

Strategic Directions

Achievement Report

2021

AFAC Limited (ABN 52 060 049 327)

Level 1, 340 Albert Street, East Melbourne VIC 3002

P +61 3 9419 2388

E afac@afac.com.au

www.afac.com.au

Cover images, clockwise from top left: Fire and Rescue NSW, ACT ESA, ACT Parks, ACT ESA, CFA, NSW Rural Fire Service, DFES and Fire and Rescue NSW

AFAC acknowledges the Aboriginal and Torres Strait Islander peoples as traditional custodians of Australia and Māori, as the Tangata Whenua and Treaty of Waitangi partners in Aotearoa-New Zealand.

We recognise their unique cultural and spiritual relationships to the land, waters and their rich contribution to society.

We pay our respects to ancestors and Elders, past, present and future.

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From the CEO

It is my pleasure to provide the annual *AFAC Strategic Directions Achievement Report for 2020-2021*.

The Strategic Directions provide guidance to fire and emergency services to ensure activities focus on supporting resilient communities, trusted response, credible and timely information, effective governance and research utilisation. They ensure emergency management agencies are positioned to better meet challenges of changing community needs and expectations, an ageing, and diverse population, changing climate, natural hazards, national security, and the impacts of a pandemic. Effective management of fire and emergency services to address these challenges will lead to greater community confidence, trust and support.

This year's report delivers in the same format as previous years. It demonstrates through case studies the work that has been completed in the last 12 months by all jurisdictions in conjunction with AFAC members and our partner agencies. This is just a sample of initiatives undertaken, rather than an exhaustive list of all work relating to the Strategic Directions. Together these initiatives support a more disaster resilient Australia by demonstrating a level of national capability, based on operational readiness and underpinned by the most current qualifications and standards available, lessons management and research utilisation.

The work undertaken by AFAC and its members goes to the heart of the overarching principles articulated in the Strategic Directions: primacy of life, trust and confidence, interoperability and accountability.

The Strategic Directions have become fundamental to the work of fire and emergency services. A shared commitment, a unified vision and focus in achieving the Strategic Directions, have ensured our sector is well placed to serve our communities as we progress. AFAC National Council has updated the Strategic Directions for 2022–2026, adding another direction while remaining committed to this current approach of achievement reporting.

I extend my thanks and gratitude to all AFAC members, other emergency management agencies and industry for the commitment and collective achievements during the year.

Stuart Ellis, AM

Chief Executive Officer,
Australian Fire and Emergency Service Authorities Council

Acknowledgments

The Australasian Fire and Emergency Service Authorities Council (AFAC) expresses gratitude to all members and affiliate members for their commitment to delivering on the fifth *Strategic Directions Achievement Report*.

AFAC acknowledges the staff within agencies who shared their own case studies. In the fifth report, this has included examples from Australian Capital Territory Fire and Rescue Service, Australian Capital Territory Parks and Conservation Service, Australian Institute for Disaster Resilience, Bushfire and Natural Hazards Cooperative Research Centre, Country Fire Authority, Victoria,

Department of Fire and Emergency Services (WA), Fire and Rescue New South Wales, National Aerial Firefighting Centre, AFAC National Resource Sharing Centre, New South Wales State Emergency Service, Queensland Fire and Emergency Service, Resilience New South Wales, Rural Fire Services New South Wales and South Australia Country Fire Service.

These contributions have ensured the final result is wide-ranging and reflective of the work undertaken by the fire and emergency services industry.

Background

Strategic Directions for Fire and Emergency Services in Australia and New Zealand 2017–2021 was endorsed by the Australia-New Zealand Emergency Management Committee (ANZEMC) and the Law, Crime and Community Safety Council (LCCSC) in 2016.

AFAC is proud to present the 2021 Strategic Directions Achievement Report to Ministers with responsibility for emergency services. This report provides examples of

industry and jurisdictional activities in support of the Strategic Directions.

This completes the final Achievements Report for the current Strategic Directions, consisting of five priority areas that reflect a shared vision and joint commitment to safe and secure communities in Australia and New Zealand.

THE FIVE STRATEGIC DIRECTIONS ARE:



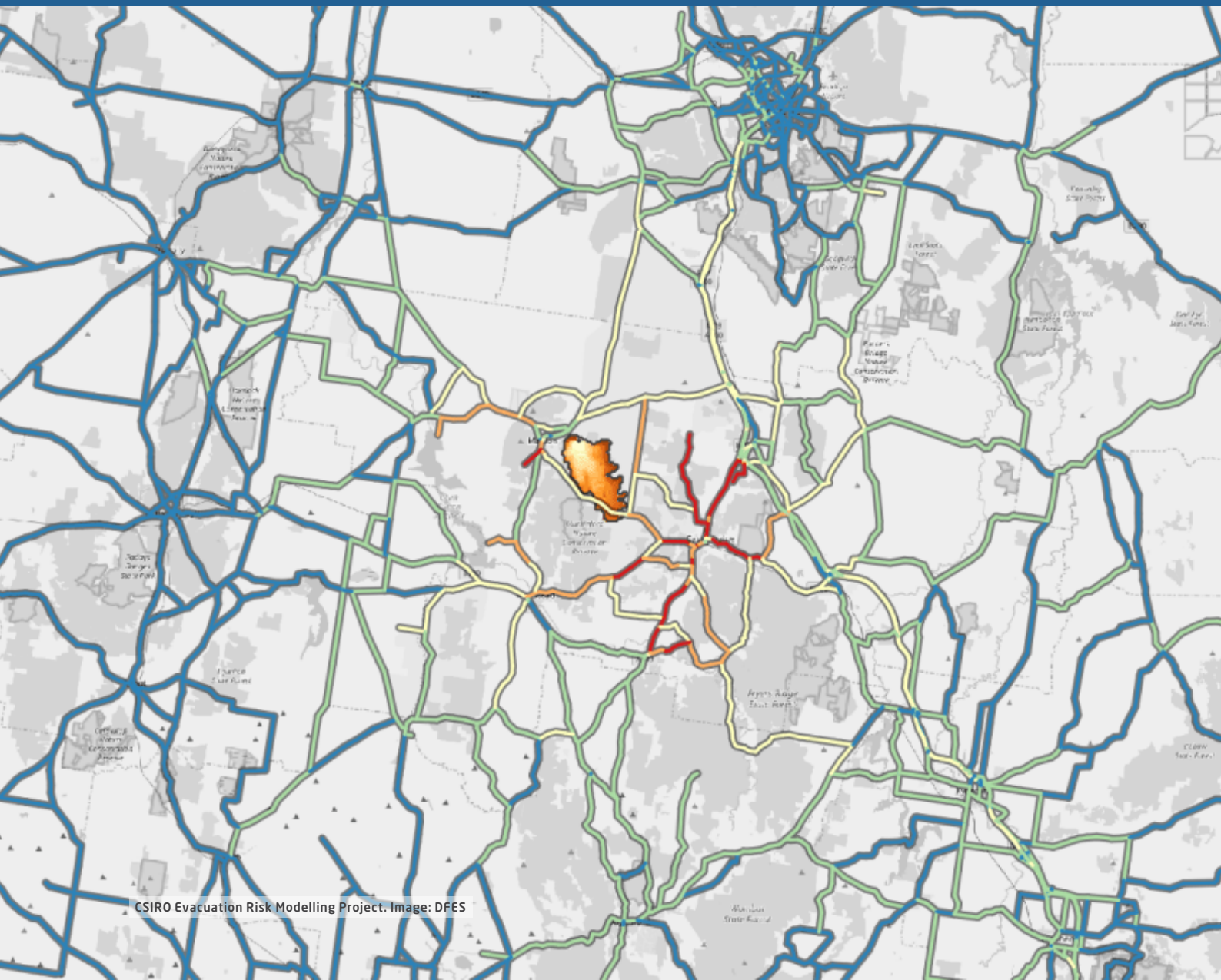
The expectation within the AFAC National Council is that the Strategic Directions will be considered in the development of each agency's strategic plan. Together with states and territories and the Australian and New Zealand Governments, the priorities are shaping the future of emergency management.

Next year, AFAC and AFAC member agencies will demonstrate its achievements against a refreshed set of six Strategic Directions for 2022–2026. This provides the opportunity to address changing environmental factors and community and business settings, as we continue to transition from traditional fire and emergency service delivery to emergency management professionals integrated with, and working for, our communities.

DIRECTION ONE

Supporting resilient communities through risk reduction

- > AFAC Residential Fire Fatality and Injury Prevention Strategy: Towards Zero Fatalities
- > Our World Our Say Report
- > Supporting community recovery following the Black Summer bushfires
- > CSIRO Evacuation Risk Modelling Project
- > SACFS Child and Youth Disaster Risk Reduction and Resilience Project



CSIRO Evacuation Risk Modelling Project. Image: DFES

A broad range of partners work collaboratively to support disaster resilience for Australian communities, through the provision of a range of initiatives designed to reduce the impacts of emergencies and disasters on communities, and to support recovery.

These initiatives are based on the following principles:

- Partnering with communities on risk reduction initiatives will optimise the resilience of communities and enhance recovery
- Strategies and approaches build on existing community strengths and capacity and facilitate connectedness through participatory approaches
- Strategies acknowledge shared responsibility for disaster risk reduction between emergency management agencies, other organisations, communities and individuals, and seek to develop and utilise partnerships
- Risk reduction and resilience building is a shared responsibility across sectors and communities.

Strategies are underpinned by sound research and practice. A key role for the emergency management sector is to provide advice, education and information to the community to mitigate the risk of emergencies and disasters. Once policy, planning decisions, construction options, compliance requirements and individual choice have been determined, the focus turns to preparedness and risk reduction with and for the community.

Supporting resilient communities is a shared responsibility across all levels of government, fire and emergency services and the community.

A range of approaches and strategies are utilised to enhance public safety. These include community education, community engagement, community development, partnership development, legislation, building codes and standards, influence and advocacy for innovation and improvements, and broader risk mitigation activities and initiatives.

Fire and emergency services contribute to resilient communities through –

AFAC Residential Fire Fatality and Injury Prevention Strategy: Towards Zero Fatalities

INITIATIVE DRIVER – Between 2005 and 2019 there had been no research undertaken to capture residential fire fatality data at the national level. Building on the evidence from the 2019 study *Preventable Residential Fire Fatalities in Australia – July 2003 to June 2017*, AFAC recognised the need to develop a strategy to reduce residential fire risk.

AIM – The strategy will support fire and rescue services to reduce the number of preventable residential fire fatalities towards zero.

FEATURES – Each year in Australia, an average of 64 people die in preventable residential fires. Deaths from residential fires have significant social, economic and emotional impacts on individuals, families, communities and the firefighters and other emergency service workers who attend these tragic incidents.

The strategy develops recommendations from the 2019 study across two key areas of action:

- Developing and maintaining national fire fatality and injury datasets
- Strengthening partnership approaches to reduce residential fire risk.

Improved data will enable fire services and other stakeholders to better understand and address the key risk factors for fire injuries and fatalities and to evaluate the effectiveness of fire prevention interventions. Strengthening partnership approaches will highlight and reinforce good practice that builds on the concept of shared responsibility for fire safety for those at greater risk from fire in their home.

OUTCOMES – The development of the strategy will help fire services and other stakeholders, individually and collectively, to focus on actions to effectively reduce the toll from preventable residential fires in Australia.

Our World Our Say Report

INITIATIVE DRIVER – Australian youth feel unprepared for disasters, saying schools are failing to prepare them with the skills they need to face an uncertain future, and that decision-makers are not listening to their concerns.

AIM – The survey, co-designed by young people and the Australian Institute for Disaster Resilience (AIDR) in partnership with other organisations working with young people in Australia and the Asia-Pacific region, sought to determine young people's views on climate change and provide them with a voice in dealing with climate-related hazards.

FEATURES – It included 27 questions on climate change, natural hazards and disaster risk, with questions designed to identify young people's priorities for action by decision makers. The online survey was Australia's largest ever consultation of young people on climate change and disaster risk.

OUTCOMES – The survey data indicated concern about the far-reaching impacts of climate change and specific

concerns about climate-related disaster risk:

- > 88% of young people thought they should learn more about natural hazards and how to reduce them
- > 78% of respondents reported being 'concerned' or 'very concerned' about climate change
- > Over 90% of young people had lived through at least one natural hazard event
- > Over 60% believed that disasters were occurring more frequently.

An additional document was released alongside the results, compiling 852 participants' [personal messages to government](#), reflecting the views of young Australians in their own words.

The Federal Minister for Emergency Management, the Hon. David Littleproud MP, took part in a webinar in 2020 with a youth panel to discuss the results of the survey and hear first-hand the concerns of young Australians.

View the report [here](#).

Supporting community recovery following the Black Summer bushfires

INITIATIVE DRIVER – The Black Summer bushfires were a crisis that required the entire disaster resilience and emergency management community to contribute to support response and recovery efforts. Due to the scale of events, there was a pressing need to build capacity within an emerging workforce of recovery practitioners.

AIM – The Australian Institute for Disaster Resilience (AIDR) identified service gaps and addressed these by connecting practitioners with knowledge, resources and information that would assist them to make evidence-based decisions and apply good practice in recovery.

FEATURES – The specific initiatives were:

- > Knowledge-into-action briefs: consolidated good practice guidance from the *Community Recovery Handbook*
- > Recovery Matters webinar series: explores key issues in disaster recovery, featuring a broad range of expert speakers

- > Possibility Lab: a community of practice network to support people working in community recovery
- > Education for Young People Program: curated a collection of resources, and supported recovery through partnerships and collaboration, to aid educators and those working with children in bushfire affected areas.

OUTCOMES – Practitioners and communities were able to access a broad range of tailored recovery information developed through collaboration with experts in the field. Practitioners were able to connect with their peers, share their experience, and solve problems in a safe space. Overall, these initiatives created a more connected community of recovery practitioners, with a greater capacity to use best practice and leading thinking to support communities in recovery.

CSIRO Evacuation Risk Modelling Project

INITIATIVE DRIVER – Jonathon Palmer – Bushfire Spatial Analyst

AIM – The CSIRO Evacuation Risk Modelling Project is a collaboration between the Western Australia Department of Fire and Emergency Services, CSIRO Data 61 and the Victorian Department of Environment, Land, Water and Planning. Its objective is to develop a web-based decision support tool that will quantify community evacuation risk across Western Australia for a given set of fire behaviour and spread scenarios.

FEATURES – Functionality of this tool includes:

- Ability to run fire behaviour simulation from Australis and/or Spark simulators
- Execute fast landscape-based analysis
- Produce evacuation risk assessment based on the outcome from fire behaviour simulator as well as under different evacuation scenarios
- Self-explanatory evacuation assessment maps.

The project splits the works program into three distinct work packages. Work packages one and two aim to

complete the functionality of the Static Evacuation Model with respect to key requirements identified by collaborators, followed by making the tool available for testing. Work package three will focus on refining the tool based on regular and structured feedback from usage and testing by collaborators.

OUTCOMES – The outcomes from this project align with the findings of the 2020 Royal Commission into National Natural Disaster Arrangements that summarises the evacuation planning concern as:

‘Properly planning for evacuations is an important part of keeping communities safe from the harm caused by natural disasters. Planning for evacuations should occur early and involve local governments and communities. Evacuation planning should factor in key issues such as seasonal populations, evacuation routes, sheltering facilities, jurisdictional boundaries, messaging to communities and risks to safe evacuation.’

(Chapter Summary 12.1 Royal Commission into National Natural Disaster Arrangements – Report, Oct 2020)

SACFS Child and Youth Disaster Risk Reduction and Resilience

INITIATIVE DRIVER – The Child Centred Disaster Risk Reduction research project, funded through the Bushfire and Natural Hazards CRC, and collaboration with the Australian Institute for Disaster Resilience Education for Young People Program underpinned the development of this project. The project is also consistent with the priorities of *South Australia’s Disaster Resilience Strategy* and responds to community demand.

AIM – Develop and implement new strategies and tactics for the SA Country Fire Service (SACFS) to reduce disaster risk to young people while supporting them to be active participants in their own safety before, during and after a bushfire.

FEATURES – Long term and multi-pronged approach to child and youth disaster risk reduction, leveraging key partnerships and opportunities.

OUTCOMES –

- Draft five-year SACFS *Strategy for Child and Youth Disaster Risk Reduction and Resilience* which aligns with the SACFS *Disaster Resilience through Community Engagement Framework*

- Recruitment and appointment of a Child and Youth Project Officer, as a core SACFS resource with expertise in teaching and child and youth development
- Development and implementation of pilot program ‘Emergency preparedness in education, early learning and childcare’ to foster understanding of local risks and solutions in child and youth centres. Initial findings to be presented at the 2021 Australian Disaster Resilience Conference
- Development and implementation of pilot resources for disaster resilience education for young people and their educators for bushfire in South Australia
- Ongoing collaboration with key partners including the Office for the Commissioner for Children and Young People, emergency services and child and youth organisations to develop a young peoples’ disaster resilience strategy, action group and implementation plan for South Australia.

DIRECTION TWO

Providing trusted response and facilitating the transition to relief and recovery

- > FRNSW investment in the Ignitable Liquid Detection Canine Program
- > NRSC season summary 2020-21
- > New edition of the National Capability Statement
- > Recovery centres during the March 2021 NSW floods
- > AFAC independent reviews



FRNSW investment in the Ignitable Liquid Detection Canine Program. Image: Fire and Rescue NSW

The practice of emergency management incorporates the framework of Prevention, Preparedness, Response and Recovery (PPRR), underpinned by the principles of risk management – where the risks to life, property and the environment from a range of hazards are identified and appropriate measures taken to address them.

Fire and emergency service agencies provide the best incident management services. This includes responses before, during and after the event, expert advice and advocacy for community safety outcomes.

Through the shared commitment by the industry to provide a trusted response, practitioners and technical experts are working to review and develop new operational doctrine which outlines the method for the provision of incident and disaster management and interoperability. They foster and promote the sharing of case studies, emanating from the delivery of their services.

The AFAC National Resource Sharing Centre continues to facilitate a coordinated national approach to resource sharing to sustain emergency response efforts over extended periods and to deploy overseas to assist in international response efforts to large-scale bushfires.

There is a continued focus in all the Strategic Directions on incorporating knowledge and research into the practice of emergency management. It is important that such research is available so that practitioners and technical experts can keep pace with contemporary expectations and requirements.

Associated with this Strategic Direction, AFAC and AFAC members continue to work in partnership to support a coordinated capability development approach that strengthens interoperability and capacity of disaster and emergency management agencies across Australia and New Zealand.

Fire and emergency services reliably respond when required by –

FRNSW investment in the Ignitable Liquid Detection Canine Program

INITIATIVE DRIVER – Maintaining best practice standards in ignitable liquid detection and associated equipment.

AIM – To continue to pioneer and evolve the utilisation of the canine capability of ignitable liquid detection in Oceania.

FEATURES – Fire and Rescue NSW (FRNSW) pioneered the use of dogs for the detection of ignitable liquids in the southern hemisphere with the establishment of the first team in 1995. With ongoing investment, the capability is now recognised as one of the most valued components of FRNSW's Investigation and Research Unit. The capacity is integral to the organisation and is utilised extensively by other services.

OUTCOMES – The Canine Unit continues to expand, and through partnerships with analytical and research facilities have helped to improve the dogs' accuracy. Further, the validity has been enhanced by having NSW Police audit the Canine Unit capacity.

Recent investment in a portable gas chromatograph mass spectrometer for preliminary identification of samples has further refined the capability. Equally important is the recognition of the welfare of the dogs. This year FRNSW delivered the first of the new canine vehicles that have significant improvements including:

- > Dual access to the K9 cage (rear and off-side)
- > Standalone (independent of vehicle engine) air-conditioning for the K9 cage powered by a lithium battery with roof mounted solar charging
- > Stowage compartments for equipment, dirty gear and ignitable liquids.

The Canine Unit is a unique example showcasing the commitment that FRNSW has in ensuring that not only is its response trusted, but that the relief, recovery and welfare of its personnel and animal resources is prioritised.

NRSC season summary 2020-21

INITIATIVE DRIVER – The Commissioners and Chief Officers Strategic Committee (CCOSC) tasks the National Resource Sharing Centre (NRSC) to support interstate and international deployments of fire and emergency services resources across Australia and internationally.

AIM – That the NRSC supports movements of resources between Australian states and territories and New Zealand and provides up-to-date situational awareness and reporting to AFAC members.

FEATURES – Following a request from the Prime Minister's Office, Emergency Management Australia (EMA) contacted the NRSC in September 2020 to discuss national COVID-19 planning for interstate deployments. Significant planning was undertaken with Resource Management Group members, notably EMA and NSW Rural Fire Service, who worked with NRSC and the National Aerial Firefighting Centre (NAFC) to produce a protocol and supporting model plans for interstate deployment of fire and emergency resources.

During 2020–2021, NRSC supported the following interstate resource movements:

- > QLD storms, November 2020 – Total of 102 interstate personnel deployed to assist with storm recovery activities

- > NSW floods, March 2021 – Total of 344 interstate personnel deployed in response to severe flooding across the state
- > Perth Hills bushfire, February 2021 – Additional Large Air Tanker (LAT) support was provided to WA to assist the bushfire emergency response efforts in the Perth Hills and Yallingup areas
- > Tropical Cyclone Seroja, April 2021 – Total of 205 interstate personnel deployed to WA to provide support to WA agencies in responding to cyclone damage in the state.

OUTCOMES – The COVID-19 Protocol for interstate deployments was endorsed by CCOSC and National Cabinet. The LAT deployments leveraged the newly established NRSC Standard Operating Procedure: Redeployment of Aviation Resources, which outlines the cooperation procedures between NRSC and NAFC in facilitating aviation resource movements between AFAC member agencies who are party to the NAFC Resource Management Agreement.

New edition of the National Capability Statement

INITIATIVE DRIVER – To provide a national resource containing information on key Australian fire and emergency service assets held by AFAC members across the states and territories.

AIM – To keep the *National Capability Statement* (NCS) up to date, and contribute towards Recommendation 6.2 of the Royal Commission into National Natural Disaster Arrangements (RCNDA): A national register of fire and emergency services personnel and equipment.

FEATURES – During the 2020–21 financial year the NCS was refreshed, with support from technical reference groups considering and revising existing function statements for the various capabilities in the NCS and working to achieve increased standardisation of data descriptions for function statements under the categories of:

- > Firefighting (bushfire)
- > Firefighting (other)
- > Search and rescue

- > Severe weather response
- > Hazardous materials
- > Damage and impact assessment
- > Incident management
- > Aviation.

Data was collected from each AFAC member as to their resource holdings against each identified capability and these were aggregated to jurisdictional level before being reported in the final publication.

OUTCOMES – As a result of this work, the NCS reflects national capability in the areas covered as at the start of 2021, and more robust data definitions have increased the quality of data reporting against each capability. The NCS represents the only national document currently in existence that contributes to the intent of RCNDA recommendation 6.2.

NATIONAL STATEMENT OF CAPABILITY FOR FIRE AND EMERGENCY SERVICES

2021 EDITION

Australian Government
Department of Home Affairs



NATIONAL
CAPABILITY
STATEMENT FOR
FIRE AND
EMERGENCY SERVICES
2021 EDITION





Recovery Centre



ville Senior Citizens Centr

Disaster Recovery



Recovery centres during the March 2021 NSW floods

INITIATIVE DRIVER – In March 2021, a record level of rainfall fell across NSW resulting in flooding over many areas along the state’s coastline and interior. The persistent rainfall led to flooding in the Hunter, Central Coast and the Hawkesbury Nepean Valley. This was the first major flood experienced by many people living in downstream communities. New residents were not prepared for flood impacts. Many of the lower lying areas are home to some socially vulnerable members of the community.

AIM – Resilience NSW worked with local communities to establish a range of recovery services shortly after the floods to provide trusted, accessible and coordinated support for those adversely affected. This included eight recovery centres based in Macksville, Kempsey, Port Macquarie, Laurieton, Taree, Windsor, South Richmond and Wiseman’s Ferry.

FEATURES – The recovery centres were led by local councils and brought together government and non-government services in a ‘one-stop-shop’. They allowed people to quickly access help and advice from trusted agencies including Service NSW, Department of Communities and Justice, Department of Primary Industries, Legal Aid, the National Recovery and Resilience Agency, insurers, and charity partners. The services on offer evolved as people’s needs transitioned from immediate relief to their recovery. The centres were complemented by a mobile recovery service to meet people that couldn’t travel into the recovery centres, as well as specific targeted programs for adversely affected communities.

OUTCOMES – Most centres were open for between 8-12 weeks, and more than 9,600 people accessed recovery centres for support.

AFAC independent reviews

INITIATIVE DRIVER – AFAC’s facilitation of assurance activities for AFAC members provides a cost-effective way for fire and emergency service organisations to review aspects of their operations or business, based on industry expertise.

AIM – To foster a culture of continuous improvement in AFAC member agencies by providing independent, expert, and value-for-money reviews of AFAC member activity at their request, making recommendations about opportunities for development.

FEATURES – AFAC’s ability to use its networks to source senior industry experts to participate in review panels means that agencies or governments commissioning AFAC reviews can be confident that these activities will be carried out by people who thoroughly understand the

subject matter and have a contemporary appreciation of industry good practice. This in turn means that the review activities themselves are more targeted on the real issues, and recommendations are specific, realistic, and relevant.

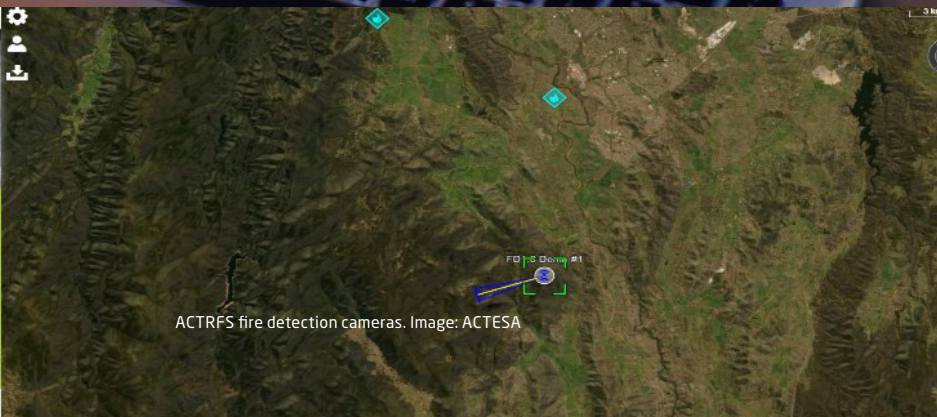
In 2021, AFAC National Council approved the updated doctrine *AFAC Operational Assurance Activities*.

OUTCOMES – In 2020-21, AFAC conducted an independent operational review of the New Zealand International Convention Centre fire for Fire and Emergency New Zealand. This represented the first major review of a structure fire that has been carried out under the AFAC program. Eleven recommendations were made on subjects such as the management of high-risk buildings in the urban environment, firefighter welfare, and engagement with iwi for major incidents.

DIRECTION **THREE**

The source of credible and timely information

- > Australian Fire Danger Rating System
- > QFES damage assessment electronic data collecting and reporting tool
- > Using community voice to build a new national warning system for Australia
- > Geospatial agility in operations during the March 2021 NSW floods
- > ACTRFS fire detection cameras



Fire and emergency services are committed to providing credible information to enable individuals and communities to make appropriate, informed and timely decisions.

To support this, the industry continues to develop new operational capabilities to keep the community well informed before, during and after events.

Working closely with other agencies such as the Bureau of Meteorology, the industry incorporates predictive forecasts and warnings, available intelligence, including local knowledge and historical information, to develop warnings messages that identify the likely impact of the hazard on communities.

The intent is to provide consequence-based warnings, inclusive of key safety messages, to empower communities to take action to increase safety and minimise loss of life. The recent release of a nationally agreed Australian Warning System will support a consistent approach to community warning messages, regardless of hazard or location.

Technology is maximised, including data and provision to mobile devices, to rapidly advise and warn the community about emergencies that are likely to impact them. New technologies support dispatch of resources in a more timely and efficient way.

This is underpinned by the investment from the industry in the development of predictive models which can provide the best available advice based on existing information.

Development of national capabilities such as the Australian Fire Danger Rating System and a national bushfire simulator aim to strengthen the intelligence used to make decisions.

Fire and emergency services in Australia and New Zealand continue to enhance national capability to manage the largest emergencies and promoting Australia and New Zealand's role as good global citizens supporting international partners in times of need.

Fire and emergency services provide credible and timely information by –

Australian Fire Danger Rating System

INITIATIVE DRIVER – Led by the NSW Rural Fire Service, the Australian Fire Danger Rating System (AFDRS) Program is jointly funded by states, territories and the Australian Government. It represents a three-year collaborative project due for completion in 2022.

AIM – The AFDRS will substantially improve fire agencies' capability to communicate the fire threat across Australia and provide for a national decision-making framework that supports operational planning, response and consistent community messaging. The AFDRS is well on its way to achieving national consistency in levels, colours and language – all of which are critical for community understanding.

FEATURES – Collaboration has been at the heart of the design and implementation, with state and territory agencies working alongside the Australian Government to deliver a step change in the quality of information available for decision making. The strong commitment of agencies around the country to work together has allowed the development of a national system that will flexibly meet the needs of communities everywhere.

OUTCOMES – Outcomes during 2020–21 include the delivery of a sophisticated decision support portal into operations. Although still being calibrated, it will allow agencies to become familiar with the system for 12 months before it is implemented operationally. The system provides important link between the complex scientific techniques, Bureau of Meteorology forecasts and outcomes in the community.

Working through the Bureau of Meteorology, improvements are also being made to forecasting fire danger on a seasonal scale.

The AFDRS represents a collective effort to provide the most credible, accurate and timely information to keep Australians safe.

QFES damage assessment electronic data collecting and reporting tool

INITIATIVE DRIVER – The collection analysis and shared use of contemporary damage assessment data is essential for coordinated and collaborative responses for community support and recovery in the aftermath of natural and man-made disasters. The development of intelligent, interoperable and adaptive capabilities for community benefit is a key driver.

AIM – To provide accurate and timely damage assessment data to regional and state coordination centres to coordinate response and recovery services to communities in need.

FEATURES – The data collection tool is built on an iOS application that can be used on any Queensland Fire and Emergency Services (QFES) iDevice, with appropriate login access for authorised users. The data collection tool enables the collection of damage assessment data from the incident ground, with immediate transmission and display of incident ground data (including pictures) to the QFES Total Operational Mapping platform.

OUTCOMES – The method of collecting and capturing damage assessment data has developed over recent years, from a paper based manual system through to an electronic ‘collect and download’ format, to now being a digital tool which immediately transmits information that is consistent with the AFAC standard data dictionary. Following engagement with the Queensland Reconstruction Authority (QRA) in 2020, QFES amended the Fire and Rescue Service Damage Assessment Tool to provide more comprehensive data to QRA and local governments following significant natural weather events.

The enhanced data collection tool provides increased quality data and information from damage assessments undertaken following significant community damage as a result of fire, flood, storm, landslide or structural collapse. The quality and integrity of the collected data is maintained by trained members of the Fire and Rescue Service Disaster Assistance Response Team (QLD-1 DART) from regional resources or from state level deployments to support regional communities.

Using community voice to build a new national warning system for Australia

INITIATIVE DRIVER – In Australia, warning systems vary significantly across hazards and jurisdictions which presents a significant barrier for communities to be able to comprehend and respond to warning messages.

AIM – Complete and communicate the findings of the national multi-hazard warnings social research project used to inform the development of a new Australian Warning System (AWS).

FEATURES – The AWS has been developed based on community research and input from Australia’s emergency services and hazard agencies. As part of a major national research project, more than 14,000 people were surveyed or interviewed to assess community perceptions of existing warning systems and improvements to make warnings clearer and lead people to take action during hazard events.

OUTCOMES –

- SA Country Fire Service, in collaboration with AFAC, established a national steering and working group to inform and guide the development of the research approach
- Five hazards were tested to determine the communities understanding of symbology, colours and language that promoted the most appropriate protective action during emergencies
- Socialisation of the four stages of research occurred across all jurisdictions with the final report completed and socialised in September 2020
- The research informed the development of the AWS which incorporates three levels of warnings nested with a call-to-action statement, with an agreed national hazard icon set
- The AWS was endorsed by ANZEMC in early 2021 and will be fully implemented by all jurisdictions throughout the 2021–22 financial year.

Geospatial agility in operations during the March 2021 NSW floods

INITIATIVE DRIVER – Active sharing of information within and between agencies.

AIM – To promote visual agility of community impact using geospatial intelligence in the March 2021 NSW floods.

FEATURES – Geospatial intelligence is at the forefront of operational agility in NSW State Emergency Service (SES). The Geospatial Emergency Management System (GEMS) provides real time dashboards in NSW SES incident control centres. Key data is incorporated providing scenario analysis of potential impact areas, and summary information to other agencies through the Multi-Agency Platform for Sharing (MAPS) web map.

The real-time intelligence (including aerial reconnaissance, satellite imagery and community evacuation status) gathering from the incident validates forecast scenarios and supports decision making in incident control centres.

The agile approach provided adaptability during the response with dashboards being developed as information was required. The Warnings and Evacuations Overview dashboard was developed to provide a clear and concise summary with a visual location of each warning or evacuation with population affected. As the initial recovery effort commenced, GIS was utilised to identify the extent of damage to properties and the broader community.

OUTCOMES – Demonstration of these tools and their agile functional development over the NSW floods during March 2021 highlight the value and importance of geospatial intelligence as a critical operational capability. Changes provided an improved user experience and situational awareness for the incident management team personnel and field teams. All information was shared across agencies to streamline interagency situational awareness.

ACTRFS fire detection cameras

INITIATIVE DRIVER – The ACT is undertaking a trial of fire detecting cameras. This initiative is being conducted in partnership with the Minderero Foundation, Optus and the Australian National University. ACT Rural Fire Service (ACTRFS) have seven cameras in total, placed on the four fire towers looking over the ACT and surrounding areas of NSW. This initiative is driven by the need to quickly and accurately identify and confirm active fires within the ACT and neighbouring regions (within the capabilities of the cameras).

AIM – The aim of the trial is to quickly and accurately detect fire ignitions, thereby reducing the significant risk of undetected fire spread within the ACT.

FEATURES – The seven cameras are operated using multi-vendor technologies including Bushfire-Live and Insight Robotics.

Bushfire Live key features:

- > High-definition Axis PTZ cameras (Pan-Tilt-Zoom)
- > 80x zoom allows fires to be viewed at distances of up to 60 km or more
- > Ability to incorporate Artificial Intelligence Technology (AI).

Insight Robotics key features:

- > Automatic long wave infrared fire detection scanning at ~ 15 km radius
- > Remote real-time monitoring: spot over 95% of small fires within 10 minutes of ignition
- > Accurate 3D fire location map: able to pinpoint location +/- 50 m
- > Mobile application available for real-time wildfire alerts and information.

OUTCOMES – Whilst the cameras are still within the trial period and will again be used for the 2021–22 fire season, results to date have been promising with the cameras detecting fire activity and the ongoing learning and improved abilities of the AI equipped camera. The cameras have also been used to confirm or dismiss 000 calls reporting fires and to provide responding crews with real-time fire behaviour intelligence as they proceed to the fire ground. Monitoring storm cells and structural fire smoke plumes have also been a use for the cameras in the past 12 months. The cameras have already provided benefits in minimising work health and safety risks by not needing to have staff work in remote locations, allowing the services to optimise resource allocations during peak seasons.

DIRECTION **FOUR**

Effective governance and resource management

- > AFAC Doctrine
- > National Aerial Firefighting Strategy
- > Positive Mental Health in Young Adult Emergency Services Personnel Project
- > CCOSC resource prioritisation
- > Building flexible delivery options for AILMS training



COVID-19 has been a phenomenon that has not only challenged governments and communities but also the ability of our systems to be resilient and responsive in uncertain times. COVID-19 has tested the global community, national and international government health policies and how resources urgently needed by communities are managed. It has tested our ability to be agile in an environment that has affected communities at all levels and continues to be characterised by uncertainty and significant risk. The events experienced in Australia and New Zealand over the past two years have reinforced the importance of effective governance and resource management in both the public and private sector. They have strengthened the need for responsible and justifiable resource management, the criticality of governments and communities working together and sharing collective expertise and knowledge. While COVID-19 has been a significant and prolonged event, Australia and New Zealand have faced other significant environmental challenges. Prolonged periods of drought, compounded by a severe and intense 2019–20 bushfire season that destroyed significant areas of the Australian landscape, damaged public and private infrastructure and devastated wildlife, have also challenged the resilience of our communities, all levels of government, our people and first responders.

AFAC member agencies recognise that their greatest asset is their people. Our agencies represent a workforce of 288,000 personnel. 254,000 are registered volunteers, 34,000 are paid staff in career roles and 6,000 are retained or part-time staff. A diverse and geographically dispersed workforce, however, requires optimal human resource management strategies, industry-wide workforce planning and targeted capability development. To meet the needs of a geographically dispersed volunteer workforce requires innovative, targeted and flexible strategies for their recruitment, engagement and retention. AFAC members recognise this need and work with volunteer associations to share their expertise in this field.

Emergency management is inherently risky and managing a large workforce requires an evidence-based approach to issues of national and international importance. Evidence-based decision making, the creation and review of national and international standards, worker health and safety, and mental health and wellbeing are all key priorities for fire and emergency services. While AFAC members operate within legislative and regulatory arrangements, they share their collective knowledge and expertise by collaborating to achieve consistent outcomes that reduce duplication of effort and ensure the safest possible environment for the community and personnel.

Fire and emergency services maintain effective governance and resource management by –

AFAC Doctrine

INITIATIVE DRIVER – AFAC Doctrine is one of AFAC members’ most important intellectual property assets. The suite of sector-agreed, evidence-based doctrine is vested as the official view of the AFAC National Council and is central to supporting the Strategic Directions.

AIM – Doctrine supports AFAC members in defining accountabilities and practice against which AFAC members can measure their organisational performance. By aligning research to organisational strategies, doctrine can define best practice and support learning, knowledge management, succession planning and benefit organisational culture.

FEATURES – The AFAC Doctrine collection comprises over 100 evidence based publications and includes positions, guidelines and training resources. Doctrine is classified as either capstone, fundamental, procedural or technical.

OUTCOMES – In 2019–20 AFAC delivered:

- > 3 doctrine proposals
 - *Industry Role in Land Use Planning*
 - *Considerations for the Selection of Falling Object Protection Structures for Firefighting Appliances Guideline*
 - *HazMat (CBRN) National Capability Statement Guideline*
- > 4 new doctrine completed
 - *Residential Fire Safety Position*
 - *Design, Installation and Maintenance Requirements for Dry Hydrants*
 - *Volunteer Inclusion Model Guideline*
 - *Selection, Use, Care and Maintenance of Operational Equipment*
- > 10 revised doctrine
 - *Aerial Appliance Maintenance*
 - *Optimising Service Life of Operational Response Vehicles Guideline*
 - *Rural Firefighting Vehicles Burn-over Protection Guideline*
 - *Selection of Appropriate RPD During Bushfires*
 - *AFAC Operational Assurance Activities*
 - *Emergency Medical Response Guideline*
 - *Incidents Involving PV Array and Battery Energy Storage Systems*
 - *Operational Guideline for Acetylene Cylinder Incidents*
 - *Operational Response Vehicle Tyre Management Guideline*
 - *Emergency Service Vehicle Warning Devices (Audible, Optical and Visual)*

National Aerial Firefighting Strategy

INITIATIVE DRIVER – Informing and meeting the expectations of governments and communities regarding aerial firefighting.

AIM – The purpose of the National Aerial Firefighting Strategy ('The Strategy') is to provide a baseline of the overall effects and outcomes that the National Aerial Firefighting Centre (NAFC) is seeking to achieve across the nation with aerial firefighting, and describe the resources identified to deliver those effects. The strategic intent and purpose of the Strategy is to maximise the potential benefit of aerial firefighting, to keep communities safe and to minimise loss from fire.

FEATURES – This is the first time since NAFC was formed in 2003 that we have an active, viable, national strategy.

The Strategy lays out what we have, what we need, and how we are going to get there. It describes the multiple capabilities provided through the aerial firefighting fleet from identifying fires, to aerial bombing to ignited fuel reduction fires.

OUTCOMES – The strategy draws together the national requirements of aerial firefighting. It has already provided the context for operating two national Large Air Tankers (LAT) in Australia throughout the year. In 2021 this is being achieved with the Australian Government funding a National LAT. The Strategy will evolve and be reviewed annually, noting the evolving operating environment. It confirmed national governance, procurement and acquisition approaches, future research and evaluation and how we are mitigating risk.

Positive Mental Health in Young Adult Emergency Services Personnel Project

INITIATIVE DRIVER – AFAC recognised the need to understand how to best support the mental health of young volunteers to ensure that the wellbeing of the entire voluntary workforce can be maintained.

AIM – To determine what strategies can minimise the short- and long-term impacts of potentially traumatising events and to promote good mental health and wellbeing for young adult (16–25 year old) volunteers.

FEATURES – The project was initiated by AFAC and funded by the Bushfire and Natural Hazards Cooperative Research Centre's Tactical Research Fund and the Hospital Research Foundation as a partnership with the University of Adelaide, Flinders University, the University of Western Australia, the University of British Columbia in Canada, Military and Emergency Services Health Australia, the Young Volunteer Advisory Committee, and key fire and emergency service organisations.

Researchers analysed mental health and wellbeing data for young adult fire and emergency service volunteers, conducted extensive surveys of this cohort in all Australian states and territories, and assessed existing mental health programs within emergency services.

OUTCOMES – Researchers developed the *Wellbeing Framework for Young Fire and Emergency Services Volunteer Mental Health*, as well as several key resources that have been disseminated among emergency services to begin better supporting young adult mental health. This includes a *Care4Guide*, posters, social media assets, fact sheets of key findings and an *Agency Implementation Guide*, all of which are publicly available on the Bushfire and Natural Hazards CRC website.

CCOSC resource prioritisation

INITIATIVE DRIVER – At the request of the Commissioner and Chief Officer Strategic Committee (CCOSC), the AFAC National Resource Sharing Centre (NRSC) hosted a workshop in June 2021 that discussed a set of proposed decision points, and criteria to establish a set of resource prioritisation support tools. The workshop sought to discuss and reach an agreed format, that applies the National Resource Prioritisation Guidance to discussions within the CCOSC forum. The National Resource Prioritisation Guidance, endorsed by the Australia-New Zealand Emergency Management Committee, supports agencies and government in making difficult and complex decisions when severe to catastrophic events result in competing demands for effort and resources.

AIM – The resource prioritisation support tools aim to provide:

- A structure for CCOSC discussions when resource demands exceed resources available at a national level that incorporates the Emergency Management Australia prioritisation criteria
- A format for recording the outcomes of that discussion.

FEATURES – The resource prioritisation support tools include a CCOSC Resource Prioritisation Flow Chart and an accompanying CCOSC Resource Prioritisation Discussion Guide. The flow chart provides a visual representation of the key considerations and pathways by which CCOSC members may determine that demand for national resource exceeds supply and suggests how the Resource Prioritisation Discussion Guide may be utilised by CCOSC members.

Where demand for resources exceeds supply, the Discussion Guide assists CCOSC members to undertake resource prioritisation discussions. Under these scenarios, NRSC would ask requesting participants to submit their responses to the National Resource Prioritisation Criteria, to be presented in the matrix format at an operational CCOSC meeting.

OUTCOMES – By adopting an agreed format for discussions which identifies in advance the criteria to be applied to resource prioritisation, CCOSC enhances transparency and accountability in relation to this critical national activity.

Building flexible delivery options for AIIMS training

INITIATIVE DRIVER – Australasian Inter-service Incident Management (AIIMS) training has traditionally been face-to-face. COVID-19 accelerated the need for online learning and, in recognition of this need, AFAC made AIIMS online training a priority. Over 2020–21, AFAC released a refreshed AIIMS 2107 Principles online course and developed a new AIIMS Awareness online course. Both nationally accredited courses are designed around an all-hazards approach to incident management and complement the AFAC AIIMS face-to-face resources already available.

AIM – To increase the availability, accessibility and take up of AIIMS online training during the COVID-19 pandemic.

FEATURES – The refreshed and updated AIIMS 2017 Principles online course provides a comprehensive overview of the system, comprising 14 modules and 5

assessment tasks. The final scenario-based assessment offers learners 21 hazard-specific scenarios to select from, covering bushfire, flood, road crash rescue, water, recovery and public health.

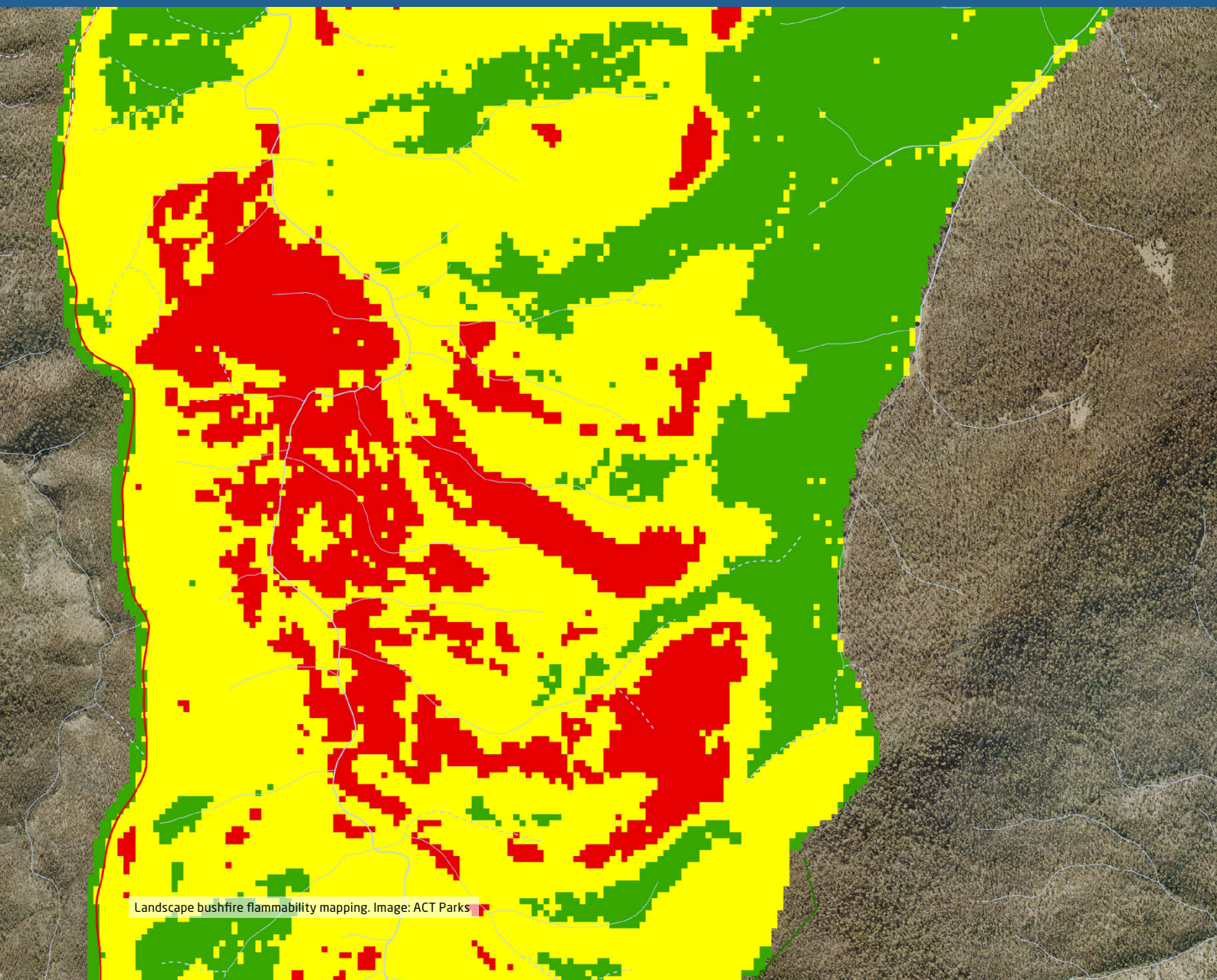
The new AIIMS 2017 Awareness online course can be completed fully online and covers all the features and principles of the system, comprising of seven modules and three assessment tasks.

OUTCOMES – During the 2020–21 financial year, 140 students completed the AIIMS Principles online course, and 818 students completed the AIIMS Introduction and AIIMS Awareness online course, which superseded the Introduction course in March 2021. The online courses provided learners with an opportunity to participate in face-to-face AIIMS training during COVID-19. The result is better prepared personnel and agencies to respond to an incident.

DIRECTION FIVE

Informed by knowledge and research

- > Landscape bushfire flammability mapping
- > CSIRO Report on Climate and Disaster Resilience
- > CFA Injury and Incident Data Linkage Project
- > Transformative scenarios in a climate challenged world: Alternative futures for planning and decision making
- > Fire research testing into battery electric vehicles



Landscape bushfire flammability mapping. Image: ACT Parks

AFAC member agencies value, create, share, and use a range of evidence and knowledge derived from research, experience, or observation.

AFAC supports deep connection within and outside the sector, maximising the sharing of knowledge and innovation and collectively supporting improvements in each agency. AFAC's collaboration groups are communities of practice, each working to collectively further the sector's knowledge.

Knowledge is collated through a range of products such as AFAC Doctrine developed by member agencies through AFAC, the Handbook Collection developed by the Australian Institute for Disaster Resilience, as well as the many community safety training products.

A comprehensive professional development program supports learning. The signature national event, the AFAC conference, is a partnership whereby researchers, practitioners and policy makers actively share and learn. The AFAC conference program now also includes the

Australian Disaster Resilience Conference, which extends our collective reach to broader audiences. Although COVID-19 forced the cancellation of the 2020 event, AFAC adapted to host forums, workshops, seminars and webinars. New challenges led to new ways to collaborate.

The Research Committee of the AFAC Board provides strategic guidance to AFAC National Council about research needs and works closely with research providers to strengthen the sector's capability. The Knowledge, Innovation and Research Utilisation Network (KIRUN) is closely aligned to the delivery of this Strategic Direction and seeks to shape how knowledge is gathered, shared and used.

The sector continues to learn from major events, such as the Black Summer bushfires. Through such tragedies emerge an unwavering mission to capture knowledge, shape future response and ultimately keep our communities as safe as possible.

Fire and emergency services are informed with knowledge and research by –

Landscape bushfire flammability mapping

INITIATIVE DRIVER – Development of new technology to improve the prediction of landscape flammability for prescribed burning and fire suppression.

AIM – To bring into operation new landscape flammability intelligence systems.

FEATURES – ACT Parks and Conservations Service is working with research partners to develop and test new landscape flammability intelligence tools. The work operationalises the expertise of research partners at the Australian National University, University of Melbourne, Geoscience Australia and Alluvium to produce pilot products for operational validation.

Three tools have been developed. The first tool is a landscape classification derived from the results of prescribed burning determined using burn severity mapping. The results from the mapping were classified to aspect and then applied to a digital elevation model of the ACT.

The second tool predicts landscape flammability using a sub-canopy climate model derived from aspect, elevation, vegetative cover and climate to predict average monthly net radiation across the ACT. The estimates of net radiation were classified, and the patterns used to inform operations.

The third tool is a high-resolution version of the Australian Flammability Monitoring System which applies an algorithm to Sentinel 2 satellite data to derive fuel moisture. The data were trialled in two forms, an instantaneous estimate of fuel moisture and as a climatology for planning purposes.

OUTCOMES – The trials have shown that the three products are complementary and together deliver valuable flammability intelligence in a form suitable for staff. Ongoing work will look at refining the use and extending it to fire suppression functions.

CSIRO Report on Climate and Disaster Resilience

INITIATIVE DRIVER – Climate change influences the frequency and severity of many natural hazards events. Following the summer of 2019–20, CSIRO was tasked by the Prime Minister to deliver an independent study to determine how Australia can increase its climate and disaster resilience.

AIM – To provide practical options for Australian governments to support and improve Australia’s climate and disaster resilience.

FEATURES – The *CSIRO Report on Climate and Disaster Resilience* draws on: CSIRO’s research expertise; lived experiences from Australian communities; insights from the Australian research community; consultation with relevant government reference groups and AFAC; and supported by an Expert Advisory Panel chaired by Australia’s Chief Scientist, Dr Alan Finkel.

OUTCOMES – The [*CSIRO Report on Climate and Disaster Resilience*](#) delivered six actionable themes:

1. A harmonised and collaborative national approach is required to achieve global best practice
2. The national approach requires systems thinking and solutions to deal with complexity
3. Availability of data is a key enabler
4. Communities play an essential role in all phases of resilience building and must be appropriately included and engaged
5. Investment in targeted research, science and technology remains a key enabler of many of the improvements required to build resilience
6. We need to build back better. Resilience needs to be embedded as an explicit consideration in all future planning, agricultural and urban land use and zoning and investment decisions.

CFA Injury and Incident Data Linkage Project

INITIATIVE DRIVER – The Country Fire Authority (CFA) Outcomes Framework and strategic goals related to fire related injuries and fatalities.

AIM – To link CFA incident data with external injury datasets in order to improve CFA’s understanding of the full burden of fires in communities. It is widely recognised that injury data available in agency incident reporting systems has limitations and does not allow for consideration of the full burden of injury from fires.

FEATURES – A collaboration between CFA and Monash University Accident Research Centre to test the feasibility of linking CFA incident data with injury data held by external organisations, including Ambulance Victoria. The project established a methodology for ongoing linkage between CFA’s Fire Incident Reporting System (FIRS) and key datasets detailing injury outcomes in CFA attended events.

OUTCOMES – The creation of a matched dataset between FIRS and the Victorian Ambulance Clinical Information System (VACIS) has allowed injury trends to be examined. It has highlighted the value of ongoing linkage between the datasets to allow for monitoring of injury trends over time. A second stage of the data linkage has also been devised to link the matched dataset to trauma registry data, which will enable the longer-term outcomes and costs from injuries to be explored.

Overall, this will provide important measures for use in risk analysis and intervention design. It will also enable enhanced reporting of injuries in CFA’s Outcomes Framework and more detailed analysis and reporting of trends in fatalities and injuries.



Transformative scenarios in a climate challenged world: Alternative futures for planning and decision making

INITIATIVE DRIVER – The AFAC Climate Change Group (CCG) works to strategically support effective climate change risk mitigation, planning and adaptation outcomes for AFAC members, their stakeholders and the community.

AIM – The CCG received Tactical Research Funding through the Bushfire and Natural Hazards Cooperative Research Centre to work with RMIT University and Reos Partners to produce a set of logically plausible scenarios about how the future might unfold in a climate-challenged world, and what this means for strategic planning and operations in the fire and emergency services sector.

FEATURES – Representatives from the emergency management sector (EMS) worked together to explore the driving forces that shape the future in unpredictable and volatile ways. The team constructed a set of plausible

futures for the EMS to examine current thinking and strategies and what might happen over 2021–2035 in a climate challenged world.

OUTCOMES – The research project produced three key outputs, including:

- > *EMS Guide for Using Transformative Scenarios in a Climate Challenged World* – a method for organisations to test and improve decision making and planning in a climate challenged future.
- > *EMS Case Studies as Worked Examples* – four examples from different emergency service agency types: urban operations, rural operations, land management, and state emergency services.
- > *Implications of Climate Change for Emergency Services Operations* – insights from the literature.

Fire research testing into battery electric vehicles

INITIATIVE DRIVER – The pace of emerging technology in alternative energy and the limited knowledge of battery fire safety has compelled research into their performance under different abuse scenarios from a public and firefighter safety perspective.

AIM – To conduct testing into batteries and battery electric vehicles to inform emergency response in the event of fire.

FEATURES – Lithium-ion battery (LIB) incidents are increasingly common as there is a greater uptake of the technology by consumers and aging battery systems begin their end-of-life cycles. Conflicting literature on the nature of LIB failure scenarios and the appropriate suppression and extinguishment response requirements led to an exploratory study conducted by the Fire and Rescue NSW Fire Research Team.

Over the course of the 2020–21 financial year, several small capacity LIB's were subjected to thermal abuse in-order to assess the toxicity of the off-gassing, conditions of thermal runaway and determine best practice for extinguishment to inform operational doctrine. Various LIB form factors (cylindrical and pouch) and states of charge (SOC) were investigated. A full-scale test was also conducted using a complete battery electric vehicle.

OUTCOMES – Operational doctrine was developed based on the learnings obtained over the course of testing. The performance of different battery form factors was reviewed under thermal abuse and further research on LIB's will be conducted, including mechanical abuse scenarios with a dedicated destructive battery test facility.



Fire research testing into battery electric vehicles. Image: Fire and Rescue NSW



AFAC is the National Council for Fire and Emergency Services

Level 1, 340 Albert Street, East Melbourne VIC 3002

+61 3 9419 2388 | afac@afac.com.au

www.afac.com.au