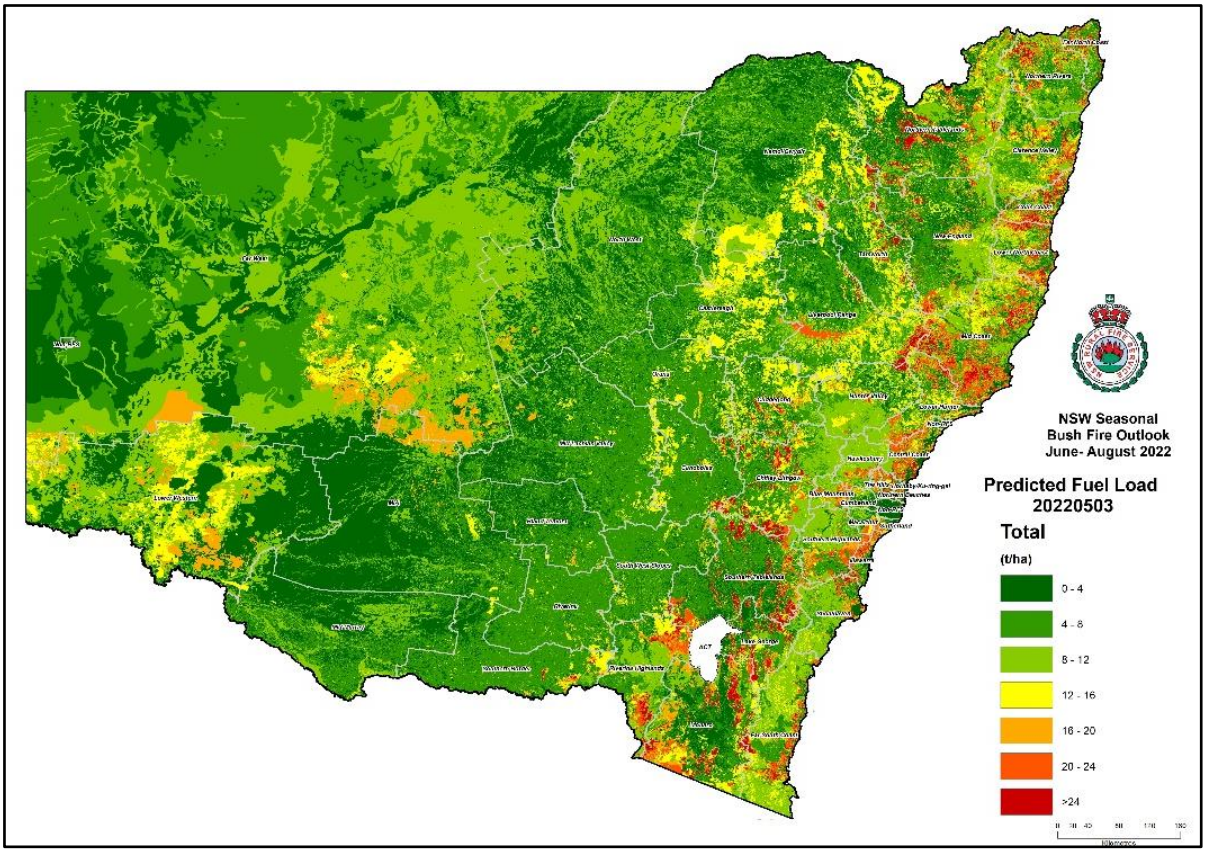


Figure 4 - Predicted Forest Fuel loads as at 3 May 2022

Fuel loads depicted in this map are dependent on the severity of the preceding fire and growing conditions. Fuels may be locally higher or lower than predicted in this state-wide analysis. This is particularly true of mallee, grassland and cropland fuel loads.

These fuels are considered current at the time of map preparation, however may fluctuate significantly depending on growing conditions, stocking and cropping cycles.

Grassland and Crop Fuel Loads

Grassland fuel loads vary from season to season depending on growing conditions.

Winter and spring rainfall, temperature and other factors, such as drought, stocking and sowing rates, are key factors in determining the hazard associated with grass and crop loads across the state. Leading into the season, reports of very high grass fuel load have been received from most parts of NSW (Figure 5).

Figure 5 - Grass fuel loads from NSW (Source: RFS)

According to the Australian Crop Report for NSW, winter crop production has been high and is 36 per cent above the 10 year average. Crop prospects into spring are expected to support high yields in the south of the state. However, exceptionally wet soils in the central and northern parts of the state have prevented planting and some fields have been left fallow. These conditions are also making access by firefighting appliances difficult in these areas.

Summer crop production was high last year and with similar conditions forecast this year, summer production is again likely to be high. Crop production is estimated at being 32% above the 10 year average. It is important to note that these crops will be more susceptible to fire, as well as potentially presenting as a fire hazard, at various intervals during the cropping cycle. It is also important to note that fields left fallow are likely to present a fire hazard, as they are likely to support growth of local native and non-native grasses.

With good root zone soil moisture and prospects for above average rainfall, grass growth is also likely to accelerate across NSW in spring as temperatures warm. There is high probability of moving into summer with very high to extreme grass fuel loads possible across most of the state.

Figure 7 shows that compared to the start of the 2020-21 fire season, there have been widespread and significant increases to grass fuel loads throughout much of NSW.

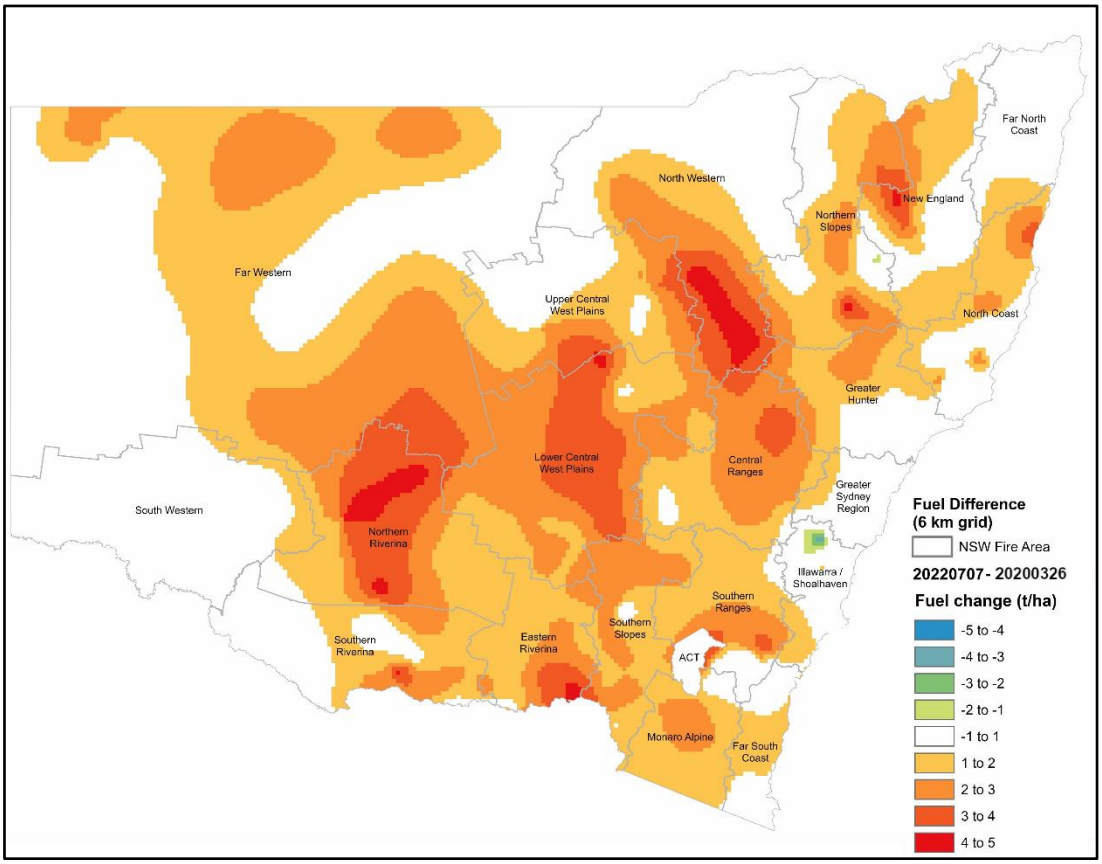


Figure 7 – Grassland Fuel Load differences between the end of the 2019-20 fire season and the start of this fire season

Fuel State

Fuel state, or how dry fuels are leading into a fire season, is a particularly important indicator of the level of early fire season activity and the difficulty of suppressing fires. Drier fuels ignite more easily and in times of prolonged drought the combination of very dry soil and fuel makes suppressing fires much more difficult, requiring more water and resources.

Within the fire industry, fuel state leading into a season is often inferred through the KBDI anomaly map. This map compares current soil moisture conditions to the (30 year) average for the same time of year to highlight areas that may be significantly wetter or drier than usual.

Figure 8 indicates soils are wetter than average for this time of year across central and western NSW and along most of the northern NSW coast. Elsewhere, conditions appear average for this time of year.

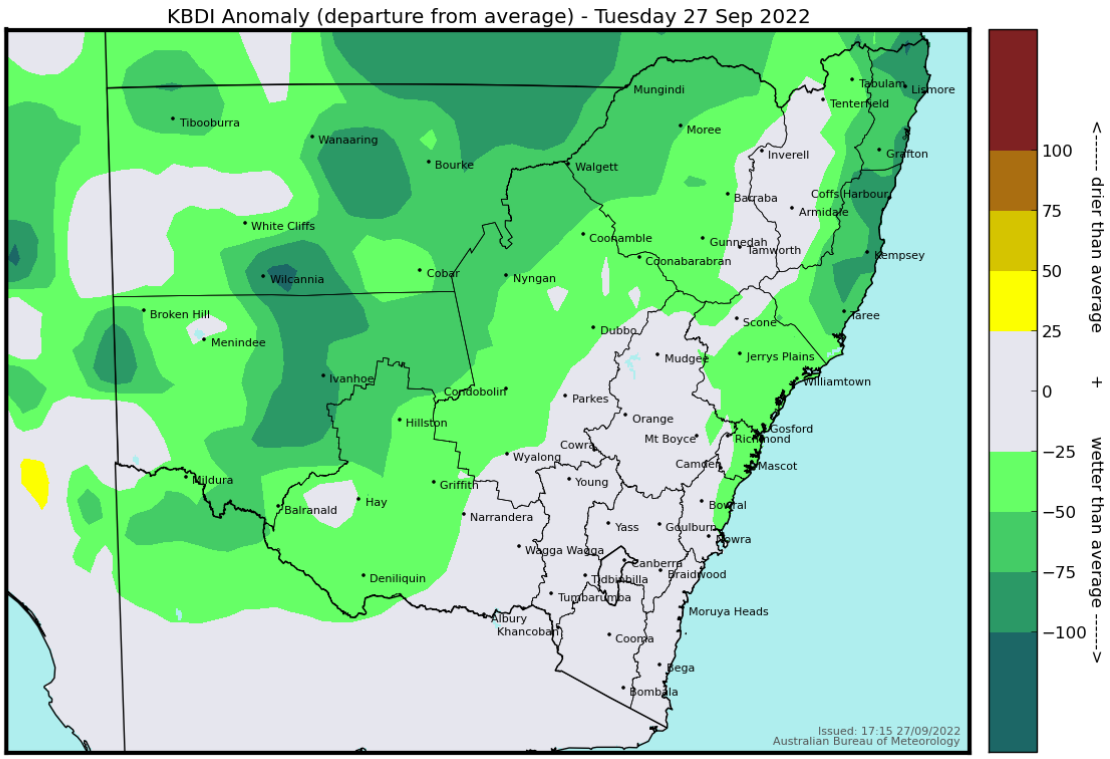


Figure 8 – KBDI Anomaly map for 28 September 2022 (Source: BoM)

Bush fire risk through spring

The RFS works with member agencies of the Australasian Fire and Emergency Services Authorities Council (AFAC) to produce quarterly fire season outlook statements. An example of the September to November outlook is shown in Figure 9.

Although the seasonal statement map and the seasonal outlook appear similar, they assess different timescales. In this case, the quarterly spring outlook map assesses the period from September to November and reflects the reports of high grass and crop fuel loads through central and western parts of the state, as well as the opposed competing factor of the climate outlook, which sees most parts of the state receiving above median rainfall during.

The September to November winter quarter outlook for NSW shows that these opposed and competing drivers will result in relatively normal fire potential for the majority of NSW. Areas depicted as below normal potential were burnt during the 2019/20 fire season, with forest fuel loads lower and still recovering in these areas of the state. It is possible, however, for any season to include periods of rapidly escalating fire danger and fires that may require assistance from beyond the area of origin to suppress.

The signal for above median rainfall across NSW may see a delayed start to the fire season, however, if this rainfall occurs and temperatures warm through spring, it is likely that grass and crop fuel loads will increase even further into summer.

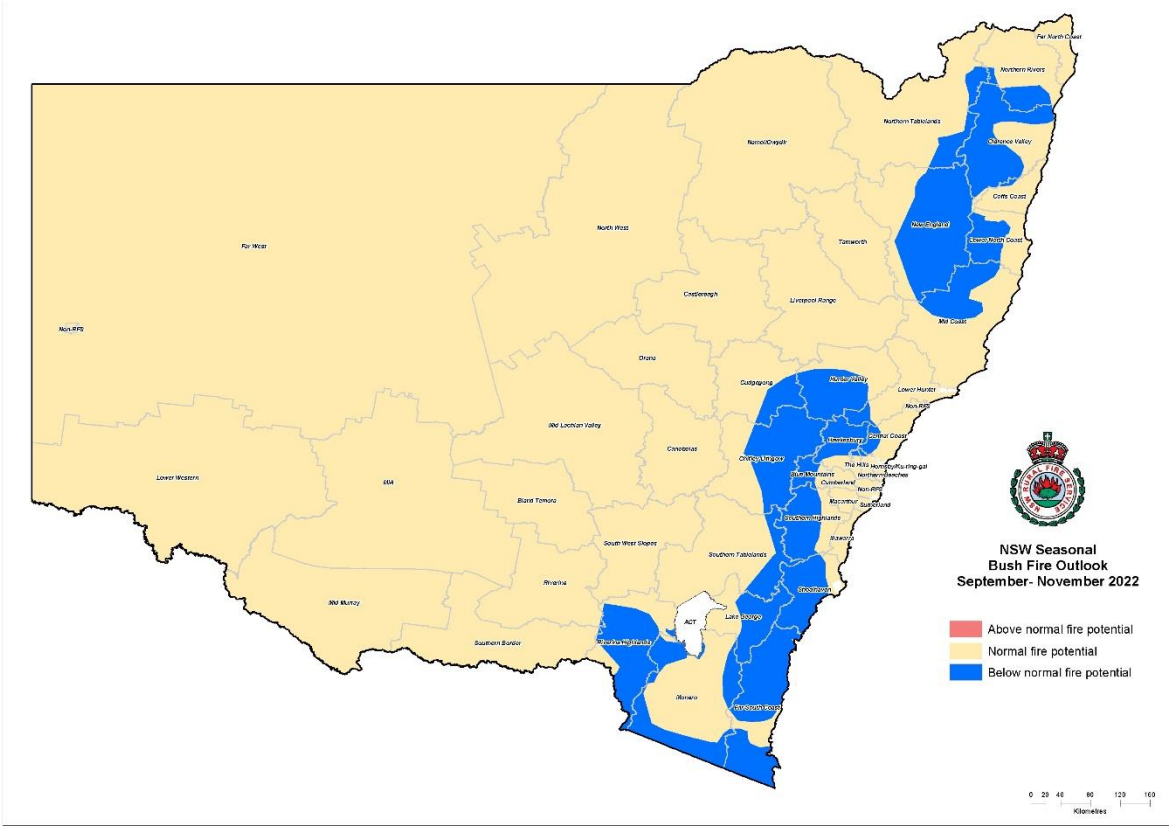


Figure 9 –Seasonal outlook (September to November)

Forecast Weather Conditions

NSW fire agencies work closely with the Bureau of Meteorology (Bureau) to monitor weather impacts and understand the medium and long-term weather forecasts for fire operations and planning.

Climate Drivers

The Bureau releases fortnightly updates on Australian climate drivers. In the 13 September 2022 update, the Bureau has identified that a negative Indian Ocean Dipole (IOD) event has occurred and is continuing.

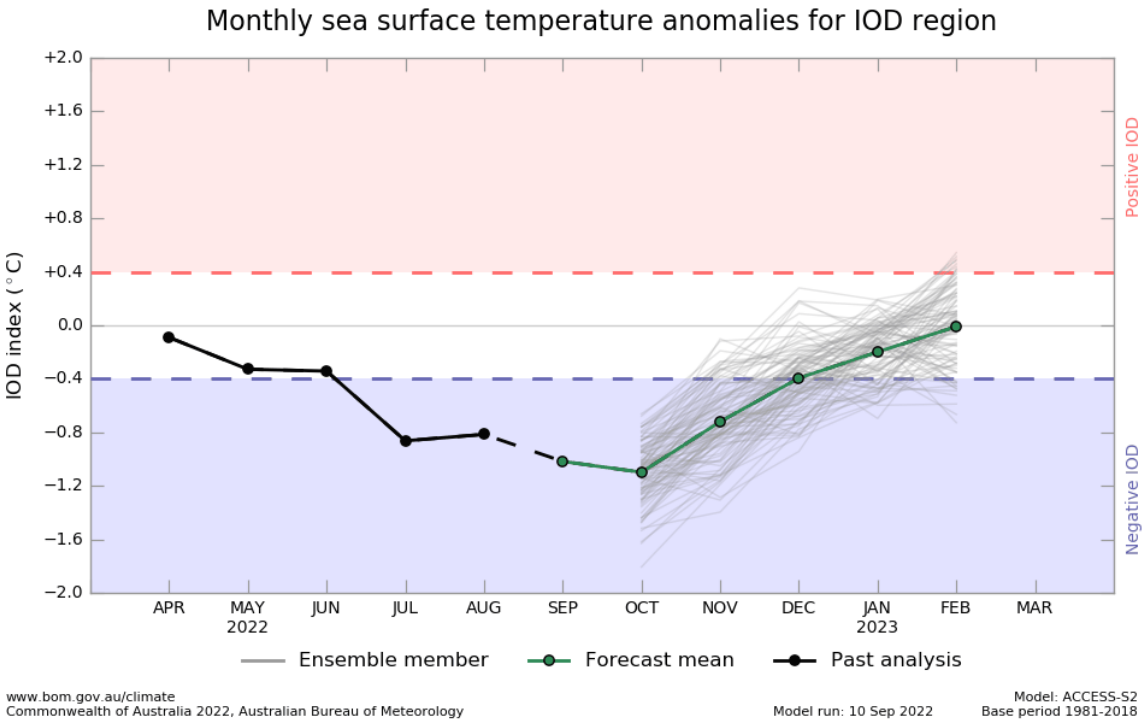


Figure 10 – Bureau Indian Ocean Dipole Forecast issued 13 September 2022

All five climate models surveyed by the Bureau indicated negative IOD conditions were likely for the remainder of spring. A negative IOD increases the likelihood of above average spring rainfall for much of Australia.

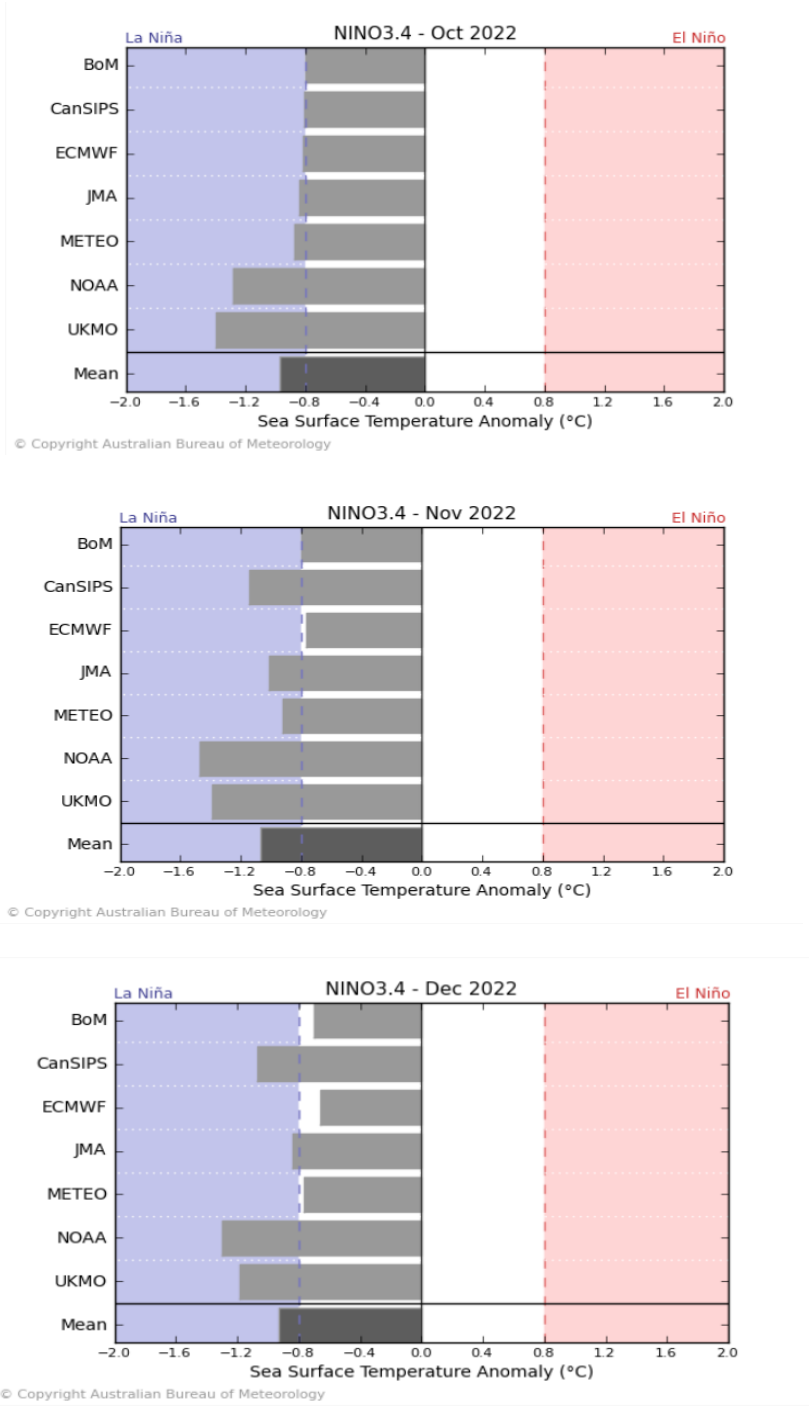


Figure 11 - ENSO outlook forecast, issued 13 September 2022

The Bureau has declared that a La Nina event is under way in the tropical Pacific. Models indicate that this La Nina may peak during spring and return to neutral conditions early in 2023. La Nina events increase the chances of above-average rainfall for northern and eastern Australia during spring and summer.

This is now the third consecutive La Nina event in a row. While back-to-back La Nina events are not uncommon and have occurred in approximately half of all events since 1900, three consecutive La Nina events are less common, having previously occurred only three times in the Bureau record since 1900.

Temperature and rainfall outlooks

Current rainfall and temperature outlooks issued by the BoM indicate October 2022 (Figure 12) is likely to see wetter than average conditions, cooler than average days, slightly cooler than average nights along the northern coast and near or warmer than average nights elsewhere.

Outlooks for October to December 2022 (Figure 13) are showing a continuing risk of wetter than average conditions, mostly notably in the southeast (>80% chance of exceeding median rainfall in that region). Meanwhile, daytime temperatures are likely to continue being cooler than average, overnight temperatures above average in the west and south, and near or slightly below in the northeast.

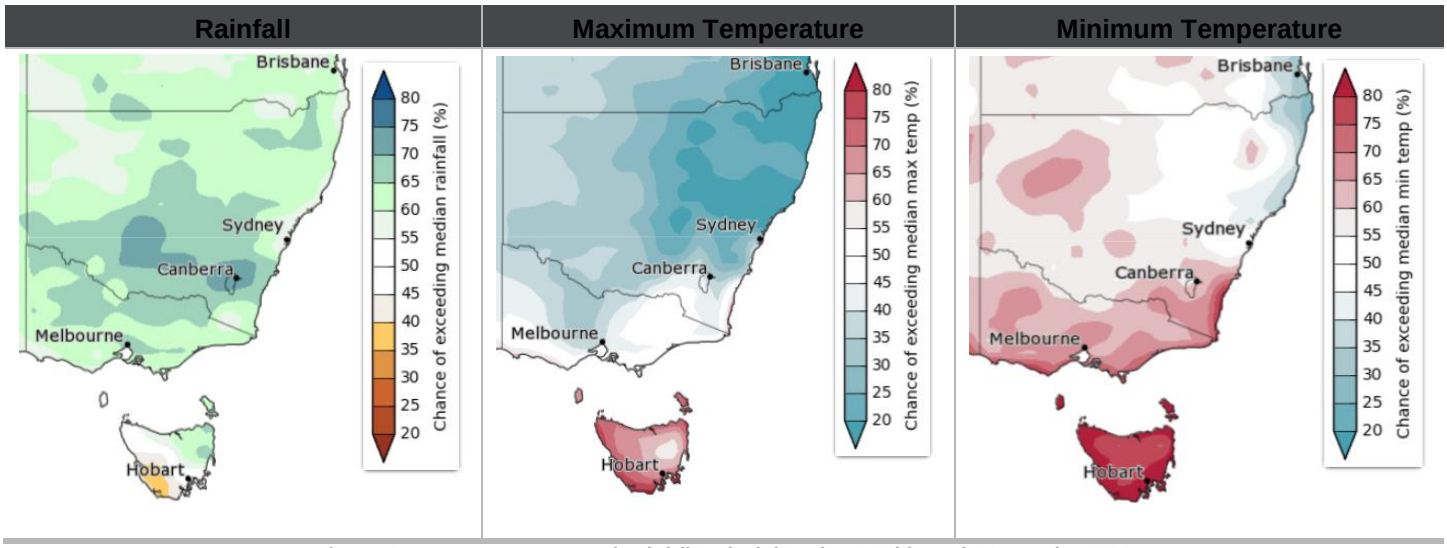


Figure 12 – BoM Temperature and Rainfall Outlook (October 2022) issued 8 September 2022

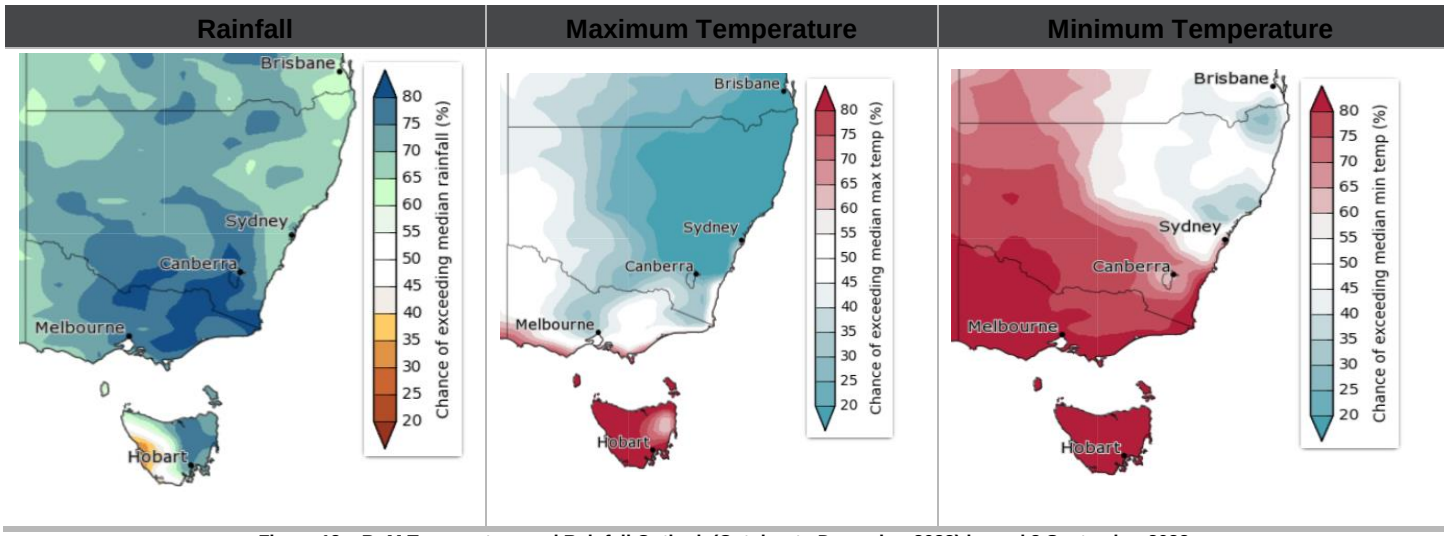


Figure 13 – BoM Temperature and Rainfall Outlook (October to December 2022) issued 8 September 2022

It is important to note that these outlooks cannot model individual weather events and instead indicate expected conditions averaged across one or several months. Despite the cool and wet outlook, occasional periods of warm, dry and windy weather may still emerge during spring, elevating bush fire risk.

Predicted Fire Season Outlook

A number of factors are assessed in predicting the bush fire seasonal outlook. These include fuel loads and their current and predicted states (the hazard), and the likelihood of these fuels being susceptible to fire via climate outlooks.

The accuracy of fire seasonal outlook maps is dependent on a range of factors, including fuels and their susceptibility to fire.

The information is based on forecasts available at the time of production and it should be noted that there can be a large amount of uncertainty in climate outlook forecasts, particularly for those longer than three months in duration.

This year's outlook reflects the current very high grass and crop growth and the potential for a continuation of good growing conditions leading into summer. The areas highlighted below as having above normal potential are predominantly grassland and cropping areas. The concern is that high grass and crop fuel loads will persist into summer and are now reported to be occurring in areas that do not often see such significant growth, such as far western NSW.

Higher grass fuel loads can cause higher fire danger ratings and higher intensity fires that are more difficult to extinguish. Continuous grass fuels in the landscape can also result in larger fires as they spread more easily. Crop and grass fires can also spread more rapidly than bush fires.

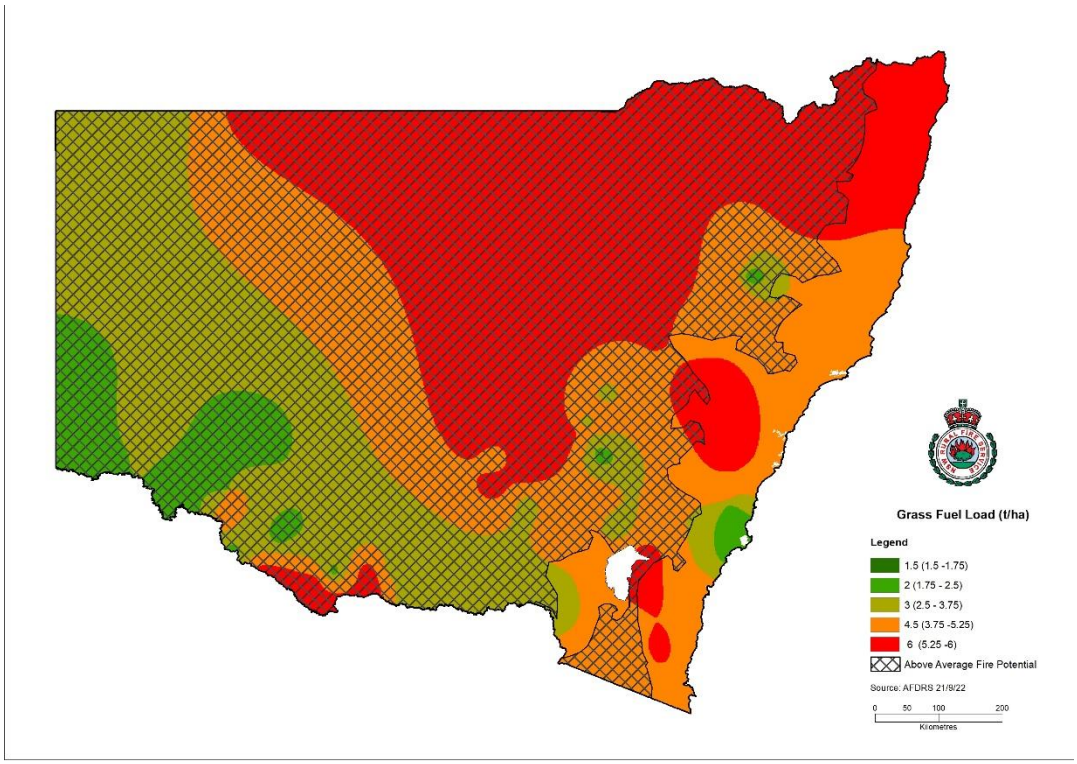


Figure 15 – Comparison of above normal fire season potential to grass fuel loads leading into the bush fire season

Figure 15 compares the grass fuel load leading into the 2021-22 fire season to the prediction for above normal fire potential. This map shows that the prediction for above normal fire potential has been produced in response to current and predicted crop and grass fuel growth during spring.

The seasonal outlook is shown in Figure 16. The blue areas are those considered to have below normal potential. These are predominantly forested areas where the fuel loads are still recovering from the 2019-20 fire season. Although there may appear to be a significant jump between some of the below normal and the above normal potential areas, this is driven by the accumulation of grass fuels adjacent to recently burnt forest areas with reduced fuel loads.

The areas east of the Great Dividing Range, highlighted as having normal potential, reflect the competing drivers of extremely high fuel, the significant potential for fuel loads to increase through spring and into summer and the uncertain outlook for above average summer rainfall. This leads to the expectation that a season with such widespread extreme grass fuels could see periods of escalated fire danger and fires that require assistance from beyond the area of origin in grassland areas.

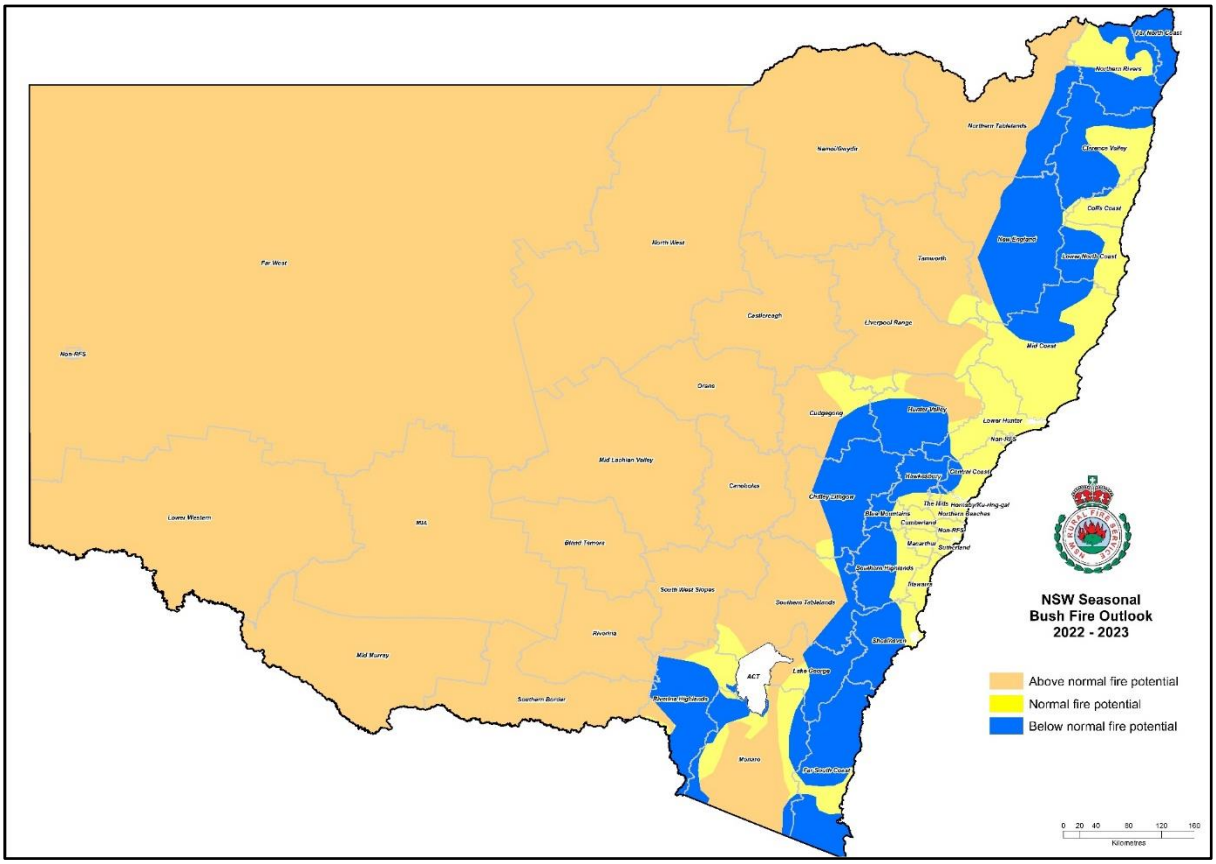


Figure 16 – NSW Seasonal Bush Fire Outlook

Managing Bush Fire Risk

Australian Fire Danger Rating System

The new Australian Fire Danger Rating System (AFDRS) came into effect on 1 September 2022.

The AFDRS is the most significant change to the way fire danger ratings are determined and communicated in more than 50 years, delivering a consistent national approach.

The AFDRS development has been led by the NSW Rural Fire Service, with the support of AFAC and the Bureau of Meteorology. The project has been jointly funded by State, Territory and Commonwealth governments.

The previous Fire Danger Rating system used only two types of vegetation (bush and grass) to assess fire danger. The new system has mapped vegetation across the entire country to a 1.5 square kilometre grid, increasing accuracy at a local level.

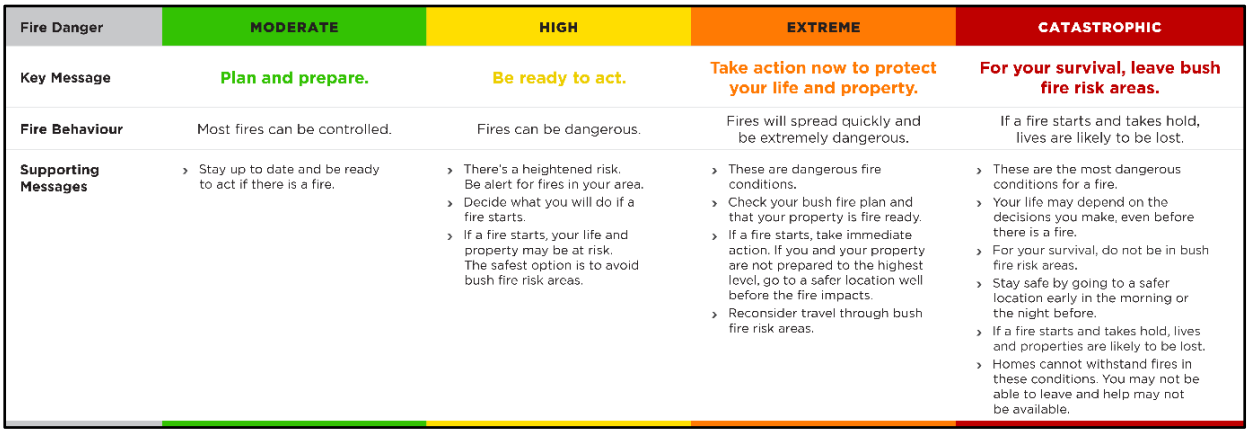
The system also includes models of each of the eight different vegetation types to understand the different ways fire behaves, meaning the danger ratings are more reliable and reflect local conditions.

The design of the new system has been driven by science, research and input from the community. This included one of Australia's largest social research projects, involving more than 5,000 people nationally, to inform the design.

The new system consists of four level of fire danger: Moderate, High, Extreme and Catastrophic.

Figure 17 – NSW Sign concept

Each of the four levels of fire danger has a standard community message to clearly explain the actions required (Figure 18).



Fire Danger	MODERATE	HIGH	EXTREME	CATASTROPHIC
Key Message	Plan and prepare.	Be ready to act.	Take action now to protect your life and property.	For your survival, leave bush fire risk areas.
Fire Behaviour	Most fires can be controlled.	Fires can be dangerous.	Fires will spread quickly and be extremely dangerous.	If a fire starts and takes hold, lives are likely to be lost.
Supporting Messages	› Stay up to date and be ready to act if there is a fire.	› There's a heightened risk. Be alert for fires in your area. › Decide what you will do if a fire starts. › If a fire starts, your life and property may be at risk. The safest option is to avoid bush fire risk areas.	› These are dangerous fire conditions. › Check your bush fire plan and that your property is fire ready. › If a fire starts, take immediate action. If you and your property are not prepared to the highest level, go to a safer location well before the fire impacts. › Reconsider travel through bush fire risk areas.	› These are the most dangerous conditions for a fire. › Your life may depend on the decisions you make, even before there is a fire. › For your survival, do not be in bush fire risk areas. › Stay safe by going to a safer location early in the morning or the night before. › If a fire starts and takes hold, lives and properties are likely to be lost. › Homes cannot withstand fires in these conditions. You may not be able to leave and help may not be available.

Figure 18 – AFDRS community messaging

To support the implementation of the AFDRS in NSW, training has been made available to fire agencies, land managers and key stakeholders. Comprehensive briefings have also been provided through tailored workshops and presentations.

The RFS is leading the development of a national public education campaign on the new system, consisting of television, radio, online, and outdoor and social media advertising. The campaign aims to raise awareness and educate people about how to use the new system to make informed decisions about their safety.

New or updated community engagement resources have also been developed to support the rollout in NSW, with more than 500 fire danger rating signs across the state being progressively updated.

Fire danger ratings are displayed on the RFS website and through the Fires Near Me NSW smartphone application.

Bush Fire Co-ordinating Committee

The Bush Fire Co-ordinating Committee (BFCC) is an avenue for multi-agency bush fire prevention and mitigation, as well as co-ordinated bush fire suppression.

In response to Recommendation 25 of the NSW Bushfire Inquiry, the *Rural Fires Act 1997* was amended in 2020 to include the appointment of three Aboriginal representatives to the BFCC to promote the integrity of cultural burning and Indigenous practices.

Chaired by the RFS Commissioner, the BFCC now consists of 20 representatives, including a range of government agencies and stakeholders, including Fire and Rescue NSW, the NSW Police Force, Department of Planning and Environment, Local Government NSW, NSW Forestry Corporation, Resilience NSW, NSW Farmers, Nature Conservation Council, Aboriginal Land Council, NTS Corp

Limited, Rural Fire Service Association, Fire Brigade Employees Union, Public Service Association and a representative of Minister for the Environment and a nominee to promote the integrity of cultural burning.

The BFCC acknowledges the importance of Indigenous land management practices and is presently considering a draft position on cultural burning, taking into account the recommendations of the NSW Bushfire Inquiry and the Cultural Fire Management Strategy being developed by a cross-government working group. At the local level, Aboriginal Land Council representatives are invited to join Bush Fire Management Committees (BFMCs).

All BFMCs have an approved Bush Fire Risk Management Plan, with 34 BFMCs progressing the development of their Next Generation Bush Fire Risk Management Plan. A total of 55 Fire Access and Fire Trail Plans have been submitted for assessment, with 50 of those endorsed by the BFCC. All BFMC Operations Co-ordination Plans were current for the 2021-22 fire season, with no plans for review ahead of the 2022-23 season.

The BFCC has been working to develop a range of strategies to mitigate the risk of destructive fires sparked by lightning. Seventeen of the 20 most destructive fires in NSW in the past decade were started by lightning. These ignition locations are often in remote or difficult to access areas, contributing to ignitions taking hold and escalating to fires that are difficult to suppress.

To complement the existing Bush Fire Management Zones and to give effect to NSW Bushfire Inquiry recommendations, the BFCC has recently endorsed the addition of new Ignition Management Zones (IMZs).

IMZs focus on hazard reduction in the broader landscape, targeting locations of likely ignition sources and areas that are susceptible to generating extreme fire behaviour. The strategic application of IMZs will assist in enhancing the effectiveness of rapid suppression operations, further reducing the number of ignitions that develop into extreme bush fires.

Bush Fire Risk Management Plans and Outcomes

A Bush Fire Risk Management Plan (BFRMP) is a strategic plan that identifies the fire risk to communities and the assets they value in the local area.

The aim of a BFRMP is to reduce the impact of fires on life, property, environment, infrastructure and economic, cultural, agricultural and community assets. Section 52 of the *Rural Fires Act 1997* requires each BFMC to prepare a Plan specifically for its local conditions, terrain, vegetation and fire risks.

The NSW Bushfire Inquiry recommended prioritising the implementation of a revised process of bush fire risk management planning that incorporates new modelling and methods for quantifying risk.

As technology and the understanding of bush fire behaviour and risk has changed, the RFS has been working with the University of Melbourne and the NSW National Parks and Wildlife Service to develop a new bush fire risk management process. Next Generation Bush Fire Risk Management

Plans use the best available science and fire spread modelling to provide a quantitative assessment of bush fire risk to assets.

Next Generation Plans are being developed by local BFMCs, incorporating feedback and input from fire agencies, land managers, stakeholders and the community. Thirty-four of the 56 BFMCs around the state have begun the rollout of the Next Generation BFRMPs, with the first of the new plans, for the Lower Hunter, placed on public exhibition in July 2022. Work remains on track to complete these new generation plans within three years.

As part of the development of its Next Generation BFRMP, a BFMC will identify Focus Areas. These are groups of assets or areas in the landscape that the BFMC has identified as having significant or unacceptable risk and requiring targeted treatment strategies. Treatment strategies include fuel management, ignition prevention, community preparedness and response. Focus Area treatments will be the highest priority treatments for the BFMC and will guide its Annual Works Program over a five-year period.

Hazard Reduction Works

The ability of the RFS, its partner agencies and landholders to complete hazard reduction burning is highly weather dependent and the windows available for this work are, therefore, limited.

Unusually wet conditions across much of NSW over the past 18 months have created significant challenges in carrying out hazard reduction activities. Prolonged rainfall and major floods have restricted opportunities for completing hazard reduction burning in particular.

The abnormal wet conditions in western parts of the state have led to prolific grass growth, adding a further hazard dimension not commonly experienced in many of these areas.

Despite these challenges, between 1 July 2021 and 30 June 2022, BFMCs have treated 40,796 hectares of bush across NSW, protecting 47,941 properties directly on the urban and bush interface.

NSW fire agencies and land managers are continuing to undertake hazard reduction burns when conditions allow ahead of the 2022-23 fire season.

Table 1 – Hazard reduction hectares summary by land tenure and risk management zone for financial year, as at 29 September 2022

	Proposed 1 July 2021 – 30 June 2022					Completed 1 July 2021 – 30 June 2022				
	APZ	SFAZ	LMZ	Other	Total	APZ	SFAZ	LMZ	Other	Total
State Total	**3,720.4**	**30,230.5**	**55,266.6**	**13,454.5**	**102,672**	**4,708.7**	**22,508.4**	**18,446.14**	**6,151.73**	**51,815.1**
Commonwealth	251.9	527.4	186.1	307.6	1,273.1	126.94	358.7	63.0	287.70	836.5
DPE (Crown Lands)	212.56	894.43	250.34	570.29	1,927.6	279.88	370.22	64.28	287.70	1,002.1
Forestry Corporation	72.66	2,537.72	13,612.50	3,800.21	20,023.10	13.66	2,987.49	281.97	1.35	3,284.5
Local Government	2,130.40	465.67	63.54	2,585.72	5,245.3	1,251.47	324.11	34.18	65.03	1,674.8
NPWS	515.95	21,000.54	38,567.04	2,416.33	62,499.9	2,685.71	12,463.70	15,698.13	304.97	31,152.5
Private	271.78	4,226.40	2,197.73	3,272.13	9,968.0	21.07	1,350.65	1,180.28	86.92	2,638.9
Other	478.96	986.15	469.61	776.81	2,711.5	246.25	1,217.38	189.20	4,236.37	5,889.20

* Fire & Rescue NSW	12.77	196.06	50.87	8.93	268.6	8.05	57.03	59.50	0.23	124.8
* Rural Fire Service	617.83	5,644.22	1,579.43	1,833.55	9,675.0	75.67	3,379.12	875.60	881.46	5,211.8

Note: FRNSW and the RFS are not land tenures. The associated areas and properties in the summaries are derived from the hazard reduction activities undertaken by them alone or together with other agencies.

Table 2 – Hazard reduction property summary by lodging agency and risk management zone for financial year, as at 08 August 2022

	Proposed 1 July 2021 – 30 June 2022					Completed 1 July 2021 – 30 June 2022				
	APZ	SFAZ	LMZ	Other	Total	APZ	SFAZ	LMZ	Other	Total
State Total	**113,084**	**5,938**	**1,937**	**3,703**	**124,662**	**76,132**	**4,027**	**1,491**	**3,287**	**84,937**
DPIE (Crown Lands)	8,515	96	15	19	**8,645**	2,824	-	-	1	**2,825**
Forestry Corporation	27	22	73	7	**129**	19	263	12	-	**294**
Local Government	50,720	1,450	698	625	**53,493**	33,724	81	-	533	**34,338**
NPWS	24,071	1,305	457	1	**25,834**	23,801	1,293	457	1	**25,552**
Other	3	160	3	6	**172**	23	72	74	18	**187**
* Fire & Rescue NSW	-	-	-	-	**-**	146	310	553	3	**1,012**
* NSW Rural Fire Service	29,748	2,905	691	3,045	**36,389**	15,595	2,008	395	2,731	**20,729**

Table 3 – Hazard Reduction – Activities Summary by Activity Type for financial year, as at 08 August 2022

Activity Type	Number of Activities	Areas Treated (ha)	Properties Protected
Burn	301	36,266.31	8,805
Mechanical	1,912	9,375.66	76,132
Total	**2,213**	**45,642**	**84,937**

Grazing Trials

Recommendation 21 of the NSW Bushfire Inquiry included commissioning research into a range of other hazard reduction techniques to better understand the cost versus benefit and the effectiveness of different practices, including grazing.

In response, the RFS is conducting a trial using goats to undertake hazard reduction work in selected areas across NSW.

The aim of the grazing trial is to obtain data and intelligence on the practical application of grazing / browsing by goats as a bush fire hazard reduction method, including the limitations of such an approach; gauge its effectiveness in comparison to other hazard reduction methods across varying fuel types, topography, fuel loading and locations in reducing potential fire ignitions / fire impact; and to deliver hazard reduction requirements under relevant Bush Fire Risk Management Plans.

Grazing is commonly used as a hazard reduction method in agricultural applications to reduce fuel loads around homesteads and other key infrastructure in the lead-up to the onset of the Bush Fire Danger Period. Goat grazing is also used as a hazard reduction technique by land managers overseas.

Identification of goats for the grazing trial was determined by the advantages the animals offer:

- Ability to easily negotiate rough, inaccessible country, and

- Willingness to eat a wide range of vegetation species (not just grasses) that other stock would normally avoid.

The trial sites are identified Asset Protection Zones (APZ) that have been a point of concern for the surrounding communities for some time due to their heavy fuel loads and their proximity to the community.

Figure 19 - Werris Creek Hospital SFAZ goat grazing treatment before and after

Since the start of the program, 10 sites have been completed, a further four are currently being grazed and scoping work is continuing to identify more trial locations.

Table 4 – RFS Goat Grazing Trial Sites (as at 1 August 2022)

Area Command	District	Site	Status
North Western	Liverpool Plains	Werris Creek Health Facility on township interface APZ	Completed
North Western	Gwydir	Coolatai Village APZ	Completed
North Western	Tamworth	Bendemeer Village APZ	Completed
Western	Cudgegong	Clandulla APZ	Completed
Western	Cudgegong	Cemetery Road, Mudgee APZ	Completed
Western	Cudgegong	Goolma Public School APZ	Completed
South Western	Riverina	APZ west of Ardlethan Village	Completed
North Eastern	Inverell	Gilgai School SFAZ	Completed
South Eastern	Riverina Highlands	Rosewood School APZ	Completed
North Western	Tamworth	Limbri	Completed
Western	Cudgegong	Lue Mudgee APZ	Grazing under way
Western	Cudgegong	Gulgong APZ	Grazing under way
Greater Sydney	Macarthur	Woodbine APZ	Grazing under way
North Western	Gunnedah	Curlewis	Grazing under way

When the trial program is complete, the RFS will undertake further analysis in conjunction with relevant agencies to determine the potential for the ongoing use of grazing as a hazard reduction method that complements traditional methodologies.

Cultural Fire Management

The RFS is currently developing a Cultural Burning Guide to assist Rural Fire Brigades and Districts to integrate cultural burning as a component of fire management.

The RFS has been working closely with Local Aboriginal Land Councils, Traditional Owner groups and other Aboriginal Corporations to implement cultural burning across the state. Cultural burning is currently undertaken by communities on private land, sometimes in partnership with the RFS, and on public land in partnership with government agencies.

While prescribed burning activity undertaken under the *Rural Fires Act 1997* has the objectives of hazard reduction, Aboriginal cultural fire management has many more complex objectives, including the physical, mental and spiritual health of the community and healthy country, in addition to hazard reduction outcomes.

The RFS has been undertaking kindred agency training with Local Aboriginal Land Councils, Traditional Owner groups and other Aboriginal Corporations to enable their members to gain qualifications in bush firefighting to enable the practise of cultural burning on private and agencies' lands.

RFS Interface Program

In 2021, the RFS began the Interface Mapping and Treatment Program to identify, map and mitigate sites of bush or grassland near urban interfaces throughout NSW. 3,551 sites have been inspected, with 1,560 sites found to be compliant. The RFS is planning work at the remaining sites.

Figure 20 - interface example, before and after work

Figure 21 - Example of inspected areas and works completed around Ivanhoe

To better protect communities, the interface program is changing to holistically manage Asset Protection Zones around communities along the urban interface. In this context, a community is defined as human settlements of more than one dwelling across multiple tenures.

Preliminary work indicates there are 2,732 communities across NSW. RFS mitigation crews and rural fire brigades will inspect these communities, and mitigation works (if applicable) will be completed and recorded on annual work programs. The red dots depicted in Figure 22 show the 2,732 communities identified.

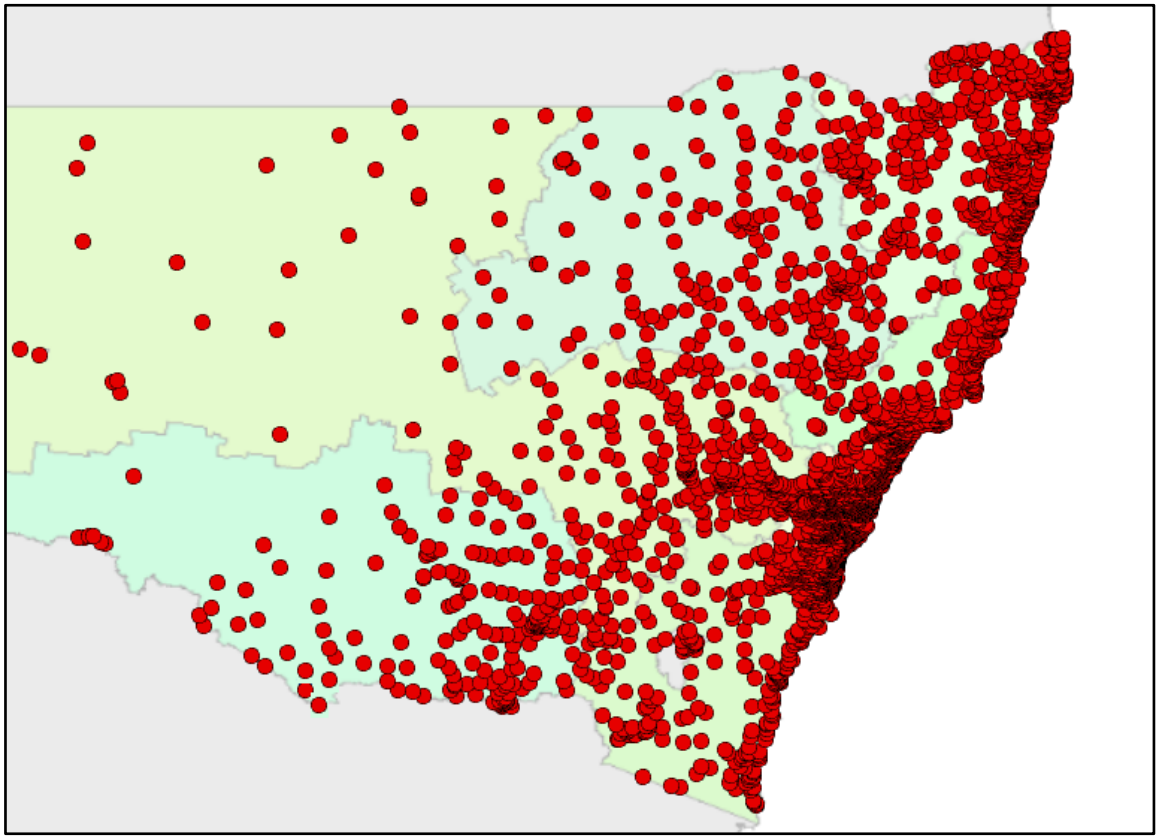


Figure 22 – Communities identified within the Interface Program

Mitigation Crew Program

In line with Recommendation 21 of the NSW Bushfire Inquiry, the RFS has extended its Mitigation Crew Program to take full advantage of opportunities to implement hazard reduction activities. Figure 21 provides a summary of mitigation works undertaken.

Activity	2021/22 Financial Year
AIDER (Assist Infirm, Disabled and Elderly Residents) Program	855
Mitigation jobs completed	933
Properties protected	20,954

Figure 21 - Summary of RFS Mitigation Crew activity leading into the 2022-23 fire season

With seasonal outlooks indicating a greater potential for prolific grass growth, the RFS is using contracted equipment as well as its own fleet to focus on Asset Protection Zone maintenance and creation.

In June 2022, the NSW Government announced additional funding for the RFS as part of the response to the NSW Bushfire Inquiry recommendations. The funding package is leading to positive changes to RFS Mitigation Crew roles, with more than 300 crew members now to be available to support brigades, districts and communities to reduce bush fire risks. This funding enabled the Mitigation Crew roles to be converted from temporary to permanent, providing security of employment and improved pathways towards other development and career opportunities for these staff.

The funding also has enabled the RFS to increase the number of Aboriginal and Torres Strait Islander (ATSI) crews to a total of 11 in rural locations. The employment of ATSI crews within their own communities enables the RFS to build on established relationships and improve engagement with Indigenous communities. These Indigenous crews carry out mitigation works in their own and surrounding communities to protect them from bush fire, using their local knowledge to complete safe, responsible and respectful fire mitigation works.

A map of current Mitigation Crew locations is depicted in Figure 23 and new proposed locations in Figure 24 below.

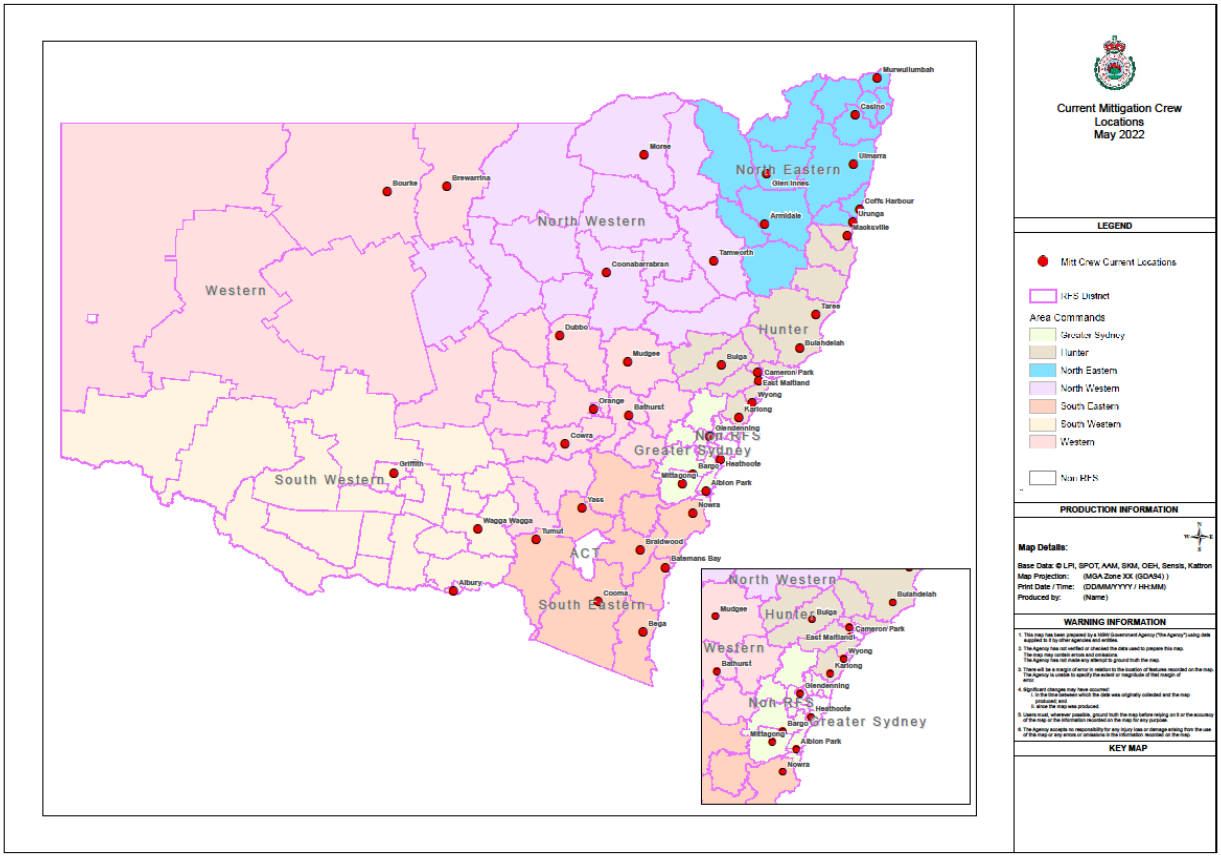


Figure 23 - Map of Mitigation Crew locations, as at May 2022

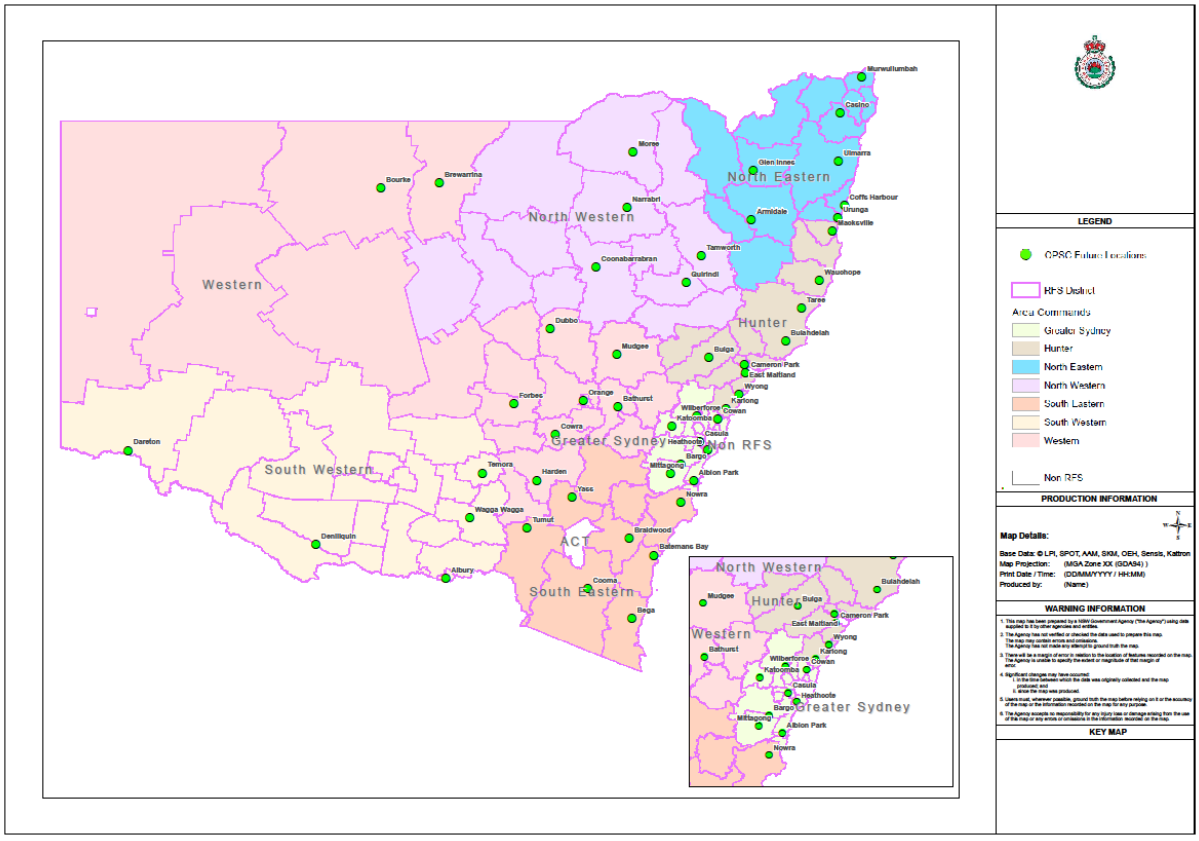


Figure 24 – Map of future Mitigation Crew locations, proposed August 2022

Addressing Bush Fire Hazard Complaints

1,430 Bush Fire Hazard Complaints were registered in the past financial year, representing a slight reduction on the previous year. About 11.4 per cent of these complaints were upheld. This was a reduction of 21.6 per cent on the previous year, noting the percentage of hazard complaints upheld will vary according to the merit of the complaints raised by the community (Figure 25).

Of the 1,430 Bush Fire Hazard Complaints, 484 related to public land and 51 (10.5 per cent) of these were upheld. Additionally, 438 (30.6 per cent) of the total complaints were registered as a Duty of Care (i.e. initiated by the RFS).

The hazard management process, including the mechanism by which the RFS engages with the community around hazard complaints, has undergone a significant change.

The RFS is developing a tenure blind approach, ensuring that all lands, whether public and private, are dealt with consistently and the focus is on ensuring identified hazards are dealt with. This change has been driven by the Service's commitment to increasing community confidence in and the timeliness of its response to these complaints.

District and Area staff are currently undertaking training in the new process for assessing hazard complaints. Once all staff have been trained in the updated practice, the RFS expects to continue to increase the total hazard complaints assessed and actioned as it transitions to a more contemporary approach to managing hazard complaints that is not as reliant on public complaint submissions.

Next Generation Bush Fire Risk Management Plans are being rolled out to complement these changes. The community is encouraged to provide input to the early development of the plans and comment on draft plans during the formal public exhibition phase. Access to information about Bush Fire Management Committees and the public exhibition process for Bush Fire Risk Management Plans is being provided via the RFS website.

Amendments to the *Rural Fires Act 1997,* introduced in 2020, were a critical driver of these changes, increasing the audit and oversight responsibility of the RFS beyond plans of operations and Fire Access and Fire Trail Plans.

The RFS Commissioner now has consistent oversight of the outcomes of risk management plans and the hazard complaint management process for complaints that relate to public lands, consistent with private lands.

The Service is working with its stakeholders to ensure that it meets its responsibilities under the Act and delivers an increased level of community safety.

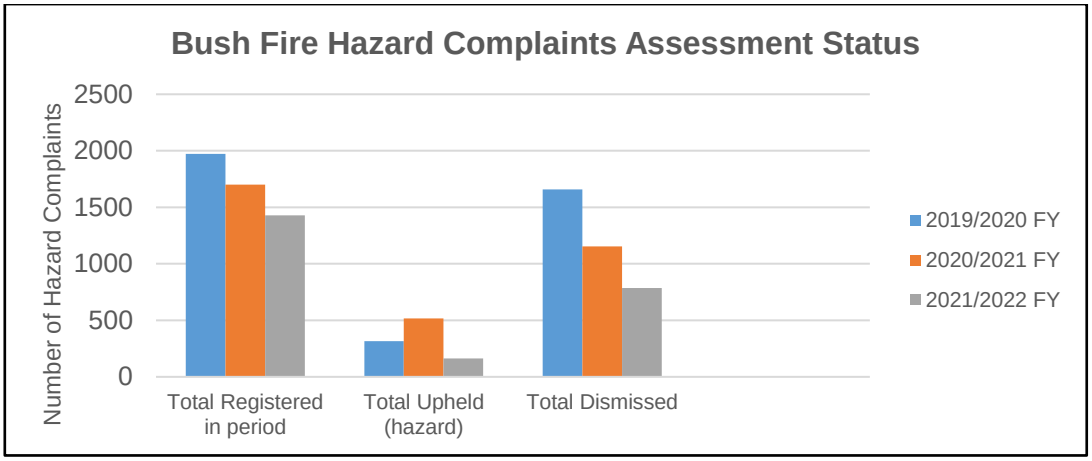


Figure 25 - Bush Fire Hazard Complaints and their assessment status

Figure 26 shows the number of Bush Fire Hazard Complaints registered in 2021/2022, based on land tenure, noting complaints include those received from the public and hazards identified by the RFS.

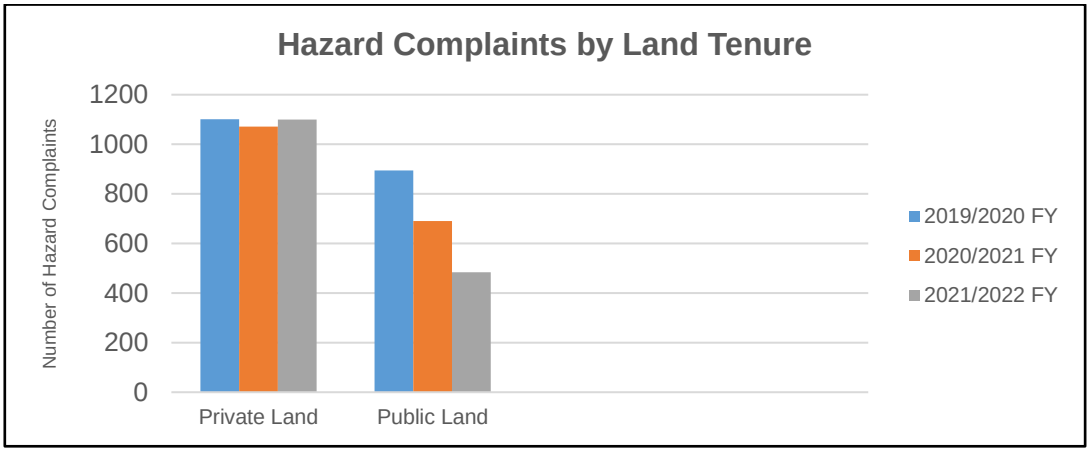


Figure 26 - Bush Fire Hazard Complaint by land tenure

Figure 27 shows the status of Bush Fire Hazard Complaints registered against public lands in 2021-22.

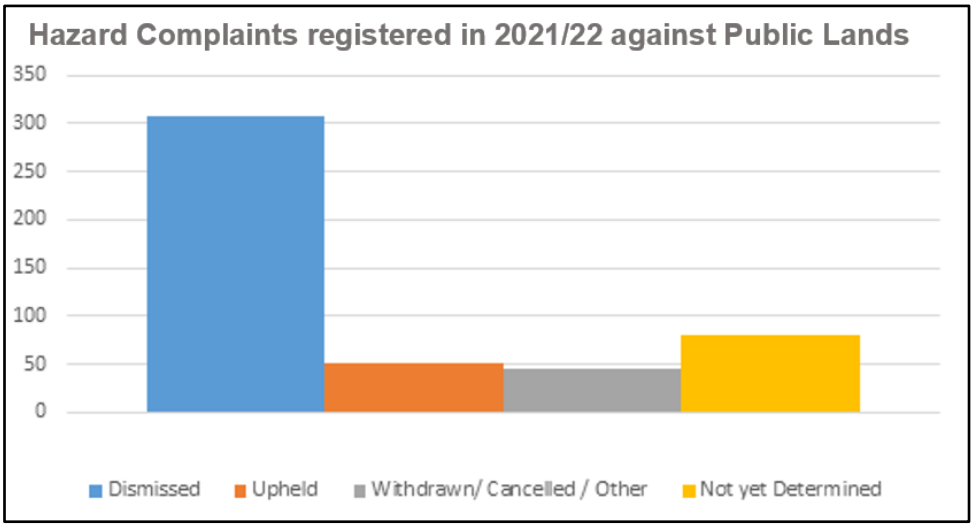


Figure 27 – Hazard Complaints Registered against Public Lands in 2021-22

Operational Preparedness

During the 2021-22 bush fire season, fire authorities responded to more than 6,500 bush and grass fires. While this was fewer than in previous years, the RFS maintained a focus on supporting communities recovering from fires and supporting the response to other events, including COVID-19, significant flooding and recovery operations.

In preparation for the 2022-23 fire season, face-to-face multi-agency pre-season briefings have been held across regional areas, including Glen Innes, Quirindi, Wyong, Dubbo, Queanbeyan, Griffith and Regentville, as well as at the RFS Headquarters at Sydney Olympic Park.

All services operate in a multi-agency response environment in NSW with a focus on the co-ordinated dispatch of resources. The RFS has previously introduced centralised dispatch arrangements facilitated through the Operational Communications Centre, using Computer Aided Dispatch. Forty-two Rural Fire Districts will be operating on centralised dispatch after 16 Districts are on-boarded by the start of September 2022. The remaining two Districts are expected to be on-boarded in early 2023.

The RFS, through its State Operations Centre, will continue to monitor forecast conditions, changing risk assessments and incident activity to maintain a high level of operational preparedness.

Ignition Management

Fire permits are used as a way of managing ignitions. These permits, which are freely available to landholders, place legal conditions on the use of fire on the ground and in the open. Permits are issued by the RFS during the Bush Fire Danger Period (BFDP) for ignitions in Rural Fire Districts and are issued year-round by Fire and Rescue NSW for those undertaking ignitions within a Fire District.

A review of the RFS Fire Permit system is being undertaken to facilitate the concurrent implementation of online and standardised, centralised manual permits across all Rural Fire Districts. A working group has been established with relevant internal and external stakeholders, including the Rural Fire Service Association and NSW Farmers. Advice and guidance has been provided to accommodate the new Australian Fire Danger Rating System (AFDRS).

The statutory BFDP declaration starts on 1 October 2022 for the majority of NSW Local Government Areas (LGAs), however, due to climatic conditions and to manage ignitions in areas conducive to fire activity, six LGAs in the state's north have a permanent variation in place to start their BFDP on 01 August. Due to recent significant rainfall, the start of the BFDP in these areas has been delayed to 01 September 2022.

A further 21 LGAs are scheduled to start their BFDP on 01 September 2022, however, this is being reviewed in light of rainfall and local conditions.

The RFS will expand its Ignition Prevention Plan (IPP) trial with 12 Bush Fire Management Committees involved. These 12 Rural Fire Districts have been chosen based on historical data for deliberate, suspicious, careless and / or illegal fires over the past five years.

The IPPs are customised to provide localised strategies to prevent these types of ignitions, including actions to be undertaken at different levels of fire weather risk using an Ignition Prevention Checklist. Following this pilot and feedback, IPPs are likely to be implemented state-wide following the 2022-23 season.

NSW fire agencies also continue to be focused on the most effective use and pre-deployment of Rapid Aerial Response Teams and the pre-determined dispatch of aircraft to enable rapid initial attack of new remote area ignitions in the landscape. This is driven by Recommendation 45 of the NSW Bushfire Inquiry.

Aviation

NSW continues to have access to the largest aerial firefighting fleet in Australia and is regularly requested to provide assistance to other Australian and international jurisdictions.

2022-23 Fire Season Preparation

Aircraft contract commencement dates have been finalised for the pending fire season, with 27 National Aerial Firefighting Centre (NAFC) contracted services available for firefighting in NSW. The RFS also has access to more than 300 state-based Call When Needed aircraft.

Three Large Air Tankers (LAT) will be available during the 2022-23 season, including the RFS-owned 737 and two contracted aircraft. The first contracted LAT, to be based in Dubbo, is scheduled to start operations on 20 October 2022 to help address the grass fire risk in western NSW. Equipped LAT air bases are operational at Dubbo, Coffs Harbour, Richmond and Albury, with new automated loading facilities being installed at Coffs Harbour and Dubbo (similar to the Richmond base).

In line with the NSW Bushfire Inquiry recommendations, the RFS continues to build its capabilities in relation to scanning, automated mapping and detection of fires. Two RFS-owned Cessna Citation planes will also be available for scanning, transport and lead plane operations. Aerial scanning capabilities include mapping fire activity, as well as impact assessments, search operations and vegetation mapping. For example, the RFS deployed scanning aircraft to assist Western Australian agencies with significant fire activity in 2022 and assisted the NSW State Emergency Service (NSW SES) and NSW Department of Primary Industries (NSW DPI) with scanning of impacted areas during major 2022 flood events in Greater Sydney and the state's north and west.

The RFS rotary wing fleet currently operates with three Bell 412 helicopters and two BK117 helicopters. The rotary fleet will continue to be used for aviation search and rescue, surveillance and firefighter transportation, including the deployment and extraction of remote area firefighters.

Regionalisation

Under a plan to regionalise the RFS aircraft fleet, three multi-purpose firefighting helicopters are to be based at Coffs Harbour, Tumut and Dubbo. This will allow for the rapid deployment of aviation support regionally during the bush fire season, provide other regional emergency services with real time high definition video streams, and assist with search and rescue missions. The first of these helicopters

commenced operations in Dubbo in August 2022 and the remaining two will be in place over the coming months.

Continual Enhancement of Aviation Capability

During the 2022-23 fire season, several trials to enhance RFS aviation capabilities will continue. These relate directly to recommendations 46 and 52 of the NSW Bushfire Inquiry. Trials of night-time aviation firefighting operations and the use of medium sized Remote Piloted Aircraft Systems (RPAS) were conducted during the 2021-22 season, with the outcomes currently being reviewed. During summer, the RFS will have one night-time aircraft (Chinook) with capability to fire-bomb up to 20 hours a day. The contract service period for the Chinook is being confirmed in line with the weather forecast.

The Pre-Determined Dispatch (PDD) trial is an initiative to introduce early suppression to new fires and reduce the response time of aviation assets arriving at fire incidents. The aim is to keep a fire small by providing aerial firefighting assets at the earliest opportunity to support ground crews and provide timely and essential intelligence to Incident Management Teams.

For the 2022-23 fire season, the PDD trial has been expanded to 12 locations, particularly within grassland areas, including at Bourke / Cobar, Griffith, Warnervale, Moruya and Deniliquin. Other PDD locations are Wagga Wagga, Cowra, Narrabri, Armidale, Scone, Kempsey and Greater Sydney.

Heavy Plant

Phase 1 of the Arena HP program has been completed in response to Recommendation 49 of the NSW Bushfire Inquiry. The Arena HP Program facilitates the rapid identification of approved and contracted Heavy Plant Operators based on their proximity to an emergency event. This has enabled the Service to respond to emergencies more expediently, particularly in regional NSW. The system also provides a significant reduction in processing of associated invoices.

Almost 370 approved contractors with more than 3,800 registered plant and attachments are available to provide services through Arena HP. In the past financial year, 60 engagements were made through the Arena HP platform.

A contraction in the amount of machinery availability to undertake firefighting duties is being experienced, particularly in the initial phase, but the RFS is continuing to work with operators in local areas to increase the level of machinery available for firefighting operations.

More than 100 RFS and NPWS users of Arena HP have been trained on the system. The Heavy Plant Supervisor course has been updated, with 29 Heavy Plant Supervisors across NPWS, Forestry Corporation and the RFS already qualified. On boarding of contractors, users and supervisors will continue to be developed and rolled out in conjunction with interagency collaboration

COVID-19 planning

Responding to firefighting and other emergency support activities during the COVID-19 pandemic continues to present unique challenges.

The RFS continues to manage the dynamic situation through a dedicated Critical Incident Co-ordinator, working closely with the Senior Executive and other emergency services organisations to ensure a consistent approach to COVID-19 planning and support.

As COVID-19 restrictions are amended commensurate to risk, the RFS is updating advice to members regarding response arrangements and internal activities/events, including training. Consistent with NSW Government advice and public health orders, activities, events and training continues to be undertaken with COVID-safe practices strongly encouraged.

Until June 2022, the RFS conducted Rapid Antigen Testing at high priority locations, such as at the State Operations Centre, at the State Training Academy and when Incident Management Teams were established. Rapid Antigen Testing kits have since been made available to these facilities and all Brigades for use on a voluntary basis. This will continue throughout the 2022-23 season.

Support for Agency Personnel

In acknowledgement of the significant impact of the 2019-20 bush fire season on firefighters and other emergency service personnel, the NSW Government has committed $36 million to a new first responder mental health strategy for emergency services.

In 2020, the RFS, FRNSW and NSW SES established a Joint Agency Initiative to build capability and capacity for members in resilience, supportive leadership and mental health first aid. The Joint Agency Initiative continues to be delivered with a dedicated resilience program focused on first responders being implemented.

Government funding, of approximately $17 million over five years, is helping the RFS take a holistic approach to the mental health and wellbeing of its people, with the RFS establishing Area-based psychological services and implementing an enhanced peer support program to support the mental health of volunteers and staff.

The RFS is developing a mental health strategy, with the support of Phoenix Australia (the Australian National Centre of Excellence in Post-Traumatic Mental Health) to review the Service's current mental health and wellbeing programs, and provide a five-year action plan. A key component of this strategy is the development of an enhanced peer support program and framework.

Agency Firefighting Capability

NSW Rural Fire Service	75,354 members (61,800 firefighters) 700 Remote Area Fire Fighters 3,883 Appliances (bush fire tankers and pumpers) 9 owned aircraft (1 Large Air Tanker, 2 fixed wing, 6 rotary) More than 300 contracted aircraft available 40 Aviation Rescue Fire Fighters 368 approved heavy plant contractors, with more than 3,800 registered plant
NSW National Parks & Wildlife Service	1,267 Fire Fighters (including more than 700 remote area fire fighters) 377 appliances and 183 heavy plant 3 owned aircraft (rotary) and 4 leased aircraft (2 rotary / 2 fixed wing). 1 additional contracted rotary aircraft to support NPWS rapid aerial response teams (RART) during the bush fire season
Forestry Corporation	528 Fire Fighters 336 appliances and 24 heavy plant 3 contracted aircraft 82 Remote Aerial Piloted Systems (21 with thermal capability, 5 with high resolution cameras
Fire & Rescue NSW	6,822 Fire Fighters (3,579 Permanent, 3,243 Retained) 573 bush fire tankers and pumpers 53 bush fire appliances 72 RPAS 511 Community Fire Units, 4,642 members

Community Preparedness

Bush fire preparedness is a shared responsibility between fire agencies, land managers and the community.

The community's awareness of risk and the actions needed to reduce personal risk reached a peak during the devastating 2019-20 bush fire season. The subsequent COVID-19 pandemic and persistent wet weather events have impacted on fire safety awareness.

The RFS conducts regular tracking of community awareness and preparedness through its annual Prepare Act Survive public awareness campaign. The research, using an online panel of more than 1,400 people a year, has measured changes in the level of preparation and planning since its inception in 2009.

The proportion of people with some form of plan of what they would do during a bush fire stood at 30 per cent in 2009. In September 2020, this reached a peak of 80 per cent before declining as wet weather returned. At March 2022, the level was at 78 percent (Figure 28).

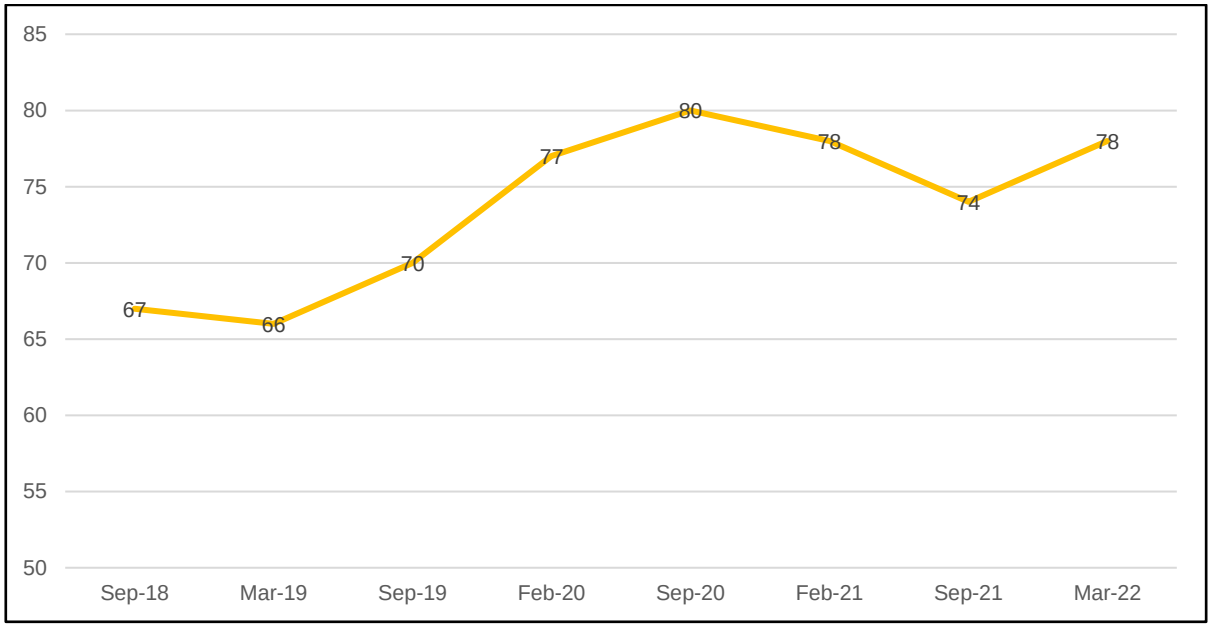


Figure 28 - Proportion of people with some form of plan (written, verbal) for what to do during a bush fire

Of those with a plan, 61 per cent felt they were very or extremely confident in the plan they had developed, with 78 per cent more confident than a year ago. While the level of planning remains high, there is a continued focus on the need to improve the quality of people's plans, such as the number of actions taken and the level of property preparation.

The percentage of people who had taken action to prepare their homes was 53 per cent in March 2022 (Figure 29). The most common actions taken were clearing or tidying gardens, clearing gutters and moving fuel.

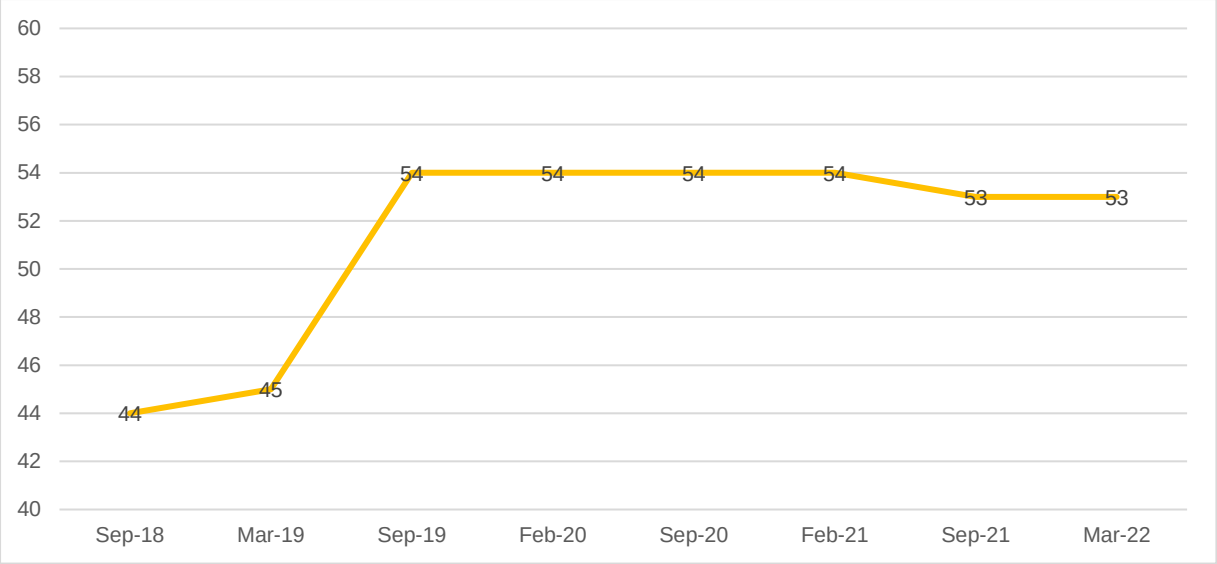


Figure 29 - Proportion of people who had taken some form of action to prepare for bush fire

Community focus groups conducted by the RFS found many people felt they had a reduced capacity to plan and prepare for bush fires due to the pandemic and wet weather, mainly due to competing priorities or the inability to complete preparation activities due to the conditions.

The tracking research also found:

- 76 per cent felt they would know what to do if a fire started
- 75 per cent planned to be prepared for fire season
- 70 per cent believed a bush fire could happen to their neighbours
- 67 per cent believed a bush fire could happen to them
- 61 per cent considered themselves well prepared
- 46 per cent believed their home would survive a bush fire
- 42 per cent were concerned about their exposure
- 21 per cent felt that preparing for bush fires was too much work.

Of note, 45 per cent of people were aware of or had used the RFS guide to making a bush fire survival plan, the key document to support planning and preparation activities.

As part of its response to the NSW Bushfire Inquiry, the RFS has evaluated the efficiency and effectiveness of its entire suite of bush fire preparedness programs, including formal programs, local grassroots activities and partnership programs.

The evaluation highlighted the diverse nature of preparedness programs, which cater to a wide range of vulnerabilities, risk levels, needs and preferences of NSW communities. Programs are delivered by volunteers in a multitude of ways according to local needs and are tailored to local conditions. It was noted that the diversity of preparedness programs was a strength of the approach to community preparedness.

To enhance community safety, a number of new or redesigned preparedness programs are undergoing state-wide trial ahead of the 2022-23 season.

The Property Assessment Tool Level 3 involves local brigade members providing comprehensive advice to residents in bush fire prone areas. The Tool has had outstanding success in some areas affected by the fire season of 2019-20. It boosts positive relationships between a brigade and its local community and delivers a comprehensive report on prevention measures to improve the safety of a property. Eight communities in diverse locations are involved in the 2022 pilot.

Disaster Resilience Education continues to be a focus, including through the Triple Zero Hero Challenge. This school program for Year One students was tested in 2022 and despite access to schools being restricted during COVID-19, was launched prior to the 2022-23 season.

A number of large scale public education and awareness campaigns are planned for the 2022-23 season, including the annual Prepare Act Survive public awareness campaign, designed to increase community planning and preparedness, which will be carried out across the state. This is in addition to the largest local and face-to-face community engagement event, Get Ready Weekend, held in September each year and hosted by about 500 RFS brigades. The 2022 RFS Get Ready Weekend is scheduled for 17 to 18 September.

The RFS also has developed a new national campaign to support the new Australian Fire Danger Rating System. The campaign is designed to increase awareness and instil community confidence in the system. The RFS has also updated the display of fire danger ratings through its Fires Near Me app and website to support the new system.

A predominately online and social media campaign will also be carried out relating to the Australian Warning System. The system provides for a nationally consistent three level framework using Advice, Watch and Act, and Emergency Warning. While the system has been in place for bush fires in NSW since 2009, it will be applied to floods from late 2022 and other hazards in the future. The campaign will be used to educate the community about the system and what to do when a warning is received.

Targeted messaging and campaign material has also been developed relating to the expected grass fire season. This includes tailored and localised messaging explaining the increased risk, the speed and danger of grass fires and how community members can prepare for them.

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