



**Royal Commission into  
National Natural Disaster  
Arrangements | Review of  
Findings (Released Nov 2020)**  
**Healthy Land and Water**  
Healthy Land and Water,  
Queensland Fire and  
Biodiversity Consortium and  
Partners



## Authors

Annie Keys (Keys Consulting) and Dr Samantha Lloyd (Healthy Land and Water)

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## About the Queensland Fire and Biodiversity Consortium

Healthy Land and Water's Queensland Fire and Biodiversity Consortium is a network of land managers and stakeholders devoted to providing a coordinated response and best-practice recommendations for fire management, fire ecology and the conservation of biodiversity in the state of Queensland through education, community engagement and applied research.

## About Healthy Land and Water

Healthy Land and Water is the **peak environmental group** for South East Queensland. For over 20 years it has been dedicated to investing in and leading initiatives to **build the prosperity, liveability, and sustainability of our 'future region'**.

We are experts in research, monitoring, evaluation and project management. Our team has led many thousands of projects to restore waterways and landscapes, improve native habitats, manage weeds, protect native species, inform policy and educate communities on the best ways to improve and protect the environment for future generations.

Working in partnership with Traditional Owners, government, private industry, utilities and the community, Healthy Land and Water delivers innovative and science-based solutions to challenges affecting the environment. The combination of scientific expertise and on-ground management works to deliver Healthy Land and Water's mission to **lead and connect through science and actions that will preserve and enhance our natural assets and support resilient regions long into the future.**

## Acknowledgements

The material contained in this publication is produced for general information only. It is not intended as professional advice on specific applications. It is the responsibility of the user to determine the suitability and appropriateness of the material contained in this publication to specific applications. No person should act or fail to act on the basis of any material contained in this publication without first obtaining specific independent professional advice. Healthy Land and Water and the participants of our network expressly disclaim any and all liability to any person in respect of anything done by any such person in reliance, whether in whole or in part, on this publication. The information contained in this publication does not necessarily represent the views of Healthy Land and Water or the participants of our network.

## Traditional Owner Acknowledgement

We acknowledge that the place we now live in has been nurtured by Australia's First Peoples for tens of thousands of years. We believe the spiritual, cultural and physical consciousness gained through this custodianship is vital to maintaining the future of our region.

## Contact details

For further information about Healthy Land and Water [www.hlw.org.au](http://www.hlw.org.au), please email [info@hlw.org.au](mailto:info@hlw.org.au) or telephone (07) 3177 9100.



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## 1 Introduction

In response to the devastating bushfires of 2019/2020, a Royal Commission into National Natural Disaster Arrangements (RCNDA) was announced by the Federal Government in February 2020. The Terms of Reference were broad directing examination of, among other things: the responsibilities of, and coordination between, Australian, state, territory and local relating to natural disasters,

- Australia's arrangements for improving resilience and adapting to changing climatic conditions.
- What actions should be taken to mitigate the impacts of natural disasters.
- Whether changes are needed to Australia's legal framework for the involvement of the Commonwealth in responding to national emergencies.

For more information on the Royal Commission and to download the RCNDA Report please go to <https://naturaldisaster.royalcommission.gov.au>

The following document provides a guideline on the RCNDA Report structure, key points and recommendations considered most relevant to Healthy Land and Water, Queensland Fire and Biodiversity Consortium and Partners and some general observations. Quick reference tables have also been developed to enable ease of access to the RCNDA Report. This document does not cover all sections of the Report.

## 2 The RCNDA Report Structure

The resulting RCNDA Report was released in November 2020. It comprises 2 parts – a summary of key points and recommendations resulting from the Inquiry (24 Chapters, 594 pages) and an Appendices (25 Appendices, 387 pages) that records the way in which the Royal Commission engaged with the public throughout its Inquiry (see Appendix 3, p 47). This included:

- Hosting 16 community fora in fire affected regions with 150 attendees.
- Organising six Consultation Roundtables on five different themes (aerial firefighting industry, health, constitutional law, small and large charities, consumer issues).
- Inviting and receiving 1,772 public submissions (see Appendix 4, p53).
- Publishing five Background Papers (see Appendix 5, p85) that summarised existing literature on various topics:
  1. National Natural Disaster Arrangements,
  2. Australian Inquiries and Reports Concerning Natural Disasters,
  3. Constitutional Issues and National Natural Disaster Arrangements,
  4. Land Management – hazard reduction: a literature review,
  5. Cultural burning practices in Australia.
- Publishing four Issues Papers (May/June 2020) that explored themes relevant to its inquiry and sought responses on specific policy questions (see Appendix 6, p86) 173 responses were received:
  1. Constitutional Arrangements for the Declaration of a State of National Emergency,
  2. Health Arrangements in Natural Disasters,
  3. Local Governments and Natural Disasters,
  4. Firefighting and Emergency Services Personnel and Equipment.
- Publishing Draft Propositions by Counsel Assisting the Royal Commission. The Draft Propositions were informed by the range of information provided to the Royal Commission through submissions, responses to Issues Papers and compulsory notices, evidence presented during public hearings, and Interim Observations published by the Royal Commission on 30 August 2020. 143 responses were received (Appendix 7, p93).
- Virtual hearings from Canberra (Appendix 8, p97):

1. Block 1: Setting the scene (May-June, 2 weeks),
2. Block 2: Investigating natural disaster management in Australia (June- July, 5 weeks),
3. Block 3: National coordination (August, 1 week),
4. Block 4 – Looking to the future (September, 1 week).

Overall, the Commission received extensive evidence, from more than 270 witnesses, almost 80,000 pages of tendered documents and 1,772 public submissions orally and in writing. Organisations provided 433 submissions. Of those, 25 were from professional and volunteer fire brigades, associations, unions, and collectives. The other 408 were from government, non-government, private sector, peak body, community groups and associations with expertise in a range of fields relevant to the work of the Commission, including: environment, land management, forestry, fire ecology, land planning, traditional land management, climate, natural hazard modelling, emergency services, disaster response and management, radio communications, health, community welfare, wildlife conservation, resilience, building standards, and aviation (Appendix 4, pt 4.7, p54).

The Healthy Land and Water/ Queensland Fire and Biodiversity Consortium Public Submission was recognised as no. NND.001.00849 in Table 6, Appendix 4, 4.7 (p66).

### 3 Approach to Analysing the RCNDA Report

Whilst the entire RCNDA Report has relevance, it is very lengthy. The summary list of recommendations at the front end of the Report (p34) takes up 13 pages. To assist Queensland Fire and Biodiversity Consortium partners, the key points and recommendations of those Chapters considered of most interest have been lifted into two quick reference tables provided as Attachments 1 and 2. The tables including page numbers for each item for easy reference back to the original Report.

Table 1. RCNDA Report Chapter Summary, listing the Report's Chapters, highlighting those considered most relevant, key recommendations, and points including relevant page numbers for easy reference back to the original Report.

Table 2. Healthy Land and Water/QFBC Submission Key recommendations, as aligned with the relevant recommendations from the RCNDA Report including relevant page numbers for easy reference back to the original Report.

### 4 General Observations

The RCNDA Report has been written to appeal to a broad audience. It provides detailed background information and incorporates summaries of previous multiple relevant reviews, dating back at least 20 years. It was noted that the RCNDA Report provided an opportunity to place this detail on public record for the first time. In order to develop recommendations, the Commission also found it necessary to describe current institutional arrangements (point 3.5, p10). Each Chapter is therefore lengthy and sometimes repetitive and there is cross referencing between Chapters as the issues are not mutually exclusive.

There are 80 recommendations provided throughout and summarised at the beginning of the report (p34 - 41). Many are broad brush, and not specific regarding how they will be actioned, who will be responsible and in what timeframe, or any suggested measures of success. The Report provides the following logic for this (p33):

'Many of our recommendations identify what needs to be done, rather than how it should be done. This provides flexibility to governments in implementing recommendations to take into account jurisdictional and local needs. It does not, however, diminish the importance of implementation.'

The Report found that due to the sheer size of the bushfire disaster, there was strong public expectation that Federal Government should have been more engaged despite the primary responsibility and accountability for emergency management residing with the States/Territories. 'Fire

fighting at an operational level is a state responsibility". This has been a catalyst for the recommendation regarding new federal powers to enact a National State of Emergency that would allow the Federal Government to deploy troops and its full resources without State or Territory Government request (Recommendation 5.1, p149).

There is recognition that national coordination is essential and should be improved. 'Australian, state and territory governments should establish an authoritative advisory body to consolidate advice on strategic policy and relevant operational considerations for ministers in relation to natural disasters' (Recommendation 3.2, p99).

As expected, the RCNDA Report presents a national perspective whilst stressing that effective implementation of measures should be undertaken at a local level to benefit from local knowledge and skills. State/Territory governments were encouraged to support the capability of local governments.

The RCNDA Report and resulting recommendations do support the type of community resilience building work that is a key priority and core business for the Queensland Fire and Biodiversity Consortium. Chapter 10. of the Report (p245) is dedicated to Community Education. It is comparatively brief and provides the following points but no actual recommendations (refer to Table 1.):

- 10.7 Need to promote and encourage disaster-resilient communities.
- 10.13 Education is key to informing and empowering communities.

Other Summary points from the report of interest include:

- **Climate change** will exacerbate the intensity and frequency of catastrophic events (Chapter 4).
- **Changes to the climate** could impact disaster management (CSIRO/BOM) 'further warming over the next two decades is inevitable' (Chapter 4).
- Australian governments should review their legislation **on vegetation management and hazard reduction** to ensure they are more user friendly/better vegetation management and hazard reduction (Chapter 17, recommendation 17.2, p381).
- **Reduction of fuel load management on private property** is recognised as a key factor in countering the spread of bushfires.
- **Prescribed burning** could materially reduce the risk to properties but there are significant gaps in the science, including in relation to the role of fuels in extreme fires that need to be addressed through continued research. Caution against viewing prescribed burns as a panacea to the risk posed by bushfires.
- Recommendation for **a new national fire danger rating system** to be rolled out including a nationwide education program to improve fire literacy (Chapter 17, recommendation 17.3, p385).
- State and Territory Governments need to take steps to **improve public understanding of fuel management**.
- Greater engagement with **Indigenous Australians** on fire and land management (Chapter 18).
- **Building codes and regulation** in fire prone areas essential (Chapter 19).
- **Communication** during the disasters was a consistent issue (Chapter 19).
- Australian, state and territory governments should support the implementation of the **National Disaster Risk Information Services Capability** (NDRISC) and aligned climate adaptation initiatives. (NDRISC) should include tools and systems to support operational and strategic decision making, including integrated climate and disaster risk scenarios tailored to various needs of relevant industry sectors and end users. This service would connect information held by the Bureau of Meteorology, CSIRO, Geoscience Australia and the Australian Bureau of Statistics. (Chapter 4 recommendation 4.3, 4.4, p121).

## 5 Healthy Land and Water/Queensland Fire and Biodiversity Consortium report recommendations

It is apparent that a lot of detail has been wrapped up in the need to deliver a broad national perspective. The Healthy Land and Water/Queensland Fire and Biodiversity Consortium submission has significant meaning at a State/Regional/Local level.

For an analysis of the content of the Healthy Land and Water/Queensland Fire and Biodiversity Consortium submission against the key points and recommendations provided by the RCNDA Report please refer to Table 2.

The RCNDA Report did not directly cite the Healthy Land and Water/Queensland Fire and Biodiversity Consortium submission, but there were many statements throughout the Report that aligned very closely with our recommendations or agreed with our sentiments. Many submissions provided similar advice. Refer to FFDI example in Box 1. below.

Box 1. Example of RCNND Report reflecting advice provided by the Healthy Land and Water/QFBC Submission

### RCNND Report (p413)

#### Chapter 19. Land use planning and building regulation

**Point 19.79** In some cases a single fire danger index is applied across a broad area, regardless of differences in vegetation and topography. For example, Queensland has an FFDI of 40 for the whole state, 109 when we were told it should apparently be between 80 and 130.<sup>110</sup>

**Point 19.80** Additionally, there are cases where the fire danger index is very different immediately either side of state boundaries, even where vegetation and topography does not differ, such as where Queensland uses an FFDI of 40 and northern NSW uses an FFDI of 80.<sup>111</sup>

#### Recommendation 19.4 National Construction Code (p414)

The Australian Building Codes Board, working with other bodies as appropriate, should:

### Healthy Land and Water/QFBC Submission (p24)

#### Forest Fire Danger Index Ratings for Queensland

It is widely acknowledged that stringent building standards, accurately reflective of bushfire risk, are an effective strategy for mitigating against house loss in the event of a fire. Moreover, an increase in house loss is associated with an increase in the loss of human life (Blanchi et al., 2012). The use of different Forest Fire Danger Index (FFDI) for both State Planning Policy (SPP) planning matters and AS3959-2018 building matters can result in a significant difference between the approved radiant heat flux level of a development and a building certifier's Bushfire Attack Level (BAL) assessment. The SPP adopts a site specific FFDI value that reflects a 5% Annual Exceedance Probability (AEP), whereas Queensland's adoption of AS3959-2018 **uses a single FFDI value for all of Queensland (FFDI of 40)**. The greater the variance in the SPP FFDI to the AS3959-2018 FDI 40 value, the greater the likelihood of discrepancies between planning and building outcomes. For example, the SPP could require a site-specific FFDI of 60, when calculated based on the Asset Protection Zone width, whereas the AS3959-2018 Method 1 calculation would require an FFDI of 40.

After consultation with stakeholders in SEQ, and based on evidence and values in neighbouring states, **the**

(1) assess the extent to which AS 3959:2018 Construction of buildings in bushfire-prone areas, and other relevant building standards, are effective in reducing risk from natural hazards to lives and property, and

(2) conduct an evaluation as to whether the National Construction Code should be amended to specifically include, as an objective of the code, making buildings more resilient to natural hazards.

Qld Fire and Biodiversity Consortium believes that the current FFDI for SEQ is too low and does not accurately reflect the conditions specific to SEQ or the associated risk. The FFDI for the neighbouring Northern Rivers region of NSW, is 80 FFDI (more than double that of SEQ), but the vegetation and weather conditions in northern NSW greatly overlap with those of SEQ. An increased FFDI, would more accurately reflect the conditions and risk in SEQ allowing for higher building standards and providing greater protection of homes and related infrastructure for homeowners. Consideration could also be given to the initiation of a mapping layer which identifies and records BAL ratings of individual structures to better inform interface management in residential and commercial estates in urban areas, as well as similar applications relevant to rural landscapes. This submission recommends a review of the FFDI for Queensland, as supported by Douglas and Yaping (2017), who also recommend that the value be higher than those listed by the AS3959.

*(NB: Citings used for FFDI recs 110 HAF.9002.0001.0002. 111 HAF.9002.0001.0002. 112 HAF.9002.0001.0002. 113 PMC.0001.0002.0446. were from Ministerial Council docs/papers noted as exhibits rather than submissions.)*

## 6 Australian Government response

**ABC Report, 13 Nov 2020:** The Federal Government says it will create a new law that will allow it to declare a national state of emergency if needed during future natural disasters.

The 80 recommendations from the Royal Commission provided advice on a range of areas, from the coordination of all levels of government during emergencies, warning systems for the public, climate data, the role of the Australian Defence Force and how charities and other groups can best respond in the wake of disasters.

While the Government supported, or supported in principle, most of the 55 recommendations directed at it specifically or all levels of government, it will not take on board the recommendation to establish a sovereign aerial firefighting fleet.

The Government has supported, or supported in principle, most of the recommendations. It will introduce legislation to give it the power to declare a national state of emergency. It is not supporting the creation of a national aerial firefighting fleet. The Government's response comes on the same day as the latest Bureau of Meteorology and the CSIRO biannual report on the climate which shows Australia is already experiencing climate change.

"One of the key findings, conclusions, of the royal commission was that the locked-in impacts of climate change already that are there largely set an elevated risk for the next 20 years," Prime Minister Scott Morrison said. "The report actually says that, regardless of what might happen in terms of emissions reduction, that is a known quantity. As a result, a key part of dealing with climate change in this country is dealing with the resilience to what is already there. The Government will also be establishing a new national disaster recovery agency that will look after all natural disasters. That will bring together the current flood and drought agencies and bushfire agencies," Mr Littleproud said.



**Attachment 1.** Table 1. RCNND A Report Chapter Summary: Key Report Chapters, recommendations and points (including relevant page numbers for easy reference back to the original RCNND A Report).

| Chapter Title  | RCNND A Report<br>Page no. | Summary of recommendations and key points   | RCNND A Report<br>Page no.  |
|--|----------------------------|---|-----------------------------|
| Overview - Need for strategic leadership<br><br>List of all 80 Recommendations |                            | 51. ... establish a senior ministerial forum, supporting National Cabinet, to make strategic decisions about national natural disaster arrangements.<br><br>57. A national entity dedicated to championing resilience across the nation should be established.... | 25<br><br>26<br><br>34 - 41 |
| 2. Natural disaster risk<br>(background)                                       | 55                         | No recommendations<br><br>Points 2.4, 2.7, 2.9  | 55                          |
| 3. National Coordination Arrangements  | 73                         | Points 3.3, 3.5<br><br>3.121  | 74<br><br>96                |
| 4. Supporting better decisions   | 110                        | 4.3 Implementation of the National Disaster Risk Information Services Capability,<br><br>4.4 Features of the National Disaster Risk Information Services Capability<br><br>4.5 National climate projections   | 121<br><br>121              |



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|   |     | 4.6 Consistent impact data standards   | 125 |
|   |     | 4.7 Collection and sharing of impact data  | 133 |
|   |     |  | 133 |
| 5. Declaration of national emergency                          | 135 | <p><b>Recommendation 5.1 Make provision for a declaration of a state of emergency</b></p> <p>The Australian Government should make provision, in legislation, for a declaration of a state of national emergency. The declaration should include the following components:</p> <ol style="list-style-type: none"> <li>1. The ability for the Australian Government to make a public declaration to communicate the seriousness of a natural disaster.</li> <li>2. Processes to mobilise and activate Australian Government agencies quickly to support states and territories to respond to and recover from a natural disaster.</li> <li>3. The power to take action without a state or territory request for assistance in clearly defined and limited circumstances.</li> </ol> | 149 |
| 6. National emergency response capability                     | 152 |  | 152 |
| 7. Role of the Aust Defence Force                             | 185 |  | 185 |
| 8. National aerial firefighting capabilities and arrangements | 203 |  | 203 |



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|-------------------------|-----|--|-----|
| 9. Essential Services   | 225 | 9.2 Comprehensive information- State and territory governments should include road closure and opening information on all roads within their borders on public apps.                                     | 236 |
|                         |     | 9.3 Provision of information - State and territory governments should provide information to the public on the closure and opening of roads.   |     |
|                         |     | 9.4 Collective awareness and mitigation of risks to critical infrastructure.   |     |
|                         |     | 9.5 Improving coordination arrangements between critical infrastructure sectors and with government.   | 236 |
| 10. Community education | 245 |  | 240 |
|                         |     |  | 244 |
|                         |     |  |     |
| 10. Community education | 245 | No recommendations, (points 10.1, 10.3,4,5,6,7,8, 10.13)<br><br>10.7 Need to promote and encourage disaster-resilient communities<br><br>10.13 Education is key to informing and empowering communities. | 245 |
| 11. Emergency planning  | 252 | 11.1 Responsibility for local government disaster management capability and capacity).   | 261 |
|                         |     | 11.2 Resource sharing arrangements between local governments.  | 261 |



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|  |     |  |                       |
| 12. Evacuation planning and shelters   | 263 |  | 263                   |
| 13. Emergency information and warnings | 284 | <p>13.1 Development and implementation of the Australian Fire Danger Rating System.</p> <p>13.2 Education on the Australian Fire Danger Rating System.</p>   | <p>294</p> <p>294</p> |
| 14. Air quality                        | 310 |  | 310                   |
| 15. Health                             | 330 |  | 330                   |
| 16. Wildlife and heritage              | 352 | <p>16.1 Environmental data -Australian, state and territory governments should ensure greater consistency and collaboration in the collation, storage, access and provision of data on the distribution and conservation status of Australian flora and fauna.</p> <p>Points 16.4, 16.53.</p> <p>Point 16.4 ..... there is a need to better integrate environment and heritage needs into emergency planning and response.</p> | <p>363</p> <p>353</p> |



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| 17. Public and private Land Management        | 365 | <p>17.1 Public availability of fuel load management strategies.</p> <p>17.2 Assessment and approval processes for vegetation management, bushfire mitigation and hazard reduction.</p> <p>17.3 Classification, recording and sharing of fuel load data.</p>   | <p>378</p> <p>381</p> <p>385</p> |
| 18. Indigenous land and fire management       | 386 | <p>Recommendation 18.1 Indigenous land and fire management and natural disaster resilience. Australian, state, territory and local governments should engage further with Traditional Owners to explore the relationship between Indigenous land and fire management and natural disaster resilience.</p> <p>Recommendation 18.2 Indigenous land and fire management and public land management. Australian, state, territory and local governments should explore further opportunities to leverage Indigenous land and fire management insights, in the development, planning and execution of public land management activities.</p> | <p>396</p> <p>396</p>            |
| 19. Land use planning and building regulation | 398 | <p>19.1 Communication of natural hazard risk information to individuals.</p> <p>19.2 Guidance for insurer-recognised retrofitting and mitigation.</p>   | 406                              |



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|  |     | 19.3 Mandatory consideration of natural disaster risk in land-use planning decisions.<br>19.4 National Construction Code.  | 410<br><br>411<br><br>414 |
| 20. Insurance  | 415 |  | 415                       |
| 21. Coordinating relief and recovery                       | 426 |  | 426                       |
| 22. Delivery of recovery services and financial assistance | 454 |  | 454                       |
| 23. National research and emergency technology             | 488 | No recommendations<br><br>23.52 There are opportunities to develop and utilise technologies in all phases of natural disaster management. This should not just be through the development of new technology, but also through better use of existing technology. | 497                       |
| 24. Assurance and accountability                           | 501 |  | 501                       |



**Attachment 2.** Table 2: QFBC/Healthy Land and Water Submission Key Recommendations: Aligned with the relevant recommendations from the RCNDA Report (including relevant page numbers for easy reference back to the original Report)

| QFBC Submission                                 | RCNDA Report  | RCNDA Report   | RCNDA Report Page no. |
|---|---|--|-----------------------|
| Key Recommendations                             | Relevant Chapter  | Relevant Recommendations/Points  |                       |
| 1. Applied Fire Science Research                | 4. Supporting better decisions<br>13. Emergency information and warnings<br>16. Wildlife and heritage<br>23. National research and emergency technology | <i>Pt 4.24 The pursuit of nationally consistent data has been raised by a number of reviews and inquiries. Since at least 2002 there have been ongoing calls for national consistency in disaster information and data.</i><br><br>Recommendation 4.3 Implementation of the National Disaster Risk Information Services Capability.<br><br>Recommendation 4.4 Features of the National Disaster Risk Information Services Capability.<br><br>Recommendation 4.5 National climate projections.<br><br>Recommendation 4.6 Consistent impact data standards.<br><br>Recommendation 4.7 Collection and sharing of impact data. | 115                   |
| 2. Collaborative and long-term engagement model | 10. Community education   | 10.7 Need to promote and encourage disaster-resilient communities.<br><br>10.13 Education is key to informing and empowering communities.  | 247<br><br>251        |
| 3. Cross tenure fire management planning        | 11. Emergency Planning  | Recommendation 11.1 Responsibility for local government disaster management capability and capacity. State and territory governments should take responsibility for the capability and capacity of local governments to which they have delegated their responsibilities in  | 261                   |



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|                             | 9. Essential Services                  | <p>preparing for, responding to, and recovering from natural disasters, to ensure local governments are able to effectively discharge the responsibilities devolved to them.</p> <p>Recommendation 9.4 Collective awareness and mitigation of risks to critical infrastructure.</p> <p>The Australian Government, working with state and territory governments and critical infrastructure operators, should lead a process to:</p> <ol style="list-style-type: none"> <li>1. Identify critical infrastructure.</li> <li>2. Assess key risks to identified critical infrastructure from natural disasters of national scale or consequence.</li> <li>3. Identify steps needed to mitigate these risks.</li> <li>4. Identify steps to make the critical infrastructure more resilient.</li> <li>5. Track achievement against an agreed plan.</li> </ol> | 240 |
|                             | 17. Public and private Land Management | <p>17.2 Assessment and approval processes for vegetation management, bushfire mitigation and hazard reduction. Australian, state and territory governments should review the assessment and approval processes relating to vegetation management, bushfire mitigation and hazard reduction to:</p> <ol style="list-style-type: none"> <li>1. Ensure that there is clarity about the requirements and scope for landholders and land managers to undertake bushfire hazard reduction activities.</li> <li>2. Minimise the time taken to undertake assessments and obtain approvals.</li> </ol>  | 381 |
| 4. Education and engagement | 10. Community education                | 10.7 Need to promote and encourage disaster-resilient communities  | 247 |
|                             |  | 10.13 Education is key to informing and empowering communities.  | 251 |



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|                               | 13. Emergency information and warnings   | 13.1 Development and implementation of the Australian Fire Danger Rating System.<br><br>13.2 Education on the Australian Fire Danger Rating System.   | 294<br><br>295                       |
| 5. Fuel management            | 17. Public and private Land Management<br><br>23. National research and emergency technology | 17.1 Public availability of fuel load management strategies.<br><br>17.2 Assessment and approval processes for vegetation management, bushfire mitigation and hazard reduction.<br><br>17.3 Classification, recording and sharing of fuel load data.<br><br>23.50 Improvements in technology have helped resolve many natural disaster challenges over recent decades. However, in many areas, available technology has not been leveraged or applied to its full extent. For example: <ul style="list-style-type: none"> <li>• <b>Fuel load estimates</b> are often based on visual assessments, yet remote sensing and other technologies such as radar and LiDAR,<sup>37</sup> that improve the direct capture and spatial mapping of fuel loads across landscapes and ecosystems, are available.</li> <li>• In some parts of Australia, early detection of fires is undertaken using manned fire towers to spot smoke, yet multiple early fire detection technologies exist, such as remotely piloted aircraft and sensors.</li> <li>• Some jurisdictions use manual recording of information during impact assessments, yet there are digital platforms that are centrally connected and allow instantaneous sharing.</li> </ul> | 378<br><br>381<br><br>385<br><br>497 |
| 6. Indigenous fire management | 18. Indigenous land and fire management<br>4. Supporting better decisions                    | Recommendation 18.1 Indigenous land and fire management and natural disaster resilience. Australian, state, territory and local governments should engage further with Traditional Owners to explore the relationship between Indigenous land and fire management and natural disaster resilience.  | 396<br><br>396                       |



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|  |   | <p>Recommendation 18.2 Indigenous land and fire management and public land management. Australian, state, territory and local governments should explore further opportunities to leverage Indigenous land and fire management insights, in the development, planning and execution of public land management activities.</p> <p>4.80 Australian, state and territory governments should identify all existing data collected and maintained by them in respect of the elements that may be at risk of a natural hazard event now and in the future, including: individuals; dwellings or households and communities; buildings and structures; public facilities and infrastructure assets; agricultural commodities; environmental assets; <b>cultural assets</b>, and business activity.</p>   | 128   |
| 7. National reporting framework and fire history data resource | 3. National Coordination Arrangements<br>4. Supporting better decisions | <p>4.43 Although there are clear benefits in nationally coordinated data and information, we also acknowledge that the best level for making decisions can be at a local level – national harmonisation of data and technology should not be at the expense of relevance to local communities, nor compromise local community responses.</p> <p>4.81 Australian, state and territory governments should take steps to harmonise, at a national level, exposure information.</p> <p>4.82 National Exposure Information System (NEXIS) and Australian Exposure Information Platform (AEIP) should be maintained and improved.</p> <p>4.103 The National Bushfire Recovery Agency has created the Bushfire Recovery Data Working Group to identify and develop a series of nationally consistent reporting metrics, produce an agreed set of data sharing principles, and facilitate all jurisdictions in communicating and referencing the same foundation datasets. By September 2020, this working group had developed a set of consistent key impact metrics that can be used in the future to provide more complete impact data. NSW, Victoria and the NT drew our attention to the work of the ANZEMC's Community Outcomes and Recovery Sub-committee data sharing project which seeks</p> | <p>121</p> <p>129</p> <p>129</p> <p>132</p> |



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|                                   |   | <p>to develop a methodology for collecting and assessing data on recovery needs and to develop a mechanism to share recovery needs assessments. It is unclear to what extent both pieces of work overlap, and care should be taken to avoid duplication of effort.</p> <p>4.104 To provide a sound basis for short and long term decision-making, impact data needs to be comprehensive, accurate, consistent and timely. Nationally consistent reporting metrics, and an agreed set of data sharing principles between states and territories, which apply across different hazards, should be pursued.</p> <p>4.110 State, territory and national processes should ensure the sharing of consistent, accurate, comprehensive, and timely data. Platforms should be interoperable, both intra-jurisdictionally and inter-jurisdictionally.</p> <p>4.111 As part of this, consideration should be given to greater incorporation of data collected from non-government organisations and improving the capacity of entities responsible for conducting impact assessments.</p> | <p>132</p> <p>133</p>                       |
| 8. Planning decisions and permits | 19. Land use planning and building regulation | <p>19.1 Communication of natural hazard risk information to individuals.</p> <p>19.2 Guidance for insurer-recognised retrofitting and mitigation.</p> <p>19.3 Mandatory consideration of natural disaster risk in land-use planning decisions.</p> <p>19.4 National Construction Code:</p> <p>The Australian Building Codes Board, working with other bodies as appropriate, should: (1) assess the extent to which AS 3959:2018 Construction of buildings in bushfire-prone areas, and other relevant building standards, are effective in reducing risk from natural hazards to lives and property, and (2) conduct an evaluation as to whether the National Construction Code should be amended to specifically include, as</p>   | <p>406</p> <p>410</p> <p>411</p> <p>414</p> |



|                    |  |  |                                  |
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|                    |  | an objective of the code, making buildings more resilient to natural hazards.  |                                  |
| 9. Planned Burning | 17. Public and private Land Management   | <p>17.1 Public availability of fuel load management strategies.</p> <p>17.2 Assessment and approval processes for vegetation management, bushfire mitigation and hazard reduction.</p> <p>17.3 Classification, recording and sharing of fuel load data.</p>  | <p>378</p> <p>381</p> <p>385</p> |
| 10. Resourcing     | <p>Throughout document, in particular Chapter 11</p> <p>11. Emergency Planning</p>                   | <p>Recommendation 11.1 Responsibility for local government disaster management capability and capacity. State and territory governments should take responsibility for the capability and capacity of local governments to which they have delegated their responsibilities in preparing for, responding to, and recovering from natural disasters, to ensure local governments are able to effectively discharge the responsibilities devolved to them.</p> <p>Recommendation 11.2 <b>Resource sharing arrangements</b> between local governments. State and territory governments should review their arrangements for sharing resources between their local governments during natural disasters, including whether those arrangements:</p> <ol style="list-style-type: none"> <li>1. Provide sufficient surge capacity.</li> <li>2. Take into account all the risks that the state or territory may face during a natural disaster.</li> </ol> | 261                              |
| 11. Smart Tools    | <p>17. Public and private Land Management.</p> <p>23. National research and emergency technology</p> | <p>17.88 There is benefit in states and territories developing and utilising remote sensing and other technologies (for example LiDAR) to improve the capture of fuel load data.</p> <p>23.52 There are opportunities to develop and utilise technologies in all phases of natural disaster management. This should not just be through the</p>  | <p>383</p> <p>497</p>            |



|   |                           |   |                                  |
|---|---------------------------|---|----------------------------------|
|   |                           | development of new technology, but also through better use of existing technology.  |                                  |
| 12. Threatened species and high value areas | 16. Wildlife and heritage | <p>Recommendation 16.1 Environmental data -Australian, state and territory governments should ensure greater consistency and collaboration in the collation, storage, access and provision of data on the distribution and conservation status of Australian flora and fauna.</p> <p>16.4 ... there is a need to better integrate environment and heritage needs into emergency planning and response. This includes working with relevant non-government organisations to establish best practice arrangements and responses relevant to emergency wildlife response and recovery. Greater consistency and collaboration is also required in the collation, storage, access and provision of data for Australian flora and fauna.</p> <p>16.53,... a natural hazard can be identified as a 'key threatening process'. To date, no natural hazards have been listed as such. We heard that 'things are listed as, or could be listed as a key threatening process if they could cause a species or an ecological community to become endangered, or threatened, or to become more threatened or endangered'. We heard that, in 2008 fire regimes was nominated as a key threatening process. No decision was made at that time to give effect to the nomination, and renewed consideration was sought in 2018. In light of increasing anticipated impacts of natural hazards, we suggest this nomination be reconsidered.</p> | <p>363</p> <p>353</p> <p>363</p> |

## Attachment 3. Summary of points and recommendations from RCNND Report relevant to Healthy Land and Water/QFBC and partners

### Chapter 1. Introduction (p47)

Need for strategic leadership

**51.** Australian, state and territory governments should also establish a **senior ministerial forum, supporting National Cabinet, to make strategic decisions about national natural disaster arrangements**. This forum should consider both long-term strategic policy matters directed at making Australia more resilient, and shorter-term strategic matters concerning specific national disasters, like the 2019-2020 bushfires.

**57. A national entity dedicated to championing resilience across the nation should be established.** Its remit should be to think broadly about all of the measures necessary to make the country resilient to natural disasters, and plan and respond accordingly. It should focus on reducing long-term disaster risk and harmonising approaches across Australia. It should be accountable to ministers and, in turn, the Australian public. (p26)

### Chapter 2. Natural disaster risk (p54)

**2.4** Climate change has already increased the frequency and intensity of extreme weather and climate systems that influence natural hazards (p55).

**2.7** We can also expect more concurrent and consecutive hazard events (p55).

**2.9** We must assess the risk of multiple hazard events occurring concurrently or consecutively. We must look for opportunities to reduce the exposure of communities to natural hazard events and increase the capacity of communities to prepare for and recover from their impacts. (p55)

**4.92** As noted in Chapter 2: Natural disaster risk, the **Bushfire and Natural Hazards Cooperative Research Centre and the University of New England launched the Australian National Disaster Resilience Index**. The Index provides a tool to understand, at a national level, how resilience varies in different regions of Australia, providing a means to track change over time and to allocate resources accordingly. The Australian Disaster Resilience Index assesses resilience based on two sets of capacities—coping capacity and adaptive capacity, through a combination of social, economic, natural environment, built environment, governance and geographical factors.

### Chapter 3. National Coordination Arrangements (p74)

**3.3** Existing arrangements have grown organically over time to fill a void, and have largely served Australia well. The Australasian Fire and Emergency Service Authorities Council (AFAC), a not-for-profit company, has led on specific areas related to fire and emergency services. AFAC represents the Australian and New Zealand fire and emergency services sector and is primarily comprised of state and territory government fire and emergency services agencies (p74).

**3.5** The changes to Australia's national arrangements for coordinating disaster management that are contemplated in this chapter are substantive and structural. It has therefore been necessary to set out the current arrangements in detail. It is also necessary to do so because much of the detail was not on the public record (p74).

**3.121** Ministers can, and for practical reasons must, delegate some decisions to senior officials. For example, ministers cannot, and should not, be making day-to-day operational decisions about the use of fire and emergency services, let alone tactical decisions on the fire ground itself. This would be inconsistent with both the principles of subsidiarity and operational independence, and significantly reduce the flexibility of combat agencies to respond effectively to disasters. As explained by AFAC:

*...the idea that a body of politicians, however senior, should be making decisions about operational response would appear heterodox to the majority of professional emergency managers. Operational decisions may need to be made in a timeframe of minutes and against a breadth and depth of technical experience that political leaders do not have. (p96)*

#### **Recommendation 3.1 Forum for ministers**

Australian, state and territory governments should restructure and reinvigorate ministerial forums with a view to enabling timely and informed strategic decision-making in respect of:

1. Long-term policy improvement in relation to natural disasters.
2. National preparations for, and adaptation to, natural disasters.
3. Response to, and recovery from, natural disasters of national scale or consequence.

Including, where appropriate, through the National Cabinet or equivalent intergovernmental leaders' body (p99).

#### **Recommendation 3.2 Establishment of an authoritative disaster advisory body**

Australian, state and territory governments should establish an authoritative advisory body to consolidate advice on strategic policy and relevant operational considerations for ministers in relation to natural disasters (p99).

### **Chapter 4. Supporting better decisions (p110) links to Chapter 3 and 23**

**4.19** Bringing this data together (data generated at a variety of scales, including national-scale products produced through satellite imagery and modelling, down to local and state-scale data generated using field-based techniques, remote sensing and modelling, (4.18), at a national scale, can result in a patchwork of inconsistent data of variable quality, at different scales and related to different periods. .... variability (in risk assessment methodology) limits the ability to bring together the outcomes of these risk assessments in a meaningful or comparable way. A further limitation is that disaster risk assessment is most effective when undertaken at a localised level, recognising context and specific details around hazards, vulnerability and exposure. When aggregated to a national level, the context and meaning is largely lost (p114).

**4.20** Existing risk assessment and management approaches are useful for some sorts of natural hazards and categories of risk, but are inadequate when dealing with cumulative and cross scale issues, or situations where the likelihood is low but the consequences are catastrophic.

**4.24** The pursuit of nationally consistent data has been raised by a number of reviews and inquiries. Since at least 2002 there have been ongoing calls for national consistency in disaster information and data (p115).

#### **Pursuing consistent data: harmonisation versus standardisation (p117)**

**4.31** A harmonisation approach brings together various types, levels and sources of data such that they can be made compatible and comparable. A standardisation approach relies on agreed minimum standards as to how data are recorded, collated and stored.

**4.32** Harmonisation differs from standardisation in that it does not impose a single standard, methodology or norm, but rather seeks to find ways of integrating information gathered through disparate methodologies. A harmonisation approach allows information systems to be brought together to ensure comparability of the data delivered by those systems and provide a broader picture. It also allows for the integration of the best parts of each system, without replacing the systems already being used by each state and territory.

**4.43** Although there are clear benefits in nationally coordinated data and information, we also acknowledge that **the best level for making decisions can be at a local level** – national harmonisation of data and technology should not be at the expense of relevance to local communities, nor compromise local community responses (p121).

**Recommendation 4.3 Implementation of the National Disaster Risk Information Services Capability.**

Australian, state and territory governments should support the implementation of the National Disaster Risk Information Services Capability and aligned climate adaptation initiatives. (p121)

**Recommendation 4.4 Features of the National Disaster Risk Information Services Capability.** The National Disaster Risk Information Services Capability should include tools and systems to support operational and strategic decision making, including integrated climate and disaster risk scenarios tailored to various needs of relevant industry sectors and end users. (p121)

**4.57** We heard from CSIRO that **regional climate models can be used to better understand and simulate potential disaster extremes at a regional and local scale.** These climate projections are tailored to enable impact assessment and adaptation planning, especially in the natural resources management sector. This is sometimes referred to as 'down-scaling' (p124).

**4.61** A number of state and territory governments have produced down-scaled regional climate projections for risk assessments and adaptation planning to meet the needs of their own state or territory. For example: The Victorian, **Queensland** and Tasmanian governments have each partnered with the CSIRO to produce downscaled climate projection datasets (p125).

**4.65** End users may need education and support to use data on climate trends effectively, including scenarios for stress testing disaster response and resilience. Tools should be co-developed and tailored to meet the needs of particular end-users such as land-use planners or emergency managers. State and territory governments should also build capacity and tools to better integrate climate and weather intelligence into disaster planning mitigation and response and provide **support for local governments** to use this intelligence (p125).

**Recommendation 4.5 National climate projections** (p126). Australian, state and territory governments should produce downscaled climate projections:

1. To inform the assessment of future natural disaster risk by relevant decision makers, including state and territory government agencies with planning and emergency management responsibilities.
2. Underpinned by an agreed common core set of climate trajectories and timelines.
3. Subject to regular review.

**4.80** Australian, state and territory governments should identify all existing data collected and maintained by them in respect of the elements that may be at risk of a natural hazard event now and in the future, including:

- Individuals.
- Dwellings or households and communities.
- Buildings and structures.

- Public facilities and infrastructure assets.
- Agricultural commodities.
- Environmental assets.
- Cultural assets.
- Business activity (p128).

**4.81** Australian, state and territory governments should take steps to **harmonise, at a national level, exposure information** (p129).

**4.82 National Exposure Information System (NEXIS)** and Australian Exposure Information Platform (AEIP) should be maintained and improved (p129).

**4.103** The **National Bushfire Recovery Agency has created the Bushfire Recovery Data Working Group** to identify and develop a series of nationally consistent reporting metrics, produce an agreed set of data sharing principles, and facilitate all jurisdictions in communicating and referencing the same foundation datasets. By September 2020, this working group had developed a set of consistent key impact metrics that can be used in the future to provide more complete impact data. NSW, Victoria and the NT drew our attention to the work of the ANZEMC's Community Outcomes and Recovery Subcommittee data sharing project which seeks to develop a methodology for collecting and assessing data on recovery needs and to develop a mechanism to share recovery needs assessments. It is unclear to what extent both pieces of work overlap and care should be taken to avoid duplication of effort (p132).

**4.104** To provide a sound basis for short and long term decision-making, impact data needs to be comprehensive, accurate, consistent and timely. Nationally consistent reporting metrics, and an agreed set of data sharing principles between states and territories, which apply across different hazards, should be pursued (p132).

**4.110** State, territory and national processes should ensure the sharing of consistent, accurate, comprehensive and timely data. Platforms should be interoperable, both intra-jurisdictionally and inter-jurisdictionally (p133).

**4.111** As part of this, consideration should be given to greater incorporation of data collected from non-government organisations and improving the capacity of entities responsible for conducting impact assessments (p133).

#### **Recommendation 4.6 Consistent impact data standards**

Australian, state and territory governments should work together to develop consistent data standards to measure disaster impact.

#### **Recommendation 4.7 Collection and sharing of impact data**

Australian, state and territory governments should continue to develop a greater capacity to collect and share standardised and comprehensive natural disaster impact data.

## **Chapter 9 Essential Services (p225)**

**9.5** There is also scope for more to be done to improve the identification, and mitigation, of natural disaster risks to electricity and telecommunications critical infrastructure assets. We heard that awareness of natural disaster risks to specific assets (such as powerlines and telecommunications mobile towers) varies between government and sectors, as do the actions taken to mitigate these risks. Given that electricity and telecommunications are highly interconnected, a holistic

understanding of risks and the mitigations applied is required to prevent outages and facilitate the rapid restoration of services (p226).

**9.6** We also heard that existing processes for facilitating coordination and information sharing between critical infrastructure operators and government are not necessarily working as effectively as they need to be, and that there are opportunities for improvements to be made (p226).

**9.11** A disruption to one essential service can trigger failures in dependent services (see Figure 35).<sup>4</sup> For example, a damaged powerline can cause a power outage to a mobile telecommunications tower, which can then cause an outage in mobile telecommunications coverage (p227).

### **Recommendation 9.2 Comprehensive information**

State and territory governments should include road closure and opening information on all roads within their borders on public apps (p236).

### **Recommendation 9.3 Provision of information**

State and territory governments should provide information to the public on the closure and opening of roads. Information should be provided in real-time, or in advance based on predictions, where possible (p236).

**9.67** Awareness of critical infrastructure assets and their importance is vital to informing preparedness and response efforts (p238).

### **Recommendation 9.4 Collective awareness and mitigation of risks to critical infrastructure (p240)**

The Australian Government, working with state and territory governments and critical infrastructure operators, should lead a process to:

1. Identify critical infrastructure.
2. Assess key risks to identified critical infrastructure from natural disasters of national scale or consequence.
3. Identify steps needed to mitigate these risks.
4. Identify steps to make the critical infrastructure more resilient.
5. Track achievement against an agreed plan.

**9.81** We heard that the peak bodies of both industry sectors, being the Communications Alliance and Energy Networks Australia, through a working group chaired by NBN Co, are currently developing guidelines aimed at improving information sharing and coordination arrangements during disasters, and we encourage them, and their members, in this effort (p241).

**9.82** Governments have led a range of mechanisms to facilitate information sharing between critical infrastructure operators. One such mechanism is the **Trusted Information Sharing Network (TISN)**, managed by the Department of Home Affairs. The aim of the TISN is to facilitate engagement between various sectors on improving critical infrastructure resilience in an all-hazards context. We heard that the TISN has supported information sharing on natural disaster preparedness, but has been less helpful in facilitating information sharing during incidents and that participation in the TISN is voluntary.

**9.83** The need for improvement to the TISN is acknowledged by the Department of Home Affairs, with it stating 'the experience of the 2019-2020 bushfire season and COVID-19 has demonstrated that we need to do more to build close partnerships with industry and to connect them with the information and capabilities of the Australian Government'. We note that the Department of Home Affairs is currently updating the TISN, and as part of this process we encourage it to consider how the TISN

could better facilitate operational coordination between critical infrastructure operators during large-scale natural disasters.

**Recommendation 9.5 Improving coordination arrangements between critical infrastructure sectors and with government (p244)**

The Australian Government should work with state and territory governments and critical infrastructure operators to improve information flows during and in response to natural disasters:

1. Between critical infrastructure operators.
2. Between critical infrastructure operators and government.

**Chapter 10. Community education (p245)**

**10.1** Preparing for natural disasters is not the sole domain of governments and agencies. Individuals and communities also have an important role in ensuring that, if a disaster were to strike, they are prepared to manage the consequences.

**10.3** In encouraging individual and community preparedness for natural disasters, governments have a critically important role in providing information on disaster risks via community education and engagement programs. These education and engagement programs are key to informing and empowering individuals and communities, and they should be fit for purpose – accounting for changing risk profiles and community demographics.

**10.4** We encourage efforts by governments to deliver, evaluate, and improve these programs, to ensure that individuals and communities are resilient to natural disasters.

**10.5** Individuals and communities, particularly those in high-risk areas, have a responsibility to be prepared for natural disasters. For individuals and communities, planning and preparing for a natural disaster can minimise injury and damage to property or possessions while reducing harm and trauma. Most importantly, it can be the difference between life and death.

**10.6** Individuals and communities, if given the right information about the risks to which they are exposed, have the opportunity to act and take meaningful action to prepare for natural disasters.

**10.7 Need to promote and encourage disaster-resilient communities.**

**10.8** Community education and engagement programs have an important role in educating and engaging communities. Governments, emergency service agencies and non-government organisations must continue to extend and use these programs to encourage disaster resilience within their communities and to provide accessible, accurate and authoritative information. **This empowers people at all levels to become more self-reliant and better prepared.**

**10.13** Education is key to informing and empowering communities. Education and engagement programs should account for changing risk profiles and community demographics to ensure that they are fit for purpose and support individual and community resilience to natural disasters. Programs must have all of the information people need to make informed decisions.

**No listed recommendations**

**Chapter 11. Emergency planning (p257)**

**11.17** Australian, state, territory and local governments should include stakeholders with relevant capabilities and expertise, at appropriate times, in emergency planning processes. (p257)

#### **Local government disaster management capabilities**

**11.22** The capability and capacity of local governments to fulfil the responsibilities delegated to them appear to depend on factors including their relative size, natural disaster risk profile, demographics and the resources available to them (p258).

The Queensland Emergency Risk Management Framework (QERMF) Risk Management Process provides the capability for local governments to assess resources available for disaster management. That includes a review of the disaster risk profile of the local government area or district by the Hazard and Risk Unit within QFES, and an 'action plan' provided to the local or district disaster management group. The risk assessment process enables local governments to identify and take steps to rectify deficiencies in their resources. If rectification is not possible at the local government level due to a lack of capacity, funding or resources, the QERMF classifies this as a 'residual risk' which can be escalated to the district level for further evaluation and additional support if necessary.

The Queensland Inspector-General of Emergency Management (IGEM) also conducts reviews of district and local disaster management capability, through reviewing the self-assessments of local disaster management plans and reviewing district capability on an as-needs basis. We discuss the role of IGEMs further in Chapter 24: Assurance and accountability.

#### **Recommendation 11.1 Responsibility for local government disaster management capability and capacity (p261)**

State and territory governments should take responsibility for the capability and capacity of local governments to which they have delegated their responsibilities in preparing for, responding to, and recovering from natural disasters, to ensure local governments are able to effectively discharge the responsibilities devolved to them.

#### **Recommendation 11.2 Resource sharing arrangements between local governments (p261)**

State and territory governments should review their arrangements for sharing resources between their local governments during natural disasters, including whether those arrangements:

- (1) provide sufficient surge capacity, and
- (2) take into account all the risks that the state or territory may face during a natural disaster.

## **Chapter 13. Emergency information and warnings (p284)**

### **Understanding your fire danger risk**

**13.26** Fire danger ratings provide a simplified measure of fire danger to assist in the management of bushfires. Theoretically, fire danger refers to the risks posed by bushfires; covering the likelihood of a fire igniting, rate of spread and difficulty of control of a fire once started, and the value of the assets that could be impacted. However, in practice, most fire danger ratings in use around the world focus on fire behaviour and are typically designed to provide a measure of the difficulty of suppressing or controlling a fire (p289).

**13.27** Most people know of the current Fire Danger Rating System (FDRS) from the roadside fire danger rating signs, like that shown in the image below (p289).

**13.31** The current Forest Fire Danger Index (FFDI) and Grass Fire Danger Index (GFDI), are based on two fire behaviour models from the 1950s and 1960s and do not fully reflect the variability of landscapes across Australia. The FFDI and GFDI also do not accurately capture the influence of fuels on fire behaviour; primarily because of the way in which fuel loads are estimated for the purposes of calculating both indices. These limitations have been the driving factor in pursuing the Australian Fire Danger Rating System (p291).

#### **Improving the science to understand fire risk**

**13.34** It is widely acknowledged that there are limitations with the FDRS's reliance on the FFDI and GFDI. Most notably, research has shown that fires behave differently in different vegetation types because of the continuity and structure of the fuels. Australia has a wide range of vegetation types with different structural characteristics that influence fire behaviour. The FDRS is unable to capture this because it currently uses only two vegetation types, forests (FFDI) and grasslands (GFDI). In addition to this, the FFDI and GFDI are currently calculated with limited reference to the structure and mass of fuels in the landscape, and to the extent that fuel structure and mass is considered, there are differences in approach between the states and territories (p291).

**13.35** New research has greatly improved the ability to predict fire behaviour and the potential threat to the community accurately. For example, new fire behaviour models are now available to estimate the intensity and rate of spread of fires more accurately in a range of vegetation types (p291)

**13.44** State and territory governments should ensure that the visual display for the AFDRS and the recommended action for individuals are nationally consistent (p293).

#### **Recommendation 13.1 Development and implementation of the Australian Fire Danger Rating System**

State and territory governments should expedite the development and implementation of the Australian Fire Danger Rating System. It should ensure that there is national consistency in the visual display of the AFDRS and action to be taken in response to each rating (p294).

#### **Recommendation 13.2 Education on the Australian Fire Danger Rating System**

State and territory governments should deliver education to ensure that the public understands the new Australian Fire Danger Rating System ratings, the potential danger attached to each rating, and the action that should be taken in response to each rating (p294).

### **Chapter 16. Wildlife and heritage (p352)**

**16.4** There is a need to better integrate environment and heritage needs into emergency planning and response. This includes working with relevant non-government organisations to establish best practice arrangements and responses relevant to emergency wildlife response and recovery. Greater consistency and collaboration is also required in the collation, storage, access and provision of data for Australian flora and fauna (p353).

**16.8** There are more than 100,000 known Indigenous art sites across Australia and there are likely to be even more sites as yet not revealed to or recognised beyond local community groups. The large number of commemorative places poses challenges to their protection and management, particularly in terms of resourcing (p354).

**16.13** Over 330 threatened species and 37 threatened ecological communities protected under the EPBC Act were in the path of the bushfires,<sup>1</sup> and we heard estimates that the number of animals killed 'greatly exceeded' one billion.<sup>15</sup> Additionally, we heard that species and communities, not currently listed as threatened under national environmental law, may now be threatened, as the consequences of the season are better understood (p355).

**16.20** There is a need to better integrate consideration of environment and heritage assets in emergency planning and response. This requires accessible data, including on the location of environmental, heritage and cultural sites, the distribution of species and ecological communities and priorities to guide response efforts (p357).

**16.22** Rapid determination of environmental priorities assists in ensuring timely implementation of strategies to recover from natural hazards (p357).

**16.35** State and territory governments should ensure that effective wildlife response and recovery capabilities are developed and integrated into emergency planning processes for natural disasters. This could include consideration of specific coordination capabilities, such as rapid deployment of appropriately trained personnel (p360).

**16.41** Additionally, in early 2020, to meet the broader need for a 'reliable, agreed, fit for purpose and repeatable national dataset of burnt areas',<sup>44</sup> the Department of Agriculture, Water and the Environment developed and released a **National Indicative Aggregated Fire Extent Dataset (NIAFED)** (p361).

**16.42** The NIAFED aggregated data for the 2019-2020 fire season and provided a cumulative national view of the areas impacted by fires across Australia.<sup>45</sup> According to the Panel, this has provided 'critical' support to its work in prioritising species for urgent intervention (p362).

**16.44** The Department of Agriculture, Water and the Environment noted that 'while it is the best national dataset currently available for this purpose, the limitations of the NIAFED would have affected the accuracy of the derived analyses'. They identified several known issues, including: low accuracy for some data inputs:

- A lack of national coherency due to the variety of mapping methods.
- A lack of information on fire severity in these areas (only outlines of burnt areas are shown) (p362).

#### **Recommendation 16.1 Environmental data**

Australian, state and territory governments should ensure greater consistency and collaboration in the collation, storage, access and provision of data on the distribution and conservation status of Australian flora and fauna. (p363)

**16.49** Although states and territories have primary responsibility for protecting the environment, we heard a number of expert opinions and public comments on Australia's national environmental law (the EPBC Act) in the context of threats to the environment from natural hazards. **Chapter 17: Public and private land management also explores environmental protection in the context of land management and hazard reduction (p363).**

**16.53** We understand that natural hazard risks for wildlife and ecosystems can be considered under the EPBC Act in two main ways: First, natural hazard occurrence or prevalence may factor into the determination that a particular species or ecological community is threatened, and by extension influence the management and protection of that species or community. We heard **fire is noted as a threat for a number of listed species, and factors into conservation advices and recovery plans for these species.** The Interim Report for the EPBC Act review notes that, although the EPBC Act provides for the preparation of recovery plans for threatened species and ecological communities, there is 'no requirement to implement a recovery plan, or report on progress or the outcomes achieved'. It notes that 'under these arrangements it is not surprising that the list of threatened species and communities

has increased over time and there have been very few species that have recovered to the point that they can be removed from the list'.

Secondly, **a natural hazard can be identified as a 'key threatening process'**. To date, no natural hazards have been listed as such. We heard that 'things are listed as, or could be listed as a key threatening process if they could cause a species or an ecological community to become endangered, or threatened, or to become more threatened or endangered'. We heard that, in 2008 fire regimes was nominated as a key threatening process. **No decision was made at that time to give effect to the nomination, and renewed consideration was sought in 2018. In light of increasing anticipated impacts of natural hazards, we suggest this nomination be reconsidered (p363).**

## Chapter 17. Public and Private Land Management (p365)

### Summary (p366)

**17.5** There is strong public interest in, and there are polarising views on, fuel management activities, particularly **prescribed burning**. There is clear benefit in public land managers improving the public's knowledge and understanding of the fuel management.

**17.9** There is an opportunity for Australian, state and territory governments to review their legislation and processes relating to vegetation management, bushfire mitigation and hazard reduction, to ensure that there is clarity about the requirement and scope for landholders and land managers to undertake bushfire hazard reduction activities; and minimise the time that is necessary to obtain approvals.

**17.10** There is widespread support for further investigation, improvement and more cost-effective collection of fuel data using remote sensing and satellite technology. In addition to improving the way in which data are collected, there is also support for a continuation of effort to improve national consistency in the way fuel data are classified, recorded and shared across jurisdictions.

### 17.37 (p 372)

Weather has the greatest influence on bushfire behaviour and that, as fire weather conditions deteriorate, the influence of fuels declines. This means that the benefits of fuel load management activities also decline as fire weather conditions deteriorate. Research suggests that most bushfire-related impacts on lives and property in Australia have occurred in severe, extreme or catastrophic fire weather conditions.

### 17.45 A need for further research (p 373)

Considerable research and scientific attention has been dedicated to fuel management, particularly prescribed burning. There is a need for continuing research to address significant gaps in the science, including in relation to the role of fuels in extreme fires, and the effectiveness and efficiency of fuel management strategies and techniques.

**17.54** Fuel management activities are only one of a number of strategies employed by state and territory fire and land management agencies to mitigate risk from bushfire. Other activities include, for example, community engagement, preparedness and education programs (for example targeting ignition prevention) and construction and maintenance of fire trails (p375).

### Community concerns about fuel management on public land (p375)

**17.56** There is strong interest in, and polarising views on, fuel management activity, particularly prescribed burning to manage fuel loads.

**17.57** We heard many perspectives from public submissions that describe prescribed burning as, in effect, a panacea – a solution to bushfire risk. It is not.

**17.58** Part of the explanation for the strength of views of fuel load management, and prescribed burning in particular, may be due to a lack of community understanding about its effectiveness and the factors that influence the choice of strategy.

**17.62 Disclosure of clear information about fuel management strategies on public land**, including the rationale, intended objectives, degree of implementation, and impact of different strategies and techniques, enables communities living in bushfire-prone areas to be fully informed about the fuel hazard aspect of the risk profile of their surrounding landscape. There was a high degree of support from state and territory governments that they should articulate and make available to the public their respective fuel management strategies, as well as the implementation and outcomes of those strategies.

**17.63** Queensland Parks and Wildlife Services is developing a **Bushfire Risk Management Framework**, which is intended to provide 'a transparent and evidence-based rationale for the management of bushfire risk on all lands that QPWS manages, in a manner that is consistent with government and community expectations, national standards and best practice' (p377).

**Recommendation 17.1 Public availability of fuel load management strategies**

Public land managers should clearly convey and make available to the public their fuel load management strategies, including the rationale behind them, as well as report annually on the implementation and outcomes of those strategies. (p378)

**17.70** Fuel load management on private land is of considerable importance to the protection of lives, property and other assets of value (p379).

**17.82** In considering the appropriateness of different regulatory systems to govern hazard reduction activities, some jurisdictions have highlighted the value of streamlining assessment and approval processes and improving community awareness (p381).

**Recommendation 17.2 Assessment and approval processes for vegetation management, bushfire mitigation and hazard reduction**

Australian, state and territory governments should review the assessment and approval processes relating to vegetation management, bushfire mitigation and hazard reduction to:

1. Ensure that there is clarity about the requirements and scope for landholders and land managers to undertake bushfire hazard reduction activities.
2. Minimise the time taken to undertake assessments and obtain approvals (p381).

**17.88** There is benefit in states and territories developing and utilising remote sensing and other technologies (for example LiDAR) to improve the capture of fuel load data. (p383)

**17.95** Despite good intentions, implementation of the **Bushfire Fuel Classification project** (begun in 2011) stalled during the trial implementation period. Mr Ellis attributed the stoppage to the 'substantial effort involved [for trialling agencies] to remap their existing fuel layers and change their bespoke IT and mapping systems and procedures. 'Additionally, some existing vegetation types could not be translated into the Bushfire Fuel Classification system.

**17.96** Focus then shifted to developing a system of **mapping fuels nationally** to support the development of the AFDRS. The AFDRS's fuel classification also looks at how fuel structure influences

fire behaviour. It uses existing agency data and fuel types based on the existing fire behaviour models used by the AFDRS (p384).

### **Recommendation 17.3 Classification, recording and sharing of fuel load data**

Australian, state and territory governments should develop consistent processes for the classification, recording and sharing of fuel load data (p385).

## **Chapter 18. Indigenous land and fire management (p387)**

**18.4** There is growing recognition of the value of Indigenous land and fire management practices as a way to mitigate the effects of bushfires. This is particularly evident in the north of Australia, where it has been used to reduce the intensity and extent of bushfires. However, conditions enabling Indigenous land management in the north of Australia vary in a number of ways compared to prevailing conditions in southern parts of Australia. There may nevertheless be opportunities to reinvigorate Indigenous land management practices in parts of southern Australia (p387).

**18.5** Australian, state and territory governments are increasingly supporting Indigenous land management practices. There is a desire to generate hazard reduction and environmental benefits, while also improving the resilience of Indigenous communities (p387).

**18.6** All governments should work with Traditional Owners to explore the relationship between Indigenous land management and natural disaster resilience (p387).

**18.7** Governments and land managers should further explore the opportunities for Indigenous land and fire management in land management strategies (p387).

**18.33** We heard of a number of forms of engagement and sharing of knowledge between Indigenous land and fire managers and state and territory fire and land management agencies, including:

- Consultation and partnership arrangements with Indigenous Australians on land and cultural heritage management, including managing bushfire risk.
- Joint Land Management arrangements between governments and Traditional Owners to share responsibility for the management of public land (p391).

**18.34** We heard from jurisdictions that this engagement is reflected and promoted in strategic documents and arrangements. For example, the ACT emphasised that engagement has been incorporated as an action in the ACT's Strategic Bushfire Management Plan. **Queensland's Department of Environment and Science outlines their structured partnerships with Indigenous communities and work underway to prepare Strategic Plans for Gondwana, Riversleigh and K'gari (Fraser Island) World Heritage areas.** These plans will consider approaches to bushfire management. Victoria's Department of Environment, Land, Water and Planning highlighted the development of bespoke partnerships with individual Traditional Owner corporations at a regional level, tailored to reflect their specific interests and capabilities and underpinned by memoranda of understanding (p391).

**18.36** We also heard of instances where support networks and mechanisms have been effective in renewing connection. Firesticks Alliance Indigenous Corporation told us that they help to establish fire programs on Country by working with communities to re-invigorate and share knowledge of how fire should interact with their landscapes (p393).

**18.39** Indigenous land management advocates highlighted benefits of bringing Indigenous and non-Indigenous land managers to learn together. Victor Steffensen from **Firesticks** highlighted the value of

these opportunities, where appropriate, to give 'non-Indigenous people a greater understanding of [Indigenous] culture' as well as an understanding that 'Indigenous fire management is valuable for the future, not just culturally but to look after the environment' (p393).

#### **Recommendation 18.1 Indigenous land and fire management and natural disaster resilience**

Australian, state, territory and local governments should engage further with Traditional Owners to explore the relationship between Indigenous land and fire management and natural disaster resilience (p396).

#### **Recommendation 18.2 Indigenous land and fire management and public land management**

Australian, state, territory and local governments should explore further opportunities to leverage Indigenous land and fire management insights, in the development, planning and execution of public land management activities. (p396)

### **Chapter 19. Land-use planning and building regulation (p398)**

**19.4** The **effectiveness** of some standards intended to mitigate natural hazard risk is currently unclear and should be assessed to ensure that resources spent on mitigation efforts are effective and proportionate. Consideration should be given to the costs and benefits of amending the National Construction Code to add the resilience of buildings to natural hazards as an objective, in addition to the protection of life.

**19.19** Cross Dependency Initiative (XDI), a business specialising in risk analysis, has modelled and analysed natural hazard risks. XDI estimates that over 380,000 properties are currently exposed to 'high natural hazard risk' and this may grow to 735,000 by 2100 – this is in the absence of any new houses being built, due to an increasing frequency and severity of hazards. See Figure 72 (p402).

**19.20** The Insurance Council of Australia (ICA) noted that in the 2019-2020 fire season, 99% of buildings destroyed were within 500m of bushland, and 74% of buildings lost were constructed prior to the introduction of building standard AS 3959.21 Related work from the Bushfire Building Council estimates that:

*90% of buildings in bushfire prone areas in Australia have not been built to bushfire planning and construction regulations because they were built prior to regulation being applied (p403).*

**19.28** States and territory governments should be responsible and accountable for addressing legacy risk. The Australian Government should work with states and territories to address risk where it is efficient and effective to do so. (NSW said it would not support an approach that undermined state responsibilities in this space.<sup>42</sup> We agree with this sentiment (p404).

#### **19.39 Previous inquiries have also recommended better direct communication of risk**

Stakeholders broadly support a mechanism to communicate risk, with most states supporting in principle and noting they would like to be closely involved in any development process. We agree that the development process should be collaborative (p406).

**Recommendation 19.1** Communication of natural hazard risk information to individuals  
State and territory governments should:

1. Each have a process or mechanism in place to communicate natural hazard risk information to households (including prospective purchasers) in 'hazard prone' areas.
2. Work together, and with the Australian Government where appropriate, to explore the development of a national mechanism to do the same (p406).

**19.42** In other inquiries and in a number of submissions from private sector bodies, state and local governments, and emergency responders we heard a desire for greater investment in mitigation.<sup>56</sup> We also heard that mitigation in many cases can be a cost-effective means of managing risk.<sup>57</sup> The CSIRO contended:

*A \$1 investment in climate adaptation or disaster risk reduction saves between \$2 and \$11 in post disaster recovery and reconstruction (p406).*

**19.51** States, territories and local governments should consider if, where, and how it is appropriate for them to create incentives for natural disaster mitigation (p408).

### **Recommendation 19.2 Guidance for insurer-recognised retrofitting and mitigation**

The insurance industry, as represented by the Insurance Council of Australia, working with state and territory governments and other relevant stakeholders, should produce and communicate to consumers clear guidance on individual-level natural hazard risk mitigation actions insurers will recognise in setting insurance premiums (p410).

### **Land use planning**

**19.61** While we heard that land-use planning regimes have improved recently in relation to managing natural hazard risk,<sup>84</sup> we also heard calls from peak bodies, insurers, local governments, and emergency response organisations, for further strengthening of land-use planning regimes (p410).

**19.62** Currently, all states permit homes to be built in bushfire and flood prone areas, and the degree to which planning or building standards act to mitigate risk varies across jurisdictions. Industry groups, local governments, and insurers expressed concern about development continuing to occur in high-risk areas. Former Commissioner of the Queensland Fire and Emergency Services, Lee Johnson, said that land-use planning 'is an area of great weakness in the whole system of dealing with the risk of bushfire in Australia (p410).

**19.66** Since 2002, a number of major inquiries have suggested better integration of risk data into land-use planning regimes.<sup>92</sup> The 2004 National Inquiry on Bushfire Mitigation and Management, said that, to reduce natural hazard risk from bushfires:

*Planning processes [should] ensure that built assets are not placed in areas of high fire risk and that structures meet standards of construction that reduce their vulnerability (p411.)*

### **Recommendation 19.3 Mandatory consideration of natural disaster risk in land-use planning decisions**

State, territory and local governments should be required to consider present and future natural disaster risk when making land-use planning decisions for new developments (p411).

**19.75** The period following a natural disaster provides a brief window to collect data to assess which aspects of buildings made them more or less likely to be damaged or destroyed. Although some bodies such as Risk Frontiers have used existing data to reveal key issues at a high level, we heard of a desire for improved impact data, which we addressed in Chapter 4: Supporting better decisions. For instance, CSIRO has suggested that the creation of a national register of planning and building regulation controls that are, or have been, implemented to manage risk as it is essential to estimating vulnerability and eventual performance of built assets. Currently this information is not aggregated at a state or territory level, must be requested from individual local governments, and assessments are often too time and resource intensive to perform. According to Mr Stingemore, Standards Australia:

*...the better the data that we have available to us, the better our technical committees are able to set levels within a particular standard ... [but] all we really have today are anecdotes and statements available to us that things either did perform well or they did not perform well.*

**19.76** The effectiveness of relevant building standards to manage natural hazard risk should be reviewed using the best available data, and better data should be commissioned if current data are inadequate.

**19.78** In some places the fire danger information used to calculate the **Bushfire Attack Levels (BALs)** for the purposes of AS 3959 is out of date and does not accurately quantify expected risk. For example, in the latest 2018 version of AS 3959 BAL the Forest Fire Danger Index (FFDI) values used are from 2009 rather than more contemporary values or a future-looking FFDI for the life of a structure (p412).

**19.79** In some cases a single fire danger index is applied across a broad area, regardless of differences in vegetation and topography. For example, Queensland has an FFDI of 40 for the whole state, when we were told it should apparently be between 80 and 130.110.

**19.80** Additionally, there are cases where the fire danger index is very different immediately either side of state boundaries, even where vegetation and topography does not differ, such as where Queensland uses an FFDI of 40 and northern NSW uses an FFDI of 80.111.

**19.81** In March 2020, the Council of Australian Governments directed the Building Ministers Forum (BMF) intergovernmental body to consider how the Code could be updated to enhance climate and disaster resilience.112 The ABCB has informed us that a process is currently underway with CSIRO and others to consider how to better account for future climate risks.

**19.82** The data used in relevant building standards that manage natural hazard risk should be updated to reflect the best data available, and use data projections if these projections are relevant and can be given with confidence.

**19.87** Where the National Construction Code can be expanded in a proven, cost-effective way to improve the ability of a structure to withstand damage and destruction of property from natural hazards, it should be.

#### **Recommendation 19.4 National Construction Code (p414)**

The Australian Building Codes Board, working with other bodies as appropriate, should:

1. assess the extent to which AS 3959:2018 Construction of buildings in bushfire-prone areas, and other relevant building standards, are effective in reducing risk from natural hazards to lives and property.
2. conduct an evaluation as to whether the National Construction Code should be amended to specifically include, as an objective of the code, making buildings more resilient to natural hazards.

#### **Chapter 23 National research and emerging technology (p488)**

**23.30** On 24 July 2020, the Australian Government announced funding of \$88.1 million to 'support the transition of the BNHCRC (Bushfire and Natural Hazards Cooperative Research Centre) to a new, world-class research centre for natural hazard resilience and disaster risk reduction' (p493).

**23.31** The new research centre will be co-funded by the states and territories, universities, and industry partners.14 We were told that the Department of Home Affairs will consult with the Department of Industry, Science, Energy and Resources and other stakeholders, such as CSIRO, BNHCRC (Bushfire and Natural Hazards Cooperative Research Centre) and AFAC to determine the governance and funding arrangements for the new research centre (p494).

**23.35** Research partners and end-users of the research should be consulted on research priorities for the new national research centre for natural hazard resilience and disaster risk reduction, including as to the implementation of ideas and the practical applications of the results of that research (p494).

**23.42** The private sector is an essential contributor to long term natural disaster resilience (p496).

**23.50** Improvements in technology have helped resolve many natural disaster challenges over recent decades. However, in many areas, available technology has not been leveraged or applied to its full extent. For example:

- **Fuel load estimates** are often based on visual assessments, yet remote sensing and other technologies such as radar and LiDAR,<sup>37</sup> that improve the direct capture and spatial mapping of fuel loads across landscapes and ecosystems, are available.
- In some parts of Australia, early detection of fires is undertaken using manned fire towers to spot smoke, yet multiple early fire detection technologies exist, such as remotely piloted aircraft and sensors.
- Some jurisdictions use manual recording of information during impact assessments, yet there are digital platforms that are centrally connected and allow instantaneous sharing (p497).

**23.52** There are opportunities to develop and utilise technologies in all phases of natural disaster management. This should not just be through the development of new technology, but also through better use of existing technology (p497).

**23.55** The National Environmental Science Program, NESP is a long-term investment by the Australian Government into environment and climate research. The program's second phase, NESP 2, announced on 27 March 2020, to commence from mid-2021, will promote and build national research depth to respond to the extraordinary environmental challenge of managing the risks of a changing climate. Climate adaptation will be a core mission of all four thematic research hubs of the program (p499).

**23.59** In our view, 'national' research and technology priorities should be identified. It may be that proposed research is national in coverage or relates to a localised research priority but with national significance (p499).

**23.62** There is a need for Australia-wide agreement on a prioritised research agenda that identifies and targets critical knowledge gaps. Such an agenda would assist in ensuring that finite resources are strategically targeted to critical priorities, while reducing duplication.



Level 19, 160 Ann St, Brisbane QLD 4000 | PO BOX 13204 George St, Brisbane QLD 4003  
T. 07 3177 9100 | F. 07 3177 9190 | [hlw.org.au](http://hlw.org.au)